

Introduction

- Japan deeply appreciates the tremendous contributions of all participants in the ADS-IWG and OPI meetings. Thanks to your efforts, discussions on the realization of ADV safety have been progressing steadily.
- One notable achievement of this conference is the formulation of “the Guidelines and Recommendations for ADS” last June—a milestone that would not have been possible without your invaluable support. We extend our sincere respect and gratitude for your commitment.
- Nevertheless, challenges remain within the ADS-IWG, and Japan is fully committed to making its best effort to address these issues.
- With this determination, we would like to share our thoughts on the premise for further discussions at the ADS-IWG.

Premises of the Discussions for the ADS Regulation

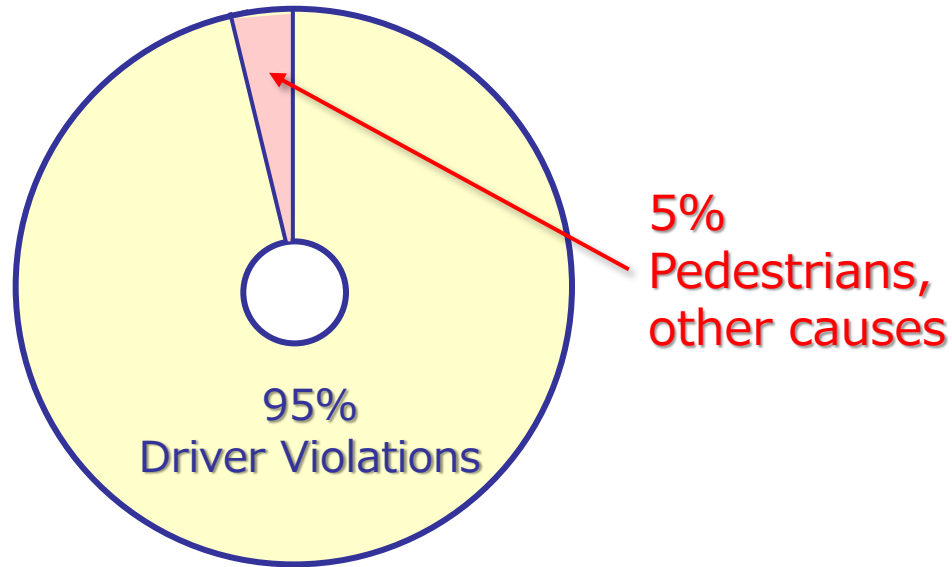
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Prerequisite

- Principle of ADS; ADS vehicles shall not cause any traffic accidents resulting in injury or death that are reasonably foreseeable and preventable within ODD.
- It is reasonable to expect that the OEM will develop an ADV and the vehicle user will operate it with their best efforts to avoid traffic accidents. At the same time, TAA and TS should work on developing the necessary technical standards and review systems for ADS.
- Currently, it is impossible to create an ADV that can avoid accidents completely; traffic accidents of unforeseeable and unpreventable cannot be avoided perfectly, and in some cases, accidents due to malfunctions in the systems would happen.
→ **Should develop ADS regulation to minimize the residual risks on the recognition that traffic accidents of unforeseeable and unpreventable may occur even with ADVs.**
When it comes to traffic accidents of unforeseeable and unpreventable, it is difficult to cover all the causes in advance. Therefore, it is necessary to consider a mechanism for the investigation of the causes and the feedback of the analysis results into the regulation after the event.
- Liability in the event of an accident is a judicial decision based on the circumstances of each incident. It cannot be predetermined for all cases.

How much can accidents be reduced?

Ratio of fatal accidents caused by violation of laws (2021)



Implications of Automated Driving

- The majority of fatal accidents are caused by "driver error".
- The practical application of automated driving is expected to be effective in significantly reducing traffic accidents caused by drivers.

However

Even if drivers were to never violate the law, 5% of accidents (including caused by the others) would still occur.

The possibility of an accident is Never Zero.



The possibility of accidents cannot be ruled out, even with ADV that do not violate laws.

Number of traffic accidents resulting in fatalities and injuries in 2021

fatalities	2,636
injuries	362,131

From the 2022 edition of the White Paper on Traffic Safety

Differences between Conventional and AD Vehicles in Certification Tests

	Perception, Decision, Operation	Motion
Conventional Vehicles	<p>Human</p> <p>Driver </p> <p>The driver's license system ensures that the driver is able to perceive, decide, and operate the vehicle correctly.</p>	<p>Vehicle</p> <p>Vehicle </p> <p>Certification, inspection, and recall systems ensure that the system functions properly in <u>response to driving operation</u>.</p>
Automated Driving Vehicles	<p>Vehicle Vehicle (w/ AD System)</p>	
	<p>How can we ensure safe driving, traditionally guaranteed by human drivers?</p> <p>Addressing this aspect is crucial</p>	<p>Certification, inspection, and recall systems ensure that the system functions properly in <u>response to driving operation or system input</u>.</p> <p>Can be tested using similar test methods as conventional vehicles</p>

What can We do?

What we can do is make every effort to operate ADVs in a manner that can be considered safe and, in the unfortunate event of a traffic accident, to ensure that the cause for the accident can be fairly and impartially determined by outsiders. This is also for the protection of OEMs who are developing and manufacturing ADVs that are safe and beneficial to society.

- It is obvious for the OEM to design the vehicle with the best possible efforts to ensure safety in the event of any foreseeable occurrence.

However, traffic accidents cannot be perfectly avoided.

The essential points which OEMs and TAAs can do are:

- To establish management system in advance to clarify the cause after an accident occurs.
- If the issue occurs due to the ADV, have a development system to consider and develop countermeasures (improvement of hardware and/or software etc.).

What we should do?

1) To confirm Implementing countermeasurement

a) To set up scenarios in ODD to ensure safety in events and situations that can be generally anticipated. At the same time, we need recognize there is limitation of the number of scenarios we can check at certification stage.

b) Audit the development process, etc., to confirm development with maximum efforts to ensure safety. (To be discussed)

2) To confirm the responsibilities of the authorities

c) To build the capacity to examine the validity of the OEM's methods for ensuring safety and update scenarios and requirements continuously based on the traffic accident information

3) To implement (Causes and countermeasures for unforeseen events):

d) Information is needed to evaluate the ADS status (especially whether it was preventable) at the time of the accident. (DSSAD, external information etc.)

e) Countermeasures are implemented ,for example, by modifying the hardware and/or the software.

(Remedy actions for identified causes relating the vehicles operated in the market.)

f) Identify events that have not been anticipated by reports of safety relevant events by ISMR.

ADVs are Nothing Special

- Automated vehicles are essentially the same as human-driven vehicles.
- When an accident occurs, we must avoid a situation where liability is not or cannot be clearly defined.
- Even if the ADV has passed the certification, it cannot be avoided that unforeseeable or unpreventable traffic accidents may occur. In these cases, the causes or the liability of traffic accidents might be on a case-by-case basis.
- When driving the vehicles, the ADS (w/ OEM) must always account for the risk of accidents, just as in cases involving human drivers.

Summary

ADS vehicles shall not cause traffic accidents resulting in injury or death that are reasonably foreseeable and preventable within ODD.

It is reasonable to expect that the OEM will develop an ADV and the vehicle user will operate it with their best efforts to avoid accidents. At the same time, TAA and TS should work on developing the necessary technical standards and review systems for ADS.

However, traffic accidents that are unforeseeable and unpreventable may occur even with ADS.

Our responsibility is to make every effort to operate ADVs in a manner that prioritizes safety. In the unfortunate event of an accident, it is crucial to ensure that the cause of the accident can be fairly and impartially determined by external.

For operating these vehicles, the ADS (in conjunction with the OEM) must take action of countermeasures, just as is expected in cases of conventional vehicle.

We believe it is important to be conscious of these aspects to proceed with realistic methods of vehicle safety assessment.