Preparation of the discussion on agenda item 3 of the provisional agenda of the third GRVA

<u>Note:</u> This document was prepared following consultations (via WebEx meetings) of the GRVA leadership and then of the Heads of Delegations (HoDs) of Contracting Parties of WP.29/GRVA.

I. Introduction

Documentation: ECE/TRANS/WP.29/1145, paras. 25-48
ECE/TRANS/WP.29/2019/34
Informal document WP.29-177-19

1.   The World Forum for Harmonization of Vehicle Regulations (WP.29) identified a series of work priorities on automated driving at its 177th session in March 2019. WP.29 requested the secretariat to distribute this document with an official symbol (ECE/TRANS/WP.29/2019/34) at the June 2019 of WP.29 for review and potential adoption.

2.   GRVA is expected to propose GRVA subgroups (Informal Working Groups) to address the WP.29 priorities.

3.   GRVA agreed to develop technical provisions suitable for use under either the 1958 or 1998 Agreements.
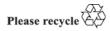
II. Key safety aspects to be considered

4.   ECE/TRANS/WP.29/2019/34 identifies the following safety aspects.

a.   System Safety
b.   Failsafe Response
c.   Human Machine Interface (HMI) /Operator information
d.   Object Event Detection and Response (OEDR):
e.   Operational [Design] Domain (O[D]D) (automated mode)
f.   Validation for System Safety
g.   Cybersecurity
h.   Software Updates
i.   Event Data Recorder
j.   Data Storage System for Automated Driving vehicles (DSSAD)
k.   Remote operation (e.g., unmanned urban transport pods)
l.   Safety of In-Use Vehicles
m.   Consumer Education and Training

Annex I

Table 1
Detailed WP.29 work priorities related to automated/ autonomous vehicles

Title	Allocation & Leadership	Description of work ECE/TRANS/WP.29/2019/2	Corresponding principles / elements	Main target	Activities		Deliverable/ Deadline
					Current activities (not necessarily exclusive)	Future activities	
Functional Requirements for Automated / autonomous Vehicles	IWG reporting to GRVA **Chair:** Country A **Vice-Chairs** Countries B & C **Secretariat** [UNECE]	This work item should cover the functional requirements for the combination of the different functions for driving: longitudinal control (acceleration, braking and road speed), lateral control (lane discipline), environment monitoring (headway, side, rear), minimum risk manoeuvre, transition demand, HMI (internal and external) and driver monitoring. This work item should also cover the requirements for Functional Safety.	a. System safety b. Failsafe Response c. HMI / Operator information d. OEDR (Functional Requirements)	Automated / Autonomous vehicles	ACSF / ALKS Functional requirements for Lane Keeping systems of SAE levels 3/4 (New UN Regulation for contracting parties to the 1958 Agreement)	Common functional requirements on existing national/regional guidelines and other relevant reference documents (1958 and 1998 Agreements)	March 2020 March 2020

New assessment / Test method / "VMAD"	IWG reporting to GRVA **Chair:** Country A **Vice-Chairs** Countries B & C **Secretariat** [UNECE]	Multi-pillar concept: Audit, simulation, electronic system compliance, digital identity, test track, real world driving evaluation. This work item should also cover the assessment of Functional Safety.	d. OEDR (Assessment Method) f. Validation for System Safety (including CEL)	Automated / Autonomous vehicles	New assessment /Test method of AD		December 2020
						The test and assessment method, (including CEL) for Lane Keeping systems of SAE levels 3/4 as New UN Regulation for contracting parties to the 1958 Agreement	March 2020
						Review of the existing and upcoming methods and a proposed way forward for the assessment of AD	March 2020
						CEL for AD	December 2020
Cyber security and (Over-the-Air) Software updates	IWG reporting to GRVA **Chair:** Country A **Vice-Chairs** Countries B & C **Secretariat** [UNECE]	Work of Task Force on Cyber Security and (OTA) software updates (TF CS/OTA) ongoing. Draft recommendations on the approach (based on draft technical requirements).	g. Cybersecurity h. Software Updates	Conventional and Automated / Autonomous vehicles	Test phase on the draft requirements under 1958 Agreement		
					Review of draft set of technical requirements for 1998 CPs	Report of the test phase on the draft requirements	November 2019

Data Storage System for Automated Driving vehicles (DSSAD)	IWG reporting to GRVA first and then to GRSG **Chair:** Country A **Vice-Chairs** Countries B & C **Secretariat** [UNECE]	DSSAD are for autonomous vehicles (e.g. accident recoding). This work item should take into consideration of the discussion at GRVA and its Informal Working Group on Automatically Commended Steering Function (IWG on ACSF). Clear objectives, deadline and the identification of differences with EDR to be determined first before discussion on detailed data information.	j. DSSAD	Automated / Autonomous vehicles	Draft TOR of IWG on DSSAD and EDR is submitted		June 2019
						Clear objectives, deadline and the identification of differences with EDR	November 2019
						DSSAD requirements for Lane Keeping systems of SAE levels 3/4 as New UN Regulation for contracting parties to the 1958 Agreement	March 2020
						Review of the existing national / regional activities and a proposed way forward for DSSAD	March 2020:
Event Data Recorder (EDR)	**Chair:** Country A **Vice-Chairs** Countries B & C **Secretariat** [UNECE]	Existing systems - as road safety measure (e.g. accident recoding).	i. EDR	Conventional and Automated / Autonomous vehicles	Draft TOR of IWG on DSSAD and EDR is submitted		June 2019
						Clear objectives, deadline and the identification of differences with DSSAD	November 2019
						Review of the existing national /regional activities and a proposed way forward for EDR	November 2020

Annex 2

Proposed tasks for the four Informal Working Groups

The following tasks are proposed for consideration by the respective IWGs. The IWGs may wish to review this non-exhaustive list and will provide recommendations to GRVA.

A. Functional Requirements for automated / autonomous vehicles

Automated/autonomous acceleration and deceleration (longitudinal control)
- Full speed range adaptive cruise system (including ACC)

Automated/autonomous steering function (lateral control)
- Automated/ emergency steering system
- Lane keeping system

Combined control
- Traffic jam assistance/pilot
- Highway assistance/pilot
- Automated parking

Human Machine Interface (HMI)
- Warnings
- Driving status monitoring and display
- Interactive operations

Transition process
- Minimum risk achievement
- Responsibility for takeover operation
- Transitional process
- Transitional period

Driving availability recognition

Driving environment monitoring
- Headway, side, rear

B. New assessment / Test method/ VMAD

[Objective methodology to assess automated driving performance including:
- Traffic rules
- Traffic signs
- Driving capabilities]

Driving Scenarios
- Operational Domain distinction and characterisation (Highway/Motorway, Inter-urban & Rural, Urban)
- Operational Domain specific scenario classification
- Scenario format specification
- Scenario library/database

Methodology for assessing the OEM's processes
- Functional safety concept including hazard and risk perception in the operating domain
- Safe system / software design/production audit/validation
- Conformity of production

Methodology for assessing the vehicle in a controlled environment,
- Minimum validation assessments to permit real-world evaluation/validation

- Test scenarios addressing foreseeable events for which real-world evaluation would be unsuitable-

Methodology for assessing the vehicle performance under real-world conditions.
-Operating domain hazard and driving task descriptors to characterise the real-world road route profile.
- Objective methodology to assess automated driving performance

Simulation and virtual testing methodology
- Driving scenario centred modelling

C. Cyber security and (Over-the-Air) Software updates

Assessment and validation of methodology
- As proposed in ECE/TRANS/WP29/GRVA/2 for Cyber Security and
- As proposed in ECE/TRANS/WP29/GRVA/3 for Software updates
Drafting of Agreement neutral text
- For use under both the 1958 and 1998 Agreements

D. DSSAD / EDR

1. Data Storage System for Automated Driving vehicles (DSSAD)

Requirements for application with Automated Lane Keep Systems
- Minimum data channels/fields
- Data format
- Data access (protection against unauthorised and facility for authorised access)
- Data Privacy provisions
- Minimum data storage provisions (time and volume limits)

Coordination with GRSG for development of DSSAD beyond step 1 above.

2. Event Data Recorder (EDR)

To be defined with / by GRSG

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