

Introduction to the Institute for Automotive Innovation and Technology Standardization

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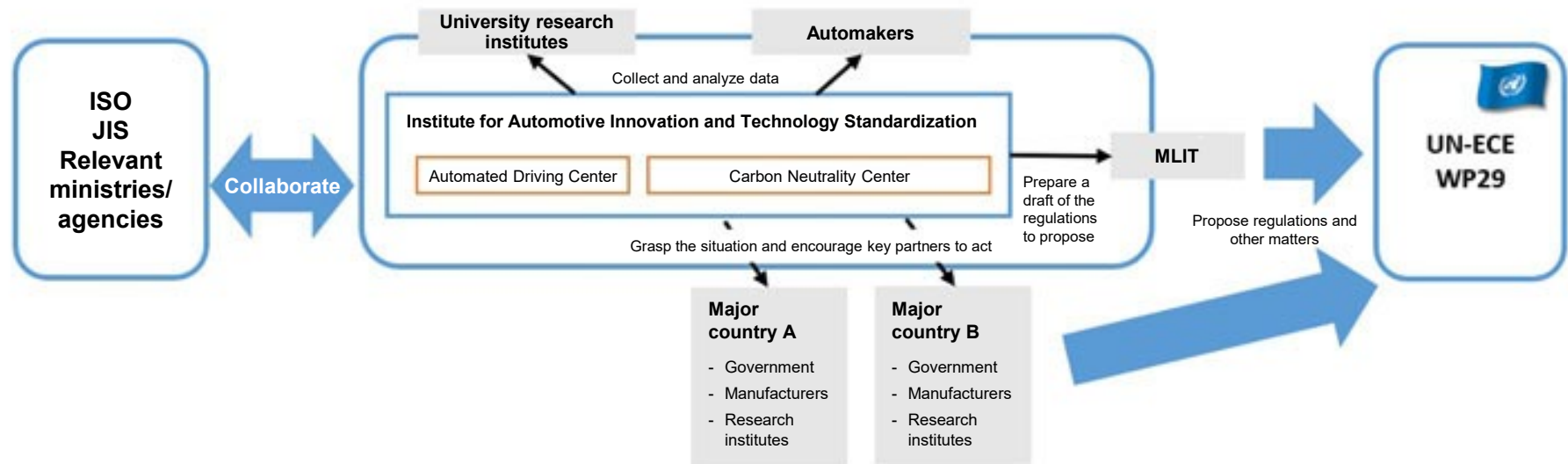
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1. About the Institute for Automotive Innovation and Technology Standardization

Overview of the Institute for Automotive Innovation and Technology Standardization

- In May 2016, the Institute for Automated Driving Standardization, a public-private partnership organization, was established to enable all of Japan to work together to realize the international standardization of automated driving.
- In January 2024, the Institute was reorganized into the Institute for Automotive Innovation and Technology Standardization. For the purposes of enhancing vehicle safety and environmental performance as well as ensuring the international competitiveness of relevant industries, it is carrying out activities as an organization that leads the international standardization of **“automated driving technology”** and **“carbon-neutral technology”** through a public-private partnership with the Automated Driving Center and the Carbon Neutrality Center.
- The Automated Driving Center examines the overall strategy for developing international regulations for automated driving.

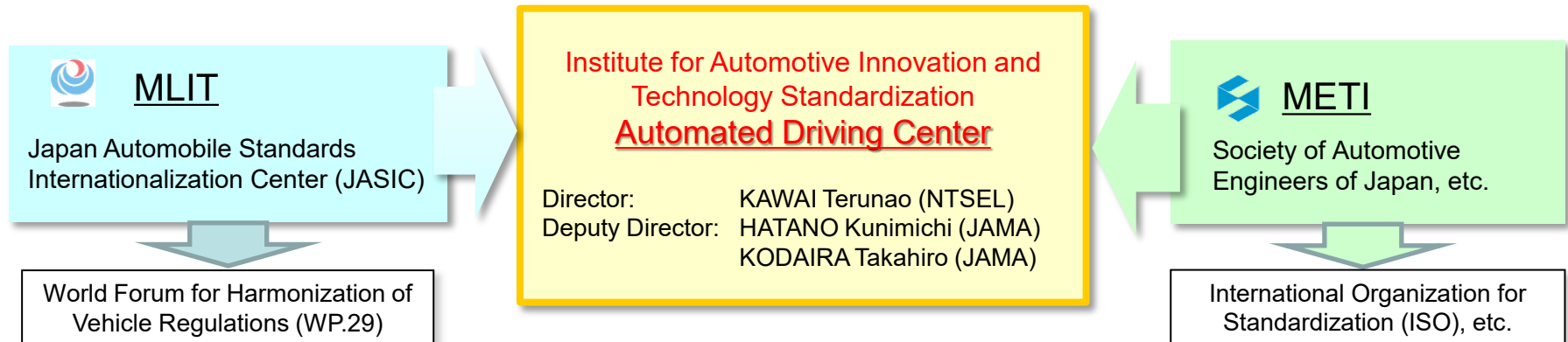


The Automated Driving Center's Roles and Structure


■ The Automated Driving Center's roles


- (1) Consideration of action plans for discussion by the World Forum for Harmonization of Vehicle Regulations (WP.29)
- (2) Basic research and studies for (1)
- (3) Collaboration with and outreach to governments, manufacturers, and research institutes of major countries
- (4) Collaboration with standardization efforts (METI/ISO & JIS)
- (5) Holding of symposiums on the domestic/global status of automated driving ➡ **Today**


■ The Automated Driving Center's structure



Members (around 60)


 Ministry of Land, Infrastructure, Transport and Tourism

 Ministry of Economy, Trade and Industry


 National Agency for Automobile and Land Transport Technology/National Traffic Safety and Environment Laboratory

 JAMA Japan Automobile Manufacturers Association (automakers)

 JAPIA Japan Auto Parts Industries Association (parts manufacturers)

 JSae Society of Automotive Engineers of Japan (standardization representatives)

 JAIA

 ITS Japan and others

2. The Automated Driving Center's Efforts

2-1 Linkage of Regulations and Standards

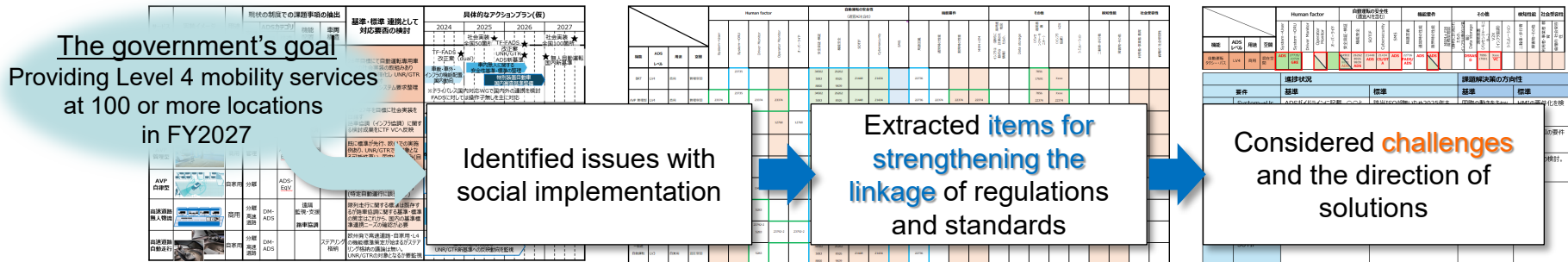
To achieve the government's goals, we are examining strategies while sharing the latest domestic and global trends and current issues to collaboratively promote the development and introduction of regulations (mandatory legislation) and standards (voluntary standards) for automated driving.

Our efforts so far

FY2016	<ul style="list-style-type: none">• We extracted items on automatic steering to be regulated/standardized.
FY2017	<ul style="list-style-type: none">• We organized the items on automatic steering to be regulated/standardized in order of priority.
FY2018	<ul style="list-style-type: none">• We surveyed and organized trends on safety evaluation methods and other matters for Level 3 and higher automated driving to create the Regulations and Standards Linkage Roadmap.
FY2019	<ul style="list-style-type: none">• The Regulations and Standards Linkage Roadmap was updated based on a framework document that specifies the automated driving standardization activities at WP.29.
FY2020	<ul style="list-style-type: none">• Personnel involved discussed safety evaluation methods to prepare draft UN regulations on low-speed ALKS (automated lane-keeping systems).• We formulated a medium-term plan to respond to environmental changes by surveying and analyzing global trends in regulations and standards.
FY2021	<ul style="list-style-type: none">• We conducted a SWOT analysis based on Japan's internal environment (strengths and weaknesses) and external environment (opportunities and threats).• We shared information on the survey of trends in overseas discussions on automated driving with the personnel involved.
FY2022	<ul style="list-style-type: none">• We prepared to respond to overseas service-car-related regulations, and we organized issues related to Japanese service cars.
FY2023	<ul style="list-style-type: none">• We updated the Regulations and Standards Linkage Roadmap.• We considered plans to link regulations and standards (we formulated a medium-term plan).
FY2024	<ul style="list-style-type: none">• We shared issues for regulations and standards for Level 4 mobility services and selected items for strengthening linkage (automated buses/taxis, AVP).

Strengthening of Regulations and Standards Linkage for Level 4 Mobility Services (From FY2024)

- Based on the government's goal (of providing Level 4 mobility services at 100 or more locations in FY2027), we identified issues with the social implementation of Level 4 mobility services, extracted items for strengthening the linkage of regulations and standards, and considered the direction of the plan.
- In FY2024, we mainly examined the high-priority items “automated buses/taxis” and “automated valet parking (AVP)” among those pertaining to Level 4 mobility services.
- In FY2025, we will examine “BRT” and “unmanned logistics on expressways.”



For automated buses/taxis:

Item for strengthening linkage		Challenge
Automated driving safety	Safety argumentation and verification	Specific, quantitative indicators must be examined to review and verify safety.
	Functional safety	The handling of the vehicle's external systems and equipment is insufficient.
Human factor	System → ORU*	It is unclear how best to provide information to the outside of the vehicle.

* Other Road User

2-2 Experiments and Research

We are conducting research studies that contribute to international discussions. Based on the results, we have made proposals at the UN World Forum for Harmonization of Vehicle Regulations (WP.29) and expert meetings thereunder to contribute to the development of proper regulations.

Research themes

FY2016	<ul style="list-style-type: none">Research on vehicle security to develop regulations for automated driving
FY2017	<ul style="list-style-type: none">Research on technology for handling abnormal control caused by incorrect operation, etc. of autonomous vehicles
FY2018	<ul style="list-style-type: none">Research on vehicle requirements considering human factors in Level 3 and higher automated driving
FY2019	<ul style="list-style-type: none">Research on secondary activity evaluation methods for Level 3 and higher automated driving
FY2020	<ul style="list-style-type: none">Research on quantitative examination of operation handover behavior in Level 3 and higher automated driving
FY2021	<ul style="list-style-type: none">Research on the cognitive reaction time of skilled drivers in a real traffic environmentThe cognitive reaction time (0.75 seconds) was concluded to be reasonable in a real traffic environment.
FY2022	<ul style="list-style-type: none">Research on the ability to recognize hazardous events
FY2023	<ul style="list-style-type: none">Research on the social acceptance of external HMI for automated driving
FY2024	<ul style="list-style-type: none">Research on external HMI for automated driving in a virtual evaluation environment

Research on External HMI of Autonomous Vehicles (FY2023 to FY2024)

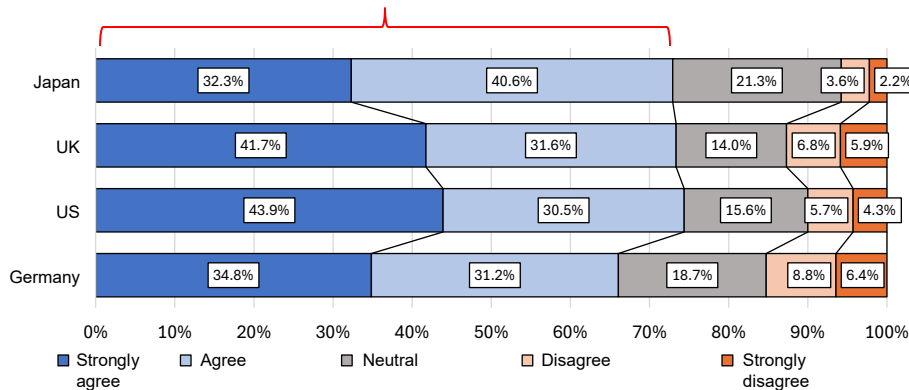
Based on discussions regarding the standardization of a display that informs surrounding traffic participants of automated driving mode (an automated driving marker lamp), we conducted a survey to contribute to the study of its necessity and installation method.

• Research on the social acceptance of external HMI for automated driving

We conducted a survey on the awareness of regular drivers in Japan, the UK, the US, and Germany regarding the introduction of automated driving marker lamps.

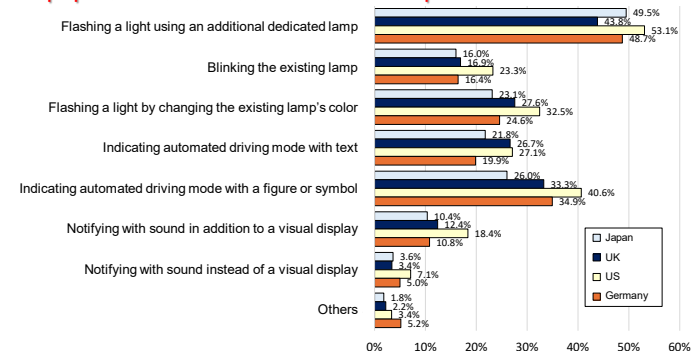
Sample Q1. Is it better to be able to distinguish whether a vehicle is in automated driving mode?

⇒ Nearly 70% of respondents in each country answered yes.



Sample Q2. Which of the following is your preferred means to indicate that a vehicle is in automated driving mode? (Multiple answers can be selected.)

⇒ The answers were in the same order in all countries. The most popular answer was "dedicated lamp."



Results

- Nearly 70% of respondents responded affirmatively in each country.
(Main reasons) It will enable them to pay attention to autonomous vehicles' movement; it will be necessary for the police to crack down.
- Some respondents responded negatively.
(Main reasons) It will distract nearby drivers; it may lead to tampering, harassment, or theft.

Research on External HMI for Automated Driving in a Virtual Evaluation Environment

We created an environment to virtually evaluate the actual luminance of automated driving marker lamps.

Example of a vehicle with a marker lamp



Front



Rear



Simulation of a driving scene



Display
the actual
luminance



Equipment displaying the actual luminance



Results

This research was able to evaluate a marker lamp while changing various simulation conditions (such as the marker lamp's design/brightness, the brightness of the surroundings, road type, and vehicle speed).

We will continue to examine the requirements for marker lamps.

3. Today's Lectures

- “Japan’s Efforts to Promote Automated/Autonomous Driving, Including Robotaxis”
NAONO Takashi, MLIT
- “TBD”
SOMEYA Tomoyuki, METI
- “TBD”
HATANO Kunimichi, JAMA
- “A Global Regulatory Framework for Automated Driving Systems”
Richard Damm, Chair of the Working Party on Automated/Autonomous and Connected Vehicles (GRVA), UN WP.29
- “Considerations for Robotaxi Deployment: Some Canadian Perspectives on North American Activities to Date”
Ibrahima Sow, Transport Canada
- “Status of EU Regulatory Activities on Driving Automation and Next Steps”
Mohamed Brahmi, European Commission
- “The Construction and Development of Standard System for Intelligent and Connected Vehicles in China”
Chen Chen, CATARC