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## Legal Aspects of Automated Driving

Vellinga, N. E.

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### 3 Automated Driving and its Challenges to International Traffic Law: Which Way to Go?

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**Abstract:** As more and more automated vehicles are driving down public roads for test purposes, it becomes necessary to address the challenges that this technological development poses to law. One of those challenges is the central concept of *driver* in traffic laws, more importantly the Geneva Convention on Road Traffic of 1949 and the Vienna Convention on Road Traffic of 1968. These Conventions form the base of many national traffic laws across the globe. The notion of *driver* is a central notion within these Conventions. In this Chapter, it will be argued that an automated vehicle does not have a *driver* within the meaning of the Conventions. Four different approaches on how to revise the Geneva Convention and the Vienna Convention will be discussed. A comparison of the approaches will bring out the (dis)advantages of each approach and will lead to the recommendation of one of the approaches.

### 3.1 Introduction

Slowly, but gradually, more and more automated vehicles are driving down public roads for test purposes. Given the progress made by several companies during the testing of their vehicles, it will only be a matter of time before these vehicles become available to the general public.<sup>1</sup> Until then, legislators are facing legal challenges, posed by the absence of a human driver behind the wheel. The dynamic driving task - the longitudinal and lateral vehicle motion control, the monitoring of the environment via the detection of objects and events and responding to those objects and events, the manoeuvre planning and the enhancing of conspicuity (signalling, gesturing etc.)<sup>2</sup> – is performed by a human when driving a conventional vehicle. In an automated vehicle, however, the dynamic driving task is performed by the self-driving system of that vehicle.<sup>3</sup>

By shifting the performance of the dynamic driving task from the control of the human driver to the self-driving system gives rise to legal questions regarding traffic laws. The Geneva Convention on Road Traffic of 1949 and the Vienna Convention on Road Traffic 1968, which lie at the base of many national traffic laws, are built around the notion of *driver*: in the 35 articles of the Geneva Convention, the word *driver* is used 30 times, whereas in the Vienna Convention (56 articles) the word *driver* is used over 140 times (all excluding annexes). Both Conventions are of great global importance as Contracting Parties are required to base their national traffic laws on the Conventions (art. 3 Vienna Convention, art. 6 Geneva Convention), therefore leading to uniform traffic rules across borders. At the moment of writing, the Geneva Conventions has 97 Contracting

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<sup>1</sup> For instance, Google claims to have driven over 8 million miles with their test vehicles on public roads: <waymo.com/ontheroad/> accessed 15 August 2018.

<sup>2</sup> SAE International, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. Standard J3016* (revised June 2018) 6-7. See also Economic Commission for Europe Inland Transport Committee (75th Session) 'Automated Driving, Informal document No. 8' (4 September 2017) 9-10; John A Michon, 'A Critical View Of Driver Behavior Models: What Do We Know, What Should We Do?' in L Evans, RC Schwing (eds), *Human behaviour and traffic safety* (New York: Plenum Press, 1985).

<sup>3</sup> The strategic functions involved in driving, such as the scheduling of the trip and determining a destination, are always performed by a human. SAE International, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. Standard J3016* (revised June 2018) 5-7; Economic Commission for Europe Inland Transport Committee (75th Session) 'Automated Driving, Informal document No. 8' (4 September 2017) 10.

States,<sup>4</sup> whereas the younger Vienna Convention has 77 Contracting Parties (several of which are also party to the Geneva Convention).<sup>5</sup>

The legal questions regarding traffic law discussed in this paper, are primarily questions of public law. The outcomes of these questions are, however, also important for tort law as the violation of a statutory rule, such as a traffic rule, can give rise to liability.<sup>6</sup> In regimes with a no-fault compensation scheme, as discussed recently in this journal,<sup>7</sup> this is of lesser importance. A no-fault compensation scheme would provide compensation without needing to identify a liable person, or obtain proof of negligence and causality, thus making the question of whether or not a statutory rule has been violated less relevant to obtaining compensation.<sup>8</sup>

In this chapter, reference will be made to the SAE Levels of automation. SAE International has described six levels of automation, ranging from Level 0 (no driving automation) to Level 5 (full driving automaton).<sup>9</sup> For the purpose of this chapter, ‘automated vehicle’ means a SAE Level 4 or an SAE Level 5 vehicle.<sup>10</sup> These vehicles are able to drive themselves either for an entire trip (Level 5) or part of a trip (Level 4).<sup>11</sup>

What are the consequences of the absence of a human behind the wheel, and the resulting shift in the control over the performance of the dynamic driving task, for the Geneva and Vienna Conventions? Do these Conventions require

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<sup>4</sup> The United Nations Economic Commission for Europe (UNECE), ‘UN Transport Agreements and Conventions: Convention on Road Traffic, of 19 September 1949’ (*unece.org*) <[www.unece.org/trans/maps/un-transport-agreements-and-conventions-07.html](http://www.unece.org/trans/maps/un-transport-agreements-and-conventions-07.html)> accessed 28 June 2018.

<sup>5</sup> The United Nations Economic Commission for Europe (UNECE), ‘UN Transport Agreements and Conventions: Convention on Road Traffic, of 8 November 1968’ (*unece.org*) <[www.unece.org/trans/maps/un-transport-agreements-and-conventions-08.html](http://www.unece.org/trans/maps/un-transport-agreements-and-conventions-08.html)> accessed 28 June 2018.

<sup>6</sup> Cees van Dam, *European Tort Law* (2nd edn, Oxford University Press, 2013) 279ff, p408ff.

<sup>7</sup> Maurice HM Schellekens, ‘No-fault compensation schemes for self-driving vehicles’ (2018) 10(2) *Law, Innovation and Technology* 314.

<sup>8</sup> Maurice HM Schellekens, ‘No-fault compensation schemes for self-driving vehicles’ (2018) 10(2) *Law, Innovation and Technology* 314.

<sup>9</sup> SAE International, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. Standard J3016* (revised June 2018).

<sup>10</sup> SAE International, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. Standard J3016* (revised June 2018) 19ff.

<sup>11</sup> SAE International, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. Standard J3016* (revised June 2018) 19ff.

revision in order to accommodate automated driving? In this chapter, it will be argued that, according to the ircurrent interpretation, an automated vehicle does not have a *driver* within the meaning of the Conventions.

Four different approaches on how to revise the Conventions in order to accommodate automated driving will be discussed. First, it will be explored how traffic laws governing other modes of transport that are familiar with a degree of automation accommodate this automation and whether this approach would be suitable to apply to a revision of the Geneva Convention and Vienna Convention [Option 1]. Another way to accommodate automated driving would be to take a novel interpretation of the Conventions. In order to do this, one would need to view the Conventions as ‘living instruments’. Next, it will be considered how the interpretation of the notion of *driver* can depend on the notion’s function [Option 2] and whether or not a user can be regarded to be the *driver* within the meaning of the Conventions when interpreting the Conventions differently [Option 3]. The final approach that is explored is the *functioneel ouderschap* approach, which is based around the theory of *functioneel ouderschap* from Dutch Law [Option 4]. These approaches will be compared to one another, thereby arguing that the *functioneel ouderschap* approach is the preferred option.

### 3.2 The Functions of the Notion of *Driver*

The notion of *driver* is central to the Geneva and Vienna Conventions. The notion of *driver* serves as a starting point for putting requirements in place to guarantee the safe interaction of road traffic. Depending on the context, the notion of *driver* can have a different function. This will be illustrated by examples from the Conventions and from national legislation. Within the Geneva Convention and the Vienna Convention, the notion of *driver* is mainly present in capacity requirements and rules of conduct.

#### 3.2.1 The Function of the Notion of *Driver* in Technical Regulations

In technical regulations, the notion of *driver* serves as a passive object. In this context, the driver has no rights or obligations; the function of the notion is only to describe the person sitting in a certain place in the vehicle. See, for instance, a provision from UNECE Regulation No 79:<sup>12</sup>

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<sup>12</sup> This UN Regulation is, as many other regulations, annexed to the Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which

“Any fault which impairs the steering function and is not mechanical in nature must be signaled clearly to the driver of the vehicle.(...)”<sup>13</sup>

A definition for the notion of *driver* in the technical regulations can be found, for instance, in the U.S. Federal Motor Vehicle Safety Standards (FMVSS):

“Driver means the occupant of a motor vehicle seated immediately behind the steering control system.”<sup>14</sup>

Here the notion of *driver* describes a certain object. The driver in these technical regulations has no rights or duties. The function of the use of the notion of *driver* is merely descriptive.

### 3.2.2 The Function of the Notion of *Driver* in Capacity Requirements

In capacity requirements, the function of the notion of *driver* is more substantive. The driver himself has to meet certain requirements. He has to have the necessary knowledge and skills before he is allowed on the road (art. 8 paragraph 4 Vienna Convention) and he needs a driving permit (art. 41 paragraph 1(a) Vienna Convention). Holding a driving permit is a necessary obligation, as it is proof of his competence to drive. Even if the driver holds a driving permit, he still needs to be in a fit condition to drive (art. 8 paragraph 3 Vienna Convention). These capacity requirements can also be found in national legislation, see, for instance, art. 107 of the Dutch *Wegenverkeerswet* 1994. In this context, the function of the notion of *driver* is to set certain requirements for the driver.

### 3.2.3 The Function of the Notion of *Driver* in Rules of Conduct

Within traffic law, the notion of *driver* is central. The driver has to comply with certain rules of conduct (Chapter II of both the Geneva Convention and the Vienna Convention). A duty of care is often imposed upon the driver. The rules of conduct are directed at (among others) the driver, as he is the one who has

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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 (Geneva, 20 March 1958). This agreement has 52 Parties (incl. the EU) and is referred to in the Vienna Convention on Road Traffic 1968 (see art. 8 paragraph 5bis). See for the current status of the 1968 Agreement: United Nations, ‘Status of the 1958 Agreement (and of the annexed regulations)’ <[www.unece.org/?id=25980](http://www.unece.org/?id=25980)> accessed 25 September 2019.

<sup>13</sup> UNECE Regulation No. 79, 5.4.1.1.

<sup>14</sup> 49 CFR 571.3 (b).

to behave in a certain way. Take, for example, art. 7 paragraph 3 of the Vienna Convention:

“Drivers shall show extra care in relation to the most vulnerable road-users, such as pedestrians and cyclists and in particular children, elderly persons and the disabled.”

Here, the notion of *driver* is not just a description for the person sitting behind the wheel, but rather carries rights and duties within traffic laws. The function of the notion of *driver* is to address someone who is driving a vehicle in accordance with traffic rules. This can also be illustrated through examples from national traffic laws:

Germany:<sup>15</sup> §3(1) Straßenverkehrsordnung (StVO): “Wer ein Fahrzeug führt, darf nur so schnell fahren, dass das Fahrzeug ständig beherrscht wird (...).”

Netherlands: art. 15 lid 1 Reglement verkeersregels en verkeerstekens 1990: “Op kruispunten verlenen bestuurders voorrang aan voor hen van rechts komende bestuurders.”<sup>16</sup>

The rules of conduct show who is responsible for the operation of the vehicle: responsibility rests with the driver. At the base of many liability questions lies the violation of a traffic rule, as breaching a statutory duty can be punishable under criminal law or prove negligence in a civil liability case. However, depending on national criminal law or civil law, certain requirements will also need to be fulfilled in order to assess the liability of the driver. For instance, a causal link, damage or the absence of a ground for exculpation, might all need to be proven before the driver can be held (civilly or criminally) liable. So, responsibility does not automatically equal liability.<sup>17</sup>

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<sup>15</sup> Germany has already taken legislative measures to allow some level of automation of vehicles: §1a-1c of the German StVG on automated driving.

<sup>16</sup> This can be translated as: at an intersection, drivers shall give way to drivers coming from the right.

<sup>17</sup> See with regards to the Vienna Convention: Benjamin von Bodungen and Martin Hoffmann, ‘Belgien und Schweden schlagen vor: Das Fahrsystem soll Fahrer werden!’ (2015) Neue Zeitschrift für Verkehrsrecht 521.

### 3.2.4 The Function of the Notion of *Driver* in Liability Law

In line with the above, the notion of *driver* also has a function in liability law. Whereas in the previous section, the notion's function determined who has to behave in certain ways, the function of the notion of *driver* as discussed in this section takes it a step further: it sees to who bears the legal consequences in the form of criminal or civil liability for misconduct. Depending on national law, the driver could be liable for ignoring the rules of conduct. Under national civil law, the driver could have a duty to pay damages:

§18(1) Straßenverkehrsgesetz (StVG): "(...) ist auch der Führer des Kraftfahrzeugs oder des Anhängers zum Ersatz des Schadens nach den Vorschriften der §§ 8 bis 15 verpflichtet. Die Ersatzpflicht ist ausgeschlossen, wenn der Schaden nicht durch ein Verschulden des Führers verursacht ist."

The notion of *driver* can also be present in a criminal liability context. For instance, driving under the influence of alcohol or drugs can be a punishable offence (see, for instance, art. 8 of the Dutch *Wegenverkeerswet* 1994). If an offender qualifies as *driver*, this can also open up more possibilities regarding punishment. The driver could, for instance, be facing a driving disqualification (see, for example, art. 179 *Wegenverkeerswet* 1994). It is not always the driver that gets punished for his misconduct: under Dutch law, under specific circumstances, the holder of the registration number of the vehicle can be fined for minor traffic offences committed with his vehicle, without being in the driver's seat himself (art. 5 *Wet administratiefrechtelijke handhaving verkeersvoorschriften*).

In this chapter, the function of the notion of *driver* in rules of conduct will be discussed further, as this is the function that is most present in the Geneva Convention and the Vienna Convention. The other functions will be touched upon briefly.

## 3.3 The Notion of *Driver* in the Conventions

### 3.3.1 The Functions of the Notion of *Driver* in the Conventions

Both the Geneva Convention and the Vienna Convention contain rules of the road (Chapter II). These rules evolve largely around the notion of *driver*. The notion's function in this context concerns the function of the notion of *driver* in rules of conduct as discussed above: duties are imposed on the driver. For instance, a driver has to, before making a turn, make sure that he can do so without danger to other road users (art. 12 paragraph 4(a) Geneva Convention)



and the driver should not drive whilst being distracted: “A driver of a vehicle shall at all times minimise any activity other than driving.”(art. 8 paragraph 6 Vienna Convention). These and other provisions are based on art. 8 paragraph 1 Geneva Convention and art. 8 paragraph 1 Vienna Convention.<sup>18</sup>

Art. 8 paragraph 1 Vienna Convention: “Every moving vehicle or combination of vehicles shall have a driver.”

The driver can perform these duties as he is able to control his vehicle:

Art. 8 paragraph 5 Vienna Convention: “Every driver shall at all times be able to control his vehicle or to guide his animals.”

Art. 13 paragraph 1 Vienna Convention: “Every driver of a vehicle shall in all circumstances have his vehicle under control so as to be able to exercise due and proper care and to be at all times in a position to perform all manoeuvres required of him (...).”

### 3.3.2 The Notion of *Driver* and Control

What consequences do the provisions discussed above have for automated driving? The requirement of control seems to leave a bit of room for a driver to let the car handle (parts of) the dynamic driving task, especially art. 8 paragraph 5 Geneva Convention and art. 8 paragraph 5 Vienna Convention. Both provisions require that the driver should at all times be able to control his vehicle. These provisions could, however, be understood as meaning that the driver does not have to exercise that control at all times, it could suffice when the driver is able to exercise that control at any given time. However, even if this is the case, there would still need to be a driver that can exercise the control at any given time. Because an automated vehicle does not have a human performing the dynamic driving task, this raises the question of if an automated vehicle even has a *driver* within the meaning of the Geneva Convention and the Vienna Convention.

### 3.3.3 The Definition of the Notion of *Driver*

The Conventions provide the following definition for *driver*:

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<sup>18</sup> For matters of readability, the Geneva Convention will only be quoted in case it significantly deviates from the Vienna Convention.

Art. 1(v) Vienna Convention: ““Driver” means any person who drives a motor vehicle or other vehicle (including a cycle), or who guides cattle, singly or in herds, or flocks, or draught, pack or saddle animals on a road (...)”<sup>19</sup>

This does not provide much clarity. Is the person who falls asleep behind the wheel still the driver of the vehicle? Or the person who pulls the hand brake from the passenger’s seat? And regarding automated driving: is the person who only decides on the destination of a self-driving vehicle the driver of that vehicle?

#### 3.3.4 The Interpretation of the Notion of *Driver*

There has not been much discussion on the definition of driver in the Conventions.<sup>20</sup> During the drafting process of the Geneva Convention, the matter was raised briefly. The French representative stated “that to define driver, (...), was not to define the word at all.”<sup>21</sup> The French definition of driver in the official translation of the Geneva Convention therefore reads:

“Le terme “conducteur” désigne toutes personnes qui assument la direction de véhicules, y compris les cycles, guident des animaux de trait, de charge, de selle, des troupeaux sur une route, ou qui en ont la maîtrise effective (...);”<sup>22</sup>

Since the rise of driver assistance systems, the notion of *driver* has been subject to discussion in WP.1, the United Nations ECE organ responsible for keeping the Conventions up to date, more frequently. The debate has, so far, not led to a clear position on the definition of *driver*.<sup>23</sup> A complete picture of a more precise interpretation of the notion of *driver* is therefore not yet provided for. However,

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<sup>19</sup> See also art. 4 paragraph 1 Geneva Convention.

<sup>20</sup> Bryant Walker Smith, ‘Automated Vehicles Are Probably Legal in the United States’ (2014) 1 Texas A&M Law Review 411 428-429.

<sup>21</sup> United Nations Conference on Road and Motor Transport, Committee III on Road Traffic, Summary Record of the Seventeenth Meeting Held at the Palais des Nations, Geneva, on Tuesday, 6 September 1949 at 3 pm (21 November 1949) E/CONF8/CIII/SR17/Rev.1 2.

<sup>22</sup> Translated: ‘The term “driver” refers to all persons who assume the direction of vehicles, including cycles, guide draft animals, pack animals, saddle animals, herd animals on a road, or who have effective control.’

<sup>23</sup> See for instance Economic Commission for Europe, Inland Transport Committee (74th Session), ‘Autonomous Driving Informal document No. 2’ (14 March 2017); Economic Commission for Europe, Inland Transport Committee (73rd Session), ‘Autonomous Driving Informal document No. 4’ (14 September 2016).

a closer look into the definition of *driver* given by Contracting Parties in their national laws can provide more insight.

In German law,<sup>24</sup> reference to the *driver* (in German: Fahrzeugführer) is made in, amongst others, the Straßenverkehrsordnung (StVO), Straßenverkehrsgesetz (StVG) and the Strafgesetzbuch (StGB). The German constitutional court (BGH) has described *driver* and *driving* as follows:

“Führer eines Kraftfahrzeuges im Sinne dieser Bestimmung ist, wer das Fahrzeug in Bewegung zu setzen beginnt, es in Bewegung hält oder allgemein mit dem Betrieb des Fahrzeugs oder mit der Bewältigung von Verkehrsvorgängen beschäftigt ist. Bringt ein Kraftfahrer sein Fahrzeug nicht verkehrsbedingt zum Stehen, bleibt er solange Führer des Kraftfahrzeugs, wie er sich noch im Fahrzeug aufhält und mit dessen Betrieb oder mit der Bewältigung von Verkehrsvorgängen beschäftigt ist. Dies ist regelmäßig erst dann nicht mehr der Fall, wenn er sein Fahrzeug zum Halten gebracht und den Motor ausgestellt hat.”<sup>25</sup>

The Dutch interpretation of *driver* (*bestuurder*) deviates from the German definition, even though both countries are parties to the Vienna Convention:<sup>26</sup> if a person influences the direction and/or speed in which the vehicle is moving by operating the controls, he is driving the vehicle and therefore he is regarded to be the driver of that vehicle, regardless of his position in the vehicle.<sup>27</sup> The passenger that pulls the hand brake is at that moment the driver of that vehicle.<sup>28</sup> Even a vehicle that is being towed can have a driver, as long as the

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<sup>24</sup> Germany is party to the Vienna Convention, but not to the Geneva Convention.

<sup>25</sup> Translated: ‘Driver of a motor vehicle within the meaning of this provision is who starts to set the vehicle in motion, who keeps the vehicle moving or who is generally occupied with the operation of the vehicle or with the handling of traffic operations. If a driver does not bring his vehicle to a halt due to traffic conditions, he remains the driver of the motor vehicle so long as he is still in the vehicle and occupied with the operation of the vehicle or with the handling of traffic operations. This is usually no longer the case if he has stopped the vehicle and turned off the engine.’ BGH 4 StR 592/16, 27 April 2017, ECLI:DE:BGH:2017:270417U4STR592.16.0. See with regards to the Vienna Convention: Ulrich Franke, ‘Rechtsprobleme beim automatisierten Fahren - ein Überblick’ (2016) 86(2) Deutsches Autorecht 61.

<sup>26</sup> See also Advies Raad van State, *kamerstukken* II 2017/18, 34838, 4. See more extensively on the Dutch *bestuurdersbegrip*: Joep BHM Simmelink, *Algemeenheden in het wegenverkeersrecht* (Dissertation, Tilburg University 1995), para 2.3.3.1.

<sup>27</sup> HR 13 August 2005, ECLI:NL:HR:2005:AT7292, NJ 2005/542.

<sup>28</sup> HR 13 August 2005, ECLI:NL:HR:2005:AT7292, NJ 2005/542.

person can influence the direction the vehicle is traveling in.<sup>29</sup> A driver does not necessarily have to be inside the vehicle:<sup>30</sup> a person walking next to the car, whilst the motor is running and determining the direction of the vehicle by using the steering wheel, while leaning through the opened window, is the driver of that vehicle.<sup>31</sup>

From these descriptions of the notion of *driver*, it follows that the driver can decide on the direction and speed (lateral and longitudinal control) by operating at least some of the controls of the vehicle.<sup>32</sup> His actions have an immediate effect on the speed and direction of the vehicle, and these decisions are made on the spot. This gives rise to the question whether or not an automated vehicle has a *driver* within the meaning of the Geneva Convention and the Vienna Convention.

### 3.4 The Driver of an Automated Vehicle

#### 3.4.1 The Possible Drivers of an Automated Vehicle

Given these features of the notion of *driver*, who or what can possibly be regarded to be the driver of an automated vehicle? Perhaps the manufacturer of the vehicle, the company that programmed the software, the system of the automated vehicle (the self-driving system), or the person that uses the vehicle to get to work? What these parties all have in common is that in one way or another they influence the direction and/or speed of the vehicle.

##### 3.4.1.1 *The Manufacturer as the Driver of the Automated Vehicle?*

The manufacturer of the vehicle and the company that programmed the software influence the direction and/or speed of the vehicle before the automated vehicle drives down public roads by equipping the vehicle with certain radars, cameras, and by programming the software in a certain way. Can either of these legal persons be regarded to be the driver of the automated vehicle? The definition of *driver* from art. 4 paragraph 1 Geneva Convention and

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<sup>29</sup> HR 2 February 1965, ECLI:NL:HR:1965:AB3467, NJ 1965/281; HR 26 January 1971, ECLI:NL:HR:AB5997, NJ 1971/208; HR 1 December 1987, ECLI:NL:HR:1987:AB7814, NJ 1988/689; HR 2 October 1990, ECLI:NL:HR:1990:ZC8593, NJ 1991/380.

<sup>30</sup> See regarding stepping out of the vehicle: HR 21 October 2003, ECLI:NL:HR:2003:AL3411, VR 2004/36.

<sup>31</sup> HR 12 June 1990, ECLI:NL:HR:1990:ZC8550, NJ 1991/29, VR 1990/158. See also HR 23 February 1999, ECLI:NL:HR:1999:ZD348, VR 2000/81.

<sup>32</sup> See also Joep BHM Simmelink, *Algemeenheden in het wegenverkeersrecht* (Dissertation, Tilburg University 1995) 77.

art. 1(v) Vienna Convention requires that the driver is a person. Although this does not seem to exclude a legal person, given the current state of the discussion, the time of writing of the Conventions and the overall structure of the Conventions (a legal person with a driving permit (art. 41 Vienna Convention, art. 24 Geneva Convention), a fit physical and mental condition of a legal person (art. 8 paragraph 3 Vienna Convention?)), in this context, by *person* a human is meant. Therefore, neither the manufacturer of the automated vehicle nor the company that programmed the software can be classified as the driver of the automated vehicle within the meaning of the Geneva Convention or the Vienna Convention.

#### 3.4.1.2 *The Self-Driving System as the Driver of the Automated Vehicle?*

As the *driver* within the meaning of the Geneva Convention and the Vienna Convention is a human, the self-driving system (SDS) of the vehicle, that makes all the decisions regarding the dynamic driving task, is not the *driver* within the meaning of the Conventions because the system is not human. However, in a different context— that of technical regulations – the notion of *driver* is sometimes interpreted in such a way that it does capture the self-driving system. An example is the interpretation the United States National Highway Traffic Safety Administration (or NHTSA) gave of several US Federal Motor Vehicle Safety Standards (FMVSS): ‘If no human occupant of the vehicle can actually drive the vehicle, it is more reasonable to identify the “driver” as whatever (as opposed to whomever) is doing the driving. In this instance, an item of motor vehicle equipment, the SDS, is actually driving the vehicle.’<sup>33</sup> Even if the definition of *driver* would be different, applying this reasoning to the notion of *driver* in the Geneva Convention and the Vienna Convention would still prove challenging. The *driver* in the Geneva Convention and the Vienna Convention has rights and obligations, whereas the driver in technical regulations (often) has not. In technical regulations, the notion of *driver* is used to describe a passive object.<sup>34</sup>

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<sup>33</sup> National Highway Traffic Administration, ‘Letter responding to a letter from Dr. Chris Urmson (Director of the Self-Driving Car Project, Google, Inc.)’ (4 February 2016) <<http://isearch.nhtsa.gov/files/Google%20-%20compiled%20response%20to%2012%20Nov%20%2015%20interp%20request%20-%204%20Feb%2016%20final.htm>> accessed 9 August 2018.

<sup>34</sup> See for instance UNECE Regulation No. 79. Uniform provisions concerning the approval of vehicles with regard to steering equipment (adopted 20 March 1958, entered into force 1

### 3.4.1.3 *The User as the Driver of the Automated Vehicle?*

In the future, someone might summon an automated vehicle to pick him up after, for instance, doing the groceries. This user – the person using the automated vehicle for a trip, although he is not necessarily inside or in the vicinity of the vehicle – decides on the direction of the vehicle travels by providing its destination and he dispatches the vehicle. Is deciding on the destination and dispatching the automated vehicle enough to regard the user as the driver of the vehicle within the meaning of the Geneva Convention and the Vienna Convention? The user meets the requirement that the driver has to be human. But does the user ‘drive’? As discussed, the *driver* within the meaning of the Conventions will have to decide on the direction and speed by operating at least some of the controls of the vehicle. His actions have an immediate effect on the speed and direction of the vehicle. Although the user does decide on the destination of the vehicle, it does not decide on the direction and speed at any given point in time during the trip. The user does not decide to make a left turn, to swerve, to brake. The actions of the user do not have immediate effect – he might change the destination but that does not have the same direct effect as swerving, braking etc. The user cannot exercise any lateral or longitudinal control. In other words: the user does not perform the dynamic driving task. Taking all of this into account, the user cannot be regarded to be the *driver* within the meaning of the Conventions.<sup>35</sup>

### 3.4.2 An Automated Vehicle is Driverless within the Meaning of the Conventions

As all the parties discussed cannot be regarded to be the *driver* within the meaning of the Geneva Convention and the Vienna Convention, the Conventions will need to be revised or a new convention on road traffic law will need to be drafted in order to accommodate automated driving. Below, some possible ways to revise the Conventions so that they can accommodate automated driving are discussed.

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December 1988) 1519 UNTS 288, para 5.4.1.1: ‘Any fault which impairs the steering function and is not mechanical in nature must be signaled clearly to the driver of the vehicle.(...)’.

<sup>35</sup> It can be argued that if the user pulls the emergency brake of the automated vehicle (if the vehicle is equipped with one) for that short moment he is the driver of that vehicle.

## 3.5 The Laws of Other Modes of Transport as a Source of Inspiration [Option 1]

### 3.5.1 Maritime and Aviation Traffic Law

Aviation and maritime transport are two modes of transport that have already been confronted with (a degree of) automation. Although the level of automation of an autopilot of a vessel or aircraft might not be as high as the expected level of automation of an automated vehicle – the autopilot on board an aircraft or ship needs a certain level of supervision and might not respond to objects and events (see, for instance, paragraph 10 of the IMO Recommendation on navigational watchkeeping) – , maritime and aviation traffic law could provide inspiration for revising the Geneva Convention and the Vienna Convention.

International rules on air traffic can be found in Annex 2 to the Convention on International Civil Aviation (Chicago Convention). See, for example, the provision on how to handle a head-on situation:

3.2.2.2 Annex 2 Chicago Convention: “(...) When two aircraft are approaching head-on or approximately so and there is danger of collision, each shall alter its heading to the right.”

This traffic rule is not directed at the pilot (as the traffic rules from the Geneva and Vienna Conventions are directed at the driver of the vehicle), but at the aircraft itself. The responsibility for complying with these and other air traffic rules lies with the pilot-in-command.<sup>36</sup> It is not relevant if this pilot-in-command actually operates the controls:

2.3.1 Annex 2 Chicago Convention: “The pilot-in-command of an aircraft shall, whether manipulating the controls or not, be responsible for the operation of the aircraft in accordance with the rules of the air, except that the pilot-in-command may depart from these rules in circumstances that render such departure absolutely necessary in the interests of safety.”

So even though the pilot-in-command might not be operating the controls, perhaps he is not even anywhere near the controls, he is responsible for the

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<sup>36</sup> See on the “see-and-avoid” requirement’: Douglas Marshall, ‘Unmanned Aerial Systems and International Civil Aviation Organization Regulations’ (2009) 85 North Dakota Law Review 693.

operation of the aircraft. It is not relevant if the operation of the aircraft is performed by a pilot, the autopilot or someone else; the pilot-in-command is responsible.

A similar situation can be found in maritime traffic law, in the United Nations International Regulations for Preventing Collisions at Sea of 1972 (COLREGS 1972). Here, the master of the ship is one of the persons responsible for the operation of the ship in accordance with the traffic rules:

Rule 2 a COLREGS 1972: “Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.”

The master of the ship can be, alongside the owner or the crew, held responsible for the operation of the ship even though he might not have been operating the controls.<sup>37</sup> The traffic rules from the COLREGS are also, similarly to the Chicago Convention, not directed at a person but at the vessel:

Rule 14 COLREGS 1972: “(...) When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision, each shall alter her course to starboard so that each shall pass on the port side of the other.(...)”

### 3.5.2 A Distinction Between Operation and Responsibility

As follows from the above, the structure of the traffic rules of Annex 2 to the Chicago Convention and the COLREGS 1972 differ from the structure of the rules of conduct of the Geneva Convention and the Vienna Convention:

- The traffic rules are directed at the vessel or aircraft, not at the person that might operate the controls;
- Responsibility for compliance with the traffic rules lies with a person that does not necessarily operate the controls.

As a result, it is not important if the autopilot or a crew member performs the tasks involved in flying or sailing; the aircraft or vessel has to ‘behave’ in

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<sup>37</sup> AN Cockcroft, LNF Lameijer, *A Guide to the Collision Avoidance Rules: International Regulations for Preventing Collisions at Sea* (Elsevier 2012).



accordance with the traffic rules and someone bears responsibility for this. A distinction is made between who or what performs the dynamic driving task and who is responsible for the performance of the dynamic driving task: the dynamic driving task is performed by a pilot of an aircraft by operating the yoke or by the autopilot that keeps the aircraft at a certain height and course, whilst the pilot-in-command is responsible for the performance of the dynamic driving/flying task (2.3.1 Annex 2 Chicago Convention). Responsibility in this context does not equal liability. Under national law more factors can play a role in establishing (civil or criminal) liability.

This approach can be used in revising the road traffic law.<sup>38</sup> When applying the same structure as in maritime and aviation traffic law, the self-driving system of the automated vehicle performs the dynamic driving task, for which perhaps a person can be held responsible. This opens up the possibility to assign responsibility to a legal person, like the manufacturer. This approach would accommodate traffic of mixed levels of automation without the need for a different law or other instrument for each level of automation. If the conventional driver performs the dynamic driving task, he can be held responsible for the performance of that task; if the self-driving system performs the dynamic driving task the responsibility for the performance of that dynamic driving task can be assigned to a (legal) person).

### 3.5.3 The Vehicle and the Conventions

To revise the Conventions using the same approach as that taken in the discussed aviation and maritime traffic law, three steps need to be taken:

1. A vehicle should no longer need to have a driver;
2. The rules of conduct need to be directed at the vehicle instead of the driver;
3. A person or persons (not necessarily a human) should be made responsible for the operation of the vehicle in accordance with the traffic rules.

As a result, a distinction is made between who or what performs the dynamic driving task and who is responsible for the performance of the dynamic driving task. There is still someone responsible for the operation of the vehicle like the

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<sup>38</sup> See also NE Vellinga, 'Self-driving vehicles: preparing road traffic law for a driverless future' (25<sup>th</sup> World ITS Congress 2018, Copenhagen, 17-21 September 2018).

conventional driver is under the current Conventions, even though there is no longer a *driver* as within the current meaning of the Geneva and Vienna Conventions, and vehicles of all levels of automation need to obey the same traffic rules.

To reach this result, art. 8 paragraph 1 of the Geneva Convention and art. 8 paragraph 1 of the Vienna Convention, that both state that every vehicle should have a driver, need to be revised. As discussed above an automated vehicle does not have a *driver* within the meaning of the Conventions. So in order to accommodate automated driving, these provisions will either need to be revised or deleted. For example, the provisions could state that a vehicle should have a driver or a self-driving system. Either way, it can no longer be required for a vehicle to have a driver.

The next step is to revise the rules of conduct in such a way that they are no longer directed at the driver but at the vehicle, just like the rules on avoiding a head-on collision of Annex 2 of the Chicago Convention and the COLREGS 1972. Take, for example, art. 11 paragraph 1(a) of the Vienna Convention on overtaking (see also art. 11 paragraph 1 Geneva Convention) which states:

“Drivers overtaking shall do so on the side opposite to that appropriate to the direction of traffic.”

A revised provision, that is directed at the vehicle instead of the driver, could state:

“Vehicles overtaking shall do so on the side opposite to that appropriate to the direction of traffic.”

Other rules of conduct do not need revision to accommodate automated driving because they are only suitable for a situation where there is a conventional driver behind the wheel. A revision would not benefit road safety or it is simply not possible for a vehicle to perform the obligation. See, for instance, art. 7 paragraph 5 on the wearing of safety belts:

“The wearing of safety belts is compulsory for drivers and passengers of motor vehicles, occupying seats equipped with such belts, save where exceptions are granted by domestic legislation.”

It would not benefit road safety to also make it compulsory for vehicles to wear safety belts (aside from the question how a vehicle can actually wear such a

belt). This provision can therefore be left as it is; this way it remains compulsory for passengers (of conventional vehicles and of automated vehicles) and conventional drivers to wear safety belts, which contributes to safety.<sup>39</sup>

#### 3.5.4 Responsibility

To come to a separation between who or what performs the dynamic driving task and who or what is responsible, it will be necessary to, just like in Annex 2 of the Chicago Convention and the COLREGS 1972, assign a person as the person who bears responsibility for the operation of the automated vehicle in accordance with the traffic rules. This person could be a human, or perhaps a legal person. After all, the responsible (legal) person does not have to be able to perform the dynamic driving task, he only bears responsibility for the performance of the dynamic driving task. With whom the responsibility rests is of importance as it can play a role in establishing liability, although this role would be limited if a no-fault compensation scheme is in place.<sup>40</sup>

Regarding conventional vehicles, there does not seem to be a reason why the conventional driver cannot remain responsible. But who should bear the responsibility for the performance of the dynamic driving task of an automated vehicle?

It can be argued that the manufacturer of the vehicle or the company that programmed the software should be responsible as they can influence the operation of the vehicle by the choices they make in hardware (radars, cameras, processing power etc.) and software (for instance, by programming the distance between the automated vehicle and the vehicle driving in front of it). However, the user and the owner of the vehicle can also influence the operation of the vehicle somewhat (by (lack of) maintenance, by choosing (not) to use the vehicle, by ignoring a software update etc.). Perhaps they should bear responsibility, or perhaps multiple persons should bear responsibility. An example of the latter is Rule 2 a of the COLREGS 1972: the owner of the vessel, the master of the vessel and/or the crew can be held responsible for the

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<sup>39</sup> World Health Organization, *World report on road traffic injury prevention* (WHO 2004).

<sup>40</sup> Maurice HM Schellekens, 'No-fault compensation schemes for self-driving vehicles' (2018) 10(2) *Law, Innovation and Technology* 314.

operation of the vehicle.<sup>41</sup> Further discussion is needed in order to come to a decision regarding the assignment of a responsible person.<sup>42</sup>

### 3.5.5 Arguments For and Against This Approach

The approach discussed above has several advantages. It provides for mixed traffic, where vehicles of different levels of automation share the public roads. The newest model of a fully automated vehicle, a car with adaptive cruise control or an old-timer: all vehicles have to 'behave' in accordance with the same traffic rules.<sup>43</sup> Once agreement has been reached on who should be responsible for the operation of the vehicle in accordance with the traffic rules, all parties involved will have more certainty on their legal position. For the legal position of conventional drivers driving conventional vehicles, all these changes would not have any negative consequences: in the end, their position remains as it is. Besides, the Vienna Convention is familiar with the discussed approach, as it already has a provision formulated according to this approach:

“A vehicle shall not overtake another vehicle which is approaching a pedestrian crossing marked on the carriageway or sign-posted as such, or which is stopped immediately before the crossing, otherwise than at a speed low enough to enable it to stop immediately if a pedestrian is on the crossing. (...)” (art. 11 paragraph 9 Vienna Convention)

The approach does, nevertheless, require an extensive overhaul of both the Geneva Convention and the Vienna Convention. Multiple provisions of both

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<sup>41</sup> AN Cockcroft, LNF Lameijer, *A Guide to the Collision Avoidance Rules: International Regulations for Preventing Collisions at Sea* (Elsevier 2012).

<sup>42</sup> This also raises the question if perhaps robots should be assigned legal personhood and be responsible for their own actions, see for instance: Nevejans N, 'European Civil Law Rules in Robotics. Study' (Directorate-General For Internal Policies Policy Department C: Citizens' Rights and Constitutional Affairs, Legal Affairs, 2016) <[www.europarl.europa.eu/RegData/etudes/STUD/2016/571379/IPOL\\_STU\(2016\)571379\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/571379/IPOL_STU(2016)571379_EN.pdf)> accessed 20 August 2019, 14ff; European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)) [2017] para 59; European Commission, 'Artificial Intelligence for Europe' COM (2018) 237 final, 25; 'Open Letter to the European Commission Artificial Intelligence and Robotics' <[www.robotics-openletter.eu/](http://www.robotics-openletter.eu/)> accessed 9 August 2018; Ton Hartlief, 'Van knappe koppen en hun uitvindingen' (2018) *Nederlands Juristenblad* 1265.

<sup>43</sup> See in a different context on the importance of this: Benjamin von Bodungen and Martin Hoffmann, 'Belgien und Schweden schlagen vor: Das Fahrsystem soll Fahrer werden!' (2015) *Neue Zeitschrift für Verkehrsrecht* 521.

Conventions will have to be amended. The amending processes of both Conventions – especially of the Geneva Convention – are time-consuming (art. 31 Geneva Convention, art. 49 Vienna Convention). Coordinating the amendment processes to avoid divergence between the two Conventions will be challenging, as well as reaching the required majorities. This has already proven to be difficult<sup>44</sup> and might not be politically feasible. Instead of choosing to take the route of amending the Conventions, drafting a new convention using the approach discussed above could also provide the desired result. This way, the difficult amending process can be avoided. However, less drastic options should also be explored.

### 3.6 The Notion of *Driver*: A different driver per function [Option 2]

3.6.1 The Interpretation of the Notion of *Driver* Depending on its Function  
On the assumption that the Conventions might be interpreted relatively flexibly as *living instruments*,<sup>45</sup> it might be possible to accommodate the notion of a *driver* to automated vehicles. Interpreting the notion of *driver* differently per provision would give a very fractured and perhaps unworkable result. As described above, the function of the notion of *driver* can differ depending on the context. In order to achieve more coherence, the interpretation of the notion of *driver* will be discussed per function of the notion.

#### 3.6.2 The Notion of *Driver* in Technical Requirements

The function that is only sporadically present in the Vienna Convention and Geneva Convention, is the function of the notion of *driver* in the context of a technical nature. In the Vienna Convention, this function is present in art. 30 paragraph 2(b), art. 30bis, art. 32 paragraph 2(a); in the Geneva Convention, this function is only present in art. 22 paragraph 1. These provisions require that the driver's view not be blocked, lighting be sufficient for the driver to see clearly and the vehicle to be in such a condition so as to not endanger the driver. In

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<sup>44</sup> See United Nations Economic and Social Council, 'Consistency between the Convention on Road Traffic (1949) and Vehicle Technical Regulations' (10 January 2014) UN Doc ECE/TRANS/WP.1/2014/1; United Nations Economic and Social Council, 'A Safe System Approach' (11 July 2014) UN Doc ECE/TRANS/WP.1/2014/4/Rev.1; United Nations Economic and Social Council, 'Report of the sixty-eighth session of the Working Party on Road Traffic Safety' (17 April 2014) UN Doc ECE/TRANS/WP.1/145.

<sup>45</sup> See for instance *Tyrer v. United Kingdom* App no 5856/72 (ECtHR, 25 April 1978) with regard to the Convention for the Protection of Human Rights and Fundamental Freedoms.

these contexts, the driver has no rights or obligations, the notion is only of a descriptive nature. The driver is a passive object. Therefore, when looking at it from a *living instrument* perspective, the notion of *driver* in this context can not only be interpreted as the human who drives the vehicle, but also as the self-driving system. That would lead, for instance, to the requirement that the self-driving system's 'view' should not be blocked. In more concrete terms: the sensors and cameras of the self-driving vehicle should not be blocked, as this impedes the 'view' of the self-driving system.

### 3.6.3 The Notion of *Driver* in Capacity Requirements

Another context in which the notion of *driver* appears in the Conventions, is in the requirements that are set for drivers. Drivers should hold a driving permit as proof of their competence (Chapter V Geneva Convention, Chapter IV Vienna Convention) and they should have the necessary physical and mental ability and be in a fit physical and mental condition to drive (art. 8 paragraph 3 Vienna Convention). The driver should also possess the knowledge and skill necessary for driving (art. 8 paragraph 4 Vienna Convention). There is no purpose in demanding a vehicle or a self-driving system should be in a certain physical or mental condition. These requirements are clearly written with a human driver in mind. In this context, the interpretation of the notion of *driver* can therefore remain as 'a human who drives a vehicle'.

### 3.6.4 The Notion of *Driver* in Rules of Conduct

The notion of *driver* is central to the traffic rules of both Conventions (Chapter II Geneva Convention, Chapter II Vienna Convention). Duties are imposed upon the driver: the driver has to overtake in a certain manner (art. 11 Geneva Convention, art. 11 Vienna Convention), the driver should show extra care around vulnerable road users (art. 7 paragraph 3 Vienna Convention), the driver should not brake abruptly unless it is necessary to do so for safety reasons (art. 17 paragraph 1 Vienna Convention), and so on. A *living instrument* approach would open up the possibility of broadening the interpretation of the notion of *driver* from 'the human who drives', to 'who or what drives the vehicle'. The traffic rules would no longer be directed only at the human driver, but also at the self-driving system or the vehicle itself. This way, the Conventions could accommodate automated driving.

The requirement that every vehicle should have a driver (art. 8 paragraph 1 Geneva Convention, art. 8 paragraph 1 Vienna Convention), is achieved through this approach. In this context, the notion of *driver* should be interpreted as who or what drives the vehicle. So, this can be a human driver when the vehicle is a

conventional vehicle, or the self-driving system of an automated vehicle. However, before it is possible to use the *living instrument* approach to interpret the Conventions, the definitions of the notion of *driver* given by the Conventions need changing. Currently, the Conventions state that the *driver* is the *person* who drives the vehicle (art. 4 paragraph 1 Geneva Convention, art. 1 (v) Vienna Convention). This definition prevents interpreting the *driver* as being the self-driving system. Therefore, the definition needs either to be changed to state that the *driver* is *anything* or *any person* driving the vehicle, or to be completely removed from the Conventions. This last option provides optimal flexibility for the years to come, in order to accommodate for unforeseen developments.

### 3.6.5 Arguments For and Against This Approach

The *living instrument* approach shines a new light on the interpretation of the notion of *driver*. One way to interpret the notion of *driver* is, as discussed, to interpret the notion per function instead of having one and the same interpretation of the notion throughout the Conventions. An advantage of this approach is that, besides the deletion of the definition of *driver* (art. 4 paragraph 1 Geneva Convention, art. 1 (v) Vienna Convention), it does not require amendments to be made to the Conventions. This avoids a complex and lengthy amendment process. However, the approach comes with a degree of uncertainty as to the interpretation of the notion of *driver*, and therefore where the responsibility for the traffic behavior lies, can differ depending on the notion's function in that specific context. This can be overcome by capturing the interpretation of the notion of *driver* in its different functions in an agreement between the Contracting Parties of the Geneva Convention and the Vienna Convention (ex. Art. 31(3)(a) Vienna Convention on the Law of Treaties). Although this requires consensus between the parties, it could well be an easier process than amending the Conventions as it does not require following a fixed process. This also provides flexibility; if unforeseen circumstances arise, the agreement can be adjusted if needed without having to go through the amendment procedure. It may, however, still leave the national legislator with uncertainty concerning the compatibility of national traffic laws with the (interpretation of the notion of *driver* in the) Geneva Convention and the Vienna Convention. Besides, it leaves the question of who is responsible for the acts of the driver, if the driver is the self-driving system, unanswered.

### 3.7 The User Operating the Controls? [Option 3]

#### 3.7.1 The Start Button as a Control of the Automated Vehicle

Perhaps a less complicated solution than the approach discussed in the previous section is possible. In the previous paragraph, the focus was on who or what operated the vehicle and who or what performed the dynamic driving task. In this paragraph, the emphasis will lie more on the operation of the controls of the vehicle. After all, the traditional controls of the vehicle will disappear: a fully automated vehicle will probably not have pedals or a steering wheel. It will however have a new element: a start button<sup>46</sup> with which to dispatch the vehicle. Given the starting point that the Conventions are *living instruments*, can this start button be regarded as a *control* of the vehicle and if so, does that mean that the user of the vehicle – the human using the start button to dispatch the vehicle and who determines its destination – can be regarded as the driver of the automated vehicle?

#### 3.7.2 The Controls and the Driver of an Automated Vehicle

It can be argued that, although the automated vehicle does not have the traditional controls, the start button is the control of a fully automated vehicle. The start button almost forms a sort of overlapping control which allows the self-driving system to use the controls that are needed for steering, braking, accelerating etc. Though this interpretation of *control* might not fit with the current interpretation of the notion of *control*, the *living instrument* approach opens up the possibility for this novel interpretation.

If the start button can be regarded as a control of the automated vehicle, it can be argued that the user is the driver of the automated vehicle: the user operates the control (the start button), thereby in a sense deciding over the direction and speed of the vehicle, and the user is human. This would mean that the user fills the void the conventional driver left behind. The Conventions do not need to be amended to provide for this new interpretation. However, for some provisions it is not necessary to change but desirable nevertheless. For instance, art. 8 paragraph 3 Vienna Convention:

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<sup>46</sup> See for instance Darrell Etherington, 'Waymo's first product will be its own on-demand ride hailing service' (*TechCrunch*, 7 November 2017) <<https://techcrunch.com/2017/11/07/waymos-first-commercial-product-will-be-its-own-on-demand-ride-hailing-service/?guccounter=1>> accessed 16 August 2018.



“Every driver shall possess the necessary physical and mental ability and be in a fit physical and mental condition to drive.”

What is the purpose of requiring the user – the driver – to be in a fit mental and physical condition while he is not the one performing the dynamic driving task like a conventional driver does. The self-driving system is performing the dynamic driving task. For the same reason, one could wonder if it serves any purpose to require the user/driver to hold a driving permit, like a conventional driver (art. 24 Geneva Convention, art. 41 paragraph 1 Vienna Convention).

### 3.7.3 Arguments For and Against This Approach

As discussed above, the approach that a start button is also a control of a vehicle does not require amendments to the Geneva Convention and Vienna Convention, unlike the approach from maritime and aviation traffic law and the approach of a different interpretation of the notion of *driver* per function. It also provides a clearer approach than interpreting the notion of *driver* differently per function of the notion.

Nevertheless, there is a complication. The *start button is a control* approach puts the responsibility for the operation of the vehicle with the new driver: the user of the vehicle. The responsibility for the operation of a conventional vehicle lies with the conventional driver. The responsibility lies with the conventional driver as he performs the dynamic driving task: he decides to stop for a red traffic light, to slow down when driving past a playground, to swerve for someone stepping out onto the road, etc. The user would, however, under this approach bear responsibility for the operation of the vehicle - which can subsequently play a role in (civil and criminal) liability matters (also depending on the insurance scheme)<sup>47</sup> - but he would not perform the dynamic driving task and he would not explicitly decide on any manoeuvre the self-driving system makes. One could argue that the user has accepted how the self-driving system performs the dynamic driving task by pressing the start button: by pressing the start button the user makes the conscious decision to let the self-driving system perform the dynamic driving task, thereby agreeing on the lateral and longitudinal movements of the vehicle. But is that enough justification for holding the user responsible for the actions of the self-driving system? At the

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<sup>47</sup> Maurice HM Schellekens, ‘No-fault compensation schemes for self-driving vehicles’ (2018) 10(2) Law, Innovation and Technology 314.

end of the day, the Parties to the Geneva Convention and to the Vienna Convention will have to answer that question.

### 3.8 Functioneel Daderschap [Option 4]

#### 3.8.1 The Dynamic Driving Task and the Notion of *Driver*

This paragraph is taking the performance of the dynamic driving task as a point of departure. It can be argued that, in essence, the driver is who or what has deciding influence on the performance of the dynamic driving task. Does this provide possibilities for automated driving without the need for an extensive overhaul of the Geneva Convention and the Vienna Convention?

By focusing on the performance of the dynamic driving task, the self-driving system comes back into the frame as a possible driver. The self-driving system decides, through its combination of hardware and software, if the vehicle brakes, swerves or accelerates etc. If the self-driving system 'sees' via its sensors a pedestrian suddenly stepping onto the road, its software will calculate to swerve, or brake. If, for instance, a sensor breaks, the system will decide: continue as normal, warn the user of the automated vehicle, or make an emergency stop. All those decisions are made on the spot, in specific conditions. Therefore, the dynamic driving task of an automated vehicle is performed by the self-driving system of the vehicle. So, it can be argued that, when only taking the performance of the dynamic driving task into account, the self-driving system of the automated vehicle is the driver of that vehicle.

The (legal) person having the most influence on the performance of the dynamic driving task by the self-driving system is the manufacturer of (the self-driving system of) the automated vehicle. The manufacturer can, through the hardware and software, determine in advance and to some extent, how the automated vehicle will respond to a certain situation or event. The manufacturer can decide how much distance the automated vehicle should keep from a vehicle travelling in front of it, that the automated vehicle will stop for a red traffic light, and that the automated vehicle will slow down when approaching a pedestrian crossing. The manufacturer equips the vehicle with certain hardware and has the software programmed in a certain way. So why not attribute the acts of the vehicle or the self-driving system to the manufacturer; why not hold the manufacturer responsible for the performance of the dynamic driving task?

### 3.8.2 Inspiration from Dutch Law

Dutch law is familiar with the attribution of acts to a legal person. In 1979, a case regarding the statements of an alderman concerning who was liable for the collapse of a roof of a primary school was brought before the Dutch Supreme Court (Hoge Raad).<sup>48</sup> The Hoge Raad decided that the statements by the alderman could be attributed to its municipality, meaning that a legal person (in this case the municipality) can not only commit a tort through one of his administrative organs but also through someone like the alderman, if his acts in society are seen as acts of the legal person.<sup>49</sup> The act of the alderman is seen as the conduct of the municipality itself.<sup>50</sup>

Under Dutch criminal law, the acts of an individual can be attributed to the legal person that in effect had control over the conduct, meaning that the legal person can commit a crime through another person. The Dutch criminal code (Wetboek van Strafrecht or Sr) already stated that a legal person can commit a criminal offence (art. 51 Sr),<sup>51</sup> when in 2003, a case reached the Hoge Raad raising questions regarding the attribution of a criminal offence to a legal person.<sup>52</sup> This case concerned a manager of a company that managed farmlands, who was convicted by the Court of Appeal for the wrongful use of animal manure on those farmlands (an economic offence).<sup>53</sup> The manager pleaded for dismissal of the criminal charges as, among others, she was not the owner of the farmlands and she had not given anyone permission to use the manure on the farmlands.<sup>54</sup> This case gave the Hoge Raad reason to explain under what circumstances a criminal offence can be attributed to a legal person and is regarded to be a criminal offence committed by the legal person itself,

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<sup>48</sup> HR 6 April 1979, NJ 1980/34, m. nt. C.J.H. Brunner.

<sup>49</sup> HR 6 April 1979, NJ 1980/34, m. nt. C.J.H. Brunner, r.o. 1. See also HR 11 November 2005, ECLI:NL:HR:2005:AT6018, NJ 2007/231 m.nt. Vranken, r.o. 3.6; HR 7 October 2016, ECLI:NL:HR:2016:2285, JOR 2016/325 m. nt. B.M. Katan.

<sup>50</sup> HR 6 April 1979, NJ 1980/34, m. nt. C.J.H. Brunner.

<sup>51</sup> Art. 51 lid 1 Sr: 'Strafbare feiten kunnen worden begaan door natuurlijke personen en rechtspersonen.'

<sup>52</sup> HR 21 October 2003, ECLI:NL:HR:2003:AF7938, NJ 2006/328 (drijfmestarrest) m. nt. P. Mevis; Markus J Hornman, 'De strafrechtelijke aansprakelijkheid van leidinggevenden van ondernemingen: Een beschouwing vanuit multidimensionaal perspectief/Criminal Liability of Corporate Executives. A Multidimensional Approach' (Dissertation, University of Utrecht 2016) paras 2.5.2, 3.3ff.

<sup>53</sup> Conclusie A-G Wortel, ECLI:NL:PHR:2003:AF7938, 5.

<sup>54</sup> Conclusie A-G Wortel, ECLI:NL:PHR:2003:AF7938, 11.

further developing the theory of *functioneel daderschap*.<sup>55</sup> The legal person is regarded to be the offender when the conduct can reasonably be imputed to him.<sup>56</sup> Whether this is reasonable depends on the specific circumstances of the case. The Hoge Raad did not give a general rule. An important guideline, however, is that if the act took place within the sphere of the legal person, this act can, in principle, be regarded to be committed by the legal person.<sup>57</sup> According to the Hoge Raad, such an act could exist in one or more of the following circumstances:

- If it concerns an act or an omission from someone under an the employment of, or who is on another basis employed for the benefit of, the legal person;
- If the conduct fits into the normal business operations of the legal person;
- If the conduct has been useful to the legal person in his business operations;
- If the legal person had the power to determine whether the conduct would or would not take place, and this or similar conduct was, given the actual course of events, accepted or would have been accepted by the legal person. 'Accepting' also includes not exercising the care that can reasonably be required of the legal person to prevent the conduct.<sup>58</sup>

This shows that under certain conditions an act can be attributed to a legal person and is regarded to be the act of the legal person.<sup>59</sup> An offence can be

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<sup>55</sup> HR 21 October 2003, ECLI:NL:HR:2003:AF7938, NJ 2006/328 (drijfmestarrest) m. nt. P. Mevis. See also Simone N de Valk, 'Aansprakelijkheid voor leidinggevenden naar privaatrechtelijke, strafrechtelijke en bestuursrechtelijke maatstaven' (Dissertation, University of Groningen 2009) para 5.4.3.

<sup>56</sup> HR 21 October 2003, ECLI:NL:HR:2003:AF7938, NJ 2006/328 (drijfmestarrest) m. nt. P. Mevis, r.o. 3.3.

<sup>57</sup> HR 21 October 2003, ECLI:NL:HR:2003:AF7938, NJ 2006/328 (drijfmestarrest) m. nt. P. Mevis, r.o. 3.4.

<sup>58</sup> HR 21 October 2003, ECLI:NL:HR:2003:AF7938, NJ 2006/328 (drijfmestarrest) m. nt. P. Mevis, r.o. 3.4. See also HR 23 February 1954, NJ 1954/378 (ijzerdraad-arrest); HR 14 January 1992, NJ 1992/413.

<sup>59</sup> Simone N de Valk, 'Aansprakelijkheid voor leidinggevenden naar privaatrechtelijke, strafrechtelijke en bestuursrechtelijke maatstaven' (Dissertation, University of Groningen 2009) para 5.4.3; Markus J Hornman, 'De strafrechtelijke aansprakelijkheid van

perpetrated not only by the person that commits the conduct, but also by the legal person that has the power to dispose over the conduct. Although the legal person did not “get his hands dirty”, he is the *functioneel dader* (freely translated: *vicarious perpetrator*). So, the emphasis lies on who has the power to, through the relationship within the company or with the individual, determine the conduct, not so much on who actually commits the conduct. This approach from Dutch case law can be used as an example with regards to the acts of the self-driving system of an automated vehicle being attributed as the acts of the manufacturer of that vehicle.

### 3.8.3 Functioneel Daderschap and the Conventions

If the *functioneel daderschap* approach is applied to automated driving, the acts of the self-driving system, that performs the dynamic driving task, can be regarded to be the acts of the manufacturer of the automated vehicle. For instance, if the automated vehicle overtakes another vehicle on the wrong side of that vehicle (art. 11 (1)(a) Vienna Convention, see also art. 11 (1) Geneva Convention), this act can be seen as an act of the manufacturer of this vehicle.

It can be argued that the manufacturer of the automated vehicle, including the self-driving system, had the power to determine whether the conduct would or would not take place, via the hard- and software with which the manufacturer equipped the automated vehicle. He has influence over the response of the vehicle/system to a traffic light, what distance the vehicle will keep from a vehicle travelling in front of it, if the full capacity of the brakes is used when stopping for someone who suddenly crosses the road, etc. The manufacturer’s acceptance of the behaviour of the vehicle can be derived from the decision of the manufacturer to put the vehicle, with all its flaws, into circulation. It can be argued that this reasoning also applies to an act of an automated vehicle equipped with self-learning software. After all, it was the manufacturer who decided to equip the vehicle with self-learning software, and he consciously put it into circulation. Looking at it from this perspective, the conduct of the self-driving system falls within the sphere of the manufacturer. Therefore, it could be reasonable to attribute the acts of the self-driving system to the manufacturer and consider them to be acts of the manufacturer. So, along the

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leidinggevenden van ondernemingen: Een beschouwing vanuit multidimensionaal perspectief/Criminal Liability of Corporate Executives. A Multidimensional Approach’ (Dissertation ,University of Utrecht 2016) para 3.4.

lines of the discussed Dutch case law, the manufacturer can be held responsible for the conduct of the automated vehicle, which can subsequently lead to criminal or civil liability for the manufacturer. The manufacturer becomes, as it were, the 'vicarious driver' of the automated vehicle.

This *functioneel daderschap* approach provides an incentive for the manufacturer to only put automated vehicles into circulation that have been tried and tested. If, nonetheless, the manufacturer commits a traffic offence through an automated vehicle that ignored a traffic rule, the manufacturer could be fined for the misconduct of the automated vehicle or perhaps the (type-) approval of the vehicle could get withdrawn. If the vehicle not only ignores traffic laws but also causes damage, the manufacturer could be exposed to a civil liability claim.<sup>60</sup>

This approach could fit within the Geneva Convention and the Vienna Convention, if the definition of *driver* is deleted from the Conventions (art. 4 (1) Geneva Convention, art. 1 (v) Vienna Convention). The current definition does not leave room to qualify the system as *driver* because the system is not a person. This definition needs to change in order to facilitate the interpretation of *driver* as meaning what/who performs the dynamic driving task.

#### 3.8.4 Arguments For and Against This approach

The incentive to only put automated vehicles into circulation that have been tried and tested could stimulate increased road traffic safety, in line with the aims of the Geneva Convention and the Vienna Convention. The *functioneel daderschap* approach also provides clarity regarding the responsibilities of the parties involved. The approach does not require a substantial revision of the Conventions, thus avoiding a possibly unsuccessful, complicated and lengthy amendment process. A possible disadvantage of the *functioneel daderschap* approach, however, is that it might hinder innovation. If manufacturers are confronted with high fines or the possible withdrawal of the type-approval of their automated vehicle, this could make manufacturers hesitant to put new automated vehicles with new technologies into circulation. That way, road traffic could be deprived from technology that benefits road safety. Another disadvantage is that not all contracting parties to the Conventions might be

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<sup>60</sup> See, however, on no-fault insurance schemes for self-driving vehicles: Maurice HM Schellekens, 'No-fault compensation schemes for self-driving vehicles' (2018) 10(2) Law, Innovation and Technology 314.

familiar with this theory or a similar doctrine, making this *functioneel daderschap* approach incongruous with their legal system.<sup>61</sup>

### 3.9 The Way Forward

#### 3.9.1 The Four Approaches

Given the current interpretation of the notion of *driver*, an automated vehicle does not have a *driver* within the meaning of the Geneva Convention and the Vienna Convention. Above, four approaches on how to accommodate automated driving in the Conventions have been discussed.

The first approach, drawing inspiration from maritime and aviation traffic law, ties in with the existing art. 11 paragraph 9 of the Vienna Convention as that particular traffic rule is already addressed at the vehicle. Despite this, this approach does require an extensive overhaul of the Conventions.

The Geneva Convention and Vienna Convention could be regarded as *living instruments*, which opens up the possibility of revising the Conventions through new ways of interpretation. This can be done by interpreting the notion of *driver* per each of the notion's functions that the notion has within the Conventions (the second discussed approach). This provides flexibility, but it also causes uncertainty as the correct interpretation might not always be clear to the national legislator or judge. It also does not answer the question of who is responsible for the operation of the automated vehicle.

The third approach, regarding the start button as a control of the vehicle, does answer this question. If the start button is regarded as a control of the vehicle, the user can be regarded as the driver of the automated vehicle. This would mean that the user is responsible for the operation of that vehicle.

The *functioneel daderschap* approach puts responsibility for the operation of the automated vehicle with the manufacturer of that vehicle. The acts of the self-driving system are considered to be the acts of the manufacturer.

Given these four approaches, which approach is most suitable for a driverless future?

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<sup>61</sup> Erik Gritter, 'Effectiviteit en aansprakelijkheid in het economisch ordeningsrecht' (Dissertation, University of Groningen 2003) ch 4.

### 3.9.2 Towards a Driverless Future

Out of the four approaches presented as options for revising the Geneva and Vienna Conventions in order to accommodate automated driving, the *functioneel daderschap* approach offers a considerable benefit over the other approaches: it provides a clear legal framework without the need for extensive amendments to the Conventions. The definition of driver will need to be deleted from the Conventions in order to enable the *functioneel daderschap* approach, but that is just a minimal change compared to the overhaul of the Conventions that is required when following the approach from maritime and aviation law discussed above. The only approach that does not require any amendments at all to either the Geneva Convention or the Vienna Convention is the approach that regards the start button of the automated vehicle as a control within the meaning of the notion of *driver*, making the user the driver of the automated vehicle. However, that approach also puts the responsibility for the performance of the dynamic driving task on the user, who has no actual influence over the performance of the dynamic driving task. The manufacturer has, through the hardware and software it equips the vehicle with, the most influence over the performance of the dynamic driving task. The *functioneel daderschap* approach gives the opportunity to put the responsibility for the performance of the dynamic driving task with the (legal) person that has the most influence over the performance of the dynamic driving task: the manufacturer. The *functioneel daderschap* approach therefore provides an answer to the question who is responsible for the performance of the dynamic driving task, a question that is left unanswered by the approach adhering to maritime and aviation traffic law and the approach concerning a different interpretation of the notion of *driver* depending on its function. Therefore, out of the discussed approaches, the *functioneel daderschap* approach is the most suitable for the Conventions in order to accommodate automated driving, providing a clear legal framework for all the parties involved.



## Epilogue: Developments on the Notion of *Driver*

Since the completion of the previous chapter in which a recommended way forward was formulated, the discussion on the notion of *driver* within the meaning of the Geneva Convention and Vienna Convention has continued. There have also been some legal developments on a national level. These developments do not follow the proposed *functioneel daderschap* approach (section 3.9), but offer different approaches. In addition, a relevant court decision was reached by a Dutch court on this notion of *driver*.

In the previous chapter, it was argued that the *driver* is a human who decides on the speed and direction of the vehicle by operating (at least some of) the controls. This interpretation was recently validated in a case relating to a Tesla owner who had used his mobile phone whilst the vehicle's so-called Autopilot-function was engaged.<sup>1</sup> A Dutch court confirmed that a driver is a human that decides on speed and direction of the vehicle by operating at least some of the controls, including the Autopilot function, of the vehicle.<sup>2</sup>

Working Party 1, the body of the United Nations ECE responsible for updating the Geneva Convention and the Vienna Convention, continues work on the notion of *driver* in both Conventions. Recently, the United Kingdom submitted a discussion document to Working Party 1 on proposed amendments to the Vienna Convention to support the use of automated vehicles.<sup>3</sup> A new definition of driver is one of the proposed amendments (changes to the current definition are in bold):

“(v) “Driver” means any person who, **from inside or outside of the vehicle**, drives a motor vehicle or other vehicle (**including a vehicle with an ADS or a cycle**) **or combination of vehicles**, or who guides cattle, singly or in herds, or flocks, or draught, pack or saddle animals on a road.”<sup>4</sup>

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<sup>1</sup> Hof Arnhem-Leeuwarden, 31 July 2019, ECLI:NL:GHARL:2019:6122.

<sup>2</sup> Hof Arnhem-Leeuwarden, 31 July 2019, ECLI:NL:GHARL:2019:6122, r.o. 15 and 16.

<sup>3</sup> United Nations Economic and Social Council, ‘Discussion document for a package of article-by-article amendments to the 1968 Convention on Road Traffic to support the use of automated vehicles’ (5 July 2019) UN Doc ECE/TRANS/WP.1/2019/7.

<sup>4</sup> United Nations Economic and Social Council, ‘Discussion document for a package of article-by-article amendments to the 1968 Convention on Road Traffic to support the use of automated vehicles’ (5 July 2019) UN Doc ECE/TRANS/WP.1/2019/7, p. 3.

ADS stands for Automated Driving System, defined in the discussion document as “the combination of hardware and software to exercise dynamic control on a sustained basis on behalf of the driver.”<sup>5</sup> In addition, the United Kingdom also introduce changes to a number of other provisions, including art. 8 of the Vienna Convention. The proposals give rise to several questions, for instance, concerning the definition of driver: can someone *drive* a vehicle whilst not exercising dynamic control, as the dynamic control is exercised by the automated driving system (ADS)? And how can this driver be distinguished from the passengers?

France has also brought a proposal to the table. In contrast to the United Kingdom, France only proposes changes to art. 8 Vienna Convention in order to accommodate increasing vehicle automation, adding two new paragraphs to the article.<sup>6</sup> The proposed paragraph 5(b) would form an exception to paragraph 1 of art. 8 (“Every moving vehicle or combination of vehicles shall have a driver.”):

“5 (b) As an exception to the paragraph 1 above, some vehicles systems can take over all of the driving tasks of the driver.

(i) When an automated driving system assuming all dynamic driving tasks within a pre-defined design domain, with the expectation that the driver will respond to requests to intervene, is active, the driver behind the wheel is exempted from the driving task except in case he has to obey to instructions given by authorized officials, to follow the rules which apply towards priority vehicles, in case of an evident vehicle system failure and has to respond upon any request to intervene in accordance with what is requested by the automated driving system.

Notwithstanding these exceptions, the driver behind the wheel can exercise other activities than driving provided these activities do not prevent him/her from responding safely to demands from the vehicle system for taking over the driving task. Moreover, these activities shall be consistent with the prescribed use of the vehicle systems and their defined functions. Such an automated system shall be in conformity with the conditions of construction, fitting, utilization and

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<sup>5</sup> United Nations Economic and Social Council, ‘Discussion document for a package of article-by-article amendments to the 1968 Convention on Road Traffic to support the use of automated vehicles’ (5 July 2019) UN Doc ECE/TRANS/WP.1/2019/7, p. 3.

<sup>6</sup> United Nations Economic and Social Council, ‘Amendment proposal to Article 8 in the 1968 Convention on Road Traffic’ (9 January 2019) UN Doc ECE/TRANS/WP.1/2019/1.

validation according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles

(ii) When an automated driving system assuming all of the driving tasks of the driver at all times, is active, the user is exempted from the driving task. Subsequently paragraphs 5 (first sentence) and 6 of this Article, and paragraph 1 of Article 13 do not apply. The provisions of the convention which apply to drivers, other than those linked to the driving tasks, apply to the person who has engaged the autonomous driving system. Such an automated system shall be in conformity with the conditions of construction, fitting, utilization and validation according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles”<sup>7</sup>

These proposed changes to art. 8 of the Vienna Convention do not clarify if the automated driving system should comply with the rules of the road of Chapter II Vienna Convention, which entail traffic rules directed, among others, at the driver. The French do clarify the role of the user of a fully automated vehicle:

“5 (c) Users of fully automated vehicles shall comply with the safety instructions given by the automated system. When the automated system assuming all driving tasks at all times, within a pre-defined design domain is under remote supervision and control, this automated system and the corresponding communication, supervision and control system shall be in conformity with the conditions of construction, fitting, utilization and validation according to international legal instruments concerning wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles”<sup>8</sup>

The aforementioned countries, together with other mainly European countries (e.g. the Netherlands, Spain and Germany etc.), seem to be the most involved in the discussions on the notion of *driver*. This could be explained by the economic importance of road transport for those countries and therefore the importance of legislation for international road traffic, as well as through the lack of

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<sup>7</sup> United Nations Economic and Social Council, ‘Amendment proposal to Article 8 in the 1968 Convention on Road Traffic’ (9 January 2019) UN Doc ECE/TRANS/WP.1/2019/1, p. 2-3.

<sup>8</sup> United Nations Economic and Social Council, ‘Amendment proposal to Article 8 in the 1968 Convention on Road Traffic’ (9 January 2019) UN Doc ECE/TRANS/WP.1/2019/1, p. 3.

international land borders with other countries and therefore the lesser importance of legislation for international road traffic (for instance, the United States). However, the proposals of both the United Kingdom and France would require more extensive amendments, leave open a number of questions, and offer no more benefits than the *functioneel daderschap* approach proposed in Chapter 3. Therefore, these proposals do not change the findings of the previous chapter.

On a national level, the English Law Commission and Scottish Law Commission propose a new type of user for an automated vehicle in a consultation paper.<sup>9</sup> This new type of user, the ‘user-in-charge’, “would not be a driver whilst the automated driving system was in operation but must be qualified and fit to drive.”<sup>10</sup> It would be the user-in-charge who has to take over in planned circumstances or after the vehicle has reached a minimal risk condition.<sup>11</sup> When the automated vehicle is performing the dynamic driving task, the user-in-charge is not the driver and can undertake other activities than driving.<sup>12</sup> The user-in-charge would bare criminal liability for offences that are not related to the performance of the dynamic driving task.<sup>13</sup> In addition, both Law Commissions refer to the US draft Uniform State Laws<sup>14</sup> and the Australian<sup>15</sup> example of an “Automated Driving System Entity” which should bear the

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<sup>9</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 3.24ff.

<sup>10</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 3.27.

<sup>11</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 3.27, 3.34.

<sup>12</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 3.35.

<sup>13</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 3.27, 7.37ff.

<sup>14</sup> Smith BW, ‘Highly Automated Vehicles Act. Reporter’s Version Release Note’ (2018). See also Automated Operation of Vehicles Act Committee <[www.uniformlaws.org/committees/community-home?CommunityKey=43730d6f-013d-4883-b2b7-98e66bda3239](http://www.uniformlaws.org/committees/community-home?CommunityKey=43730d6f-013d-4883-b2b7-98e66bda3239)> accessed 5 September 2019.

<sup>15</sup> See for instance National Transport Commission, ‘Automated Vehicle Program’ (2019).

responsibility of ensuring the vehicle's safety.<sup>16</sup> This entity "should also be subject to a system of regulatory sanction if the vehicle acts in a way which would be considered a criminal offence if done by a human driver."<sup>17</sup> Possible sanctions could be fines or the withdrawal of the approval.<sup>18</sup>

Although these proposals are very interesting, many questions remain unanswered. The role of the Automated Driving System Entity needs more clarification,<sup>19</sup> as does the relationship between the Geneva Convention and Vienna Convention and the user-in-charge.<sup>20</sup> The introduction of a user-in-charge would require substantial amendments to both Conventions, as the user-in-charge is a new type of road user for which provisions from the Conventions may (e.g. art. 8 paragraph 3 Vienna Convention on a fit physical and mental condition to drive) or may not apply (e.g. art. 13 paragraph 1 Vienna Convention: should the user-in-charge, like the driver, have his vehicle under control?). Therefore, this approach does at the moment not offer as good a solution as the *functioneel daderschap* approach.

Germany has already taken legislative steps to accommodate the post-testing deployment of automated vehicles. The country has adopted a change to the Straßenverkehrsgesetz (StVG) on the notion of *driver* (Fahrzeugführer). Several provisions were added or changed, including the new §1a Absatz 4 StVG which reads:

"Fahrzeugführer ist auch derjenige, der eine hoch- oder vollautomatisierte Fahrfunktion im Sinne des Absatzes 2 aktiviert und zur Fahrzeugsteuerung verwendet, auch wenn er im Rahmen der

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<sup>16</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 1.44.

<sup>17</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 1.44.

<sup>18</sup> Law Commission (Consultation Paper No 240, 2018) and Scottish Law Commission (Discussion Paper No 166, 2018), *Automated Vehicles. A joint preliminary consultation paper*, para 1.44.

<sup>19</sup> Law Commission and Scottish Law Commission (2019), *Automated Vehicles: Analysis of Responses to the Preliminary Consultation Paper. Analysis of Responses to LCCP No 240/SLCDP No 166*, para 1.7.

<sup>20</sup> Law Commission and Scottish Law Commission (2019), *Automated Vehicles: Analysis of Responses to the Preliminary Consultation Paper. Analysis of Responses to LCCP No 240/SLCDP No 166*, para 3.19.

bestimmungsgemäßen Verwendung dieser Funktion das Fahrzeug nicht eigenhändig steuert.”<sup>21</sup>

This means that, under the StVG, the driver (Fahrzeugführer) of a vehicle is also the person that activates the automated driving system of an automated vehicle (“eine hoch- oder vollautomatisierte Fahrfunktion (...) aktiviert und zur Fahrzeugsteuerung verwendet”), even if it is within the intended scope of that system that the driver does no longer drives the vehicle himself (“auch wenn er im Rahmen der bestimmungsgemäßen Verwendung dieser Funktion das Fahrzeug nicht eigenhändig steuert”). From the definition given in §1a Abs. 2 StVG<sup>22</sup> it follows that this provision is only applicable up to SAE Level 3 (conditional driving automation) vehicles, not the SAE Level 5 vehicle that is central to this thesis.<sup>23</sup> Therefore, this new development in German law has no consequences for the findings of this research.<sup>24</sup> Nevertheless, the revision of the StVG illustrates the challenges posed by the notion of *driver* in traffic laws.

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<sup>21</sup> Absatz 2 describes the automated driving system, including that the system can be overridden by the driver: “Kraftfahrzeuge mit hoch- oder vollautomatisierter Fahrfunktion im Sinne dieses Gesetzes sind solche, die über eine technische Ausrüstung verfügen, 1. die zur Bewältigung der Fahraufgabe – einschließlich Längs- und Querführung – das jeweilige Kraftfahrzeug nach Aktivierung steuern (Fahrzeugsteuerung) kann, 2. die in der Lage ist, während der hoch- oder vollautomatisierten Fahrzeugsteuerung den an die Fahrzeugführung gerichteten Verkehrsvorschriften zu entsprechen, 3. die jederzeit durch den Fahrzeugführer manuell übersteuerbar oder deaktivierbar ist, 4. die die Erforderlichkeit der eigenhändigen Fahrzeugsteuerung durch den Fahrzeugführer erkennen kann, 5. die dem Fahrzeugführer das Erfordernis der eigenhändigen Fahrzeugsteuerung mit ausreichender Zeitreserve vor der Abgabe der Fahrzeugsteuerung an den Fahrzeugführer optisch, akustisch, taktil oder sonst wahrnehmbar anzeigen kann und 6. die auf eine der Systembeschreibung zuwiderlaufende Verwendung hinweist. Der Hersteller eines solchen Kraftfahrzeugs hat in der Systembeschreibung verbindlich zu erklären, dass das Fahrzeug den Voraussetzungen des Satzes 1 entspricht.”

<sup>22</sup> See also §1b StVG.

<sup>23</sup> Jan-Erik Schirmer, ‘Augen auf beim automatisierten Fahren! Die StVG-Novelle ist ein Montagsstück’ (2017) 30 (6) Neue Zeitschrift für Verkehrsrecht 253; Matthias von Kaler, Sylvia Wieser, ‘Weitere Rechtssetzungsbedarf beim automatisierten Fahren’ (2018) 37 (6) Neue Zeitschrift für Verwaltungsrecht 369; Volker Lüdemann, Christine Sutter, Kerstin Vogelpohl, ‘Neue Pflichten für Fahrzeugführer beim automatisierten Fahren – eine Analyse aus rechtlicher und verkehrspsychologischer Sicht’ (2018) 31 (9) Neue Zeitschrift für Verkehrsrecht 411; Mathias N. Schubert, ‘Der Automated and Electric Vehicles Act 2018. Ein (weiterer) Irrweg für das Vereinigte Königreich?’ (2019) 19 (4) Straßenverkehrsrecht 124.

<sup>24</sup> This approach does not provide a solution for SAE Level 5 vehicles, and was therefore not discussed in Chapter 3.

In the context of insurance, the notion of *driver* is also of importance. Under the EU Motor Insurance Directive,<sup>25</sup> Member States need to take “appropriate measures to ensure that civil liability in respect of the use of vehicles normally based in its territory is covered by insurance.”<sup>26</sup> This insurance should cover, according to art. 12 (1) of the Motor Insurance Directive, liability for personal injuries to all passengers, other than the driver, arising out of the use of a vehicle. So, the insurance does not have to cover the damage sustained by the *driver* of the vehicle. The Motor Insurance Directive does not provide a definition of *driver*.<sup>27</sup> If, however, the definition of *driver* in this Directive deviates from the definition of *driver* given in the context of the Geneva Convention and Vienna Convention, this could have significant consequences. This can be illustrated by an example: an SAE Level 5 vehicle is equipped with an emergency break, which one of the passengers pulls in order to avoid a serious accident. An accident is not completely avoided, but there is less damage than would be the case if this person had not pulled the emergency brake. In pulling the emergency brake, and depending on the definition of *driver*, this person might become the driver of the automated vehicle within the meaning of the Motor Insurance Directive. If this would be the case, the damage the person that pulled the emergency brake suffered is not covered by the insurance, whilst the insurance does cover the damage suffered by the other persons in the vehicle who did not try to prevent a serious accident from occurring, by pulling the emergency brake. This illustrates that, depending on the exact definition, an automated vehicle might have a driver within the meaning of the Motor Insurance Directive, which driver would not be covered by the mandatory insurance. The matter of the notion of *driver* in the Motor Insurance Directive requires further research, which goes beyond the scope of this thesis.

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<sup>25</sup> Directive 2009/103/EC of the European Parliament and of the Council of 16 September 2009 relating to insurance against civil liability in respect of the use of motor vehicles, and the enforcement of the obligation to insure against such liability OJ L 263/11 (Motor Insurance Directive).

<sup>26</sup> Recital 3 Motor Insurance Directive.

<sup>27</sup> The Benelux Court did, back in 1994 and therefore predating the Motor Insurance Directive of 2009, provide a definition of *driver* in art. 3 of the *Gemeenschappelijke Bepalingen behorende bij de Benelux-Overeenkomst betreffende de verplichte aansprakelijkheidsverzekering inzake motorrijtuigen*: “onder 'bestuurder' dient te worden verstaan hij die het voertuig werkelijk en zelfstandig bestuurt en aldus in feite verantwoordelijk is voor het sturen”, see Court Benelux/Beneluxhof 8 December 1994, A 93/5 (Assurance Liégeoise/Adam), NJ 1995/529.

The discussed approaches on the notion of *driver* within the meaning of the Geneva Convention and Vienna Convention shed a new light on the challenge concerning the notion of *driver* in these Conventions. The approaches discussed in this epilogue differ from the approaches discussed in Chapter 3. This chapter concluded with the *functioneel daderschap* approach as recommended way forward. The approaches that have been discussed in this epilogue do not alter this conclusion, as these approaches have disadvantages (extensive amendments, only applicable to automated vehicles of SAE Level 3, etc.) that the *functioneel daderschap* approach does not have. Therefore, the *functioneel daderschap* approach remains the preferred way forward.



