

Distr.: General
14 September 2016

Original: English only

Economic Commission for Europe

Inland Transport Committee

Working Party on Road Traffic Safety

Seventy-third session

Geneva, 19 – 22 September 2016

Item 3 (c) of the provisional agenda

Automated driving

Automated driving

This document, submitted by the Chair of WP.1 Informal Group of Experts on Automated Driving, provides a report of the Group's fourth meeting that was held on 1 July 2016 in London, England.

**4th MEETING OF THE WP1 INFORMAL WORKING GROUP
ON AUTOMATED DRIVING**

London, 1 July 2016

REPORT

Chair: Mr. Joël Valmain (F)
Secretary: Mr. Olivier Fontaine (OICA)
Venue: UK Department for Transport, London, UK
Date: 1 July 2016

INTRODUCTION

The chair organized a tour de table for introducing the new attendees.
Dr. Sachin Suchak, Head of the UK Regulatory Programme for Connected and Autonomous Vehicles, welcomed the participants to the meeting. The chair transmitted the apologies from the co-chair, Mr. Peter Striekwold (NL).
The agenda was adopted with no change.

1.- UPDATE OF DEVELOPMENTS

Update of relevant developments (Violeta Bulc/EC letter, Gear2030, UNECE, Declaration of Amsterdam, Sub-group of G7 Ministers of Transport, on "Automated and Connected driving and ITS")

The chair underlined the recent release of information concerning a fatal accident in the USA, involving a vehicle equipped with driver assistance system (Tesla).

The chair then started the meeting by the observation that, in EU, 2015 faced a (slight) increase of fatalities in road traffic for the first time after more than 10 years of reduction. This triggered a kind of alert from Mrs. Violeta Bulc, EU Commissioner in charge of Transport (see document WP1-IWG-AD-04-02) urging to continue the same measures, but investigating in addition the new tools of automated vehicles, connected vehicles, etc. the chair stressed the possible existing confusion within the EU Institutions between automated and connected vehicles. The "Declaration of Amsterdam" adopted under the Dutch presidency of the Council of Ministers of the UE developed ambitious road safety targets for 2019, yet without clarifying the difference between automated and connected vehicles. In the European Commission, a lot of different DGs (MOVE, CONNECT, GROW, etc.) deal with the issue of automated vehicles, which makes the situation unclear.

The European Commission informed about their regional development:

- DG GROW (for vehicles): o Framework Directive, General Safety Regulation are legal tools for triggering road safety
- Gear 2030 looks at the future of the vehicles, where important aspects are automated and connected vehicles (report with recommendations, roadmap for safety).

- DG MOVE (Mobility and Transport): Follows WP1, owes a unit dedicated to ITS, another one dedicated to road safety, to discuss issues related to connectivity. 1st phase is completed, 2nd phase starts after the summer 2016
- High-level group for road safety: in this group, high level representatives (Directors General) of the Member States come together to share how to improve road safety within EU.

Its expert pointed out that roadworthiness and other items must be taken into account. He indicated the need for good coordination between those making rules for the vehicles and those for user behaviour.

The chair stressed that nobody challenged the statement that automation and connectivity will improve road safety, yet this is still to be confirmed.

G7 sub-group on automated and connected driving. The group was informed about a G7 Ministry conference in September 2016 in Japan, where a Declaration of the G7 Ministers of Transport will be released, confirming the importance of the international cooperation in this field.

Update of regulations/laws/provisions in different countries:

The UK representative reported about the Queen's 2016 speech with regard to autonomous vehicles ("Modern Transport Bill"): among others, there is a wish that the legislation will put the UK at the forefront of safe technology in the autonomous vehicles industry, ensuring appropriate insurance is available to support the use of autonomous and driverless vehicles. There would be no obstacle to testing provided that you comply with the rules of traffic, insurance, etc.

The representative of the NL explained that his country is currently drafting a new legislation for testing of automated vehicles. An internet consultation will be organized in this regard. He committed to provide an English version of the draft legislation (see document WP1-IWG-AD-04-05).

D informed about the establishment of a federal experts' group on ethical decision making in automated vehicles.

S informed about a governmental inquiry delivered in April, with a proposal to guidelines to perform tests on Swedish roads, where the Swedish Transport Agency should provide a kind of approval. The procedure must still be established.

B informed that the country is currently establishing a code of practice. The applicant first gets an approval for the prototype from federal agency, then goes to the regions for ability to drive on roads. The agency is currently awaiting the final approval by the Parliament. The text and procedure are deeply based on the UK code of practice.

E: the representative from Spain informed that they are currently writing a new version of code of code for vehicles (this code basically sets the conditions and requirements for vehicles, their registration and life-cycle, see attached document for more information), with a chapter dedicated to automated vehicles, aiming at opening the door to the new technologies. It is expected that this Code will be enacted by 2017. The expert re-assured that E is still working on ratifying the Vienna Convention, in parallel to national regulation's modification process.

The expert from FIN informed that there is a procedure for the testing of automated vehicles in Finland. He clarified that the text was accepted in March 2016.

The chair, as representative from France, anticipated that in August 2016 there will be binding rules for testing. In addition, a high-level inter-ministerial meeting [Ministry of Transport (Road

infrastructure and Vehicles Safety regulation), Ministry of Economy and Industry and Ministry of the Interior] of the High Committee on Automated Driving will regularly take place to ensure that decision-makers are aware of automated driving. This body is expected to meet 3 times a year, before WP29 and WP 1 meetings, such that France speaks with one voice and that a clear mandate be given from the political level, to speak at WP1 and WP29.

Moreover France is thinking that it will be soon necessary to include other concerned Ministries like Justice, Health, Research, National Education, etc...

There was a last minute information from the chair of WP1: NHTSA and WP29 will organize a 2-day dedicated autonomous vehicle event in the Silicon Valley. The dates still to be defined.

Conclusion:

- All contracting parties to provide an English summary of the situation in their countries, with possible internet link.
- Chair to request the other contracting parties at WP1 to provide the same.
- Information to be available on the website of WP1-IWG-AD.

2.- DEFINITION OF LEVEL 5

To which extend should “autonomous” be defined?

Level 5

The chair pointed out that the media sometimes confuse the wordings like autonomous driving, driverless and self-driving.

The expert from the UK was of the opinion that “automated” similar to “autonomous”, because it depends on the level of automation in the vehicle. A level 4 vehicle may behave the same way as a level 5 in the relevant situation. He added that there may be sub-classification in Level 5.

D did not share this opinion: “Autonomous” is equal to “driverless” while “Automated” needs a driver.

F informed about a growing request from the local authorities that the public transports may be driverless (they face budget pressure and need to gain efficiency e.g. in the driving personnel).

The expert from Spain supported F that there is a need. He however found that automatization is more a functionality than a characteristic of the vehicle: *“When I use my car in driverless mode, then I’m not a driver anymore, rather a passenger”*.

Yet NL replied that, in terms of liability, someone must be liable. A human must be involved, at least for ordering the destination, similar to the liability a citizen may have when guiding his animals.

FIN wondered why discussing this definition. The expert was of the opinion that a clarification will be needed when the group will enter the discussions on the role of the driver. He stressed that this discussion confirms the need for close connection with WP29. When the autonomous vehicles will be type-approved, there will be a need for a clear link.

S was of the opinion that it is important to work out common definitions between WP 1 and WP 29. WP 29 will probably have to develop regulations which will make it possible to approve vehicles or systems in relation to a certain definition, level or functionality. WP 1 may develop regulations for the role of the driver in relation to these definitions, levels or functionalities. The expert from S supported FIN on the need to work in cooperation with WP29. The chair pointed out the danger of making too early strict definitions.

The UK stressed that the important is the purpose of the definition. The expert distributed the chart that was used in the UK for distinguishing the levels (see document WP1-IWG-AD-04-06 – can be found at

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/536365/driverless-cars-proposals-for-adas-and_avts.pdf).

D explained that it has to analyse the chart distributed by the UK today in the meeting.

OICA clarified that “autonomous system” means that the system does not require a driver for the driving tasks, where the human in the car is a passenger with no further obligation or liability on the driving tasks. The expert informed that OICA defined the idea of “intended use” which is the instruction to the driver how to operate the system. As an example, the Tesla case (fatal accident occurred in May 2016) was most probably a misuse: the vehicle was in assistance mode while the driver seemed to use it in automated mode. The “intended use” is indicated in the owner’s manual and as for any product, the user is expected to use the product in the intended use.

Debate:

E confirmed the need for a good cooperation and supported a clear definition of the 3 states: “automated”, “autonomous” and “self-driving”. The expert suggested adding “brain-off” in the chart of document WP1-IWG-AD-04-06. He informed that in the Spanish code for vehicles, there will be a level allocated to each vehicle. It is being considered and analyzed whether to identify levels of automation with a dedicated sticker for identification on vehicle’s windscreen.

The expert from D stressed the importance of the purpose of the definition: on the basis of a preliminary assessment the current versions of the Vienna Convention/Geneva Convention do not seem to permit driverless vehicles, hence there might be a need for action in that regard. The expert was sure that the SAE levels are a good start for defining Level 5 – autonomous/driverless driving. Regarding Level 5 the group might have to differentiate between technical aspects and behavioural law-aspects. Concerning the cooperation, the expert reminded that the group already identified this need. The expert outlined that the group could consider whether to establish a tool such as a steering group for coordinating the actions.

S supported D on the need to cooperate. ACSF is defining categories A to E, while the WP1-IWG-AD members are the persons responsible for defining the duties of the drivers in relation to the technical systems.

OICA pointed out the misunderstanding: at ACSF, there is no discussion on the levels of automation, rather on the functionalities. The expert from OICA informed that the WP29-ITS/AD will invite the WP1-IWG-AD for well presenting the situation. The expert proposed to the ambassador (M. Asplund) to jointly prepare such meeting in September 2016.

F took the example of the PAS (Park Assist System), where the rules are different according to the countries, illustrating the need for good cooperation with the WP29 experts. He emphasised the high demand from the manufacturers for this cooperation.

Conclusion:

- The group convened it is too early to decide on a definition.
- All to send their definition of “automated”, “autonomous”, “driverless”, just for discussion.
- WP1-IWG-AD to take the SAE chart as a reference document, under the form of document WP1-IWG-AD-04-06.

3.- NECESSITY OF AMENDMENT TO THE CONVENTION

“Is there a need for amendment to the Conventions in order to make sure that automated driving is really addressed and then allowed on open roads?” Revision of the inputs received to date. The chair introduced the subject, informed that F could not reply yet to the questions, as some internal organizational items had first to be finalized. He recalled that the group acknowledged difficulty in amending the Geneva Convention. The email inquiry (see Annex 1 to the report) showed a tendency toward a “side document” that could avoid amending the conventions. Yet the aim is to provide recommendations to WP1 on the way to proceed. The chair informed having received some requests for interpretation from the Industry with regard to the possibility, according to the Vienna Convention, to apply certain technologies. He then asked the following question: “Do we all agree that the last amendment to the Vienna Convention does not allow highly automated driving?”

- B: allows levels 1 to 5, but under the condition that there is a driver in the vehicle and that the systems are deemed to be in conformity with the UN regulations.
- S: supported B, but the text allows the use up to level 3. Yet the driver still must decrease the tasks other than driving. However S was of the opinion that level 4 would be possible provided that when the human driver does not drive the vehicle, he or she is not defined as the driver.
- France pointed out that “minimizing the other tasks” does not mean “doing nothing at all”.
- FIN: supported B, the text does not restrict the systems, rather its use.
- UK: need to read the amendment in the context of the Vienna Convention, hence the UK have no clear answer to the question
- D: the group should focus on cases where the driver is needed / not needed. The group should better concentrate on “driver not needed”, thus the WP1-IWG-AD needs a future-oriented approach to cover “driverless” systems.
- NL: today there must anyway always be a driver involved to comply with Article 8 of the Vienna Convention. In addition, the other activities still need to be minimized.
- OICA: the convention still needs some improvement
- European Commission: independently of the form it would take, an amendment is needed.

Debate:

S: when the driver is not in control, then he is not a driver. The delegate insisted that some sort of amendment must be done: should the same or other rules apply to the human vs. the system? The chair recalled the appeal from the manufacturers for harmonization of the rules. He insisted on the need for a good education of the users by the manufacturers. The manufacturers may risk selling their systems as permitting any tasks other than driving. Yet the chair declared that it is not up to the manufacturers to decide which tasks are permitted or not to the driver, rather this WP1-IWG-AD group and its parent body WP1.

E: the Vienna Convention must now take into account the new situation. The delegate questioned how many lives can be saved via the automated driving technology. The chair insisted that the statement that AD will improve road safety – even if it is well admitted that it will be the case - was never proved. He suggested that some study be done on this. The secretary informed that the answers to the questions will be collected into a separate document, and be available on the UN website. D challenged this idea as the input via e-mail has been provided as a basis for discussion in WP 1-IWG-AD. The expert preferred that the report only reflect the debate of this session, and that the opinions sent by emails be added as an annex to the report.

The chair pointed out that the AD technology makes us turn a new page in the history of the motor vehicles, and urged the group to write this new page.

UK found that the question should be “what can we do for improving the situation” rather than “is an amendment necessary”. The expert suggested using the inherent flexibility which is already present. If we add a new protocol, it will finish in a situation where the contracting parties will have to sign the protocol. We can e.g. issue a statement, during the technology progress, then amend the conventions when the technology is mature for the countries that need it. If there is an obstacle to the technology now, then we may lose the opportunity to saving lives; we should be “enabling”, not building walls. The chair recalled that the Geneva Convention and the Vienna Convention are already divergent. The manufacturers may not have all the spectrum of road safety in their mind when offering a new technology. And studying the answers received to date, it is necessary to act anyway, for avoiding the emergence of barriers to the technology. UK insisted that the right question should be “what could we do to improve road safety?” As the technologies do not exist yet, we risk blocking their emergence of these technologies by making the wrong moves with the conventions. The expert pointed out that it will be difficult to achieve consensus within WP1 on a change of either texts.

D found it necessary that some action be taken in order to permit a safe introduction of autonomous driving. Complementing the feedback sent via e-mail D explained that – on the basis of a preliminary assessment – an amendment or Protocol could be needed for autonomous (driverless) driving. The existing flexibility also has its limits. At the same time the realization of technology in a safe way needs to be supported. Due to technological advancement there is a need to tackle issues of driverless driving rather soon. B recalled that on the technical point of view, the conventions are quite flexible, only the behaviour of the driver is regulated. UK recalled that none of the conventions defines the driver as a human being, rather as a “person”, when a person can be a legal vs. a physical person. In that sense, a driver can be an individual or corporation.

NL supported the UK, and stressed that regulating will be possible when we know what vehicles will exist in the future.

The European Commission pointed out that even the path of the text interpretation, as recommended by the UK, would have to be adopted somehow, and that could also be difficult and time-consuming.

S could support some kind of explanatory note. This could be fast enough, permitting not to be always behind the technology. The expert was of the opinion that there are two ways of interpreting: “what is the purpose?” vs. “what do we need now?”

UK pointed out that the item is about how to use the existing flexibility such that the technology is introduced safely. They suggested doing this via proper interpretation of the texts. There was a conflict on the anticipation of the consequences of the decision: the chair challenged the idea of interpretation because in practice, there would need too much WP1 sessions to provide new interpretations for new technologies, at least as much sessions which would be needed to discuss an “amendment” . The chair found that the authorities already have been going very far in the interpretations of the conventions by permitting some vehicles equipped with hands-off technologies (as an assistance system only).

The secretary questioned the logics of preventing from a certain solution just because the tool (in this case the Geneva Convention) to achieve this solution is difficult to adapt. He suggested to further scrutinize the feasibility of amending the Geneva Convention, or at least the procedure to amend the Geneva Convention. He informed about the precedent of the 58 Agreement, where amendments are assumed accepted by a contracting party unless it informs that it cannot accept the amendment.

D also raised doubts concerning an interpretation of the Convention-texts. This would be difficult and costly in terms of time. The focus for the future should be on how to deal with

driverless driving. In this regard convergence between the two Conventions is needed. This was also expressed in the letter written by the Chair of WP 1 (document WP1-IWG-AD-04-04).

E suggested that the group work on short term and mid-term simultaneously.

The chair supported that idea, i.e. short term as an interpretation of the conventions for the WP1 session of September, and mid-term still to be defined (e.g. amendments of the conventions). The chair questioned whether, within the contracting parties present around the table, it is permitted in their territory to drive on a highway with the hands off the steering control. He also had the concern that automation incites the drivers to resign from the monitoring of the driving tasks.

S: yes it is allowed to drive hands-off, but the legal responsibility is on the driver.

UK: the expert did not see any problem for Remote Control Parking (RCP: ultra-low speed), as long as the driver can exercise the control of the vehicle. In case of misuse, the driver can be prosecuted. For higher levels (e.g. Level 4), the question is more difficult. With RPC (Remote Parking Control), we can be sure that the driver is in the loop (not having the hands on the steering control cannot be used to prosecute the driver), not with higher level systems.

D could support the idea of giving a recommendation concerning RCP to WP 1. D also stated that the conditions of the Vienna Convention/Geneva Convention have to be met with – this includes that the driver has to be able to control the parking operations at all times. D also stressed the need to think already now about the future technologies of driverless driving. The chair formulated the concern of some authorities that the automated technologies lead to the accusation: “you are putting the driver in a situation of being fined”.

OICA explained that there will be requirements in the amendment of UN-R 79 regarding the driver availability recognition. OICA further committed to periodically present the recent amendment efforts to the IWG WP.1/AD.

About EDR (Event Data Recorder), the group was informed about the difference between DSSA (at Data Storage System for ACSF at the WP29-GRRF-ACSF level) and EDR (in EU level). EDR is in the list of the priorities of the European Commission.

B repeated that some amendments are needed under their opinion.

J pointed out that not all options have been studied in the group. S supported that point of view.

D pointed out that harmonization is the goal, as mentioned in the letter from the chair of WP1 (document WP1-IWG-AD-04-04). The expert outlined that the group should aim at a convergence of the conventions.

FIN strongly supported the idea of investigating the solution of the protocol for clarifying the interpretations of the conventions.

Conclusion:

- All to reconsider their opinions and send them to the chair before September 2016
- Common interpretation that the use of RCP is legitimated under the current Vienna/Geneva Conventions
- Chair to elaborate a document showing the possible options forward
- Common goal to make progress in the interpretation of the conventions. D asked to delete this sentence.
- Opinions sent by emails to be added as an annex to the report (done by Annex 1)

4.- HOW TO COORDINATE THE WP1 IWG ACTIVITIES WITH HE WP29 GRRF DEVELOPMENT

FIN, as ambassador, reported about the brief ITS/AD meeting at the last WP29 meeting. The document on the definition of the levels (ITS/AD-08-05) would be worth to distribute, together with data privacy and the cyber security document. Yet the document may be misleading, the DIL/DOL item may confuse the experts. The group was informed about a meeting that will take place on 19 September to address the possible simplification of the document and to produce a consolidated version of it.

OICA updated the group on the progress made at ACSF at its 7th meeting (London, 28-30 June 2016). The expert regretted that no real progress was achieved since the last meeting. He informed about the problem that some existing systems (Lane Keeping Assist System – LKAS) will be categorized under a new category (ACSF), with new requirements, such that lengthy technical discussions took place. The next meeting of the GRRF-ACSF informal group is scheduled early September in Sweden (Stockholm, 6-8 September 2016).

There was a debate and some explanations on the exemption procedures at EU level for new technologies (EC/2007/46 - A20). The European Commission representative raised the concern that the new technologies are now related to software.

There was a commitment from OICA to update the group about the discussions at ACSF, on the legislative point of view as well as on the technical point of view.

The chair raised two concerns:

- What is expected from the driver?
- How do the manufacturers teach the traffic rules to the automatic systems?

He informed that in France (but surely also in other countries), the traffic rules are often to be interpreted by the judges, hence he wondered how can a machine deal with such complex environment?

The ambassador proposed to hold a joint meeting perhaps once a year, for levelling the understanding of the technical capabilities of the automated systems. The Secretary pointed out that the presence of OICA and CLEPA in the meeting is for the purpose of providing the technical background. S was keen that the WP1 informal group be involved into the decision process of the technical regulation. D suggested that in addition the WP1-IWG-AD also communicate its outcomes to the WP29 fora. It would be up to the ambassador to do that.

Conclusion:

- Take the opportunity of the common week in September to organize a joint meeting (see item 7 below)
- OICA to present the progress of the work of GRRF-ACSF at next meeting
- WP1-IWG-AD and ITS/AD to meet once a year, details to be further elaborated

5.- RECOMMENDATIONS TO WP1

Recommendations of IWG/AD members to WP 1 on already existing automatized driving tasks on the market, i.e. for instance remote park assist (driver outside of the vehicle) and semi-automated driven cars on motorways were discussed.

There was a consensus on the PAS.

Yet the chair questioned the group about partly automated driving on motorways.

For UK, the difficult case is more level 4 rather than the lower levels.

The Chair proposed to elaborate a document showing the possible options forward.

D and OICA suggested presenting to WP1 the agreement on RCP in addition to the different options.

Conclusion:

- Chair to use the UK document.
- Chair to inform that the group failed to achieve a clear statement.
- Chair to communicate that it is better provide a good input with delay, rather than bad recommendations in time.
- Chair to elaborate during the summertime a document showing the possible options forward.
- Clarification that the use of RCP functionality is in conformity with the Vienna/Geneva Convention.

6.- ANY OTHER BUSINESS

7.- DATES OF NEXT MEETINGS

- Possible coordination meeting in the evening of 19 September, at the UNECE premises; Ambassador and OICA to coordinate this organization.
- Email exchanges between now and the WP1 session of September for elaborating the communication to WP1.

Annex 1

Compilation of answers from the parties attending WP1-IWG-AD to the key questions raised by the chair together with the distribution of the agenda of WP1-IWG-AD-04

1. Update of relevant developments (Violeta Bulc/EC letter, Gear2030, UNECE, Declaration of Amsterdam, Sub-group of G7 Ministers of Transport, on "Automated and Connected driving and ITS")
2. Definition of level 5 (especially to which extend we define autonomous)
3. **Necessity of amendment of Conventions**
4. How to coordinate the WP1 IWG AD activities with the WP 29 GRRF development
5. Recommendations of IWG/AD members to WP 1 on already existing automatised driving tasks on the market, i.e. for instance remote park assist (driver outside of the vehicle) and semi-automated driven cars on motorways.
6. AoB
7. Next meeting

Request for input from the Chair regarding point 3: do you think that an amendment to the Conventions is needed in order to make sure that automated driving is really addressed and then allowed on open roads?

- If no, why?

- If yes, to your opinion, what would be the best way: continuing amending the Vienna Convention based on our Belgian and Swedish colleagues' proposal already discussed at our last meeting? Or writing a new text / legal instrument in order to have a specific text for automated driving while Geneva and Vienna Conventions wordings would remain as they are nowadays regarding the control by the driver of non-automated cars?

Thank you for sending your answers/input by the end of May 2016, it will help speeding up the discussion at the next meeting in London and avoiding wasting time.

Answers of the Contracting Parties regarding item #3

JAPAN Dear colleagues

Japanese point of view regarding the question made by Oliver is as follows.

In principle, we are of the view that an amendment to the Conventions is necessary for full-automated vehicle to be allowed on open road, given that the Convention provides "every vehicle shall have a driver".

Thus, as a measure to ensure the consistency between full-automated vehicle and the Conventions, we are of the view that it is a natural path to amend the provisions, including Article 8, of the Conventions. However, if there are any more feasible and reasonable options other than the amendment to the Conventions, we could consider such options.

(We think that examination from the legal aspect is essential to consider the feasibility of the options, and we are now considering in close cooperation with our Ministry of Foreign Affairs who is responsible for the interpretation of the Conventions in Japan. If respective countries have such other authority too, please refer to our way.)

SPAIN Dear All,

Regarding questions made by Olivier, Spain considers that it is not so simple to answer. It should be analyzed in depth, which will be the implications and limitations of an amendment to the deployment of automated vehicles and whether the current articles of Vienna Convention allow these systems to drive or not, literally or by using legal interpretation techniques.

All in all, before taking the decision to amend V.C., we all must be sure that this is the best option and obviously, thinking in the future and, with a long-term vision, try to do our best for a long-lasting regulation.

UK

Dear colleagues

With regards to question asked for item 3, Piers and I do not believe that the answer is a simple 'yes or no'. I attach a paper that sets out our reasoning for your consideration.

I look forward to seeing you in London on 1 July.

Amending the Geneva and Vienna Conventions on Road Traffic

The answer to the question “should the Geneva Convention and Vienna Conventions be amended to support higher levels of autonomy” is not a simple ‘yes or no’.

Arguments can be, and have been, made for both positions. For example, at the recent G7 preparatory meetings in Germany and Japan, delegates had different views on whether changes were needed. While, in the WP IWG AD meetings, some delegates have expressed significant support for changes to the Vienna Convention. The academic work of Bryant Walker Smith¹, provides well-reasoned arguments that the Conventions already support higher levels of autonomy.

There is risk in stating that change is needed

The prize of safer roads, through the safe introduction of connected and autonomous vehicle (CAV) technology to the vehicle fleet, is huge. Delays to commercial introduction carries a cost that can be measured in lives lost and injuries that could have been prevented, as well as missed direct and indirect economic benefits (eg in R&D, and manufacturing, as well as congestion etc).

If international discussions continue to be framed on the basis of ‘needing’ to amend the conventions, there is a risk that the amendments would be seen as a prerequisite for deployment and use – thus creating costly delay. In addition:

- failure to secure positive support from 2/3rd of Geneva contracting parties for CAV amendments, as seen with the proposed ADAS amendments, could be perceived as a block on deployment in countries that had ratified that convention.

- there would be confusion in countries that had ratified and were bound by both conventions, if changes were made to Vienna but not Geneva under circumstances where countries continued to argue that changes to Geneva were also needed.

Consensus would be needed across both sets of contracting parties in order to secure convention change. And, it is clear that, at this stage, consensus does not exist. In the interim (and possibly longer term), a more flexible interpretation could well be the answer.

¹Automated Vehicles Are Probably Legal in the United States, Bryant Walker Smith, University of South

Carolina - School of Law; Stanford Law School Center for Internet and Society, 2014. Abstract and download

available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2303904

For discussion purposes only. This paper does not represent the formal position of Her Majesty's Government

There is flexibility in the conventions

It can be argued that the conventions, as currently written, already provide a significant

amount of flexibility that would support the introduction of CAV technologies.

Drivers and control

For example, the English language text of article 8 of both Conventions states that drivers “*shall at all times be able to control*” their vehicles. The implication is that the driver can, at

times, not be in control. As the term ‘control’ is not defined, article 8 could be seen as compatible with SAE level 3 and 4 automated driving – the driver is either:

- Actively monitoring, and has to resume driving if the system fails or exceeds operating parameters (level 3); or
- Disengaged from driving, but able to resume control if they so wish, or actively driving in use cases that exceed the capability of the vehicle (level 4)

One could even theorise that level 5 (full autonomy) is compatible with article 8 where the driver has the ability to control the vehicle. For example, if they can switch the self-driving system on and off, or issue commands (eg destination or routing options). In this later case, it would seem to match with the provisions for driving animals (Geneva A4, Vienna A1.v), where the driver is able to control by guiding animal's actions rather than exercising direct control over every single action at all times.

In addition, WP1 IWG AD has agreed that, for the purposes of testing CAV technology, a driver does not need to be in the vehicle, as long as they are able to exercise control of that vehicle (ie if something were to go wrong with the self-driving vehicle). The UK has used the term operator for a driver that is not in the vehicle.

Does a driver have to be human?

Both conventions state that every vehicle shall have a driver (Geneva A8, Vienna A8.1), and that a driver means any person who drives a vehicle [...]. (Geneva A4, Vienna A1.v). Neither convention defines that a person must be a human. The closest reference states that “*A vehicle [...] is owned by a natural or legal person [...]*” (Vienna 1.b.i). This opens the possibility that a driver could be a natural person, ie a human, or a legal person, such as a corporation.

While it is recognised that the concept of a legal person as driver may not always fit well with all of the articles in both Conventions, it is important not to rule out the possibility of interpreting “driver” flexibly. A flexible approach raises the possibility of the driver being a corporation in some circumstances under the Conventions. So it might be possible to argue that driver can be a different person (natural or legal) for different parts of the journey or for different driver roles and responsibilities. For example, the driver might, at the start of the journey, be a human who turns on the automated function and then be a corporation

For discussion purposes only. This paper does not represent the formal position of Her Majesty's Government

who is responsible for the driving task when the automated function is in operation (eg SAE Levels 4 and 5).

From a safety perspective the key will be to have legal rules in place, through a combination of domestic laws and guidance, supported by international regulations, that makes it clear

who is legally responsible for being able to control the vehicle at any point in time. This

opens the possibility that once domestic laws and guidance and international regulations have evolved to cater for a wide spectrum of automated vehicles the “driver” for the purposes of the Conventions could in some circumstances be a corporation, made legally responsible under domestic law, and not anyone actually in the vehicle.

Inflexibility will create delay

If the conventions are interpreted as inflexible, then the commercial introduction of potentially lifesaving CAV technology will have to wait until amendments are made. As discussed at the last WP1 plenary session creating a suitable amendment may not be as simple as just changing the definition of a driver; a protocol to both conventions may possibly be required. Complexity will add time, and more importantly contracting parties must take care that in trying to support new technologies, that they do not inadvertently stifle progress by over regulating at an early stage, and ‘locking out’ potential benefits by stipulating how a system should work.

CAV technology is still in its infancy, and it is not clear how it will operate (and there may be many routes to full autonomy). Without that clarity, it is difficult to see how amendments to the conventions can be made in a way that will avoid the pitfalls of overregulation or poor regulation. Also, as discussed previously, without consensus it is equally difficult to see how the Geneva Convention could be amended.

A way forward

Ultimately, the conventions need to support technological developments that improve road safety and smooth efficient movement of people and goods. The attraction of amending the Geneva and Vienna Conventions – potentially with a protocol that sits alongside both – as a way of ensuring this is understandable. However, the risk of making amendment a prerequisite is one that should be avoided, given uncertainty of how to amend or if amendments can be secured at all, otherwise the conventions may act as a block on progress.

On that basis, it is possible to argue that, if contracting parties for both conventions take a more flexible interpretation, technologies can be brought to market sooner. This would allow countries to secure the safety benefits of CAV technology sooner. And, with the knowledge of how the technology works, amendments could be made ‘after the fact’ to provide clarity for those who need it. This would avoid stifling progress, and reduces the risk of contracting parties having to change amendments that caused problems.

SWEDEN Dear Mr. Fontaine,

From a Swedish point of view we are still of the opinion that the 1968 Convention (and also the 1949 Convention) constitutes an obstacle to the development of higher levels of automated driving.

We think that the principles of the Swedish – Belgian proposal still are valid, especially regarding the obligations of the technical system. The system should basically have the same obligations and should show the same behavior as a vehicle with a human driver.

If it is possible to have a new specific text, protocol or other type of legal instrument, which would circumvent the problems with amending the 1949 Convention, Sweden is in favor of that. However, if this is not a possible way forward we are of the opinion that we should continue our work amending the 1968 Convention.

FINLAND Dear colleagues,

Our preliminary view is that we need amendments to the convention(s) to fully facilitate at least the fully autonomous driving - even if we get around the question of driver by interpreting that the driver is the person "pushing the button", the formulations in conventions might not be ideal to reflect the actual situation on who is responsible to monitor the traffic conditions etc. If this could be solved through a separate protocol, that might be the optimal solution, especially taking into account the difficulties in amending the Geneva Convention, but we are open to other solutions.

We are especially going to look closely into the very interesting paper sent by our UK colleagues and see if there is a possibility for a part of the solution there.

SWEDISH-BELGIAN Proposal

Amendment of Article 8

Article 5bis is amended as follows (parts in bold):

5bis. Vehicle systems , **other than those meant in article 5ter and quater**, which influence the way vehicles are driven, **by taking over some of the driving tasks of the driver**, shall be deemed to be in conformity with paragraph 5 of this Article and **with the first sentence of** paragraph 1 of Article 13, when they are in conformity with the conditions of construction, fitting and utilization according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles.

Vehicle systems, **other than those meant in article 5ter and quater**, which influence the way vehicles are driven, **by taking over some of the driving tasks of the driver**, and are not in conformity with the aforementioned conditions of construction, fitting and utilization, shall be deemed to be in conformity with paragraph 5 of this Article and **with the first sentence of** paragraph 1 of Article 13, when such systems can be overridden or switched off by the driver.

~~(When vehicles are driven by such a vehicle system, the driver must at all times be able to assume control over the vehicle when the vehicle system alerts him to do so.)~~

This is the amendment going into force on the 23th of March 2016. The parts in bold are necessary to be consistent with the changes in article 5ter and quater, to clearly state that this § is about systems taking over **some of the driving tasks of the driver** and also to state that it is not the whole first paragraph of article 13 which is concerned but only the first sentence of article 13, §1.

This paragraph is about systems of SAE level 1 (steering or acceleration/deceleration, ex. lane keep assistance, advanced cruise control) and level 2 (steering and acceleration, ex. lane change assist). The human driver performs all remaining parts of the driving task and shall at all times minimize any other activity than driving (cf. art. 8, §6). In view of this the last sentence of §5bis seems not necessary.

Two new paragraphs (i.e., paragraph 5ter & 5quater) are to be inserted into Article 8.

The paragraph 5ter shall read as follows:

5ter Vehicles systems taking over all of the driving tasks of the driver, other than those meant in 5quater, shall be deemed to be in conformity with paragraph 5 of this Article and with the first sentence of paragraph 1 of Article 13, when they are in conformity with the conditions of construction, fitting and utilization according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles.

When vehicles are driven by such a vehicle system paragraph 6 of this Article does not apply. However, the driver must at all times be able to reassume control over the vehicle when a vehicle system alerts him to do so.

This paragraph is about systems taking over all driving tasks in particular use cases, with the exception of those taking over all the driving tasks during the whole journey as foreseen in §5 quarter. When those systems take over the full control over the vehicle in a certain use case, it is no longer necessary that the driver minimizes any other activity than driving. Therefore §6 does not apply in case the system takes over the full control over the vehicle in a certain use case.

This paragraph is about SAE levels 3 (all aspect of the dynamic driving task, driver is fallback) and 4 (all aspects of the dynamic driving task, system is fallback if driver does not respond appropriately to a request to intervene), example is a system taking over the full control over the vehicle on a certain stretch of highway. Because the vehicle system only takes over the full control over the vehicle in a certain use case, there is thus always a driver necessary to drive the car manually to reach the place where the system can take over the full control over the vehicle.

For road safety reasons there is no distinction made between level 3 and 4. Because also in level 4, at the end of the use case, the driver shall have to reassume the control over the vehicle it seems wise that the driver is at all times able to reassume the control over the vehicle when the systems asks him to do so. Being able to reassume the control does not imply that the driver may not do other things, it just implies that he is awake, not drunk, has a proper driver license etc. Even in level 4 the system will ask the driver to reassume the control but if the driver doesn't respond the system will act itself as fallback and stop the car at a safe place.

The paragraph 5quarter shall read as follows:

5quarter Vehicles systems assuming all of the driving tasks from departure until arrival, shall be deemed to be in conformity with paragraph 5 of this Article and with the first sentence of paragraph 1 of Article 13, when they are in conformity with the conditions of construction, fitting and utilization according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles¹.

When vehicles are driven by such a vehicle system paragraph 1 does not apply.

This paragraph is about systems taking over all driving tasks from the beginning of the journey until the end (example is a fully automated shuttle bus driving around in a restricted area). In this case a driver is no longer necessary.

For such vehicles it seems from the viewpoint of road safety that it should not be possible that such a vehicle could also be driven manually, WP29? If they can be driven also manually these systems should be considered as of level SAE 4, and thus a driver able to (re)assume the control is necessary.

General remark: the reason that the SAE levels as such are not mentioned explicitly is because they might change in time, the SAE scale is not binding and in each country different classifications might be used. Therefore I opted for a more general wording, such as **some or all of the driving tasks**. The most important being that if a system takes over only some of the driving tasks, the driver still is in control and if the system takes over all the driving tasks the driver is no longer in control.

¹ The UN Regulations annexed to the "Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be fitted and/or be used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions" done at Geneva on 20 March 1958. The UN Global Technical Regulations developed in the framework of the "Agreement concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts which can be fitted and/or be used on Wheeled Vehicles" done at Geneva on 25 June 1998.

Article 3, §1

Add a point c):

c) In view of keeping up with technical and technological progress and improving road safety, and having regard to the usefulness of carrying out experiments before proposing

amendments to this Convention, it shall be open to Contracting Parties to derogate from the provisions of this Convention, for experimental purposes and temporarily, on certain sections of road.

GERMANY

Dear colleagues,

For some reason the formatting in my last Email got confused... See below again the text of my Email with (hopefully) better formatting:

First of all, apologies for the delay.

1. Do you think that an amendment to the Conventions is needed in order to make sure that automated driving is really addressed and then allowed on open roads?

From our point of view, amendments to the Conventions are necessary in order to enable all automated driving systems, including autonomous driving systems.

2. If yes, to your opinion, what would be the best way: continuing amending the Vienna Convention based on our Belgian and Swedish colleagues' proposal already discussed at our last meeting? Or writing a new text / legal instrument in order to have a specific text for automated driving while Geneva and Vienna Conventions wordings would remain as they are nowadays regarding the control by the driver of non-automated cars?

It shall be the aim to find a solution in the near future which allows for both legal certainty and technical advancement. We should consider all options – amending the Conventions themselves as well as creating a new separate Annex /Protocol.

According to our preliminary legal analysis a separate Annex/ Protocol would have the same legally binding character as an amendment to the Convention(s). Additionally, the procedure to be applied in order to pass a separate Protocol seems to be similar to the procedure to be applied in order to amend the Vienna Convention itself. That is something that ought to be considered and discussed in our group. Our suggestion would be that IWG "AD" requests the UNECE Secretariat to clarify whether or not the procedure to amend the Conventions is to be applied to the adoption of a separate Annex/ Protocol as well. However, in order to ensure that the Protocol applies to all Contracting States a provision could provide for that the Protocol only comes into force when all Contracting States have ratified it. This could also be discussed.

From our point of view, a horizontal provision in a Protocol/ Annex could be convenient as the necessary rules regarding automated driving systems, including autonomous driving systems, would be clearly combined in one specific document.

I am looking forward to meeting you again in London.

Kind regards,

Jan Michael Schüngeler

THE NETHERLANDS

Dear Colleagues,

Please find below our answers to the questions posed to us.

Do you think that an amendment to the Conventions is needed in order to make sure that automated driving is really addressed and then allowed on open roads?

We feel that it is too early to draw any conclusion on this subject. We find the UK paper very interesting and worth for further discussion. We advocate a proper scrutiny of the current text and options to arrive at a common viewpoint, shared by all (or a majority) of the IWG-AD members.

If yes, to your opinion, what would be the best way: continuing amending the Vienna Convention based on our Belgian and Swedish colleagues' proposal already discussed at our last meeting? Or writing a new text / legal instrument in order to have a specific text for automated driving while Geneva and Vienna Conventions wordings would remain as they are nowadays regarding the control by the driver of non-automated cars?

As said above: we currently do not feel that it is a yes or a no. If it is a yes than we should consider the following points:

- In accordance with the German point of view an amendment of the Conventions or a Protocol has both the same legally binding character. If it is easier to get a new Protocol into force than an amendment, perhaps a Protocol would be the best option.
 - A Protocol is like a Convention itself and therefore also contains articles for the settlement of disputes, articles on who may amend the Protocol, and so on. However, when using a Protocol the articles of the Convention will not be amended. A protocol is often used for a topic that is related to the original Convention but is not the same topic, it is an addition. Some protocol examples:
 - Protocol on Road Markings, additional to the European Agreement supplementing the Convention on road Signs and Signals opened for signature at Vienna on 8 November 1968;
 - Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context;
 - Kyoto Protocol to the United Nations Framework Convention on Climate Change.
 - In our case the topic for driving with a driver or with a system is road safety (or safe driving) and most of the obligations of the Convention that apply to a driver should apply to a system in the same way. For instance obligations with regard to overtaking, passing of oncoming traffic, behaviour of drivers towards pedestrians and so on. From that point of view we think an amendment is the better option.

I am looking forward to meeting you in London,
Florent
Florent van Gogh
Senior lawyer

ITALY (Chair of the WP.1)

Amending the Geneva and Vienna Conventions on Road Traffic

The process of amending an international Treaty is an extremely complex and time consuming procedure. As far as Road Traffic is concerned, the two Geneva (1949) and Vienna (1968) Conventions – classified as open treaties (which means that accession to them is possible at any moment in time) –deal with all the issues of Road traffic aspects which were deemed to be of utmost relevance at the time of the editing and signing.

The detailed procedure for making any amendments is embedded in each of the Conventions and mirrors the main rules which apply to international treaties. These rules seek to preserve and safeguard the original text from alteration or modification unless Contracting Parties have been notified of any amending proposals, and unless they have expressed their consensus.

Some treaties, such as the 1949 Geneva Convention, have an even more complex procedure, and incorporate a very high threshold which needs to be reached before any amendments can enter into force . At the time, this procedure was quite deliberately incorporated into UN treaties in order to thwart changes and modifications unless the desire to make amendments was virtually almost by unanimous consent.

In this context, while the recent WP1 amendment to article 8 to the 1968 Vienna Convention has completed its diplomatic path and entered into force in March 2016, the parallel “ twin” amendment of Article 8 to the 1949 Geneva Convention has not been successful. This is precisely because of the minimum (very high) threshold required for making amendments to the Treaty, which has largely been missed.

As a unique Intergovernmental body dealing with Road Safety at global level, and having in its mandate three Treaties (namely the two above mentioned Conventions on Road Traffic and the Convention on Road Signs and Signals), WP1 is now called upon to determine how to manage the unbalanced legal situation, whereby the two Conventions on Road Traffic now have non- equivalent provisions in Article 8. This particularly affects several countries which are Contracting Parties only to Geneva Convention.

For those countries which are Contracting Parties to both Conventions, in fact, there would be no need to insist upon them updating the 1949 Treaty. This is because the subsequent Treaty deals with the same subject and it is therefore considered to be the prevailing one according to the legal provisions which state the temporal succession of the Treaties¹. Nevertheless, both Conventions fall within WP1 mandate and the need for a clear defined approach is of paramount importance. Actually, the need for a common approach is even more relevant and necessary bearing in mind that within the next decade technological advances are likely to advance vehicles from their already highly automated mode to one which can provide fully autonomous driving.

Despite the best endeavours of WP1 and more specifically of the IWGAD, concerns have been raised that, continuing with the quest to amend the 1949 Convention in the light of the now novel Article 8 of the 1968 Convention, and continuing with the updating process , could be very time- consuming and also produce an uncertain outcome.

¹1969 Vienna Convention on the Law of the Treaties,
<https://treaties.un.org/doc/Publication/UNTS/Volume%201155/volume-1155-I-18232-English.pdf>

Academic studies² and related literature suggest the opportunity of adopting an interpretative approach to the Conventions so far as the role of the driver is concerned, and also the human interaction with the automated (stages 3-4) and autonomous vehicle.

These studies could undoubtedly provide an excellent theoretical basis for the investigation of what really needs to be the subject of rules under a new legal approach; and, also, what could perhaps be left behind, since it does not really contribute any more in the context of a “digital realm of road transport”. It may indeed be relevant to explore the role and responsibility, which will eventually still remain with the human driver; and correspondingly, eventually re-shapes the new role as “vehicle operator”. If this were to be the new situation for the current vehicle “driver” the full set of provisions for holding a driving license would need to follow this significant shift, and to be modified accordingly. Last but not least for consideration would be the dilemma of legal liability (as between the manufacturer, owner, operator); and the importance of framing the chain of responsibility in a clear, shared, approach. All of these issues would clearly need to be considered.

Therefore, it would still be a priority for WP1 to focus on the importance of delivering defined key principles and offers fundamental guidelines on all the key subjects (eg role of the driver, liability). These are the principles which are nowadays incorporated anyway within the Convention.

In the alternative, if we were to adopt a regulatory standstill which instead relied on Contracting Parties applying a “domestic Interpretation” to the Conventions, the outcome may well not be as rewarding as it may appear. Whilst apparently offering the attractiveness of simplicity and less administrative effort, such an approach would be likely generate legal uncertainty; and, it would certainly be counterproductive in the context of overlapping international *modus operandi*.

Hence, returning to the quest for finding a feasible solution to the current apparent impasse, it has to be said that the complexity of amending Treaties (within a considerable passage of time hampering the efficacy of the envisaged legal guidance) is not something affecting only our Traffic Conventions. On the contrary, the need for the Conventions to be flexible and able to cater for the global economic regional shifting and societal challenges has prompted international actors to work on alternative parallel legal tools, which are seen as ancillary to the main diplomatic documents (so called Soft Law approach³)

A good example can be the Montreal Protocol which serves as an adjunct to the 1985 Vienna Ozone Convention, and is regarded as a prototype for an evolving new form of international cooperation. This Protocol provides a sort of binding –non binding voluntary agreement, and is therefore a very constructive, flexible, legal instrument.

One of the main reasons for implement “Agreement”, “Decision”, “Recommendations”, and “Protocol”, is that their law-creating and law updating structure empowers the capacity and expertise of international organization entities. This procedure of making law within a common, over-arching international framework offers a flexible tool enabling the interested countries to obtain a consolidated agreement on a specific subject.

The co-operative and solid relationship between a Convention and the related protocol (or agreement), can help to shape an international regulatory regime which sets uniform obligations and principles for the contracting parties to the protocol (agreement). At the same time, such a process precludes the prospect of differing or contradictory legal interpretation.

In case of a Protocol dealing with the Automated/autonomous driving, it is clear that the eventual ancillary protocol should serve both the 1949 and the 1968 Conventions, because

² http://cyberlaw.stanford.edu/files/publication/files/2012-Smith-AutomatedVehiclesAreProbablyLegalInTheUS_0.pdf

³ http://www.minnesotalawreview.org/wp-content/uploads/2011/08/ShafferPollack_MLR.pdf

those treaties set the basis on which supplementary protocols are built. Accordingly, it is not possible to become party of a protocol unless the country concerned is already (or is due to become) a contracting party to the originating Convention.

Dott.ssa Iorio Luciana , UNECE-WP1 Chair.

OICA

Dear Colleagues from the WP1-IWG-AD,

Please see below the OICA answer to the chair's request for input:

“The current provisions in the Conventions provide flexibility for interpretations with respect to automated driving. However, an amendment especially for autonomous functionalities that do not require a driver at all seems to be necessary.

Besides proceeding in amending the text of the current Conventions, WP.1 IWG “AD” should also take into consideration the solution of a new protocol (e.g. agreement/recommendation) to promote a convergence of the traffic rules with respect to autonomous driving”

Best Regards,
