

Transmitted by Chair of SIG AVRS

Informal Document **GRBP-78-24**  
78<sup>th</sup> GRBP, 30<sup>th</sup> August- 1<sup>st</sup> September 2023,  
agenda item 13

# Report to 78<sup>th</sup> Session of GRBP (August/September 2023)

Special Interest Group Automated Vehicles Regulation Screening  
(SIG AVRS)

# SIG Automated Vehicles Regulation Screening



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## Number of Meetings

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### Web-meetings

- 1<sup>st</sup> SIG AVRS: 7<sup>th</sup> December 2022
- 2<sup>nd</sup> SIG AVRS: 18<sup>th</sup> January 2023
- 3<sup>rd</sup> SIG AVRS: 2<sup>nd</sup> June 2023
- 4<sup>th</sup> SIG AVRS: 19<sup>th</sup> June 2023
- 5<sup>th</sup> SIG AVRS: 28<sup>th</sup> June 2023
- 6<sup>th</sup> SIG AVRS: 14<sup>th</sup> July 2023
- 7<sup>th</sup> SIG AVRS: 26<sup>th</sup> July 2023

Guidance meetings with GRVA FADS  
April/June 2023



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## Participants (Contracting Parties & NGOs)

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- CPs:  
Germany, China, Japan, The Netherlands
- NGO's:  
OICA

# SIG Automated Vehicles Regulation Screening

## Targets

- WP.29 requests a screening of regulation for application of Automated Vehicles.
- GRVA proposed a template for the screening
- TF-FADS (GRVA) provides further guidance

## Roles

- Chair: Netherlands
- Secretariat: OICA

## SIG AVRS wikipage

<https://wiki.unece.org/pages/viewpage.action?pageId=190087308>

### Documentation:

Report of the World Forum for Harmonization of Vehicle Regulations on its [187th session](#) pg.8/9

19. AC.2 received an update on the work of GRVA and automated vehicles related activities:

(e) AC.2 recommended the GRs to consider using the template in [GRVA-13-18](#) when screening UN GTRs and UN Regulations with regards to ADS.

Reference:

[https://unece.org/sites/default/files/2022-07/ECE-TRANS-WP29-1166e\\_0.pdf](https://unece.org/sites/default/files/2022-07/ECE-TRANS-WP29-1166e_0.pdf)

<https://unece.org/sites/default/files/2022-05/GRVA-13-18e.pdf>

Report GRVA FADS from WP.29 June 2023: <https://unece.org/sites/default/files/2023-06/ECE-TRANS-WP.29-2023-86e.pdf>

Report WP29 190<sup>th</sup> meeting, June 2023: [https://unece.org/sites/default/files/2023-07/ECE\\_TRANS\\_WP.29\\_1173e\\_0.pdf](https://unece.org/sites/default/files/2023-07/ECE_TRANS_WP.29_1173e_0.pdf) items 25 to 32.

# Summary of earlier work

- 21 regulations screened
- 13 regulations for further consideration
- GRBP decides to start with first detailed assessment of prioritized regulations
  - R9, **R28, R51, R138**, R165
- (Sub)categories of AVs are not defined yet

# Developments

- Under GRVA guidance
  - Report for all GR's and regulations to be assessed with priority
  - Proposal accepted in WP.29 June 2023
- GRVA-16-13 document with proposal for subcategories (OICA/CLEPA)
  - Needs further detail and confirmation in R.E.3 (expected in oct. 2023)
  - Some category letters are already in use, new definition needed

# Vehicle categorization under R.E.3

## New sub categories for Automated Vehicles (AV's)

### Subcategory A „Driverless Vehicles with ADS“

Designed primarily for the carriage of people

Designed primarily for the carriage of goods

Subcategory D „Dual Mode vehicles“

Designed primarily for the carriage of people

Designed primarily for the carriage of goods

Subcategories X & Y „Low speed driverless AV's“

**M1**  
Driver seat + max. 8 add. seats, no limitation of GVM

**M2**  
Driver seat + more than 8 add. seats, GVM max. 5 t

**M3**  
Driver seat + more than 8 add. seats, GVM exceeding 5 t

**N1**  
GVM  $\leq 3.5t$

**N2**  
 $3.5t < GVM \leq 12t$

**N3**  
GVM  $> 12t$

Examples:

**M1D**  
e.g. Robotaxi

**N3D**  
e.g. Hub-2-Hub truck

**M1Z**  
e.g. AVP equipped vehicle

**M1A**  
seated only, max. 9 seats

**M2A**  
More than 9 seats or standing passengers, GVM Max. 5t

**M3A**  
More than 9 seats or standing passengers, GVM exceeding 5t

With or w/o passengers

**N1A**  
GVM  $\leq 3.5t$

**N2A**  
 $3.5t < GVM \leq 12t$

**N3A**  
GVM  $> 12t$

Examples:

**M2X**  
 $< [25] \text{ km/h}$   
e.g. Campus shuttle

**M2Y**  
 $[25] \text{ km/h} \leq v \leq [50]$   
e.g. Urban shuttle

\*Class I, II, III and Class A, B can be carried over

Vehicles which can be driven manually under nominal conditions

AV's which do not require a driver/fallback-ready user

# General principle

- Approach for amendments

- Scope
- Definitions
  - Incl. type definitions
- Specifications
- Test method

Each with justification to support understanding and considerations of the group

- Use-cases will be discussed in the GRVA-FADS

- Verify the usefulness of test and regulation for the use-case
- Exemptions for AV's in GRBP Regulations for special use-cases

# First discussion on R51

- General
  - R51 test method can be adopted for AVs
  - Are R51 formal aspects, limits and testing suitable for AVs?
    - Use-case specific (city shuttles, robotaxi, delivery robot) exemptions and adoptions might be necessary.
    - This needs input from GRVA/industry
- Subcategory approach and exempt specific subcategories
  - Exact definition of categories is pending (R.E.3)
- Dual mode discussion
  - Needs further refinement
  - Try to use the existing test method in manual mode



# First discussion on R138

- General
  - R138.02 could typically be used for AVs
    - Existing requirement in R138 (Scope) allows also non-audible solutions<sup>1</sup>
    - Test methods (simulated speed) fits very well
  - Are R138 limits and testing suitable for AVs?
    - Is AVAS still needed for the safety level of AVs?
    - First impression is: Yes, but it could be more limited to specific situations (only for areas with interaction with pedestrians, “uncontrolled” situations, etc). “Smart AVAS”.
    - Use-case specific
  - Subcategory approach and exempt specific subcategories
    - Exact definition of subcategories probably based on use-cases is pending (R.E.3),
  - Dual mode (automatic/manual like R157 ALKS)
    - Needs refinement
    - Special test mode = simulated speed signal
  - Test methods would work for AV

1) At this stage, only acoustic measures shall be developed in order to overcome the concern of reduced audible signals from electrified vehicles. After finalization, **the appropriate GR shall be assigned with the enhancement of the Regulation in order to develop alternative**, non-acoustic measures, taking into account active safety systems such as, but not limited to, pedestrian detection systems. To provide for environmental protection, this Regulation specifies also maximum limits.

# Dependencies

- Vehicle subcategories will be updated (GRSG R.E.3)
- Use-cases should relate to subcategories
- Input from GRVA for requirement in GRBP regulations
  - Concept of Communication/Warning needed

# Next steps

## **Regulations with first priority (based on priority and capacity of the group)**

- R28 (postponed)
- R51
  - Definitions will be aligned with GRVA
  - Dual mode can be added when assumed that the manual mode is the loudest
- R138
  - Start in September 2023 after draft text of R138.02
  - R138.02 (jan. 2025) can probably be used with minor changes

We expect slow progress due to complexity of the subject and dependencies.

- R.E.3 update by GRSG
- Feedback of GRVA
- All changes before end of 2025 need to be in a supplement

Thank you for your attention

**Next slides are background from GRBP-77**

# Screening process: Presumptions

1. Availability of manual driven vehicles was assumed for component (tyres) testing
2. Categories of AVs are not defined yet
  - Excluding an AV-category is not possible yet
  - AV-categories could be useful
3. Automation of Powered 2 Wheelers is unlikely, but prototypes exist.
  - L1/L3 is not excluded
  - Priority could be “LOW”

# Screening process: Considered items

1. Terminology and concepts
2. Relevance of regulation for AVs
  - The subject of the regulation is relevant to the AVs
  - The test method needs reconsideration for AVs
    - For driverless AVs (Level 5, shuttles)
      - With passenger
      - Without passengers (cargo)
    - For AVs with driver (Level 3/4, fallback driver/user)
    - Bi-directional AV's
3. Requirement to AVs to fulfill Regulation that is screened.

UN Regulations	Title	Topic	Vehicle and/or Component	category	to be checked	changes required	First suggestions of the SIG-AVRS					Possible action
							Issue	Issue for fully automated vehicles?	Issue for dual mode vehicles?	Issue for vehicles without occupants?	Issue for other use cases?	
UN R 9	Noise of three-wheeled vehicles	Noise	Vehicle	L2, L4, L5	YES	YES	measurement procedure	YES	No	YES		Test mode
UN R 28	Audible warning devices	Noise	Component & Vehicle	M, N, L3, L4, L5	YES	YES	requirements for courtesy hom. actuation	YES	YES	YES		new requirements
UN R 30	Tyres for passenger cars and their trailers	Tyres	Component	M, O	No							
UN R 41	Noise emissions of motorcycles	Noise	Vehicle	L3	YES	??**	measurement procedure	YES	No	?		Test mode
UN R 51	Noise of M and N categories of vehicles	Noise	Vehicle	M, N	YES	YES	measurement procedure	YES	No	YES		Test mode
UN R 54	Tyres for commercial vehicles and their trailers	Tyres	Component	N, O	No							
UN R 59	Replacement silencing systems	Noise	Component & Vehicle	M1, N1	YES	copy UN R 51	measurement procedure	YES	No	YES		Test mode
UN R 63	Noise emissions of mopeds	Noise	Vehicle	L1	YES	??**	measurement procedure	YES	No	?		Test mode
UN R 64	Temporary use spare unit, run flat tyres	Tyres	Component & Vehicle	M, N	YES	?**	measurement procedure	?	No	?		
UN R 75	Tyres for motorcycles/mopeds	Tyres	Component	L1, L3	No							
UN R 92	Replacement exhaust silencing systems (RESS) for motorcycles	Noise	Component & Vehicle	L	YES	copy UN R 41**	measurement procedure	YES	No	?		Test mode
UN R 106	Tyres for agricultural vehicles	Tyres	Component	T, R, S	No							
UN R 108	Retreaded tyres for passenger cars and their trailers	Tyres	Component	M, O	No							
UN R 109	Retreaded tyres for commercial vehicles and their trailers	Tyres	Component	N, O	No							
UN R 117	Tyres, rolling resistance, rolling noise and wet grip	Tyres	Component*	M, N, O	No							
UN R 124	Replacement wheels for passenger cars	Tyres	Component	M	YES	YES	application in Avs	YES	YES			new requirements
UN R 138	Quiet Road Transport Vehicles (QRTV)	Noise	Vehicle	M, N	YES	YES	measurement procedure	?	No	?		new requirements, Test procedure
UN R 141	Tyre Pressure Monitoring Systems (TPMS)	Tyres	Component & Vehicle	M1, N1	YES	YES	warning strategy, actions?	YES	YES	YES		new requirements
UN R 142	Tyres installation	Tyres	Component & Vehicle	M1	YES	?	vehicle dynamic aspects?	YES	YES	YES		new requirements
UN R 164	Studded tyres with regard to their snow performance	Tyres	Component*		No							
UN R 165	Audible reverse warning devices and audible reverse warning signals	Noise	Component & Vehicle	M2, N2, M3, N3	YES	?	warning strategy	YES	YES	YES		new requirements
GTR No. 16	Tyres	Tyres	Component*		No							

Sum of "YES" 13

\* needs any non fully automated vehicle for testing

\*\* usecase questionable

20-1-2023



# For reference

## TCl-model

Task Capability Interface Model (Simplified)  
Fuller, 2000  
For reference and to explain complex traffic situations

