

Japanese Policy and contribution to the International Activities on Automated Driving

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1. Japanese Policy on AD
2. contribution to the International Activities on AD

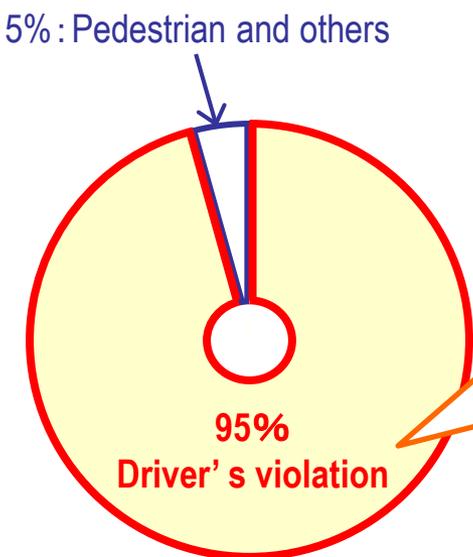
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Significances of Automated Driving

Realization of automated driving is expected to significantly decrease traffic accidents caused by drivers' error. Providing mobility for elderlies and overcoming challenges in professional driver shortage will also be expected.

Cause of fatal traffic accidents per type of law-violation (2018)



Source: White Paper on Traffic Safety 2019

Number of traffic deaths/injuries (2019)

Death	3,215
Injury	460,715

Example: Effects of automated driving

Reduction of traffic accidents

Providing mobility for elderlies

Reducing and eliminating traffic jam

Measure against aging population and productivity improvement

About 40% of truck drivers are over 50 years old

Source: "2015 Labour Force Survey" (MIC)

Decreasing transportation services (mainly rural areas)

Route bus's operation frequency per day (compared to 1970 indexed to 100)

Year	Index
1970	100.0
1980	100.3
1990	69.6
2000	61.5
2010	57.2

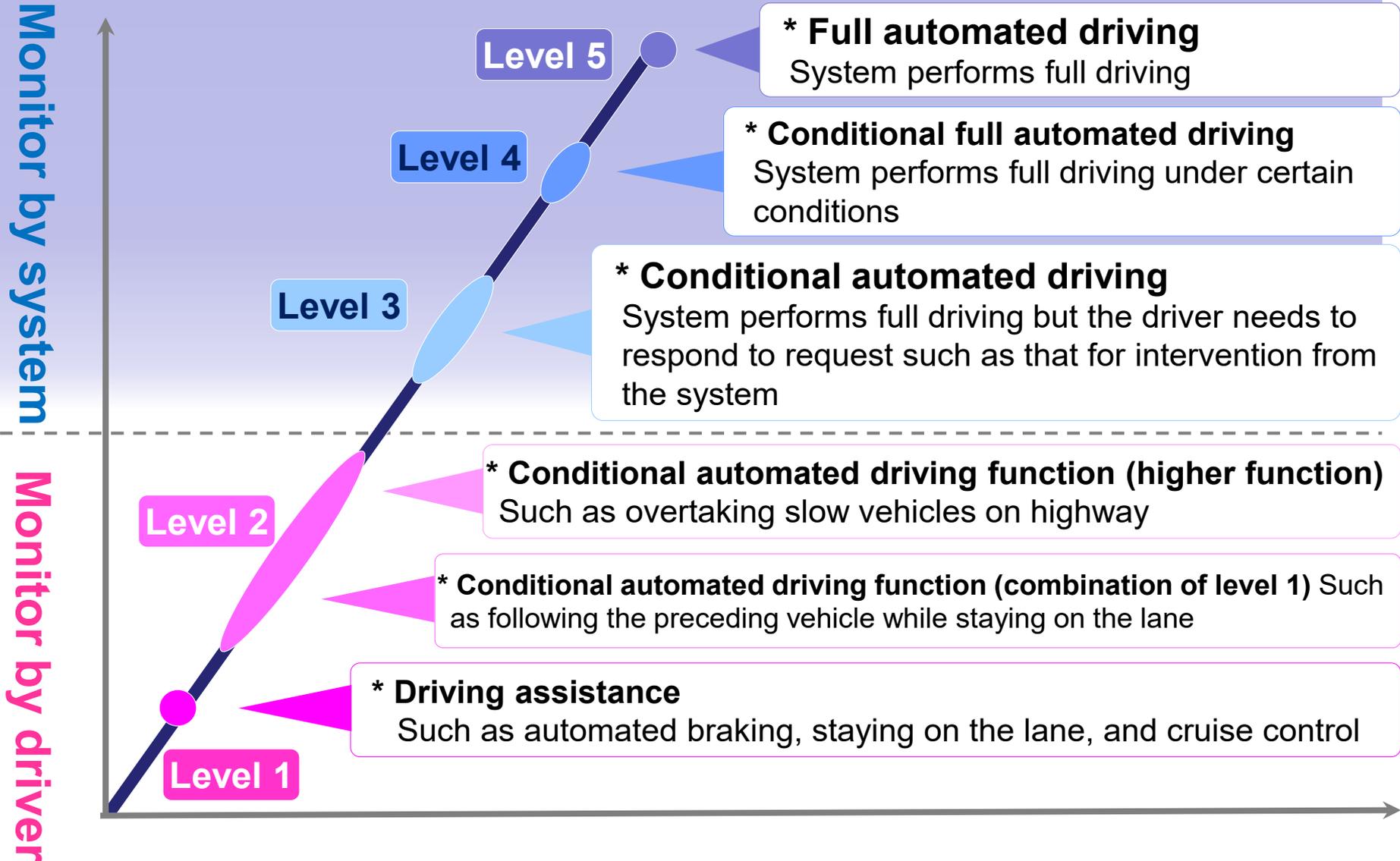
Strengthening international competitiveness

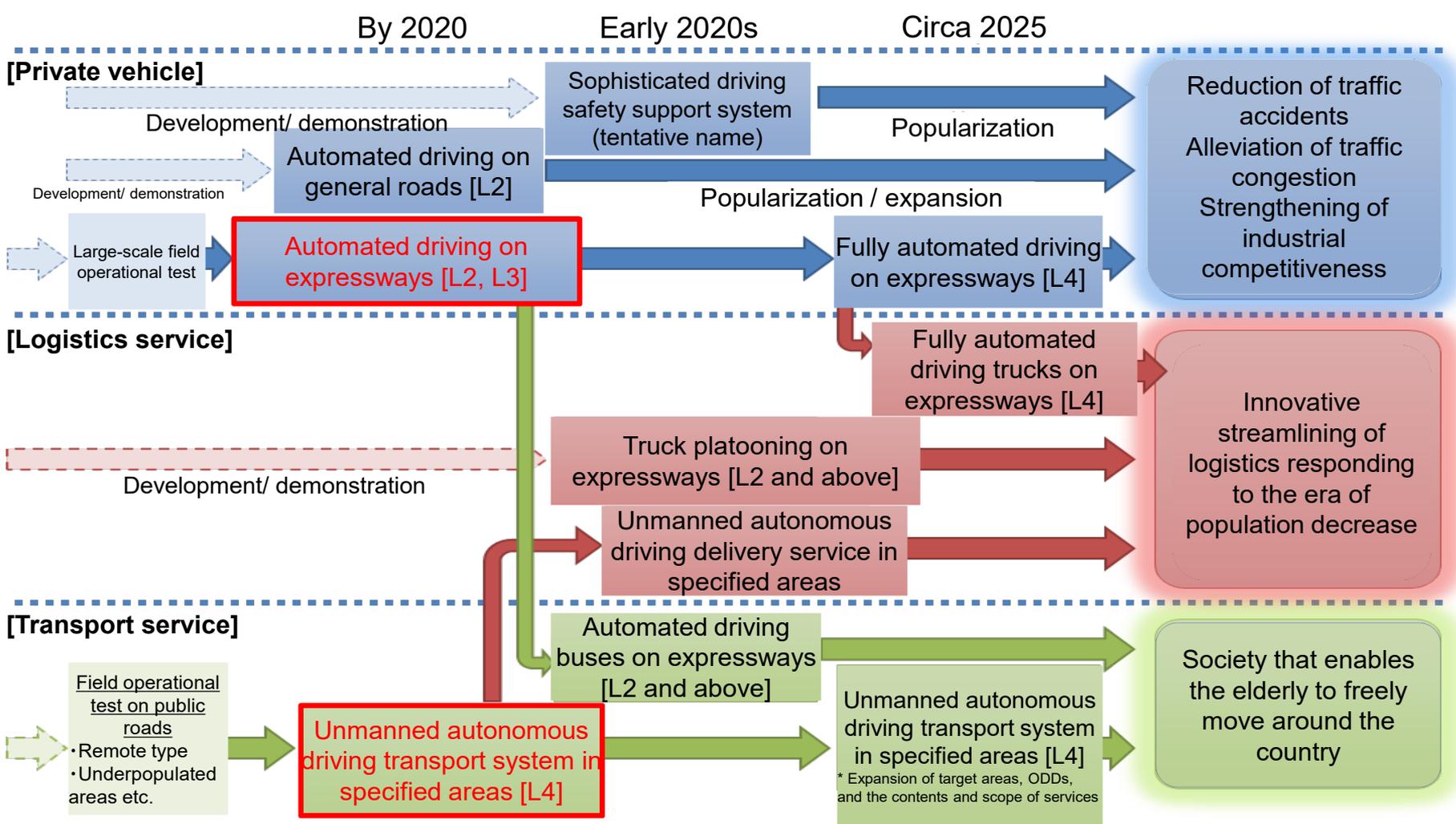
Streamlining domestic transportations efficiently

Packaging

International expansion

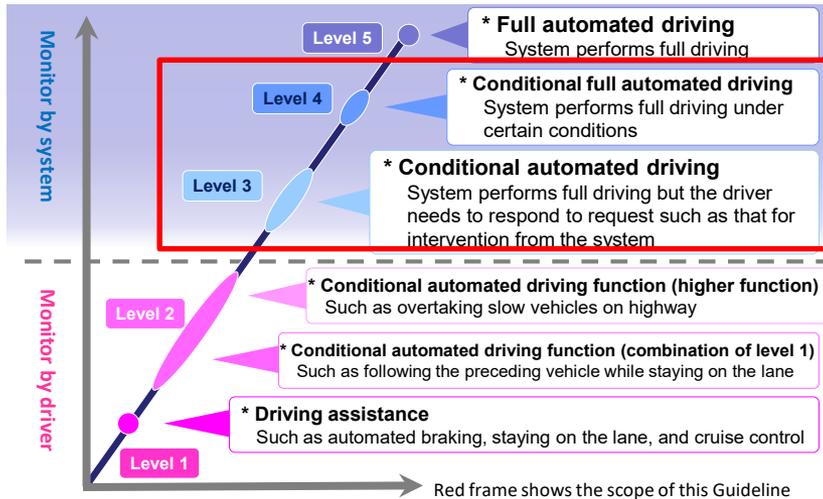
Levels of Automated Driving





Vehicles subject to the Guideline

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



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

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 or 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 injury or death that are rationally foreseeable and preventable” and establishes vehicle safety elements and their requirements based on the vehicle safety concept.

Vehicle safety elements for Automated Vehicles (10 elements)

Automated vehicles should meet the following requirements to ensure safety:

- (i) Establishment of operational design domain (ODD)
- (ii) Safety of automated driving system
- (iii) Compliance with safety regulations, etc.
- (iv) Human Machine Interface (HMI)
- (v) Mounting of a data recording device
- (vi) Cyber security
- (vii) Safety of vehicles for unmanned automated driving transportation service (additional requirements)
- (viii) Safety evaluation
- (ix) Ensuring safety in use process
- (x) Provision of information to users of automated driving vehicles

Government's goals

- Automated driving of Level 3 on expressways (around 2020)
- Unmanned autonomous driving transport services (Level 4) in specified areas (by 2020)



Automated driving of private vehicles on expressways



To realize these goals, it is necessary to make national laws compatible with automated driving



Unmanned mobility services in specified areas

Amendment to Road Vehicle Law (Passed and enacted in May 2019)

- "Automated driving system*" added to systems subject to Safety Regulations for motor vehicles *Applicable to automated driving of Level 3 and Level 4
 - Specific details of the technical requirements will be adopted domestically in view of the discussions at WP.29
- The conditions under which each of the automated driving system is used (ODD) shall be respectively designated by MLIT.
 - MLIT ensures safety by limiting the conditions of use of automated driving system such as speed, route, and weather.
 - MLIT shall confirm the appropriateness of the ODD defined by automakers, etc. as well as their compliance with safety regulations of automated driving system.

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Governments

- More efficient rulemaking process
- Streamlined examination process for certification

Automakers, etc.

- Development, certification and production costs reduction through unification of vehicle design specifications and standardization of parts
- Global and flexible supply chains
- More resources to the development of safety and environmental technologies

Harmonization of Regulations

Motor Vehicle Users

- Safer and more environmentally-friendly vehicles
- Accessible vehicle prices

Joint Declaration at Cagliari, Italy on 23 June, 2017 (excerpt)



- the G7 countries reaffirmed their commitment to identify and remove potential barriers to the introduction of automated guidance technology and to connect to existing regulation systems at international and country levels.
- The Joint Declaration names WP29 as a forum for such cooperation at international level

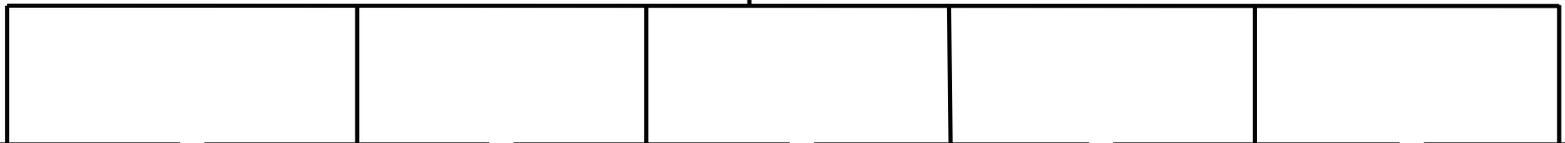
The United Nations



The U.N. Economic Commission for Europe
(UNECE)



World Forum for Harmonization of
Vehicle Regulations(**WP.29**)



Automated
driving
(GRVA)

General
safety
(GRSG)

Passive
safety
(GRSP)

Lighting
(GRE)

Noise
and tyres
(GRBP)

Pollution
and
energy
(GRPE)

- At the United Nations WP29 (World Forum for Harmonization of Automobile Standards) in June 2019, the framework document on automated/autonomous vehicles created by Japan with the United States and Europe, etc. was established. (ECE/TRANS/WP.29/2019/34/Rev.1)

outline of the Framework document

● Safety Vision

“an automated/autonomous vehicle shall not cause any non-tolerable risk”, meaning that automated/autonomous vehicle systems, under their automated mode ([ODD/OD]), shall not cause any traffic accidents resulting in injury or death that are reasonably foreseeable and preventable.

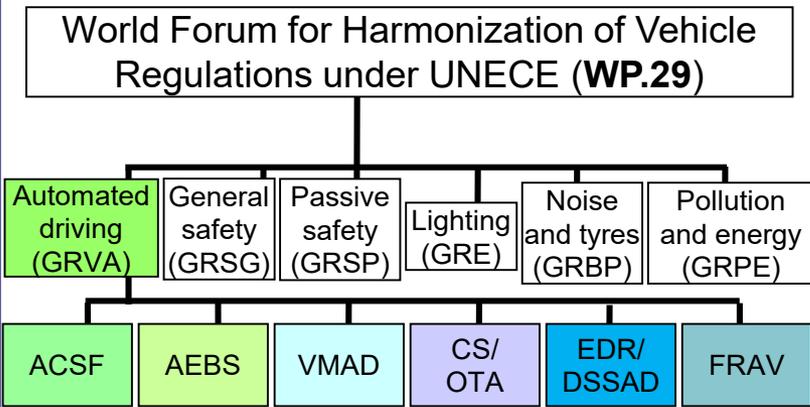
● Key issues and principles to be considered by WP29 subsidiary bodies as a priority

A	System Safety
B	Failsafe Response
C	Human Machine Interface (HMI) /Operator information
D	Object Event Detection and Response (OEDR)
E	Operational Design Domain (ODD/OD) (automated mode)
F	Validation for System Safety
G	Cybersecurity
H	Software Updates
I	Event data recorder (EDR) and Data Storage System for Automated Driving vehicles (DSSAD)



Japan will continue contributing the discussion of specific requirements at each GR and informal working groups.

Reference: Deliberative system for international regulations on automated driving technology



Major deliberative bodies on automated driving technology	Japan's post
Working Party on Automated/Autonomous and Connected Vehicles (GRVA)	Vice-chair
Informal Working Group on Automatically Commanded Steering Function (ACSF)	Co-chair (with Germany)
Informal Working Group on Advanced Emergency Braking Systems (AEBS)	Co-chair (with EC)
Informal Working Group on Validation Methods for Automated Driving (VMAD)	Co-chair (with the Netherlands)
Task Force on Cyber security and OTA issues	Co-chair (with UK)
Informal Working Group on Event Data Recorder (EDR) and Data Storage System for Automated Vehicle (DSSAD)	Co-chair (with US and Netherlands)
Informal Working Group on Functional Requirements for Automated and Autonomous Vehicles (FRAV)	Technical secretary

Thank you for your attention!