Comment and Response to “ACPE-GTR-01-03”

Overview

2026.Feb.24

Item List

	Item (related UNR text)	Contents	Results
1	Traffic accidents analysis (0. Introduction, 1. Scope)	• Traffic accidents outline • Typical scenario extraction	Reflect test scenario
2	Research of “Pedal error maneuver” (5. Specification, 5.1.2)	• Analysis by Driving Simulator experiments (JAMA internal research)	Definition of Pedal error maneuver
3	ACPE test condition setting (5.Specification, 5.1.1, 5.1.5)	• Reflect accidents analysis results • Reflect “Pedal error maneuver”	Test condition setting
4	Consider driver’s override (5.Specification, 5.1.11)	• Consider necessity (false positive countermeasure)	Allows the driver to interrupt control
5	Estimation of the system’s effectiveness (0. Introduction)	• Effectiveness in the market from statistics	The effect of reducing accidents is apparent
6	ACPE function (5. Specification, 5.1.1)	• Acceleration suppression only or • Acceleration suppression and brake	Setting “Acceleration suppression” as a minimum requirement. (Helps simplify system configuration and facilitate widespread adoption)
	Tbd ….		

These items are mentioned “ACPE-GTR-01-03 (Chair) Table Document_UN R175 towards an ACPE GTR.docx”
(Pick up main topic)

Traffic accidents analysis outline

- Taking an overall view of the traffic accident analysis
- Extract the characteristics of “pedal error” accidents

Traffic accidents outline

Pedal error accidents rate in JAPAN

Year	2021	2022	2023
All traffic accidents number	305,196	300,839	307,930
Pedal error accidents number	3,164	3,050	3,110
Pedal error accidents rate	1.04%	1.01%	1.00 %

<Traffic statistics> ref ; 交通統計 - 交通事故総合分析センター (Japanese only)

The ACPE accident rate is extremely low

Pedal error accidents rate by age in JAPAN

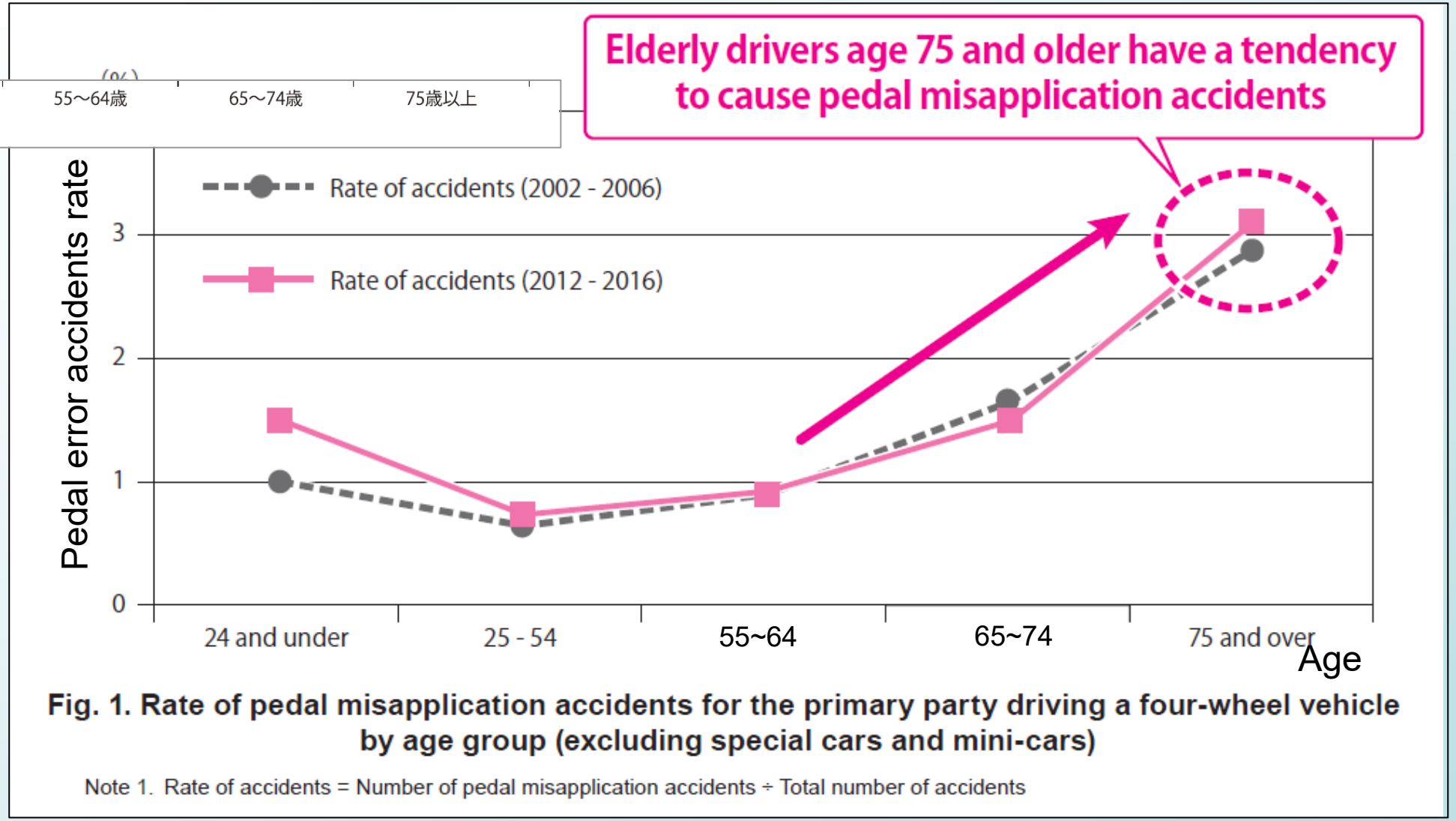


Fig. 1. Rate of pedal misapplication accidents for the primary party driving a four-wheel vehicle by age group (excluding special cars and mini-cars)

Note 1. Rate of accidents = Number of pedal misapplication accidents ÷ Total number of accidents

High accident rate among elderly people

ref : info124_e.pdf

Pedal error accidents : road type, place in JAPAN

(Repost; ACPE-09-05 document)

ACPE-09-05

Background : Traffic Accidents Analysis

- **ACPE traffic accidents rate** (Percentage of ACPE accidents in the "number of accidents" by location)
  - Rate is higher at parking lot

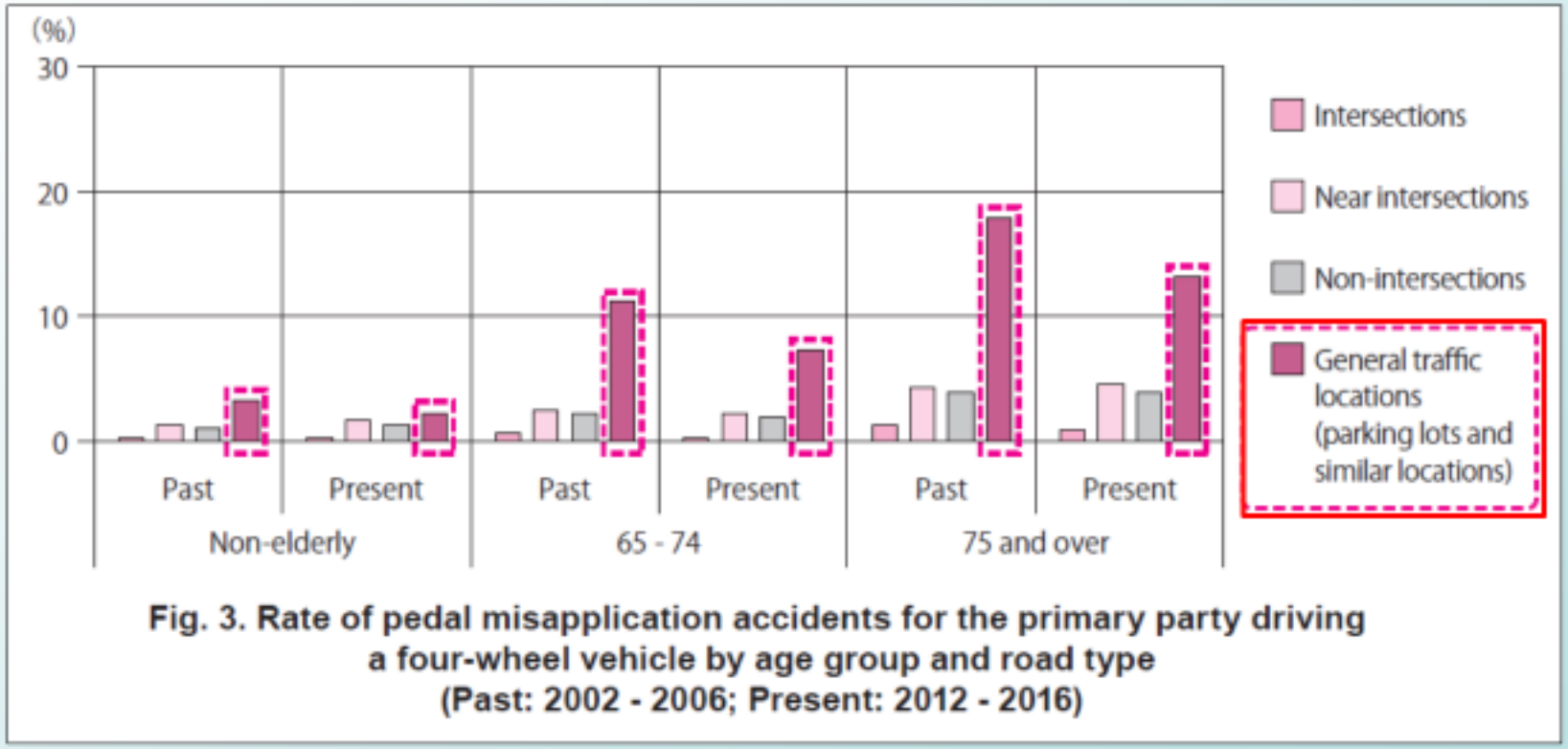


Fig. 3. Rate of pedal misapplication accidents for the primary party driving a four-wheel vehicle by age group and road type (Past: 2002 - 2006; Present: 2012 - 2016)

Ref ; info124_e.pdf (itarda.or.jp)

ref : info124_e.pdf

Pedal error accidents : type of movement at parking lot in JAPAN

(Repost; ACPE-09-05 document)

ACPE-09-05

Background : Traffic Accidents Analysis

- Actions to take in the event of ACPE accident (Parking lots)
  - Starting up, Moving straight are higher
  - Reversing and turning are lower

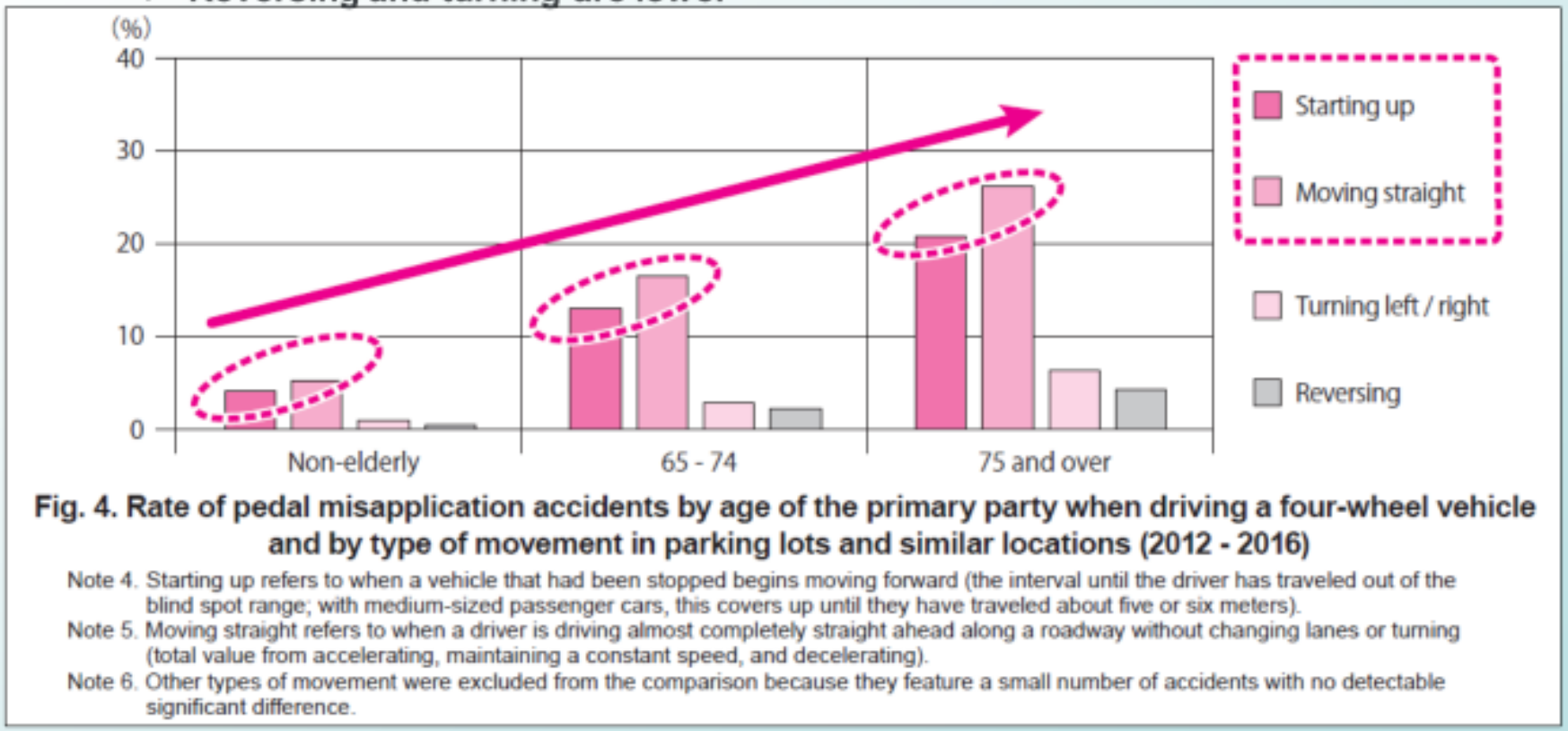


Fig. 4. Rate of pedal misapplication accidents by age of the primary party when driving a four-wheel vehicle and by type of movement in parking lots and similar locations (2012 - 2016)

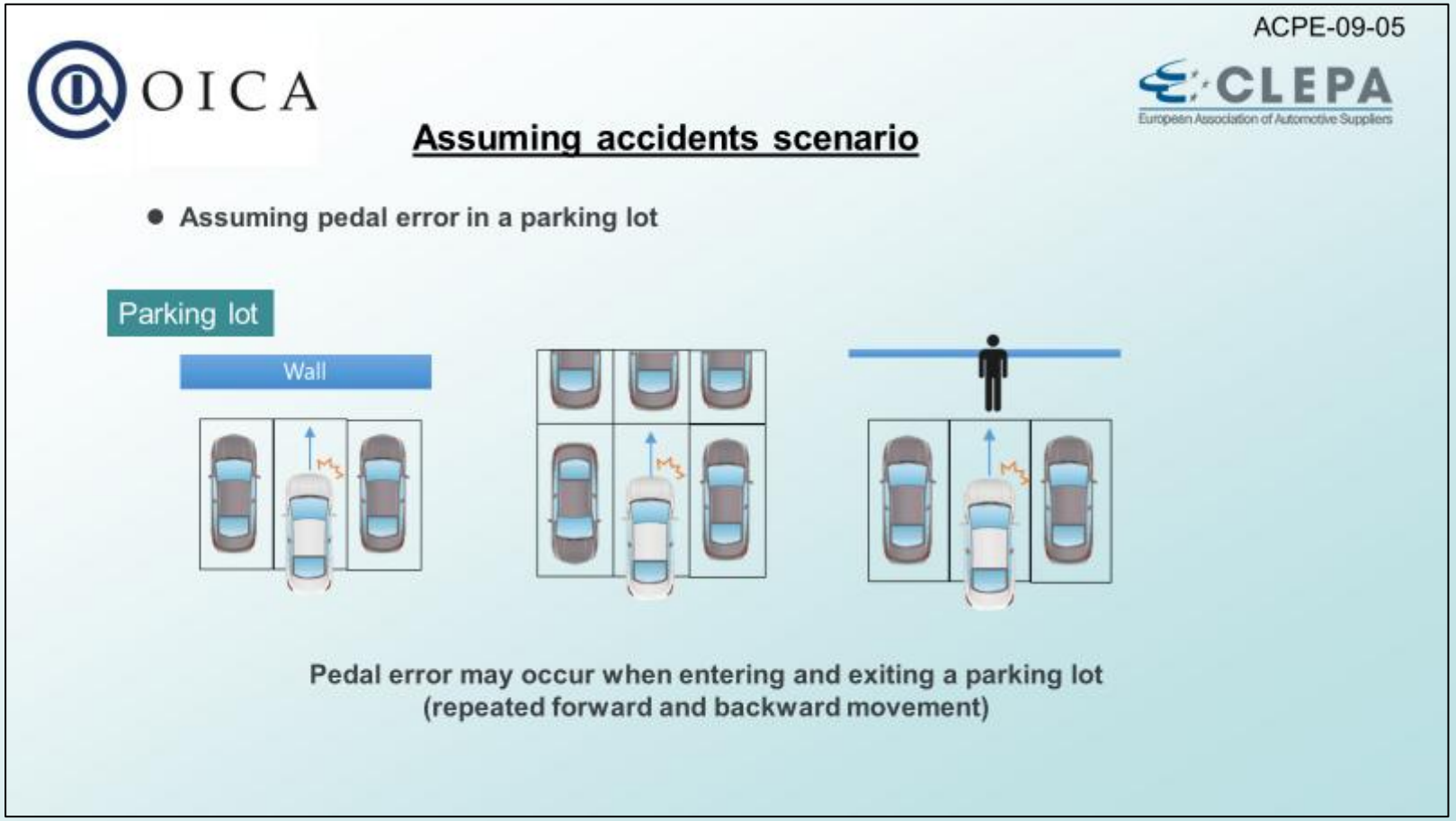
Note 4. Starting up refers to when a vehicle that had been stopped begins moving forward (the interval until the driver has traveled out of the blind spot range; with medium-sized passenger cars, this covers up until they have traveled about five or six meters).
Note 5. Moving straight refers to when a driver is driving almost completely straight ahead along a roadway without changing lanes or turning (total value from accelerating, maintaining a constant speed, and decelerating).
Note 6. Other types of movement were excluded from the comparison because they feature a small number of accidents with no detectable significant difference.

Ref ; info124_e.pdf (itarda.or.jp)

Pedal error accidents assumption

(repost ACPE-09-05)

- **ACPE accidents tendency**
  - ●Driver : Elderly driver,
  - ●Place : Parking lot,
  - ●Driving behavior ; Starting up, Low speed running



- Various pedal error accidents have occurred, but we have developed a system that can handle the majority of accidents, which are those that occur when the vehicle is stationary or traveling at extremely low speeds. (considering technical feasibility)

Pedal error accidents scenario and Pedal error maneuver

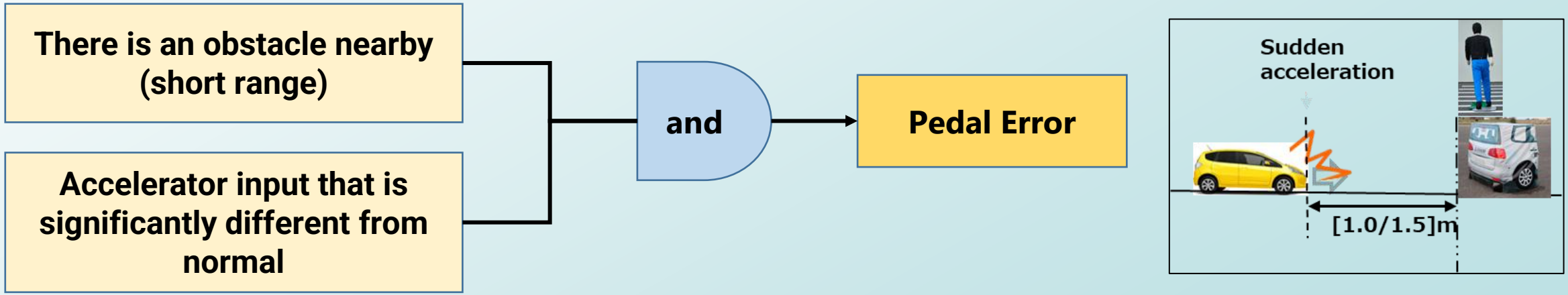
What is Pedal Error ?

■ How to decide “Pedal Error”

- An incident in which the driver mistakes the accelerator pedal pressing hard for the brake pedal.
- However, it is impossible to accurately judge this, because we cannot know what is going on in the driver's mind.

- A "pedal error" is determined in limited circumstances.
- Decisions are made based not only on pedal operation but also on the situation.

☐ Assuming situations where accidents are likely to occur, decisions are made in the following situations:



In Japan, the system was just beginning to become widespread, and JNCAP began evaluating it.
(ref ; ACPE-01-06,　JNCAP Start : FY 2018~)

Research of “Pedal Error”

(JAMA internal research)

- Study driver pedal operation when panicked by Driving Simulator experiments (see another document)

➢ Results: During panic operations, the pedal speed was faster than normal, but some overlapped with normal operation.

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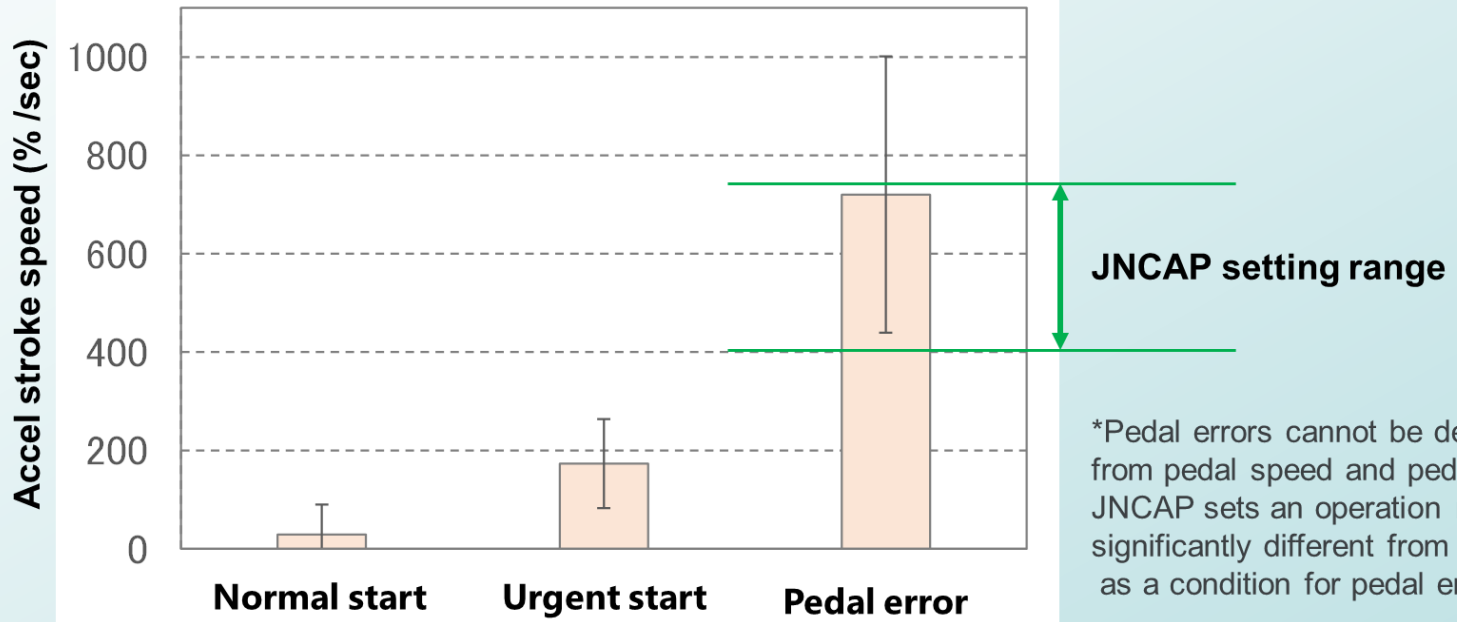
➢ Abnormal operation was set to 400%/sec or higher. (speed-range)

* Setting the pedal speed lower increased the overlap with normal operation, increasing the possibility of false positive operation.

■ Research summary



*These results were presented to JNCAP, who adopted them as a testing method.

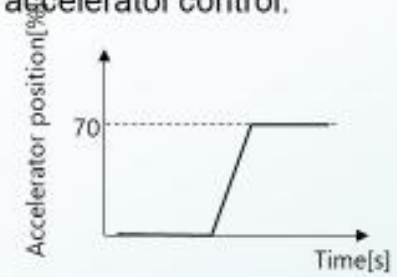
*Pedal errors cannot be determined from pedal speed and pedal stroke alone. JNCAP sets an operation range that is significantly different from normal operation as a condition for pedal error operation.

Pedal Stroke at “Pedal Error” (repost: ACPE-05-04)

ACPE-05-04

5.1.1 Accelerator pedal operation

(iv) The pedal application has a velocity of at least 400 %/s over a travel distance of at least 70% of the total travel distance of the accelerator control.



【Concern】

The text means to activate the ACPE when the accelerator pedal is pressed from 0[%] to70[%] .
There are few accidents when the maximum accelerator position is 70[%].
The risk of ACPE activation during normal driving will be increased.xx

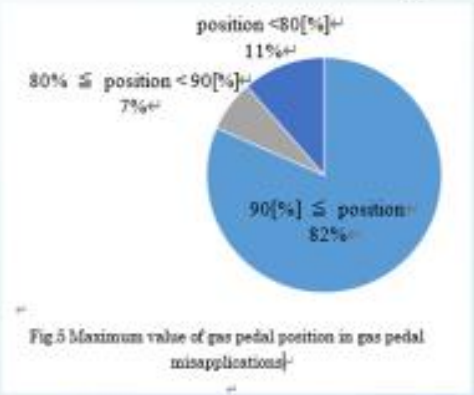


Fig.5 Maximum value of gas pedal position in gas pedal misapplications

【Accident Data】

As a result of analyzing 100 cases of pedal misapplications,
maximum accelerator position was 90[%] or more in 82% accidents.

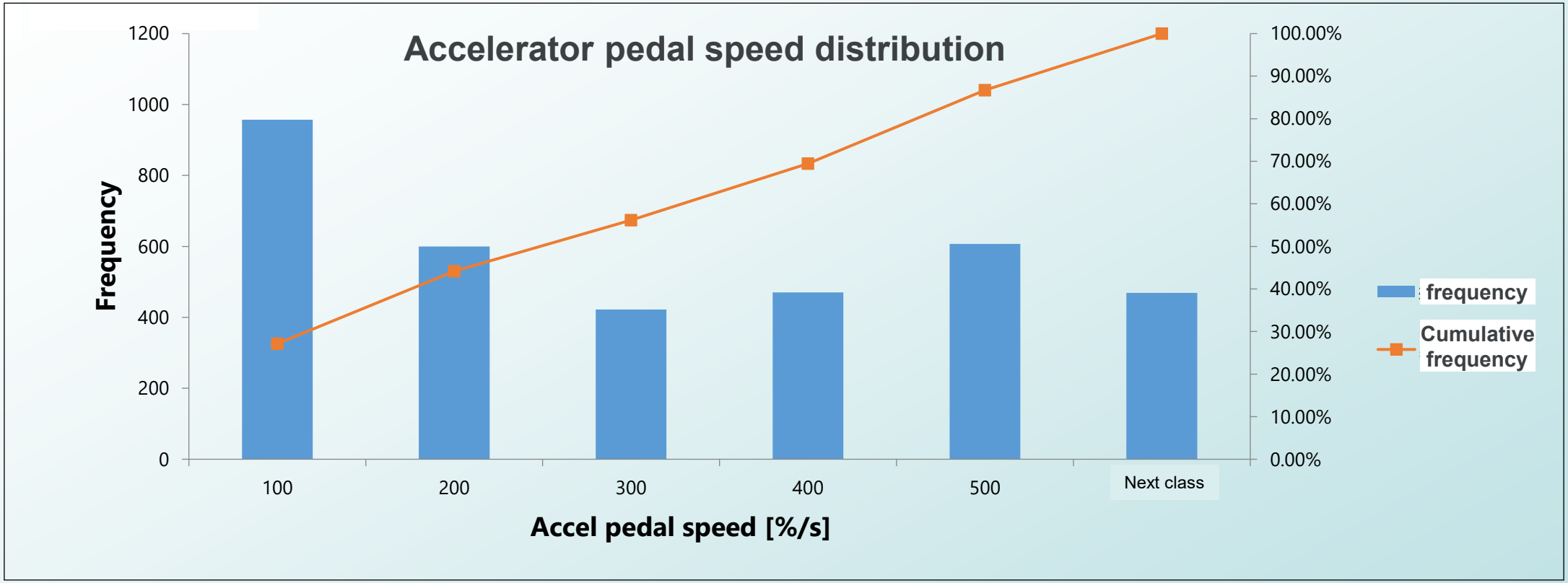
[Refence] Society of Automotive Engineers of Japan, Autumn conference in 2020
『Development of the acceleration suppression system for gas pedal misapplication using big data』

【Amendment proposal】

(iv) The pedal application has a velocity of at least 400 %/s over a travel distance of at least 70% of the total travel distance of the accelerator control.
and the maximum value of the accelerator pedal is depressed at least 90%.

After these discussions, the test method was established as UNR.

Big data analysis of “Pedal Maneuver”
(JAMA OEM data)



[Data Acquisition Conditions]

- Extracted under the following conditions
- Vehicle number ; approximately 270,000
- Driving mileage ; approximately 55 million km
- Speed ; 10 km/h or less
- Accelerator pedal depression of 90% or more
- 70% of the accelerator depression speed was measured
- Measurement sampling rate ; 100 ms

➢ Even during normal driving,
- There is a large variation in pedal depression speed
- Difficult to determine “Pedal error” by pedal maneuver alone.

Driver override function

Necessity of driver override
(measures against false positive operation)

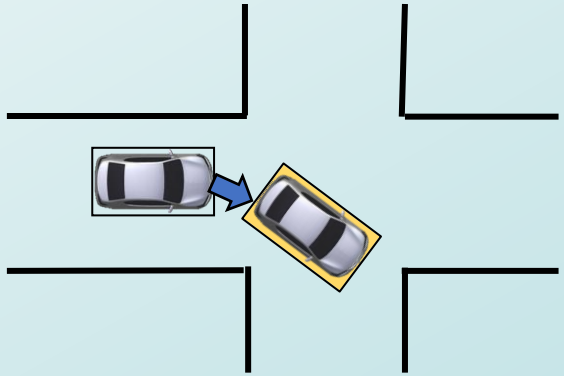
■ Possibility of false positive operation

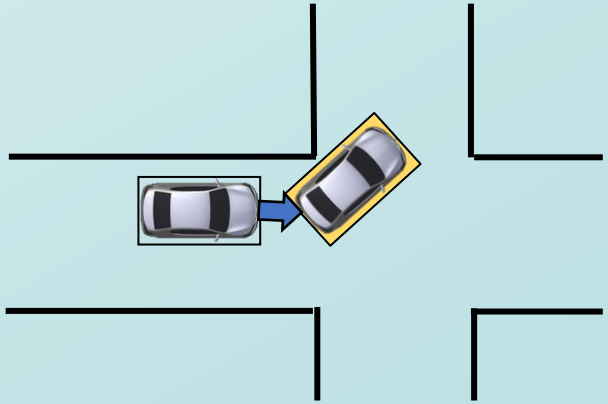
➢ Even if there is an obstacle immediately in front and the condition of excessive pedal operation is set,
false positive operation operation will occur.

➢ Example scenario (False positive scenario)

- Approaching right-turn preceding vehicle (JAPAN)
- Approaching a vehicle ahead while turning left (JAPAN)
- Trapped at a railroad crossing
- Approaching a wall in an uphill parking lot

etc.





→ Requires a means for the driver to suppress the control

■ ex. Trapped at railroad crossing
(example VTR (Youtube))

See below link VTR
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ref : 【まさか】線路内でトラック立ち往生 運転手が助け求めるも… ポーランド #鉄道ニュース

See below link VTR
↓

ref : 【ポーランド】踏切内で立ち往生…迫る列車逃げようとするも衝突『世界のミダシ』

Countermeasures against false positive operations are essential.
- Driver-initiated release of control → “Suppression function” is required.

Traffic accidents reduction effectiveness

The installation rate of ACPE systems and their accidents reduction effect (in JAPAN)

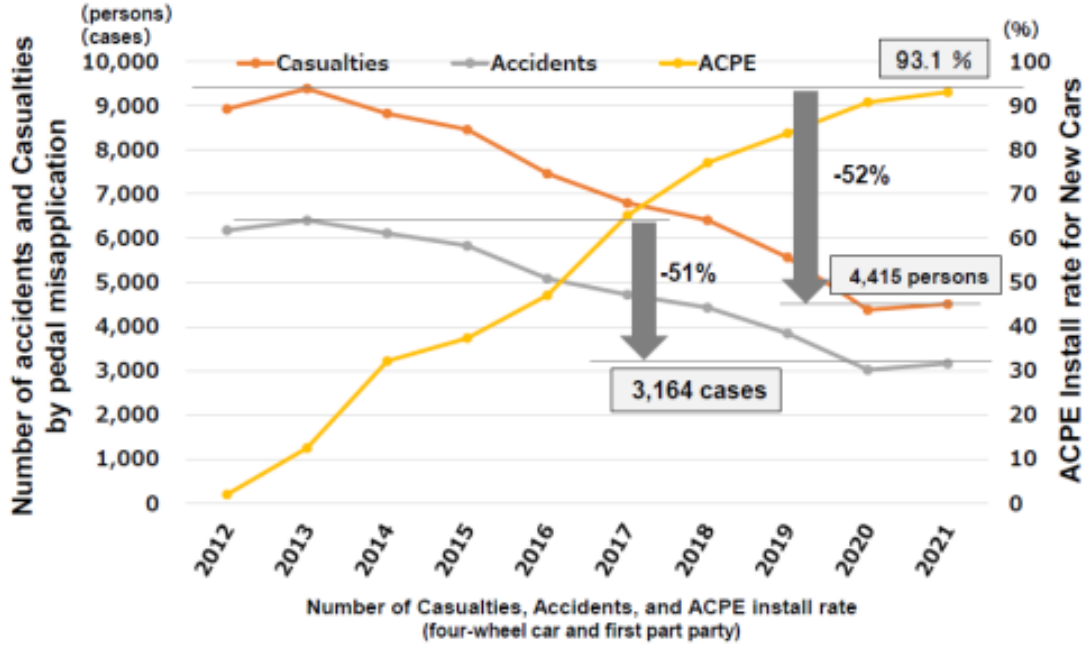
■ **Popular ACPE systems in Japan**

- **Sensor ; ultrasonic sensor (short distance detection capability)**
- **Control ; Suppress acceleration, and/or Suppress acceleration with brake control**

ACPE-06-03 Submitted by Japan

Pedal misapplication accidents and the Installation rate of ACPE

- The installation rate of ACPE in new cars has increased since 2012, and evaluation by JNCAP began in 2018 after discussions on test methods.
- The number of accidents and casualties due to pedal errors have decreased by half in this ten years as ACPE spreads.



Number of Casualties, Accidents, and ACPE install rate
(four-wheel car and first part party)

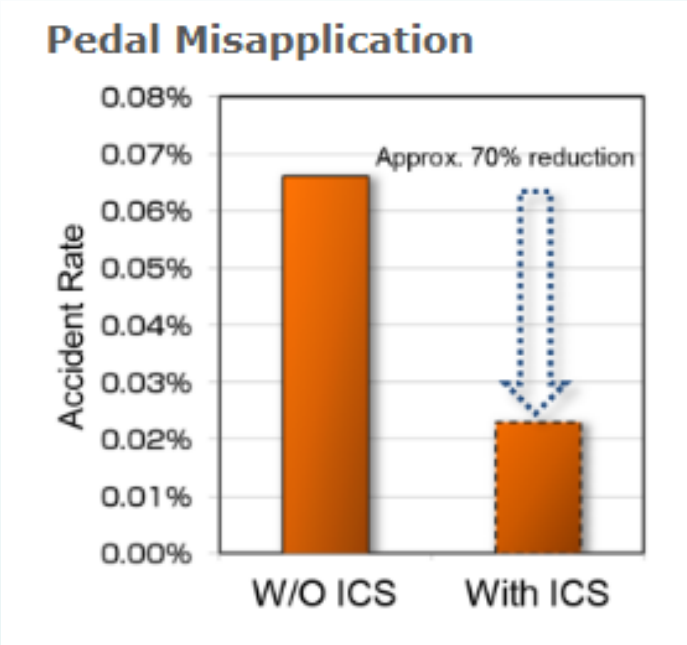
Source: Traffic Accident Statistics and Statistic Chart Data, ITARDA, 2021

- **As the installation rate of new cars increases, the number of pedal error accidents is decreasing. (repost : ACPE-06-03)**

- **Even systems that are compatible with stationary and low speed driving have been effective in reducing accidents in the market.**

Market effectiveness

Market data indicate that ACPE systems are delivering positive effects.



- **Target vehicle models: 3 models**
- **Sample size: 63,000 vehicles**
- **Period: 18 months (January 2015 to June 2016)**
- **Sensor system : Ultrasonic-sensor**

The difference in accident incidence was examined between vehicles equipped with the system and those without it.

※ICS is a system name

ref ; Toyota Announces the Accident Reduction Effects of Intelligent Clearance Sonar, a Safety Support Technology for Parking | Toyota Motor Corporation Official Global Website

The number of pedal-misapplication (Pedal error) accidents in parking lots decreased by about 70% after the system was introduced.

OICA

CLEPA
European Association of Automotive Suppliers

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