

## **GRE Taskforce on Autonomous Vehicle Signalling Requirements (AVSR) Status Report**

The Task force presented the results of the discussion in GRE 81 and GRE was briefed on the progress of the task force on the signalling requirements for automated/autonomous vehicles (TF AVSR) (GRE-81-08-Rev.1 and GRE-81-12-Rev.1). GRE noted that the TF had not been able to reply to the main question on whether or not there should be a safety requirement for automated/autonomous vehicles to provide specific signals. GRE was not in a position to reach a consensus on this question either. While some experts felt that such signals were necessary for safety reasons, some others held a different view. The expert of SAE pointed out that his organization was developing lamps for automated/autonomous vehicles. GRE decided to request WP.29 for guidance on this matter. The Chair invited GRE experts to provide him with arguments for the request to WP.29 at its session in June 2019.

WP.29 concluded, to discuss this question in the Global Forum for Road Traffic Safety (WP.1) at the 80<sup>th</sup> Session under item 3 (c) (i) of the Provisional agenda and Germany introduced the Informal document No.13 on the possible need to require an automated vehicle to indicate –by either an optical or audible signal or both –its mode of operation (“automated vs manual”). After discussion –with observations including the interaction with law enforcement, other road users and possible undesirable incentives to use fake signals –WP.1 agreed to consider this topic at the next session under agenda item 3(c). Germany had put this item on the agenda of WP.1 on behalf of the Taskforce under GRE to clarify the needs for such a signal and to start a process of clarification. But in the meantime it was decided under GRVA to discuss at first the necessity in principle and, if applicable, the performance characteristics for such a signal.

In the 81<sup>st</sup> Session of WP.1 had agreed to consider this topic in more detail at the current session. At this session, Germany informed WP.1 (through the secretariat) that due to the COVID-19 situation the relevant World Forum for the Harmonization of Vehicle Regulations(WP.29) bodies (i.e., Working Party on Lighting and Light-Signalling (GRE) and Working Party on Automated/Autonomous and Connected Vehicles (GRVA)) could not meet and thus make progress on this issue.

The discussion on "optical and/or audible signals in DAS and ADS vehicles" is taken over by GRVA. Therefore this item will be raised up at WP.1, at that time when GRVA asked GRE to restart the discussion and ask WP.1 for guidance or this will be done by GRVA itself. So at the moment the Taskforce under GRE has no mandate for further actions.

France stressed the importance of this topic. WP.1 agreed and invited Germany to provide a revised document at the next session. At least the discussion was continued at the 11<sup>th</sup> FRAV informal Working Group Session on the base of the Informal document No.13 of WP.1. After the Presentation of the document and accentuation of question on whether or not there should be a safety requirement for automated/autonomous vehicles to provide specific signals, the expert of the United Kingdom Mr. Oliver Carsten mentioned the Final Report of the Study on the effects of automation on road user behaviour and performance of the European Commission.

With the conclusion under item 7.2. **External HMI** (on page 82)

“The following issues concerning the interaction of the vehicle within its context of operation for e-HMI were identified: to make clear that no additional e-HMI for interaction with the environment is needed (thus, no new standards are required); the need to have a signal that the vehicle is under ADS control; and rural platooning for safe overtaking. The key stakeholders to lead the necessary actions outlined in Table 11 (further below) are the European Commission (DG Grow and DG R&I), OEMs, logistic companies and UNECE WP.29 Similar to external HMI, the actions required and outlined in the table can be completed within one to three years for Level 3 automation.”

In the Table 11 mentioned above will be pointed out:

- No Additional e-HMI for interaction because existing e-HMI is adequate and no major additional e-HMI for interaction with other road users, including VRUs. Thus no action is needed, with the exceptions below. No new standards are required.

But with the following two exceptions:

- (1) Active ADS signal for road users with exterior light indication that vehicle is under the control of ADS. Could explain behaviour to VRUs and useful for enforcement.
- (2) Active ADS signal with exterior signal to assist in stand-off situation with VRUs

Under Roles and Responsibilities, DG Grow – decide and recommend type of exterior light signal (e.g., LED, colour) OEMs to agree to fit UNECE WP.29 to agree on standard signal and, if necessary, amend vehicle lighting regulations.

Regarding this outcome of the Study the Chair of the GRE TF “Autonomous Vehicle Signalling Requirements” (AVSR) ask GRE and the FRAV informal Working Group for further guidance and whether GRE and FRAV share the view of the Chair of the GRE TF AVSR of the necessity to amend the relevant vehicle lighting regulations as pointed out in Table 11 of the Final Report.