

Japan's views on Automated Driving

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consideration in Japan
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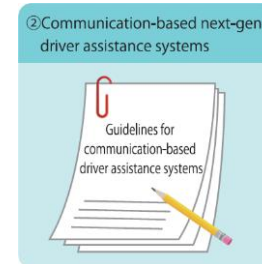
Our safety measures

1. 1991 ~ launching and exploiting

ASV (Advanced Safety Vehicle) project



2. Regulation, including guidelines and regulations



3. New Car Assessment



The ASV Project

Since 1991, academia, industries, and government have been conducted the project more than 20 years to develop new advanced technologies of vehicles. Main actions are as follows:

Basic principles for ASV

- Driver Assistance
- Driver Acceptance
- Social Acceptance

Assumed reduction of accidents by new technologies

Device	Number of fatalities of traffic accidents	Number of injuries of traffic accidents
AEBS (alarm)	-291	-79,066
AEBS (control)	-350	-51,241
LDWS	-165	-4,838
Night vision	-239	-1,901

(A large scale) demonstration (2004,2009,2013)

2004 ; Verification Test for Communication-based systems

2009 ; Open Road Integrative Test for Communication-based systems

2013 ; Open Road Integrative Test for Communication-based systems

Communication-based systems - public road test in 2013



Pedestrian existence alarm system



Crossing collision prevention system



Road-works vehicle information system



Approaching emergency vehicle information system



40 (including target vehicles and campaign models) vehicles were demonstrated.

Communication-based systems

- public road integrative test in 2009



Communication-based systems

- open road verification in 2004



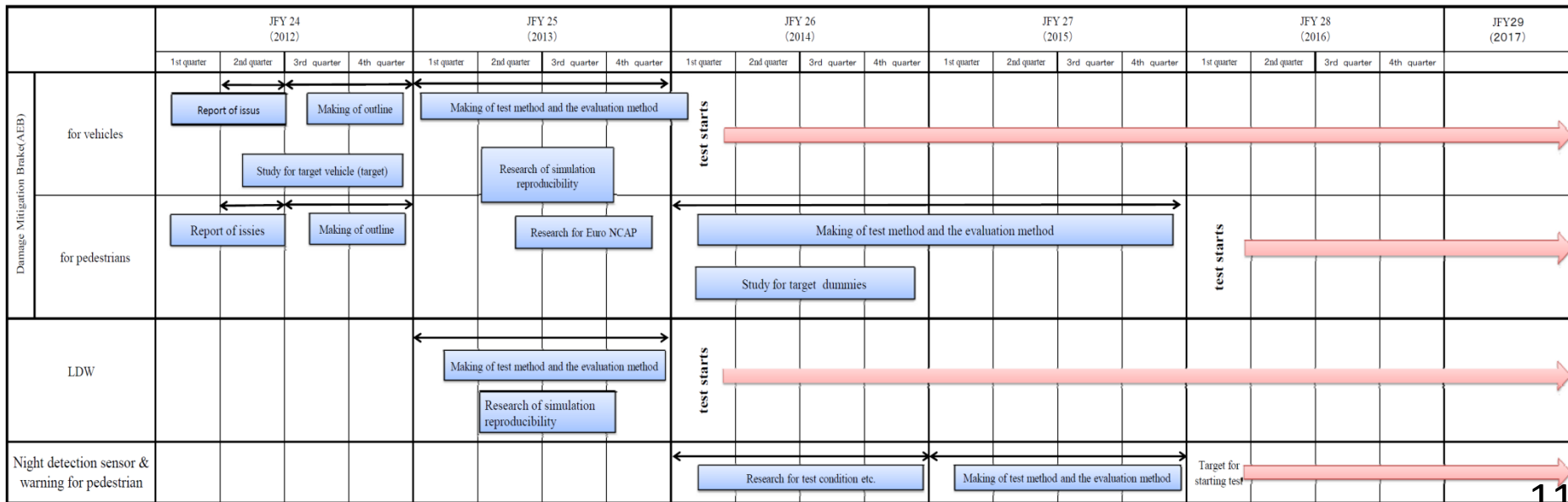
Guidelines for New Technologies and Development of Regulations

- Develop Technical Guidelines
 - Full Speed Range Adaptive Cruise Control System with Brake Control (in 1999)
 - Speed limitation system with brake control (in 1999)
 - Lane Keeping Assistance System (in 2000)
 - Nighttime frontal monitoring system (in 2002)
 - Advanced Emergency Braking System (in 2003)
 - Rear Parking Assistance System (in 2003)
 - Advanced Emergency Braking System for Low Speed (in 2009)
- Contribution to developing UN Regulation
 - Developed UN Regulation (R130) for LDWS (in 2013)
 - Developed UN Regulation (R131) for AEBS (in 2013)
- Contribution to developing UN Guideline
 - Common Understanding for ADAS : classified as information, warning, control
 - Warning Guidelines : adopted at 154th session of WP29, June, 2011, and have been taken into account when establishing new rules.
 - Control Principles : adopted at 159th session of WP29, June, 2013

Introducing Active Safety Technologies into New Car Assessment

- AEBS for vehicles and LDWS (2014~)
- AEBS for pedestrians (2016~)
- Night vision (2016~)

Road Map: Introduction of Preventitive Safety Technology for JNCAP



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Japan Reconstruction Strategy (Cabinet decision June, 2013)

II. 3. Building infrastructure for future generation—Safe, Comfortable and Economical

② Enabling society to transport people and things safely and comfortably

To realize such society, national project should be worked on Driving Safety Support Devices and Systems by using Vehicle–Vehicle and Infrastructure–Vehicle Communication, etc. and by building Automated Driving System, Traffic congestion forecasting system, and Logistics System.

○Development and Environmental Improvement needs for Driving Safety Support System and Automated Driving

Declaration of creating the world's most advanced IT nation (June, 2013)

III.2. to live healthy and securely and comfortably in the safest and most disaster-resistant society.

(4) to realize the safest, environment concerned and economical road traffic in our society.

Science technology innovation integrated strategy (June, 2013)

C2.III. Development of next generation infrastructure ahead of the world

To create communities through the development of the next generation infrastructure.

(3) Advanced Traffic System realization

Society where enables people and things to transport safely and comfortably

Traffic accidents decrease dramatically . Life without traffic accident.

Roadmap for Development of Auto Pilot System

Goal set out by the Government
(Japan Revitalization Strategy)
Making a test installation of
Automated Driving System

<Scope>

(Aimed at driving on the same lane.)

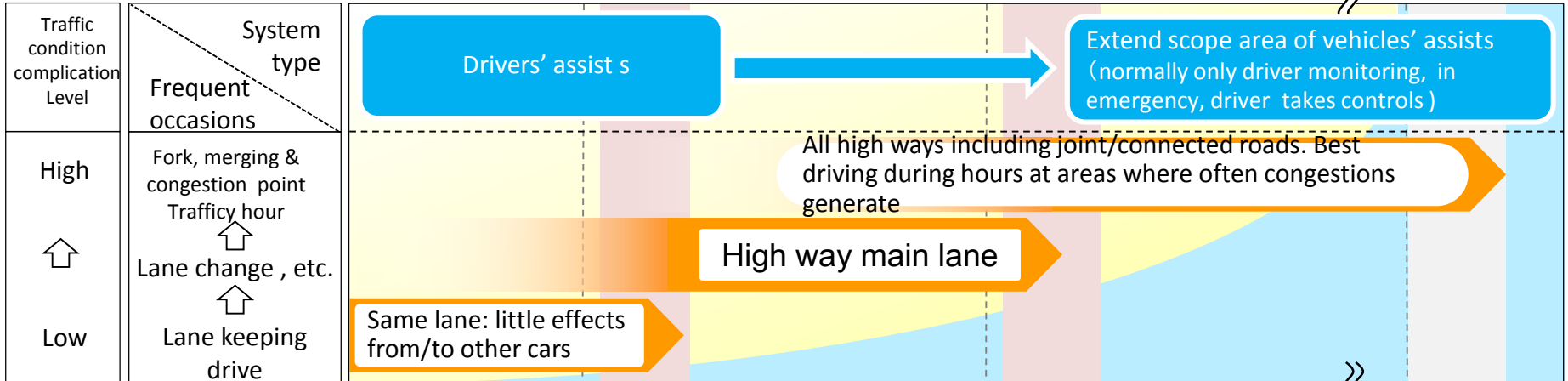
Goal: Driving on main high way
without changing lanes.

2013

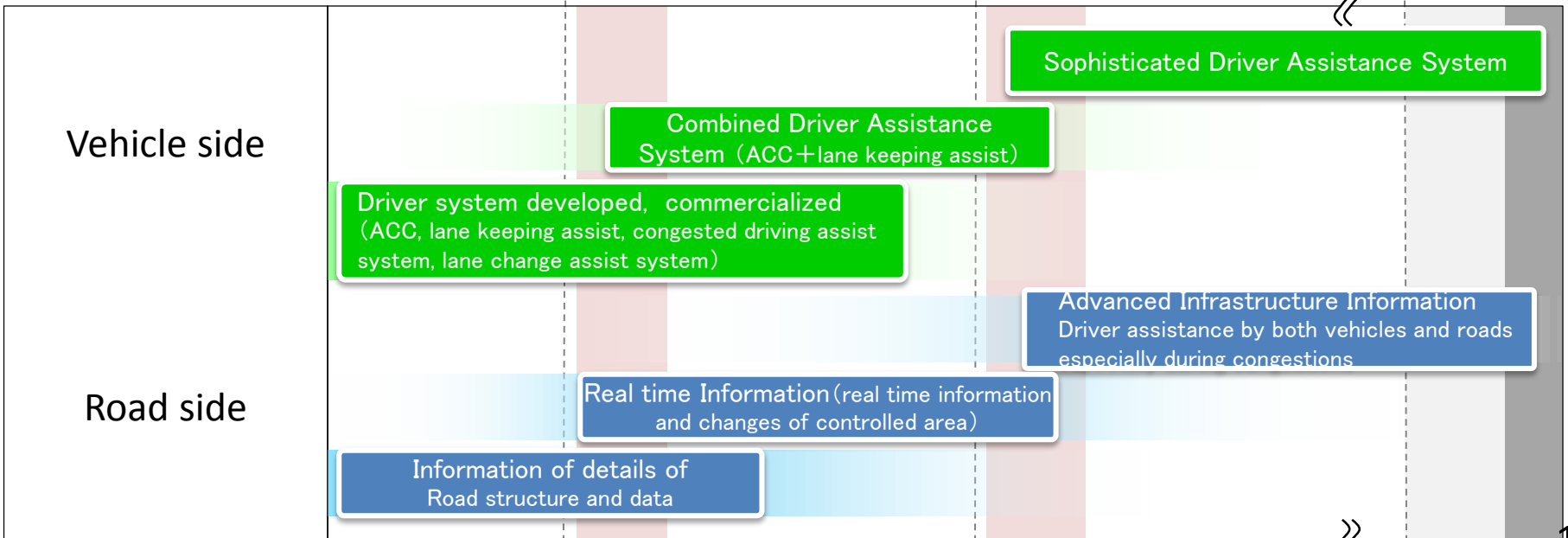
2015

2020

>> 2030

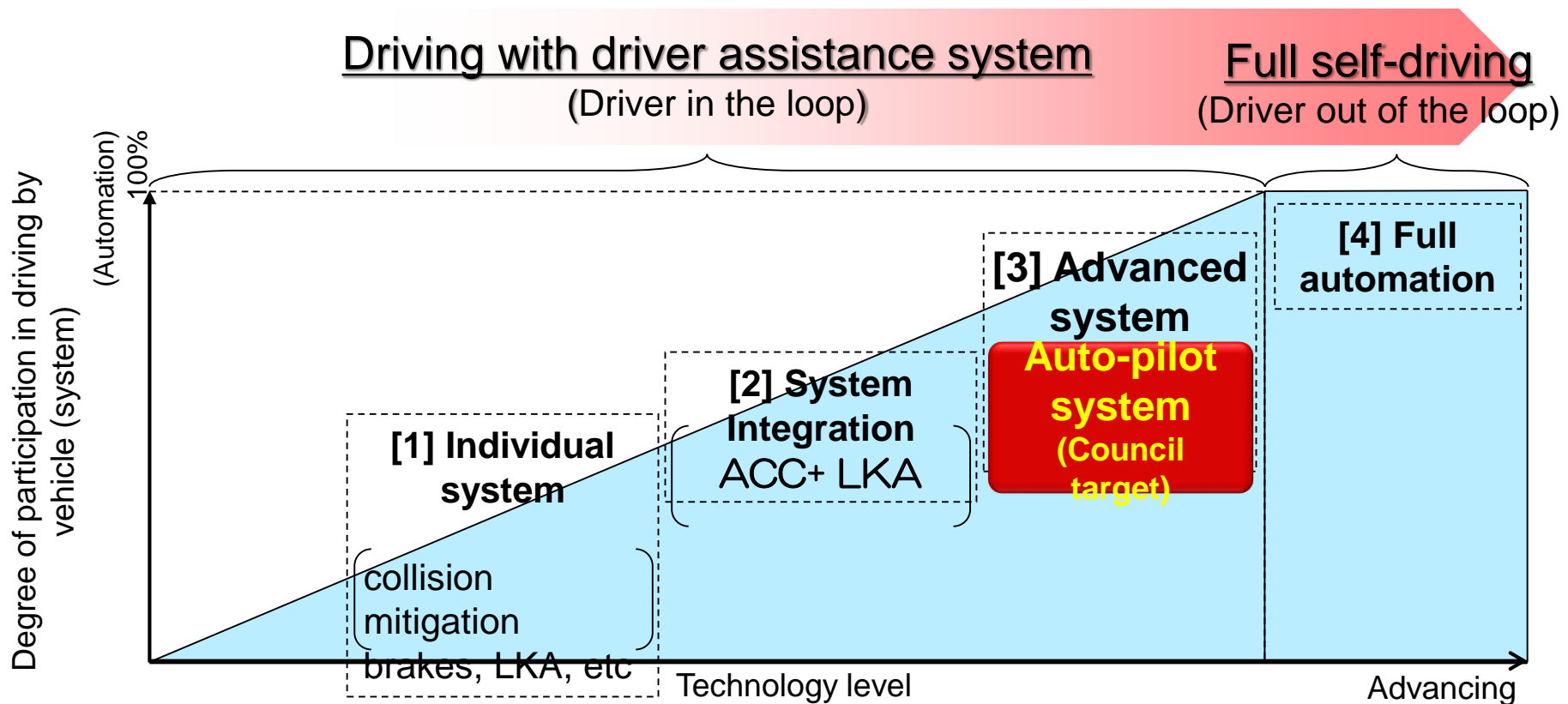


<main issues>



○ The Council defines driving with driver assistance system and full self-driving as automated driving.

Automated driving



Current situation on Automated Driving Technologies

Type of Automated Driving	Manufacturers development situation	Under the current law (road transport vehicle act)
Driving with driver assistance system (Driver in the loop)	Aiming at advanced driver assistance technology	<ul style="list-style-type: none"> ▪ no special procedures for driving on public road (※)
Full self-driving (Driver out of the loop)	Manufacturers are not aiming at developing full self-driving . There is no test driving scheduled either.	<ul style="list-style-type: none"> ▪ It changes role of human driver. ▪ As technology advances, new laws on these technologies may be discussed.

(※) Vehicles with lane change assistance system and some automated driving technologies manufactured by Toyota, Honda, Nissan and other companies have already been registered and conducting fleet test on public road.

(October, 2013) (July, 2013) (September, 2013)



(Reference)

- ① Convention on Road Traffic (Geneva, 1949) provides that every vehicle has to have a driver and the driver always has to control the vehicle.
- ② Concerning Google car in USA, test driving in some states is allowed under the condition that special trained driver is seated in driver's position. Operation without driver is not allowed.
- ③ NHTSA stated that it is too soon to reach conclusions about the feasibility of producing a vehicle that can safely operate in a fully automated (or "driverless") mode.
- ④ UN ECE WP29 (World forum for harmonization of vehicle regulation) had made design principles for control systems of advanced driver assistance system. (Jun, 2013)

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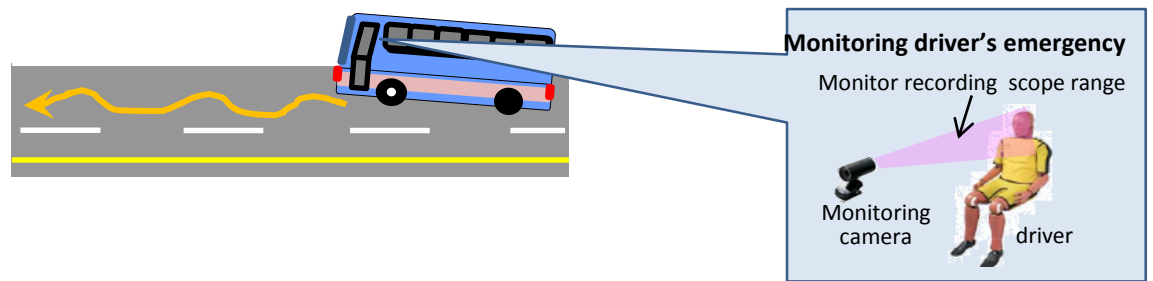
- Driving with driver assistance system
 - Based on international discussions and mutual understandings, driver assistance system and other new technologies are worth supported and encouraged to become commercialized for the improvement safety.
- Full self-Driving (NHTSA, level4 ?)
 - We haven't had a prospect of practical use of full self-driving so far and share NHTSA's view that "it is too soon to reach conclusions about the feasibility of producing a vehicle that can safely operate in a fully automated (or "driverless") mode".
 - Based on the development of public acceptance, we think that the discussion may be started. Along with that, related existing laws should be amended at the same time.

- How Individual case should be treated ?
 1. Driving without holding steering wheel Is it OK if a driver could override?

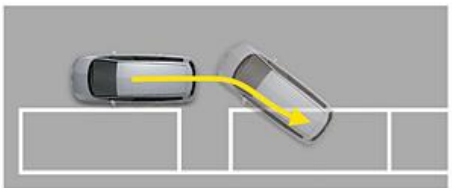
Is it a part of corrective steering of R79?



2. Dead-man system Is it OK if a driver could override?



3. Remote controlled parking assist R46 and R121; Vienna Convention needs to be amended? _____



Thank you for your attention.