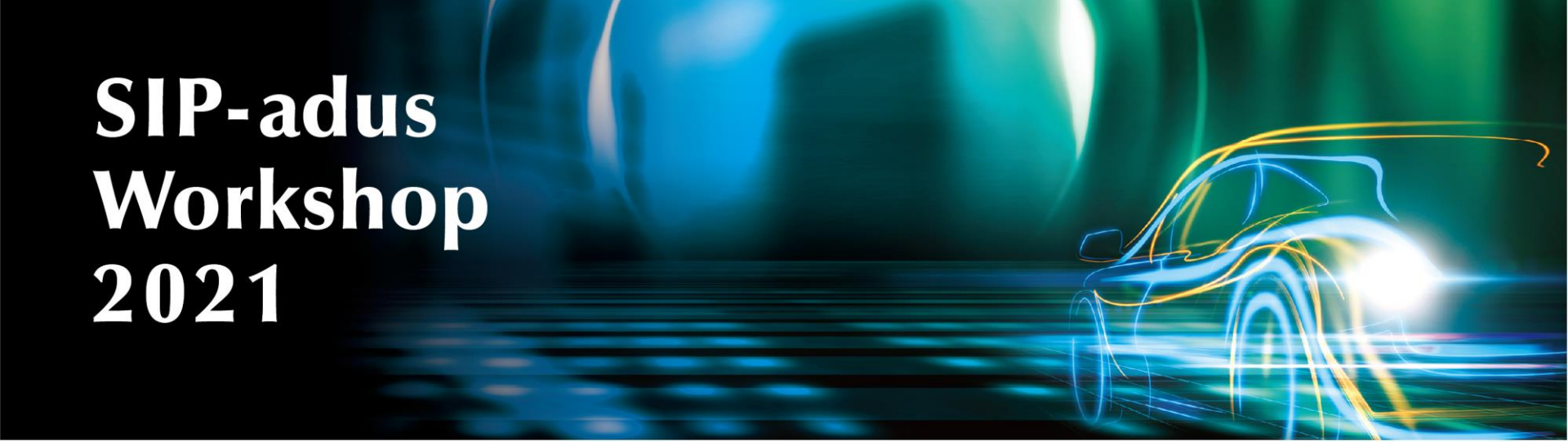


SIP-adus Workshop 2021 Report

Cross-Ministerial Strategic Innovation Program, Secretariat of Science, Technology and Innovation Policy, Cabinet Office, Government of Japan
New Energy and Industrial Technology Development Organization (NEDO)
Supported by ITS Japan

NEDO SIP Cabinet Office

SIP-adus Workshop 2021

INDEX

1. Summary

◆ Objectives:

- Accelerating discussions on common international issues regarding automated driving among Japanese and overseas policymakers and experts.
- Presenting Japan's initiatives on automated driving R&D.
- Promoting international standardization and cooperation.
- Developing human capital through active participation by young researchers.

◆ Results:

- The workshop has been consistently held as an international conference on automated driving, thus increasing Japan's presence within the industry.
- The workshop has assisted many participants in collecting information and building personal networks with respect to automated driving projects overseas.

■ **Plenary Session**

- Date : November 9-10, 2021
- Format : Virtual conference (live/on-demand streaming)
  All sessions were streamed live online. Additionally, on-demand streaming times were made available in Central Time, European Time, and Eastern Standard Time for worldwide participants.

■ **Breakout Workshop**

- Date/Format : Each theme was held online before or after Plenary Session.

2. Program

■ Plenary Session

Speeches on automated driving policies by government representatives from Japan, the U.S. and Europe at the opening session, and presentations by Japanese and International experts on the eight key themes of SIP automated driving were streamed online.

■ Breakout Workshop

Before and after the Plenary Session, Breakout Workshops were held to provide a forum for discussions by experts.

Plenary Session Program

November 9 (Day 1)			
Session	Japan (JST)	Europe (CET)	Americas (EST)
Opening Session / Regional Activities	9:00 - 10:40	1:00 - 2:40	#19:00 - #20:40
	17:30 - 19:10	9:30 - 11:10	3:30 - 5:10
	*1:00 - *2:40	17:00 - 18:40	11:00 - 12:40
Impact Assessment	10:50 - 12:15	2:50 - 4:15	#20:50 - #22:15
	19:20 - 20:45	11:20 - 12:45	5:20 - 6:45
	*2:50 - *4:15	18:50 - 20:15	12:50 - 14:15
Service and Business Implementation / FOTs Human Factors	13:15 - 15:10	5:15 - 7:10	#23:15 - 1:10
	21:00 - 22:55	13:00 - 14:55	7:00 - 8:55
	*4:30 - *6:25	20:30 - 22:25	14:30 - 16:25
Japanese Government	15:25 - 16:40	7:25 - 8:40	1:25 - 2:40
	23:10 - *0:25	15:10 - 16:25	9:10 - 10:25
	*6:40 - *7:55	22:40 - 23:55	16:40 - 17:55

November 10 (Day 2)			
Session	Japan (JST)	Europe (CET)	Americas (EST)
Dynamic Map	9:00 - 10:30	1:00 - 2:30	#19:00 - #20:30
	17:30 - 19:00	9:30 - 11:00	3:30 - 5:00
	*1:00 - *2:30	17:00 - 18:30	11:00 - 12:30
Connected Vehicles	10:40 - 12:05	2:40 - 4:05	#20:40 - #22:05
	19:10 - 20:35	11:10 - 12:35	5:10 - 6:35
	*2:40 - *4:05	18:40 - 20:05	12:40 - 14:05
Safety Assurance	13:10 - 14:45	5:10 - 6:45	#23:10 - 0:45
	20:50 - 22:55	12:50 - 14:25	6:50 - 8:25
	*4:20 - *5:55	20:20 - 21:55	14:20 - 15:55
Cybersecurity	15:00 - 16:15	7:00 - 8:15	1:00 - 2:15
	22:40 - 23:55	14:40 - 15:55	8:40 - 9:55
	*6:10 - *7:25	22:10 - 23:25	16:10 - 17:10
Closing	16:15 - 16:20	8:15 - 8:20	2:15 - 2:20
	23:55 - 0:00	15:55 - 16:00	9:55 - 10:00
	*7:25 - *7:30	23:25 - 23:30	17:25 - 17:30

3.1 Opening Session & Regional Activities

Plenary Session

Overview of the Session

- In the Opening Session, Mr. Takayuki Kobayashi, the Minister of State for Science and Technology Policy, Cabinet Office, delivered a welcome speech, and high-ranking officers from the United States Department of Transportation (USDOT) and the European Commission (Directorate-General for Research and Innovation (DG-RTD)) and Mr. Seigo Kuzumaki, Program Director for SIP-adus, gave keynote speeches.
- In the subsequent Regional Activities Session, speakerwhich has s from Europe, the U.S., and China introduced the latest initiatives for automated driving by the governments of these regions.
  - Mr. Robert Heilman, USDOT: Introduced an automated driving system demonstration grants program, a digital infrastructure framework, a safety assurance program for automated commercial vehicles, an automated bus project, and other initiatives.
  - Mr. Ludger Rogge, European Commission: Explained an overview of three large-scale demonstration projects conducted in Horizon 2020, as well as the details of Horizon Europe, just started.
  - Mr. Reinhold Friedrich, BMBF, Germany: Introduced initiatives by Germany's three federal ministries related to automated driving (BMVI, BMWi, BMBF), as well as Japanese-German Research cooperation.
  - Dr. Keqiang Li, Professor at Tsinghua University, China: Introduced ICV*-related initiatives in China, new industrial chains related to automated driving, and smart mobility initiatives toward carbon neutrality.
    *ICV: Intelligent Connected Vehicle

Outcomes of the Session

- Following the preceding year, we had keynote speeches by high-ranking officers from the USDOT and the European Commission (DG-RTD).
- In the subsequent Regional Activities Session, we had presentations by speakers from Europe, the U.S., and China, and were able to grasp overviews of the ongoing initiatives in each region as intended.
- Field operational tests on large budgets by the respective governments are still in progress, and we had the impression that the initiatives place stronger focus on automated driving of commercial service vehicles (transportation trucks, buses, shuttle vehicles).

3.1 Opening Session & Regional Activities

Opening Session

Welcome Speech

Takayuki Kobayashi
Minister of State for Science and Technology Policy
Cabinet Office

Keynote Speech

Kenneth M. Leonard
Director, Intelligent Transportation Systems Joint Program Office
The United States Department of Transportation

Rosalinde van der Vlies
Director, Clean Planet Directorate, Directorate-General for Research and Innovation
European Commission

Seigo Kuzumaki
Program Director for SIP-adus
Fellow, Advanced R&D and Engineering Company, Toyota Motor Corporation

3.1 Opening Session & Regional Activities

Regional Activities

Moderator

Manabu Umeda
Collaborative Research Coordinator for SIP-adus
Project researcher, Mobility innovation collaborative research organization (UTmobI), The University of Tokyo

Speakers

Robert Heilman
Director, Office of the Assistant Secretary for Research and Technology
The United States Department of Transportation

Ludger Rogge
Policy Officer, Directorate-General for Research and Innovation
European Commission

Reinhold Friedrich
Deputy Head of Division, Electronics and Autonomous Driving
Federal Ministry of Education and Research

Keqiang Li
Professor, School of Vehicle and Mobility
Tsinghua University

3.2 Impact Assessment

Plenary Session

Overview of the Session

- Diffusion of automated driving vehicles (ADs) will help to reduce traffic accidents, alleviate traffic congestion, resolve the driver shortage, and resolve other social problems.
- On the other hand, ADs are necessary to be installed with adequate consent by people and society (social acceptance).
- In the Session, issues and initiatives related to the social impact of automated driving technologies were introduced.
- A total of five speakers, two from each of the Japanese and German parties involved in Japanese-German Research cooperation and Dr. Smith from the Volpe Center of the USDOT, made presentations.
- Dr. Winkler from DLR, Germany, and Professor Miyoshi at Doshisha University, Japan, reported on activities related to the diffusion of automated driving.
- Mr. Fleischer at the Karlsruhe Institute of Technology, Germany, and Professor Taniguchi at the University of Tsukuba, Japan, reported on activities related to public acceptance.
- Dr. Smith of the U.S. reported an approach to assessing the social impact of automated driving using system dynamics (SD), which is jointly promoted between the U.S. and Europe, and an analysis of the short-term impact (shared vehicle services) and the long-term impact (land use) as a case study and other activities.

Outcomes of the Session

- Following the preceding year, we had reports about initiatives concerning two themes, “diffusion of automated driving” and “social acceptance,” in Japan and Germany, and confirmed the status of the partnership between the parties involved in Japanese-German Research cooperation.
- The concept of the analysis using SD promoted under the initiative of the Volpe Center of the U.S. and its case study were reported, and the presentation enabled us to gain a deeper understanding of the method for assessing the social impact of automated driving.

3.2 Impact Assessment

Moderator

Takashi Oguchi
Director, Advanced Mobility Research Center, Institute of Industrial Science
The University of Tokyo

Speakers

Christian Winkler
Head of Department, Institute of Transport Research
German Aerospace Center (DLR)

Hiroaki Miyoshi
Professor, Graduate School of Policy and Management
Doshisha University

Torsten Fleischer
Deputy Director, Institute for Technology Assessment
and Systems Analysis (ITAS)
Karlsruhe Institute of Technology (KIT)

Ayako Taniguchi
Professor, Systems and Information Engineering
University of Tsukuba

Scott Smith
Operations Research Analyst, Volpe Center
The United States Department of Transportation

3.2 Impact Assessment

Breakout Workshop

Overview of the Session

- The Session was held online in real time, and the moderator and 16 panelists discussed mainly two themes for about three hours.
- Part 1 (1 hour): Based on the draft of factor classification affecting the diffusion of automated driving proposed by Dr. Kuhnimhof, who is a professor at RWTH Aachen University, Germany and involved in Japanese-German Research cooperation, the concept underlying the index representing each factor, the organization and classification of the factors, the importance thereof, and so on were discussed from various perspectives.
- Part 2 (1 hour): The Karlsruhe Institute of Technology, which is involved in Japanese-German Research cooperation, proposed the concept that social acceptance includes not only public acceptance but also expert acceptance, such as acceptance, recognition, and understanding by policy decision-makers. Furthermore, Ms. Yamasaki at the Karlsruhe Institute of Technology suggested an example of analysis of the policy decision-making process by the Japanese government for promoting automated driving as a topic, and social acceptance issues were widely discussed.

Outcomes of the Session

- Using the online whiteboard Miro, information about what was not verbally communicated was exchanged by posting opinions.
- Draft of factor classification affecting the diffusion of automated driving: 1) settlement patterns, 2) road transport supply, 3) public transport, 4) cost of driving, 5) domestic car industry (comparison of indices among Japan, Germany, and the U.S.).
- Discussion about the impact on diffusion: Difference of history among cities, impact of remote work, urban sprawl, costs incurred by items other than fuel (example: parking fees), road quality (maintenance and management), road traffic LOS evaluation indices, speed limit, and factors other than the production output of automobiles. Which factor is most important?
- Discussion about expectations of policy decision-makers: What mechanism determines the resource balance between automated driving and other measures (response to climate change/COVID-19) etc.? Impact of industry; outcome evaluations based on an evaluation board and rebalancing of resources for the next fiscal year; response to uncertain factors through social experiments, living laboratories, etc.; long-term consistent plans; long-term impact of hardware investments; huge investments required for implementation; the issue that social experiments and field operational tests (FOTs) do not contribute to implementation; role of long-term trials in penetration into society; importance of a bottom-up process; necessity for in-depth observation and analysis of case studies of demonstration tests and FOTs (example: Helmond, Netherlands).

3.3 Service and Business Implementation/FOTs

Plenary Session

Overview of the Session

- This year, the SBI/FOT (Service and Business Implementation & FOT) and HF (Human Factor) Sessions separately held in the preceding year were organized and held as a joint session.
- Session planning, selection of panelists, and presentation themes were also determined jointly with HF to enable comprehensive discussion on how to link “technology” and “urban activities and people” toward the practical use of automated driving, how to design services, and the concepts of business models.

Outcomes of the Session

- We had experts in a wide range of fields from the U.S. and Europe, including those invited to the SIP-adus Workshop for the first time, as speakers.
- Technology development and field operational tests of automated driving are in progress in many regions and cities around the world, and SIP is also committed to various activities with “social implementation” in mind. The introduction of automated driving services was discussed from the standpoint of what business models and service designs automated driving should be based on, taking into account the vision of each region and city.

3.3 Service and Business Implementation/FOTs

Moderator

Yurie Toyama
Researcher, Smart Region Division
Mitsubishi Research Institute

Speakers

Jan Hellåker
Chairman
Drive Sweden

Timothy Haile
Executive Director, All Departments
Contra Costa Transportation Authority

Habib Shamskhou
President, Engineering/Program Management/Technology Facilitation
Advanced Mobility Group

Jordana Maisel
Assistant Professor, Urban and Regional Planning
University at Buffalo, State University of New York

3.3 Service and Business Implementation/FOTs

Breakout Workshop

Overview of the Session

- In the discussion, the following questions were asked to the speakers (for SBI) at the Plenary Session:
  - What advantages does automated driving offer (from the respective standpoints of citizens, service operators, and local governments) ?
  - Ideas to realize economically feasible automated driving services
  - How should local communities accept and manage automated driving (from the standpoint of both policies and service designs) ?

Outcomes of the Session

- In the Plenary Session, it was difficult for the speakers, including those invited to the SIP-adus Workshop for the first time, to discuss among themselves because it was held online. Thus, the aim of the Breakout Workshop was to give them an opportunity to introduce themselves, exchange opinions, and ask and answer questions.

3.4 Human Factors

Plenary Session

Overview of the Session

- Joint session of Service and Business Implementation and Human Factors
- To put services into practical use, all of the benefits for users, business operators, and society, which are involved in a complex manner, need to be fulfilled. These benefits include safety, service quality, service value and acceptance, service efficiency, and the sustainability of service businesses. However, it is difficult to separate only safety and human factors. For this reason, a session was planned jointly with SBI to introduce an overview of the field operational test projects.

Outcomes of the Session

- The lectures covered various topics, including the technical standpoint of autonomous automated driving systems, vehicle-infrastructure cooperative systems, and so on in light of accessibility for people with disabilities and the mobility of the elderly, and the standpoint of business models and social systems.
- We felt that shared issues and issues peculiar to respective local communities should be separated and closer international collaboration on shared issues is necessary in initiatives for implementing services that are provided on a global scale.

3.4 Human Factors

Moderator

Satoshi Kitazaki
Director, Human-Centered Mobility Research Center
National Institute of Advanced Industrial Science and Technology (AIST)

Speakers

Lutz Eckstein
Director, Institute for Automotive Engineering (ika)
RWTH Aachen University

Katrin Schwager
Project Manager, Innovation and Change
Hamburger Hochbahn AG

Shin Kato
Prime Senior Researcher, Human-Centered Mobility Research Center
National Institute of Advanced Industrial Science and Technology（AIST）

Daniel McGehee
Professor and Director, National Advanced Driving Simulator and Dept of Industrial and Systems Engineering
University of Iowa

3.4 Human Factors

Breakout Workshop

Overview of the Session

- The main theme of the Session was “human factors in automated driving services.”
- Six speakers, Prof. Klaus Bengler (TUM, Germany), Prof. Daniel McGehee (University of Iowa, U.S.), Dr. Annika Dreßler (DLR, Germany), Dr. Jonas Andersson (RISE, Sweden), Dr. Joanne Harbluk (Transport Canada, Canada), and Dr. Naohisa Hashimoto (AIST, Japan), made presentations.
- Each speaker was requested in advance to include in their presentation answers to two questions, “most important human factor-related issue” and “matters that should be standardized.”

Outcomes of the Session

- Human factor-related issues: Many human factors, including ODD, MRM, HMI, remote operators, passengers, design processes, complexity/use cases, and social/user acceptance, were recognized as issues. It is probably necessary to first define a research and development framework.
- Standardization: We received comments that various factors, such as ODD, MRM, HMI, remote operators, telecommunication, design processes, and validation, need to be standardized. On the other hand, there were some comments that service businesses by an increasing number of new companies were difficult to standardize. These comments will be reflected in discussions at SC39/TC22/WG8.

3.5 Dynamic Map

Plenary Session

Overview of the Session

- To share the current status of dynamic information coordination using dynamic maps and map updates and issues.
  - Introduction (trend in ISO etc.): Satoru Nakajo
  - ADASIS and SENSORIS: Jean-Charles Pandazis (ERTICO)
  - OADF – status update: Andras Csepinszky (OADF)
  - Fully automated mobility with location intelligence: Akihiro Takahashi (HERE Technologies)
  - Dynamic Map Platform Co. Current Initiatives and Future Developments: Hiroyuki Inahata (DMP)
  - FOTs in the Tokyo Waterfront area FY2019 to 2020 Results and Overview of Implementation in FY2021: Yoshiaki Tsuda (Mitsubishi Electric Corporation)

Outcomes of the Session

- ADASIS v3.2 has been officially released, and the development of v3.3 will continue.
- The standardization of SENSORIS has been proposed to CEN TC278/WG7 and ISO TC22/SC31.
  - CEN TC278/WG7 (and ISO TC204/WG3): Data model and data dictionary
  - ISO TC22/SC31: Interface Architecture
- With regard to DMP, next-generation HD maps and the global format were mentioned.

3.5 Dynamic Map

Moderator

Satoru Nakajo
Visiting Researcher, Center for Spatial Information Science
The University of Tokyo

Speakers

Jean-Charles Pandazis
ADASIS & SENSORIS coordinator, Innovation & Deployment
European Road Transport Telematics Implementation Coordination Organisation-Intelligent Transport Systems & Services Europe (ERTICO-ITS Europe)

Andras Csepinszky
Speaker, Steering Committee
Open Auto Drive Forum

Akihiro Takahashi
VP Sales & Japan Country Manager, Sales
HERE Technologies

Hiroyuki Inahata
Representative Director, President
Dynamic Map Platform Co., Ltd.

Yoshiaki Tsuda
Chief Engineer, Spatial Information Systems Engineering Section/Information Technology Systems Department
KAMAKURA WORKS, MITSUBISHI ELECTRIC CORPORATION

3.5 Dynamic Map

Breakout Workshop

Overview of the Session

- Twelve personnel participated in the Session.
- Dr. Nakajo briefed the entire Plenary Session.
- As a supplement to the Plenary Session, an overview of NDS and supplementary information to SIP-adus field operational tests (especially interfacing with ADASIS) were explained.
- Then, the discussion took place.

Outcomes of the Session

- Interfacing with ADASIS
  - The overseas participants took a great interest in the tests performed in Japan (dynamic information was distributed by specifying a route in advance) and requested that the results of the tests be shared.
  - We received a promise of early provision of ADASIS v3.2, which has been officially released.
- Map updates and map format
  - A brief explanation of the status of DMP was given, and information collection IF (in relation to SENSORIS), the feasibility of standardizing the provided format, etc. were discussed.

3.6 Connected Vehicles

Plenary Session

Overview of the Session

- The Session was held with the theme “Share trends regarding cooperative driving automation in each region and consider issues.”
- We received the latest information about cooperative driving automation in each region from two U.S. speakers, two EU speakers, and two Japanese speakers.

Outcomes of the Session

- In the U.S., frequencies were reorganized by the FCC. The ITS radio frequency (5.9 GHz) was limited from the conventional 75 MHz spectrum to the 30 MHz spectrum, and a proposal to allocate 45 MHz to Wi-Fi has been made. However, a lawsuit was filed against the FCC by ITS America etc., and it is impossible to foresee how this matter will be settled.
- On the other hand, the field operational test CV-Pilot by the USDOT is still in progress in New York, Tampa, and Wyoming. Also in other states, pilot projects are being carried out. At present, 6,000 roadside units and 18,000 vehicles are in operation in 143 districts. They are DSRC systems, but some of them have been replaced with C-V2X.
- In the EU, the market introduction of short-distance ITS G5 (DSRC) and long-distance hybrid communication using a mobile network started in 2019. More than 500,000 vehicles have already been put to practical use. As infrastructure, 2,000 km and 100,000 km have already been constructed for DSRC and the mobile network, respectively.
- The Japanese speakers explained the initiatives of the SIP. They introduced FOTs in the Tokyo waterfront area using a network, and the future communication system studied by the Task Force on V2X Communication for Cooperative Driving Automation.

3.6 Connected Vehicles

Moderator

Norifumi Ogawa
Staff Manager, Technical Research Dept.
Mazda Motor Corporation

Speakers

John Kenney
Director, InfoTech Labs
Toyota Motor North America

Tom Schaffnit
Operations Research Analyst, Volpe National Transportation Systems Center
The United States Department of Transportation

Niels Peter Skov Andersen
CEO
Anemone Technology

Martin Boehm
Technical Director
AustriaTech - Federal Agency for technological Measures Ltd.

Masato Minakata
Grand Master, R&D and Engineering Management Div.
Toyota Motor Corporation

Norifumi Ogawa
Staff Manager, Technical Research Dept.
Mazda Motor Corporation

3.6 Connected Vehicles

Breakout Workshop

Overview of the Session

- We invited three panelists from the U.S., three panelists from the EU, and four panelists from Japan and Mr. Oyama, ARIB, as the moderator and shared information about the latest status of “Connected” in each region.
- In Part 1, the panelists presented reports, and in Part 2, answered questions from the moderator and the participants through an active exchange of opinions.
- The Session was viewed by as many as 134 general participants even though it was held at midnight Japan time. Thirty-two people in overseas countries also participated in the Session. It was a great success.

Outcomes of the Session

- In the U.S., the FCC will make a new proposal (2nd R&O) for replacement with C-V2X. According to the panelists from the U.S., however, the proposal faces such issues as interference with Wi-Fi, interchangeability between generations of C-V2X, and the bearing of costs incurred by replacement.
- On the other hand, it was reported that the standardization of communication protocols and applications by SAE is proceeding.
- In the EU, the public and private sectors are jointly promoting the C-ROADS project, and cooperation between it and the private project Car 2 Car Communication Consortium for on-board devices is the foundation for practical use. We recognized anew that public-private cooperation is indispensable for the diffusion of ITS.
- With regard to Japan, a study on the ITS frequency (5.9 GHz) was reported by the Ministry of Internal Affairs and Communications; the new utilization of ETC 2.0 was reported by the Road Bureau of the Ministry of Land, Infrastructure, Transport and Tourism; and FOTs in the Tokyo waterfront area and activities by the Task Force on V2X Communication for Cooperative Driving Automation were reported by SIP.

3.7 Safety Assurance

Plenary Session

Overview of the Session

- A reliable safety assurance method and a virtual environment compatible with it are indispensable for realizing automated driving technology safely and efficiently.
- Six speakers delivered presentations concerning cutting-edge safety assurance methods and virtual environments in anticipation of future international collaboration and harmonization.

Outcomes of the Session

- Key personnel in industry, academia, and research institutions in the U.S., Germany, and Japan shared the latest information about safety assurance methodology and virtual environments.
- The information shared in this Session will provide a guideline for future international collaboration and harmonization toward safer and more efficient deployment of automated driving technology in the world.

3.7 Safety Assurance

Moderator

Satoshi Taniguchi
Automated Driving & Advanced Safety System Development
Toyota Motor Corporation

Speakers

Frank Gruson
Head of Advanced Engineering Radar. Radar Concept Development
Continental / ADC Automotive Distance Control Systems GmbH

Matthias Hein
Director, Thuringian Center of Innovation in Mobility
Technische Universitat Ilmenau

Hideo Inoue
Director, Advanced Vehicle Research Institute
Kanagawa Institute of Technology

Jacobo Antona-Makoshi
Senior researcher and Group manager, Autonomous Driving Research Department
Japan Automobile Research Institute

Roland Galbas
Project Lead, ADAS System Development
Robert Bosch GmbH

Chan Lieu
Senior Manager, Safety Policy
Aurora

3.7 Safety Assurance

Breakout Workshop; Test Scenario

Overview of the Session

- Since 2018, many discussions and meetings have been held between the members of the HEADSTART project of the EU and the SAKURA and SIP-adus projects of Japan with emphasis on harmonization among automated driving safety assurance methods. These discussions have made significant progress in the last several months through activities toward the joint preparation of a whitepaper on the review and analysis of the methodology developed in the projects in the EU and Japan.
- The Session was intended to discuss, unify, and agree on the final contents of the whitepaper concerning automated driving safety assurance prepared jointly by the members of the HEADSTART, SAKURA, and SIP-adus projects.
- About 30 experts from the HEADSTART project of the EU and the SAKURA and SIP-adus projects of Japan participated in the Session.

Outcomes of the Session

- The results of the HEADSTART, SAKURA, and DIVP projects were reviewed, and the contents of the whitepaper were explained by section.
- An agreement was reached to unify the respective contents and publish the whitepaper by the end of December 2021. The whitepaper will include items and recommendations for potential harmonization and subsequent steps that will contribute to future cooperative activities.

3.7 Safety Assurance

Breakout Workshop; Virtual Environment

Overview of the Session

- The VIVALDI project funded by the German Federal Ministry of Education and Research (BMBF) and the VIVID project conducted in association with DIVP, which is under the initiative of the Cabinet Office, Government of Japan, are intended to contribute to and take the initiative in the international standardization of virtual simulation-based automated driving safety assurance methods.

Outcomes of the Session

- In view of expected practical outcomes from the VIVALDI and DIVP projects, an agreement was reached to organize a small-scale engineering task team on a theme basis as a “joint theme task team (JTTT)” for engineer-based engineering discussions; to visualize the purpose of cooperation and expected outcomes of most JTTTs; and to formulate an international standardization strategy at ASAM Open-X.
- As a wrap-up of the discussions of the VIVID project, the next milestone meeting is planned to take place in person in Berlin in May 2022.

3.8 Cybersecurity

Plenary Session

Overview of the Session

- The utilization of threat information detection systems represented by IDS was discussed as the key theme for realizing cybersafe automated driving.
- Director Nishant Khadria, Deloitte, Germany: Introduced the latest trends in IDS technology and discussed the components, technological requirements, and concept indispensable for the construction of VSOC that aims to make effective use of the detection information and thereby prevent damage.
- Professor Frank Kargl at Ulm University, Germany: Discussed the importance of misbehavior detection and the necessity for advanced safety control that gradually reduces the impact of cyberattacks on vehicle behavior.
- Professor Tsutomu Matsumoto at Yokohama National University, Japan: Suggested that attacks intended to tamper with data sent and received by V2I and V2V and cause false detection of automated driving control system sensors must be thoroughly considered because only measures against attacks on the operation of on-vehicle ECU software and on communication inside vehicles are insufficient.

Outcomes of the Session

- It was confirmed that the following are required: standard equipment of IDS, including the response to UN-R155, for all automated driving vehicles; advanced safety control after detection of attacks/intrusions, including measurement system cybersecurity; and prompt and appropriate initial response by the construction and operation of VSOC by each OEM.

3.8 Cybersecurity

Moderator

Shigeru Uehara
Chair of Governing Board, J-Auto-ISAC
Project General Manager, E/E Architecture Development Div.
Toyota Motor Corporation

Speakers

Nishant Khadria
Director, Cyber Emerging Technologies
Deloitte

Shinichi Kan
Associate, Technology Consulting
PwC Consulting Japan

Shigeyuki Kawana
Chair, Electronics Platform sub-committee
Japan Automobile Manufacturers Association, Inc.

Frank Kargl
University Professor, Institute of Distributed Systems
Ulm University

Tsutomu Matsumoto
Professor, Faculty of Environment and Information Sciences
Yokohama National University

3.8 Cybersecurity

Breakout Workshop

Overview of the Session

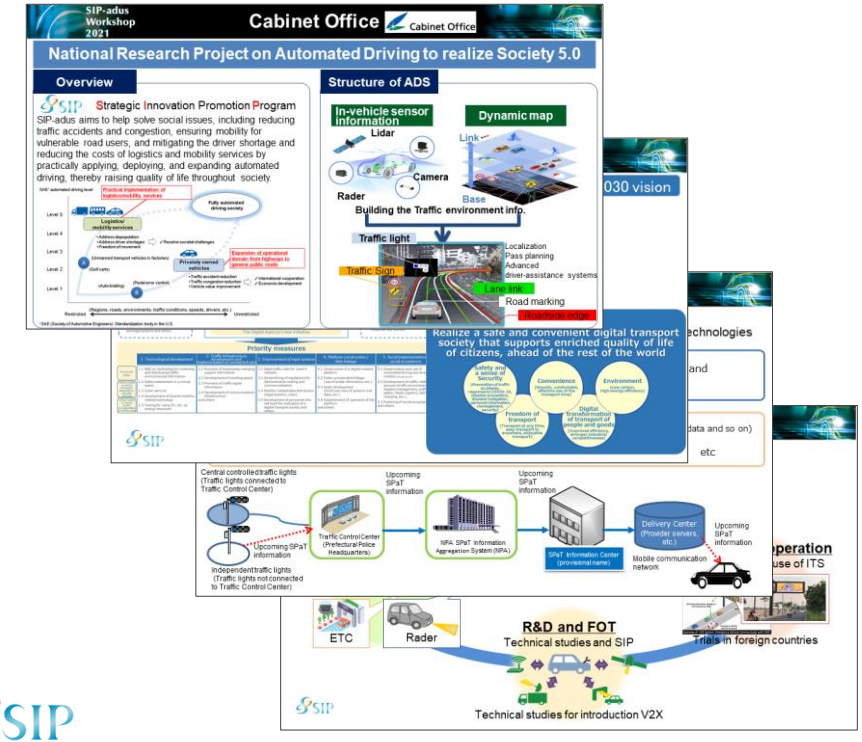
- While driving at 90 km/h on a freeway at automated driving level 4 (the driver's seat was empty and the driver viewed his/her smartphone in the passenger's seat), the IDS detected an intrusion attempt suspected to be a cyberattack and issued an alert. Starting with a discussion about an appropriate response to that given situation, the participants discussed what an ideal system would be, and exchanged opinions.
- It was confirmed, at automated driving level 4 and higher levels, that an ECU-side advanced function capable of determining whether any adverse effect is exerted on the vehicle when a cyberattack is detected is required; that a peripheral system for the ECU needs to be capable of detecting vehicle behavior as an abnormality; and that it is necessary to assume, as prompt responses, gradual mitigation of the vehicle behavior and restrictions (service disruption etc.) on Connected functions. It was also confirmed that a function capable of promptly transmitting accurate information to the VSOC needs to be installed.

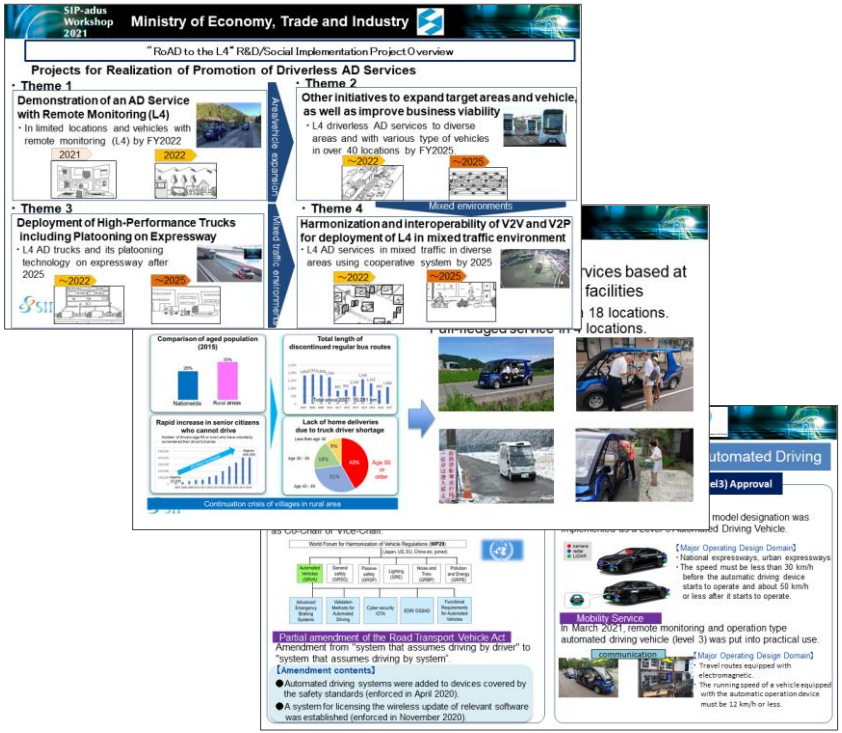
Outcomes of the Session

- It was confirmed that cyberattacks are constantly changing and becoming more sophisticated, and it is necessary for the defending side to constantly collect and share the latest information and establish an update function capable of incorporating countermeasures against cyberattacks in a timely manner and a system supporting the function.
- It was confirmed that the basic principle of never slowing down or discontinuing efforts on safety and security (investing in personnel, things, and money) does not change unless the possibility of dangerous behavior is zero when an automated driving vehicle suffers a cyberattack and is taken over by the attacker. It was confirmed that even small mass-produced vehicles are no exception if they are equipped with an automated driving function.

4. Automated Driving Projects by the Government of Japan

Automated driving related projects by Japanese Government Ministries and Agencies were introduced and presented between sessions.





5. SIP-adus Workshop 2022

- Date : October 11-13, 2022
- Location : Kyoto

We look forward to your participation!