Activities of the Japanese Police in SIP-adus

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SIP
Cabinet Office

SIP-adus promotion Framework of Japanese Government

Cabinet Secretariat
(IT Strategic Headquarters)

↔

Cabinet Office
(Council for Science, Technology and Innovation)

NPA
National Police Agency
Road traffic safety

MIC
Ministry of Internal Affairs and Communications
Info-Communication Technology for ITS

METI
Ministry of Economy, Trade and Industry
Promotion of the automobile industry

MLIT
Ministry of Land, Infrastructure, Transport and Tourism

Road Bureau
Deployment of road infrastructure

Road Transport Bureau
Safety standards for automobile

UTMS (Universal Traffic Management Systems)

AMIS Advanced Mobile Information Systems

AMIS generates information on congestion and travel time, based on traffic information collected at the Traffic Control Center, and provides that information to general drivers.

EPMS Environmental Protection Management Systems

EPMS is intended to reduce traffic pollution such as air pollution and noise to protect the environment. Based on the information, such as exhaust gas concentration, EPMS limits the inflow of vehicles and provides alternative route guidance via traffic information display boards and infrared beacons.

PICS Pedestrian Information and Communication Systems

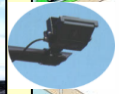
PICS facilitates safe crossing of intersections by pedestrians including the elderly and people with disabilities by providing information by voice, on the name of intersection and the pedestrian signal status.

ITCS Integrated Traffic Control Systems

ITCS is the key components of UTMS, which collects traffic information using sensors. Based on the information collected, ITCS provides optimal signal control and implements advanced functions of each subsystem of UTMS

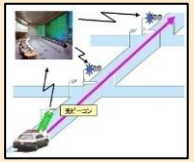
Infrared Beacon

Infrared beacon communicates bidirectionally with in-vehicle equipment.



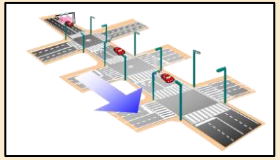
FAST FAST emergency vehicle preemption systems

FAST is intended to assist emergency vehicles to reach an accident site as quickly as possible. Based on the information received from emergency vehicles, the Traffic Control Center extends the green or shortens thered light so that emergency vehicles can arrive at the scene of accidents faster.



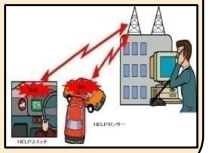
TSPS Traffic Signal Prediction Systems

TSPS encourages safe and eco-friendly driving by providing drivers with driving support information based on information about the color of traffic lights.



HELP Help system for Emergency Life saving and Public safety

In the case of an emergency while driving, such as traffic accidents, HELP reports the accident to the police and emergency services via the operation center, notifying them of the accurate location of the vehicle and the circumstances of the accident.

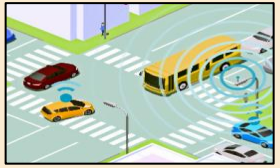


PTPS Public Transportation Priority Systems

PTPS ensures the scheduled operation of buses and other public transport. Based on vehicle ID information, the Traffic Control Center extends the green or shortens the red light so that buses can pass intersections smoothly.

DSSS Driving Safety Support Systems

DSSS grasps traffic situations of an area which is hard to see from driver's position using roadside sensors and alerts drivers via on-board units and thereby prevent traffic accidents caused by careless oversight such as inattentive driving.



Research and development items by NPA in FY2017

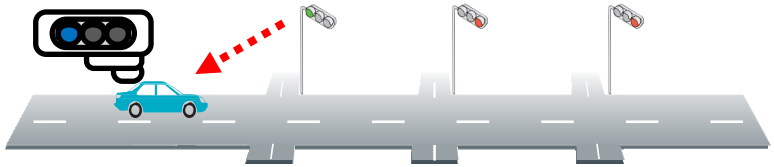
- Establishment of technology to provide signal information
- Construction of a traffic regulation information management system
- Establishment of technology to provide vehicle and pedestrian detection information
- Development of next-generation public transport systems
- Development of mobility support systems for mobility-challenged travelers, etc.

Research and development items by NPA in FY2017

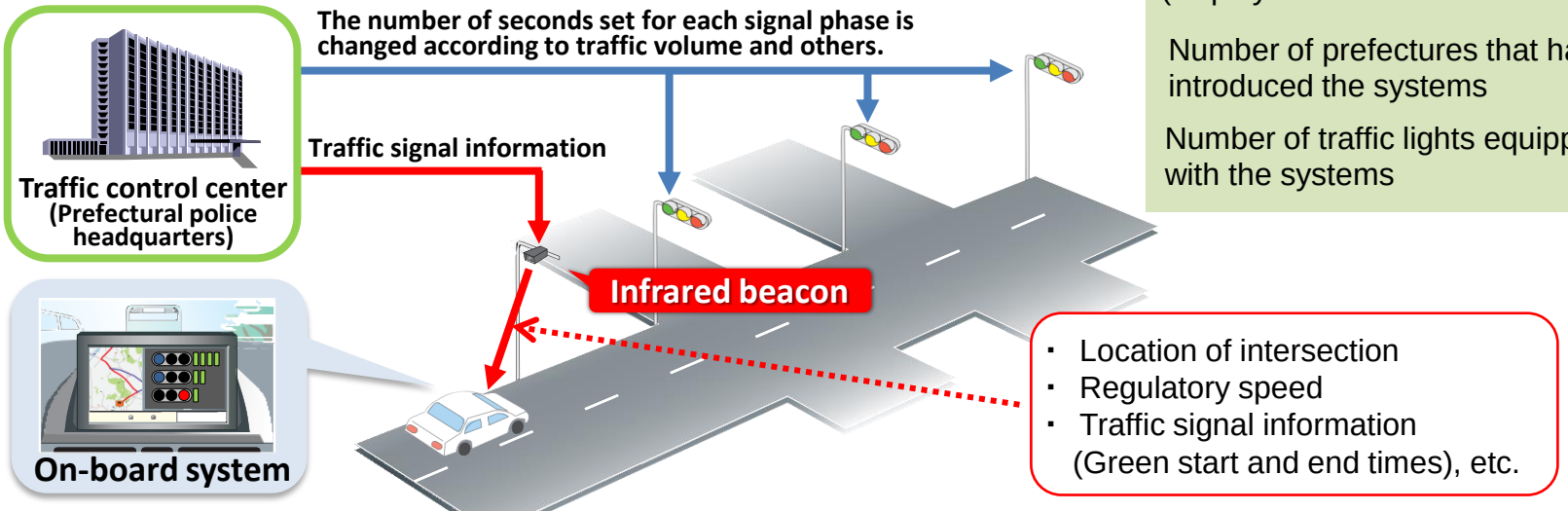
◆ NPA 1. Establishment of technology to provide signal information

Purpose

Development of technology for roadside systems that provide traffic signal information to vehicles



Current system 【 Traffic Signal Prediction Systems (TSPS) 】



(Deployment status as of end of FY2016)

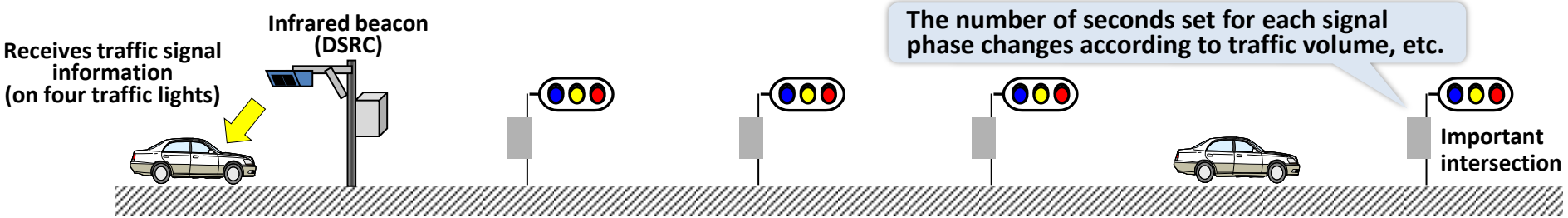
Number of prefectures that have introduced the systems	:	26
Number of traffic lights equipped with the systems	:	7,701

Research and development items by NPA in FY2017

◆ NPA 1. Establishment of technology to provide signal information

Issues in providing signal information using infrared beacons

Unable to provide definite signal information about important intersections and traffic-actuated intersections



Improvement measure

By using the 700MHz band radio communication, provision of stable and highly-accurate signal information is realized.

Communications infrastructure	Communication range	Communication volume	Time to restart	Actual operation
Wi-Fi	120 m	75 Kbytes/s	1.5 sec.	No available traffic infrastructure
Bluetooth	100 m	128 Kbytes/s	10 sec.	No available traffic infrastructure
DSRC	30m or less	217 Kbytes/s	1 sec. or less	In use on expressways
FM multiplex	10～50 km	0.2 Kbyte/s	1 sec. or less	In operation in a wide range of areas
700MHz band radio communication	250 m	30 Kbyte/s (one slot)	1 sec. or less	Already in use in experiments since 2014

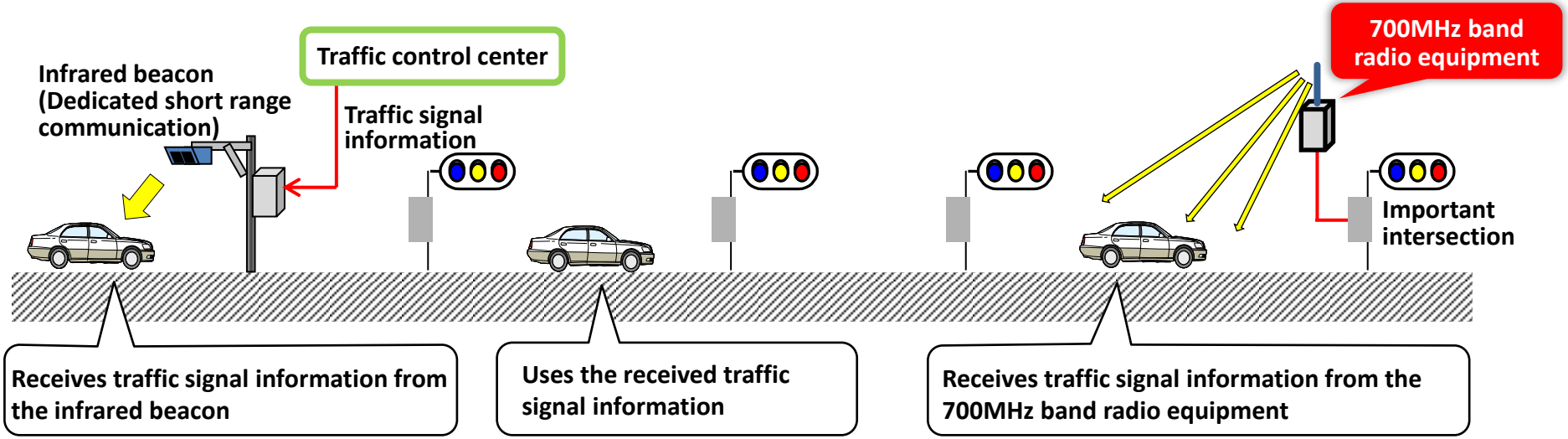
The 700 MHz band communication was determined to be optimal based on the characteristics of communication range, communication volume, etc.

[Results of the examination in FY2015]

Research and development items by NPA in FY2017

◆ NPA 1. Establishment of technology to provide signal information

Provision of traffic signal information using infrared beacons and 700 MHz band radio equipment



[Content of the project for FY2017]

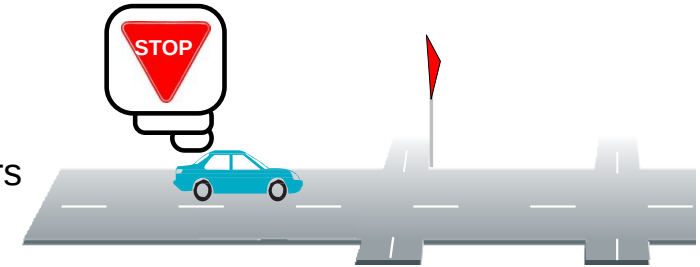
The field operational tests and verification of effectiveness.
The traffic signal information provision system using the 700 MHz band has been installed additionally on the routes where the Traffic Signal Prediction Systems (TSPS) have been installed.

Research and development items by NPA in FY2017

◆ NPA 2. Construction of a traffic regulation information management system

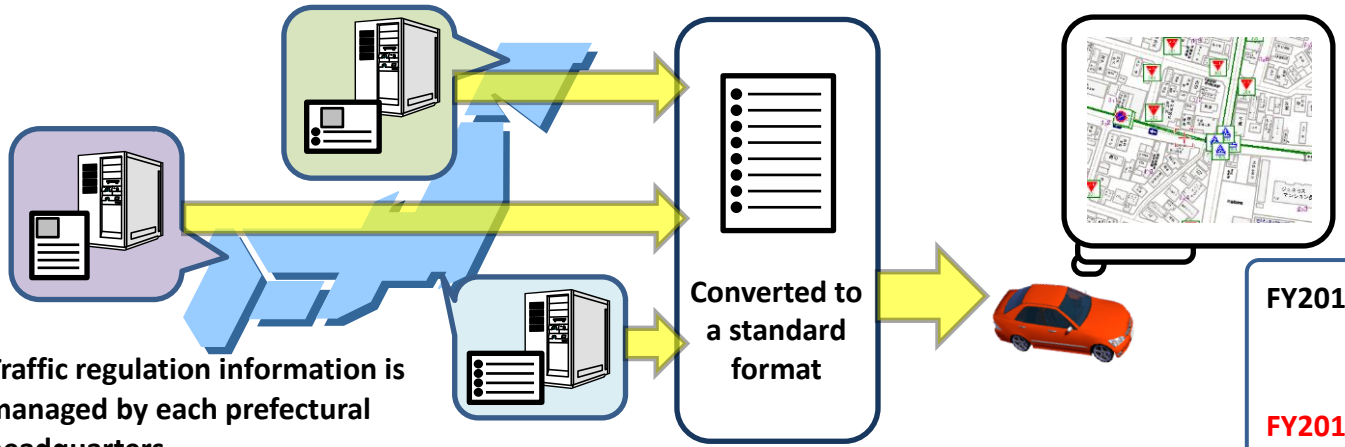
Purpose

Development of technology for traffic regulation information management systems aimed at providing vehicles with traffic regulation information managed by prefectural police headquarters



Current system

Examination of a system that allows all prefectures to provide traffic regulation information in a uniform format (a standard format and functions, etc. that need to be implemented by the prefectural information management system)



Traffic regulation information is managed by each prefectural headquarters.

FY2016: Installation of a model system (a prefectural police information management system)

FY2017: Verification of effectiveness

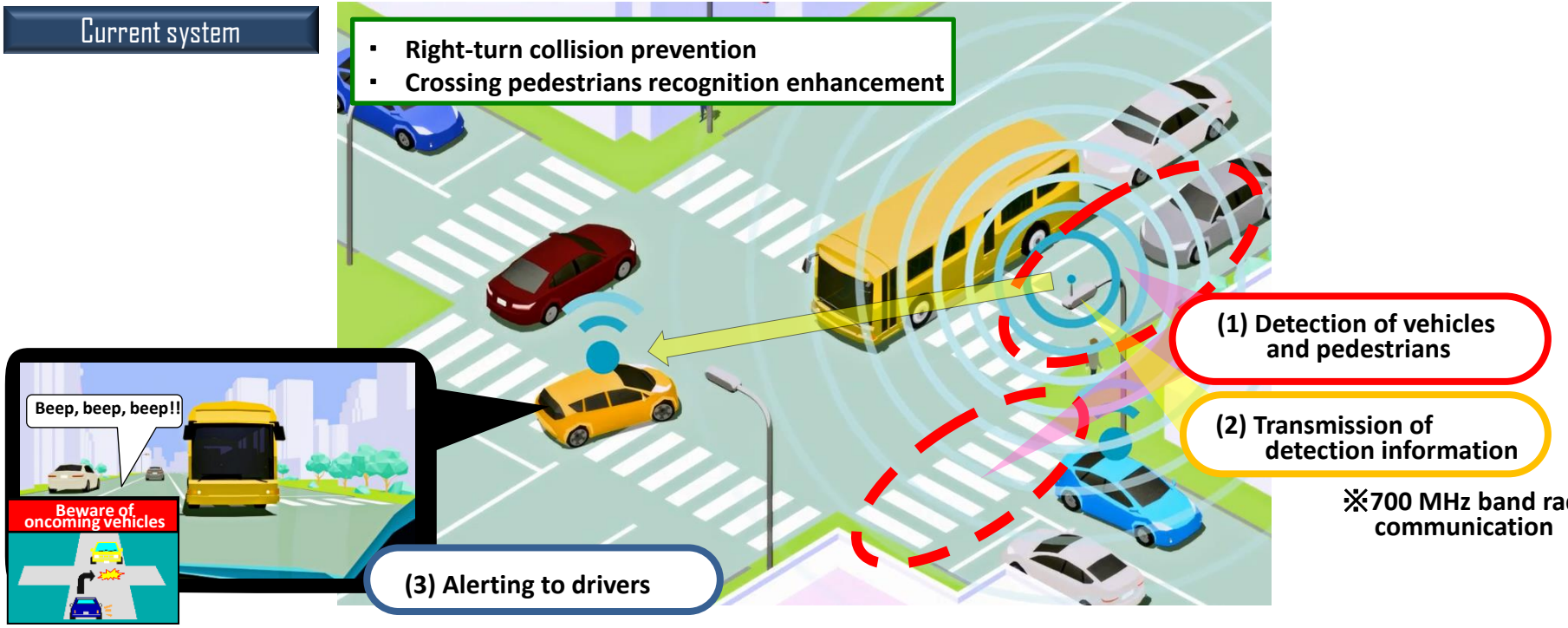
Research and development items by NPA in FY2017

◆ NPA 3. Establishment of technology to provide vehicle and pedestrian detection information

Purpose

Development of technology for roadside systems which allows the roadside systems to inform vehicles about surrounding conditions (the presence or absence of vehicles and pedestrians) including the visibility of vehicles

Current system



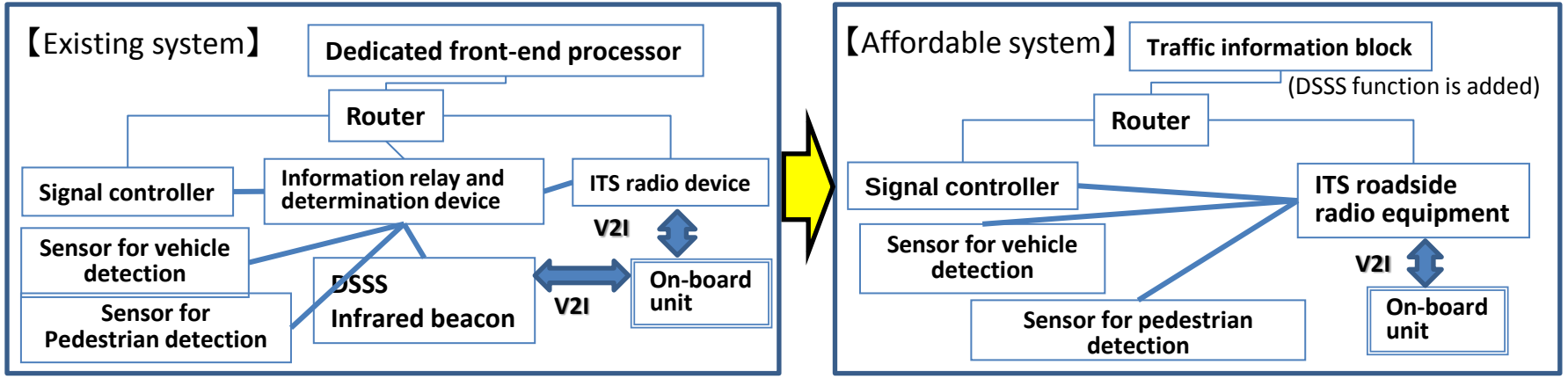
Research and development items by NPA in FY2017

◆ NPA 3. Establishment of technology to provide vehicle and pedestrian detection information

Progress of examination (Projects for FY2014 and FY2015)

- Cost reduction of roadside systems (Development of affordable systems)

  Integration of equipment, re-examination of vehicle and pedestrian detection areas, change of the own vehicle position measurement method, etc.



- Identification of functions that need to be implemented by the traffic control center

  Identification of the functions of traffic control center which will become necessary as a result of the installation of 700 MHz band radio communication terminals.

- Examination of security operational guidelines

  Security measures for each operational phase, such as installation, maintenance, relocation and disposal

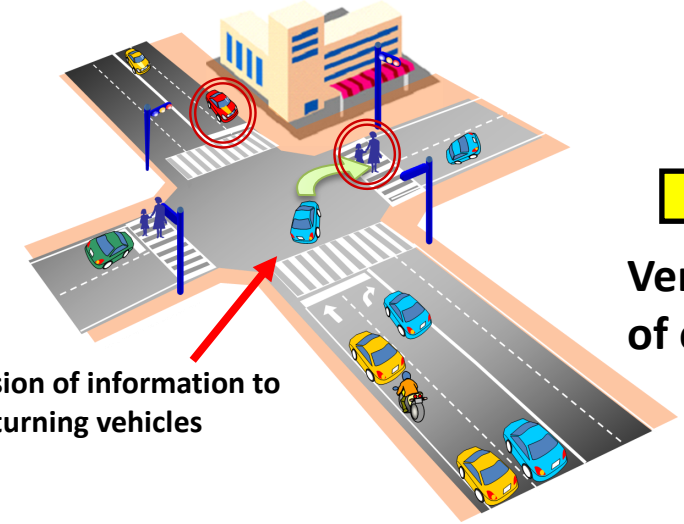
Research and development items by NPA in FY2017

◆ NPA 3. Establishment of technology to provide vehicle and pedestrian detection information

Projects for FY2016

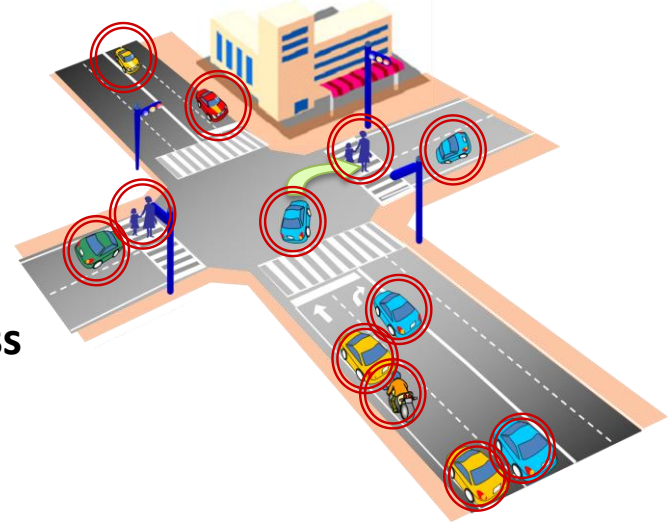
- Examination for expanding detection targets, etc.

[Current detectable target range]



Verification of effectiveness

[Possible expansion of detectable target range (proposal)]



- Detailed examination and specification of the functions that need to be implemented by the traffic control center
  Recording of information provision, recording of the behavior of vehicles, etc. around the intersection

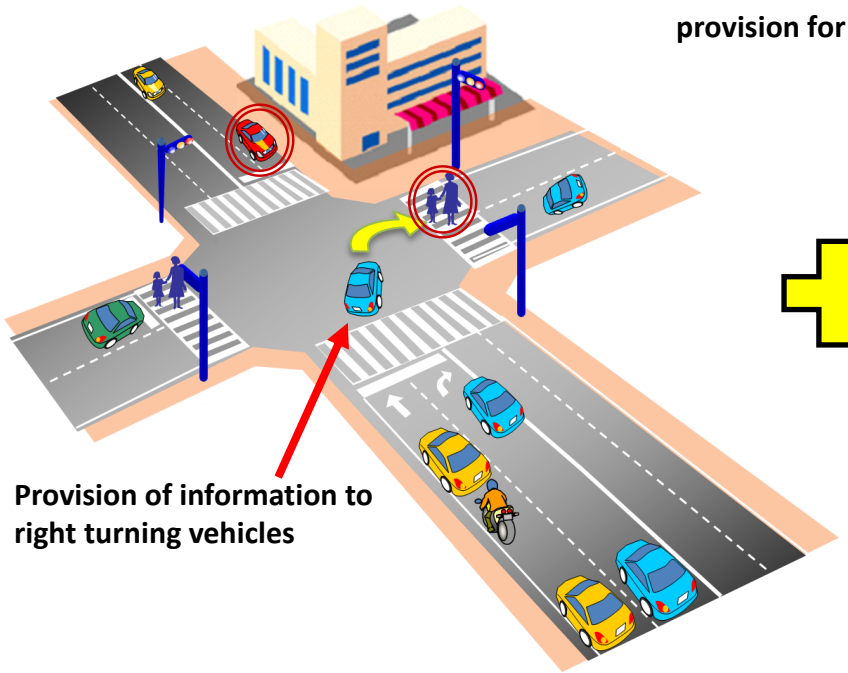
Research and development items by NPA in FY2017

◆ NPA 3. Establishment of technology to provide vehicle and pedestrian detection information

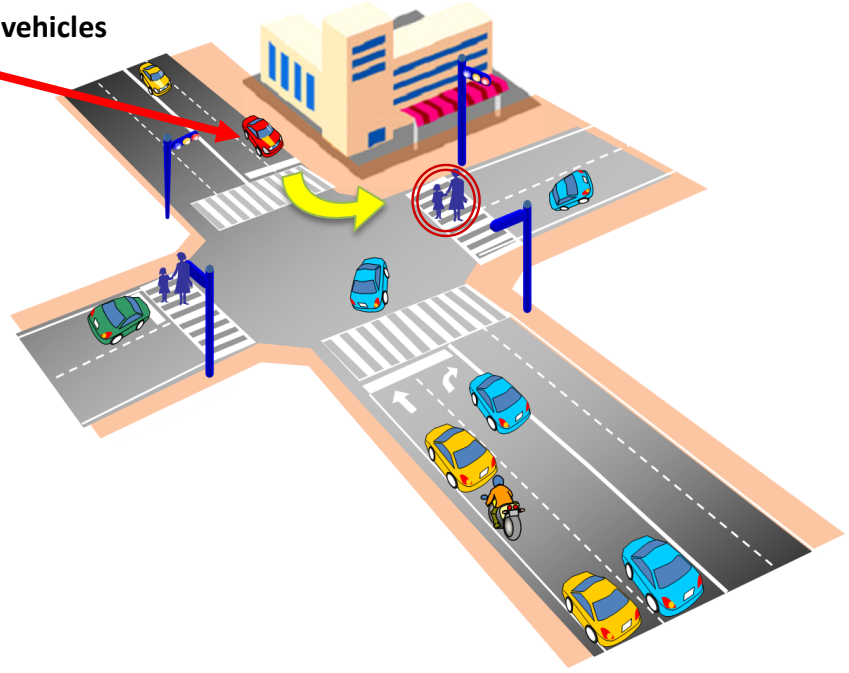
Projects for FY2017

- Installation of model system

[Current system]



[Function to add]



Research and development items by NPA in FY2017

◆ NPA 4. Development of next-generation public transport systems

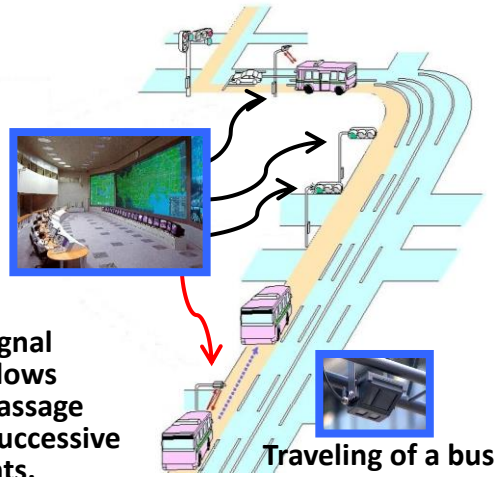
Purpose

Technology development for next-generation public transport systems

- Ensuring of safe and smooth traffic for visitors of, and those involved in the Olympic and Paralympic Games
- Continued operation of next-generation public road transport systems and dissemination of the systems to other regions

Item to be examined Upgrading of Public Transportation Priority Systems(PTPS)

[Current PTPS]

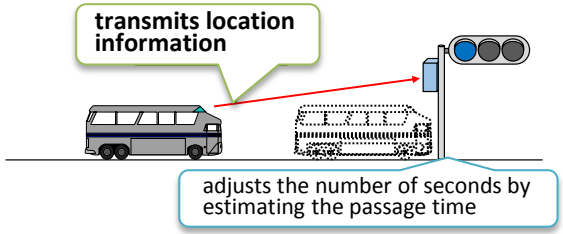


Priority signal control allows smooth passage through successive traffic lights.

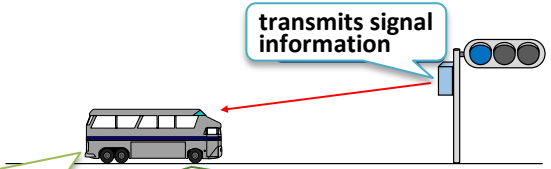
Traveling of a bus is detected via infrared beacons.

[Upgraded PTPS]

◆Optimization of signal control through continuous measurement of location



◆Reduction in the number of sudden decelerations and stops at traffic light



FY2017: Verification of effectiveness

Research and development items by NPA in FY2017

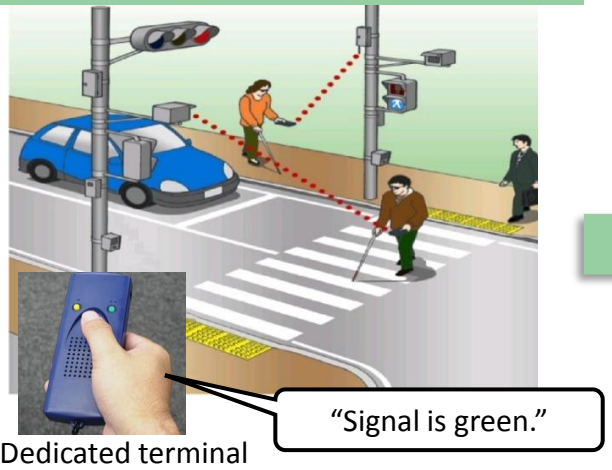
◆ NPA 5. Development of mobility support systems for mobility-challenged travelers, etc.

Purpose

Technology development for systems that support safe, secure and smooth travel for people with transport constraints

- Ensuring of safe and smooth traffic for visitors of, and those involved in the Olympic and Paralympic Games
- Continued operation of next-generation public road transport systems and dissemination of the systems to other regions

Current PICS



Dedicated terminal

PICS upgrading proposal

■ Use of a general-purpose mobile terminal

Dedicated terminal

Cell-phone

■ Screen display of intersection information
Displays an intersection name and signal information for each direction.

■ Signal control based on the pedestrian's progress in crossing the street
Adjusts green time and flashing green time by detecting the pedestrian's progress in crossing the street using an image sensor, etc.

Projects for FY2017

- Consider required function of PICS and construct the model system on a public road
- Verify the utility and effects of the system by field operational test
- Decide specifications of the system in order to put them into practical use


Thank you
SIP-adus Workshop 2017
on Connected and Automated Driving Systems