

BACK TO A SUSTAINABLE FUTURE



RESILIENT CONNECTIVITY FOR SUSTAINED RECOVERY AND ECONOMIC GROWTH

INLAND TRANSPORT COMMITTEE



UNECE

# Update on ITS activities at UNECE since last meeting

Francois E. Guichard

Sec. to GRVA & IWG on ITS

# UNECE

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UNECE is:

- A United Nations agency
- Part of the UN Secretariat
- One of the five regional economic commissions of the United Nations established under UN ECOSOC
- One of the UNECE duties is to service the WP's
- The secretariat of WP.29 and WP.1 is based in Europe
- The scope of WP.29 is global since 2000
- The scope of WP.1 is global since 2019



# Structure

- UNECE hosts intergovernmental bodies on
  - Environment
  - Statistics
  - Transport
  - ...
- Various types of output:
  - Conventions (requiring transposition),
  - Regulations,
  - Voluntary standards
- Transport related activities

EVs (Safety, environmental aspects, EMC, etc.)  
AVs (Safety, [environmental aspects])

Vehicles (safety, Cybersecurity, Emissions and CO2):



Incl. their sub-systems and parts



Social Rules  
(driving and rest/hours)



Road Traffic Rules



Drivers' License



Road Signs and Signals



Vehicle Regulations



Infrastructure (standards  
and parameters, tunnel  
safety, all land modes)



Border Crossing  
Facilitation



Statistics



Dangerous Goods

# Frameworks – relevant UNECE’s multilateral Agreements (WP.29)

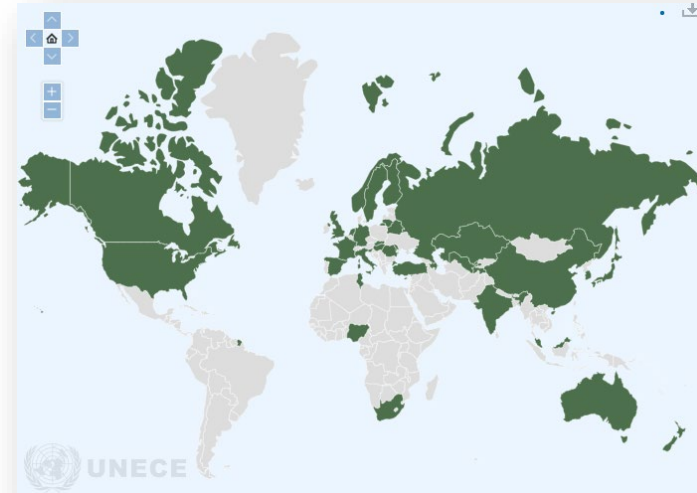
## 1958 Agreement:

- “UN Regulations”
- Directly applicable by the Countries and stakeholders/industry
- Mutual recognition of Type Approvals



## 1998 Agreement:

- “UN Global Technical Regulations”
- Requires transposition in national law
- No administrative procedures -> suitable for:
  - Self Certification
  - Type Approval



# Frameworks – relevant UNECE's multilateral Agreements (WP.1)

## 1949 Geneva Convention:

- Road traffic & road signs (protocol)



(2015)

## 1968 Vienna Convention:

- Road traffic and road signs & signals



(2015)

Before that:

- Paris conventions (motor)
- Geneva convention (signs)
- Washington D.C. convention

# Content



- **Overview of ITS related activities in 2020**
- UNECE roadmap on ITS
- 2<sup>nd</sup> session of the IWG on ITS
- Slides from the FNC-2021 on:
  - FRAV
  - VMAD
  - EDR/DSSAD

# Working Parties activities

## Highlights



- Implementation of UNECE ITS Roadmap (2012-2020)  
Example of activities by the ITC Working Parties:
  - SC.1: eCMR - Convention on the road transport of goods → shipper, carrier and addressee
  - SC.2: Monitoring through the rail security observatory, innovation platform
  - SC.3: ITS on inland waterways – RIS and smart shipping
  - WP.5: Round Table on Intelligent Transport Systems and Cyber Security
  - WP.15: Telematics in the Transport of Dangerous Goods
  - WP.30: New Group of Experts on Conceptual and Technical Aspects of Computerization of the TIR Procedure (WP.30/GE.1) for establishing eTIR specifications to have system working as of Entry Into Force of new Annex 11

# Automated and Connected Vehicles

## Highlights



- (March 2020) WP.1 – WP.29 combined session
- (June 2020) Adoption by WP.29/AC.1 of, and (January 2021) Entry Into Force of
  - UN Regulation No. 155 (Cyber Security)
  - UN Regulation No. 156 ((OTA) Software update)
  - UN Regulation No. 157 (Automated Lane Keeping System)
- (September 2020) Adoption of an amendment to the 1968 Vienna Convention
- (November 2020) Second session of the IWG on ITS
- (March 2021) Future Networked Car symposium – online over four days!

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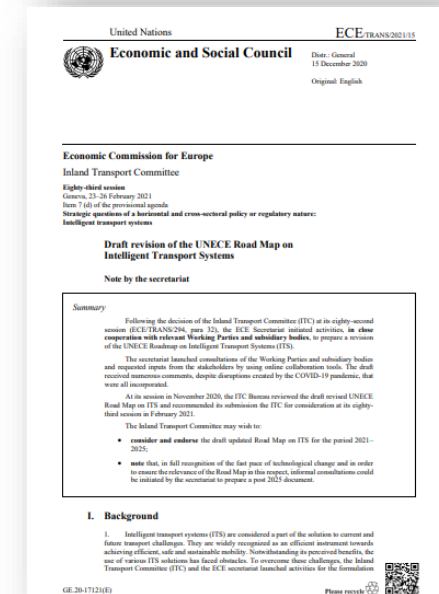
# UNECE Framework on ITS

The Member States adopted the UNECE roadmap on ITS in 2012

Focus on 20 actions:

- Definitions
- Cooperation and harmonization
- Ensure data protection
- ...
- Contributing to climate change mitigation and adaption
- Across transport modes (incl. rail and waterways navigation)

UNECE drafted its a revised roadmap in 2020, adopted in February 2021



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# 2<sup>nd</sup> IWG on ITS meeting

November 2020



UNECE

- Discussion on “V2X communication for cooperative driving automation” (Japan)
  - Can ITS signals be used for C-V2X?
  - Use cases presented: merging and lane change
- Review of the ITS Roadmap
  - Finalization of the draft
- Assignments for the preparation of the FNC 2021
  - The IWG on ITS recommended to WP.29 to foster cooperation with ITU (Session 1)



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# Framework document for automated vehicles



## Authors



MIIT



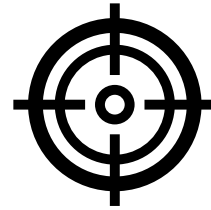
EU  
DG Grow  
Council decision



MLIT



DOT/NHTSA



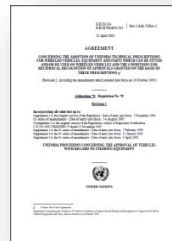
## Purpose

Guides WP.29's groups  
Programme management



## Highlights

Safety vision  
Key safety elements  
Timeline



Adopted in June 2019

# IWG on FRAV



- Leadership



MIIT, China



NHTSA, United States of America



KBA, Germany

- Secretary



American Automotive Policy Council (AAPC)

- Report to GRVA, and close connection with VMAD

# FRAV – VMAD - Coordination

REQUIREMENT  
DEFINITION

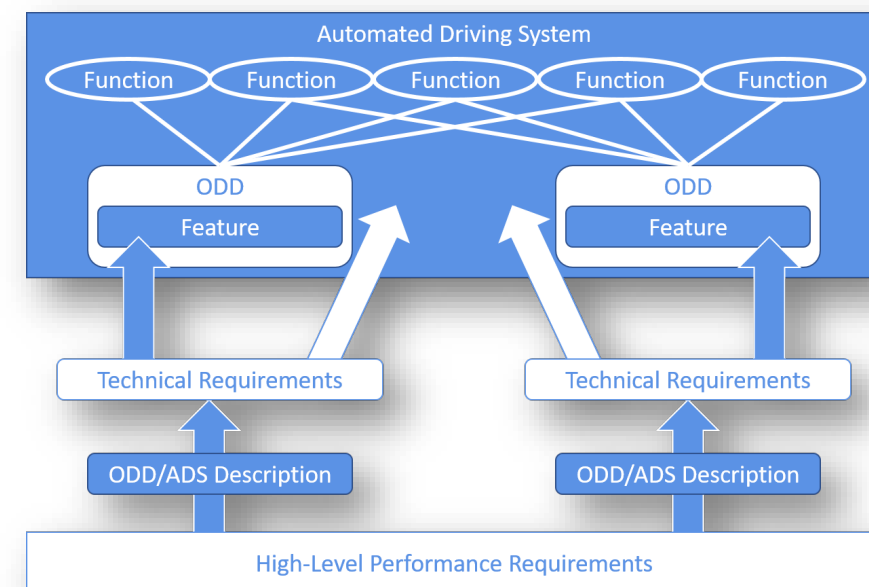
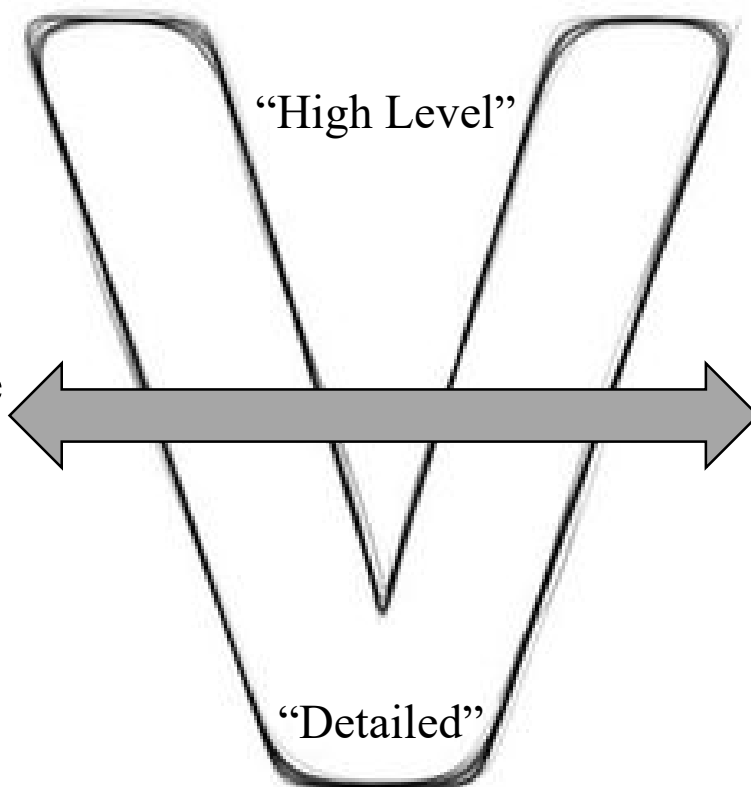
ASSESSMENT  
METHODOLOGY

FRAV

VMAD

Pass/Fail Performance  
Requirement(s)

Test/Assessment  
Procedure(s)



The ALKS regulations reflect the application of FRAV and VMAD methods in specific situations.

# FRAV - Objectives



- Functional Requirements for Automated Vehicles (FRAV)
  - Safety requirements covering all ADS configurations (SAE Levels 3-5)
  - Improve road transport, Performance-based, Technology-neutral, Measurable, Feasible, and Socially acceptable.
- Main objectives
  - ADS should drive safely
  - ADS should interact safely with the user
  - ADS should manage safety-critical situations
  - ADS should safely manage failure modes
  - ADS should maintain a safe operational state

# FRAV - Outcomes so far



- Dealing with ADS diversity
  - Each ADS assessed based on its intended uses and limitations on its uses
  - The manufacturer describes each ADS and its features
  - FRAV defining elements to be addressed in these descriptions
    - Intended use(s) and ADS configuration
    - Limitations on the ADS use, including ODD conditions and other limits of operation
- Dealing with driving diversity
  - FRAV has derived 40 aspects to be addressed in performance requirements
  - These aspects will be elaborated to provide verifiable specifications

# FRAV - In the near future



- ADS descriptions and documentation
  - ODD conditions that may impact ADS driving performance
  - ODD boundaries beyond which the ADS may not be designed to operate
  - User roles and responsibilities for correct use of a given configuration
  - Means used to enable performance of DDT functions
- Performance requirements
  - Functions required to perform the DDT
  - ADS nominal driving behaviors and compatibility with human expectations
  - ADS users, roles/responsibilities, and user interfaces/interactions
  - Other road users and their ADS interaction needs
  - ADS responses to critical events
  - Management of failures and assurance of operational safety

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# IWG on VMAD



- Leadership



Transport Canada, Canada



RDW, The Netherlands



NTSEL, Japan



Secretariat, SAE International



Secretariat, JASIC

- IWG reports to GRVA
- Four subgroups on (a) Scenarios, (b) Simulation, (c) Audit and Monitoring, and (d) Track Test and Real-world Test

# VMAD - Objectives



- IWG on Validation Methods for Automated Driving (VMAD) is dealing with:
  - *“demonstration of a robust design and validation process based on a systems-engineering approach with the goal of designing automated driving systems free of unreasonable safety risks and ensuring compliance with road traffic regulations and the principles listed in this document. Design and validation methods should include a hazard analysis and safety risk assessment for Automated Driving System (ADS), for the OEDR, but also for the overall vehicle design into which it is being integrated and when applicable, for the broader transportation ecosystem. Design and validation methods should demonstrate the behavioural competencies an Automated/autonomous vehicle would be expected to perform during a normal operation, the performance during crash avoidance situations and the performance of fall back strategies. Test approaches may include a combination of simulation, test track and on road testing”*  
– Framework Document: ECE/TRANS/WP.29/2019/34/Rev. 2
- It delivers new assessment /test method of ADS

# VMAD - Outcomes so far



- Based on the Framework Document, VMAD has submitted the following deliverables to WP.29:

| Deliverables                                                                                                                                                                           | Status                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. The test and assessment (including CEL) for Automated Lane Keeping Systems (ALKS) of SAE levels 3/4 compatible as a new UN Regulation for contracting parties to the 1958 agreement | Completed – March 2020 |
| 2. Review of the existing and upcoming methods and a proposed way forward for the assessment of automated driving system (ADS)                                                         | Completed – March 2020 |
| 3. New assessment/test method (NATM) of ADS <sup>1</sup>                                                                                                                               | Completed – March 2021 |

1: This deliverable was submitted to WP29 as the NATM Master Document.

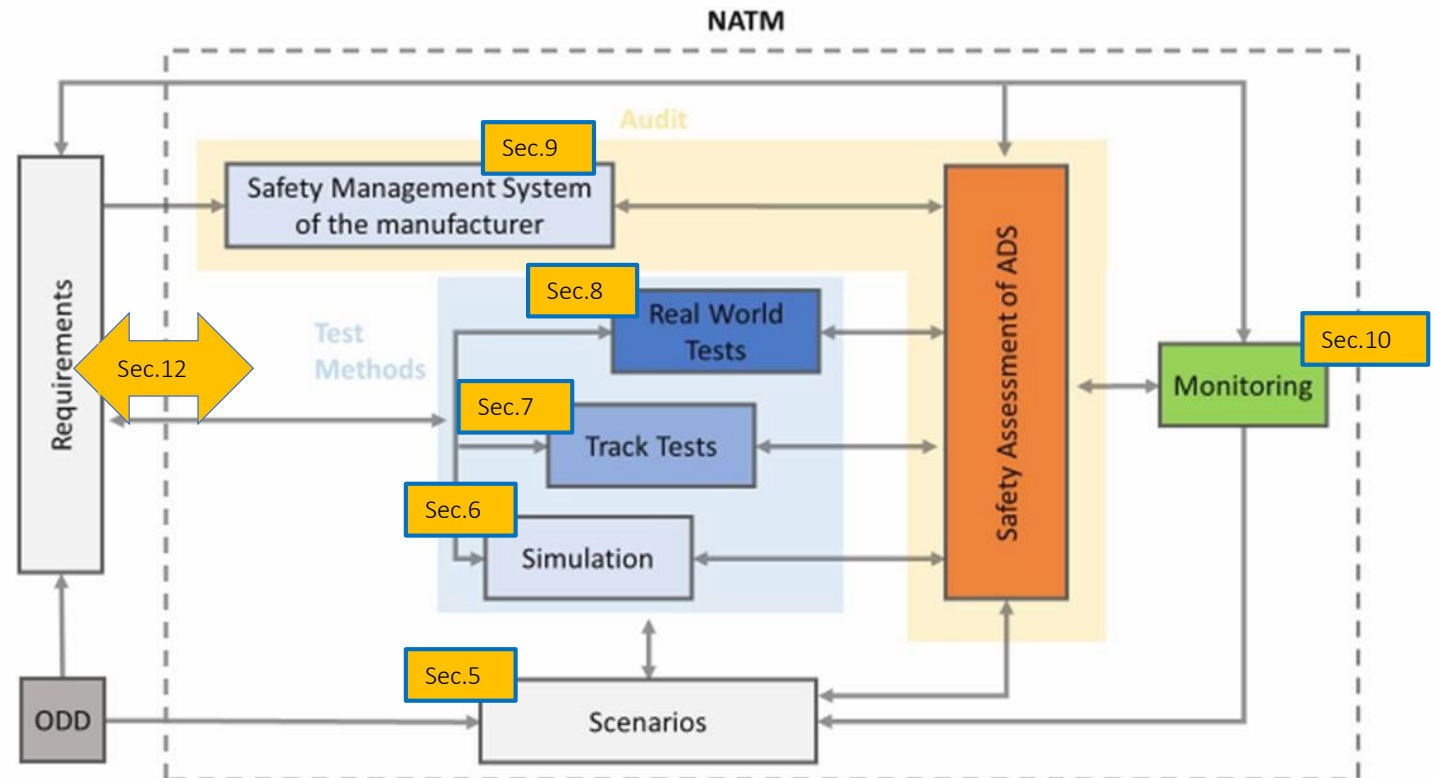
# NATM Master Document



- The NATM Master Document (MD) provides a clear overview of the NATM and its constituent pillars.
- This version of the MD provides a high-level framework for the NATM.
- Going forward, the MD will be further developed and regularly updated and informed by the outcomes of future VMAD sessions.
- WP29 at the March 2021 session recommended that the MD be considered by GRs and IWGs as a reference document when developing activities in the field of automation.

# Contents of the NATM MD

- The MD describes a multi-pillar approach, composed of a scenarios catalogue and five validation methodologies (pillars), and explains how the pillars, scenarios, and safety requirements developed by FRAV will interact with each other.



# VMAD - In the near future



- VMAD agreed to start with validation of NATM for Highway systems.
- VMAD and its sub-groups have been working together to scope out list of issues to be tackled as next steps.
- Recognizing the synergies between FRAV and VMAD, the two IWGs will continue to collaborate to advance our respective workplans.

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  - **EDR/DSSAD**

# IWG on EDR/DSSAD



- Leadership



NTSEL, Japan

NHTSA, USA

RDW, The Netherlands



Secretariat, OICA

- IWG reports to GRVA and GRSG
- Two subgroups on data storage and EDRs

# EDR/DSSAD - Objectives



- IWG on Data Storage Systems and Event Data Recorders (DSSAD/EDRs) is dealing with:
  - *“the function that collects and records the necessary data related to the system status, occurrence of malfunctions, degradations or failures in a way that can be used to establish the cause of any crash and to identify the status of the automated/autonomous driving system and the status of the driver.”* — Framework Document: ECE/TRANS/WP.29/2019/34/Rev. 2
- It delivers clear objectives, identification of differences between the systems, and proposes way forward for both systems as the technologies and privacy rights continue to evolve.



# EDR/DSSAD - Outcomes so far



- Identification of differences between DSSAD and EDRs
- DSSAD requirements for lane keeping systems of SAE Levels 3-4 as new UN regulation for contracting parties to the 1958 Agreement.
- New UN Regulation on Event Data Recorder (ECE/TRANS/WP.29/2020/123/Rev.1) for conventional vehicles, as well as the 01 Series of Amendments (ECE/TRANS/WP.29/2021/58) to it, to support EU's General Safety regulation requirements.
- Proposal for Guidance on Event Data Recorder (EDR) Performance Elements Appropriate for Adoption in 1958 and 1998 Agreement Resolution or Regulations (ECE/TRANS/WP.29/2020/100/Rev.1) and a.

# EDR/ DSSAD - In the near future



## DSSAD:

- Compilation of best practices
- ADS applicable performance elements to be developed

## EDRs:

- Performance elements appropriate for ADS equipped vehicles
- Heavy duty vehicles (request to support 2026-2029 EU GSR mandates)
- Consideration of additional data requirements



See the presentation by Mr. T. Niikuni (Japan/NTSEL) earlier today

# Schedule of meetings and documents

[wiki.unece.org](https://wiki.unece.org)



| Today                                             |                                                     | <                                          | >                                                                          | March 2021         |               |     | Subscribe |  |
|---------------------------------------------------|-----------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------|--------------------|---------------|-----|-----------|--|
| Mon                                               | Tue                                                 | Wed                                        | Thu                                                                        | Fri                | Sat           | Sun |           |  |
| 1                                                 | 2<br>📅 13:00 EDR-DSSAD<br>IWG (time US<br>eastern)  | 3<br>📅 VMAD #13 SG2<br>(13:00-14:00 CET)   | 4                                                                          | 5                  | 6             | 7   |           |  |
| 8                                                 | 9                                                   | 10<br>📅 VMAD #14 SG2<br>(13:00-14:00 CET)  | 11                                                                         | 12                 | 13            | 14  |           |  |
| 15<br>📅 TF ADAS #2 (12:00-15:00 CET)              | 16                                                  | 17                                         | 18<br>📅 UNR 157 SIG - Session #3 (12:00-14:30 CET)                         | 19                 | 20<br>🌳 Japan | 21  |           |  |
| 22<br>📅 09:00 AEBS-HDV-<br>03 Day1                | 23<br>📅 09:00 AEBS-HDV-<br>03 Day2                  | 24<br>📅 #17 VMAD IWG<br>(13:00-15:00 CET)  | 25<br>📅 VMAD - #9 SG3<br>(12:30-14:30 CET)<br>📅 09:00 AEBS-HDV-<br>03 Day3 | 26                 | 27            | 28  |           |  |
| 29<br>📅 VMAD - #13 SG1<br>(13:30 - 15:30<br>CEST) | 30<br>📅 FRAV-11 (13:30-<br>16:00 CET-<br>tentative) | 31<br>📅 VMAD #15 SG2<br>(13:00-14:00 CEST) | 1                                                                          | 2<br>🌳 Good Friday | 3             | 4   |           |  |
| 5<br>🌳 Easter Monday                              | 6                                                   | 7<br>📅 VMAD - SG2<br>(13:00-14:00 CET)     | 8<br>📅 FRAV-12 (13:00-<br>15:00)                                           | 9                  | 10            | 11  |           |  |

*Schedule of meetings and documents*

# Thank you for your intention

Francois E. Guichard