SIP-adus Field Operational Test

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SIP-adus International Cooperative WG

13 November 2018

SIP
Cabinet Office

1. Large-scale FOT
2. FOT regional activities
3. Next Step

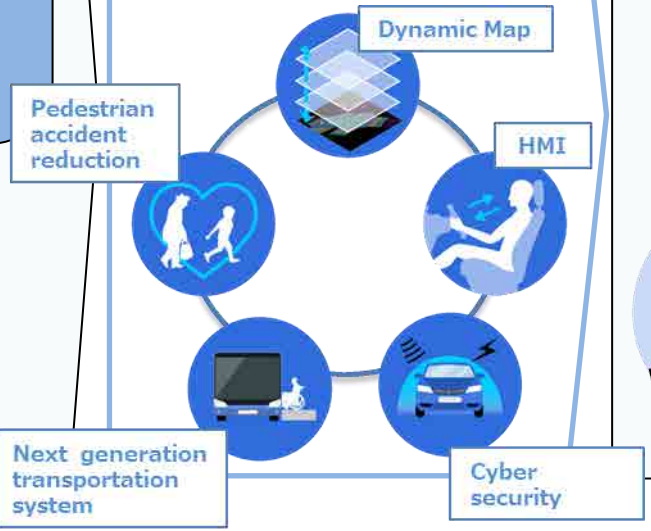
1. **Large-scale FOT**
2. FOT regional activities
3. Next Step

Steps to the Goal

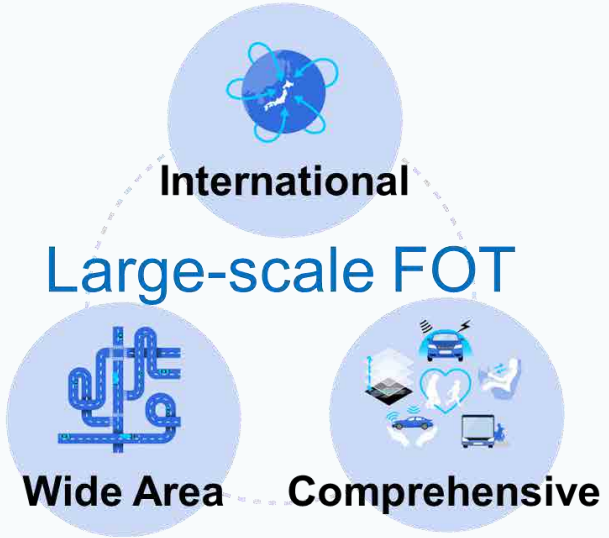
2014 → 2015 → 2016 → 2017 → 2018

- **Framework Construction**
- Investigation for various R&D theme

- **Integration into 5 major R&D theme activity**



- Final step to **the Goal**



Implementation

Large-scale Field Operational Test（FOT）

≪Main themes≫

≪Objectives≫

- Activation of the study / technology development
- An evaluation, a problem is extracted in more viewpoints
- Confirmation of the practical use
- International cooperation and harmonization
- Social acceptability promotion

Large-scale Field Operational Test（FOT）

≪Participants≫

ALPINE Driving Mobile Media Innovation
BMW
MINI
BOSCH Invented for life
Calsonic Kansei
Continental
DAIHATSU
HONDA The Power of Dreams
mazda
MLT MEIJI LogiTech
MITSUBISHI ELECTRIC
名古屋大学 Nagoya University
NISSAN MOTOR CORPORATION
OMRON
Pioneer
埼玉工業大学 Saitama Institute of Technology
SUZUKI
SUBARU
TOYOTA
Valeo
VOLKSWAGEN AKTIENGESELLSCHAFT
ZMP

(Each participant brings a vehicle of their own)

≪Period≫

Oct./2017 ～ Dec./2018

SIP

Test Sites

Test facility

JARI* Test course;
New test facility for AV evaluation

Expressway

Utilize the part of the following expressway.

Total : app.300km.

We are here.

Arterial roads

Tokyo waterfront city area app.25km

(*JARI : Japan Automotive Research Institute)

Dynamic Map FOT

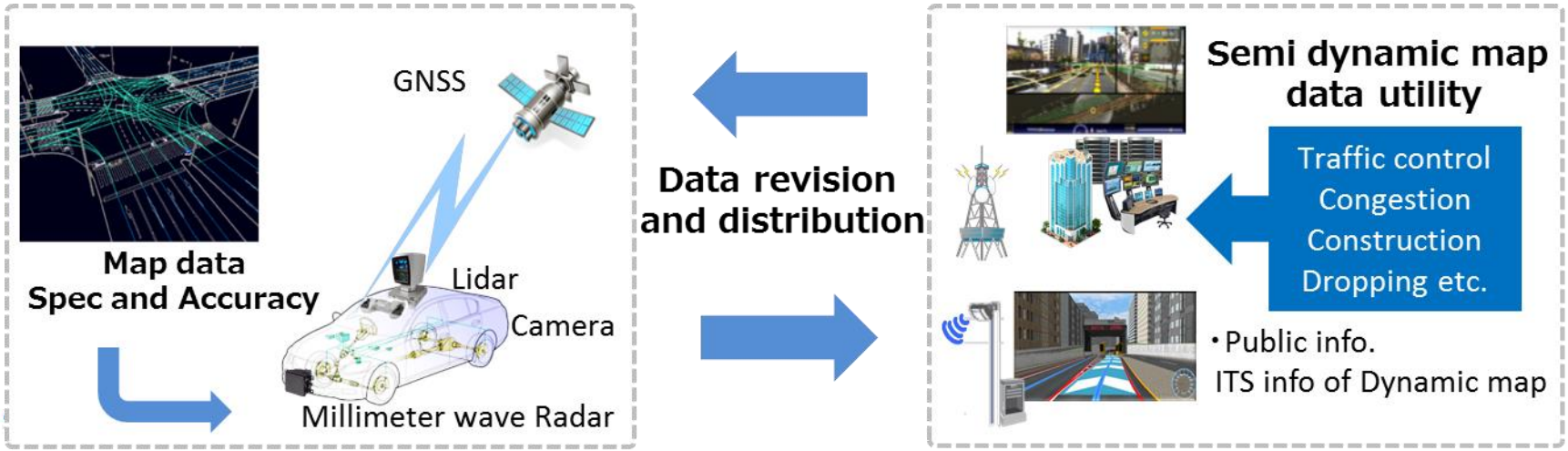
Objective Establish 3D HD digital map spec and Dynamic Map concept

(Step 1) To validate 3D high-definition digital map data.

(Step 2) To validate data collection and distribution method.

(Step 3) To verify the utility of semi dynamic and dynamic information.

✓ Map data is provided by SIP-adus.



Dynamic Map FOT

《Output from FY17 FOT》

- Preparation and distribution of 3D HD Map of 758km
- Confirmation of map features with high accuracy at public road

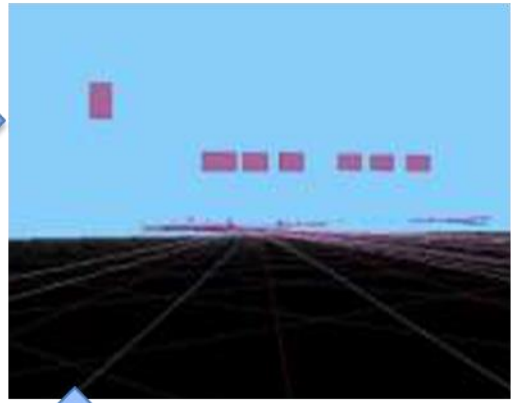
Consensus formation of essential features

《Examples of extracting subject in information freshness》

(Participant test image)

①Indication of data inconsistency

(Image at survey)



(Map data)

③Discovery of feature removal after surveying

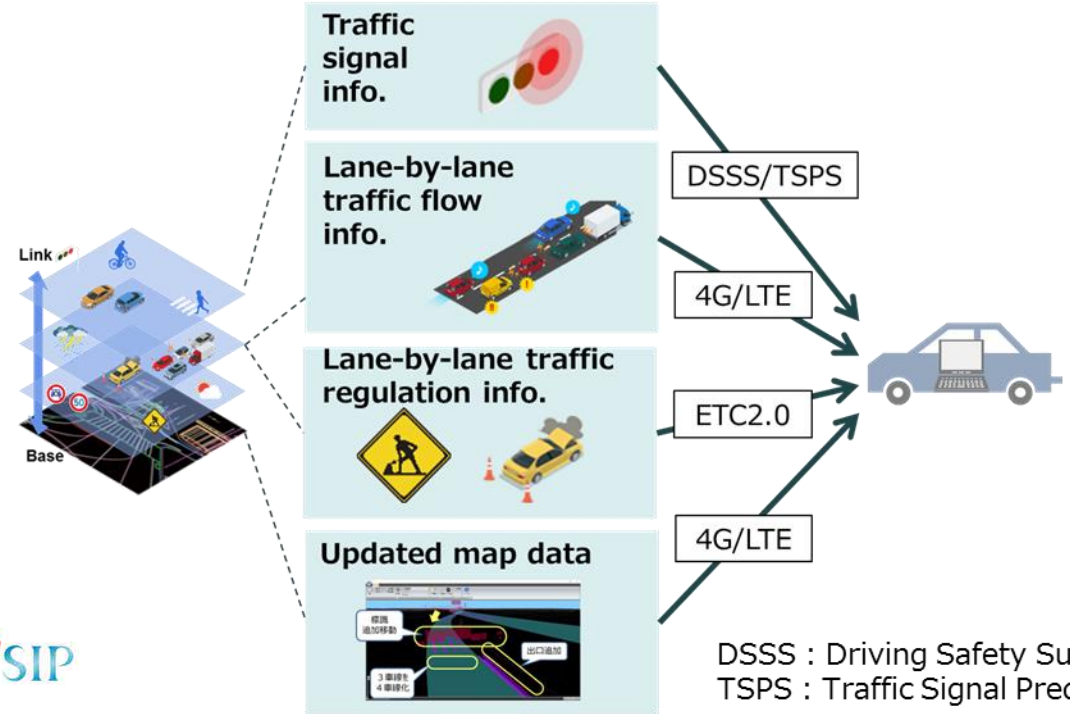
②Check consistency with survey data

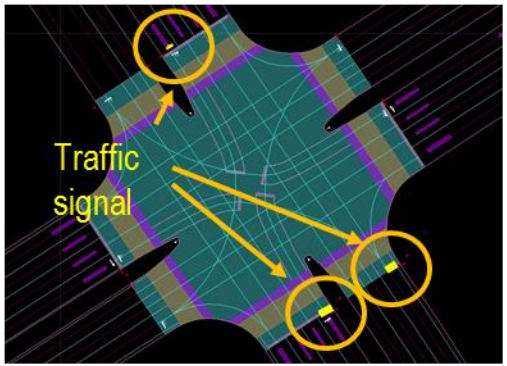
Dynamic Map FOT

《Outline of FY18 FOT》

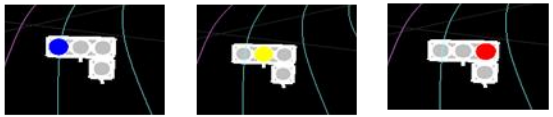
- Preparation and distribution of real-time traffic info linked to 3D HD Map at public road (～Dec./2018)

Confirmation and establishment of Dynamic Map concept





Data image viewer



Ex.)Traffic signal color

DSSS : Driving Safety Support System
TSPS : Traffic Signal Prediction System

Human Machine Interface FOT

Objective
Quantification of driver state (readiness) indicator for take-over performance

◆ **Development of in-vehicle DMS**
(Driver Monitoring System)

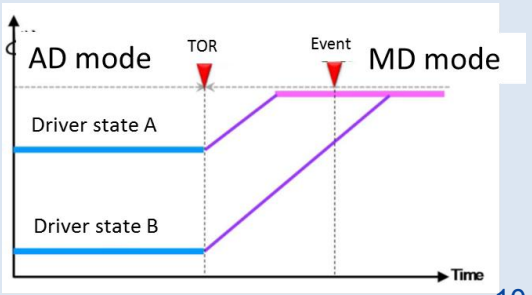
Driver state measurement @ T/C

- Frequency of the saccadic movements of the eyes, blinking frequency, percent time of forward looking, and Perclos were extracted as metrics of readiness for driver monitoring.

《Output from FOT》

◆ Participants collected data by driving a long distance on the highway with the vehicle equipped with DMS.

◆ Baseline indicator definition during manual driving mode by collected data analysis.



Cyber Security FOT

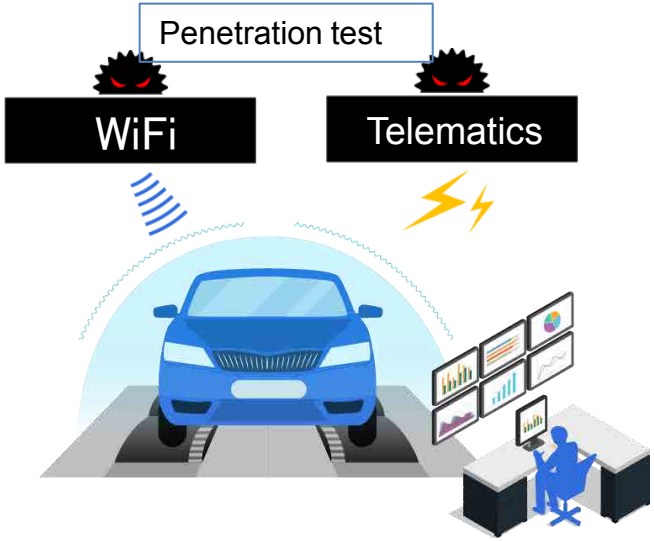
Objective Establish a Cyber Security Evaluation Guideline

Threat Analysis

- ◆Survey of world-wide automated driving systems
- ◆Already-known threat/vulnerability Info.
- ◆Risk/Impact analysis

Guideline Development

Effectiveness evaluation in Experiment



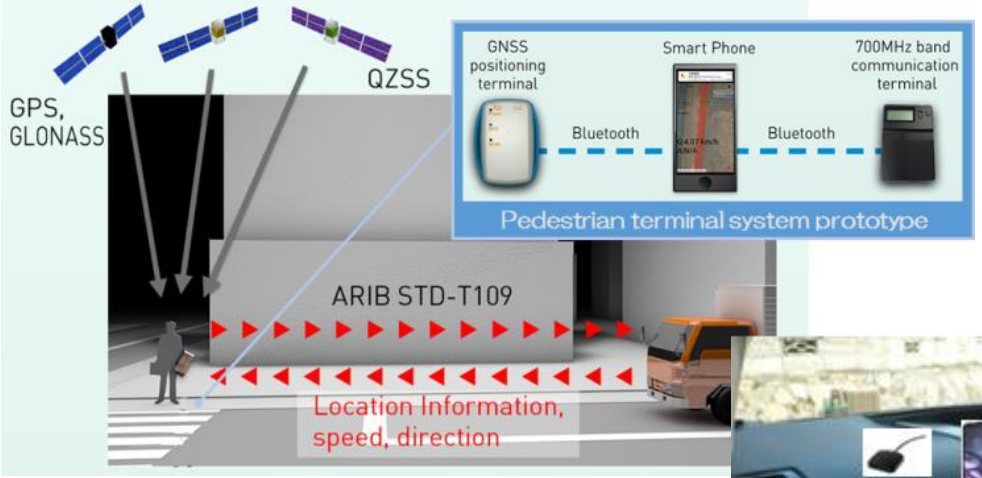
FY2017

FY2018

Pedestrian Accident Reduction FOT

Objective Evaluate V2P communication system performance and effectiveness under real traffic world

- Exchange high accuracy positions and behavior prediction between pedestrians and vehicles for recognition support.

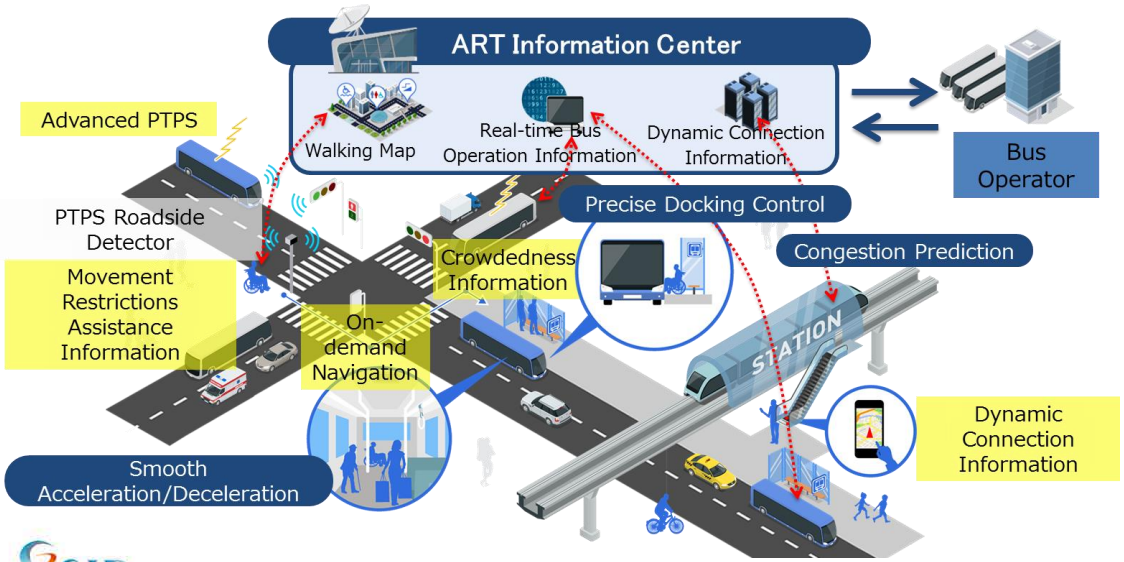


Pre-test @T/C

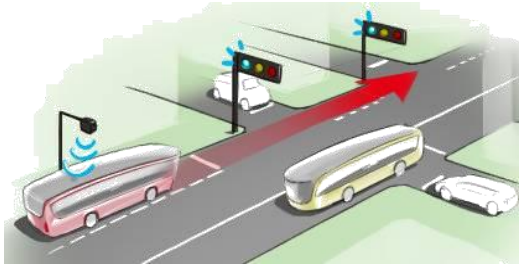
Next Generation Urban Transportation FOT

Objective Evaluate ART* system performance and effectiveness under real traffic world

- Next generation urban transportation is realized by ITS technologies and automated driving technologies.



(*ART: Advanced Rapid Transit)



Advanced PTPS
（Public Transportation Priority System）

Precise Docking Control

1. Large-scale FOT
2. **FOT regional activities**
3. Next Step

FOT regional activities

Automated driving Bus FOT

■ : Test area (3 types of location)

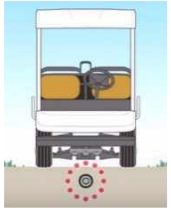
Okinawa

Ishigaki-jima

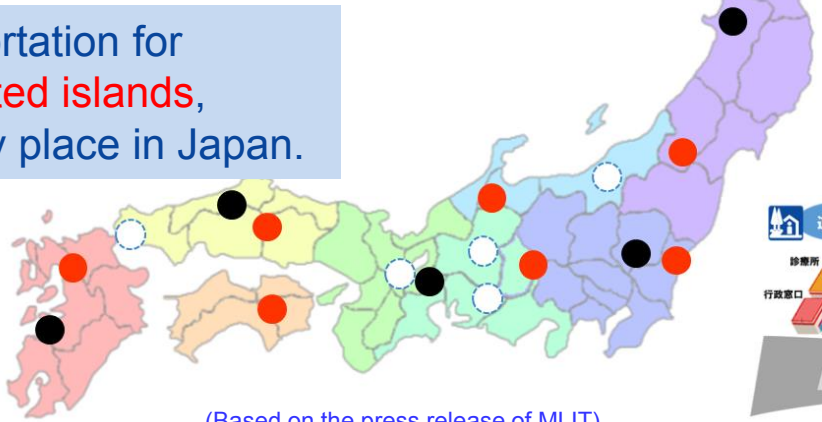
(Based on the press release of CO)

Roadside station-based FOT

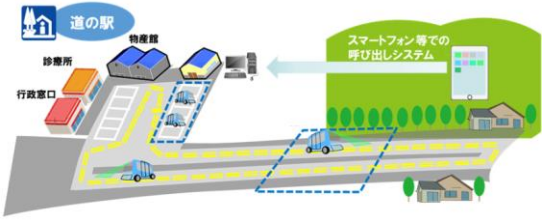
● :Regional assignment ● :Public offering ◌ :Feasibility study



Electromagnetic induction line



(Based on the press release of MLIT)



- New type public transportation for depopulated area, isolated islands, are being tested in many place in Japan.

SIP

1. Large-scale FOT
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3. **Next Step**

FOT of the 2nd phase SIP

The 2nd phase SIP will start the new FOTs in autumn 2019 in Tokyo Waterfront Area.

≪Objective≫ **Verification of automated driving technologies that utilize traffic infrastructure.**

≪Period≫ **Around late 2019 ～ End of FY2022**

≪Participants≫ **Open to domestic and foreign participants.**
(Automakers/Components manufacturers/Universities/Research institutions /Venture companies etc.)

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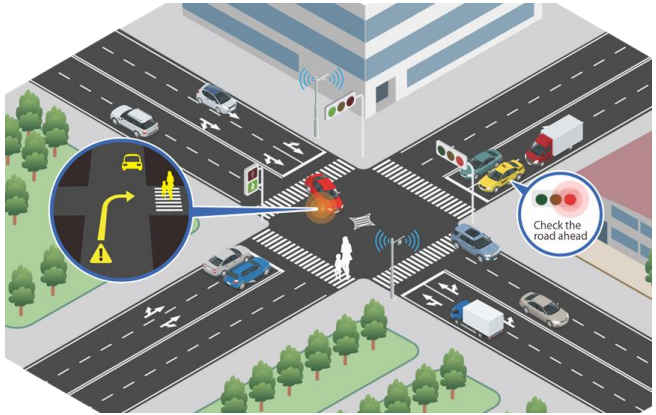
FOT of the 2nd phase SIP

≪Outline of FOTs (planned)≫

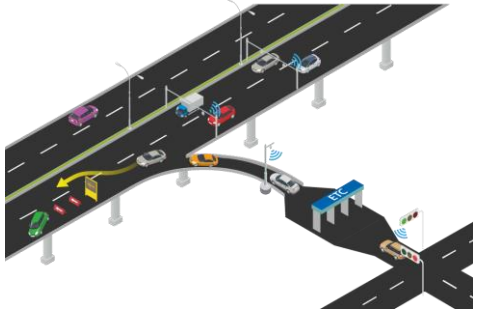
Tokyo Waterfront City area

Verification of smooth automated driving technologies using traffic signal color cycle information.



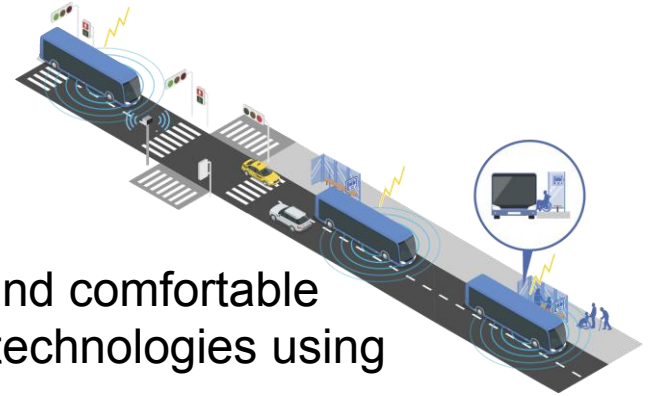
Haneda Airport Connection Expressway

Verification of ETC gate info. /Merging Support info. /Lane-level traffic regulation info. for automated driving.



Haneda Airport area

Verification of smooth and comfortable automated driving bus technologies using PTPS*/Precise docking /Acceleration & Deceleration control etc..



SIP

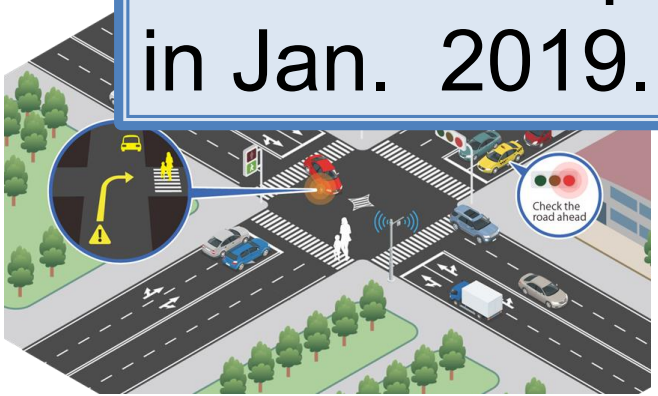
*(Public Transportation Priority System)

FOT of the 2nd phase SIP

≪Outline of FOTs (planned)≫

Tokyo Waterfront City area

Veri
drivi
sign



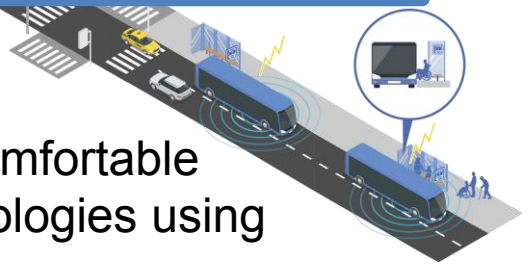
Haneda Airport Connection Expressway

Verification of ETC gate info. /Merging Support info.

Details of the FOT and Call for participation will be announced in Jan. 2019.

Haneda Airport area

Verification of smooth and comfortable automated driving bus technologies using PTPS*/Precise docking /Acceleration & Deceleration control etc..



*(Public Transportation Priority System)


Thank you for your attention