13th Japan ITS Promotion Forum

Overview of International Cooperation

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SIP Cabinet Office

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Overview of International Developments

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Overall developments

- Comprehensive initiatives have been promoted toward deployment: laws, systems, safety standards, increase in social acceptance, etc.
- In Europe and the U.S., the deployment of automated driving shuttles (truck platooning) has been promoted as national projects earlier than other projects.
- Automated driving shuttles are highly likely to be implemented locally, taking into account regional characteristics.

Developments in the United States

- Progress has been made in activities, from development by DOT/DOT Offices to deployment.

Developments in Europe

- Policy formulation and development activities have been promoted by the European Commission.
- Germany and the U.K. have been actively promoting the initiatives.

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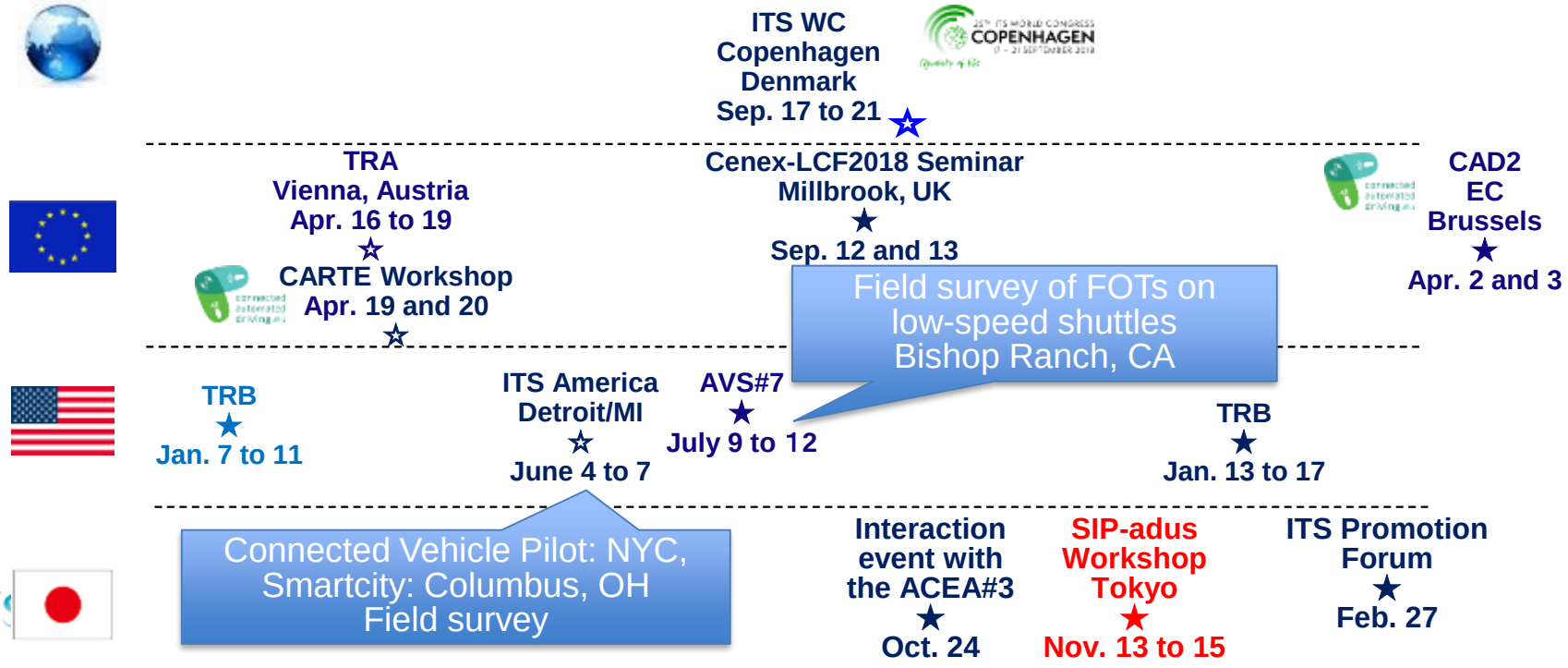
Major International Conferences of 2018

Main Conferences Related to Automated Driving

◆ SIP-adus dispatched experts to these main conferences:

FY2018



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Developments in the United States

- **Information dissemination and communication promoted by the government toward deployment**
  - The roles and responsibilities of stakeholders have been clarified.
  - The government has been promoting R&D on automated low-speed shuttles (whose public nature is high) and automated driving of commercial vehicles.
  - A new project (CARMA) has been launched to improve safety and infrastructure efficiency.

Activities of the U.S. DOT

Information dissemination from the U.S. DOT

- Automated Driving Systems 2.0
- Automated Vehicles 3.0: October 4, 2018

Communication with stakeholders

- Roundtable on Data for Automated Vehicle Safety
- Public Listening Summit on Automated Vehicle Policy
- Modal RFI and RFC Releases
- FHWA National Dialogue on Highway Automation Series
- FMCSA and NHTSA Listening Sessions

Preparation of funds

NATIONAL DIALOGUE ON HIGHWAY AUTOMATION

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Preparing for the Future of Transportation: Automated Vehicles 3.0

- **Policy on measures by the U.S. DOT: issued on October 5, 2018**

Preparing for the Future of Transportation:
Automated Vehicles 3.0

https://www.transportation.gov/av/3

Traffic Safety in Numbers: Statistics in 2017

- An estimated **39,141** persons died in total across all modes of transport.
- 37,133 persons died in car accidents.
- Of all serious car accidents, 94% were due to drivers (e.g., decrease in driving ability, carelessness, speeding, illegal driving).
- Nearly 11,000 fatalities were due to drunk driving.
- Of fatalities in accidents on highways, nearly 10,000 were due to speeding.
- Of fatalities in crash accidents, nearly 3,500 were due to carelessness.
- Regarding commercial vehicles, 13% of annual fatality accidents were due to crash accidents of large trucks.
- 82% of fatalities in crash accidents of large trucks were road users who were not in the trucks.
- Occupational drivers are 10 times more likely to die and almost nine times more likely to be injured during work compared to average workers.
- 5,977 pedestrians died in car accidents, accounting for 16% of total fatalities in traffic accidents.
- The annual average number of fatalities at highway rail grade crossings (HRGCs) during the past 10 years was 253, accounting for about a third of all railway-related fatalities.

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Summary of Automated Vehicles 3.0

- New safety guidelines for multimodal transport
- Clarification of the policy and role
- Cooperation with the U.S. DOT in line with the advancement of automated driving technologies
- Coordination of the U.S. DOT's operating administrations to improve safety

U.S. DOT's operating administrations

Federal Highway Administration (FHWA)	Federal Transit Administration (FTA)
Federal Motor Carrier Safety Administration (FMCSA)	Maritime Administration (MARAD)
Federal Aviation Administration (FAA)	National Highway Traffic Safety Administration (NHTSA)
Federal Railroad Administration (FRA)	Pipeline and Hazardous Materials Safety Administration (PHMSA)

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Six principles and strategies

Six principles:

1. **We will prioritize safety.**
2. **We will remain technology neutral.**
3. **We will modernize regulations.**
4. **We will encourage a consistent regulatory and operational environment.**
5. **We will prepare proactively for automation.**
6. **We will protect and enhance the freedoms enjoyed by Americans.**

Automated Vehicles 3.0 Contents

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FOTs on Automated Low-speed Shuttles

- Common issues
  - Use cases
  - Operating environment
  - Vehicle supply
  - Economic constraints
  - Federal, state, and local laws
  - Social acceptance
  - Planning and introduction
  - Manpower
  - Data and evaluation
- Main results
  - High public interest
  - Advancing vehicles
  - Use cases
  - In-house conductors
  - Evaluation

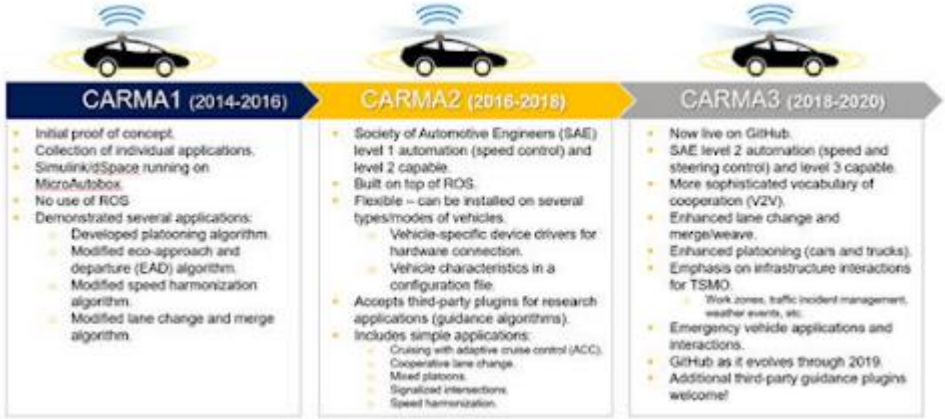
- **Future developments**
  - Research conducted by the U.S. DOT
    - (1) Smart Columbus (ITS JPO)
    - (2) San Francisco Treasure Island (ITS JPO)
    - (3) Greenville, S.C. (FHWA)
    - (4) Research on Human Factors and Social Acceptance (FTA)
  - **Financing from the U.S. DOT available**

Source: SIP-adus Workshop 2018 presentation document

Cooperative Research Mobility Applications (CARMA)

What is CARMA?

- Open source software platform initiated by the FHWA
- Testing and evaluation of the cooperative automation concept for improving safety and infrastructure efficiency
- Provide look-ahead information to vehicles and achieve safe and efficient mobility of goods and services through cooperation between infrastructure and other vehicles



Platooning and Commercial Vehicles Evaluation Program: PACE

Goals of the program

- Examine the exemption/exception rules and investigate to make judgments on applications for automated commercial vehicles (CMVs) for the pilot program (49 CFR 381)
- Identify the best practices of utilization in the industry regarding CMVs equipped with ADAS and ADS
- Promote safe driving of automated CMVs and truck platooning

Key areas

- Truck platooning and safety performance of CMVs equipped with ADS
- Verification of the safety system and data transfer to industry partners
- Testing in environments with multiple vehicles
- Safe inspection procedures
- Response of Level 4 automated CMVs in the defined work areas and safety considerations for emergency response after an accident

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Developments in Europe

- **Progress in activities after deployment of C-ITS in 2019**
  - R&D has been expanded through Horizon 2020, and Horizon Europe has been launched as the next project.
- **Promotion of initiatives based on different circumstances in respective countries**
  - Germany: initiatives for automation of passenger cars (L3Pilot, PEGASUS)
  - U.K.: maintaining competitiveness after leaving the EU
- **International cooperation for promoting deployment is a shared interest.**

Developments Related to Automated Driving by the EC

- **Measures based on the 3rd Mobility Package (May 17, 2018)**
  - Comprehensive initiatives toward development and progress of CAVs in Europe

Specific initiatives:

COMPETITIVENESS

SAFETY

SOCIETY

Investment in R&D

Appropriate legal framework

Social and ethical viewpoint

- **Europe on the Move**
  - Shaping the future of mobility
- **Horizon 2020 (H2020) to shift to the final phase of calls for proposals**
  - Mainly focusing on themes such as FOTs and international cooperation
- **Shift to Horizon Europe (2021–2027)**

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Developments Related to Automated Driving by the EC

◆ Shaping the future of mobility

- SAFE:
  - Reduce road traffic accidents
- CONNECTED & AUTOMATED:
  - Keep Europe at the forefront of innovations in mobility technology to benefit all people in Europe
- CLEAN:
  - Accelerate the shift to low-emission mobility to attain the climate goal of the Paris Agreement and to reduce urban air pollution

Vision toward 2025

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◆ Total budget: €300m (2014–2020)

Focus areas:

- Large-scale demonstrations of the automated driving system for passenger cars, trucks, and urban traffic
- Safety and end user acceptance
- Road infrastructure to support automation
- Traffic management solution
- Connectivity for automation
- Testing and verification procedures
- Impact assessment of CAD systems in terms of impact, advantages, and cost
- Cooperation and support for networking activities
- Human-centered design for automated driving vehicles

5 Calls for proposals

2016 2017 2018 2019 2020

It was decided to implement the following projects.

 Testing, validation, and certification procedures for highly automated driving functions	**HEADSTART**
 Support for networking activities	**ARCADE**
 Impact assessment of road transport automation	**LEVITATE**
 5G services for cooperative, connected, and automated mobility	**5G GROCO** **5G Mobix** **5G-Carmen**

Future projects available for calls for proposals

Calls for proposals in 2019
- Start: December 4, 2018
- Deadline: April 24, 2019

Human-centered design that is suitable for the role of new drivers in advanced automated driving

2019 Call

Development and testing of urban-type shared automated driving vehicles

Efficient and safe connected automated heavy commercial vehicles for logistics

2020 Call

Cross-border large-scale demonstrations of advanced automated driving functions for passenger cars

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Harmonised European Solutions for Testing Automated Road Transport

◆ Objectives of the project

- Define testing and validation procedures for CAD functions
- Key enabling technologies (communications, cybersecurity, positioning)
- Cross-linking of all test instances such as simulation, proving ground and real world field tests
- Validate safety and security performance according to the needs of key user groups (technology developers, consumer testing groups and type approval authorities)

◆ Project outline

- Leader: IDIADA
- 17 European organizations
- Period: from autumn 2018
- Budget: €6m

Consortium

Associated Partners (open)

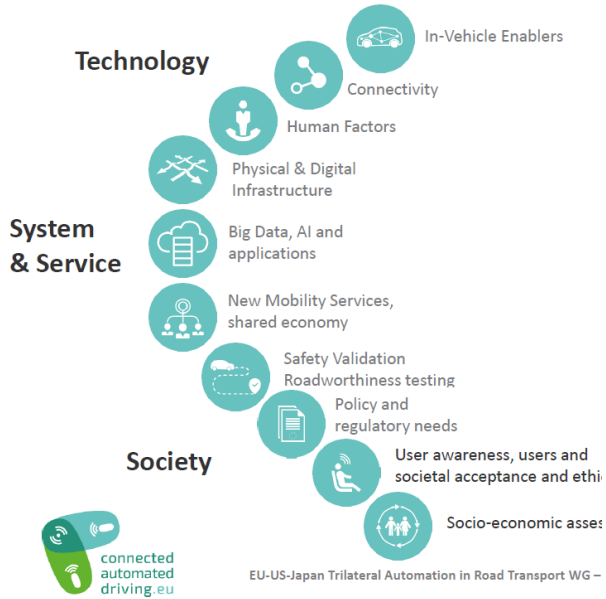
ARCADE (← CARTRE ← VRA)

Objectives of the project

- Expand the international network to non-EU countries
- Expand the initiatives to aspects related to regulations, standardization, and cargo
- Contribute to establishing priorities of future research and innovation in Europe

Project outline

- Leader: ERTICO-ITS Europe
- 23 organizations in 11 EU countries
- Period: October 1, 2018 to September 30, 2021
- Budget: €3m



LEVITATE

Objectives of the project: Impact assessment of road transport automation

- Prepare a new impact assessment framework for policymakers to introduce the CAV system
- Establish techniques in various fields to evaluate the short-term, mid-term, and long-term impact of CAVs
- Predict the impact of CAVs in various use cases, ODDs, and environments by applying techniques

Project outline

- Leader: Loughborough University
- 12 organizations
- Period: from December 1, 2018
- Budget: €6m

5G for Automated Mobility

Objectives of the project

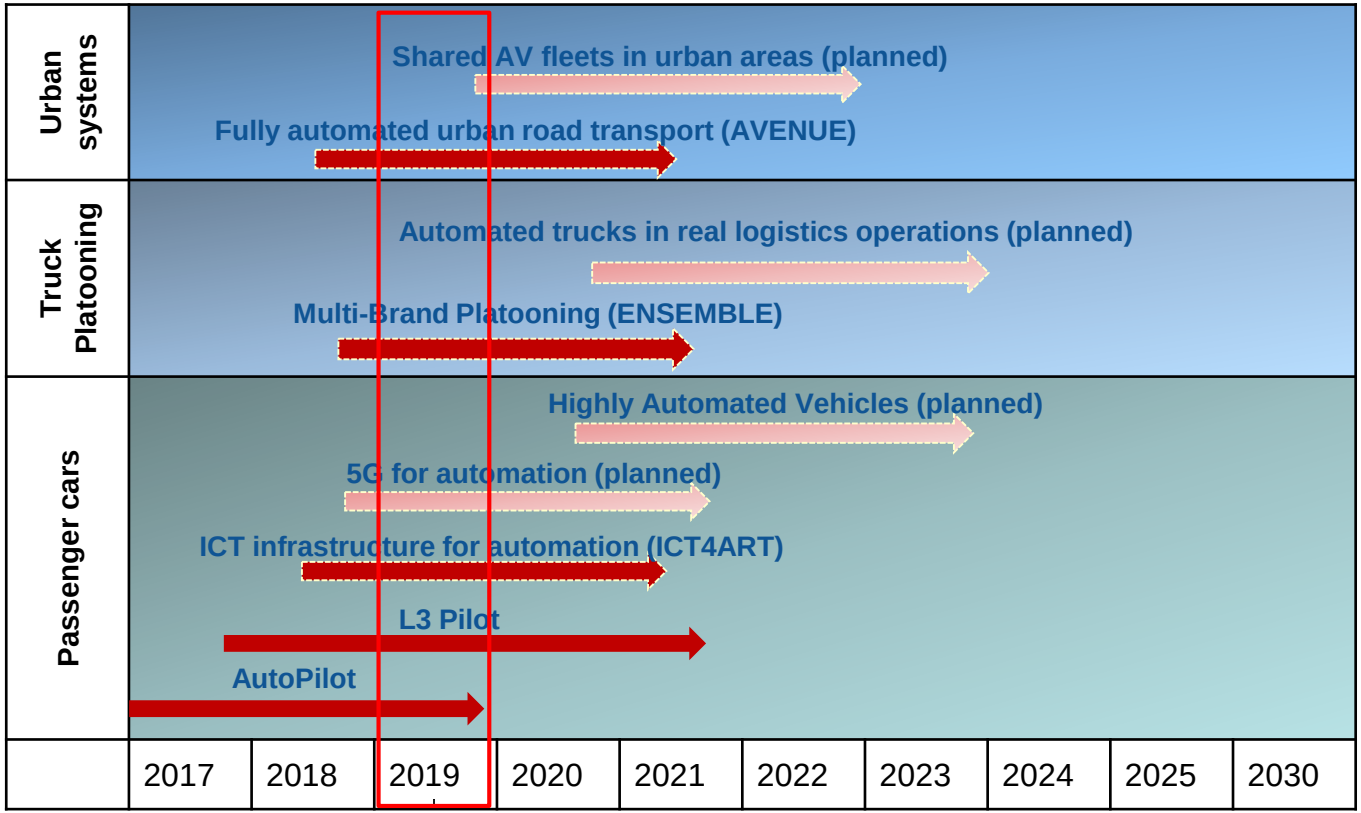
- Test utilization of 5G connectivity to achieve advanced automated driving functions and new mobility services
- Support testing of 5G for advanced automated driving functions on cross-border corridors in Europe

Project outline

- Cover the 5G cross-border corridors based on three projects:
  - Metz-Merzig-Luxembourg
  - Porto-Vigo and Evora-Merida
  - Brenner Pass between Bologna and Munich
  - Added: a small area on the border between Greece and Turkey, 8 km long
- Budget: €6m

Horizon 2020 – Plan for Large-scale Demos

Large-scale demonstration plan



Emphasis on international cooperation

- **International partners involved in all the Horizon 2020 projects**
  - Applicants from non-EU countries are eligible to participate in the Horizon 2020 programs as coordinators as well.
- **R&I topics for international cooperation**
  - Cooperation with projects and partners from the U.S., Japan, South Korea, Singapore, and Australia is encouraged.
- **Twinning**
  - Bilateral cooperation project

Horizon Europe

- **A seven-year research and innovation program worth €100 billion (2021 to 2027)**

- **Innovation instead of advancement**
  - Strengthen the EU's scientific and technological bases
  - Boost Europe's innovation capacity, competitiveness and jobs
  - Deliver on citizens' priorities and sustain our socio-economic model and values

- **Reflect the results of Horizon 2020**
  - Support epoch-making innovation
  - Create more impact through involvement of citizens
  - Enhance international cooperation
  - Enhance openness

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Outline of the PEGASUS Project

Project outline

http://pegasus-projekt.info/en/about-PEGASUS

- Period: January 2016 to June 2019 (42 months)
- Contracted organizations: OEM (Audi, BMW, Daimler, Opel, VW), tier-one suppliers, research institutes, SMEs, science institutes, etc.
- Funds: approx. €34.5m; Subsidies: €16.3m

Objectives of the project

What level of performance is expected in automated driving cars?
How can achievement of the required performance be confirmed?

Scenario analysis and quality measures	Implementation processes	Testing	Result reflection and embedding
What human and technical capabilities are needed in applications?	What tools, methods, and procedures are required?	What will be tested in laboratories, simulations, test courses, and roads?	Is the concept sustainable?

Pegasus
Project for the establishment of generally accepted quality criteria, tools and methods as well as scenarios and situations for the release of highly-automated driving functions

Source: PEGASUS

Outline of the PEGASUS Project

http://pegasus-projekt.info/en/about-PEGASUS

PEGASUS Approach

- Techniques for evaluating advanced automated driving functions
- Development and application of the PEGASUS Approach to validate functional safety in various use cases

Case examples

- Level 3 function: Highly Automated Driving Highway Chauffeur
  - Conditions
    - A highway, or a road equivalent to a highway, including road signs
    - Speed: 0 to 130 km/h
  - Functions
    - Stop & Go: automated following during congestion
    - Automated lane change
    - Automatic emergency braking and crash avoidance
- Environmental conditions
  - Areas under construction
  - Automated highway exit
  - Extreme weather conditions

Initiative to Promote Automated Driving in the U.K.

◆Industrial Strategy

- **Four measures**
  1. Future of Mobility
  2. Clean Growth
  3. Aging Society
  4. Artificial Intelligence

INDUSTRIAL STRATEGY

Department for Business, Energy & Industrial Strategy
Department for Transport
Office for Low Emission Vehicles
Centre for Connected & Autonomous Vehicles

Future of Mobility

- Become a global leader in human resources, supplies, and services

Clean Growth

- Maximize the advantages of U.K. industry to lead the global shift toward clean growth

Aging Society

- Utilize the power of innovation to meet the needs of the aging society

Artificial Intelligence

- Put the U.K. at the forefront of AI and the data revolution

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CAV Ecosystem in the U.K.

- **Become a global leader in the development and deployment of CAV**

Legal reform

Open regulatory approach – you can test on UK roads now

Lead role: Government (CCAV)

Investment in R&D

£250m invested into R&D projects - cutting edge technology

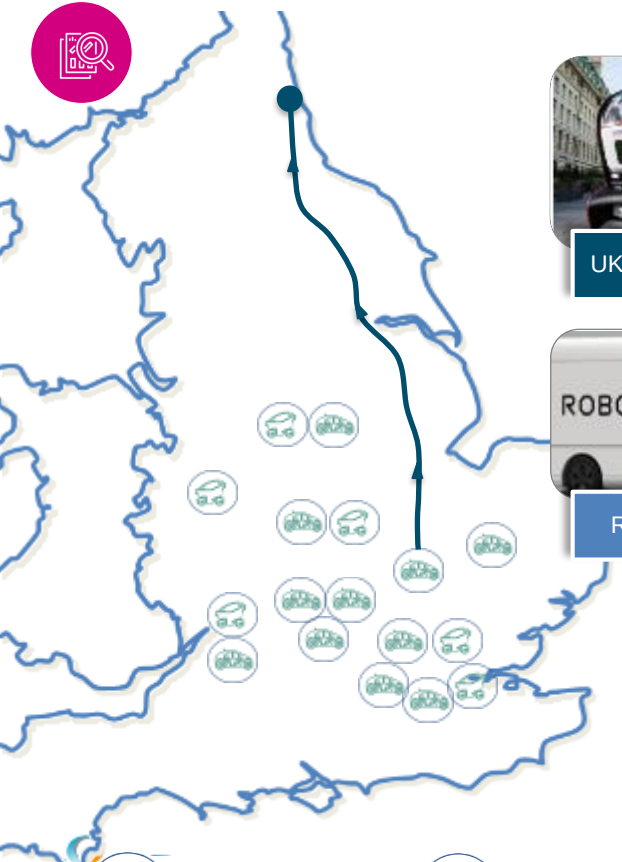
Lead role: Government (CCAV)

Investment in testing infrastructure

£200m invested in testing infrastructure - a world leading ecosystem

Lead role: Meridian

R&D Projects



UK AUTODRIVE

GATEWAY

VENTURER

STREETWISE

HUMANDRIVE

ROBOPILOT

DRIVEN

FLOURISH

INSIGHT

SYNERGY

CAPRI

T-CABs

MultiCAV

SHIFT

On Highway

Off Highway

Testbed UK - Integration Ecosystem

Phase 1: Testing in urban environment

Phase 2: Addition of suburban highways, parking lots, ... and data exchange

Trusted Intelligent CAV
MIRA Coventry University

Test Vehicles To The Limits

MIDLANDS FUTURE MOBILITY

Super Smart Infrastructure

Millbrook Culham
MILLBROOK RACE

Variable Control Levels

Smart Mobility Living Lab London

Accreditation and Scale

Data Exchange

Highway/Rural

Parking

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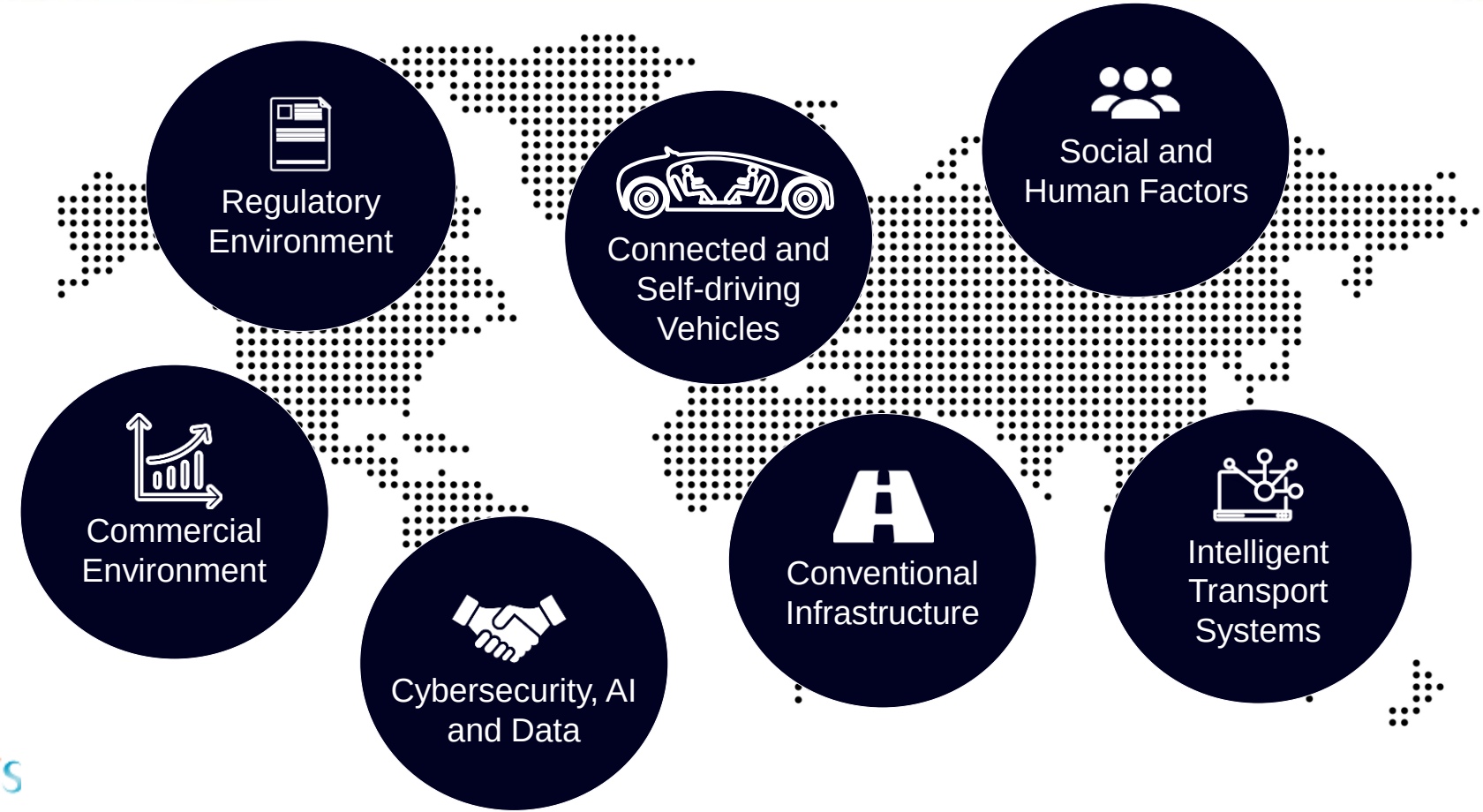
Advancements Accelerated by International Cooperation



SIP-adus Workshop 2018

SIP-adus Workshop 2018

Session (November 13-14)

- Sixty-four experts, including thirty-six experts from overseas, delivered presentations.
- Presentations were given on the following seven themes, and the status of SIP-adus development projects was reported.

Session themes:

1. Regional Activities and FOTs (Field Operational Tests)
2. Dynamic Map
3. Connected Vehicles
4. Cyber Security
5. Impact Assessment
6. Next Generation Transport
7. Human Factors

Vice-Minister for Policy Coordination Noriyuki Koda and speakers from outside Japan

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

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

The presentation documents and summary were posted on the website.
http://en.sip-adus.go.jp/evt/workshop2018/

SIP-adus Exhibition (November 13-14)

Thirty posters from ministries and agencies working for SIP-adus development projects were exhibited at a hall adjacent to the conference hall.

Poster session

Breakout Workshop (November 15)

Overseas experts were invited to participate in discussions on seven session themes with SIP-adus members and other Japanese experts.

Breakout Workshop

Breakout Workshop Summary
Sharing the results on each theme

Information about the workshop in 2019
November 12–14


Thank you