



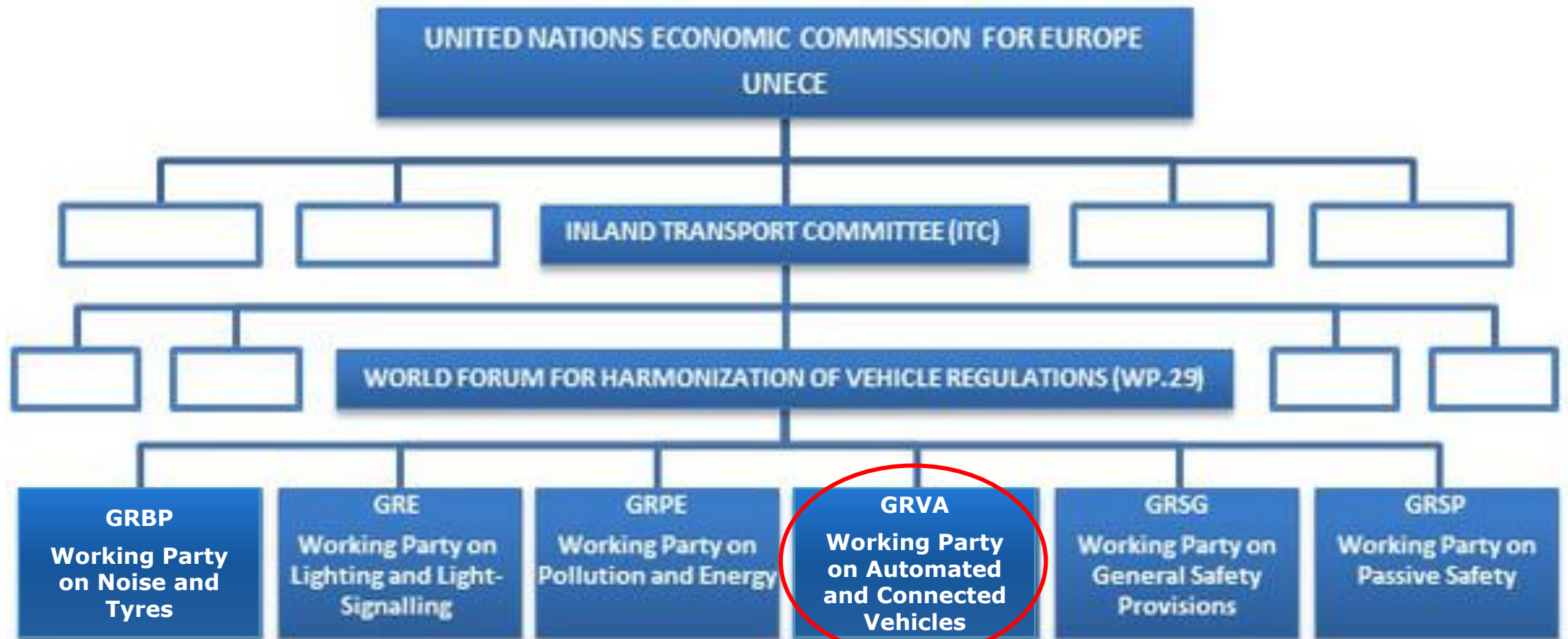
# VMAD Informal Working Group and SG3

Seminar on In service monitoring and reporting for automated driving safety

*M. Cristina GALASSI (EC-JRC)*

*16 May 2022*

# UNECE WP29/GRVA



# VMAD Informal Working Group


*“... develop assessment methods, including scenarios, to validate the safety of automated systems, based on a **multi pillar approach** including auditing, simulation, virtual testing, test track testing, real world testing...”*

- **SG1:** Scenarios
- **SG2:** Simulation and virtual testing
- **SG3:** Audit/Assessment and ISMR
- **SG4:** Physical Testing (track and real-world)

# VMAD Deliverables

## NATM Master Document

United Nations ECE/TRANS/WP.29/2021/61

 **Economic and Social Council** Distr.: General  
9 April 2021  
Original: English

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**Economic Commission for Europe**  
Inland Transport Committee  
**World Forum for Harmonization of Vehicle Regulations**

**184th session**  
Geneva, 22-24 June 2021  
Item 2.3 of the provisional agenda  
**Coordination and organization of work:**  
**Intelligent Transport Systems and coordination of automated vehicles related activities**

**New Assessment/Test Method for Automated Driving (NATM) - Master Document**

**Submitted by the Working Party on Automated/Autonomous and Connected Vehicles \*, \*\***


The text reproduced below was prepared by the Working Party on Automated/Autonomous and Connected Vehicles (GRVA) at its ninth session in February 2021, see ECE/TRANS/WP.29/GRVA.9, para. 14. It has been reviewed as information document at the 183rd session of the World Forum for Harmonization of Vehicle Regulations (WP.29) and is distributed with an official symbol as requested (ECE/TRANS/WP.29/1157, para. 23).

[ECE/TRANS/WP.29/2021/61](#)

and [2nd iteration](#)

## Guidelines

United Nations ECE/TRANS/WP.29/2022/58

 **Economic and Social Council** Distr.: General  
12 April 2022  
Original: English

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**Economic Commission for Europe**  
Inland Transport Committee  
**World Forum for Harmonization of Vehicle Regulations**

**187th session**  
Geneva, 21-24 June 2022  
Item 2.3 of the provisional agenda  
**Intelligent Transport Systems and coordination of automated vehicles related activities**

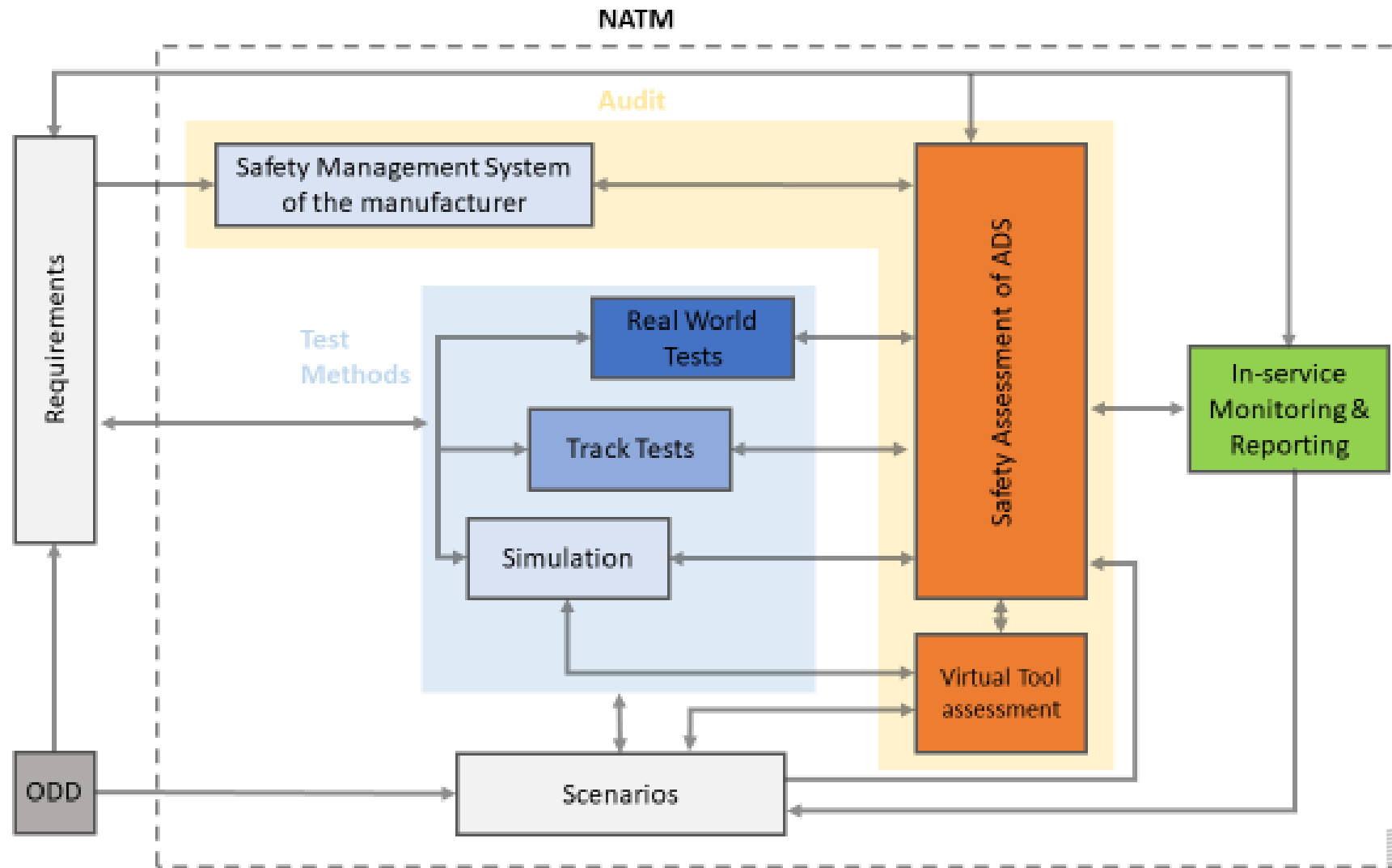
**New Assessment/Test Method for Automated Driving (NATM) Guidelines for Validating Automated Driving System (ADS)**

**Submitted by the Working Party on Automated/Autonomous and Connected Vehicles\***

The text reproduced below was prepared by the Informal Working Group (IWG) on Validation Methods for Automated Driving (VMAD). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) for information at its June 2022 session, subject to confirmation by Working Party on Automated/Autonomous and Connected Vehicles (GRVA) at its May 2022 session.

[ECE/TRANS/WP.29/2022/58](#)

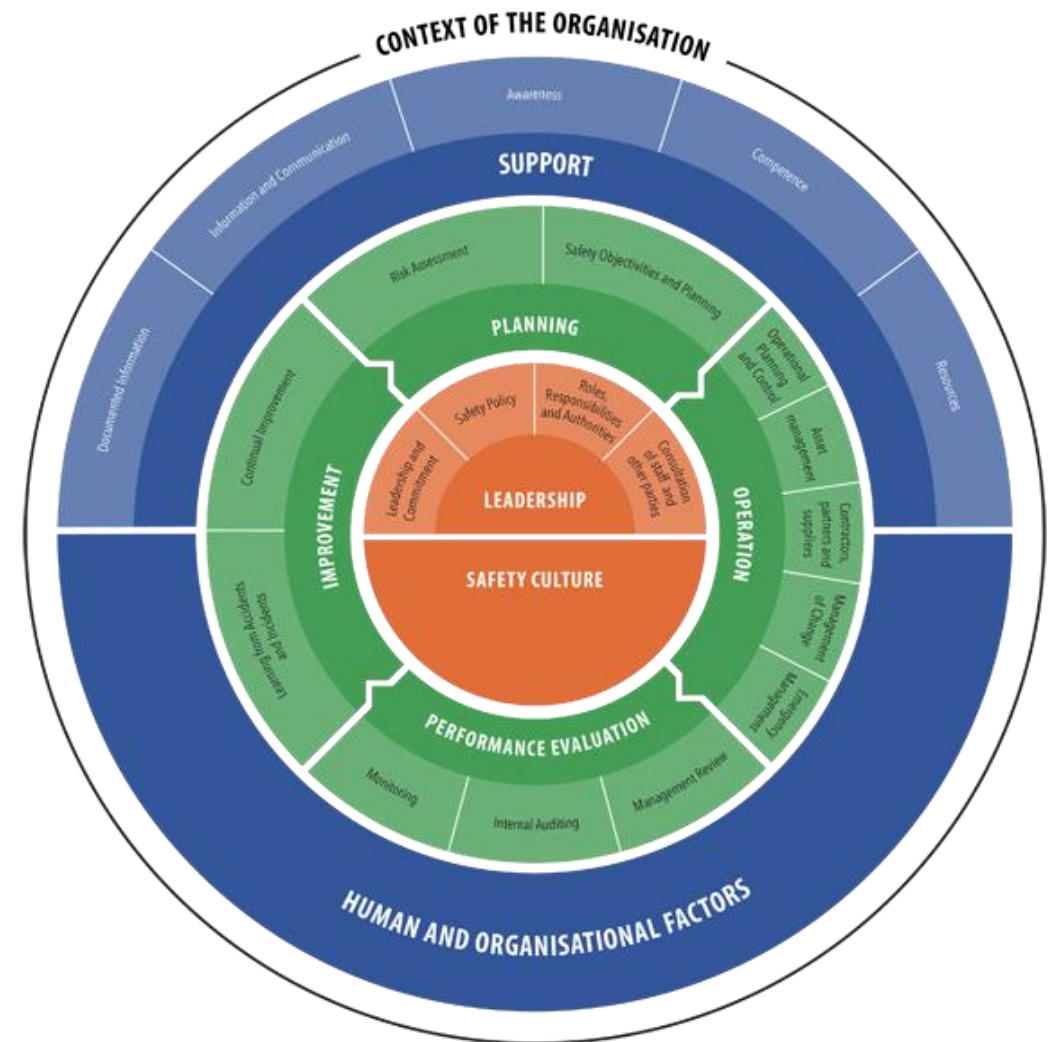
# NATM Multi-Pillars Approach



# SG3: Process Audit



*effective processes, methodologies and tools are in place, up to date and being followed within the organization to manage the safety and continued compliance throughout the product lifecycle*



[European Railway Agency – European Union Safety Management System](#)



# SG3: ADS Safety Assessment

- The safety concept complies with the legislative requirements
- It has been correctly implemented into the design
- It has been validated (through virtual, track and real world testing)
- Is correctly documented



# SG3: In-Service Monitoring and Reporting



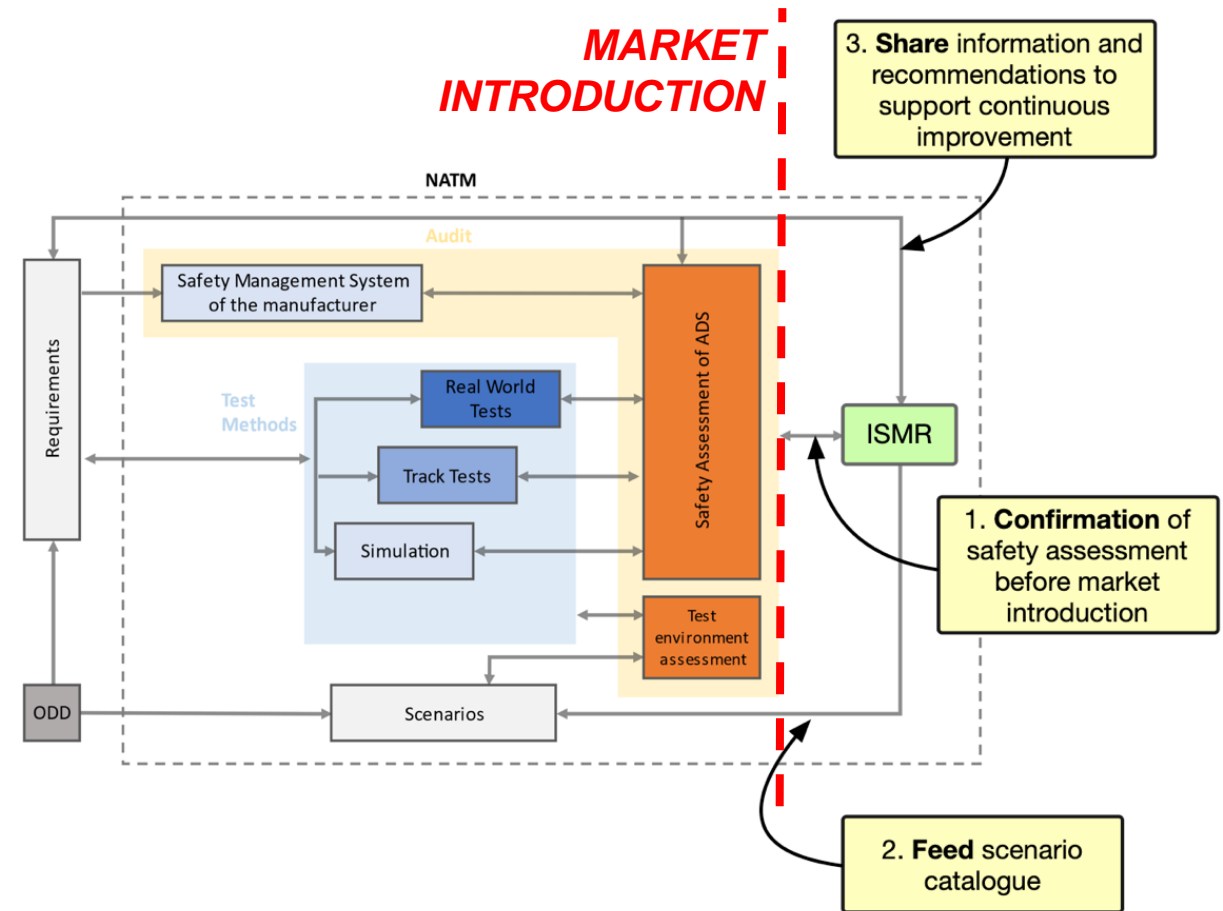
- Likely to other transport fields, learning from in-service data is a central component to the safety potential of AD systems
- **Guiding principle** that safety is of global concern and its improvement should not be limited by geographical or organizational borders (ECCAIRS)
- Need to share relevant data and safety recommendations in a common-centralized repository



# SG3: In-Service Monitoring and Reporting

ISMR addresses in-service safety *after* market introduction

- 1) Identification of risks and anomalies compared to the safety assessment before market introduction (**safety confirmation**)
- 2) Identification of new unknown and unsafe scenarios (**scenarios generation**)
- 3) To share safety-relevant lessons learned (**safety recommendations**)



# Keep in touch



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# Thank you



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Slide 6: image left-hand side, source: heiko119; Slide 6: image right-hand side, source: ERA; Slide 7: image, source: garagestock



# ISMR in the new EU ADS Regulation

Seminar on In service monitoring and reporting for automated driving safety

*M. Cristina GALASSI (EC-JRC)*

*16 May 2022*

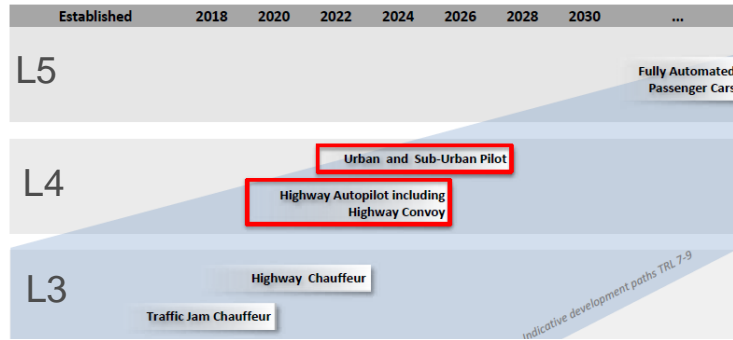
# The EC's Strategy on Connectivity and Driving Automation

- 2016** European Strategy on Cooperative Intelligent Transport Systems (C-ITS)
- 2017-** Europe on the Move: Commission takes
- 2018** action for clean, competitive and connected mobility
- 2018** On the road to automated mobility: an EU strategy for mobility of the future
- 2019** The European Green Deal
- 2020** Sustainable and Smart Mobility Strategy – putting European transport on track for the future

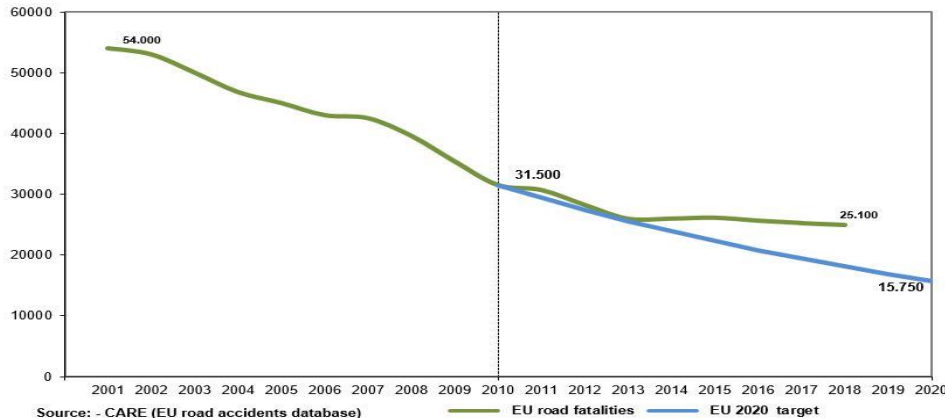


# Automated driving deployment roadmap in EU

## ERTRAC CAD Roadmap



Still too many road fatalities on EU roads. 90% of accident involve human errors



Today

Vehicles levels 1-2 (driver assist) available on the EU market

2025

2021-2024: Robot taxis/ shuttles (level 4) first commercial services.



2030

Major uptake of Robot taxi/ shuttles in cities, level 4

2050

Zero fatalities  
Mobility services  
Competitiveness

2021: First "highway chauffeur" (level 3) to go on the EU market



Major uptake of level 4 passenger cars on motorways

First level 3/4 trucks on motorways



Major uptake of level 4 trucks on motorways

# Implementing measures

Implementing measures for driving automation developed both at EU and UNECE level:

## Level 4



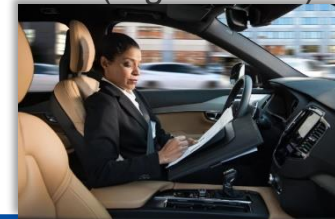
- Focus on autonomous shuttles/robot taxis produced in small series
- New concepts: Overall safety target, standard scenarios testing, audit of the safety by design, in-service monitoring.
- Q2/2022
- Will serve to discuss a future regulation in UNECE
- Member states still responsible for traffic rules and transport licencing



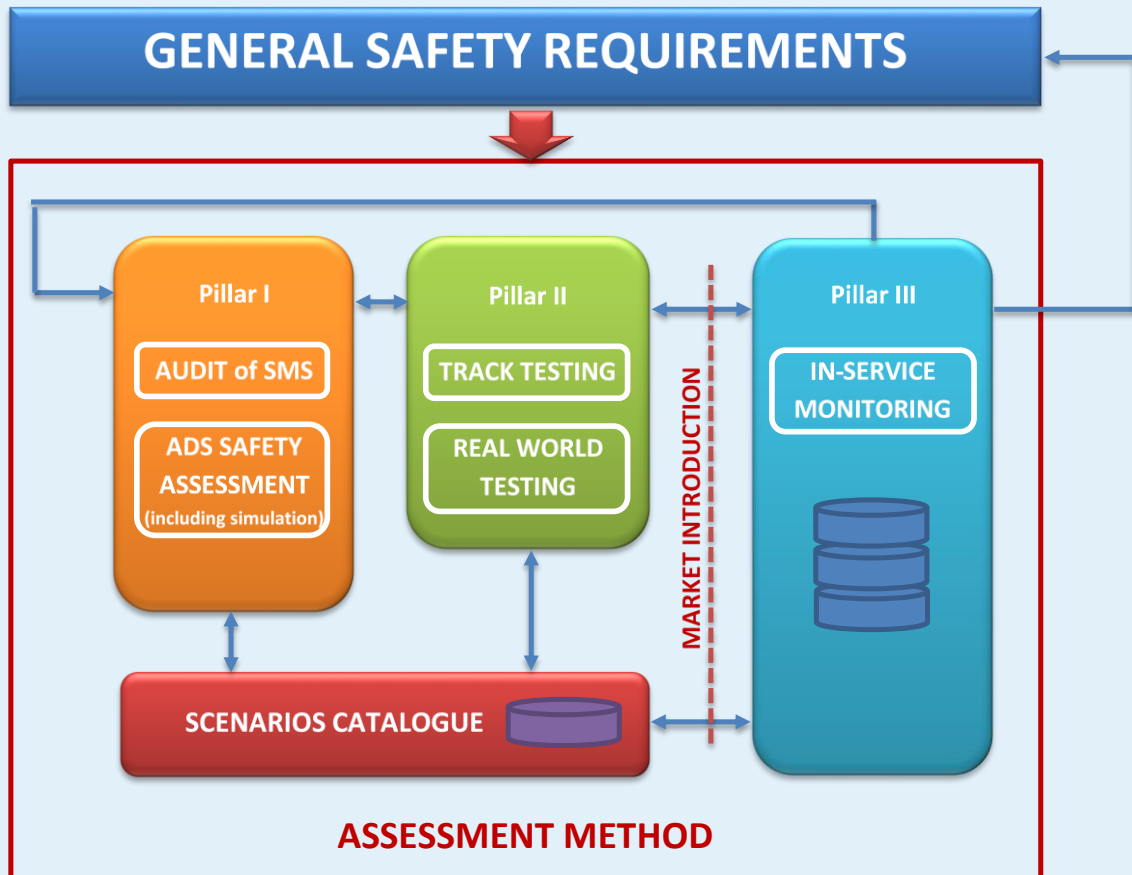
## Levels 2 and 3



- Level 2: UN Regulation being developed.
- Level 3: UN Regulation 157 on traffic jam pilot (adopted) and highway Chauffeur (Q2/2022)
- UN Regulations to be part of EU legislation
- Guidelines on other use cases (e.g. Level 4) being developed



# New Assessment Method



- I. **AUDIT** of the manufacturer Safety Management System (processes) & **ASSESSMENT** of the ADS design and validation
- II. Confirmation of the audit/check minimum performances before the vehicle is placed on the market through physical **TRACK & ONROAD TESTING** : to confirm capability to cope with emergency (track) and normal (on-road) operation.
- III. **IN-SERVICE MONITORING** after the vehicle is placed on the market: (1) safety confirmation, (2) scenarios generation, (3) safety recommendations through feedback loop from the **OPERATIONAL EXPERIENCE**

**Scenario database** as common framework for manufacturers and authorities



# The new EU ADS Regulation (2022)

**Commission Implementing Regulation** laying down rules for the application of Regulation (EU) 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications for the type-approval of motor vehicles with regard to their automated driving system (ADS)

**ANNEXES** to the Commission Implementing Regulation

- 1) Information Document
- 2) Performance Requirements
- 3) Compliance Assessment
  - PART 1 Traffic Scenarios
  - PART 2 Audit of SMS and safety assessment
  - PART 3 Tests
  - PART 4 Guidelines for the credibility assessment
  - PART 5 In-service reporting
- 4) EU Type approval certificate

Draft text available ([link](#))

# PART 5 – IN-SERVICE REPORTING

The manufacturer shall report relevant occurrences during ADS operation:

The manufacturer shall report within one month any short-term occurrences, as described in Appendix 1, which needs to be remedied by the manufacturer to the type-approval authorities, market surveillance authorities and the Commission

The manufacturer shall report every year to the type-approval authority that granted the approval on the occurrences listed in Appendix I. The report shall provide evidence of the ADS performance on safety relevant occurrences in the field.

Objectives: Safety confirmation, scenarios generation, safety recommendations

# Keep in touch



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# Thank you



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