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This document provides report of the Informal Group of Experts on Automated Driving (IGEAD) on its meeting of February 2022.

Report of the state of play concerning developing AV regulation in various countries based on the 20th meeting of IGEAD (9.-11.2.2022)

Composed by Kirsi Miettinen

1. General overview

The 20th meeting was arranged on 9.-11.2.2022 between 12-14 CET each day. The meeting was organized in a work-shop manner, with the aim to explore the best practices or ideas discovered in your respective countries or organizations. During the three days the following presentations were given:

- Professor Oliver Carsten and Dr. Rino Brouwer gave a more thorough view of the work carried out by the User Stream of the Functional Requirements for Automated Vehicles (FRAV) subgroup of Working Party of Automated/Autonomous and Connected Vehicles (GRVA) under WP.29. Professor Carsten presented the interaction requirements for AVs and Rino Brouwer talked about possible user roles in vehicles with automation. The work in still under development in the FRAV (see especially https://unece.org/sites/default/files/2022-01/GRVA-12-23e.docx) and Validation Method for Automated Driving (VMAD) groups of GRVA.

- Marine Molina presented the ADS-state of play of French regulation relating to both experimental and permanent national frameworks. France is amongst those few countries that have already given ADS-related legislation. The experimental French framework consists of the following pieces of legislation:
    - "Pacte law" (article 125/Law no. 2019-486 of May 22, 2019),
    - Ordinance No. 2016-1057 of August 3, 2016 amended relating to the experimentation of vehicles with driving delegation on public roads https://www.legifrance.gouv.fr/loda/id/JORFTEXT000032966695/
    - Decree No. 2018-211 of March 28, 2018 amended relating to the experimentation of vehicles with driving delegation on public roads . https://www.legifrance.gouv.fr/loda/id/JORFTEXT000036750342
    - Order of 17 April 2018 (amended) relating to the experimentation of vehicles with driving delegation on public roads https://www.legifrance.gouv.fr/loda/id/JORFTEXT000036868691

  The permanent French framework consists of the following:
    - "LOM" law (article 31 & 32/Law no. 2019-1428 of December 24, 2019) https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000039666574
    - Ordinance No. 2021-443 of April 14, 2021 relating to the criminal liability regime applicaple in the event of the circulation of a vehicle with driving delegation and its conditions of use https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043370894
    - Ordinance no. 2021-442 of April 14, 2021 relating to access to vehicle data https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043370884
    - Decree No. 2021-873 of June 29, 2021 implementing Ordinance No. 2021-443 of April 14, 2021 relating to the criminal liability regime applicable in the event of circulation of a vehicle with driving delegation and its conditions of operation use https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043729532

- Kirsi Miettinen presented initial thoughts of Finland on how to proceed with AV regulation. Finland has launched a national project to implement the forthcoming amendments of the Vienna convention, and the work will proceed in phases.

- Arne Zielonka talked about Germany's approach for implementing automated, autonomous and connected driving. Germany is another European country with already existing regulation in the field. The current German legal landscape is as following:
    - Act on Intelligent Transport Systems in Road Traffic and their Interfaces with other modes of transport (Intelligent Transport Systems Act – IVSG, implementing Directive 2010/40/EU)
    - Eight Act amending the Road Traffic Act (2017) ≈ Act on Automated Driving (Level 3)
    - Act amending the Road Traffic Act and the Compulsory Insurance Act ≈ Act on Autonomous Driving (Level 4)
    - The accompanying Ordinance for the implementation of the Act on Autonomous Driving is currently being finalized.
- Beau van Ooijen told about the Netherlands policy preparation for automated vehicles. The emphasis is currently to gain more knowledge and use that both nationally and in international contexts. In the Netherlands the Experimental Law allows remote driving with a permit and the Delegation on granting exemption for exceptional transport (Boev) makes exemptions possible with the driver in the vehicle.
- Hiroko Mizuno presented both the already existing legal framework of Japan for "automated driving systems" (level 3) as well as Government Road Map and the discussion of the Study Committee for the new regulatory system for level 4 vehicles. Hence, Japan is also amongst those countries that have already implemented legislation directly concerning automated driving. The National Police Agency is currently in the process of amending the Road Traffic Act on the basis of the results of the Study Committee.
- Hans Berg from Sweden talked about the idea to transform the Goal for Driver Education matrix (GDE) in to the driving competence goals for automated vehicles. This would mean that goals would be written in a language that uses active verbs.
- Jessica Uguccioni from the United Kingdom presented the GB perspective on AV regulation. The UK gave in 2018 an Act on the Automated and Electric Vehicles which already e.g. defines automated vehicles for civil liability purposes. The Law Commission has conducted a very thorough work to consider new laws to regulate vehicles that can drive themselves on roads and public places, consisting of three rounds of consultations between November 2018 and December 2020. The final report of the work was published on January 26, 2022 (https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jsxou24uy7q/uploads/2022/01/AV-Summary-25-01-22-2.pdf).

Distinguished experts of IGEAD, Professors Bryant Walker-Smith and Marieke Martens took actively part in the discussions and offered cross-cutting remarks on the presentations in the end of each day.

2. Dividing ADS equipped vehicles into two categories

There seems to be a tendency to divide the ADS featured vehicles into two categories. We either talk about 1) vehicles that can be driven by a human being (situated inside the vehicle, these are typically being private passenger cars), or 2) remotely controlled vehicles in which the humans inside the vehicle can only be passengers (or in the case of goods transport there are no humans inside the vehicle). In the latter case the typical example is the shuttle busses, which are now moving to the service production face around the world. This division is done either expressly or in practice by targeting specific regulation to the latter category. It seems that by separating these two categories things get easier to understand and explain. The two categories have rather different issues that needs to be solved on the regulatory level.

In Japan, the government roadmap for realization of the automated driving sets targets and timetables for private vehicles, logistics services and transport services (for passengers).In the UK, the binary classification of ADS features as proposed by the Law Commission consists of vehicles with User-in-charge (UIC) and vehicles with No User-in-charge (NUIC). In Germany, the Act on Autonomous Driving of 2021 is focused on autonomous shuttles, i.e. driverless vehicles as people and goods mover, whereas the Act on Automated Driving of 2017 deals with vehicles that have the driver (inside the vehicle). France has also targeted specific legislation to “Automated road transport systems (ARTS), which are remotely controlled vehicles, like shuttle busses, on pre-determined routes offering public transport services for the people.

3. What is regarded as” self-driving”

Categorising the levels of automation for regulatory purposes relates to the question, when can we say that the automated driving systems are so safe and otherwise capable that the human intervention as a driver is no longer needed while the ADS is engaged. There is reluctance to use SAE levels at least in the actual regulatory texts for this purpose, and this may well relate to the fact that SAE level 3 still causes confusion in this respect.

It seems that the regulatory initiatives define the required level of competences of the ADS with certain generally formulated wording. On the top of that, the regulatory regimes may often require some sort of permits or licenses granted by national authorities in order to guarantee the traffic safety. The general requirements and the outcomes of the national examining processes of the systems may or may not match with some specific SAE level/-s.

According to the FRAV-document referred to by Professor Carsten, Automated Driving System ADS is defined as “meaning the hardware and software that are collectively capable of performing the entire DDT on a sustained basis”. In the paper, there are five core safety aspects defined:

1. The ADS should drive safely.
2. The ADS should interact safely with the ADS vehicle user(s).
3. The ADS should manage safety-critical traffic situations.
3. The ADS should safely manage failure modes.
4. The ADS should maintain a safe operational state.

These safety recommendations will be accompanied by additional information describing more closely the meaning of each requirement, and this work is still under development.

In Japan, the Ministry of Land, Infrastructure, Transport and Tourism MLIT defines the conditions (ODD) under which it finds the performance of the ADS to conform to the vehicle safety requirements. The conditions include location (route), speed, weather and other conditions.

In the UK, by definition the ADS feature must be capable of controlling the vehicle so as to drive safely and legally. According to the Act of 2018, the Secretary of State keeps a list of AVs that are designed or adapted to be capable of safely driving themselves. On the top of

the international type approval systems or domestic AV technical approval scheme there is an authorisation phase, and a vehicle cannot be regarded as "self-driving" without the approval.

In Germany, the Eight Act amending the Road Traffic Act of 2017 explains further what is meant by motor vehicles with a highly or fully automated driving function. Amongst the six requirements are that the vehicles are equipped with technology that, when activated, is able to control the motor

vehicle — including longitudinal and lateral control — to perform the driving task and is able, while the vehicle is being controlled in the highly or fully automated mode, to comply with the relevant traffic rules and regulations for operating a vehicle. Such vehicles also needs to be licensed in accordance with section 1(1) of the law, and they also need to be type-approved.

In France, the driver-delegated vehicle can be partially, highly or totally automated. The permanent national regulatory framework allows the traffic on French roads of vehicles equipped with ADS as soon as they are type-approved. However, for "Automated road transport systems – ARTS" the framework lays down the safety rules and safety demonstration procedures, as well as attributions of the French "technical department of guided transport" which is in charge of granting accreditations to approved qualified organisations in charge of safety demonstrations.

In was argued in the Finnish presentation that there are basically only two options: we are either dealing with ADAS, when it is the human driver who shall at all times be able to control his/her vehicle, or we are dealing with ADS, when that responsibility should lay with the system.

4. Human roles with ADS equipped vehicles that can be driven by a human being

Defining the user roles when driving automated vehicles was a task that originated in FRAV. The exercise came up with many different roles that are currently parked aside in FRAV. The work, however, is continued in HF-IRADS. In the still ongoing work of defining user roles that was pre-sented by Rino Brouwer, the term " a user" is general term and the term "driver" is a sub-term linked to the certain user roles. The user role for a vehicle with automation is currently defined as a role in which the user is or may directly (= in real-time) be involved in the execution of the driving task. Currently it is also proposed to call a user a driver when the user has full control/assisted control/supervisory control at the tactical and/or operational level of the driving task. To identify possible user roles the driving task level (strategic, operational and tactical) was combined with the operation mode (how is the driver involved) and the locus of operation (where is the user), which resulted in more than 600 different combinations. Clearly not all of them made sense or were meaningful. At the moment 13 possible user roles (with the user inside the vehicle) are distinguished.

As already expressed in the FRAV-work, a single person can switch user roles during a drive, depending on the available automation. Hence, the dynamic control can switch from the human to the ADS and back along the journey.

Finland argued that from the human-centric perspective it is very important to make the division of responsibilities clear in the future legislation. The role of the driver is linked to the "driver responsibility" which is expressed in the Vienna Convention Art. 8(5) as following: "Every driver shall at all times be able to control his vehicle." Hence it is necessary to define the role of the human when he/she is not having the dynamic driving task in a manner that helps to clarify the responsibility issue. A user (of some kind) would be an option, which would lead to the clear distinction between "the driver" and "the user (of some kind)". Also the Netherlands underlined the need to make it crystal clear, who is in charge.

In the UK, the Law Commission proposes the term "User-in-Charge (UIC)", which is an AV-user performing Dynamic Driving Task (DDT) before of after the ADS to complete a trip and/or performing non-DDT relating responsibilities (like maintenance/safe loading/child seatbelts).

The responsibilities of the human when not driving

In the Law Commission proposals, to the human role when the ADS is engaged belong the need to be qualified and fit to drive, need to be inside the vehicle, as well as a need to have the access to the control. Furthermore, the UIC must be receptive to a transition demand. The UIC must only pay attention to a transition demand, he/she does not need monitor the environment, vehicle or the way it drives. The Law Commission advocates for clear messaging on prohibited non-driving related activities for UICs, as well as cautious approach with them: the use of mobile phones and sleeping should be prohibited, and use of only such screens that cut out allowed.

In Japan, under the current regulation, the ADS will automatically fulfill obligations related to driving operation (safe driving obligation, obeying traffic signals and speed limits, keeping a safe following distance, etc.). The driver carries out these obligations by using the ADS properly, but the driver is still responsible for them. Prohibition of talking on a mobile phone while driving and prohibition of watching a screen continuously do not apply to the driver using the ADS properly, because the driver does not have to constantly monitor the driving environment or operate the vehicle. For example prohibition of drunk driving does apply to drivers using the ADS properly, because he/she could be required to take over control.

In Germany, a person who activates a highly or fully automated driving function and uses such a function to control the vehicle, shall also be deemed to be a driver even though he does not control the vehicle manually within the framework of the use of these functions as intended. The driver may divert his attention from other traffic and control of the vehicle while a vehicle is being controlled by highly or fully automated driving functions. He/she must, however, remain sufficiently alert that he/she can retake control of the vehicle without delay if the automated system prompts him to do so, or if he/she realizes or, because of obvious circumstances (such as a road sign or snow), must realize that the conditions for using the highly or fully automated driving functions for their intended purposes are no longer being met.

In France, the driver must be constantly in a state and in a position to respond to a request for control when the vehicle is partially or highly automated. The driver must also be in a condition and in a position to take control without delay to comply with a summons or with instructions to stop issued by a civil servant or agent, and to facilitate the passage or to give the priority to a vehicle of general interest (e.g. emergency vehicles).

5. Automated transport services

Developing company roles

Vehicles that are being used to offer automated transport services only have humans as passengers inside, or in case of logistics services, no humans inside. Such vehicles are somehow remotely managed, and quite often operate on certain routes or defined areas. It is quite logical that in the absence of “the driver”, it is necessary to define the responsible parties and the responsibilities they need to take care of.

As discovered e.g. in Japan and UK, there are DDT-related tasks that are more difficult to perform solely by the ADS and non-DDT-related tasks (like maintenance, insurance, software updates and reporting duties) that the ADS can not perform. Such things need careful assessment.

In France, the permanent legislative framework defines the roles of the service organiser, the system designer and its operator, as well as those of the approved qualified organisations. The modes of interaction between a human supervisor and the transport system and the level of qualifications of human supervisors are also defined.

The German Act on Autonomous Driving places obligations on manufacturers of the motor vehicles with autonomous driving functions and the keepers of such vehicles. The latter must take care of e.g. maintenance and to ensure that the tasks of the technical oversight are performed. The law also introduces a new figure “the technical supervisor” and defines those duties.

In the Law Commission´s proposals the NUIC operators would need a license that would require good repute and financial standing, the remote control center situated in the UK and professional competence demonstrated by safety management system.

6. Criminal liability and regulative sanctions

Changes in the human role leads quite logically also to the changes in criminal liabilities that used to lay with the driver, and to the questions who/which entities should we hold responsible when something goes wrong, and what are the suitable consequences in the new situation. The area of regulatory sanctions will evidently become more useful than before. One more thing to resolve is the question should we put more weight on the responsibility of the companies than on the individuals acting on behalf of them. The experts, professors Walker-Smith and Martens agued both that we need to challenge the companies, not for example the CEO´s.

In the already existing pieces of regulation, some changes to criminal liabilities have already been introduced. This means relieving the burden of the humans in the user role to some extent, and also placing the companies under some criminal liability (e.g. in France). However, as regards the companies, more emphasis will be probably placed on the administrative rather than criminal sanctions. Individual human beings may face new liabilities as employees in the remote control centers.

In the UK, the UIC would have immunity from dynamic driving offences, when the ADS has the dynamic control according to the Law Commission´s proposals. An Authorised Self-Driving Entity ADSE could get regulatory sanctions if it fails to meet safety case performance or breaches the road rules. As concerning the NUIC operators, the focus would be on corporate accountability, and not on the individual staff in the centers.

In Japan, the Study Committee came to the conclusion that it should be possible to take administrative sanctions for the transport service operators e.g.in the case of non-compliance with the approved plan.

The French permanent legislative framework includes adaptation of the criminal liability regime applicable to the human driver using automated driving systems. It also includes criminal sanctions on authorized persons (working in the remote management centers).