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Agenda item 8(c))

# The necessity of New Regulations for New Technologies regarding R79

Japan

# How the ADASS Is Defined in R79

- In the Introduction section of R79, the ADASS (Advanced Driver Assistance Steering Systems) is defined as follows:

Systems whereby the driver remains in primary control of the vehicle but may be helped by the steering system being influenced by signals initiated on-board the vehicle are defined as "Advanced Driver Assistance Steering Systems".

- Based on the above definition, the requirements on "Automatically commanded steering function" and "Corrective steering function" are given in paragraphs 2.3.4.1., 2.3.4.2., 5.1.3. and 5.1.6.1.

[Appendix in last page](#)

## Japanese approach for the Technical Guideline of New Technologies regarding R79

- On the other hand, Japanese government has already placed a few Technical Guidelines about the follows devices,
  - LKAS (Lane Keeping Assist System)  
Lane Keeping Assist System can reduce driver's workload during keeping a vehicle within a lane, and it can contribute to reduction of traffic accidents by lane departure and so on.
  - PAS (Parking Assist System)  
Parking Assist System can reduce driver's workload during backward parking, and it can contribute to reduction of traffic accidents during parking.

These new devices, which meet the Technical Guidelines, are expanding on the market.

# Necessity of New Regulations for New Technologies regarding R79

- Since the devices for new technologies are going to expand on the market, we need technical standards for ensuring safety of these systems.
- The current R79 has no technical requirements for concrete devices like LKAS and PAS.



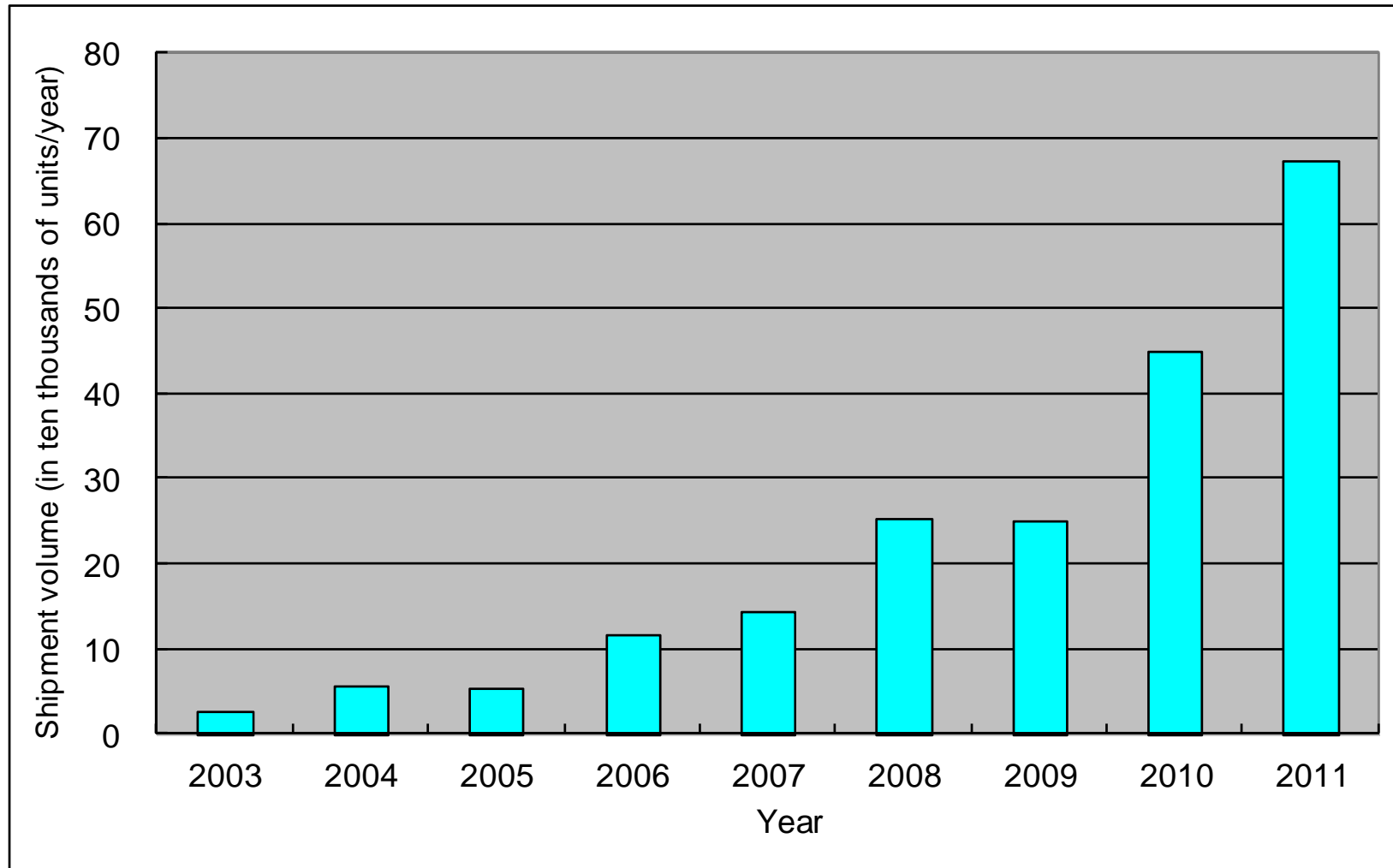
- Therefore, technical standards for LKAS and PAS should be established as new regulations.
- R79 should also be amended if necessary.

## Proposal for New Regulations for New Technologies regarding R79 at the next session

- At the next session of GRRF (Mar. 2013), Japan is considering the proposing establishment of new regulations for LKAS and PAS.
- In this case, the control principles discussed at ITS Informal Meeting will also be taken into account. In other words, the regulation for ADASS should be established based on “Design Principles for Control Systems” to guarantee prevention of any accidents caused by the system and also prevention of confusion for users.  
(Currently being developed by ITS Informal Group)

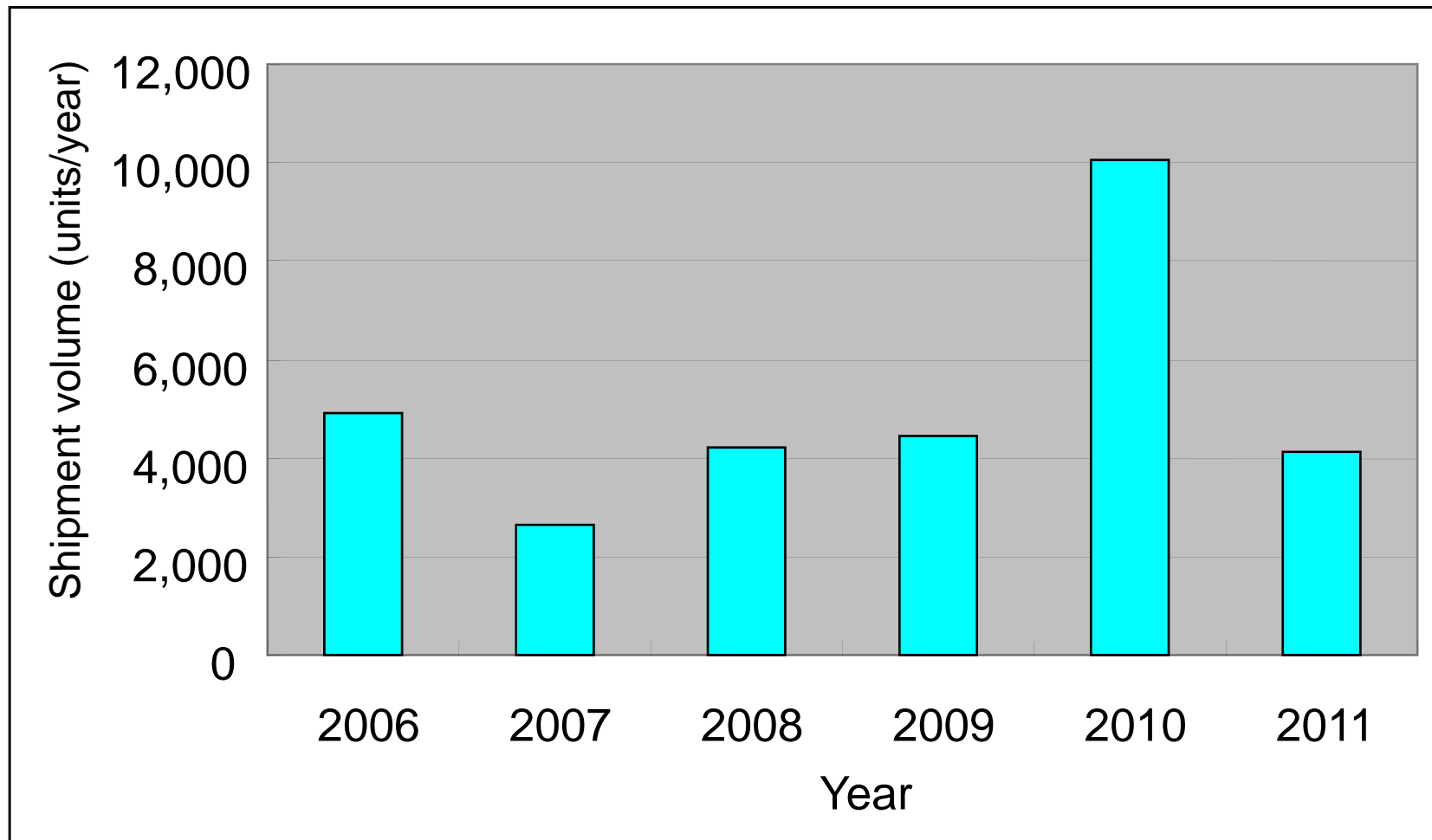
# Changes in PAS Shipment Volumes

Number of units shipped globally by Japanese car manufacturers and other countries



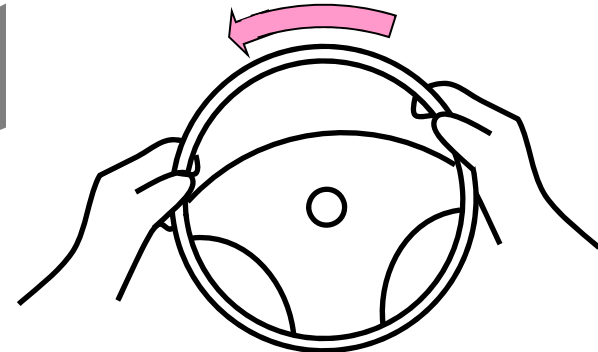
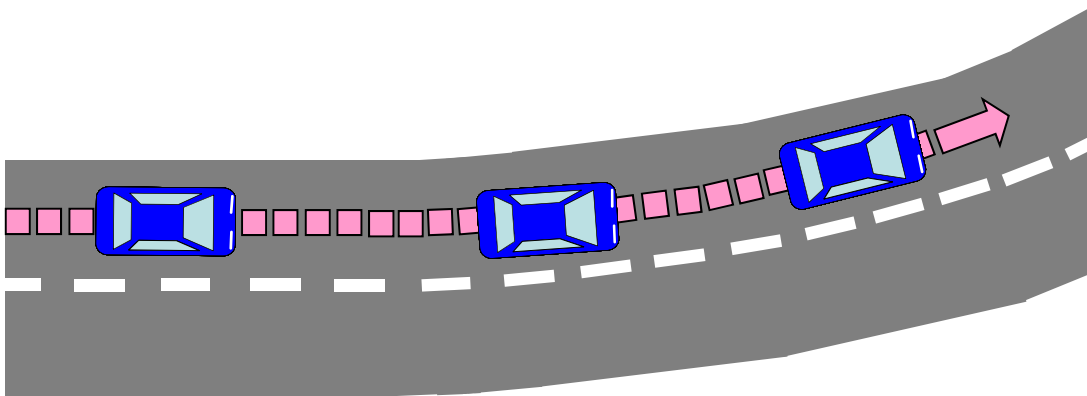
# Changes in LKAS Shipment Volumes

Number of units shipped in Japan by Japanese car manufacturers



# The abstract of Lane Keeping Assistance System

- **The system controls a steering with sensing lines on a road by a camera, and it assists a driver keeping a vehicle within a lane.**
- **It is expected that traffic accidents such as departure from a road side are reduced by the system because of reduction of driver's workload.**





# The abstract of Parking Assistance System

- The system controls a steering to assist a driver parking a vehicle into a backward parking space.
- Two types of parking are considered (Fig.1 and/or Fig.2).
- It is expected that traffic accidents during backward parking are reduced by the system because of reduction of driver's workload.

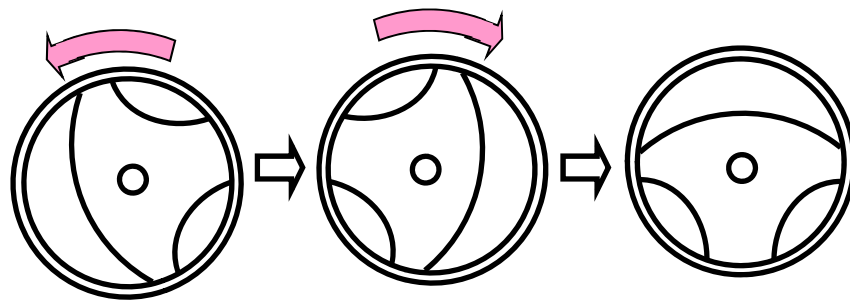
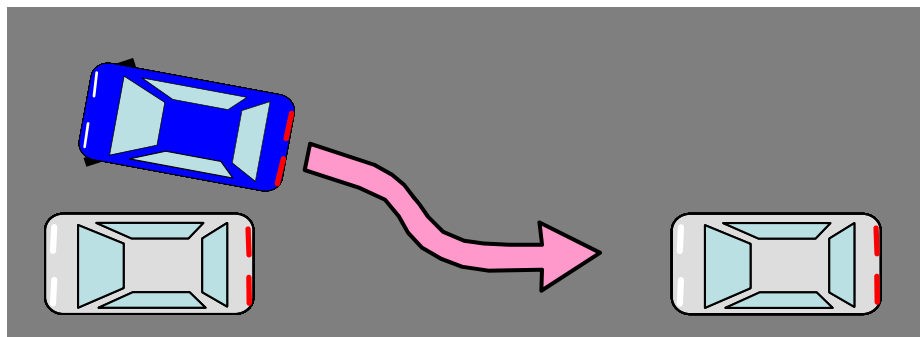


Fig.1

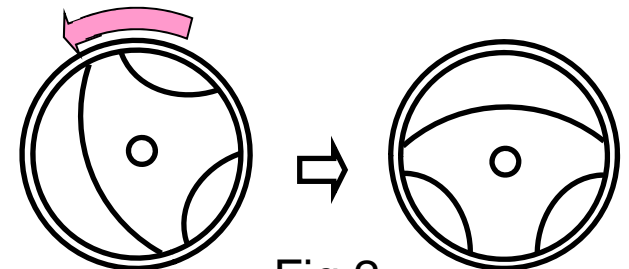
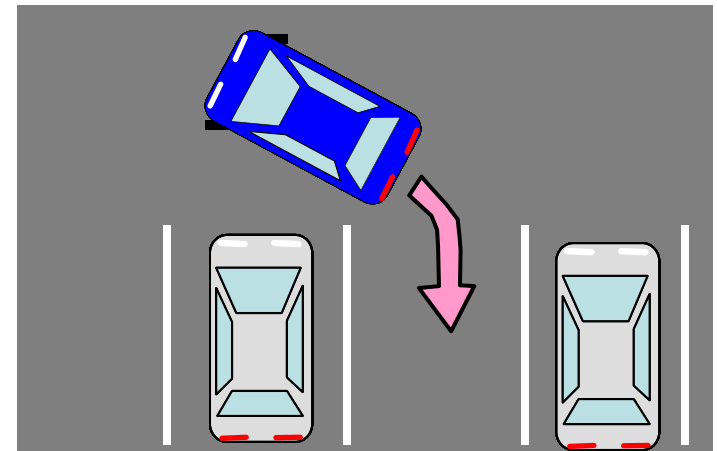


Fig.2

# The Major Contents of the Japanese Technical Guideline for Lane Keeping Assistance System

- Vehicle speed range for the system operation
- Functional limitation for the system
- Prevention of driving without holding a steering wheel
- System status of ON or OFF
- Driver's override
- Necessary information shown to a driver by display
- Methods for notifying necessary information to a driver
- Failsafe functions
- Methods and contents to make users know necessary items
  
- Test procedure
  - Confirmation method regarding technical requirement

# The Major Contents of the Japanese Technical Guideline for Parking Assistance System

- System status of ON or OFF by driver's intention
- Conditions for start of the system (target parking position)
- Assistance of a departure from the parking spot
- Vehicle speed limitation for the system operation
- Driver's override
- Prevention of harming a driver by rotation of steering wheel
- Necessary information shown to a driver by display
- Methods for notifying necessary information to a driver
- Failsafe functions
- Methods and contents to make users know necessary items
  
- Test procedure
  - Confirmation method regarding technical requirement

# Appendix (Definition of R79)

"Advanced Driver Assistance Steering System" means a system, additional to the main steering system, that provides assistance to the driver in steering the vehicle but in which the driver remains at all times in primary control of the vehicle. It comprises one or both of the following functions: (paragraph 2.3.4 of the current R79)

"Automatically commanded steering function" means the function within a complex electronic control system where actuation of the steering system can result from automatic evaluation of signals initiated on-board the vehicle, possibly in conjunction with passive infrastructure features, to generate continuous control action in order to assist the driver in following a particular path, in low speed manoeuvring or parking operations. (paragraph 2.3.4.1 of the current R79)

"Corrective steering function" means the discontinuous control function within a complex electronic control system whereby, for a limited duration, changes to the steering angle of one or more wheels may result from the automatic evaluation of signals initiated on-board the vehicle, in order to maintain the basic desired path of the vehicle or to influence the vehicle's dynamic behaviour.

Systems that do not themselves positively actuate the steering system but that, possibly in conjunction with passive infrastructure features, simply warn the driver of a deviation from the ideal path of the vehicle, or of an unseen hazard, by means of a tactile warning transmitted through the steering control, are also considered to be corrective steering. (paragraph 2.3.4.2 of the current R79)

# Appendix (Requirement of R79)

- 5.1.3. The direction of operation of the steering control shall correspond to the intended change of direction of the vehicle and there shall be a continuous relationship between the steering control deflection and the steering angle. These requirements do not apply to systems that incorporate an automatically commanded or corrective steering function, or to auxiliary steering equipment.

These requirements may also not necessarily apply in the case of full power steering when the vehicle is stationary and when the system is not energised.

- 5.1.6. Advanced driver assistance steering systems shall only be approved in accordance with this Regulation where the function does not cause any deterioration in the performance of the basic steering system. In addition they shall be designed such that the driver may, at any time and by deliberate action, override the function."

- 5.1.6.1. Whenever the Automatically Commanded Steering function becomes operational, this shall be indicated to the driver and the control action shall be automatically disabled if the vehicle speed exceeds the set limit of 10 km/h by more than 20 per cent or the signals to be evaluated are no longer being received. Any termination of control shall produce a short but distinctive driver warning by a visual signal and either an acoustic signal or by imposing a tactile warning signal on the steering control.