# **Harmonization**:
# a key to the Automated Driving

## Why can regulatory harmonization support the safe and fast advent of the automated driving?

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# Summary

Who is OICA?

State of play of vehicle regulation

Why is harmonization a key?

# Key features



- Acronym (French) for “International Organization of Motor Vehicle Manufacturers”
- World federation of the national auto industry associations
- OICA: The voice of the world vehicle manufacturers in global forums
- Created 100 years ago, celebrated its centennial in February
- Mr. **DONG YANG** (CAAM) will succeed to Mr. Peugeot as OICA President end of 2019

# OICA main activities

Who is OICA?

- **Harmonisation** of technical vehicle regulations at United Nations level

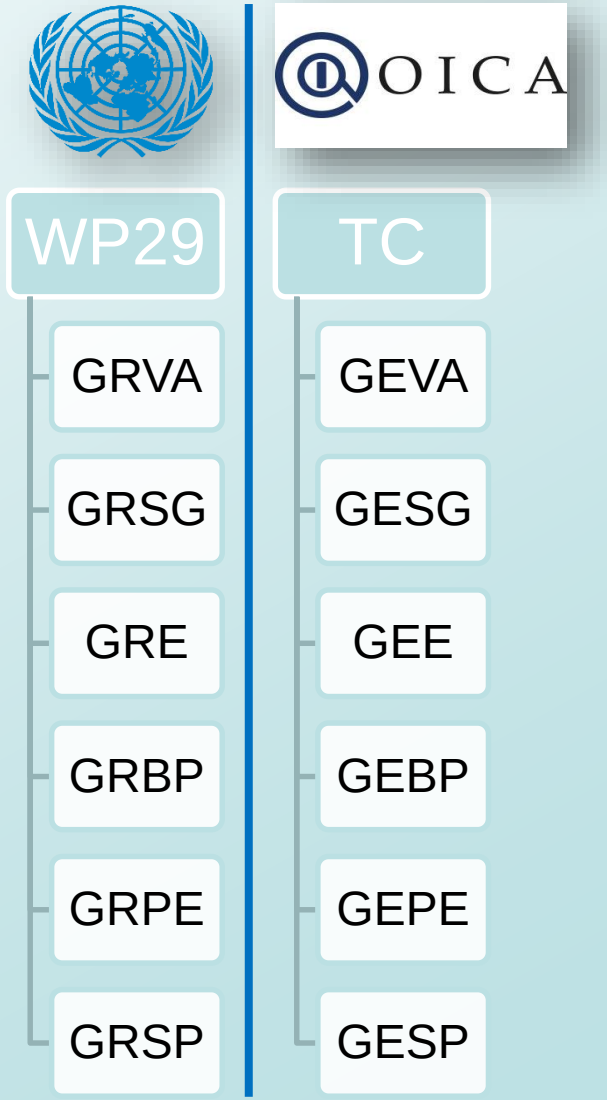
  → OICA = sole officially accredited representative of the global auto industry

- **Statistics** (production, sales, vehicles in use)
- International **motor shows**: grants accreditations and manages calendar of auto shows
- Development of **position papers** and communication

# OICA structure

Who is OICA?

- 38 members
- Chinese Federation CAAM is one of the main contributors to OICA
- Structure mirroring the UN WP.29 structure
- OICA is key member of each GR
- OICA also active on the Conventions on road traffic



# Targets reached to date

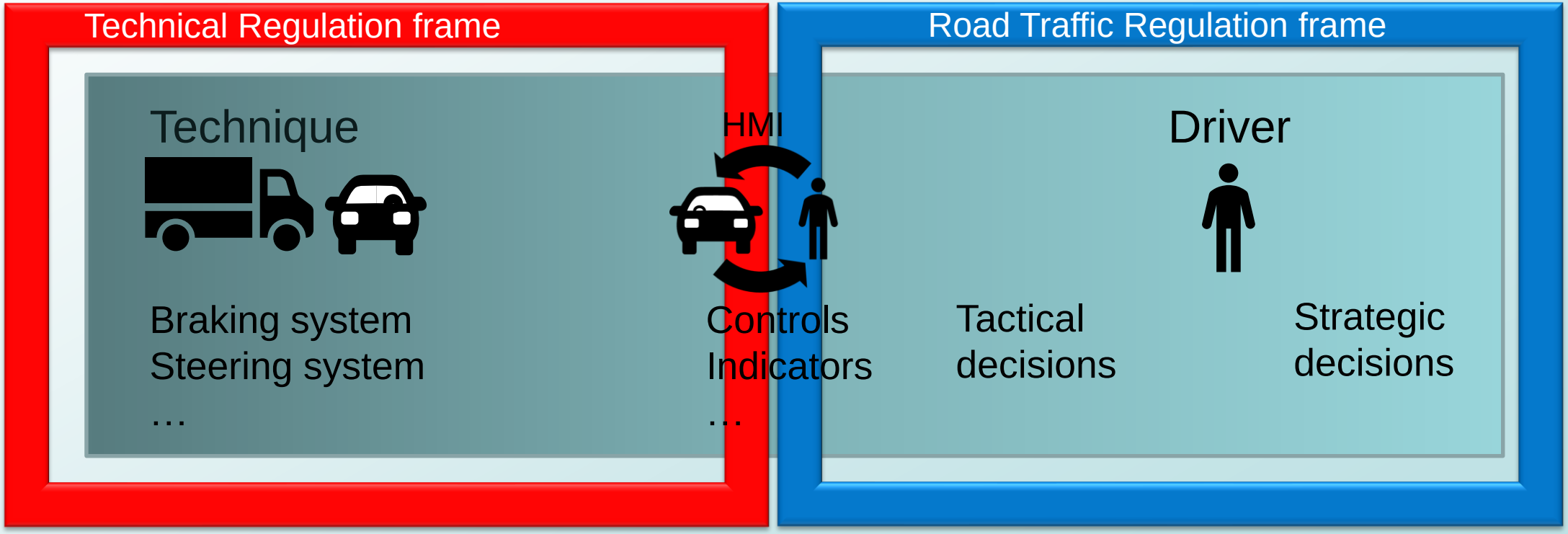
State of play of vehicle regulation

- Together with UN, OICA endeavours harmonization on technical regulations
  - Passive safety (seat belts, crash resistance, etc.)
  - Emissions (pollutants, $CO_2$, etc.)
  - Active safety (ABS, ESC, AEBS, etc.), assistance systems (LKAS, TPMS, etc.)
- Yet the advent and introduction of automated driving is a challenge to the regulation community

# Challenge facing the Automated Driving (AD)

State of play of vehicle regulation

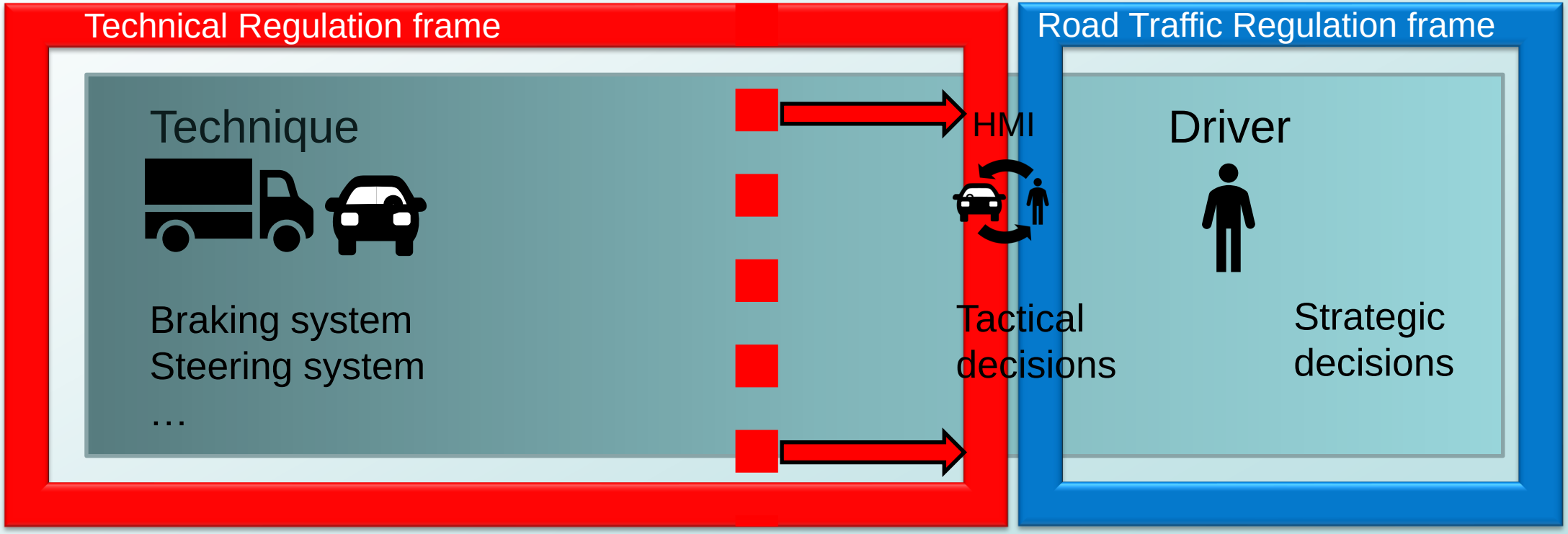
## Conventional vehicles



# Challenge facing the Automated Driving (AD)

State of play of vehicle regulation

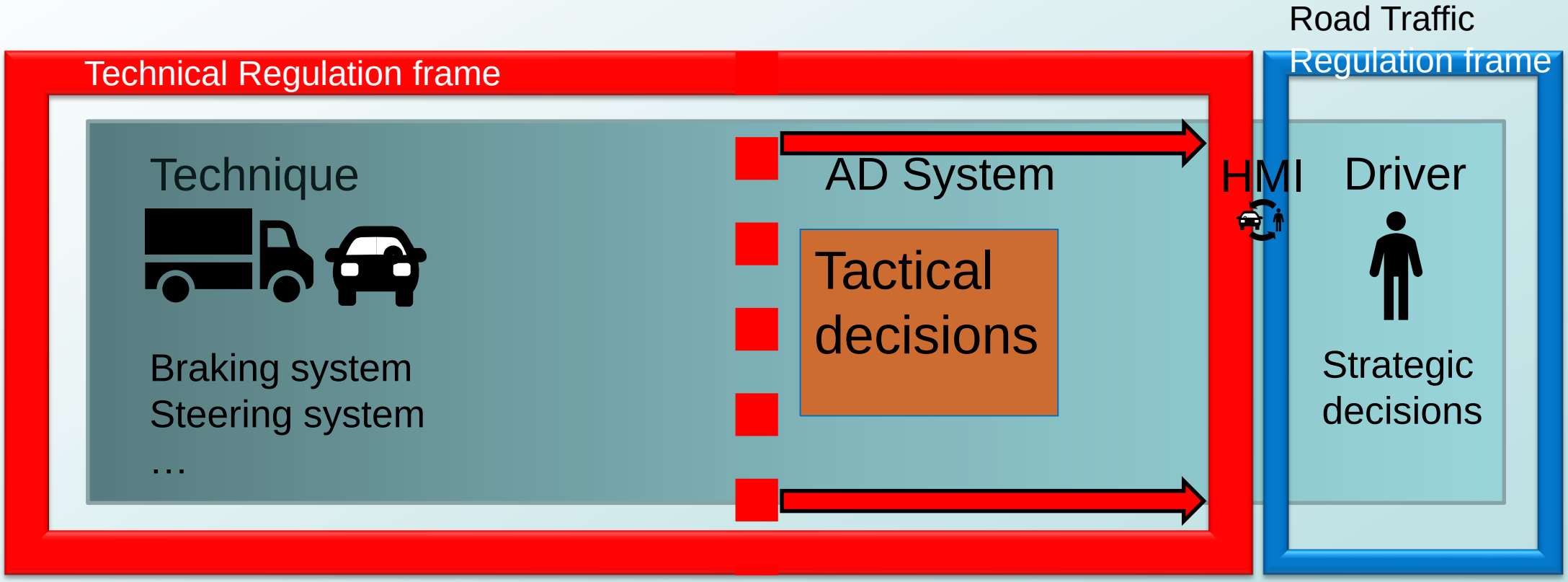
## Conditionally automated vehicles



# Challenge facing the Automated Driving (AD)

State of play of vehicle regulation

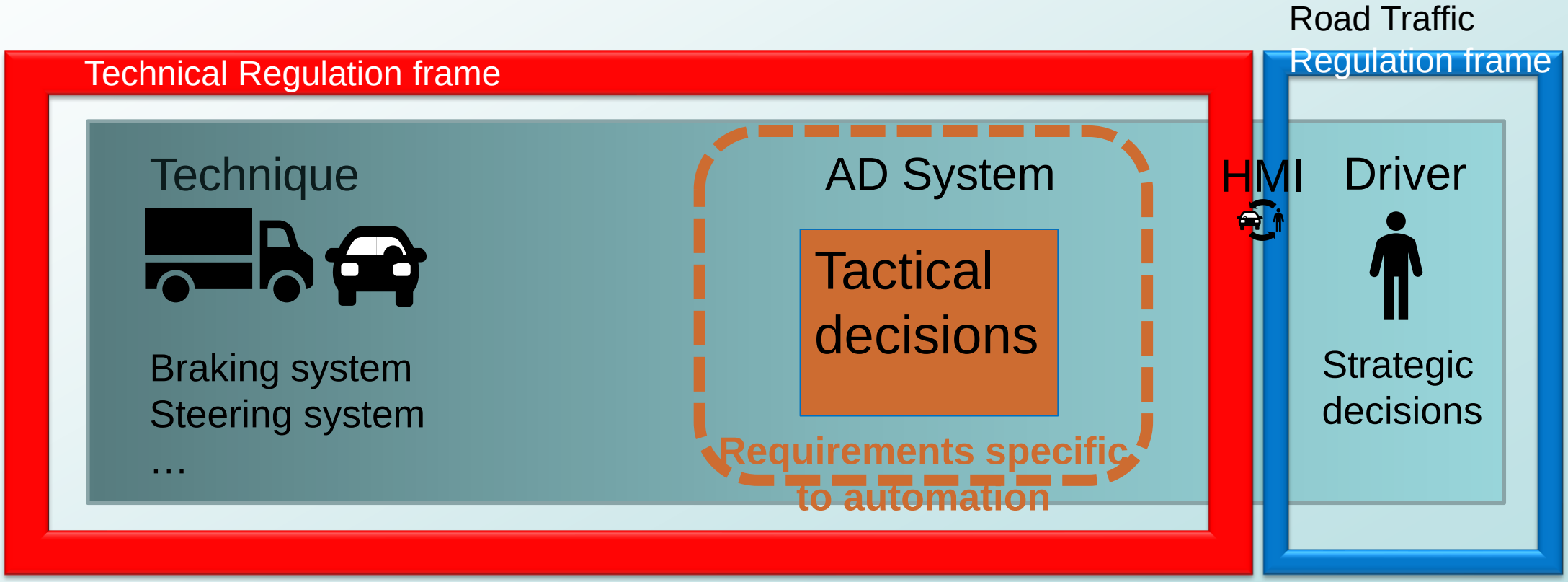
## Fully automated vehicles



# Challenge facing the Automated Driving (AD)

State of play of vehicle regulation

## Automated vehicles



# OICA solves the challenge:

## The multi-pillar approach

State of play of vehicle regulation

The “Multi-pillar approach” **augments** the “classical” certification approach

**Physical Certification Tests**

**Physical Certification Tests**

**Physical Certification Tests**

**Physical Certification Tests**

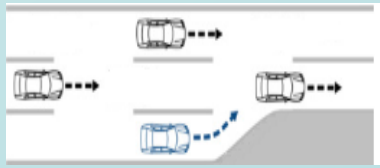
**Audit / Assessment Complex Systems Annex (incl. TESTS)**

**Audit / Assessment ENLARGED Complex Systems Annex (incl. TESTS)**

**Audit / Assessment of full SAFETY CONCEPT**

**Real Drive Emissions**

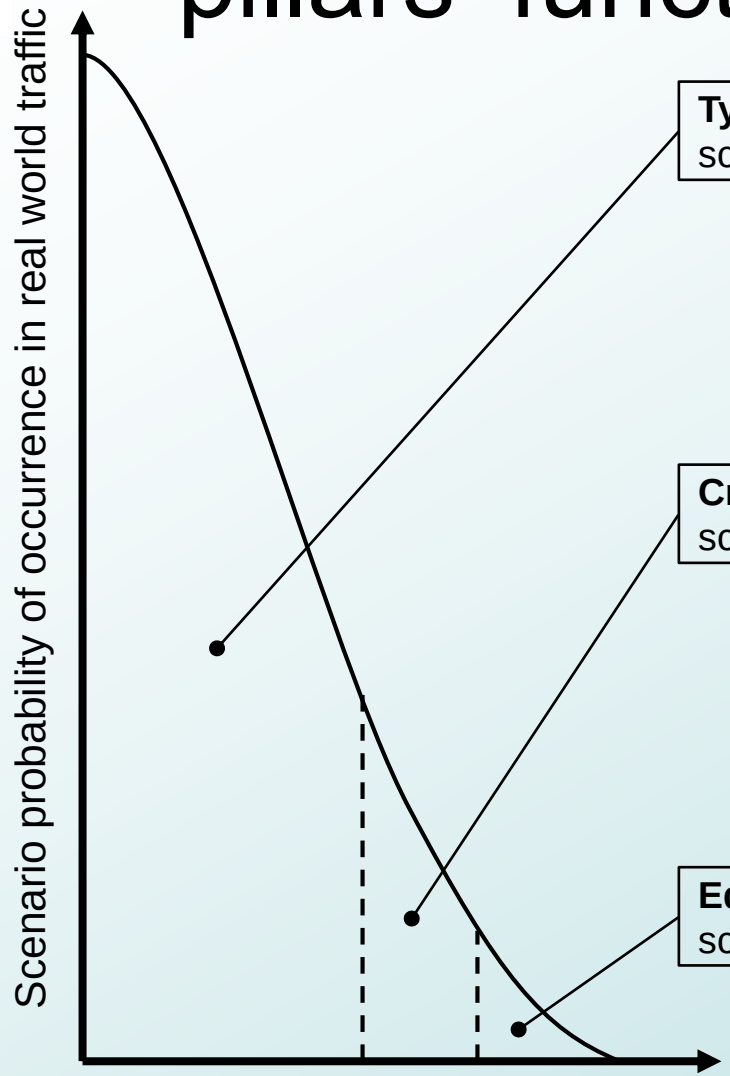
**Real World Test Drive**



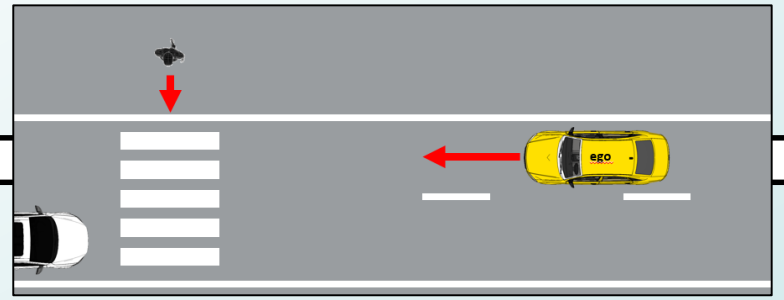
EARLY YEARS YESTERDAY TODAY **PROPOSAL FOR TOMORROW**

# Examples for the different pillars' functions

State of play of vehicle regulation



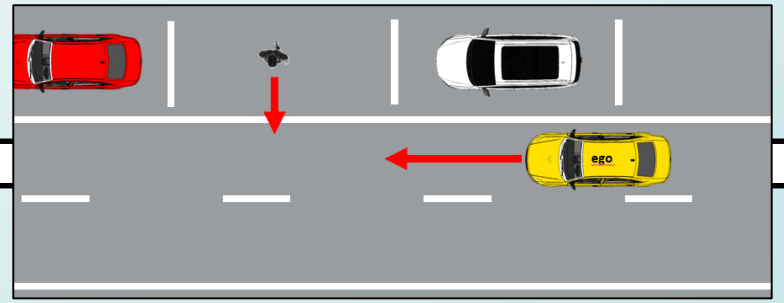

**Typical** traffic scenarios



Pedestrian crossing a crosswalk

Real World Test Drive

**Critical** traffic scenarios

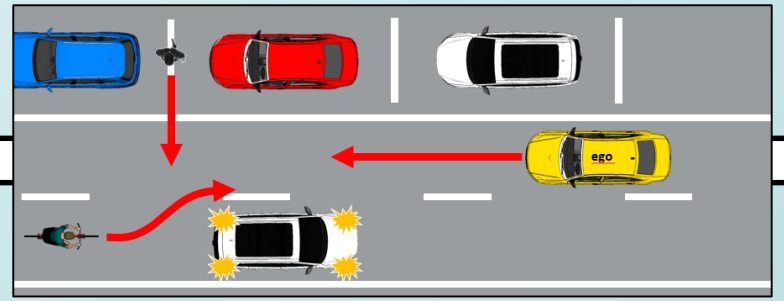


Obstructed pedestrian crossing

Physical certification Tests

**Edge case** scenarios

low probability, but high efforts to identify and confirm performance!



Obstructed pedestrian crossing + cyclist overtaking

Audit and Assessment (e.g. simulation)

# Concept for certification – the three pillars and their individual purpose

State of play of vehicle regulation

## Multi-pillar approach aims at complementing the current system

### PILLAR 1

**Audit/Assessment**

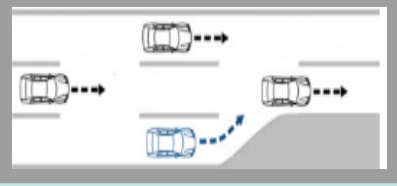
Simulation

- Understand the system to be certified
- Assess that the applied processes and design/test methods for the overall system development (HW and SW) are effective, complete and consistent
- Assess system's strategies/rest performance to address (multiple) fault-conditions and disturbances due to deteriorating external influences; vehicle behavior in variations of critical scenarios
- Simulation: Test parameter variations (e.g. distances, speeds) of scenarios and edge-cases that are difficult to test entirely on a test track

### PILLAR 2

**Physical Certification Tests**

- Assess critical scenarios that are technically difficult for the system, have a high injury severity and are representative for real traffic
- Compare with critical test cases derived from simulation and validate simulation tools



### PILLAR 3

**Real World Test Drive**

- Assess the overall system capabilities and behavior in non-simulated traffic on public roads and show that the system has not been optimized on specific test scenarios
- Assess system safety requirements like e.g. HMI and ODD
- Assess that the system achieves a performance comparable to an experienced driver

# The AD guidelines around the world: state of play

Why is harmonization a key?

| Item | China | Canada | Japan | US (FAVP 3.0) | Australia | EU |
|---|---|---|---|---|---|---|
| System safety | … | … | … | … | … | … |
| Education | … | … | … | … | … | … |
| System performance | … | … | … | … | … | … |
| HMI | | | | | | |
| Data recording | | | | | | |
| Etc. | | | | | | |
| … | | | | | | |

Virtually 90 different items ⇨ Need for harmonization !

# Harmonisation: the antidote against market fragmentation

Why is harmonization a key?


UN is at the centre of worlwide harmonization

# Harmonization is a key because…

Why is harmonization a key?

- It avoids too much fragmentation of the markets
- It unifies at UN level the Global cooperation on automated driving regulations. Multi-pillar approach
  - Is applicable in all cultures
  - Is applicable in all certification systems
  - Is applicable to each automation level
- It facilitates the lawful use of automated driving systems by drivers

# Conclusion

Who is OICA?

State of play of vehicle regulation

Why is harmonization a key?

Harmonization of technical regulations and of road traffic regulations supports the safe, global deployment of highly and fully automated vehicles in road traffic

# 谢谢