

SIP-adus Workshop 2019



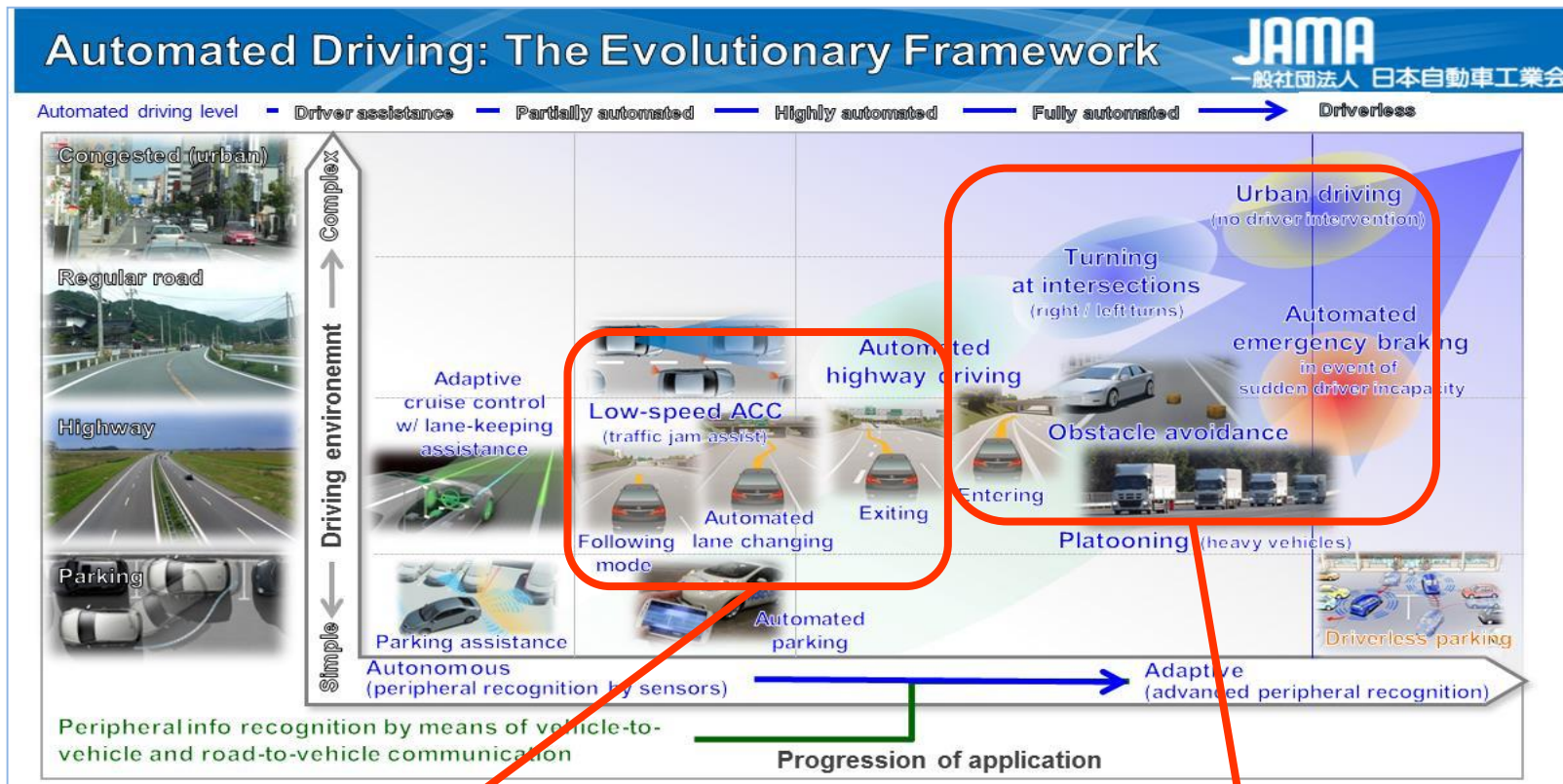
**SIP-adus
FOT in Tokyo waterfront area**

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Cooperative Automated Driving with ITS

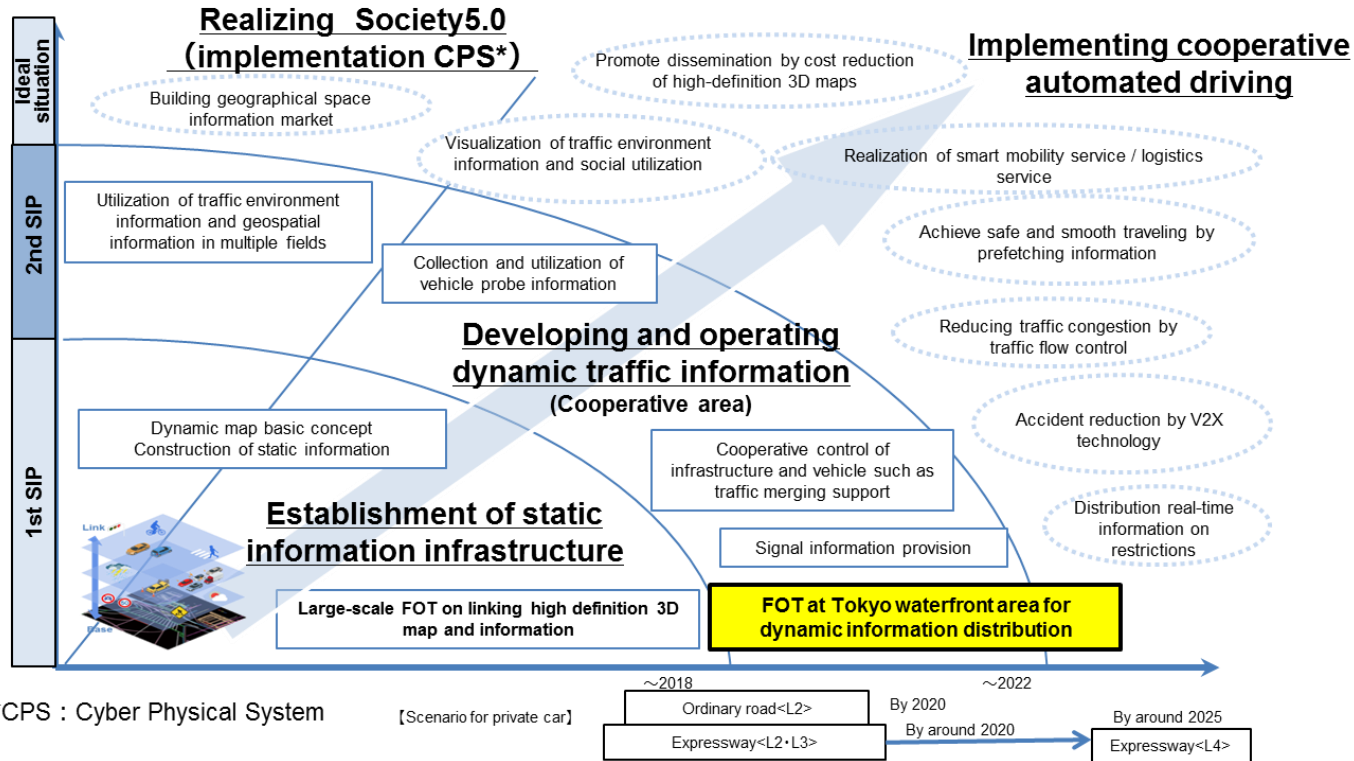


Phase 1 of SIP-adus (2014~2018)

Phase 2 of SIP-adus (2018~2022)

Building the Traffic Environmental Info. Framework

◆ Realize cooperative automated driving through **the development of dynamic traffic information.**



Challenging themes in FOT

- ◆ Prioritize and focus on necessary information in order to realize highly ADS.

Automated driving under various traffic environment



Info. which is **difficult to be detected by onboard sensors**

Info. which is **useful not only for ADS but for ADAS**

Developing traffic info.

Signal Info.



Open closed info. of ETC gate /Merging assistance info.



Lane level traffic environmental info.

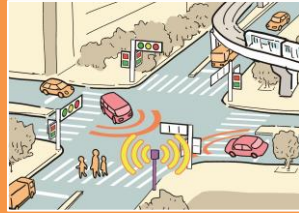


FOT areas

◆ FOTs have started in Oct. 2019 at **Tokyo waterfront area**.

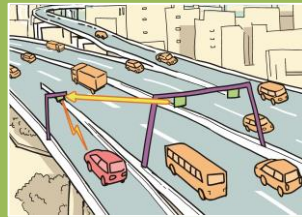


Tokyo waterfront city area



- Realization of Level 4 ADV on general road

Tokyo metropolitan expressway



- Expansion of ODD for ADV on exp. Way

Haneda airport area (AD-Bus)



- Realization of Level 4 AD-Bus under mixed traffic

Environment

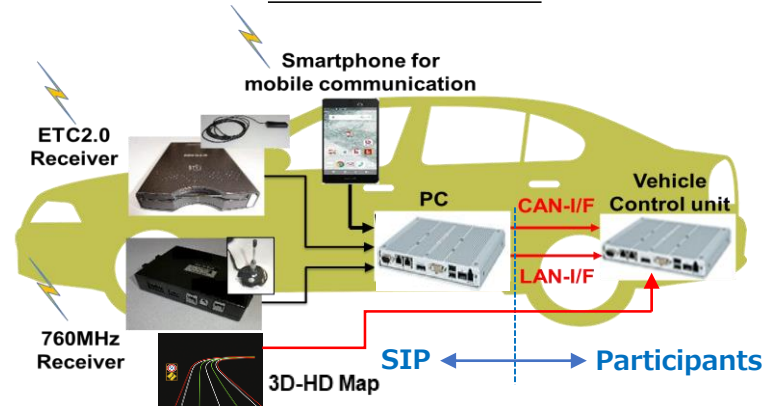
◆ Establish an experimental environment for participants

- ✓ **High-precision 3D map** distribution
- ✓ Development of information distribution **infrastructure**
- ✓ Lending information **receivers**
- ✓ **Data conversion** to in-vehicle communication I / F

Infrastructure






Data conversion



HP 3D map



Equipment

Receiver		Vehicle information collection			Data conversion
ITS receiver (Signal info.)	ETC2.0 receiver (ETC/Merging info.)	GNSS	Driving recorder	Locator	BOX PC
					

Participants of FOT in Tokyo waterfront area

◆ **Total 28 entities** including OEMs, suppliers, venture companies and universities with **100 vehicles** will participate in the FOT.



Alphabetical order
A total of 28
institutions



Signal info. experiment

- ◆ To evaluate the effectiveness of traffic signal info. under real traffic environment.

- Detection accuracy improvement by providing DSRC info. in addition to onboard sensor

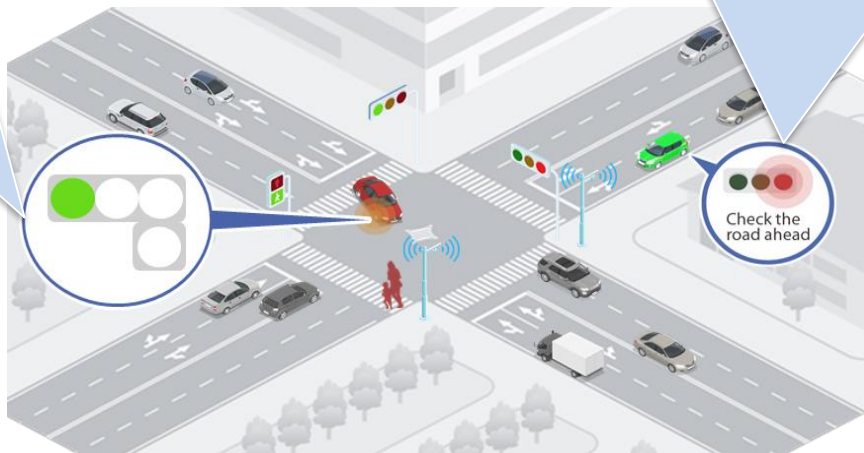


- Avoidance of dilemma* zone issue by signal remaining time info.



* It is the timing which the vehicle cannot pass the stopping line , and stop without sudden braking in yellow light,

- Effectiveness as driver assistance system



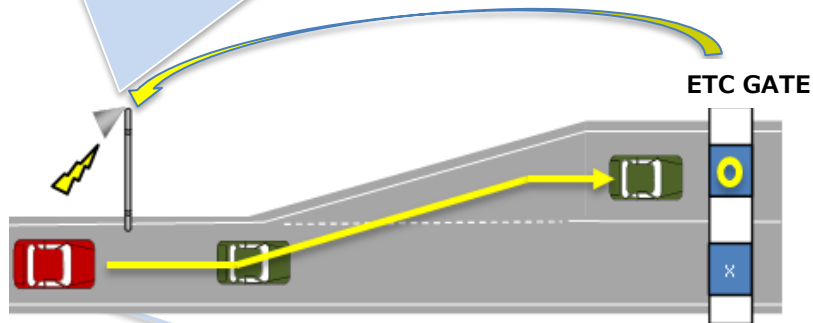
- Definition of standardization spec by FOT

⇒ Reflection to ISO/TS19091 (ISO/TC204/WG18)

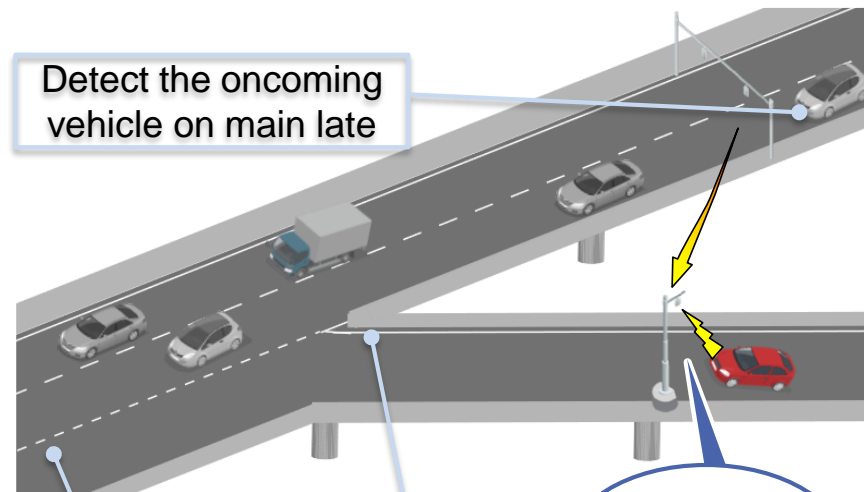
Experiment at ETC gate and merging

- ◆ To evaluate the effectiveness of info. from RSU for complement to onboard sensors.

- Early judging of passing ETC gate and making safe pass planning with active gate info.

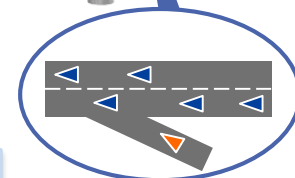


Detect the oncoming vehicle on main lane



Obstructive barrier

Short acceleration lane



- Effectiveness as **driver assistance system**

- **Safe and smooth merging** by providing main lane info.

Automated driving bus Experiment

- ◆ Demonstration with **next-generation ART*** using autonomous driving technology in mixed traffic.

- **ART** equivalent to **SAE level 4** through infrastructure cooperation



Track guidance magnetic marker

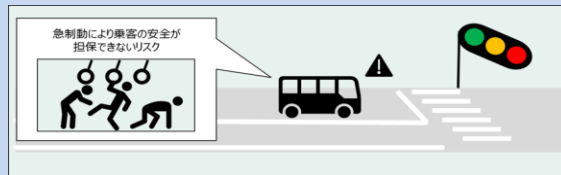


Safe and smooth scheduled operation by dedicated bus lane + PTPS**

- **Realize public transportation** that everyone can use **safely without stress**



Precise docking for accessibility

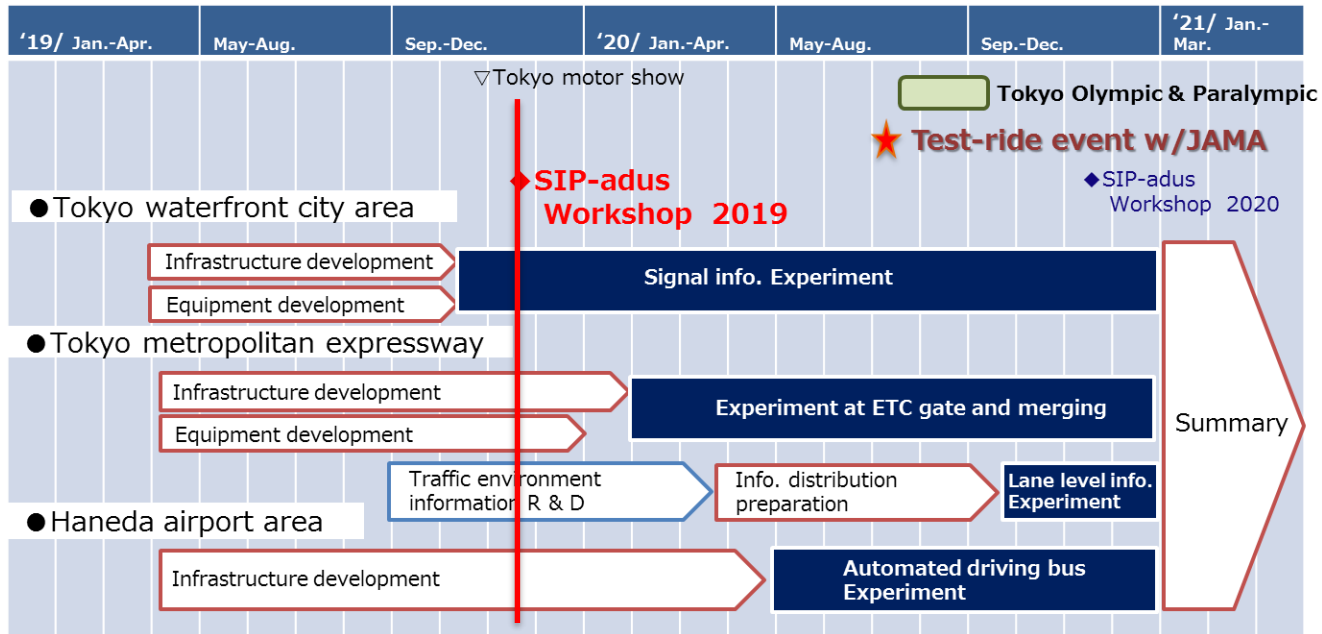


Acceleration / deceleration control and signal information when starting and stopping

*ART : Advanced Rapid Transit
**PTPS: Public Transport Priority system

Schedule

- ◆ Signal information FOT has already started **in October**.
- ◆ All FOTs will be completed by March 2021.
- ◆ Prior to the Tokyo Olympic games, a **test ride event** will be held in cooperation with JAMA.



※The schedule may change depending on the preparation status and R & D progress.

Thank you for your attention

A long-exposure photograph of a city street at night. The image is filled with vibrant, multi-colored light trails from cars and buildings, creating a sense of motion and energy. The colors range from bright yellow and white to deep blues and purples. The perspective is from a low angle, looking down the length of the street, which converges towards a vanishing point in the distance. The overall atmosphere is dynamic and futuristic.