AP 04: THE ROLE OF GOVERNMENT FOR DEPLOYING

CONNECTED AND AUTOMATED VEHICLE IN JAPAN





National Research Project on Automated Driving to realize Society 5.0 JAPAN

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Society 5.0



Data convergence

high degree of convergence between cyberspace (virtual space) and physical space (real space).

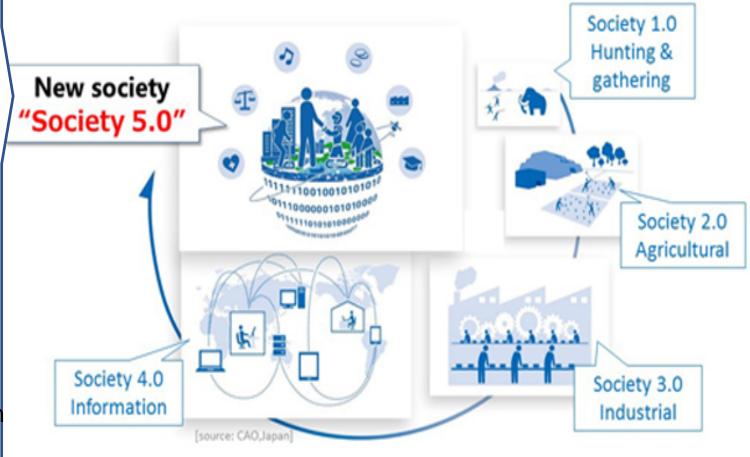
Economic advancement

Solution of social problems

provision of products and services that are needed to the people that need them at the time they are needed



human-centered society in which anyone can enjoy a high quality of life full of vigor

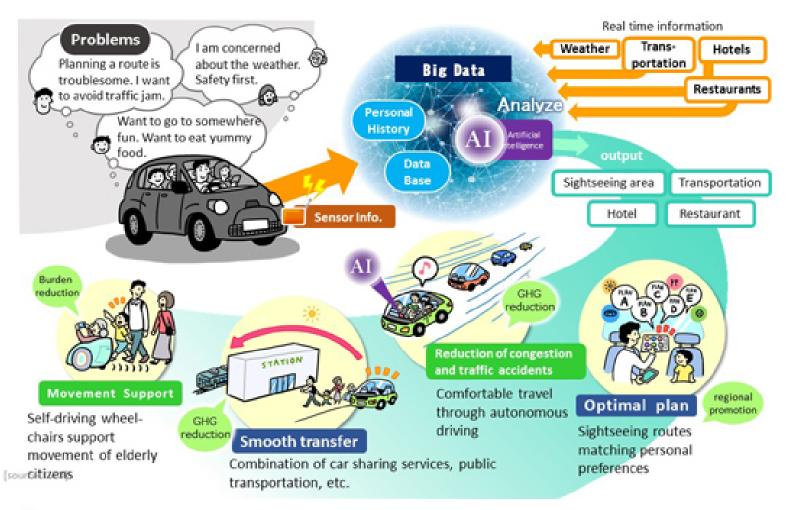


(Cabinet office HP)



New value in the field of mobility





Optimal plan

Reduction of congestion and traffic accident

Smooth transfer

Movement support



(Cabinet office HP)

Outline of SIP



> Intensive R&D program

- ✓ promote 5-years R&D (FY2018 FY2022)
- ✓ from fundamental research to practical and commercialization

> Promote cross-sector collaboration

- ✓ enhancing cross-ministerial cooperation
- promote industry-academia-government collaboration

> Leadership and total Budget

✓ CSTI appointed Program Directors and allocates the budget for each research theme.*



Cross-Ministerial Strategic Innovation Promotion Program

Council for Science, Technology, and Innovation

Governing board (CSTI Executive Members)

Outside experts

Executive Director of SIP (Assigned from 2018)

Program Director (PD)

(assigned to Cabinet Office for each policy issue)

Steering Committee

PD (Chairman), relevant ministries, experts, corporations, Cabinet Office (secretariat)

Relevant ministries and management corporations and other researchers



^{* ¥28}bil in total per yea for SIP 12 themes

2nd phase of SIP (FY2018-2022) - 12 Programs



01 Cyber Space Base Technology

Cyber Space technology utilizing big data and AI technologies

02 Physical Space Base Technology



Cyber and physical security for creation of safe IoT society



03 Security



12 Ocean

Innovative deep sea resources exploration technologies



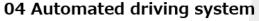
11 Land and maritime logistics

Smart logistics services



10 Health and medical care

Advanced diagnosis and medical care system by AI hospital



Practical implementation of the automated driving systems and services

09 Disaster prevention and management

Strengthening of national resilience (disaster prevention and management)

07 Bio and agriculture

Smart bio industrial and

agricultural technologies

05 Material Development



Material revolution utilizing integrated material development system



08 Energy and environment

Energy system for decarbonizing society



06 Quantum base technology

Implementation technology of Society 5.0 utilizing quantum technologies





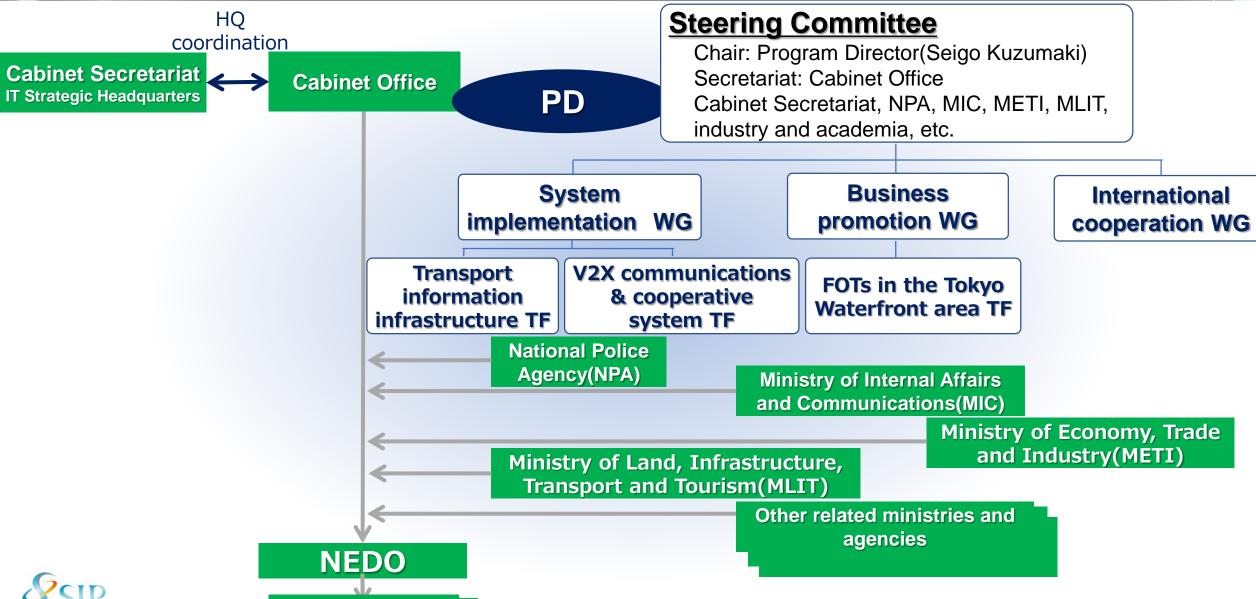
Cross-Ministerial Strategic Innovation Promotion Program (SIP)

SIP-adus; Automated Driving System for universal service



Promoting structure

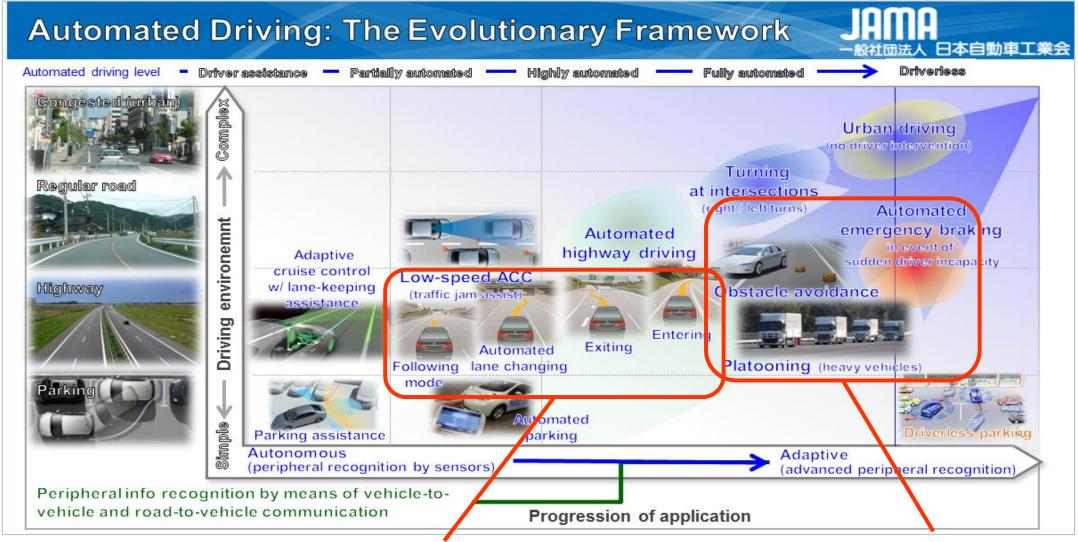




Research Groups

Cooperative Automated Driving with ITS







1st Phase of SIP-adus (2014~2018)

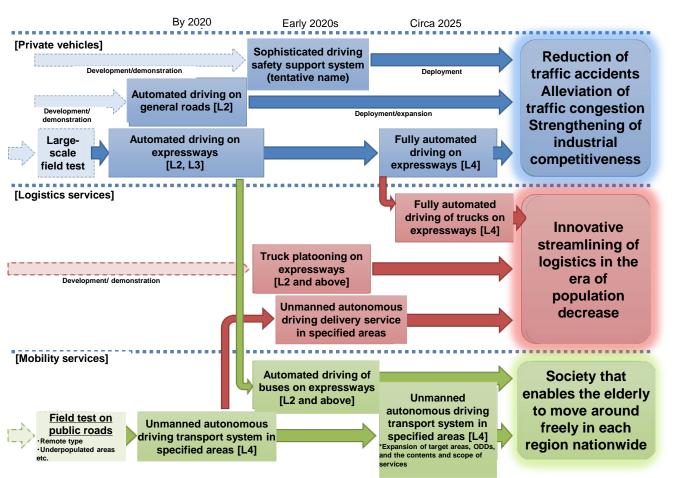
2nd Phase of SIP-adus (2018~2022)

Objectives



Public-Private ITS Initiative/Roadmaps 2019

Scenario for the commercialization and service of fully automated driving by 2025



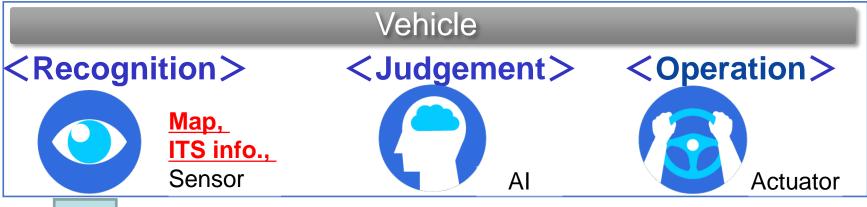


- To establish the cooperative areas technologies essential for implementation by 2023
- To create multiple example cases for commercialization through FOTs by involving various businesses and local government

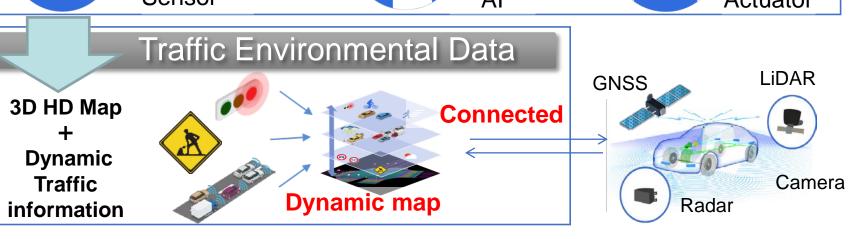


Main domain of SIP-adus' R&D















Cybersecurity



Simulation



Database



Over the air

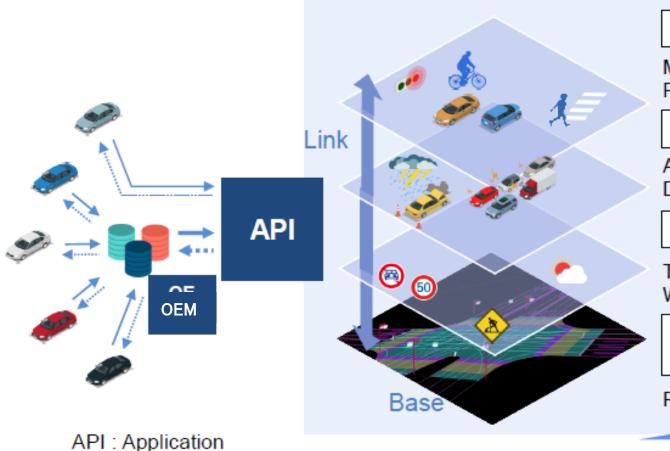


Safety assurance

In red:
Main Domain of SIP-adus
(Area of Cooperation)

Dynamic Map





Dynamic Data

Movement of Vehicles, Status of Pedestrians, Traffic Signals etc.

Semi-dynamic Data

Accidents, Traffic Jams, Detailed Weather etc.

Semi-static Data

Traffic Regulation, Road Construction, Weather etc.

Static Data

High Definition 3D Map

Road, Lane, 3D Shape of Structures etc.

Digital Mapping

3D Common Platform Data

Point Clouds, Graphics, Probe Data etc.

Competitive area

Additional data

Common (Basic) data

Cooperative area



Program

Interface

Dynamic Map Platform Co.Ltd

> The knowledge of the companies were brought together for the practical application of three-dimensional high-precision maps

Bringing together the knowledge of the providers

correction

Dynamic Map Platform Co. Ltd



correction



ZENRIN mapmaster



"High-Precision Three-Dimensional Map Data" Cooperation Areas Competitive Areas Satellite Mapping Integration Processing Utilization Measurement positionina Bringing together Examining specifications Addition the knowledge of June 2016 the users Data Integration Data integration Establishment of Dynamic ISUZU **\$** SUZUKI Map Planning Co., Ltd. Geographical Geographical Geographical object Mapping object Mapping TOYOTA object Mapping SUBARU Point cloud NISSAN MOTOR CORPORATION Point cloud ⊖HINO Point cloud Point cloud generation generation generation generation HONDA The Power of Dreams ⟨

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¬ Position Position Position Position Position correction correction MITSUBISHI MOTORS June 2017

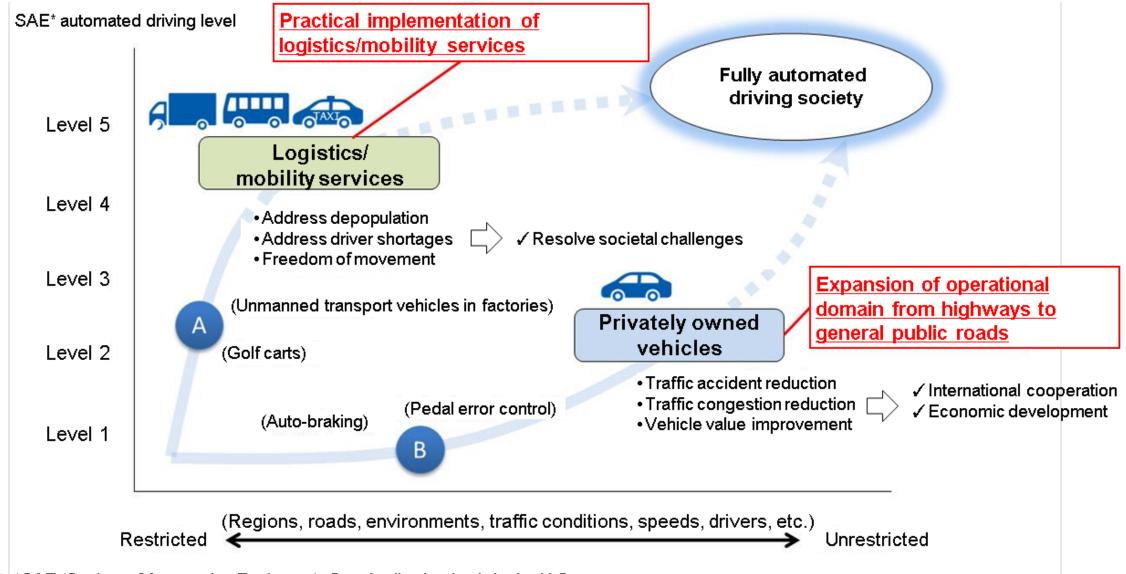
correction

(Source: Dynamic Map Platform Co. Ltd)



Overview of 2nd Phase of SIP-adus



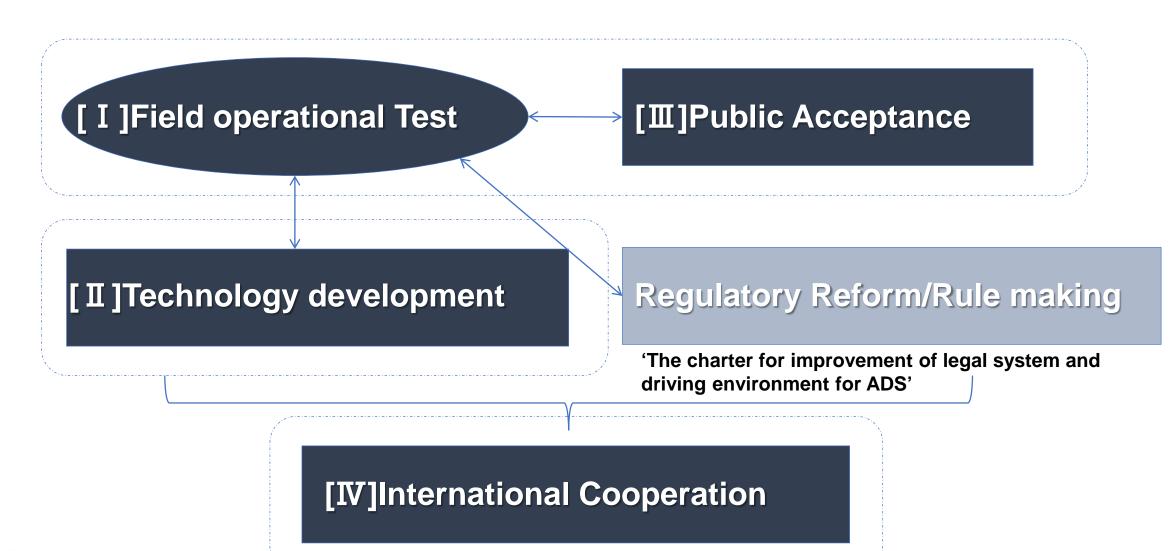




*SAE (Society of Automotive Engineers): Standardization body in the U.S.

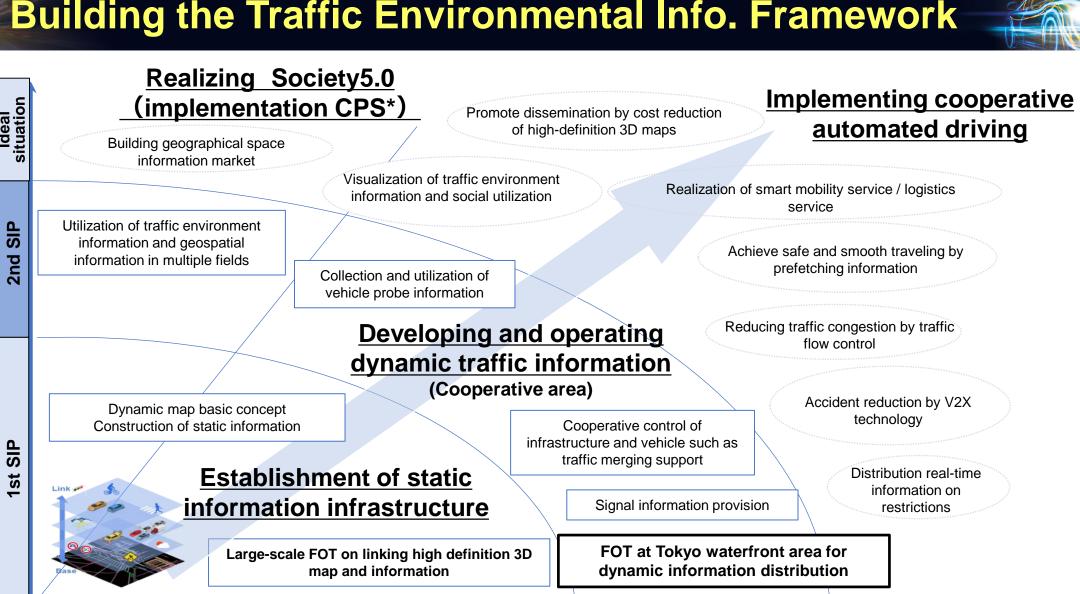
4 Pillars of SIP-adus







Building the Traffic Environmental Info. Framework





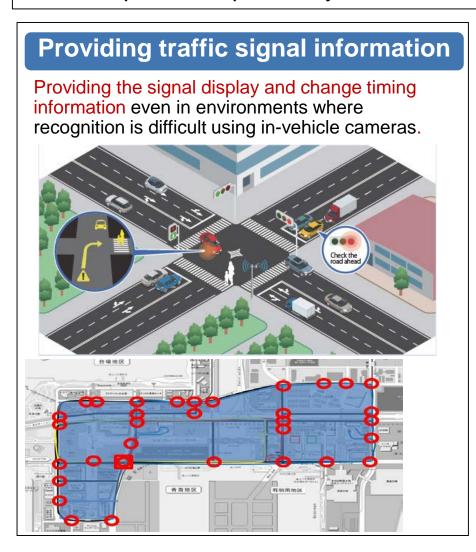
*CPS: Cyber Physical System

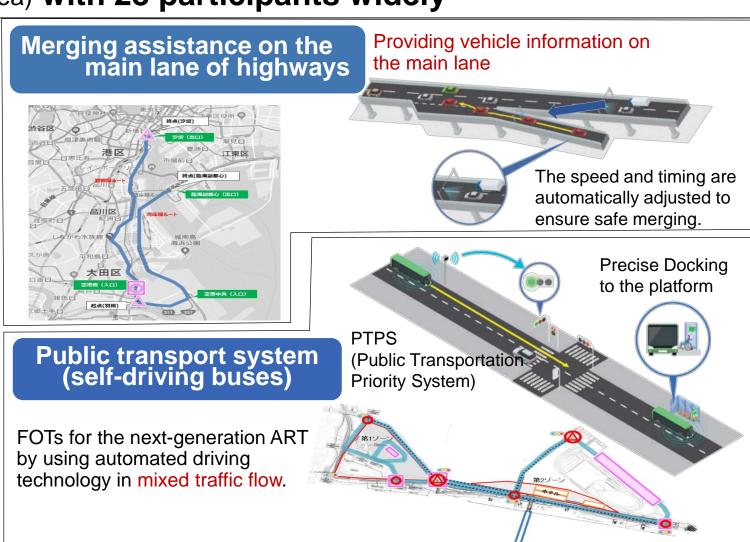
[Scenario for private car]

~2018 \sim 2022 By 2020 Ordinary road<L2> By around 2025 By around 2020 Expressway<L2·L3> Expressway<L4>

FOTs (Tokyo Waterfront City–Haneda Area)

■ FOTs started in October 2019 in the Tokyo waterfront city area (general roads and Metropolitan Expressway / Haneda area) with 28 participants widely





Participants of FOT in Tokyo waterfront area



■ Total 28 entities including OEMs, suppliers, venture companies and universities with about 100 vehicles will participate in our FOT in Tokyo.

















































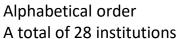












Challenging themes in FOT



■ Prioritize and focus on essential information in order to realize highly advanced ADS

Automated driving under various traffic environment



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

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

Developing traffic info.

Traffic Signal Info.



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



Lane level traffic environmental info.

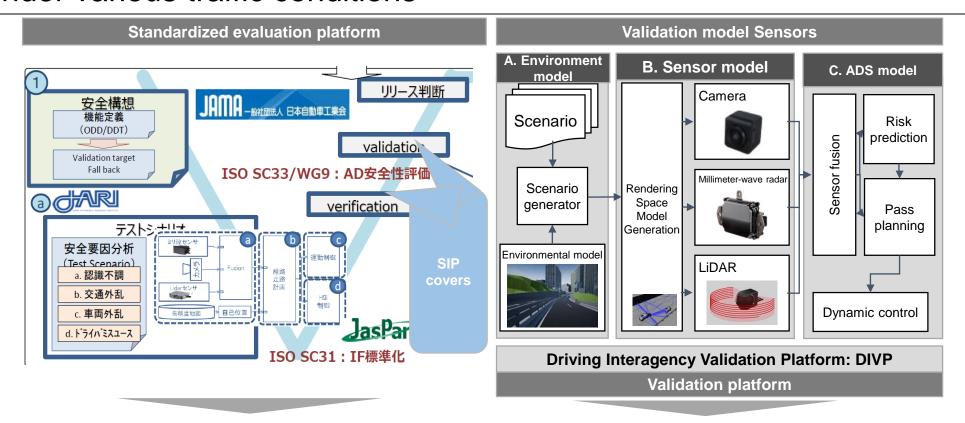




Safety Assurance



■ To develop **simulation tool and method** which can evaluate safety assurance of ADS under various traffic conditions



Disclose standardized evaluation platform

By establishing the simulation tool for sensor evaluation, enhance both safety of ADS and developing capability of OEMs and suppliers



International cooperation



SIP-adus Workshop 2019

November 12-14 @ Tokyo International Exchange Center

Regular annual international conference for Info. Sharing & discussion





Welcome Speech Noriyuki Koda Vice-Minister for Policy Coordination, Cabinet Office, Japan







1 Kenneth M. Leonard: US Department of Transportation, USA 2 Clara de la Torre: European Commission, Belgium. 3 Seigo Kuzumaki: SIP-edus Program Director, Japan.





Breakout Workshop

Main themes of **International Cooperation**

Dynamic map

Connected Vehicle

Human Factors

Cybersecurity

Safety Assurance

Field Operational Test

Impact Assessment

SIP-adus Workshop in Tokyo





Date: November 12-14, 2019

Venue: Tokyo International Exchange Center

2-2-1 Aomi, Koto-ku, Tokyo 135-8630

Program	Tuesday, November 12	Wednesday, November 13	Thursday, November 14
AM	Opening Session	Cybersecurity	Breakout Workshop
	Regional Activities	Safety Assurance	
	Poster Session		
PM	FOTs and Next Generation Transport	Dynamic Map	Breakout Workshop Summary
	Human Factors	Connected Vehicle	Closing Session



