Efforts of Road Transport Bureau, MLIT For Automated Driving

Takahiro Hirasawa
Director of Automated Driving Technology,
Road Transport Bureau, MLIT

SIP-adus Workshop 2018
November 14th, 2018

国土交通省

Efforts of the MLIT

国土交通省 Ministry of Land, Infrastructure, Transport and Tourism

Overview

Regarding the issues surrounding automated driving that is expected to have a great effect in solving motor vehicle- and road-related problems, such as the reduction of traffic accidents, the revitalization of regional public transportation, and the enhancement of international competitiveness, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) set up an Automated Driving Strategy Headquarters within the ministry to appropriately respond to those issues as the ministry as a whole.

The fourth meeting of the MLIT Automated Driving Strategy Headquarters (held on March 22, 2018)

Major efforts relating to Road Transport Bureau

- **Establishment of safety regulations for automated driving vehicles**
- **Advanced inspection and maintenance**
- **Investigation of damages liability relating to automated driving vehicles**
- **Investigation concerning introduction of automated driving vehicles into transportation business**
- **Last-miles automated driving (Demonstration Experiment)**
- **Improvement of distribution productivity — Approach toward realizing truck platooning**

Last-miles automated driving

truck platooning

Progress of Work

- December 2016 …The Automated Driving Strategy Headquarters set up
- March 2018 … Future plans of the MLIT for the realization of automated driving published (March 2018)

Guideline regarding Safety Technology for Automated Driving Vehicles [Outline]

国土交通省

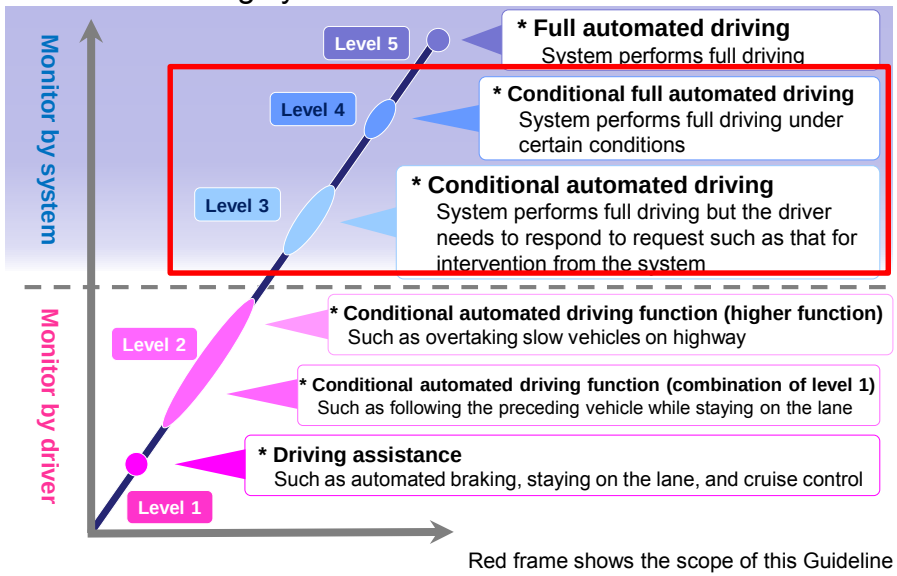
* Promotes the development and commercialization of safe automated driving vehicles by prescribing safety requirements to be met by level 3 or 4 such vehicles as a guideline before the establishment of international standards
* Sets the world's first safety vision to realize automated driving and clarifies the significance of the development and commercialization of such vehicles
  Safety vision: *realize society where traffic accidents caused by automated driving systems resulting in injury or death become zero*

History

Dec 2017	Discussion started at the WG on Safety Measures for Automated Vehicles established under the Council for Vehicle Safety Measures
Apr 2018	Completion of the guideline by around the summer of 2018 was indicated in the Outline of System Improvement for Automated Driving (determined by IT Strategic Headquarters)
Jun 2018	Completion of the draft Guideline, public comment period began
Sep 2018	Announcement of the Guideline

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.

Basic safety concept for automated vehicles

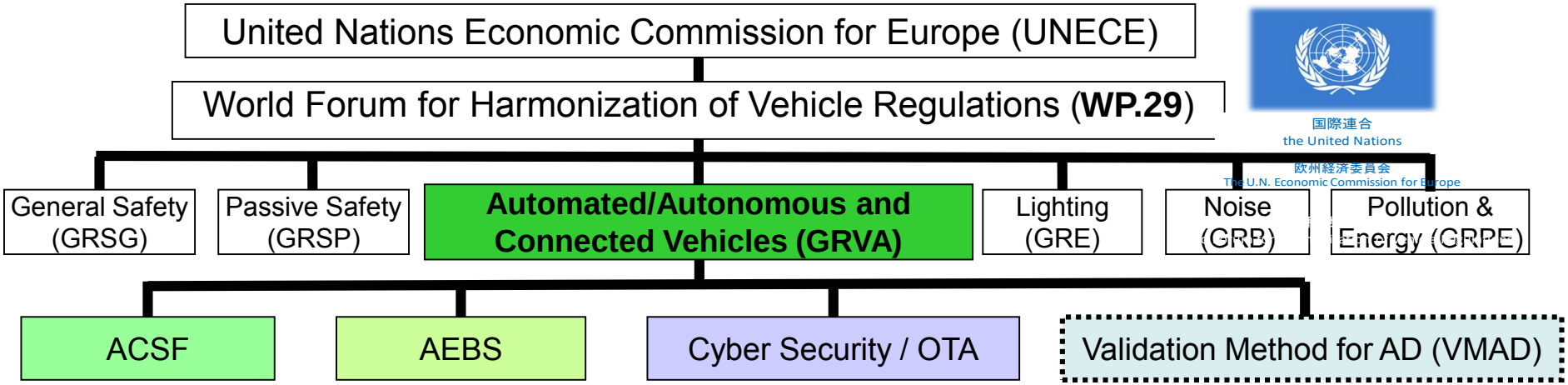
- To realize society where traffic accidents caused by automated driving systems resulting in injury or death become zero is set as a vision
- To ensure safety, vehicle safety to be met by automated vehicles is defined as "automated vehicle systems, under their operational design domain (ODD), shall not cause any traffic accidents resulting in injury or death that are rationally foreseeable and preventable" and vehicle safety requirements are established

10 safety requirements for automated vehicles

Automated vehicles shall meet the following requirements to ensure safety:

(i) Setting of ODD (ii) Safety of automated driving systems
(iii) Compliance with Safety Regulations, etc.
(iv) Human machine interface (with driver monitoring function, etc.)
(v) Installation of data recording devices (vi) Cybersecurity
(vii) Safety of vehicles used for unmanned driving services (additional requirement)
(viii) Safety evaluation (ix) Safety of in-use vehicles
(x) Information provision to automated vehicle users

Organization of WP29



Working Party/Group	Post	Recent major achievements
Automated/Autonomous and Connected Vehicles (GRVA)	Chairperson: UK Vice-chairperson: **Japan**	Established and held in this September and discussing the priority for making automated driving systems requirements.
Informal Working Group on Automatically Commanded Steering Function (ACSF)	Chairpersons: **Japan**, Germany	Drafting a regulation on systems that automatically keep the vehicle in its lane (equivalent to SAE level 3).
Informal Working Group on Automatic Emergency Braking Systems (AEBS)	Chairpersons: **Japan**, EC	Drafting a regulation on automatic emergency braking systems for passenger cars.
Cyber Security / OTA Task Force	Chairpersons: **Japan**, UK	Drafting regulations and guidelines on cyber security and software update.
[Informal Working Group on Validation Method for Automated Driving (VMAD)]	Chairpersons: **Japan**, NL	Developing the Terms of Reference of the VMAD IWG.

- Examples of technical requirements
  - **Vehicle safety concept to realize of the objective**

"Automated vehicle systems, under their operational design domain (ODD), shall not cause any traffic accidents resulting in injury or death that are rationally foreseeable and preventable."

    - Definition of the range of driving environment conditions
      - Applicable systems, definition of ODD, driver take-over conditions (TD)
    - Quantification of criteria → Numerical requirements
    - **Use case scenarios where the vehicle should be driven safely**
  - HMI, DSSAD, CS/OTA, etc.

- **Examples of evaluation method requirements**

Only these 3 are available as means of verification.

1. Track testing

- **Basic performance testing**
  - **Longitudinal control (adaptive cruise control, cruise control) performance, acceleration/deceleration performance, lateral control (lane keeping, lane change) performance, cornering/turning performance**
- **Testing at the limits of conditions**
  - Example of safety performance: The vehicle shall be driven without causing any accidents at the limits of conditions of 10 cases randomly selected from each category (e.g., 20 categories) of use case scenarios.
  - Example of sensor performance: The vehicle shall be driven without causing any accidents at the limits of ODD environmental conditions in 2 of the above 10 cases.

2. Real world testing

- **Road Traffic Act to be checked, etc.: national traffic rules / traffic laws**

3. Audit: OEM to evaluate all use cases and submit the result

- Its functional specifications, process and tool information to be included