

Submitted by the Chair of SIG AVRS

Informal Document **GRBP-79-05**
79th GRBP, 6 – 9 February 2024,
agenda item 13

Report to 79th Session of GRBP (February 2024)

**Special Interest Group Automated Vehicles Regulation Screening
(SIG AVRS)**

SIG Automated Vehicles Regulation Screening



7

Number of Meetings

Web-meetings

- 20th of October 2023 (virtual)
- 30th of October 2023 (virtual)
- 7th of November 2023 (hybrid) ACEA building Bruxelles
- 13th of November 2023(virtual)
- 20th of November 2023 (virtual)
- 4th of December 2023 (virtual)
- 18th of December 2023 (virtual)
- 15th of January 2024 (virtual)

Guidance meetings with GRVA FADS

Sept – Nov 2023



12

Participants (Contracting Parties & NGOs)

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

SIG Automated Vehicles Regulation Screening

Targets

Update of GRBP regulations to facilitate the Type Approval of AVs

Considering:

- TF-FADS suggests proposals for amendments to be submitted in 2024
- TF-FADS (GRVA) provides further guidance

Roles

- Chair: Netherlands
- Secretariat: OICA

SIG AVRS wikpage

<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/2022-05/GRVA-13-18e.pdf>

Report GRVA FADS from WP29 June 2023: <https://unece.org/sites/default/files/2023-06/ECE-TRANS-WP.29-2023-86e.pdf>

Report WP29 190th meeting, June 2023: https://unece.org/sites/default/files/2023-07/ECE_TRANS_WP.29_1173e_0.pdf items 25 to 32.

Proposal for Guideline and upgrade to TF

The objectives of the task force are to:

- a. Update GRBP regulations to facilitate Type Approval of AVs
- b. Align the work of TF-AVRS with the GRVA TF-FADS and other GRs
- c. Consider the activities and results of GRVA IWGs VMAD and FRAV
- d. Propose amendments to the R28, R51, R138 to facilitate the approval of AVs
- e. Present a timeline for the amendments of other relevant regulations under the responsibility of GRBP

Documentation:

GRBP-79-03 - [\(SIG AVRS\) Guidelines of the Task Force on Automated Vehicle Regulation Screening](#)

Align with EU-approach (EC2022R2236)

| UN Regulations | | vehicle category | | | | | | | | | | | | | class I | class II | class III | | Specific provisions | | | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|----|----|----|----|----|----|----|----|----|----|----|----|---------|----------|-----------|-----------------------|--------------------------------|--|----|----|----|----|----|----|----|----|----|---------------------------------|---|---|--|--|--|--|--|-------------------------------------|
| Number | Title | Topic | M1 | | | M2 | | | M3 | | | N1 | | | N2 | | | N3 | | | O1 | O2 | O3 | O4 | L1 | L2 | L3 | L4 | L5 | T, R and S Component/ STU | Fully automated vehicles of categories N1, N2 and N3 without driver seat and without occupant | Fully automated vehicles of categories N1, N2, N3, M1, M2, M3 without driver seat, with occupants | Dual mode vehicles: vehicles with a driver seat designed and constructed to be driven by the driver in the "manual driving mode" and to be driven by the automated driving system (ADS) without any driver supervision in the "fully automated driving mode" | | to be applied if letter S is used (i.e. the approval is not possible because it does not yet include specific requirements for fully automated vehicles) No provision shall apply if the vehicle category is not in the scope of the base regulatory act | | | |
| | | | M1 | M2 | M3 | N1 | N2 | N3 | O1 | O2 | O3 | O4 | L1 | L2 | L3 | L4 | L5 | "manual driving mode" | "fully automated driving mode" | | | | | | | | | | | | | | | | | | | |
| UN R 28 | Audible warning devices | N | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | class I: class II: class III: |
| UN R 51 | Noise of M and N categories of vehicles | N | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | class I-III: Test mode necessary. Manufacturer to define how to perform the test in accordance with the technical justification in agreement with technical service. Highest value measured in manual or/and in autonomous mode shall be considered for type approval. | |
| UN R 138 | Quiet Road Transport Vehicles (QRTV) | N | x | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | no provision | | |
| UN R 141 | Tyre Pressure Monitoring Systems (TPMS) | T | x | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | class I-III: The warning signal shall be sent to the ADS and the remote intervention operator (if applicable). | | |

N Noise
T Tyres

A applicable
S applicable with specific provisions
n/
a not applicable

Align with EU-approach (EC2022R2236)

Main categories of AVs

| <i>class I</i> | <i>class II</i> | <i>class III</i> |
|---|---|--|
| <i>Fully automated vehicles of categories N1, N2 and N3 without driver seat and without occupant</i> | <i>Fully automated vehicles of categories N1, N2, N3, M1, M2, M3 without driver seat, with occupants</i> | <i>Dual mode vehicles: vehicles with a driver seat designed and constructed to be driven by the driver in the “manual driving mode” and to be driven by the automated driving system (ADS) without any driver supervision in the “fully automated driving mode” “manual driving mode” “fully automated driving mode”</i> |

Align with EU-approach (EC2022R2236)

In detail

| UN Regulations | | class I | class II | class III | | Specific provisions | |
|----------------|---|---------|---|---|--|--|--|
| Number | Title | Topic | Fully automated vehicles of categories N1, N2 and N3 without driver seat and without occupant | Fully automated vehicles of categories N1, N2, N3, M1, M2, M3 without driver seat, with occupants | Dual mode vehicles: vehicles with a driver seat designed and constructed to be driven by the driver in the "manual driving mode" and to be driven by the automated driving system (ADS) without any driver supervision in the "fully automated driving mode" | to be applied if letter S is used (i.e. the approval is not possible because it does not yet include specific requirements for fully automated vehicles) No provision shall apply if the vehicle category is not in the scope of the base regulatory act | |
| | | | | | "manual driving mode" "fully automated driving mode" | | |
| UN R 28 | Audible warning devices | N | S | S | A | S | class I: class II: class III: |
| UN R 51 | Noise of M and N categories of vehicles | N | S | S | A | S | class I-III: Test mode necessary. Manufacturer to define how to perform the test in accordance with the technical justification in agreement with technical service. Highest value measured in manual or/and in autonomous mode shall be considered for type approval. |
| UN R 138 | Quiet Road Transport Vehicles (QRTV) | N | A | A | A | A | no provision |
| UN R 141 | Tyre Pressure Monitoring Systems (TPMS) | T | S | S | A | S | class I-III: The warning signal shall be sent to the ADS and the remote intervention operator (if applicable). |
| | | N | A | applicable | | | |
| | | T | S | applicable with specific provisions | | | |
| | | | n/a | not applicable | | | |

Priority Regulations

4 types of solutions

I. R28 – Horn

Activation by the ADS is required

II. R51 – Noise

Test mode to be required in ADS, adaption of test road (lining)

III. R138 - QRTV

Regulations only needs minor amendments

IV. R141 – TPMS (not in priority list yet)

ADS must receive the TPMS input

Dependencies

- Vehicle subcategories will be updated
 - Joint GRVA – GRSG IWG is being established for vehicle subcategories
 - Assume the 3 classes (EU-table) for GRBP work
- Use-case are not clear
 - Use-case consequences are to be included on a later stage
- Input from GRVA for functional requirements in GRBP regulations
 - Avoid incorporating new requirements in this phase

Timeline

| Time | Topic | Remark |
|-------------------|--|---|
| Febr 2024 | Describe necessary adaption of regulation | Overview sheet |
| Sept. 2024 | Informal document for regulation R28 | Definitions, wording and including AVs |
| <i>Sept. 2024</i> | <i>Proposal for adapted method for R51</i> | <i>This needs discussion in the AVRS group. Can only be with agreement of IWG R51 (ISO)</i> |
| Feb. 2025 | Informal document for regulation R138 | Definitions, wording and including AVs |
| Sept 2025 | Working documents for R28/R138 | |

Dates for oncoming meetings



Oncoming Meetings

Web-meetings

17th TF AVRS:

18th TF AVRS:

19th TF AVRS:

....

Guidance meetings with GRVA FADS (tbd 2024)

To be approved by GRBP

- The Special Interest Group AVRS will continue as a Taskforce
- The Guideline document for the TF-AVRS will be adopted

Thank you for your attention

Next slides are background from GRBP-77 and 78

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 WP29 June 2023
- GRVA-16-13 document with proposal for subcategories (OICA/CLEPA)
 - Needs further detail and confirmation in RE.3 (expected in oct 2023)
 - Updates have been submitted to GRVA-17

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

| 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

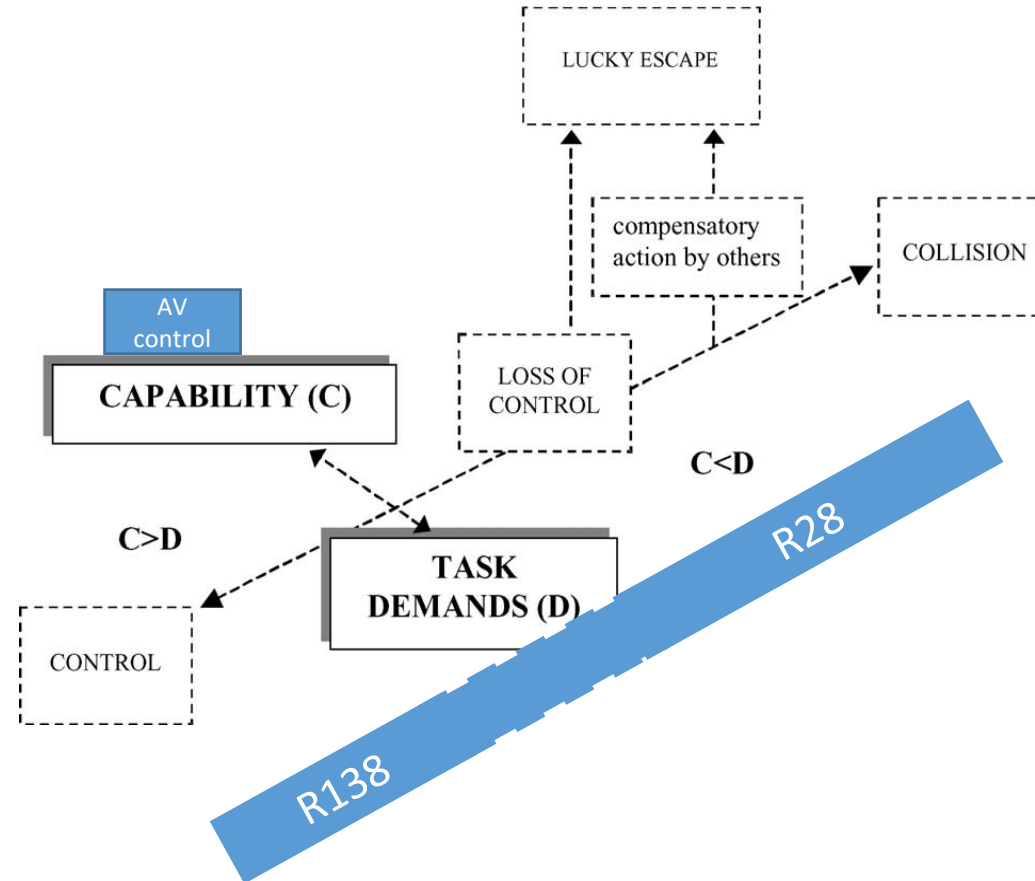
20-1-2023

TCl-model

Task Capability Interface Model (Simplified)

Fuller, 2000

For reference and to explain complex traffic situations



Timeline other regs

| Time | Topic | Remark |
|-----------|---|---|
| Sept 2024 | Conceptual approach based on priority regulations | |
| Sept 2025 | Informal documents | Where test method of regulation can be used for AVs |
| | | |
| | | |