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ITS WORLD CONGRESS 2022

Efforts of Road Transport Bureau, MLIT For the Realization of Automated Driving

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1. International standards related to automated driving technology

- Japan participated in discussions on international standards for automated driving at the United Nations World Forum for Harmonization of Vehicle Regulations (WP29) as a co-chair or vice-chair. In June 2020, standards for automated lane keeping, cyber security and others were established.
- At WP29 in June 2022, it was agreed to increase the maximum speed limit and add lane change available.

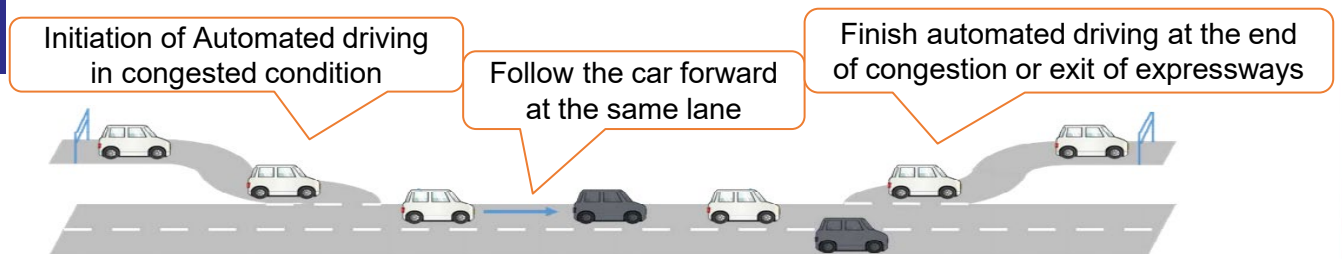
International standards review system and the considered items for automated driving technology

World Forum for Harmonization of Vehicle Regulations（WP29）

Automated Vehicle

- Advanced Emergency Braking Systems
- Validation Methods for Automated Driving
- Cyber security / OTA
- EDR / DSSAD
- Functional Requirements for Automated Vehicles

Standards developed in June 2020



Revised in November 2021

Expansion of applicable vehicle models：
Passenger vehicles only
⇒ applicable all passenger vehicles, buses and trucks


Summary of amendments agreed in June 2022

①Expansion of limited speed
Under 60 km/h ⇒ Under 130km/h

②Addition of lane change function
Lane keep only
⇒ Lane change available
（only passenger vehicles, etc.）

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2. Partial revision of the Road Transport Vehicle Act

- In order to ensure the safety of automated driving vehicles through the process of the design/manufacturing and the usage process, the Road Transport Vehicle Act has been revised and implemented in April 2020.

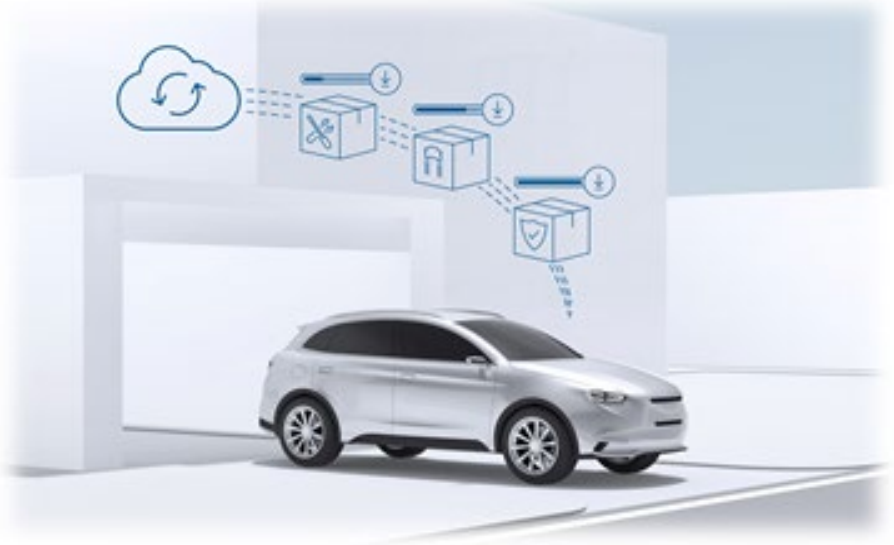
Automated driving systems were added to devices subject to safety standards.

※enforced in April 2020

source : bosch

A system for licensing the wireless update of relevant software was established.

※enforced in November 2020



source : bosch

3. 【vehicles】 Type approval of automated driving vehicles (level 3)

- In November 2020, the type approval of level-3 automated driving vehicles was implemented. Their sale began in March 2021.
- We will continue to formulate standards for more advanced automated driving functions toward the realization of Level 4 automated driving on highway.

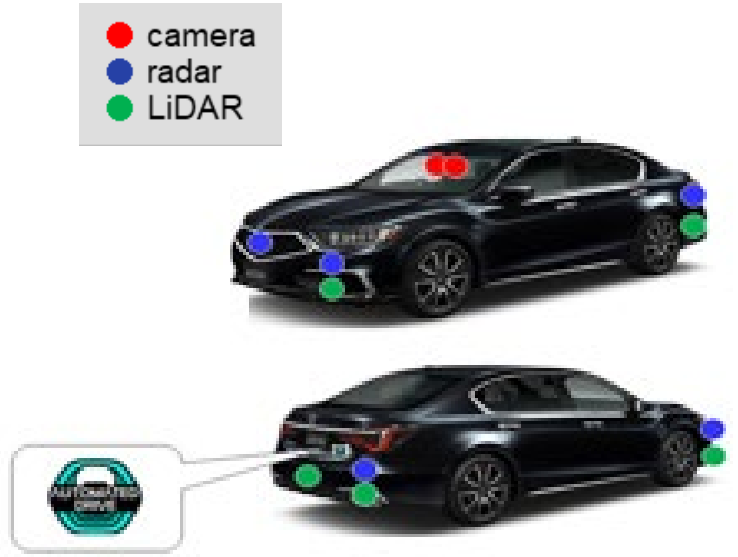
Major Operating Design Domain

●Road sections
National expressways, urban expressways and highways

●Excluded sections/locations
Sections where two lanes (a driver's traffic lane and the opposite lane) are not structurally divided by a median strip (sharp curve, service area, parking area, tollgate, etc.)

●Runningspeed
The speed must be less than 30 km/h before the automatic driving device starts to operate and about 50 km/h or less after it starts to operate.

●Runningcondition
The vehicle must correctly obtain information from the high-precision map and the Global Navigation Satellite System GNSS).



* Provided by Honda Motor Co., Ltd.

4.【Mobility service】
Approval of last-mile automated driving vehicles (level 3)

- In March 2021, we approved vehicles equipped with automated driving systems(level 3).
- The automated driving systems mounted on the vehicles make it possible for the vehicles to run along an electromagnetic induction wire installed on roads (exclusively for bicycles and pedestrians) and to detect and respond to a pedestrian, bicycle or obstacle.

Major Operating Design Domain

● Road sections

Eiheiji Mairodo (My Road), Yoshida-gun, Fukui Prefecture: Site of the now-defunct Eiheiji line of the Keifuku Electric Railroad Co., Ltd (about 2 km).

● Road conditions

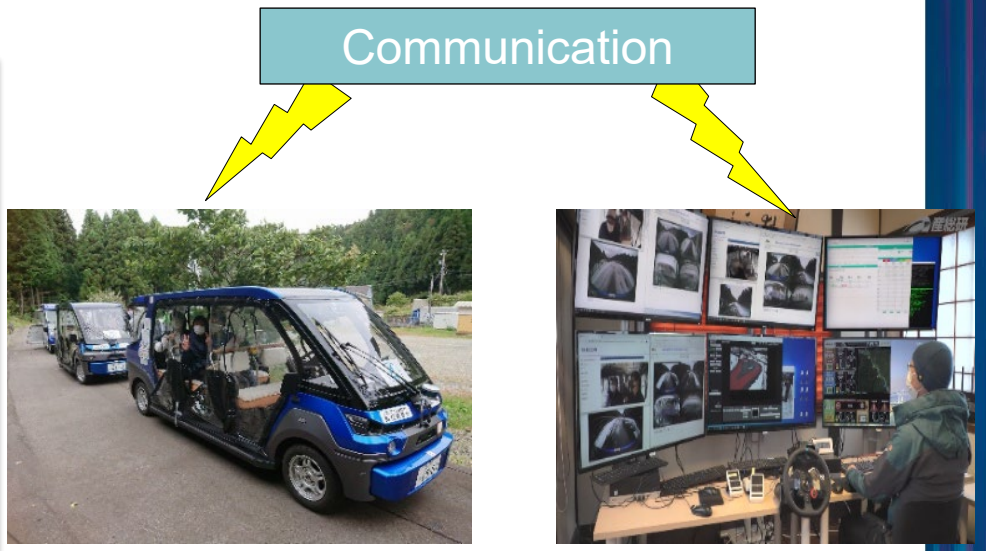
Travel routes equipped with electromagnetic.

● Running speed

The running speed of a vehicle equipped with the automatic operation device must be 12 km/h or less.

● Running condition

The vehicle must run along the electromagnetic induction wire, and the presence of magnetism detectable by the car is necessary. The road must not be in an unstable condition such as a frozen road surface.



One remote-monitoring operator controls three unmanned automated driving cars.

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5. Toward the realization of more advanced Automated driving

- In order to put automated driving into practical use, it is necessary to take comprehensive works, such as the development of vehicle technology, the improvement of the driving environment, and the improvement of social acceptance.
- Conduct research on how the system should make "decisions" from the viewpoint of social acceptability, and investigate the roles of stakeholders and technical requirements in special driving environments, such as abandoned railroad tracks.

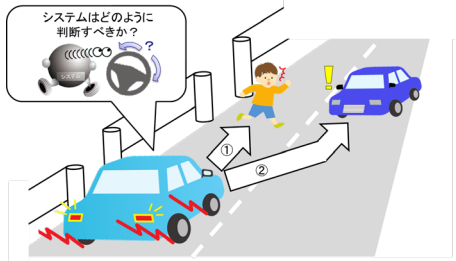
Scope of System Responsibility

Study of the extent to which the system must guarantee safety against various events that may occur on the road

⇨ Acquire and analyze driver data by using a driving simulator

Social acceptability of system decisions

Examination of how the system should make decisions in cases where either decision would cause damage, etc.



⇨ Research and study with experts, automakers, and other stakeholders

The role of stakeholders and technical requirements in special driving environments such as abandoned railway tracks

Roles of Parties Involved

- Infrastructure Management
- No Trespassing on Traveling Way
- Appropriate operation management

⇨ Study technical requirements for automated vehicles on dedicated roads, assuming more ideal driving conditions than on public roads.

6. Introduction to other efforts

- Examples of Field Operational Tests and traffic accidents are published to promote the technological development of automated driving vehicles and to enhance social acceptance of automated driving.
- There are limits to the functions of driver assistance systems, and even if the system is not malfunctioning, it may not work depending on the environment and conditions in which it is used. In order to promote understanding among automobile users, an educational video is available on the website of the MLIT and on YouTube.

Examples of Field Operational Tests

The following is posted on the MLIT website

- ✓ Demonstration period
- ✓ Driving route
- ✓ Traffic environment
- ✓ Time of day (day, night)
- ✓ Weather (sunny, rainy, snowy)
- ✓ Maximum speed
- ✓ Linkage with infrastructure
- ✓ Vehicle information
- ✓ Eased standards items
- ✓ Near-miss information, etc

Examples of accidents that occurred during Field Operational Tests

The following is posted on the MLIT website

- ✓ Date of accident
- ✓ Accident details
- ✓ Vehicle information
- ✓ Cause of accident
  - ・Error in position estimation
  - ・Vehicle control error
  - ・System setting error
  - ・Communication delay
  - ・Insufficient durability
- ✓ Recurrence prevention measures, etc

Educational video of YouTube

Please do not overconfident or misunderstand the “driving support system”! (March 19, 2020)

Examples of inoperable driver assistance systems

Sudden interruption

Unable to detect white lines

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