

Connected Automated Driving: Civil Liability Regulation in the European Union

Olga Shevchenko

Master degree in law, Vilnius University
Currently a PhD candidate, Private Law Department
The Faculty of Law, Vilnius University
Saulėtekio av. 9, LT-10222 Vilnius, Lithuania
Tel. (+370 5) 236 61 70
E-mail: <olga.shevchenko.vu@gmail.com>

The *aim* of this article is to provide with the option of civil liability regulation of connected autonomous vehicles (CAVs) and autonomous vehicles (AVs) at the European Union level in the light of introduction of Connected Automated Driving (CAD) on the common market.

Keywords: Connected Autonomous Vehicles (CAVs), Artificial Intelligence (AI), Big Data, levels 4 and 5, large-scale testing.

Automatizuotų transporto priemonių valdymas: civilinės atsakomybės reglamentavimas Europos Sąjungoje

Šio straipsnio tikslas – pasiūlyti automatizuotų transporto priemonių (ATP) civilinės atsakomybės reglamentavimą Europos Sąjungos dimensijoje atsižvelgiant į sukurtą automatizuotų transporto priemonių valdymą ES vidaus rinkoje.

Pagrindiniai žodžiai: Automatizuotos transporto priemonės (ATP), dirbtinis intelektas, didieji duomenys, ATP 4 ir 5 lygio, ATP testavimas.

Introduction

The year of 2019 reflects a sharp trend of the upcoming tendency for the full shifting from human driven vehicles to driverless and/or computer-driven vehicles. Once a vehicle might be driverless transport, the so-called connected autonomous vehicles (CAVs)¹ and autonomous vehicles (AVs)², two major

¹ Connected autonomous vehicles (CAVs) should be determined as (1) connected to other CAVs in terms of vehicle-to-vehicle (V2V); (2) connected to the telecommunication infrastructure (V2I); (3) connected to other technologies (V2X) and (4) connected to others (V2OTHERS).

² Autonomous vehicles (AVs) – controlling the environment and providing self-navigating either partially (semi-autonomous) or fully (driverless) without human's interruption.

issues could appear. Namely, whether there is a possibility of shared ownership and who is the subject bearing the burden of liability in each particular case of a road traffic collision.

Despite the fact that both autonomous and semi-autonomous vehicles were established not just as a part of an ecosystem evolution but also seeking to safeguard traffic and minimize road traffic collisions, incidents have already been registered during the testing of AVs on the public roads. We can already observe singular testing at the EU level. However, there are no large-scale tests which have been performed yet³. At this stage, we can find some rather localized testing which has been introduced, for instance in both the Netherlands and the United Kingdom shuttles on an automated platform serving the public, nevertheless, in both cases drivers are present. Nowadays, we have fully autonomous vehicles⁴ in test regime strictly on closed territories, such as airports, ports and even on the territory of Tallinn University of Technology (Tallinna Tehnikakooli)⁵. At the same time, both the United States and Japan have already introduced a large-scale testing on the public roads. In accordance with the State of California Department of Motor Vehicles Report of Traffic Collision Involving an Autonomous Vehicle, 90 reported traffic accidents were faced with by August 17, 2018, where statistically the total number of incidents has increased from 2017⁶. One of the recent fatal collisions occurred in March 2018, involving UBER's autonomous vehicle, which was being tested within the public roads in Tempe, Arizona and caused the death of pedestrian Elaine Herzberg. Bearing in mind that manufacturers continue developing of AVs in order to guarantee safeness for passengers, around humans and environment, the latter scope shall not restrain authorities from the establishment of a strict regulation covering all foreseeable outcomes possible to occur as a consequence of AVs introduction within the EU market.

The *aim* of this article is to provide with the option of civil liability regulation of CAVs and AVs at the EU level in the light of introduction of Connected Automated Driving (CAD) on the common market.

The *research object* of this article should be considered as a legal solution for the purposes of AVs and CAVs civil liability regulation at the EU level.

The objectives of this article are to examine proposed options of civil liability regulation of AVs and CAVs at the EU level. In order to achieve the aim of this research, it is also necessary to analyse the foreseeable impacts expected to occur as a consequence of the introduction of both AVs and CAVs on the common market. Another task should be considered as an introduction of both strong and weak points of proposed options of civil liability regulation that might arise as a consequence of road traffic collisions, which occurred with either AVs or CAVs. The analysis of new foreseeable risks, alongside with the examination of possible coincidences shall also be considered as the objectives for the purposes of this contribution. The above-mentioned risks shall be examined prior to the establishment of civil liability regulation at the EU level. The coincidences, as it has already been mentioned, might occur due to the multitasking nature of the civil liability regulation. Bearing in mind both, the high sensitivity

³ For the purposes of the large-scale testing in Europe, deployment, safety measures and validation must be harmonised. On 13th March 2019, European Commission has provided with the Annex to the Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regards to the deployment and operational use of cooperative intelligent transport systems. C(2019) 1789 final.

⁴ Automated shuttles were introduced by TRANSDEU Company (is a large company at the mobility, transferring and expeditions sector). Also, Volvo Group has introduced fully autonomous (driverless) trucks.

⁵ In course of the 2nd European Commission Conference on automated driving 'Europe takes the lead' in Brussels (April 2-3, 2019) Jaak Aaviksoo, the Rector of the Tallinn University of Technology has mentioned the fully automated shuttle that operates on the territory of the University.

⁶ State of California Department of Motor Vehicles Report of Traffic Collision Involving an Autonomous Vehicle. (OL 316), <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/autonomousveh_01316+>. The data was taken from the United States reports after the AVs large-scale testing.

and the urgency of the introduction of civil liability regulation for the purposes of both autonomous and semi-autonomous vehicles at the EU level, this article reflects the significant relevance in respect of the analysis provided.

In order to achieve the aim of this article, *the logical analysis method* was the key one applied through the prism of evaluation of the currently existing options of regulation of AVs and CAVs civil liability and civil liability-related measures at the EU level. *The synthesis method* was widely used in terms of the analysis of interventions among the different actors that are providing with a particular range of safety and security requirements for the purposes of further legal regulation. *The comparative method* was also widely used in this article while collating the range of proposed legal instruments and requirements aimed to establish qualitative civil liability regulation through examining of both strong and weak points of each option on regulation provided. In order to acknowledge the particular statements with regard to the different case scenarios in CAD, *the descriptive method* was applied.

Bearing in mind the level of novelty of AVs and CAVs introduction on the common market and a number of research studies available so far, however in the light of the fast development and high rate of changeability, very few relevant studies will be considered for the purposes of this contribution, among them Evas Tatjana's Study of EPRS. A common EU approach to liability rules and insurance for connected and autonomous vehicles'; Schmittner Christoph, Ma Zhendong and Gruber Thomas 'Standardization Challenges for Safety and Security of Connected, Automated and Intelligent Vehicles'; Schmidt Teresa, Philipson Ralf and Ziefle Martina, 'Safety First? V2X – Perceived Benefits, Barriers and Trade-offs of Automated Driving'. CAD-related field through the prism of legal analysis shall be considered as a less developed one in the Republic of Lithuania, in comparison with the scholars' researches in the rest of the EU member states. However, for the purposes of this contribution, the author relies on Vilius Mitkevičius 'Autonomous Vehicles – Today's Legal Challenges for Tomorrow' article published in 2016.

As far as the structure of the article is concerned, the one consists of legal analysis of the regulation options that address the civil liability of CAVs for the purposes of both large-scale testing and ultimate introduction of CAD on the common market. Section 1 provides with the analysis of both current civil liability regulatory framework and new foreseeable risks for the purposes of CAD. Section 2 examines the *status quo* as one of the introduced options of AVs civil liability regulation at the EU level; evaluates all weaknesses of the proposed option of regulation. Section 3 aims to provide legal analysis of the Product Liability Directive (PLD) reform as one of the possible legal instruments addressing regulation of CAD in Europe. Section 4 aims to examine Motor Insurance Directive (MID) reform for the purposes of AVs civil liability regulation; evaluates both strong and weak points of the proposed option of regulation. Seeking to advise on the most favourable and suitable option of the AVs civil liability regulation, Section 5 reflects the last option as an absolutely new framework separated from both PLD and MID.

1. The Current civil liability regulatory framework and new risks at the EU level

The regulation of the motor third party liability (MTPL) has already been established at the EU level in the light of the MID⁷ that defines all concerned subjects to the Directive, indicates terms and conditions

⁷ 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 (Text with EEA relevance). *Official Journal L* 263.

for the purposes of the MTPL regulation, specifies the rights and obligations of both the member states and victims of the road traffic collisions. Taking into consideration that CAVs might be supported, administrated and even co-owned by the automotive producers, the PLD⁸ regulates the liability regime for producers that is applicable to the automotive manufacturers. The Court of Justice of the European Union (CJEU) has established the sets of judgments setting the particular range of rules applicable to both manufacturers and consumers and interpreting the afore-mentioned directives in the light of both rights and obligations established for the subjects to the directives. There are a few more legal instruments established by the empowered EU institutions and related to the civil liability, automated driving, large-scale testing, safety measures and cooperation in concerned field, for instance, European Road Transport Research Advisory Council (ERTRAC) ‘Connected Automated Driving Roadmap’⁹, ERTRAC ‘Safe Road Transport Roadmap’¹⁰, ERTRAC ‘Long Distance Freight Transport. A roadmap for System integration of Road Transport’¹¹, European Parliament resolution on civil law rules on robotics (2017 European Parliament AI resolution)¹²¹³; Declaration of Amsterdam – Cooperation in the field of connected and automated driving¹⁴ (2016 Declaration of Amsterdam); Letter of Intent on the testing and large scale demonstration of Connected and Automated Driving¹⁵ (2017 Letter of Intent); European Commission public consultation on PLD and European Commission public consultation on MID and the studies¹⁶ related to the liability issues for AVs and initiated by the European Commission. However, the application of the afore-mentioned legal instruments, that have not been developed to deal with the AVs and CAVs, might bring misbalance within the existed MTPL system at the EU level and produce even more legal gaps and uncertainties. The above-stated legal gaps and uncertainties might cost huge administrative resources due to their urgency and potential victims to be uncompensated, under-compensated and/or those awaiting for the compensation beyond the frames of a relevant period of time.

⁸ 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. *Official Journal* L 210.

⁹ European Road Transport Research Advisory Council (ERTRAC), ‘Connected Automated Driving Roadmap’, Version 8 of 8th March 2019, final.

¹⁰ European Road Transport Research Advisory Council (ERTRAC), ‘Safe Road Transport Roadmap. Towards Vision Zero: Roads without victims’, Final draft of 28th February 2019.

¹¹ European Road Transport Research Advisory Council (ERTRAC), ‘Long Distance Freight Transport. A roadmap for System integration of Road Transport’, Version 4.0 of 26th February 2019, final.

¹² European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics 2015/2103(INL). FINAL A8-0005/2017.

¹³ During the European Parliament public consultations 87 % (55 % has indicated “very important” and 32 % “important”) of all respondents (stakeholders) have indicated that policy within the field of autonomous vehicles is a top priority within the European Union regulatory framework as follows from the T. Evas, ‘STUDY of EPRS A common EU approach to liability rules and insurance for connected and autonomous vehicles’. PE 615.635, February 2018, p. 15.

¹⁴ Declaration of Amsterdam on cooperation in the field of connected and automated driving. Navigating to connected and automated vehicles on European roads of 14 April 2016.

¹⁵ Letter of Intent on the testing and large scale demonstrations of Connected and Automated Driving (CAD). Rome, 23 March 2017.

¹⁶ C-ITS Final Report completed 2015 – emphasized the necessity to reconsider liability policy in the light of the upcoming automation within the vehicle operation; Business Innovation Observatory – Study by PwC commissioned by DG GROW completed 2015 – strengthen the necessity to reconsider existed liability police in the light of the semi-autonomous and autonomous vehicles within the market enabling insurance to cover needed range of the vehicles; GEAR 2030 HLG Roadmap completed 2016 – addressing the shift of liability among the wider range of subjects such as driver, manufacturer, software provider, services providers, etc.); GEAR 2030 HLG Final Report of October 18, 2017 – put particular range of issues within the EU agenda such as monitoring of the member states’ domestic liability regimes in order to either reconsider currently existed policy in the light of the new technologies within the marker or establish an absolutely new regulatory framework.

There is a particular range of risks within both PLD and MID, where a few manufacturers and/or particular service providers are responsible for the whole production of either semi-autonomous or autonomous vehicles. They might be neither covered for the purposes of PLD, nor AVs covered by the PLD itself, once the latter is limited to the property damage only. Moreover, PLD does not cover damages caused as a result of *wear and tear* or any failure of the particular services provided to the AVs (services linked to the mobility item).

At the same time, MID provides for compulsory reimbursement to ‘other traffic participants’, thus does not cover the driver, user, keeper and owner of the vehicle. MID provides compulsory rules for the minimum, hence the member states have established different liability systems consisting of the divergent threshold liability tests either within the fault-based liability system (e.g. indicating different threshold tests for the ‘fault’ determination) or within the risk-based liability system (e.g. indicating divergent protection for property, legal test for avoiding strict liability rules – negligence basis, etc.).

1.1. Major risks concerning the Connected Automated Driving (CAD) in Europe

The new major risks which are not indicated within the currently existing EU civil liability regulatory framework and covering AVs such as (1) the failure of the operating software integrated within the AVs which enables their operation, (2) network enabling software to operate in a regular course failure (5G network challenges), (3) Big Data collection, storage, transmission and access issues (huge data flow) including compliance with the General Regulation on Data Protection (GDPR)¹⁷ issues (4) cybercrimes and hacking risks (in particular addressed to the individual crimes or terrorist attacks), (5) external both foreseeable and unforeseeable interactions in respect of the programming choices of AVs, (6) requirements to the infrastructure compliance and (7) general insurance terms for the purposes of AVs.

The risk related to the AVs operating software failure raises particular issues, such as (a) whether, and if so, under what conditions the software producer might bear particular compensation costs in case the former is different from a manufacturer; (b) which threshold test shall be established for the software failure, in order to correspond to the defect system for the purposes of PLD. In case the software operating system obtains the status of the product for the purposes of PLD, the particular issues, such as (a) in which way the software operating system should be determined for the scope of ‘reasonable expectation’ and ‘development risk’ for the purposes of PLD and (b) what subject should be defined as a party-respondent – the software provider or manufacturer (in case both do not relate to the same corporation) must be put. It has to be mentioned that some manufacturers are willing to accept the burden of liability with regard to the software breakdown under the scheme of a ‘full pack service’. In case a manufacturer creates an agreement with a software provider on the basis of full responsibility, the former will be the subject to bear the burden of liability not just in case of a vehicle’s breakdown (e.g. sensors, radars, etc.), but also in case of a software failure. However, such a statement remains hypothetical until the official release from manufacturers or legal intervention comes.

The second risk from the above-stated risk group considers the network which enables software to operate in a regular course failure and addresses the issue which might be considered as a liable party for the incident that occurred as a consequence of the network failure, which made impossible AVs to receive necessary data in order to operate in the regular course. At this stage there is a number of discussions with regard to the “fifth generation” of telecommunication systems (5G network) that might

¹⁷ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance). *Official Journal* L 119.

accelerate data transmission for the purposes of AVs. 5G technology might accelerate V2X experience that aims to transmit CAD-relevant data through high-bandwidth, low-latency and high-reliability links¹⁸. However, 5G technology still remains an unknown and inexperienced telecommunication system, hence the particular wide range of safety measures in order to ensure secured and smooth data transmission shall be established.

The third risk shall be assessed through the prism of the platform enabling to collect and store relevant data, however, the huge data flow shall be considered in order to ensure a secured level of both, access and transmission of CAD-related relevant data. One more risk related to the hacking and cybercrimes is not covered yet by the liability regulatory frameworks at the EU level. These frameworks address an issue under what conditions the failure of the software provider might be defined as a defective that enables hacking and/or cybercrime to occur. Hypothetically, both hacking and cybercrimes might interact with the new GDPR to the incidents that occurred from 25 May, 2018¹⁹. However, the latter is the subject to a particular range of limitations. These limitations include producers that might be held liable in the only case, when they failed to conform with the requirements under the GDPR. It must be mentioned that the obligation of producers is to control personal data which provides determination of the scope of data processing and/or data processors under the responsibility of controlling subjects. If the formers fail to provide the necessary technical steps, hence the system remains insecure and can be hacked easily. It is clear that a ‘dynamic consent-based approach’ is necessary for the purposes of GDPR compliance. The Industry is keeping to research smart approaches with regard to the data storage, such as a data exchange platform that has been introduced by Coordination of Automated Road Transport Deployment for Europe (CARTRE). CARTRE has been revising the FOT-Net Data Sharing Framework (DSF)²⁰ based on the needs of automation pilots (SAE, Driver Inside/outside, cooperative messaging) under the requirements laid down within the GDPR²¹. CARTRE advises methodology based on the FOT-Net DSF, dissemination as a data catalogue, alongside with the agreement with data providers and storage, along with the access through repositories and e-infrastructures with a data category and an access model.

One more risk from the presented group which addresses externally both foreseeable and unforeseeable interactions in respect of the programming choices of AVs putting a particular range of issues, namely should and, if so, under what conditions the manufacturer of AVs might be held liable for the incident which occurred as a consequence of the programming choice. In order to answer the above-raised question, it is necessary to find out whether programming choice can be considered as a *defect* for the purposes of PLD.

The requirements to the infrastructure compliance shall be considered for the purposes of CAVs civil liability regulation at the EU level. The new level of infrastructure design shall ensure secure performance and resilience of CAD in Europe. The EU-funded project MAVEN²² is now developing algorithms for

¹⁸ CORDIS ‘Results Pack on connected and automated driving. A thematic collection of innovative EU-funded research results’ of March 2019. Publications Office of the European Union, ISSN 2599-8285, p. 15.

¹⁹ All incidents occurred prior to the May 25, 2018 should be regulated in accordance with the Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regards to the processing of personal data and on the free movement of such data. *Official Journal L* 281.

²⁰ European Commission, DG Connect, FOT-Net Data Sharing Framework of 31 January 2017. D3.1, WP3, F 1.0, final.

²¹ Coordination of Automated Road Transport Deployment for Europe (CARTRE), ‘Support faster deployment of connected and automated driving across Europe and Data Exchange Platform’ from the 2nd European Commission Conference on automated driving in Brussels (April 2–3, 2019).

²² MAVEN – Managing Automated Vehicles Enhances Network, coordinated by Deutsches Zentrum für Luft- und Raumfahrt Ev (DLR), Germany. MAVEN is funded under the H2020.

the purposes of V2I communication which have to be transposed into a well-framed block of the legal requirements for the purposes of V2I. Both physical and digital elements of a new era design of road infrastructure shall be considered for the purposes of further legal requirements and compliance.

The last risk from the underlined group is addressing the general insurance terms for the purposes of CAD in Europe. At the moment, in some cases, MTPL occurs due to a fault committed by a driver, when the consequence of such a fault shall be considered as an occurrence of a road traffic collision, where a victim is suffering either pecuniary or non-pecuniary losses. The scope of a 'fault' is either established in terms of the valid domestic law or determined under the common law, where the one is addressed through the four basic groups of fault, such as negligence (gross negligence), imprudent conduct, deliberate misconduct and strict liability rules apply irrespective of a fault. Despite the fact that the scope of a fault, as well as liability assessment shall be considered beyond the EU competence, thus it has not been harmonized at the EU level, the particular gross uncertainties might occur with regard to the liability assessment for the purposes of Autonomous System (AS) in the majority of the member states. It must be determined, whether a user of AVs shall be considered as a responsible one taking into account the no-fault liability basis, or strict liability provisions will pass to the AS (device itself) for the purposes of further internal investigation with regard to the liability actors (e.g. manufacturer, components producer, service provider etc.). Hypothetically, it might be the case when an AVs manufacturer is equalized to the AS itself (or to a driver in comparison with a conventional vehicle), hence the one might bear the burden of liability in each case, when particular losses have been sustained by a third party²³. In all cases, an ultimate victim might not suffer from the delays in compensation; however, it is still to be solved in which particular way insurance terms may be harmonized at the EU level for the purposes of CAVs civil liability regulation. The introduction of AS as a nuclear for the CAVs has made valid MTPL framework irrational and inappropriate for the purposes of CAVs civil liability regulation at the EU level. Where the AS substitutes a driver of a vehicle, the entire scope of the fault and liability in a broader sense shall be reconsidered.

The precise analysis of the current EU civil liability frameworks reflects further sets of issues within the agenda, namely (1) limitations and grey areas within the currently existing regulation systems; (2) torts in civil liability of AVs, (3) necessity to either reconsider, adjust or to introduce totally new regulation for the purposes of CAD in Europe alongside with the (4) procedural rules and terms addressing civil liability regulation with regard to the losses caused by AVs.

2. The *Status quo* regulation option: European Union civil liability framework after the introduction of the AVs on the common market

In accordance with the European Parliamentary Research Service (EPRS) Study,²⁴ one of the options presented is the so-called *status quo*, which implies the absence of the actions at the EU level and gives the chance to the court practice to fulfil particular gaps and solve the occurred uncertainties. The court practice might appear in the light of the requests for the preliminary rulings to the CJEU in terms of Article 267 of the Treaty on the Functioning of the European Union (TFEU)²⁵, hence it might also

²³ MITKEVIČIUS, V. Autonomous Vehicles – Today's Legal Challenges for Tomorrow. *Vilnius University Press, Journal "Teisė"*, 2016, Vol. 101, p. 136.

²⁴ EVAS, T. A common EU approach to liability rules and insurance for connected and autonomous vehicles. *European Parliamentary Research Service (EPRS)*, PE 615.635, February 2018, p. 29.

²⁵ Consolidated version of the Treaty on the Functioning of the European Union. *Official Journal C 326*.

reduce the appeared uncertainties one after another at the EU level. Nevertheless, the aforementioned option neither provides a solution, nor minimizes the administrative costs once (a) both uncertainties and legal gaps will continue to exist; (b) victims will remain either uncompensated, under-compensated or compensated with the unreasonable delay; (c) litigation costs will be sufficiently high; (d) discrepancies within the domestic legal interpretations and case-law of the member states will significantly rise due to the long-lasting cultural differences; (e) legislative changes will be inevitable, hence the required administrative costs will multiply with the litigation costs which have already been spent; consequently, it will produce double debts for both domestic and EU budgets.

While the member states have established their own legal groundings and instruments in the light of the long-lasting traditions existing within a particular culture, it would be extremely difficult, sometimes even impossible, to unite divergent traditions by Court practice at the EU level. For instance, in 2017, the United Kingdom Parliament introduced the Vehicle Technology and Aviation Bill²⁶. It was also aimed to regulate civil liability issues which appeared due to the collisions caused by AVs, holding third-party insurers, *in esse*, liable for both pecuniary and non-pecuniary losses that occurred as a cause of a traffic accident between an AV and a conventional vehicle. Nevertheless, such a solution would not satisfy the rest of the member states, which have established rather divergent civil liability rules.

Bearing in mind the necessity to gain a public acceptance with regard to the AVs introduction on the common market, it is imperative to ensure both the safety connected with automated driving and the guaranteeing of a high level of protection to potential victims. In accordance with the empirical tests,²⁷ which have been performed locally, the society, in general, is ready to accept the new era of connectivity and mobility. However, such a result is unlikely to remain identical in case of a *status quo* approach of regulation.

Taking into consideration the speed of innovations in this particular field, alongside with the upcoming large-scale testing, the EU empowered institutions have to accelerate the process in one or another way. The experience, the so-called *status quo* approach, might be helpful to fulfil the particular gaps and uncertainties in future, but cannot be considered as, *in esse*, the approach of legal regulation. Both legal gaps and uncertainties are hard to be absolutely avoided with regard to a new era of connectivity and mobility. However, there is a range of issues to be covered prior to the AVs entrance into free circulation on the internal market.

Bearing in mind the number of foreseeable consequences, such as the absence of public acceptability, harmful outcomes which are produced to the consumers and the cost-base that does not correspond to the reasonable funds achieving destination, the *status quo* approach shall be considered significantly unreasonable and unacceptable.

3. The Product Liability Directive reform as a second regulation option

The PLD regulates the liability regime for producers that is, *inter alia*, applicable to the automotive manufacturers. Therefore, all possible future amendments to the Directive shall be established in the light of its designation, namely the subject-matter which is oriented to the defective products and does not address AVs in specific. PLD imposes the obligation on both the EU and EFTA member states to integrate the

²⁶ UK Department for Transport. Vehicle Technology and Aviation Bill. Published 22 February 2017. Including a single-vehicle accident.

²⁷ SCHMIDT, T.; PHILIPSEN, R.; ZIEFLE, M. 'Safety First? V2X – Perceived Benefits, Barriers and Trade-offs of Automated Driving'. VEHITS 2015 – International Conference on Vehicle Technology and Intelligent Transport System, Lisbon, Portugal, Volume 1, DOI: 10.5220/0005487800390046.

risk-based liability rules for the regulation of defective products within the domestic law. Although the abovementioned regulation should be introduced, the particular range of legal uncertainties still exists, such as (1) in the light of the long-lasting differences within the legal culture of the member states, the ones might interpret provisions laid down within the PLD in a rather divergent manner; (2) there is a discretion for member states to introduce different civil procedure rules involving the assessment of evidence shreds, defence and both pecuniary and non-pecuniary losses calculations; (3) PLD is limited in its scope, leaving the fault-liability rules undetermined. PLD does not limit the responsibility of manufacturers only, since it should be considered in common sense, that each party contributing into the good itself, generally speaking putting their logos within the product might be held liable for the defectiveness of the product itself, including developers and manufacturers of separate parts of the product.

In light of the PLD, manufacturers may avoid liability for the losses sustained as a consequence of *design defect*²⁸ and/or *information defect*²⁹, claiming that both afore-stated defects do not relate to the *manufacturing defect*³⁰. At this stage the most important element with regard to the AV, as a product reflected through the prism of standardization for safety and security, where concrete standards and requirements are still to be defined; where safety and security must be integrated at both the vehicle level and system engineering level³¹, still remains for an inside collaboration between the Industry and law-making bodies to determine thoroughly the safety and security requirements for the purposes of further standardization. Bearing in mind all complexity and specificity of the AVs, the PLD defence strategy might lead to the claims where potential victims will remain uncompensated, under-compensated or compensated within unreasonable delay.

In accordance with Article 7 of the PLD, there is a list of manufacturer's defences available in order to avoid liability, such as (1) the product was not put into the circulation; (2) after the expert's examination, it appears that indeed the defect occurred after the product had been put into the circulation, thus might be a case of consumers/users fault; (3) the product was neither manufactured for commercial purposes (sales, distributions), nor established in terms of regular business; (4) the defect occurred in the light of compliance with the obligatory regulations provided by the public authorities and/or empowered institutions; (5) the moment, when the product was put into the circulation, occurred prior to the discovery of existence of such a defect and (6), in case of a failure of components producers, the ones guarantee that the component is attributable to the product.

In light of the existed Court practice, it should be also stressed that although Article 7 of the PLD does not include the clause with regard to the user's mistake in order to observe the instructions of exploitation, the latter should be considered as one more possible defense for the manufacturer enabling the one to avoid liability. However, such defence will be not applicable to the case when both factors are proved, namely the defectiveness of the product and user's negligence³². Taking into account AVs

²⁸ *Design defects* should be understood as flaws within the product design that is an anomaly usually occurred within the whole line of the product being introduced at the market.

²⁹ *Information defects* should be understood as a manufacturer's failure to reasonably inform the user about the product's usage, side-effects and warnings.

³⁰ *Manufacturing defects* should be understood as flaws within the vehicle or its components itself distinguished from the intended design.

³¹ SCHMITTNER, C.; MA, Z.; GRUBER, T. 'Standardization Challenges for Safety and Security of Connected, Automated and Intelligent Vehicles'. ICCVE 3rd International Conference on connected vehicles and expo, Vienna, 2014.

³² 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. *Official Journal* L 210. In accordance with Article 8 of PLD – liability of the manufacturer shall not be reduced when the damage caused both by a defect in the product and by the act or omission of a third party.

ultimate purpose, the aforementioned defences can be considered neither relevant, nor justified for the purposes of the AVs civil liability regulation on the common market. It appears that a huge disproportion within the motor insurance sector might occur providing absolutely divergent guarantees and procedures for the victims, whose sustained losses have been caused by conventional vehicles, and the victims who have suffered particular losses from the AVs.

Considering PLD terms and determinations, it should be mentioned that Article 6 claims that the defectiveness of goods shall be confirmed whenever a product does not provide the safety that the one must guarantee; thus, it might be the case of further CJEU interpretations. Such interpretations may enable victims of the traffic accidents with the involvement of AVs to claim compensation from a manufacturer avoiding additional assessment in regard of the rest of developers and the components of producers' responsibility based on the above-stated provision.

While amending the Directive, it is necessary to safeguard provisions in respect of the defective products in the broader sense. At the same time the legal gaps which address AVs at the EU level must be fulfilled. For the aforementioned reason, it would be necessary either to introduce a new normative part to the Directive, solely addressing civil liability regulation of the AVs, or to fulfil the already existing provisions by introducing the particular new articles and Annexes, which, however, should be considered as a more complicated and ambiguous option.

The amendment of PLD should consider the following aspects (a) the determination of the AVs; (b) the definition of the 'defect' for the purposes of AVs, that might be in the line with the definition of the 'defective product' in its broader sense; (c) both consumers' and manufacturers' rights and obligations; (d) the limitations of the defenses and (e) the burden of proof rules. The rest of the terms and reasonable delays in the settlement should remain the same to all defective products for the purposes of the Directive.

AVs are the special classified type of product that should not be separated from the vehicles and the regulation of road traffic itself, hence it should be in the line with MID. Accordingly, the victims who suffered from AVs for the purposes of PLD should not be distinguished from the victims covered by MID, thus the claims for reimbursement must remain similar. MID provides with a more simple procedure for the purposes of compensation claims, therefore it should be simplified within the PLD for the purposes of AVs regulation.

Consequently, the PLD reform might be considered as a possible less cost-based and more efficient option rather than *status quo*. However, the one might provide with the ambiguous effect and even generate new uncertainties in case new amendments apply to the already existing provisions.

4. The Motor Insurance Directive reform as a third regulation option

The MID addresses all concerned subjects to the Directive, indicates the terms and conditions for the purposes of MTPL regulation, specifies the rights and obligations of both member states and victims of the road traffic collisions. However, MID does not address the regulation of AVs in particular. Keeping in mind the long-lasting legal tradition among the EU member states, it might be extremely difficult to reconsider the entire MID and harmonize the already existing liability systems, such as strict-liability and no-fault systems. In the light of the legal practice of the majority of the member states, the main scope of liability that should be reconsidered for the purposes of AVs inclusion turns to include either the concept of a 'driver', an 'owner' or a 'possessor' of a vehicle. It will expand the list of the necessary legal steps to be performed in terms of both the reforms of the MID and the domestic MTPL rules. Moreover, the driver-victim concept is being excluded from the regular course of the MTPL claims

(except the Swedish approach where a driver is fully covered irrespective of fault and liability), while the similar approach is impossible to apply in terms of the inclusion of AVs regulation.

The inclusion of substantive provisions within the MID should be considered as a complicated and cost-based action once (a) the Directive does not cover substantive liability law that is required to be determined for the purposes of AVs; (b) further harmonization of the domestic laws is necessary, however, it might be extremely complicated and cost-based; (c) the MID provides a smoothed compensation procedure that might be changed in light of the AVs inclusion, hence complicate the victims' status to exercise the right to compensation.

Taking into account that the traffic rules are not harmonized at the EU level, it should be noticed that the general reform of the MID might force the member states, after all, to take a number of actions in order to reconsider the already existing legal instruments at the domestic level. Apparently, the inclusion of AVs on the common market has left authorities no choice but to provide an urgent solution seeking to ensure civil liability regulation and guarantee the right to compensation. However, according to such a scenario, the member states will remain unsuccessful, as the reconsideration of the domestic laws requires a huge range of additional steps with regard to the traffic liability rules. It has to be mentioned that the particular legal uncertainties with regard to the AVs entrance already exist among the EU member states, such as Geneva, where in accordance with the valid traffic law, each vehicle must have a driver. Hence, a driverless vehicle, even in terms of either local or large-scale testing, contradicts the provision established in Geneva³³. The traffic rules must consider both the mixed traffic flow and CAD in a broader sense, while the civil liability regulation shall include all case scenarios, such as V2V, V2I, V2X and V2OTHERS³⁴, and that remains impossible without the EU empowered institutions intervention seeking to uniform the aforementioned relations.

The MID should be reconsidered in the nearest future irrespective of the introduction of AVs, thus the complex and complicated inclusion of AVs policies might affect the whole reform of the MID itself, might raise even more uncertainties and legal gaps and even invoke a new necessity of one more reconsideration eventually. The CJEU judgment in *Damijan Vnuk v Zavarovalnica Triglav d.d. (Vnuk)*³⁵ provided with a significant impact within the scope of MTPL regulation through the broadened scope of both 'vehicle' and 'use of a vehicle' challenging the effectiveness of the current MTPL regulation. Accordingly, the reform of the MID might be even more cost-based in the light of a possible double reconsideration in terms of (1) post-effect after the *Vnuk* Judgment and (2) the introduction of AVs on the common market.

In the light of the specificity³⁶ of the AVs, it is foreseeable that the majority of road traffic collisions might occur as a consequence of their defectiveness, such as a technologies breakdown, a failure or even hackings; hence the PLD should be considered as a more accurate legal instrument addressing regulation of AVs at the EU level in comparison to the MID reform. Consequently, the reform of the MID in the light of the introduction of AVs on the common market should not be a priority option bearing in mind all complexity, difficulty and cost basis of such a regulatory approach.

³³ Geneva's example shall be considered identical to the majority of the EU member states.

³⁴ It has to be mentioned that particular standards and requirements were provided in terms of the Annex to the Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the deployment and operational use of cooperative intelligent transport systems. C(2019) 1789 final. (C-ITS).

³⁵ *Damijan Vnuk v Zavarovalnica Triglav d.d.* The Judgment of the Court (Third Chamber) of 4 September 2014, Case No C – 162/13, ECLI:EU:C:2014:2146.

³⁶ Specificity of the autonomous vehicles should be understood as their dependence on software and high-tech operation systems. Technical issues: (1) self-diagnosis in system, (2) supervising alarms, (3) supervising environment (e.g. speed limits, weather conditions), (4) cybersecurity telecommunication, (5) drive assistance, (6) navigation, (7) autopilot, (8) localizations, sensors, radars, cameras, microphones, (9) hardware and software and (10) night vision.

5. The new regulation addressing the introduction of the AVs on the common market

New technologies are now smoothing and developing the EU integration, while the already existing legal instruments addressing the legal regulation of a new product expected on the common market are getting less concrete and more uncertain. Therefore, prior to the introduction of a new product, after all, there is a strong necessity to develop a new civil liability regulation fulfilling the already existing legal gaps and uncertainties for the purposes of CAD. It is clear that a harmonised cross-border approach must take place due to the complexity of CAD itself and a high level of victims' protection.

In accordance with the analysis provided within the sections above, neither the PLD reform nor the reconsideration of the MID might be observed as the priority options claiming the introduction of AVs on the internal market. Accordingly, the establishment of a new legal instrument addressing civil liability regulation for the purposes of CAD at the EU level should be considered as the most favourable option of regulation.

5.1. The general and specific provisions for the purposes of CAVs civil liability regulation

The new regulation must address both general and specific rules with regard to the introduction of AVs on the common market. General rules should be taken for granted as minimum regulation requirements, which address both MTPL clauses and product liability policy (those might differ to some extent from the ones established in terms of both PLD and MID). It has to be mentioned that a minimum amount of coverage (1) should be concerned as a general rule seeking to ensure a high level of victims' protection and (2) should be ensured at the same level or even higher as the one addressed within the MID³⁷.

Specific rules should cover new risks, such as (1) the failure of the operating software integrated within the AS and enabling its operation, (2) the network enabling software to operate in a regular course failure, (3) data processing issues (huge data flow) (4) cybercrimes and hacking risks (in particular addressing individual crimes or terrorist attacks), (5) external both foreseeable and unforeseeable interactions in respect of the programming choices of AVs, (6) the block of requirements with regard to the new standards for road infrastructure (adopted for the purposes of CAD and mixed vehicle traffic flows). The particular rules should address a data exchange process and general communication issues with regard to the AS. All above-stated tiers of general regulation shall be accurately considered for the purposes of civil liability regulation, as each of the actors, perhaps, may be inquired as a subject bearing the burden of liability as a consequence of the particular breakdown. However, it remains undetermined whether an AVs insurer is the only subject inquired to receive a primary claim for compensation, and the later determines the particular subject for the purposes of a further recourse claim (e.g. case-scenarios determining more subjects enquired to receive a primary claim for compensation shall be considered).

It has to be stated that both a 'driver' and a 'user' of the CAVs shall be accurately defined and distinguished in order to impose the particular block of obligations on each actor. The afore-mentioned step is indeed necessary towards civil liability regulation in terms of a threshold for disputes with regard to liability. Current MTPL framework shall be invoked as an appropriate example solving liability

³⁷ Communication from the Commission to the European Parliament and the Council. The adaptation in line with inflation of minimum amounts of cover laid down in Directive 2009/103/EC 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. *Official Journal* COM/2016/246 final.

disputes in terms of both negligence and gross negligence (referring to the EU member states domestic law). Despite the fact that tort law remains beyond the EU competence, the particular elements, such as the provision in MID (Article 13 ‘Exclusion clauses’) addressing exemption from the burden given to insurer to provide with the relevant indemnity must be constant and agreed on.

Besides all complexity of technological development of infrastructure, which shall serve for the usage of AVs and mixed vehicle traffic flows, the particular standards must be harmonized at the EU level. Technical requirements must be ensured in order to avoid incidents with regard to non-adapted or sub-quality infrastructure. The disparity with regard to the infrastructure standards integrated into a concrete block of requirements must be considered as a gross non-compliance, hence such roads should be banned from a public CAD.

At the current stage, ICT4CART project aims to provide with the ICT infrastructure and reflect the existing omissions for the purposes of the normal functioning of CAD. ICT4CART project is oriented on the automation at a higher level such as L3³⁸ and L4³⁹ integrating current test performances in Laßnitzhöhe, Graz (Austria), Ulm (Germany) and Verona, Trento Centro (Italy)⁴⁰. At the same time, INFRAMIX project aims to establish road infrastructure design which is suitable for mixed vehicles traffic flows, where different mixed traffic scenarios will be analysed. Bearing in mind different case scenarios addressing civil liability issues, the infrastructure must be considered as one of the actors ensuring safety usage of CAD. Therefore, the legal framework addressing civil liability regulation with regard to the usage of AVs shall include the particular defined requirements and a block of standards for the purposes of CAD road infrastructure.

The adoption of a new legal instrument related to the introduction of AVs should fulfil a wide range of particular legal gaps and uncertainties. However, it should not be the subject challenging the already existing legal frameworks. Here, the particular complications might occur with regard to a new legal regulation, such as (1) time frames assigned for the adoption of a new legal regulation in the light of the complexity and difficulty of the concerned subject-matter and (2) potential coincidences with both PLD and MID since both directives consider subject-related policies.

In the course of the 2nd European Commission Conference on automated driving ‘Europe takes the lead’, Wim van de Camp⁴¹ has mentioned that the EU law-making process is very slow, while the representatives of Industry have confirmed that the upcoming legal instrument has slowed down technological progress and innovations due to the delays. It is hard to proceed with both large-scale testing and large-scale manufacturing without further firm steps at the EU level. It has to be mentioned that none of the options analysed in the previous sections might become the case of a faster regulation in the light of their complexity. Bearing in mind that the adoption of a new legal instrument should not invoke further necessity of reform, the one should be considered as the most time-effective option. Analysing the second disadvantage in light of the introduction of a new legal instrument addressing civil liability regulation of AVs, the former does not secure the directives from the same overlaps after the reform. Thus taking into account all advantages, it should be considered as a less harmful one compared to the others.

³⁸ Level 3 as a type of a self-driving vehicle shall be considered as a semi-autonomous system with additional extensions.

³⁹ Level 4 as a type of a self-driving vehicle shall be considered as a fully autonomous driving system, which however might require driver’s intervention in case of a system failure and does not cover the each-day driving scenario.

⁴⁰ The Innovation and Networks Executive Agency (INEA), ‘Automated Road Transport. On the way to connected and automated mobility. HORIZON 2020’, March 2019, p. 18.

⁴¹ Wim van de Camp is a Dutch politician serving as a Member of the European Parliament since 2009, rapporteur of the Committee on Transport and Tourism for autonomous driving in European transport.

5.2. The regulation ensuring AI integration and high level of victims' protection

At this stage the collaboration must materially assist further legal developments with regard to a new mobility and connectivity era. For this reason, the collaboration must be achieved at a new level, such as between the EU and the U.S. alongside with Japan in terms of the Trilateral Collaboration⁴². At the same time, the cooperation at the EU level remains incomplete due to the number of member states that are not involved in Horizon 2020 Automated Road Transport⁴³.

Internal collaboration still takes a leadership position with regard to all sectors, such as (1) a private sector, (2) a public sector, (3) Academia, (4) Industry, (5) Telecommunication, (6) Infrastructure providers, (7) Operators, (8) SMEs and (9) ultimate users. Seeking to provide with the regulation on automated driving in Europe, a complex analysis is necessary due to the high complexity of the issue itself. For instance, in course of the legal research in Australia⁴⁴, the scholars agreed upon the main clauses in civil liability regulation, such as (a) equity must be reached with regard to the accidents caused by human driving vehicles and CAVs, however, the liability with regard to the failure of either technology or software must be strictly distinguished; (b) equity must be established on a non-negotiable basis with regard to the high level of victims' protection; (c) the particular range of obligations must be provided to the driver (or user) of a CAV, such as compliance with the driver's licensing and alcohol/drugs requirements. However, at this stage, it remains unclear whether a driver's license shall be reconsidered through the prism of a new technological operation or the one shall remain untouched with regard to the legal intervention. Until now, the regulation of the driver's licensing at the EU level is considered under the Directive 2006/126/EC⁴⁵ and it addresses the operation of conventional vehicles only. Accordingly, it is still to be determined whether the possession of a current sample of a driver's license is enough for the purposes of AVs operation or the users will be obliged to gain the particular subject-specific knowledge prior to the passing 'new sample driving license' exams.

It has to be mentioned that recently the European Commission has made a firm step towards safety, security and deployment measures for the purposes of CAD in Europe by introducing an Annex to the Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the deployment and operational use of cooperative intelligent transport systems (C-ITS)⁴⁶. Although C-ITS has solved a particular range of issues with regard to the system behaviour through the prism of V2V, V2I and V2OTHERS, there is still a huge spectrum of issues to be determined and harmonised for the purposes of AVs introduction on the common market.

⁴² The Impact Assessment Sub-Group of the European-US-American-Japanese Trilateral ART Working Group, Satu Innamaa (VTT), Scott Smith (US DOT) and Nobuyuki Uchida (JARI), Draft version 1.0 of the high-level Trilateral Impact Assessment Framework for Automation in Road Transportation of 4th January 2017, <https://connectedautomated-driving.eu/wp-content/uploads/2017/05/Trilateral_IA_Framework_Draft_v1.0.pdf>.

⁴³ EU member states that are not involved in Horizon 2020 Automated Road Transport: Ireland, Portugal, Poland, Romania, Bulgaria, Hungary, Lithuania, Latvia and Estonia.

⁴⁴ In course of the 2nd European Commission Conference on automated driving 'Europe takes the lead' (2-3 April, 2019), Kirsten McKillop, Director Automated Vehicles, National Transport Commission in Australia has presented current stage of research and solutions in Australia for the purposes of CAD.

⁴⁵ Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences (Recast) (Text with EEA relevance). *Official Journal* L 403.

⁴⁶ Annex to the Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the deployment and operational use of cooperative intelligent transport systems. C(2019) 1789 final.

The society is ready to accept vehicle-assistant (so-called “TeamMate car” in accordance with the INEA⁴⁷), instead of a driverless vehicle. “TeamMate car”⁴⁸ is a necessary step prior to the introduction of the driverless vehicles on the common market. In the light of the number of researches, a human error shall be considered as an ultimate cause of traffic accidents in 94 per cent of cases, where AS is expected to contribute into the minimization of the traffic collisions and collective safety⁴⁹. However, even in case of safety prognoses, public acceptance cannot be reached unless technologies prove to be indeed safe. The legal framework must already address both driver-assist and fully autonomous driving systems’ regulation. It is still to be determined what type of testing data should be shared and made publicly available. The society should examine as many features of the CAD as possible for the purposes of further smooth public acceptance and trust. Therefore, edge cases and scenarios shall be publicly available and accessible.

At the moment it is imperative to finalize at least ‘adaptive regulation’ in order to ensure the EU smooth integration into the mobility and connectivity era. The EU shall be ready to ensure safety CAD prior to the introduction of the AVs on the common market. Despite the existing difficulties and complexity of the issue itself, the establishment of a new legal regulation with regard to the introduction of the AVs on the common market separately from both PLD and MID, is currently the most favourable and advanced option.

Recommendations and conclusions

In the course of the research the author has ended up with the following conclusions:

1. *Status quo* should not be considered as a favourable policy option in the light of both harmful outcomes which will be produced for the consumers and its high cost-basis that does not correspond to the reasonable funds achieving destination.
2. The PLD reform might be considered as a possible option which is less cost-based and more efficient than *status quo*, however, the one might provide with the ambiguous effect and even generate new uncertainties in case new amendments apply to the already existing provisions.
3. Article 7 for the purposes of PLD indicating the list of possible defences and enabling manufacturers and components producers to avoid liability cannot be considered either as a relevant one or justified for the purposes of the civil liability regulation with regard to the CAD. As result, a huge disproportion within the motor insurance sector might occur providing absolutely divergent guarantees and procedures for the victims who sustained losses caused by regular vehicles and the victims who suffered from the AVs (V2V and mixed traffic accidents).
4. The MID reform in the light of the introduction of AVs on the common market should not be a priority option bearing in mind all complexity, difficulty and cost basis of such a regulatory approach.
5. An entirely new legal instrument for the purposes of AVs civil liability regulation at the EU level shall be considered as the most favourable and advanced option. Taking into account both the difficulties and all complexity of the issue itself, the adoption of a new legal instrument should not invoke a further necessity to reform, thus, potentially should be considered as the most time-effective option.

⁴⁷ The Innovation and Networks Executive Agency (INEA) <...>.

⁴⁸ The Innovation and Networks Executive Agency (INEA) <...>, such systems as ADAS&ME that is develops Advanced Driver Assistance Systems (ADAS) and VI-DAS, which concept is based on the vision inspired Driver Assistance Systems.

⁴⁹ CORDIS ‘Results Pack on connected and automated driving. A thematic collection of innovative EU-funded research results’ of March 2019. Publications Office of the European Union, ISSN 2599-8285, p. 13.

6. The establishment of a new legal instrument for the purposes of AVs introduction should include three units regulation: (1) general minimum clauses seeking to ensure a high level of victims' protection (MID basis); (2) the adjustment of a product liability policy (PLD basis) and (3) the specific group of provisions seeking to cover AVs-related new risks.
7. A 'Driver' and a 'User' of the AVs must be defined and distinguished accordingly. The block of obligations for both a 'driver' and a 'user' shall be determined in order to access a threshold for civil liability (exemptions and negligence provisions).
8. The legal framework shall address in details all types of CAVs in relation to the rest of the actors, such as V2V, V2I, V2X and V2OTHERS for the purposes of civil liability regulation apart of the ones which have already been introduced in terms of the C-ITS Annex.
9. Legal framework addressing civil liability regulation with regard to the usage of AVs shall include the particular defined legal requirements and a block of standards for the purposes of new era road infrastructure (including requirements for the purposes of AVs, as well as mixed vehicle traffic flows).

Bibliography

European Union Legal Acts

1. Consolidated version of the Treaty on the Functioning of the European Union. *Official Journal* C 326.
2. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance). *Official Journal* L 119.
3. Annex to the Commission Delegated Regulation supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the deployment and operational use of cooperative intelligent transport systems. C(2019) 1789 final.
4. 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. *Official Journal* L 263.
5. Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences (Recast) (Text with EEA relevance). *Official Journal* L 403.
6. Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data. *Official Journal* L 281.
7. 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. *Official Journal* L 210.
8. European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics 2015/2103(INL). FINAL A8-0005/2017.

European Union Documents

9. The Innovation and Networks Executive Agency (INEA), 'Automated Road Transport. On the way to connected and automated mobility. HORIZON 2020', March 2019.
10. CORDIS 'Results Pack on connected and automated driving. A thematic collection of innovative EU-funded research results' of March 2019. Publications Office of the European Union, ISSN 2599-8285.
11. European Road Transport Research Advisory Council (ERTRAC), 'Connected Automated Driving Roadmap', Version 8 of 8th March 2019, final.
12. European Road Transport Research Advisory Council (ERTRAC), 'Safe Road Transport Roadmap. Towards Vision Zero: Roads without victims', Final draft of 28th February 2019.

13. European Road Transport Research Advisory Council (ERTRAC), 'Long Distance Freight Transport. A roadmap for System integration of Road Transport', Version 4.0 of 26th February 2019, final.
14. Letter of Intent on the testing and large-scale demonstrations of Connected and Automated Driving (CAD). Rome, 23 March 2017.
15. European Commission, DG Connect, FOT-Net Data Sharing Framework of 31 January 2017. D3.1, WP3, F 1.0, final.
16. Declaration of Amsterdam on cooperation in the field of connected and automated driving. Navigating to connected and automated vehicles on European roads of 14 April 2016.

National Legal Acts

17. UK Department for Transport. Vehicle Technology and Aviation Bill. Published 22 February 2017.

Scholarly Articles

18. EVAS, T. A common EU approach to liability rules and insurance for connected and autonomous vehicles. *European Parliamentary Research Service (EPRS)*, PE 615.635, February 2018.
19. MITKEVIČIUS, V. Autonomous Vehicles – Today's Legal Challenges for Tomorrow. *Vilnius University Press, Journal "Teisė"*, 2016, Vol. 101.
20. SCHMIDT, T.; PHILIPSEN, R.; ZIEFLE, M. 'Safety First? V2X – Perceived Benefits, Barriers and Trade-offs of Automated Driving'. VEHITS 2015 – International Conference on Vehicle Technology and Intelligent Transport System, Lisbon, Portugal, Volume 1. <<https://doi.org/10.5220/0005487800390046>>.
21. SCHMITTNER, C.; MA, Z.; GRUBER, T. 'Standardization Challenges for Safety and Security of Connected, Automated and Intelligent Vehicles'. ICCVE 3rd International Conference on connected vehicles and expo, Vienna, 2014. <<https://doi.org/10.1109/iccve.2014.7297695>>.

Judgments and Decisions

22. *Damijan Vnuk v Zavarovalnica Triglav d.d.* The Judgment of the Court (Third Chamber) of 4 September 2014, Case No C – 162/13, ECLI:EU:C:2014:2146.

Electronic documents

23. State of California Department of Motor Vehicles Report of Traffic Collision Involving an Autonomous Vehicle. (OL 316), <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/autonomousveh_ol316+>.
24. The Impact Assessment Sub-Group of the European-US-American-Japanese Trilateral ART Working Group, Satu Innamaa (VTT), Scott Smith (US DOT) and Nobuyuki Uchida (JARI), Draft version 1.0 of the high-level Trilateral Impact Assessment Framework for Automation in Road Transportation of 4th January 2017, <https://connectedautonomousdriving.eu/wp-content/uploads/2017/05/Trilateral_IA_Framework_Draft_v1.0.pdf>.

Connected Automated Driving: Civil Liability Regulation in the European Union

Olga Shevchenko
(Vilnius University)

S u m m a r y

Mobility and connectivity are now approaching a new era at the European Union dimension, where a driverless vehicle might become a new nuclear for an ecosystem, as well as make mobility safer, easier and more sustainable. The automated driving system is considered as the progress reached in the field of Artificial Intelligence, which opens a new horizon in road mobility.

Vehicles that are able to interact with each other and other road users within the road infrastructure, might solve the range of issues on the common market, such as improving environmental conditions, reducing dependency on fossil fuels, road safety mobility at a service and even urban planning. However, new technological progress is coming alongside with

a number of obstacles and foreseeable negative outcomes at the European Union level. In order to mitigate the new era of mobility and connectivity, a particular range of legal regulations have to be introduced.

At this stage, technologies cannot be considered to be certainly safe, hence particular incidents might still take place. Seeking to ensure a smooth entrance into a new era of mobility and connectivity, the regulation of civil liability, which must be strictly determined, rises as a consequence of the autonomous vehicles usage.

Automatizuotų transporto priemonių valdymas: civilinės atsakomybės reglamentavimas Europos Sąjungoje

Olga Shevchenko

(Vilniaus universitetas)

S a n t r a u k a

Mobilumas ir susisiekimas artėja prie naujos eros Europos Sąjungos dimensijoje. Automatizuotos transporto priemonės gali tapti nauju ekosistemos branduoliu, taip pat padaryti mobilumą saugesnį, lengvesnį ir tvaresnį. Automatizuotų transporto priemonių valdymas laikomas dirbtinio intelekto srityje pasiekta pažanga, atveriančia naują mobilumo horizontą.

Automatizuotos transporto priemonės, kurios gali perduoti informaciją vienos kitoms ir kitiems subjektams susisiekimo struktūroje, galėtų išspręsti įvairius vidaus rinkos klausimus, tokius kaip (1) aplinkos sąlygų gerinimas, (2) priklausomybės nuo iškastinio kuro mažinimas, (3) kelių eismo saugumas bei (4) didmiesčių restruktūrizavimas ir perplanavimas. Be visų teigiamų padarinių, kartu su technologijų pažanga atsiranda daugybė kliūčių ir numatomų neigiamų padarinių Europos Sąjungos dimensijoje. Siekiant išvystyti naują mobilumo ir duomenų perdavimo erą, būtina nustatyti tam tikrą teisinį reglamentavimą.

Šiame etape technologijos negali būti laikomos visiškai saugiomis, todėl yra tam tikra tikimybė incidentui atsitikti. Siekiant užtikrinti sklandų perėjimą į naują mobilumo ir susisiekimo erą, dėl automatizuotų transporto priemonių valdymo privalo būti įgyvendintas griežtesnis civilinės atsakomybės reglamentavimas.