Automated Vehicles research and pilots in Japan (SIP-adus)

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SIP ; Strategic Innovation Promotion Program adus ; Automated driving system for universal service

Society 5.0 and SIP-adus

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

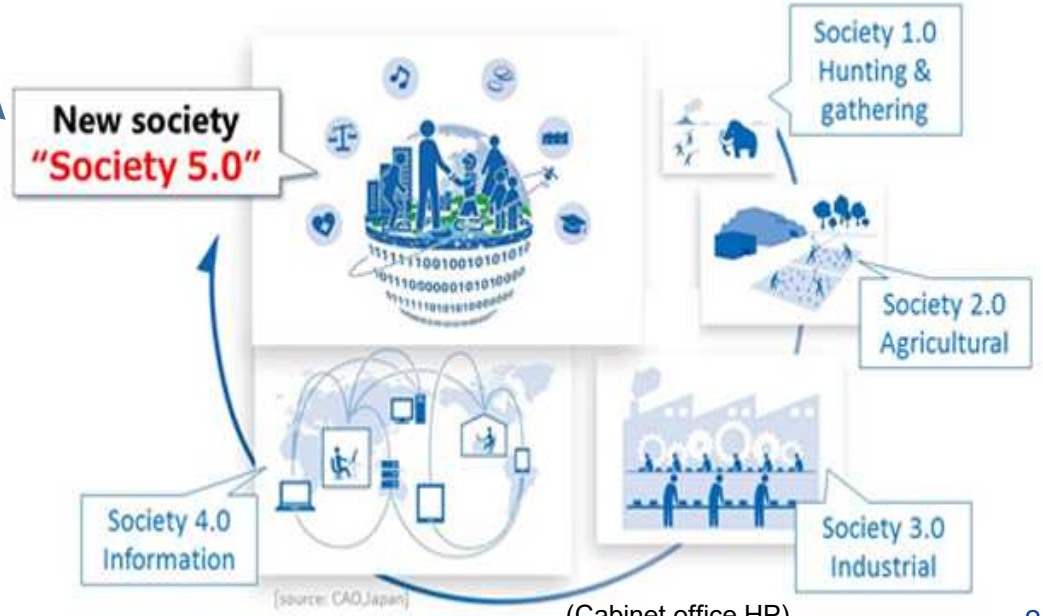
human-centered society in which anyone can enjoy a high quality of life full of vigor

SIP Strategic Innovation Promotion Program

SIP 2nd FY2018～FY2022

12 themes on going (SIP-adus is one of them)

adus ; Automated driving for universal services



(Cabinet office HP)

SIP-adus Mid-Term Result Report

- English version of SIP-adus 2nd phase Mid-Term Result Report (FY2018-2020) published last December.
- You can download it from following SIP-adus website (JPN and ENG version available).

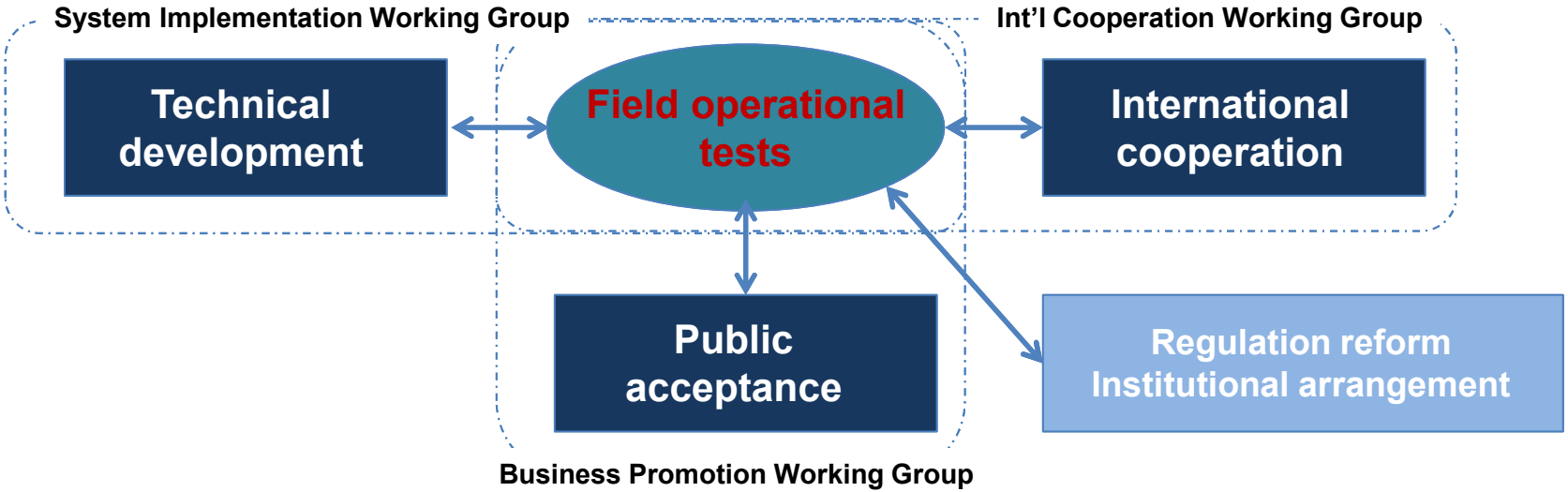
【Contents】

English Ver. : https://en.sip-adus.go.jp/rd/rd_page03.php

Japanese Ver. : https://www.sip-adus.go.jp/rd/rd_page03.php

Focus themes of SIP-adus

【4 pillars】



【Priority themes】

（Ⅰ） Traffic environment information (Dynamic map)
（Ⅱ） Traffic environment data portal
（Ⅲ） Virtual validation platform for ADS safety assurance
（Ⅳ） Evaluation methodology of Intrusion detection system

FOT in Tokyo Waterfront area (FY2019 - FY2020)

➢ To construct a system for the utilization of road traffic environment data such as **signal information using V2I**

Period

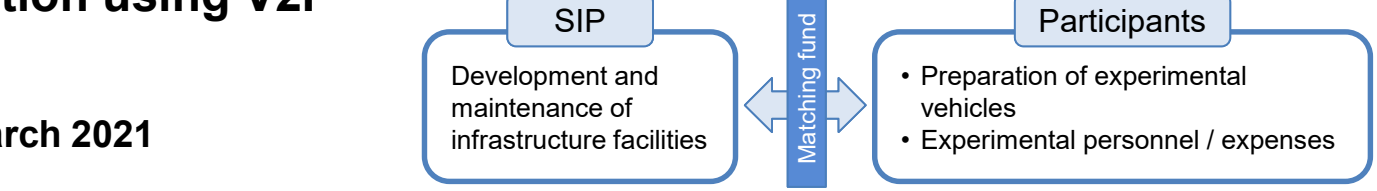
October 2019 - March 2021

Participants

Total 29 entities

先進モビリティ / AISAN TECHNOLOGY CO.,LTD. / BMW MINI / BOLDLY / BOSCH Invented for life / 中部大学 / Continental / DAIHATSU / epitomical / Field.auto / HINO / HONDA / JTEKT / 金沢大学 KANAZAWA / mazda / 名城大学 MEIJO UNIVERSITY / MITSUBISHI ELECTRIC Changes for the Better / MITSUBISHI MOTORS / 名古屋大学 NAGOYA UNIVERSITY / NISSAN MOTOR CORPORATION / SAIKO 埼工大 / SOMPO 損保ジャパン / SUBARU / SUZUKI / TierIV / TOYOTA / Valeo / VOLKSWAGEN

Alphabetical order. A total of 29 institutions

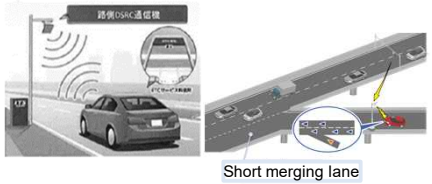


Signal information provision

- Reliability enhancement of signal recognition, development of the infra. spec. and technical requirements for safe and smooth driving

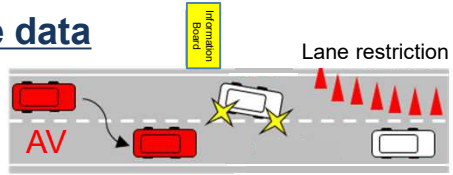
V2I・Merging support, etc.

- Development of information generation and distribution methods from infrastructure for safe and smooth driving



Collecting and Utilizing private probe data

- Development of traffic environment info. generation with lane level and distribution methods for path planning



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FOT in Tokyo Waterfront area (FY2021)

➢ To **expand applications to ADAS and ADS** by distributing road traffic environment data **using V2N**

Period

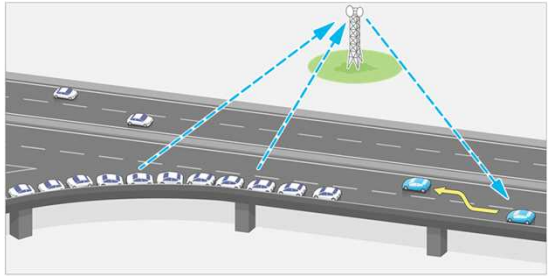
November 2021 - March 2022

Participants

Total 22 entities

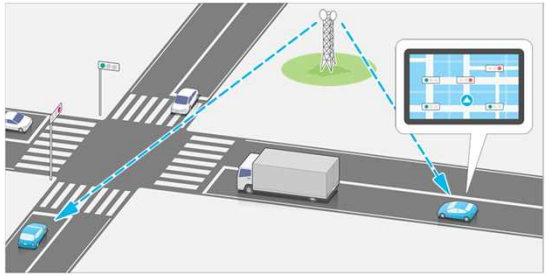
Alphabetical order. A total of 22 institutions

- **Smooth lane change using lane-based traffic jam information**

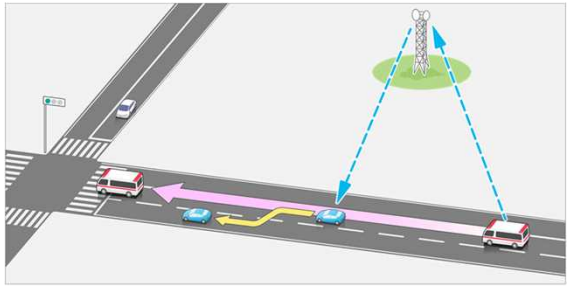


- **Prediction of sudden downpour**
  (Avoidance route, manual operation switching)

- **ADAS and ADS realization on general roads using signal information in a regional basis**



- **Warning and avoidance support for approaching emergency vehicles**



Safety assurance

- Developing a simulation platform that replaces real vehicle evaluations with sensor modelling that is highly consistent with real phenomena, in order to perform reproducible safety evaluations of automated driving in various traffic environments.

Real experimental test

Public Road

Proving Ground

Camera

Radar

LiDAR

Virtual test

DIVP

SILS／MILS
（Software in the Loop／Model in the Loop）

Connect

Connect

HILS
（Hardware in the Loop）

VILS
（Vehicle in the Loop）

Highly consistent sensor modeling

SIP

Simulation evaluation of Tokyo waterfront area

➢ Build Odaiba Virtual-PG environment

- ✓ **Modeling of FOTs in Tokyo waterfront area**
- ✓ Model building of traffic participants
  （3D model） pedestrian/bicycle/vehicle etc.
- ✓ **Reproduction of weather conditions**
  （sunlight, rain, nighttime）

➢ Evaluate tool usability and simulation results

- ✓ Evaluation of scenario setting tool including traffic participants
- ✓ Comparative evaluation of sensor detection data and simulation

SIP

"RoAD to the L4" project has just been launched

To realize and popularize advanced mobility services such as level 4 AD, the new project **"Advanced mobility service research, development and social implementation project for level 4 AD, etc. (RoAD to the L4)" has just been launched starting in 2021** and will feature consistent initiatives including R&D, demonstration tests, and social implementation.

"RoAD to the L4" project outline

- Project led by METI (Ministry of Economy, Trade and Industry) and MLIT (Ministry of Land, Infrastructure, Transport and Tourism) Road Transport Bureau
- Period : June 2021 - March 2026
- Target・KPI
  - ① Demonstrations and diffusion of driverless automated driving mobility services
    - Complete the demonstration of automated driving mobility services with remote monitoring (level 4) in limited areas and vehicles types by FY2022
    - Expansion of the service to more than 40 locations in diverse areas and vehicle types by FY2025, etc.
  - ② Diffusion of new mobility services (MaaS) using IoT and AI
  - ③ Developing and securing human resources
  - ④ Fostering public acceptance

"RoAD to the L4“ R&D/Social Implementation Project Overview

Projects for Realization of Promotion of Driverless AD Services

・Theme 1

Demonstration of an AD Service with Remote Monitoring (L4)

・In limited locations and vehicles with remote monitoring (L4) by FY2022

2021

2022

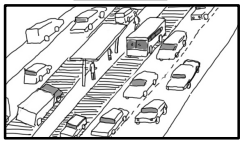
Area/vehicle expansion

・Theme 2

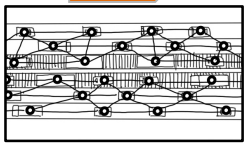
Other initiatives to expand target areas and vehicle, as well as improve business viability

・L4 driverless AD services to diverse areas and with various type of vehicles in over 40 locations by FY2025.

～2022



～2025



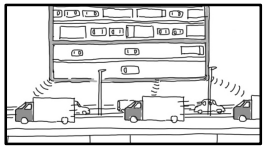
Mixed environments

・Theme 3

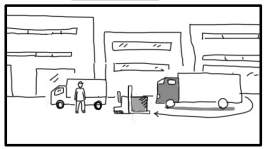
Deployment of High-Performance Trucks including Platooning on Expressway

・L4 AD trucks and its platooning technology on expressway after 2025

～2022



～2025



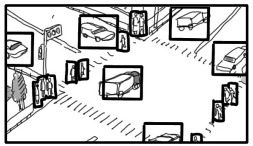
Mixed traffic environments

・Theme 4

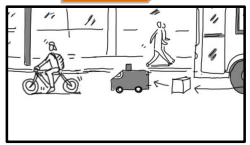
Harmonization and interoperability of V2V and V2P for deployment of L4 in mixed traffic environment

・L4 AD services in mixed traffic in diverse areas using cooperative system by 2025

～2022



～2025



International Cooperation ; SIP-adus Workshop 2021

- Virtual conference due to COVID-19
- Plenary session : November 9th,10th, 2021

  <Session theme>
  - Opening session / Regional activities
  - Impact assessment
  - Service and business implementation / FOTs
  - Human factors
  - Dynamic map
  - Connected vehicles
  - Safety assurance
  - Cybersecurity
  - Japanese government
- Breakout workshop for experts' discussion
- On-demand streaming : December 10th, 2021 - January 5th, 2022

Event summary is available from following website;
https://en.sip-adus.go.jp/evt/workshop2021/

SIP-adus Workshop 2022 : October 11th - 13th, 2022
(Planning to be held in Kyoto as an in-person event)


Thank you
SIP-adus web site
https://en.sip-adus.go.jp