



**Asia-Pacific
Economic Cooperation**

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Agenda Item: 6.2.1

Japan's Initiative to Promote Autonomous Driving

Purpose: Information
Submitted by: Japan



**30th Automotive Dialogue
Bali, Indonesia
25 to 28 June 2019**



Asia-Pacific
Economic Cooperation

Advancing
Free Trade for Asia-Pacific
Prosperity

Japan's Initiative to Promote Autonomous Driving

26-27 Jun 2019 – Bali, Indonesia

Presented by

Ministry of Economy, Trade and
Industry

Amendment of Road Traffic Act

- Japan amended the driver responsibilities in Road Traffic Act to fit practical application of automated driving.



【Prerequisites for Automated Driving Systems】

- Within ODD (Operational Design Domain), the system operates complying with traffic rules.
- The system warns the driver to takeover driving operation in a way that he/she certainly recognize when it judges the continuation of automated driving as impossible due to trouble with the motor vehicle or exiting from ODD.

【Driver Responsibilities on the Road Traffic Act (In force)】

A Responsibilities connected to driving operation

- Safe Driving Obligation
- Obligation to
 - obey traffic lights and other signals
 - obey the speed limit
 - maintain distance between vehicles etc.

B Responsibilities not connected to driving operation

B-1) Responsibilities to ensure stable implementation of A

- Prohibition against holding and using a wireless telephone such as a cellular telephone
- Prohibition against focusing attention on the screen of an image display device such as a car navigation system

Prohibition against drunk driving etc.

B-2) Other responsibilities

- Obligation to
 - aid injured persons in case of a traffic accident
 - carry and present a driver's license etc.

【 Driver responsibilities when employing automated driving system 】

The system which satisfies prerequisite (1) automatically implements Responsibilities A within ODD.

The driver remains under Responsibilities A.

Withdrawal of both of the prohibition becomes possible

The prohibition must remain

The responsibilities must remain

Amendment of Road Vehicle Act

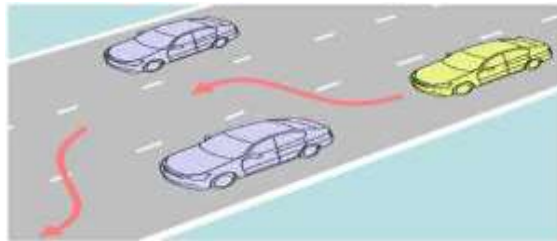
- Japan amended the Road Vehicle Act to ensure the safety of automated vehicles.



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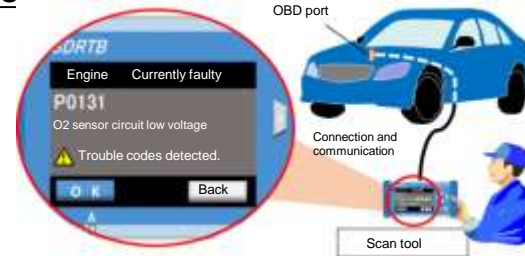
Outline of the Bill

1. Adds definition of “automated driving devices”



Automatic lane change on expressways

2. Identifies a legal entity that performs administrative tasks related to the management of technical information necessary for electronic inspections of motor vehicles



3. Requires the provision of technical information necessary for maintenance



Camera

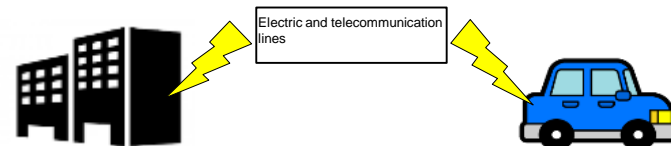
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Subaru website



Radar

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4. Creates a permission system related to remodeling etc. of automated driving devices by modification of programs embedded therein.



Japanese Guideline regarding Safety Technology for Automated Vehicles



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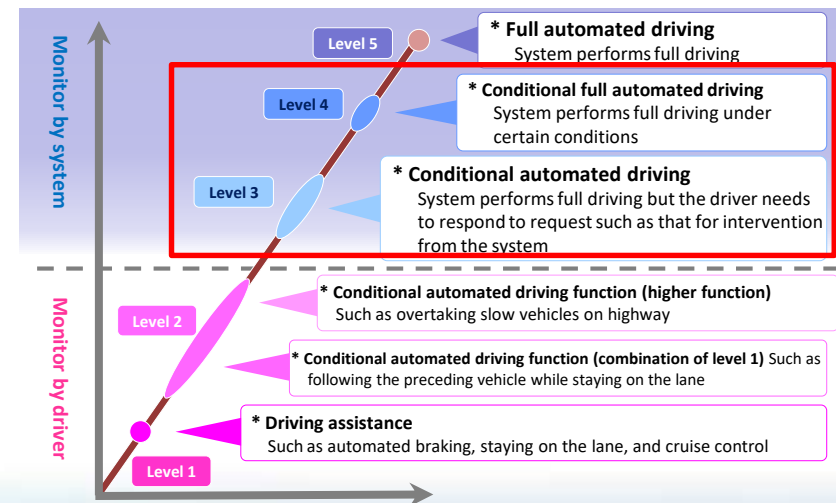
- Promotes the development and commercialization of safe automated vehicles by prescribing safety requirements to be met by level 3 or 4 such vehicles as a guideline before the establishment of international standards
- Sets the world's first safety vision to realize automated driving and clarifies the significance of the development and commercialization of such vehicles

Basic stance on safety of automated vehicles

- The Guideline sets the objective of development and practical application of automated vehicles as such that “realizing a society in which occurrence of accidents resulting in injury and death caused by the automated driving system is reduced to zero.”
- Towards the realization of the objective, the Guideline defines vehicle safety concept to be satisfied by automated vehicles as such that “automated driving systems, under their operational design domain (ODD), shall not cause any traffic accidents resulting in fatalities and injuries that are rationally foreseeable and preventable” and establishes vehicle safety elements and their requirements based on the vehicle safety concept.

Vehicles subject to the Guideline

Passenger cars, trucks, and busses with a level 3 or 4 automated driving system



Red frame shows the scope of this Guideline

* The Guideline will be reviewed as necessary based on the development of technology and international standards, etc.

Japanese Guideline regarding Safety Technology for Automated Vehicle

cont'd



Vehicle safety elements for Automated Vehicles (10 elements)

Automated vehicles should meet the following requirements in each element to ensure their safety

Elements related to vehicle safety	Main requirements
(i) Establishment of operational design domain (ODD)	To define the operation design domain (specific conditions of a traveling environment in design which is the prerequisite for correct operation of automated driving system: ODD) in accordance with the performance and the manner of use of individual automated driving vehicles.
(ii) Safety of automated driving system	<ul style="list-style-type: none"> • To ensure system safety by securing redundancy of control systems and sensor systems • To finally stop vehicle safely when automated driving cannot be continued in the case where the vehicle is found outside of the established ODD range.
(iii) Compliance with safety regulations, etc.	<ul style="list-style-type: none"> • To satisfy safety regulations of road transportation vehicles already established on automated driving. • To recommend the satisfaction of related international standards such as ISO, etc.
(iv) Human Machine Interface (HMI)	<ul style="list-style-type: none"> • To equip with HMI having the following functions in order to inform the driver or the occupant of the operational status of the automated driving system, etc. • To equip automated driving vehicles of level 3 with a function capable of monitoring that the driver is in condition to replace the system for driving operations and warn an alarm as necessary (driver monitoring system, etc.) • To equip automated driving vehicles of level 4 with a function capable of determining that the system is unable to continue automated driving and informing in advance the driver or the occupant (operation manager) of stopping them automatically.
(v) Mounting of a data recording device	To equip a device to record the operational status of automated driving system and driver's status as data.
(vi) Cyber security	To design and develop a vehicle in consideration of cyber security such as hacking in light of latest requirements of the UN (WP29) for cyber security.
(vii) Safety of vehicles for unmanned automated driving transportation service (additional requirements)	To equip automated driving vehicles used for unmanned transportation service (level 4) with a camera which allows an operation control center to monitor the conditions inside the vehicle and a function to automatically report to the same at the time of emergency stop, in addition to the requirements of (1) to (6).
(viii) Safety evaluation	To check safety in advance against reasonably foreseeable dangerous events in the established ODD by performing validation method appropriately combining simulation, track test and road tests.
(ix) Ensuring safety in use process	To ensure safety of automated driving vehicles in use, take necessary steps such as updating of the software to ensure security management (inspection and maintenance) of automated driving vehicles and cyber security.
(x) Provision of information to users of automated driving vehicles	To take measures to enable user of automated driving vehicles to get informed and gain an understanding of the method to use the system, range of ODD, functional limits, etc.

Field Operational Tests (Tokyo Waterfront City– Haneda Area)



■ **FOTs will start in autumn 2019 in the Tokyo waterfront city area** (general roads and Metropolitan Expressway / Haneda area) **with recruiting participants widely**

Providing traffic signal information

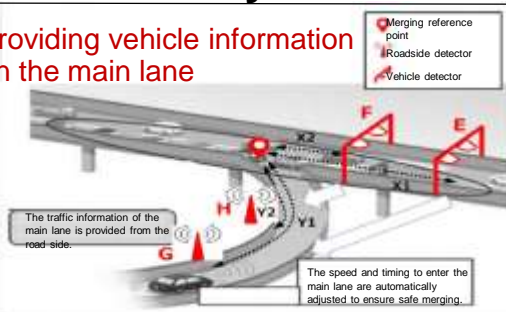
Providing the signal display and change timing information even in environments where recognition is difficult using in-vehicle cameras.



Merging assistance on the main lane of highways

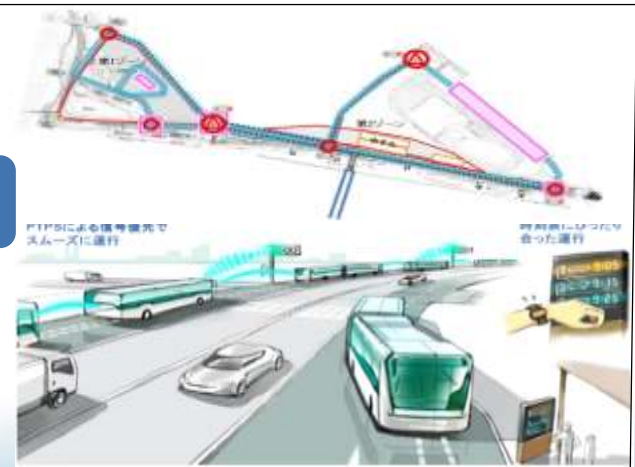


Providing vehicle information on the main lane



Public transport system (self-driving buses)

FOTs for the next-generation ART by using automated driving technology in mixed traffic flow.



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