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Convention on Road Traffic (1968):
Automated driving

Comment on the Draft terms of reference for elaboration of a non-binding advisory instrument dedicated to the highly automated and/or driverless vehicles which would serve the Contracting Parties to the 1949 and 1968 Conventions on Road Traffic

Submitted by International organization of motor vehicle manufacturers (OICA)

The document is submitted to provide comments on the informal documents number 1 and number 4 as requested by the secretariat in their email of 11 August 2017. The comments are intended to support WP.1 and the Contracting Parties in their decision making on how to proceed with the elaboration of an instrument or mechanism to deal successfully with autonomous driving systems.

Introduction / Objectives of an advisory instrument for the Contracting Parties:

(a) OICA would like to emphasize the need to consider that at the current stage and for the next years, technology for Automated/Autonomous Driving Systems will continue to evolve rapidly. Procedures that will formally require frequent updates/upgrades of the regulatory framework to enable deployment of the different kinds of systems/functions are not appropriate.

(b) It is important to consider that WP.1 is aiming at regulating the use of new technologies some of which are not available yet. When the Conventions on Road Traffic in 1949 and 1968 where developed, Contracting Parties had already gained experience with Road Traffic Safety for several decades. This indicates that it seems not realistic to regulate each and every topic in detail from the early beginning. We therefore propose to prioritize the different topics, to establish a flexible but founded basis that can be further developed and sharpened in the future as the technology establishes on the market. When it comes to highly automated and so called driverless vehicles, it seems most important that WP.1 agrees on first principles to create a framework for the use of such systems on public roads. Other issues like human driver training seem also important in the long run, but will probably not be that significant at the beginning, as it can be anticipated that mixed traffic between manually driven cars and e.g. driverless shuttles will co-exist for quite a long time.

(c) Thus, there is a need to focus on reaching a common and mutual understanding regarding the content, while the Industry needs a reliable regulatory situation which is important for decisions on product developments. OICA is involved in the work of the Informal Group on Experts on Automated Driving (IGEAD) and trusts that decision taken by the WP.1 are robust and stable, irrespective of the procedural issue (interpretation, guidance, protocol, amendment or common understanding).

(d) Furthermore, there is a need to avoid further discrepancy between the different Conventions on Road Traffic Safety: Focus and agree on procedures and principles that are supported by the Contracting Parties that have signed either or both of the Conventions on Road Traffic (1949 and 1968)

Definitions:

(e) It seems important to define what is meant by “highly automated” and by “driverless” vehicles. OICA proposes to use those definitions as commonly presented by the IGEAD (Informal Document No. 2, WP.1, 21-24 March 2017):

- Advanced Driver Assistance Systems (ADAS), SAE Level 1 and 2 equivalent

- Automated Driving Functions (ADF), SAE Level 3 and 4 equivalent (except driverless systems/functions e. g. shuttles)
- Autonomous Driving Functions (which do not need driver intervention nor a driver at all), SAE Level 4 systems/functions (e. g. shuttles) and SAE Level 5 equivalent

Nature of the Driver:

(f) The scope of the discussions in the IGEAD has until now focused on systems that still require a driver (which is the case for SAE Level 3 and some Level 4 functions where the driver has to take-over at the end of the use-case, e.g. highway).

(g) Fact is that today's text of the Conventions does not define the driver's position at the driver's seat behind the steering wheel. As the Conventions even apply to guided animals, flocks and herds, it becomes obvious that the "driver" who uses leads and reins can also be someone who is "outside". When transforming this principles to new technologies like e.g. Remote Control Parking, there's still a driver who has to use a virtual/digital rein to control the vehicle.

(h) So called driverless systems have not been discussed by the Informal Group in-depth so far and will follow in an important second step. As OICA learned in the discussions of the IGEAD the current wording of the Conventions regarding the nature of the driver seems to leave a certain flexibility. For that reason the terms of reference should not *per-se* rule-out certain solutions/interpretations from the beginning.

Nature of the Passenger/Operator:

(i) The text of the current Conventions address not only drivers, but also passengers and other road users. There will still be Articles that need to apply to the passengers of an autonomous vehicle (e.g. buckle up, secure loading before the journey, do not throw things out of the vehicle nor endanger other traffic participants, etc.) or even to its operator.

(j) As a consequence, the relevant traffic rules/duties that apply to the engaged autonomous system on the one hand and to its passengers or operators on the other hand need to be identified and clarified by analyzing the current text of the Conventions.

Non-Driving Activities:

(k) The IGEAD developed two principles to clarify the driver's non-driving activities for vehicles with automated driving system engaged that were agreed on by WP.1 in March 2017.

Principle 1: these activities do not prevent the driver from responding to demands from the vehicle systems for taking over the driving task, and

Principle 2: these activities are consistent with the prescribed use of the vehicle systems and their defined functions.

(l) OICA does not recognize a remarkable benefit to Road Traffic Safety by further detailing on these principles, since the driver retains certain responsibilities as to remain sufficiently vigilant and use the automated system within its intended use. The Conventions are not detailed road traffic codes, but they enable the Contracting Parties to develop their national traffic codes with respect to those harmonized provisions/principles. The activities that a driver of a vehicle with an engaged automated system may perform are exactly those that will not hamper him or her from complying with the driver's duty: Be willing, ready and able to perform/take-over the driving task whenever requested by the system and not to delay the resumption of the manual driving.

(m) Each Contracting Party can analyze how these two principles work together with their national traffic code and may e.g. (depending on the current structure of the national traffic code) decide to further precise driver's duties as well. In addition the OEM may e.g.

only allow the driver non-driving activities on the vehicle's infotainment system that have been tested and verified to be safe and manageable with system's take-over requests (this is covered by the prescribed use of the system that is not only part of the owner's manual but e.g. also reflected by disclaimer messages etc.).

(n) The two principles mentioned above apply to automated systems that still require a driver (which is the case for SAE Level 3 and some Level 4 functions where the driver has to take-over at the end of the use-case, e.g. highway). It is obvious that the provisions of Article 8 (6) apply to drivers of conventional vehicles and, in case of automated functions, only if they still require and thus have a driver. But when it comes to autonomous vehicles, there are several other passages of the Conventions that have to be discussed in order to reach a common understanding of the Contracting Parties. This presumably will require a considerable amount of time. OICA has concerns in terms of delays if WP.1 engages in a discussion on non-driving activities for Automated Driving Systems by going beyond the two agreed principles.

Use synergies and competences of both WP.1 and WP.29:

(o) Behavioral law as a part of the Conventions on Road Traffic under the scope of WP.1 and the national traffic codes under the scope (national) of the Contracting Parties define the role of the driver. In parallel to the activities of WP.1 and the IGEAD, WP.29 has started to update and/or develop technical provisions for future automated driving systems. The technical vehicle regulations will increasingly include requirements to support the driver in behaving in an appropriate way (by following the intended use of the function). The requirements drafted by WP.29 will therefore also shape the behavior of the driver and the discussions include e.g. topics with regard to drivers who fail to respond to a take-over request. There are many requirements under discussion for ADAS and Automated Driving Systems where the desired driver behavior should be supported /monitored by suitable technical means, e.g.:

- detection of driver availability (e.g. Hands-Off-Detection, seated/unseated, buckled/unbuckled, head and/or eye movement)
- HMI: e.g. sufficient lead time for take-over; warning cascades: e.g. visual and acoustic/haptic warnings
- automatically switch-off non-driving activities on vehicle's infotainment in case of a system's take-over request or warning is issued

(p) Besides, the requirements under draft in WP.29 include data storage for automated driving. Such data elements of a storage device will e.g. prove how the system "behaved" and as well how the driver "behaved". It will e.g. be analysed if the system worked properly (sufficient lead time for take-over, warning cascades) and how the driver behaved (did the driver comply with the prescribed use of the system, how did he react etc.).

(q) The collaboration that was already initiated between WP.1 and WP.29 (e.g. by installing an "ambassador") will be more and more useful in the future and should be further increased. This will allow to avoid double work, to further increase efficiency and speed and to further deepen trust, knowledge and exchange to reach the common aim: bringing safe automated driving functions on the roads.

Working process to develop instruments/mechanisms for autonomous driving systems:

(r) The IGEAD members provided in March 2017 a first version of a Guidance Paper containing the common understanding of the Vienna and Geneva Convention with regard to the use of automated driving functions. The content of this document received a good resonance among the Contracting Parties of the IGEAD and WP.1 (Contracting Parties that have signed both or either of the two Conventions!).

Based on this, the group has developed as well the common understanding regarding other activities than driving for automated driving (the Principles) and an outlook for autonomous driving.

(s) Hence, OICA does not see the necessity nor the benefit of setting up another group of 5 country representatives and the Secretariat to address the issues instruments/mechanisms for automated and autonomous vehicles. OICA therefore proposes to use the existing IGEAD to explore and elaborate an instrument or a mechanism to allow Contracting Parties to deal with autonomous driving systems.