European Integration Studies, Volume 12, Number 1 (2016) pp. 10–28.

LEGAL QUESTIONS ON THE APPEARANCE OF SELF-DRIVING CARS IN THE ROAD TRAFFIC WITH SPECIAL REGARD ON THE CIVIL LAW LIABILITY

ÁGNES JUHÁSZ–RÉKA PUSZTAHELYI
Senior lecturers, Department of Civil Law
University of Miskolc
civagnes@uni-miskolc.hu, reka.pusztahelyi@gmail.com

1. Introduction

More, than a century has been expired, since Bálint KOLOSVÁRY published his work[1] on the automobile law apropos of the adoption of the Austrian auto mobile act. In this work, he drew attention to the step-by-step transformation of the traditional, Roman law based liability approach. As a result of the technology's fascinatingly fast development, cars appeared in the roads and brought up such liability questions, which could not be duly answered by the contemporary Hungarian tort law.

During the 20th century, the use of motor vehicles became natural. Nowadays, the performance of the daily "logistic tasks" (e.g. shopping, traveling to the working place, bringing the children to nursery/school etc.) by car is a part of the people's everyday routine. The legal regulation of the liability for the damages caused by on the roads en masse appearing motor vehicles, functions well, regarding provisions in the Hungarian private law which are practically changeless since the depth of the 20th century.

The 21st century's leap technical development, the experiments with artificial intelligence (AI) and consequently the automating of motor vehicles has opened a new dimension of liability questions. It is difficult to answer, how those situations can be adjudicated, where the damage occurred is caused by such a – partially or fully automated – car, which was driven by a "robot pilot" in the presence of the (human) driver or possibly there is no human driver in the car at all (e.g. Google car).[2] The straight root cause of this study is the accident of the Tesla self-driving car (Tesla Model S) in May 2016, in which in the car the sitting and because of the operating of the "Autopilot" system even not driving person died. Although some accidents caused by self-driving cars have happened before, the above mentioned case was the first, which caused not only pecuniary damage, but personal injury, namely death.

Albeit we do not have to reckon with the multitudinous appearance of self-driving cars in the Hungarian roads yet, it is a reality that worldwide increases the number of those motor car-manufacture companies, which invest into the improvement of such vehicles.[3]

---

[1] KOLOSVÁRY, Bálint: Automobiljog, különös tekintettel az új osztrák automobiltörvényre. *Erdélyi Múzeum,* Vol. 25, Issue 6 (1908), 368–377.

[2] It shall be noted, that as to the USA legislation, Google's self-driving car, presented in 2014, is classified as low-speed vehicle limited to twenty-five miles per hour. Moreover, these cars have no steering wheel and no pedals. See GLANCY, Dorothy J.: Autonomous and Automated and Connected Cars-Oh My! First Generation Autonomous Cars in the Legal Ecosystem. *Minnesota Journal of Law, Science & Technology,* Vol. 16, Issue 2 (2015), 619–691, 624.

[3] In Europe, BMW tests its "Traffic Jam Assist" system in the German A9 motorway between Munich and Berlin. Scania starts its prototypes in Spain and the Volvo's "Drive Me" system is tested in Sweden, in the neighbourhood of Gothenburg. In the USA Google, Intel, General Motors

Having regard this fact, the European legislator would face the future challenges and endeavor to create a coherent legal framework on self-driving cars at a supranational level.[4]

The appearance of *autonomous technology* in the usage of motor vehicles creates a new situation for the legislator. The appearance of self-driving cars in public road traffic brings up several questions. Thus, previously separate rules were applied not only for the attendance of motor vehicles in road traffic and for the driver and its behaviour, but for the vehicle and its technical status. (The driver's behaviour has great significance in the course of determining the liability.) Nevertheless, the automating of motor vehicles has an effect on the driver's liability too, since the more autonomous the car is, the lesser participates the (human) driver in the operating of the car. In the case of *fully autonomous car* the contribution or presence of the human driver is not necessary, therefore if damage occurs, the human driver's liability cannot be determined upon the provisions of the traditional tort law.

The ultimate aim of the study is to answer the questions arisen according to the self-driving cars and to offer possible solutions for the future legislation. One of the elemental prerequisites is the creating of appropriate definitions; the study's first part focuses on this with regard to the already existing rules of the USA's certain states. Thereafter we intend to introduce the existing (international and American) provisions on self-driving cars and the future (at this time only in draft existing) European legal tools. The study's third part walks around the problems arisen with regard to the damages caused by self-driving cars. In the course of this task, we review different national rules on strict liability for traffic accident under the rule of liability for highly dangerous activities and product liability. We also intend to examine the possibility and limitations of the application of both mentioned liability constructions and offer the setting up of compensation fund as an alternative or supplementary solution. Within the liability questions, we also pay attention to the liability insurance solutions.

2. Self-driving car – Definition attempts, model solutions

In due to the automating of motor vehicles several different terms appeared, which once can be handled as synonyms, but another time they overlap only in part each other. Generally speaking, *driverless car* or *self-driving car* means such a motor vehicle, which safe operation do not make necessary the presence of the human driver.[5] Elsewhere *autonomous intelligent cars (AIC)* nominates those motor vehicles, which are guided – partially or fully – by artificial intelligence (AI).[6]

The automating of motor vehicles and the way to be autonomous is a long development process, where the using of modern technologies like lane-keep-assistance, electronic blind spot assistance, traffic jam and queuing assistance, adaptive cruise control, emergency breaking and crash avoidance etc. mean the first step. With regard to the autonomy of the certain motor vehicle (i.e. the relation of the tasks to be done by the driver or the vehicle) we can differ levels. In this system, those motor vehicles are located on the first scale,

and Autoliv Inc. are interested in the testing of self-driving vehicles, while in the Far East, Nissan (in Japan), Hyundai, GM-Daewoo and Ssangyong (in South Korea) make inquiries after the future motor vehicle technologies.

4 See later the so-called GEAR 2030 Roadmap.

5 *The Pathway to Driverless Cars: detailed review of regulations for automated vehicle technologies.* Department for Transport, London, February 2015, 20.

6 DE BRUIN, Roeland: Autonomous Intelligent Cars on the European intersection of liability and privacy. *European Journal of Risk Regulation,* Vol. 7, Issue 3 (2015), 485–501, 489.

which stands only under human power, therefore the (human) driver is liable for all event, which occur in connection with the vehicle (e.g. damages). The *fully autonomous car* is the highest level of automation, where the motor vehicle participates without human assistance (and presence), independently and safely in the road traffic. As to the forecasts, these vehicles will appear on the roads and will be available for the public at earliest in the 2020s, 2030s. Nowadays, the testing of the prototypes of the so called *highly autonomous car*s goes on. The levels of the automation of motor vehicles are demonstrated by the following figures.

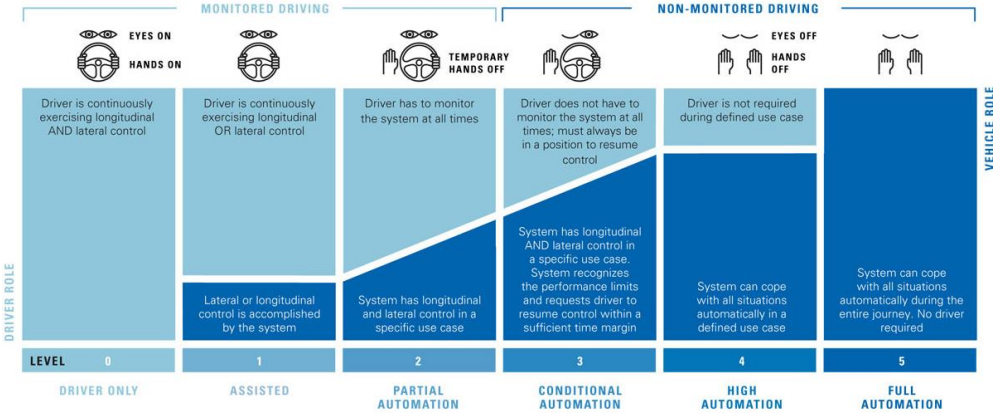

Figure 1. Levels of Automation[7]

In the course of defining self-driving cars, we can start from the legislative outcomes of certain states of the USA.[8] In the US terminology both *automated vehicle* and *autonomous vehicle* expressions are used, their content more or less overlap. As to the related act of *Nevada*[9] *autonomous vehicle* means a motor vehicle that uses artificial intelligence,[10] sensors (e.g. camera, radar, laser) and global positioning system coordinate to drive itself without the active intervention of a human operator. *Florida's* and *California's* act[11] states that *autonomous vehicle* is any vehicle equipped with autonomous technology.[12]

---

7 http://safety.trw.com/autonomous-cars-must-progress-through-these-6-levels-of-automation/0104/ (Downloaded: 2. 11. 2016)

8 The legal acts of Nevada, Florida, Michigan and California mostly concentrates on the test phase (e.g. appearance of prototypes in road traffic), but some of them also determine the conditions of self-driving car's releasing for consumers.

9 *Assembly Bill*, No. 511 of 2011 (AB511).

10 As to the AB511 "artificial intelligence" means the use of computers and related equipment to enable a machine to duplicate or mimic the behaviour of human beings.

11 Florida HB 1207, *California Senate Bill*, No. 1298.

12 As to the Florida HB 1207, the term *autonomous technology* means technology installed on a motor vehicle that has the capability to drive the vehicle on which the technology is installed without the active control or monitoring by a human operator. The term excludes a motor vehicle enabled with active safety systems or driver assistance systems, including, without limitation, a system to provide electronic blind spot assistance, crash avoidance, emergency braking, parking assistance, adaptive cruise control, lane keep assistance, lane departure warning, or traffic jam and queuing assistant, unless any such system alone or in combination with other systems enables the vehicle on which the technology is installed to drive without the active control or monitoring by a

Contrary to the applied terminology of the above mentioned three states, the act of *Michigan*[13] contains the *automated motor vehicle* expression, which means a motor vehicle on which automated technology[14] has been installed, either by a manufacturer of automated technology or an upfitter that enables the motor vehicle to be operated without any control or monitoring by a human operator.

The divergence of the US terminology inspired the discussion paper,[15] which was prepared for the European Parliament (hereinafter EP). The paper differs between *automated vehicle* and *autonomous vehicle (AV).* The former means a motor vehicle (car, truck or bus) which has the technology available to assist the driver so that elements of the driving task can be transferred to a computer system. With regard to the built-in driver assistance system, we can speak about *partially automated*[16] and *highly automated* motor vehicles.

As to the above referred discussion paper *autonomous vehicle* is a fully automated vehicle equipped with the technologies capable of performing all driving functions without any human intervention. This time partially automated systems are used in water and air transport *(robot-pilot).* Nevertheless, there is a basic difference: in the case of water- and aircrafts, the applied system's task the keeping of the given direction or speed in a relative eventless environment. Contrarily to this, the AV's computer should continuously come to a decision instead of the driver, in a certain (to the operating necessary) measure mapped and equipped, i.e. typically urban environment. AVs shall also be differentiated from cars that are remotely controlled by external operator. In these latter cases the operational control by external managers simply moves the "driver" from inside the vehicle to a location outside the vehicle.[17] AVs does also not cover the so-called "platooning", i.e. "a coupling of several vehicles within minimal distance of each other, so that they automatically and simultaneously accelerate or brake".[18]

In the following part of the study we use the terminology, which appears in the European Union's preparing documents, since in the case of adopting any legal act on self-driving cars by the EU legislator, Hungary will have to implement them into its national law.

3. International agreements

The unification of road traffic rules has started relatively early, after the 2nd World War. Under the aegis of the *UNECE (United Nations Economic Commission for Europe)*, which has been created as a regional committee in 1947 within the frames of the UN, several agreements were born, which practically cover all dimensions of the road traffic, from the

human operator. The California SB 1298 contains a simpler definition: *autonomous technology* means technology that has the capability to drive a vehicle without the active physical control or monitoring by a human operator.

13 *Michigan Senate Bill*, No. 0169.

14 Per Michigan SB 0169 *automated technology* means technology installed on a motor vehicle that has the capability to assist, make decisions for, or replace an operator.

15 *Automated vehicles in the EU.* Briefing January 2016, European Parliament, 2. http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573902/EPRS_BRI(2016)573902_EN.pdf

16 The Super Cruise system of the General Motors and the Autopilot system of the Tesla mean a partially automated technology.

17 Remote control cars are often remembered as familiar childhood toys. In the real world, they often take the form of large-scale trucks, digging equipment, and unmanned ground vehicles (UGVs) used in military and mining operations. See GLANCY, 627.

18 *Automated vehicles in the EU.* Briefing January 2016, European Parliament, 2. http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/573902/EPRS_BRI(2016)573902_EN.pdf

technical requirements on motor vehicles, through the traffic signs, until the requirements of getting a driving license.

The Article 8 of the *Convention on Road Traffic* done at Vienna, 8th November 1968 (hereinafter *Vienna Convention*)[19] stated that every moving vehicle (or combination of vehicles) shall have a driver. A further general condition is that every driver shall possess the necessary physical and mental ability and be in a fit physical and mental condition to drive. Vienna Convention also states that every driver of a power-driven vehicle shall possess the knowledge and skill necessary for driving the vehicle.

Because of the date and circumstances of the birth and thus the status of the science and technology, Vienna Convention could not calculate with the fact that after a few decades science passes through such development, which facilitates for the vehicles to circulate safely on the roads without any human contribution. With regard to the leaping technological development of the last few years and side by side the appearance of new tendencies in the motor car innovate, UNECE decided to prepare the modification of the Vienna Convention. As a result of this initiation, Vienna Convention was amended in March 2016. The modified text of the Article 8 makes possible the participation of driverless cars in public road traffic provided that the defined prerequisites are fulfilled.

The provisions and the above mentioned modification of the Vienna Convention have great significance not only on the legislation of the European Union, but also on the Member States', since most of these countries ratified it. However, there is a further question: how the international, European and national provisions relate to each other in the case of those states which did not ratify the Vienna Convention (e.g. Portugal, Spain)?[20] Another question is the cast of the United States, since it is not the party of the Vienna Convention, but ratified its "ancestor", the Convention on Road Traffic signed in Geneva on 19th September 1949 (hereinafter *Geneva Convention*).[21] It shall be also noted that Geneva Convention contains substantially softer minimum rules compared to the Vienna Convention.

4. Authorisation models

4.1. Provisions on self-driving cars in the USA

In the creating of the rules on driverless cars, the United States is on the top. However, this is not surprising, since the world's first driverless car (improved by the Google) appeared there. Though federal act on driverless cars does not exist, the elaboration of the related provisions are already in process both at state level and in the form of bilateral (inter-states) agreements.

Among the states of the USA, Nevada was the first in 2011, which adopted provisions on the driverless cars.[22] During the years 2012–2013 similar acts were born in Florida, California and Michigan and up to this day several other states decided to create the legal framework on driverless cars.

---

[19] In Hungary, the Vienna Convention was promulgated by the Statutory Rule No. 3 of 1980.

[20] Though the United Kingdom did also not ratify the Vienna Convention, we did not mention it above, because with regard to the result of the Brexit, at time of adopting the future EU regulation on self-driving cars, the UK presumably will not be the member of the European Union.

[21] https://treaties.un.org/doc/Publication/UNTS/Volume%20125/v125.pdf (Downloaded: 4. 11. 2016)

[22] TERWILLEGER, John W.: Navigating the Road Ahead: Florida's Autonomous Vehicle Statute and its Effect on Liability. *The Florida Bar Journal,* Vol. 89 (2015), No. 7. http://www.floridabar.org/DIVCOM/JN/JNJournal01.nsf/Author/BFFA213CCE8AA5B085257E6C0047DB90 (Downloaded: 4. 11. 2016)

The structure of the presently existing (and operating) legal acts are similar: they define the autonomous vehicle and gives further notions (e.g. autonomous technology, operator, automated mode etc.), which support the interpretation of the former definition. Such regulations are strongly criticized by the literature, since they do not differ between motor vehicles with regard to the level of automation.[23] Prerequisites of the autonomous vehicle's participation in public road traffic are also determined. (In 2016, Florida amended its act and allowed the participation of autonomous cars in public road traffic. At the same time, it abolished the previously defined conditions on the testing of self-driving cars and on the driver's compulsory presence in the car.)

The adopted acts also contain provisions on driving licence: California requires the autonomous vehicle's driver to have a single, special type of driving licence, while Nevada prescribes the endorsement of the traditional driving license. In Florida any person with a valid driver's license is permitted to operate an autonomous vehicle in autonomous mode.[24] A further essential prescription is (e.g. in Nevada) that each vehicle is to be equipped with a black box-type data collector to store data from the autonomous system sensors, in order to retrieve information from at least 30 seconds before a collision.[25, 26] Moreover, such technology also shall be built into the autonomous vehicle, which safely alerts the operator to take control of the autonomous vehicle if a technology failure is detected.[27] The referred Nevada act contains some serious financial prescription: before a person or entity begins testing an autonomous vehicle on a highway within the state, the person or entity must submit to the Nevada Department of Motor Vehicles the proof of insurance or self-insurance in the amount of 5 million dollars or make a cash deposit or post and maintain a surety bond or other acceptable form of security in the same amount.[28] In the case of private use, the amount of the surety bond or deposit of cash is 500,000 dollars.[29] Thus, prototypes can put in operation upon only individual allowance in a certain geographical region; test vehicles have a distinctive temporary license plate.[30]

4.2. The angles of the European Union's legislation

From 2010, the European Commission (hereinafter Commission) has proclaimed several times that it would create such an intelligent traffic system within the European Union, which keeps step with the technological development, uses the newest innovations in motor

---

[23] PEARL, Tracy Hresko: *Fast & Furious: The Misregulation of Driverless Cars*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2819473 (Downloaded: 3. 11. 2016)

[24] See PECK, Spencer–FATEHI, Leili–DOUMA, Frank–LARI, Adeel: The SDVs Are Coming! An Examination of Minnesota Laws in Preparation for Self-driving Vehicles. *Minnesota Journal of Law, Science & Technology*, Vol. 16, Issue 2 (2015), 843–878, 861.

[25] *Nevada Administrative Code (NAC).* Chapter 482A 2b. http://www.leg.state.nv.us/NAC/NAC-482A.html (Downloaded: 9. 11. 2016)

[26] The "black box" must be captured and stored in a read-only format by the mechanism so that the data is retained until extracted from the mechanism by an external device capable of downloading and storing the data. Such data must be preserved for 3 years after the date of the collision. The provisions of this paragraph do not authorize or require the modification of any other mechanism to record data that is installed on the autonomous vehicle in compliance with federal law. See *NAC*, 482A.110 2b.

[27] *NAC*, 482A.110 2d.

[28] *NAC*, 482A.110 4a. renewal, NRS 482A.060. http://www.leg.state.nv.us/NAC/NAC-482A.html (Downloaded: 9. 11. 2016)

[29] *NAC*, 482A.210 3b.

[30] *NAC*, 482A.140.

car industry and at the same time it complies to the different aims of the EU (e.g. sustainability).[31] Therefore, in October 2015, the Commission decided about the setting up of an advisory body[32] (hereinafter *GEAR 2030*), which consists of different experts. On the one hand, the members of the GEAR 2030 are state ministers, who are liable for the economy, industry and traffic. On the other hand, representatives of the industry, science, and civil sphere, e.g. consumer protective organisations (e.g. FIA[33], BEUC[34] etc.) and observers of other organisations (e.g. EIB[35], CoR[36]) also take place in it.

Discussion paper made by the GEAR 2030 for the Commission *(Roadmap on Highly Automated Vehicles)*[37] outlines the necessity of reviewing and amending the existing legal and political framework on highly automated vehicles. This demand is especially strong in the field of traffic rules, prerequisites of driving license, worthiness of roads and road signs, provisions on liability and insurance, cyber security and data protection. The main goal is the creation of such a legal framework, which is based on the international standards worked out by the UNECE and which aims fully harmonisation.

As it was mentioned before, most of the EU's Member States ratified the Vienna Convention. In accordance with this latter, every Member State has a national legislative act on the rules of road traffic.[38] Directive 2006/126/EC[39] contains minimum rules on the driving licenses; these provisions are supplemented by the national legislations. With regard to the appearance of the self-driving cars in public road traffic, Directive 2006/126/EC will need to be amended. However, the direction of the future amendment is uncertain yet. Thus, it is questionable, if the driving of such vehicles (provided that they require a special skill) can be bounded to the existing of a special driving allowance or traditional driving license on its own gives the possibility for driving an autonomous car. In the British press, such an opinion came to light, which stress that the autonomy of cars will make unnecessary the existence of driving license in the future. Since rules on driving license have already been adopted in some US states, European legislator presumably will proceed from these solutions in the course of working-up the future regulation. Nevertheless, the European legislator should have regard to the aims are to be reached with the introduction of self-driving cars in the public road traffic.

As it was referred in the GEAR 2030's discussion paper, according to the modification of Directive 2006/126/EC the amendment of the Directive 2003/59/EC on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods

---

[31] See White Paper – Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, COM (2011) 144 final, Brussels, 28. 3. 2011; CARS 2020: Action Plan for a competitive and sustainable automotive industry in Europe, COM (2012) 638 final, Brussels, 8. 11. 2012.

[32] High Level Group on the Competitiveness and Sustainable Growth of the Automotive Industry in the European Union (GEAR 2030).

[33] Fédération Internationale de l'Automobile

[34] The European Consumer Organisation

[35] European Investment Bank

[36] Committee of the Regions

[37] https://circabc.europa.eu/sd/a/a68ddba0-996e-4795-b207-8da58b4ca83e/Discussion%20Paper%C2%A0-%20Roadmap%20on%20Highly%20Automated%20Vehicles%2008-01-2016.pdf (Downloaded: 3. 11. 2016)

[38] e.g. *Act*, No. 1 of 1988 on Road Traffic (Hungary).

[39] Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences. *OJ L*, 403, 30. 12. 2006. 18–60.

or passengers[40] will also be necessary for the future. A further – at present untimely – question can be, if the requirement of a special driving license for self-driving cars can have an effect on the purchasing of such cars, i.e. only those persons could buy self-driving cars, who have this special driving allowance. (This question will not answered in this study, since the answer depends on the future – and for the present not existing – European regulation.

5. Compensation for damages, liability questions

5.1. General issues

With regard to the present legislation of the European Union and as to the initiative[41] of the *Committee for Legal Affairs of the European Parliament* (hereinafter *JURI*), robots and – in wider sense – each instrument, which uses AI (included self-driving cars) cannot be held liable *per se* for acts or malpractices that cause damage to third persons.

For the time being, liability rules only cover those cases, when the robot's "act" or "omission" originates in human contribution (e.g. manufacturer, owner, keeper) and this person has should have foreseen and prevented the robot's harmful behaviour. The strict liability of the above-mentioned person can be stated, if the robot, who caused the damage, shall be deemed as "dangerous object" or it falls into the scope of the product liability regulation.

Related to the liability questions, the Regulation 864/2007/EC[42] (hereinafter *Rome II*) shall be noticed, since it determines, which law applicable to non-contractual obligations, e.g. liability in tort/delict. Liability rules closely connected to the national laws, therefore the applicable law to certain harmful act shall be ordered. As to the Rome II, the law applicable to a non-contractual obligation arising out of a tort/delict shall be the law of the country *in which the damage occurs (lex loci damni)* irrespective of the country in which the event giving rise to the damage occurred and irrespective of the country or countries in which the indirect consequences of that event occur.[43]

As it can be seen, under the provisions of the Rome II, a certain state's national liability rules shall be applied for damages; this means an appropriate solution for these legal relations. Nevertheless, a demand has been arisen to unify or at least harmonise tort law of the Member States of the European Union. This work goes parallel with the harmonisation of the European contract law, but the realisation is different, since some scholars would integrate the European tort law into the future European Civil Code,[44] while others intend to work out separate legal rules on tort law.[45, 46]

---

[40] Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, amending Council Regulation (EEC) No 3820/85 and Council Directive 91/439/EEC and repealing Council Directive 76/914/EEC. *OJ L*, 226, 10. 9. 2003. 4–17.

[41] http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+COMPARL+PE-582.443+01+DOC+PDF+V0//EN (Downloaded: 4. 11. 2016)

[42] Regulation (EC) No 864/2007 of the European Parliament and of the Council of 11 July 2007 on the law applicable to non-contractual obligations (Rome II). *OJ L*, 199, 31. 7. 2007. 40–49.

[43] Rome II, Art. 4, para (1).

[44] See VON BAR, Christian–CLIVE, Eric–SCHULTE-NÖLKE, Hans (eds.): *Principles, Definitions and Model Rules of European Private Law. Draft Common Frame of Reference.* European Law Publishers, Munich, 2009.

[45] See European Group on Tort Law (ed.): *Principles of European Tort Law. Text and Commentary*. Springer, Vienna–New York, 2005.

The adjudication of liability questions needs different examination dependent on the fact if the using of a self-driving car is in testing phase (as at present) or already in real consumer actuation. An undertaking pursuing tests upon allowance is liable for the damages, which occurred by test cars during the testing phase. Testing – as a highly dangerous activity – can only be pursued under the observing of strict prescriptions; compensation of damage occurred can be covered either by a special liability insurance or collateral (or other) security. Since the testing of self-driving cars requires for an appropriate qualitative road infrastructure (e.g. road surface, signs, tables etc.), the liability of the state or the authority charged with the roadway surveillance and maintenance (hereinafter roadway authority) can also come up as a subsidiary. Within this category, either the manufacturer or other persons have the right to claim for damages. Manufacturers can sue for the damage occurred in the test car. Persons injured in the accident caused by the test car can claim either for compensation or restitution against the roadway authority if infrastructural deficiencies led on the accident. Since self-driving vehicles usually do not appear in the trade at the time of testing, they cannot be deemed as a product, therefore product liability rules cannot, but rules on liability for highly hazardous activity can be applied. If such a self-driving car is involved in a road accident, which was sold for private use and was taken into road traffic, the following persons can be concerned accordingly the compensation of the damage occurred:

- the injured party, who can be either the driver or any other person, who traveled in the self-driving car;
- the driver or the keeper of the car;
- the manufacturer or importer of the car (or distributor in the case of final product);
- the undertaking, which manufactured the intelligent technology or equipment, which is to be installed into the car ("intermediate product developer");
- the operator of data base or network in the case of autonomous cars connected by wireless technology;
- any other person who involved in the accident's supervention;
- the insurers of the above mentioned persons.

Among the rules on compensation for damages and liability-settling rules, under which the compensated damage can shift off, hereinafter we concentrate only on the applicability of the provisions on liability for highly hazardous activity, product liability and other strict liability rules. Nevertheless, we should mention that as a result of the so-called *non-cumul rule* in the Hungarian civil law, the contractual relationship existing between the injured party (i.e. the buyer of the car) and the manufacturer (i.e. seller) will be a principal question, which brings up further questions on the application of the rules on lack of conformity and compensation for damages caused by the lack of conformity.

5.2. Operating a self-driving car as highly dangerous activity

As to the Article 6:535 of the *Hungarian Civil Code* (Act No. V of 2013, hereinafter *HCC*) a person who pursues an activity that is considered highly dangerous shall be liable for any damage caused thereby. The keeper (pursuer), i.e. the person on whose behalf the hazardous operation is carried out, shall be relieved from this strict liability if he proves that the damage occurred due to an unavoidable cause that falls beyond the realm of highly dangerous activities. In the light of the present judicial practice, we can state that the self-

[46] About the tendencies of harmonisation of European tort law see KOZIOL, Helmut: Harmonising Tort Law in the European Union: Advantages and Difficulties. *ELTE Law Journal Separatum*, 2013/1, 73–88.

driving car's operational abnormality, inner system error or programming deficiencies cannot be deemed as a cause that falls beyond the realm of highly dangerous activity. Moreover, in our opinion, in the case of vehicles communicating with wireless connection, defaults of networking or data transmission or the hacking of the system fulfil neither the above mentioned condition, nor the unavoidability. Thus, it can be stated that provisions on liability for highly hazardous activity having objective nature, shall be appropriately applied for damages occurred in correlation to the operation of self-driving cars. Nonetheless, detailed rules can cause difficulties in the interpretation.

Problems arise with regard to the notion of keeper. On the one hand, borders between the notions worked out by the judicial practice upon the old civil code and given by the rules on compulsory motor insurance[47] has been worn off. On the other hand, since the notion worked out by the judicial practice is broader than the notion used by the HCC (this latter takes focus only on the persons, on whose behalf the hazardous operation is carried out), it is to be feared that the previously used definition is going to narrow to the personal circle designed by the HCC.

Since we have already dealt with the notion of keeper, i.e. who is obliged for the compensation of a certain damage, here we only examine, if in the case of a future driverless taxi service[48] can such a person be liable for damages occurred in an accident caused by the vehicle, who seated in it, did not drive, but the car operated on his or her behalf.

It is also questionable – and it is not an unimportant aspect – if the operating of self-driving (autonomous) vehicles in the future (in 20–30 years) shall be deemed as highly hazardous activity, when decreasing statistical data of road accidents unanimously will prove that road accidents were mostly caused by human fault. Literature standing points count on networking data transmission faults or attacks against system or software[49] in the case of connected cars, i.e. such vehicles, which are in wireless connection with a central source. These actions can be serious contingency, therefore in the North-American states the keeping-up of Internet or other wireless connection is prohibited in the course of testing.[50]

---

[47] As to the Article 3, point 35 of the Hungarian Motor Insurance Act (Act No. LXII of 2009 on the compulsory motor insurance) keeper (authorised person) is a person, who is registered in the document issued by the state of the motor vehicle's premise. In the lack of such person, owner shall be deemed as keeper.

[48] "Uber and Volvo announced plans to put driverless cars on the streets of Pittsburgh in September 2016, and Ford says it expects to introduce its first self-driving cars in 2020." See AHLEMANN, Dietmar–GERLING Walter: The autonomous frontier. In: *Connected car report 2016*. 49. http://www.strategyand.pwc.com/media/file/Connected-car-report-2016.pdf, 55. (Downloaded: 4. 11. 2016)

[49] "Original equipment manufacturers, suppliers, and technology companies are beginning to realize that the connected car could be a cyber security nightmare – unless the right steps are taken now. Determined hackers have already broken into some cars' systems, taking over vehicle functions, from navigation to safety features, and causing problems with the driver's ability to control the car. Future break-ins could even affect more than one car at a time, disrupting traffic flow or targeting an entire fleet of cars. Hackers could go after the increasing amounts of personal data flowing between the car and the cloud through car-based consumer apps and services." See MOHS, Joachim –SCHULTE, Manuel: Pitstop: Making the connected car cyber-safe. In: *Connected car report 2016*. 49. http://www.strategyand.pwc.com/media/file/Connected-car-report-2016.pdf (Downloaded: 4. 11. 2016)

[50] PECK–FATEHI–DOUMA–LARI, 843.

As to the report of the *German Federal Highway Research Institute*[51] *(BASt)* the liability of an AV's keeper can be stated under the rules on the liability for highly hazardous activity. However, the BASt also emphasized that the maintaining of the inverse burden of proof created by the related legal provisions[52] is problematic in all those cases, when the operation of the automated vehicle allows the driver not to take due attention to the driving. Although the German rules on road traffic do not prohibit driving without taking the wheel, in the case of traditional cars this act usually jeopardize the traffic safety, therefore it violates the traffic rules. However, it depends on the level of automation and the concrete circumstances of driving, if losing hold of an AV's wheel impacts the requirement of safe driving or not.[53]

Albeit German rules settle the risk from the operation of the highly hazardous activity to the keeper, the driver also can be liable under the general liability rules (Article 823 of BGB), i.e. driver is liable for damages caused by his or her negligent or voluntary act. Since highly or fully automated vehicles release their driver from the diligent behaviour, which should have been maintained by the driver within the control of the vehicle, in order to the acquittance, driver shall prove that at the time of the accident the vehicle was in automatic mode, instead of proving that his behaviour was diligent or he was not culpable.[54] As to the German rules both the keeper and driver have a duty to conclude a liability insurance contract provided that the insurer's accountability for damages caused by partially automated cars as special vehicle is not excluded or bounded to the payment of higher fee by the presently existing liability insurance contracts.

In the *Anglo-Saxon* legal systems, the basically culpability-based liability rules ("negligence liability") generally are not suitable to determine the driver's or owner's liability for damages originated from the self-driving cars' operation.[55] However, liability rules are not steady. In the majority of the states of the USA special acts settle the liability to the vehicle's owner, if the car is driven by any other person upon the driver's authorisation. The number of judicial decisions, which state that in the case, when a car becomes dangerous instrumentality because of its uncontrollable failure and therefore the owner's liability is strict, is vanishing.[56] Nevertheless, Louisiana's civil code not only knows the liability for damages caused by things, but separately regulates the liability for damages caused by default things. This latter solution can be applied to self-driving cars.[57]

---

[51] Bundesanstalt für Straßenwesen, BASt

[52] Straßenverkehrsgesetz (StVG), Art. 18.

[53] See Legal consequences of an increase in vehicle automation. Consolidated final report of the project group (hereinafter *BASt Report*), 18–19. http://bast.opus.hbz-nrw.de/volltexte/2013/723/pdf/ Legal_consequences_of_an_increase_in_vehicle_ automation.pdf (Downloaded: 4. 11. 2016)

[54] *BASt Report*, 18–19.

[55] "Negligence liability generally requires proof that (1) the defendant owed the plaintiff a duty of care; (2) the defendant breached this duty; (3) this breach was a necessary cause of the plaintiff's harm, in the sense that the plaintiffs harm would not have occurred had the defendant acted with reasonable care; (4) the breach of duty was a 'proximate' cause of the plaintiffs harm; and (5) the plaintiff suffered a legally cognizable injury as a result of the defendant's breach of its duty of care." See GLANCY, 658.

[56] DUFFY, Sophia H.–HOPKINS, Jamie Patrick: Sit, Stay, Drive: The Future of Autonomous Car Liability. *SMU Science & Technology Law Review*, Vol. 16, Issue 101 (2013), 453.

[57] We are responsible, not only for the damage occasioned by our own act, but for that which is caused by the act of persons for whom we are answerable, or of the things which we have in our custody. This, however, is to be understood with the following modifications (Art. 2317. Acts of others and of

The creating of strict liability rules on the damages caused by self-driving cars is urged by several representatives of the North-American legal literature.[58] The standing point of the JURI is similar: such (strict) liability rules shall be work out for 'smart robots', under which only the existence of the causal link between the robot's harmful act and the damage suffered by the injured party should be proved. [59]

As a summing-up, we ascertain that there is a well-perceptible tendency in the liability regulation: the number of those countries, which intend to create such a rule, upon which the liability of the self-driving cars' owner or keeper can be based even the lack of culpability, is increasing. After comparing the different national rules on liability, the difference between the Hungarian model and the solution applied by other – mostly Western-European – countries is obvious. While the Hungarian legislation applies the strict liability construction for the compensation of damages caused by any kind of highly hazardous activity, in the legislation of the majority of the European countries there are special rules on highly hazardous activities.

It shall be noticed that the operation of driverless cars is a "touchstone" of the dogmatic base of the liability for highly dangerous activities. In our opinion, the keeper's strict liability extends not only for the causing of the highly dangerous situation (i.e. starting the driverless car), but for any circumstances, which could be avoidable under the highest diligence. In these cases we presume that the keeper would be capable of the proper intervention.

Contrary to this, those cars, which do not require human intervention and operate only in automatic mode (e.g. Google cars), are originally improved to transport any person, therefore these cars are not equipped with the fittings (e.g. accelerator), which are essential in the traditional driving. The exclusion of the possibility of human intervention a paradox situation draws up: a highly dangerous machine remain without real human control, therefore the liability of this person as the keeper cannot be determined upon the fact that he did not proceed with due diligence in the course of the highly dangerous activity. In contrast to this situation, if the liability for highly dangerous activities is considered as a clearly objective liability form, i.e. we set aside from the wrongful nature of the human act, we handle the keeper's compensation duty not as liability, but as risk management question. If a highly dangerous situation can be created legally and the maintenance of this risky situation without direct and permanent human control is also a legal concept, the keeper's liability for damages originated from this situation could reflect only one approach: burden of risk has to be taken by one, who creates this situation, or who benefits from it or on whose behalf the dangerous thing operates.[60]

---

things in custody). The owner or custodian of a thing is answerable for damage occasioned by its ruin, vice, or defect, only upon a showing that he knew or, in the exercise of reasonable care, should have known of the ruin, vice, or defect which caused the damage, that the damage could have been prevented by the exercise of reasonable care, and that he failed to exercise such reasonable care. Nothing in this Article shall preclude the court from the application of the *doctrine of res ipsa loquitur* in an appropriate case (Art. 2317.1. Damage caused by ruin, vice, or defect in things). LA Civ. Code (2015).

58 DUFFY–HOPKINS, 459.

59 An obligatory insurance scheme, which could be based on the obligation of the producer to take out insurance for the autonomous robots it produces, should be established. The insurance system should be supplemented by a fund in order to ensure that damages can be compensated for in cases where no insurance cover exists. http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+COMPARL+PE-582.443+01+DOC+PDF+V0//EN (Downloaded: 4. 11. 2016)

60 The own interest attaches consequences of the burden of risk-taking to the owner.

As to the *French* law, damages caused by a certain thing should be compensated by the custodian.[61] Custody is a kind of authority, a power to use, manage and take control over the certain thing. It shall be noticed that liability is bound no to the things, but to their custody. A thing can stay under the custody of more persons. Determining the custodian's person is problematic in the case of driverless cars. Nevertheless, giving the answer is essential, since it will affect the vindication of compensation claims, which arise between the driver and the traveler of the car. We also should not forget that this liability is evoked by the – to another person escheating – damage caused by the thing's deficiency. Thus, behind the rules on the liability for things, there is causality between the thing's deficiency and the culpable act (negligence) of the custodian. If the occurrence caused by either an unmoved thing or such and unmoved or moving thing, which was not in physical contact with the aggrieved party, this latter person should prove that the thing was in an abnormal situation or its behaviour was irregular. Nonetheless, if the thing was moving and it had effect on the aggrieved party's injuries, this latter person should prove only the existence of the mentioned physical circumstances. Thus, in the case of driverless cars, the presumption of liability can be applied for the damages occurred during the operation of such cars.[62]

The above mentioned liability, i.e. the strict liability for damages caused by a defective thing, can be deemed as a type of the so-called vicarious liability (liability for another person or thing). Along with this perception, some scholar proposed to apply the liability rules on damages caused by animals for driverless cars and intelligent robots.[63]

In the course of the reviewing of the European tendencies, we noticed that the legal harmonisation of the European tort law is in process, but there are different versions on the realisation. In 2005, the *European Group on Tort Law* elaborated a collection of *Principles of European Tort Law* (hereinafter *PETL*). Article 5:101 of the PETL establishes *strict liability for abnormally dangerous activities*, but under point b) of the second sub-paragraph, this provision cannot be applicable, if the abnormally dangerous activity is the matter of common usage. Therefore, the usage of motor vehicles (as an example of common usage) falls out the scope of the referred article. Nevertheless, under the Article 5:102 of the PETL national laws can provide for further categories for strict liabilities for dangerous activities even if the activity is not abnormally dangerous. In our opinion, since autonomous cars are created for wide-spread use, it should be deemed in the future as common usage, i.e. AVs only in the testing phase can be qualified as abnormally dangerous things. In addition, these provisions of the PETL show us this strict liability for abnormally dangerous activities as a non-fault liability *per se*, where the driver's or user's conduct is irrelevant. This liability is not based on fault, so in order to carry on such activity the user/owner of AV does not need to show either active or passive behaviour.[64]

Among the provisions establishing accountability without intention or negligence, the *Draft of Common Frame of References* (hereinafter *DCFR*)[65] creates a strict liability for

---

[61] *Code Civil*, Section 1384, aliena 1: On est responsable non seulement du dommage que l'on cause par son propre fait, mais encore de celui qui est causé par le fait des personnes dont on doit répondre, ou des choses que l'on a sous sa garde.

[62] KOCH, Bernhard A.–KOZIOL, Helmut (eds.): *Unification of Tort Law: Strict Liability*. Kluwer Law International, 2002, 129.

[63] DUFFY–HOPKINS, 468.

[64] KOCH, Bernhard A.: *Strict Liability In: European Group on Tort Law, Principles of European Tort Law Text and Commentary*. Springer, Wien–New York, 2005, 105–110.

[65] Principles, Definitions and Model Rules of European Private Law Draft Common Frame of Reference (DCFR)

damage caused by motor vehicles.[66] This regulation is justified by the huge amount of traffic accidents; nevertheless, DCFR does not contain detailed rules, but determines two basic elements: liability is strict and the keeper is the person who is held liable. Beyond that, the DCFR emphasises that the liability of the driver is unnecessary, because the strict liability of the keeper, the compulsory insurance system and the direct action for the injured person against the insurer company is sufficient for the defence of victims' interests.

Liability for damages arisen in connection with the operation of driverless cars brings also problems in those national laws, which know the types of strict liability. The elimination of these problems needs for the creation of single liability rules. However, in the course of creating this rule, legislator should take into account a basic consideration: would it be reasonable to settle the duty to compensate directly to the manufacturer or not?[67]

6. Product liability[68]

Compensation for damages caused by motor vehicles is also ensured in a proper way by the Directive 85/374/EEC (hereinafter Product Liability Directive),[69] which is supplemented by the national legislation.[70] Although the provisions contained in the Product Liability Directive will not at all or will only change slightly, some questions are to be answered have arisen. Since several persons are involved to the improvement of a self-driving car, it is problematic that each participant of this working process will be individually liable for the damage occurred or joint liability can be applied, where the measure of liability acts on the measure of the participants' contribution puts up in the developing phase. A further question is that whether a fault based liability approach can be applied at all in those cases,

Outline Edition: http://ec.europa.eu/justice/contract/files/european-private-law_en.pdf, 3382. (10. 11. 2016)

66 VI–3:205: Accountability for damage caused by motor vehicles.

67 In October 2015, Volvo declared that it would pay for any injuries or property damage caused by its fully autonomous IntelliSafe Autopilot system, which is scheduled to debut in the company's cars by 2020. https://www.scientificamerican.com/article/who-s-responsible-when-a-self-driving-car-crashes/ (Downloaded: 4. 11. 2016)

68 In the study we review only the product liability models of the European Union and some stressful national legislation. We do not pay special attention on product liability rules existing in the USA, since the roots of the regulation method are different, these are far from the classical European (continental) approaches. From the relating US literature see: BOEGLIN, Jack: The Costs of Self-driving Cars: Reconciling Freedom and Privacy with Tort Liability in Autonomous Vehicle Regulation. *The Yale Journal of Law & Technology*, Vol. 17, Issue 171 (2015), 171–203; FUNKHOUSER, Kevin: Paving the Road Ahead: Autonomous Vehicles, Product Liability and the Need for a New Approach. *Utah Law Review*, Vol. 2013, No. 1, 437–462; GURNEY, Jeffrey K.: Sue My Car not Me: Product Liability and Accidents Involving Autonomous Vehicles. *Journal of Law, Technology & Policy*, Vol. 2013, Issue 2, 247–277; VILLASENOR, John: *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation*. Center for Technology Innovation at Brookings, 2014; VLADECK, Dacid C.: Machnes Without Principals: Liability Rules and Artficial Intelligence. *Washington Law Review*, Vol. 89 (2014), 117–150; WITTENBERG, Steven: Automated Vehicles: Strict Products Liability, Negligence Liability and Proliferation. *Illinois Business Law Journal*, Vol. 20 (Fall 2015), 10–29.

69 Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products. *OJ L*, 210, 7. 8. 1985. 29–33.

70 Until the adoption of the new Hungarian Civil Code (Act No. V of 2013) provisions on product liability were regulated in a single act; presently Art. 6:550–6:559 of the Civil Code contains them.

when the damage occurred by an act or event which was determined by a software or algorithm. Can a person be liable for damages caused by self-driving car only upon the fact that he or she uses a vehicle equipped with autonomous system and it means risk on its own? Is it possible to take into account external factors (e.g. vis maior) in the course of determining the liability? Can the product liability be coupled with any other (possibly mandatory) insurance construction? As it can be seen, several questions arise according to the product liability on self-driving cars. Since here we only review the existing regulation, the answering of the mentioned questions takes place in the part of this study, which concentrates on liability questions.

In the past, decisions have already arisen in the judicial practice, in which the manufacturer's liability was determined because of the defective accessories of the cars. Along these decisions, damages "caused" by driverless cars can also be compensated with the application of product liability rules. However, further questions shall be examined in the followings.

Foremost it shall be stated that because of the maximum-harmonisation nature of the EU's (previously already referred) product liability directive, the injured party is not entitled to base his damage claim on any kind of strict liability (mostly on liability for highly dangerous activities) instead of product liability rules, even if the subjects of the underlain legal relationship (i.e. injured party and tortfeasor) are the same.

The Court of the European Union (hereinafter the Court) stated as principle in its practice that product liability provisions do not exclude to claim for compensation for damages upon other (delictual or contractual) liability. Moreover, in our opinion, Article 6:145 of the HCC, which excludes the parallel (delictual and contractual) compensation claims cannot be applied in the case of product liability, since these latter rules appear in the Hungarian civil law as a result of the European legal harmonisation.

As to the Article 6:550 of the HCC the manufacturer of the defective product is liable for damages caused by these products. Both the producer of a final or intermediate product or raw material shall be deemed as manufacturer. It means that the fault of an automatic technology, which has been built in the driverless car, or the failure of the software, sensor or communication equipment can cause the joint liability of the different units' manufacturers and the producer of the final product.

A product is defective or shall be considered defective if it fails to provide a level of safety generally expected, with special regard to the purpose of the product and the way in which it can be reasonably expected to be used, the information provided in connection with the product, the date of the sale of the product, and the current state of scientific and technological achievements.[71] However, determining the objective safety requirements, which shall be taken into account in the case of driverless cars, is problematic. In the case of less automated (partially autonomous) vehicles, safety systems have only indirect impact on the driving, while in the case of highly autonomous vehicles these factors have special significance.[72] Nevertheless, it should be noticed that a product cannot be released, until it endangers seeded interest, e.g. the potential violation of certain legal objects to be protected (e.g. life, of life, bodily integrity or health) has arisen.

The safe operation of the system essentially requires from the driver to know the capacity which can be reached by the certain system and know its borders; this ascertainment is especially right in the case of partially automated systems. Concrete

[71] *HCC*, Art. 6:552.
[72] *BASt Report*, 21.

information given by the manufacturer, users' manual-books and public statements on the whole equally have impact on the user's (consumer's) expectations.

The product's fault can be based not only on the non-safe configuration of the product, but the deficiencies of the requirements on the product's operation, if the damage has occurred because of the wrong usage (misuse). According to the previously referred report of the BASt, we can differentiate between two types of usage: in the first case the misuse is reasonably foreseeable, while in the second case the usage means an abuse of a product. However, the user's behaviour is formed not only by the above mentioned manual-books, but the usual usage of the similar products. Moreover, the existence of a not fully incidental, usual misuse is also recognised in the judicial practice. The instructions of the manufacturer should especially draw the driver's attention to these kinds of usages.[73]

In the case of highly automated systems, the request for urgent human intervention in case of emergency fronts the driver with serious challenge. With regard to this, in the future the managing of such situations without human intervention will be an essential requirement of these systems. Nevertheless, if a highly automated vehicle still causes damage, a presumption shall be applied, upon which it shall be considered as the damage caused by the product's fault. If the damage is a consequence of the act of the traffic's any other participant, the above mentioned presumption cannot be applied.

Determining the damage occurred in other thing by the product's fault could be particularly important, if a traditional motor car manufacturer company purchases the technological equipment to be built-in to the driverless cars and the software which are necessary to the operation of them from external suppliers. As to an opinion appeared in the Hungarian legal literature, damage which occurred in the car because of the fault of an intermediate (semi-finished) product, shall be deemed as a damage occurred in other thing, therefore – under the product liability rules – it shall be compensated.[74] In our opinion the referred rule principally aimed at the signing the limits between the compensation for damages under product liability and the compensation claims upon non-performance and other claims. According to this, we accept the solution, where compensation of the damage occurred in the driverless car (as damage occurred in other thing) can be claimed against the producer of the intermediate (semi-finished) product. Nevertheless, it also shall be taken into account that product liability rules exclude the reimbursement of damages other than occurred in things, i.e. damages arose in the injured party's property, profit lost and justified costs cannot be covered by compensation. Thus, the driverless car as defective product can cause – personal and material – damages not only for the operator, but other persons involved in the traffic. These latter persons also have the right under the product liability rules to claim the manufacture, but an action against the keeper of the "tortfeasor car" is more obvious. In this case, damages originated from the car's malpractice and escheats to another person shall be compensated by the keeper/driver under the strict liability rules. At the same time, these persons try to wheel further this duty to the manufacturer. If under the product liability rules the keeper or the car's owner have no right to shuffle off this compensation duty, an unfair situation comes into existence. However, it is questionable, if the existing loophole should be fill in by the creation of single liability provisions or the supplement or modification of product liability rules can serve as an appropriate solution.

---

[73] *BASt Report*, 20–22.

[74] FUGLINSZKY, Ádám: *Kártérítési jog.* HVG-ORAC, Budapest, 2015, 641.

6.1. Liability insurance

Directive 2009/103/EC (hereinafter "Motor Insurance Directive"[75]) prescribes the compulsory insurance of motor vehicles. However, the more autonomous are the motor vehicles, the more difficult is the exact determination of those facts, which caused the accident. As to the referred initiative of the JURI, the creation of an insurance construction – similar to motor car insurance – can be the appropriate solution. Nevertheless, as long as the insurance in the case of traditional motor vehicles takes focus on the potential tortfeasor, i.e. insurance covers the human behaviours and injuries, in the case of vehicles using AI, the insurance duty burdens not the owner (or holder) of the vehicle, but the manufacturer. As a supplementary solution, the JURI initiates the setting up of "compensation fund" for all those cases, in which the existing insurance does not cover the damage caused by the self-driving car.

This latter solution, together with the – for expressly motor cars elaborated – notion of the keeper can be applied more pliantly in the case of damages caused by self-driving cars. It is also important that the majority of European legal systems have coupled their strict liability rules with the imposition of some compulsory insurance schemes as well as compensation funds.[76]

As it was mentioned before, (liability) insurance questions related to the driverless cars have big significance. We agree with Gerhard Wagner that "the liability of the policy-holder seems to be nothing more than an intermediate albeit necessary step, in order to trigger the obligation of the insurance company...".[77] In his – in the footnote referred – work Wagner distinguishes two basic approaches to the interplay between the two fields of law: the *deterrence model* and the *compensation model*.[78] As to the latter, the tort law and the insurance system altogether provide the victims of accidents an adequate compensation.

Under the deterrence model, which is the classical approach in the German-speaking countries of Europe, the tort system should be operated independently from the insurance aspect. Wagner mentioned that in some special areas, however, the insurance cover has an impact on the determination of liability such as the liability in equity, damages for pain and suffering or implied agreements to exclude or limit delictual liability.

The influence of the liability insurance upon the tort law can be perceived in the context of the so-called "constant dangerous activities" in which cases under the scope of highly dangerous activity are drawn much wider, when even a looser causality chain is sufficient to establish the liability. It means also that the operator can be exempted himself with more difficulty, the borders of realm of highly dangerous activity are wide. In this field the casual link between the dangerousness of the activity, its hazardous nature and the occurred damages is significant to examine. The legal practice has already shaped an axiom: "the scope of the dangerous activity should not be determined by the momentary situation, but by means of the whole course of the operation."[79] Applying this legal practice, in the case of emergency automatic stops of the AVs, the operator's liability does not end when he

---

[75] 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, 7. 10. 2009. 11–31.

[76] KOZIOL, 82.

[77] WAGNER, Gerhard: Tort Law and Liability Insurance. *The Geneva Papers on Risk and Insurance*, Issue 31 (2006), 277–292, 281.

[78] WAGNER, 278.

[79] Decision of Curia of Hungary, No. BH 1977, 491.

falls unconscious or has lost the control over the AV. However, it is still questionable, whether an insurance company excludes the risk of AVs at all, or maximizes the amount of insurance benefit or what conditions would make them to take this risk.

From the beginning of the 1950s, several national legislations (e.g. in Scandinavian countries) have worded their intention to build up a non-fault compensatory system, which would mix the strict/non-fault liability with state-subsidised insurance scheme in favour of the defence of the victims. In our opinion such an insurance system can be a good model for indemnification of the damages caused by autonomous vehicle, taking into consideration that the insurance company's or the fund's duty of payment does not depend on the fault of keeper or operator's behaviour.

7. Closing remarks

In our study we reviewed shortly the most important questions on the self-driving cars. Albeit the working-up of the topic is not thorough, it can be seen that the demand for creating legal provisions on driverless cars has been clearly and squarely worded in all over the world, included Europe. However, up to present we learned that technology develops faster, than the law could react either by the modification of the existing legal rules or by the working out of new provisions.

The appearance of self-driving cars in European public road traffic brings up several important questions, since the relatively slight distances road traffic necessarily goes hand in hand with the crossing of state borders. This factor generates the need for making provisions on technical and legal questions of self-driving cars on supranational level instead of remaining the adoption of such rules in the national (or Member State) legislator's hand.

On May 19th 2010, the European Commission launched the Digital Agenda for Europe (hereinafter Agenda), a flagship initiative within Europe 2020, which assumes that digital technologies can help societies and policy makers to address several challenges. Highly automated cars are expected to increase traffic safety by reducing accidents due to human errors, such as the driver's distraction or reduced vigilance.

Along the Commission's Agenda and our examinations, we can word the following requirements relating to the regulation of self-driving cars:

1. The future regulation shall determine all requirements, under which a certain automated vehicle can participate in the public road traffic. However, the future regulation should be fitted to the level of automation, i.e. it shall be taken into account, if a car is partially automated (and therefore has a driver or requires for human intervention in certain cases, e.g. in case of emergency) or the car reaches the level of highly or fully automation.
2. Some years before the European legislator decided the adopt standardised provisions on driving licences. In our opinion a similar step is necessary in the case of self-driving cars, where the test mode and the common usage should be differed. Moreover, the distinction mentioned in point 1) is also important, since it also shall be decided, if in the course of using a partially automated and highly autonomous vehicle – beyond the possession of a traditional driving license – extra-requirements should be prescribed for drivers and travellers in order to make the preventive intervention of these persons possible in case of emergency.
3. In our eye, accidents caused by self-driving cars and damages originated from these events shall also be regulated by legal act. Liability insurance is another essential

element of the future regulation. Nevertheless, since the legal approaches are different, certain aspects of the liability insurance should be modified.

4. In the case of a future harmonised regulation, national legislators should decide and agree on the applicable type of liability. Such a decision definitely requires for the simultaneous examination of provisions on liability for highly dangerous activities and rules on product liability. In our opinion the existing Hungarian rules on the liability for highly dangerous activities and the burden of proof based on the general exculpation model mean an appropriate solution.
5. According to the liability questions, European legislator should also decide, if it maintains the existing product liability provisions and applies them – of course in a proper way – for AVs or adopts supplementary rules. A further important question is, if the manufacturer can be obliged for compensating the consequential damages. Nevertheless, it is obvious that non-cumul rule cannot be applied in this field, contractual relation cannot exclude the manufacturer's liability.