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Autonomous vehicles: the legal landscape of using and testing autonomous cars in Poland

Pojazdy autonomiczne: uwarunkowania prawne użytkowania i testowania pojazdów autonomicznych w Polsce

Summary

Due to expected benefits of mass-use of the autonomous vehicles, specialists in many fields are trying hard to overcome all barriers related to the development and planned spreading of this way of transport. In fact, technology allows to use autonomous vehicles for years, but the real barriers to their mass-use are sociological and legal problems, which are much harder to overcome. The purpose of this paper is to analyze the amendments to the Polish Road Transport Act, which introduce the legal definition of an autonomous vehicle and defines the conditions for using and testing the autonomous vehicles on Polish public roads. This text is a brief characterization of current understanding of autonomous vehicles and it points out the sociological and legal barriers that exist on the way to their widespread use.

Keywords

autonomous vehicle, legal barriers, technology

Streszczenie

Wokół nas pojawia się coraz więcej pojazdów autonomicznych. Istnieją jednak bariery natury prawnej i społecznej, które uniemożliwiają wykorzystywanie ich na szeroką skalę. Artykuł stanowi próbę analizy znaczenia pojazdów autonomicznych i wskazuje na społeczne oraz prawne bariery, jakie istnieją na drodze do ich powszechnego używania. Są one niejednokrotnie trudniejsze do pokonania w porównaniu z przeszkodami natury technologicznej. Biorąc pod uwagę rosnące znaczenie pojazdów autonomicznych, autor artykułu zwraca uwagę na zmiany ustawy z dnia 20 czerwca 1997 r. Prawo o ruchu drogowym, mocą których wprowadzono – między innymi – prawną definicję pojazdu autonomicznego oraz określono warunki używania i testowania pojazdów autonomicznych na polskich drogach.

Słowa kluczowe

pojazd autonomiczny, bariery prawne, technologia

Introduction

In brief, we stand on the verge of a change in transportation technology and cars that move on the road without a person behind the wheel become a reality. Now we can observe rapid autonomous cars technology development which is going to radically change transportation. Advances in vehicle technology with an increased use of sensors and faster computer processing in vehicles have enabled ever-increasing levels of functions to be controlled by the vehicle, rather than the driver. The main reason for the development of autonomous cars is to increase road safety and reduce fatalities on the roads. Statistics show that human errors cause 95% of accidents in the United States [Schroll, 2015]. According to Global Status Report on Road Safety 2015 published by World Health Organization [Who.int, 2018] 1.25 million people are killed each year on the world's roads, and that this figure has plateaued since 2007. Road traffic accidents are a leading cause of death globally, and the main cause of death among people aged between 15 and 29 years. It is also recognized that road traffic injuries place a heavy burden on national economies and households. This are the reasons why driving is actually a very dangerous activity. Researchers believe that developing the autonomous cars technology really gives us a chance to dramatically reduce car incidents that are caused by human error. In a widely cited study "Automobile insurance in the era of autonomous vehicles", audit company KPMG estimated an 80% potential reduction in accident frequency per vehicle by 2040, resulting in roughly 0.009 incidents per vehicle [Kpmg.com, 2018], which would save thousands lives each year and avoid millions of injuries on roads. As Bob Lutz, former General Motors vice chairman, told during the interview given to CNBC Monday on 8 September 2014 "The autonomous car doesn't drink, doesn't do drugs, doesn't text while driving, doesn't get road rage. Young, autonomous cars don't want to race other autonomous cars, and they don't go to sleep." [Cnbc.com, 2018] Beyond safety, there are some other advantages to the technology, including providing mobility to seniors, persons with disabilities, visually impaired persons, and others who cannot currently drive. Another advantage of autonomous cars is also increasing the efficiency of people who spend long stretches of time on the road. Experts also point out broader societal benefits, including easing traffic congestion, moving people to destinations more quickly, better land use in cities by the elimination of parking lots and garages, convenience and saving time. The obvious benefit is also to conserve fuel more efficiently than the average driver by vehicle control systems that automatically accelerate and brake with the flow of traffic. Reductions in fuel consumption, of course, yield corresponding reductions in greenhouse gas emissions.

Although autonomous cars are being designed to save lives with many safety features, there are many different problems in various field related to the introduction of autonomous cars on the market. There are ethical problems, for example the issue of vehicle programming in borderline situations – whether in the event of an inevitable collision, the vehicle must at all costs protect the passengers or the driver, or should it seek a solution that minimizes the negative effects of the accident. There are also economic problems related to the profitability of production of such cars (for example in connection with the expected changes in the ownership structure that will result in a reduction of the number of vehicles operating on the market), the problem of growing unemployment among professional drivers (taxi drivers, truck drivers, carriers), issues of investments in public transport or intelligent road infrastructure. But in fact, the legal barriers are the main obstacle to mass-market sales of autonomous cars and trucks. There are different legal problems related to using and testing autonomous cars on public roads. For example, ownership problems with anticipated spreading car-sharing and carpooling, issues of road traffic law and related liability, issues of criminal law, security issues (especially regarding to avoidance of possible hacker attacks on autonomous cars), privacy issues (regulation of collecting data about the users and their current location), or finally, the issue of civil liability. The use of such cars will span various areas of the law including torts, insurance, privacy, data security, transportation and communications administrative law. It is obvious that autonomous cars also may crash and product liability litigation is inevitable. Autonomous cars are already tested on public roads, and for that reason the need to look at the using of these cars from the law point of view becomes more urgent. National law needs to be changed in order to accommodate autonomous cars, because the legal issues will arise in many areas of the law, and the legal aspect of autonomous cars and the way of solving legal problems on this matter is in fact the main challenge for humans now. In fact, legal and sociological barriers to autonomous cars are even greater than the technological challenges.

1. What are the Autonomous Cars?

The characteristics of the legal landscape of using and testing autonomous cars in Poland must be started with the definition of an autonomous vehicle. Different countries and different companies are using various terms to describe these new technologies, including “driverless”, “self-driving”, “automated”, “robotic” and “autonomous” cars (also vehicles) [Fagnant, Kockelman, 2015; Thrun, 2010]. It is worth noting that the word „autonomous” is in fact not completely correct. It suggests that autonomous car is an independent system, which is not actually true [Schellekens, 2015; Walker Smith,

2014]. There are two types of autonomous vehicles described as communicated or not communicated. Not communicated autonomous cars use for automated movement on-board sensors, cameras, lasers, GPS and telecommunications to obtain information in order to make their own judgments regarding safety-critical situations and act appropriately by effectuating control at some level. Communicated autonomous cars in turn, use only technologies that enable collecting information about the environment through communication with other vehicles (vehicle-to-vehicle – V2V communication), with infrastructure (vehicle-to-infrastructure – V2I communication) or any other elements (V2X communication) [Self-Driving Cars: The Next Revolution, 2012]. Vehicles equipped with V2V – vehicle-to-vehicle communications technology – that provide only safety warnings are not automated vehicles, even though such warnings by themselves can have significant safety benefits and can provide very valuable information to augment active on-board safety control technologies. On the other hand, in order to make the vehicle fully functional and to achieve expected autonomy, the interaction of not communicated and communicated technology is needed.

In fact, vehicle automation can range from full autonomy, where no human intervention is required, to vehicles where human intervention may be required under certain conditions. In particular, we can distinguish systems by their degree of autonomy (that is, how much intervention is required by the human driver) and by the functions that are autonomous (for example, keeping the vehicle in a lane at a constant speed, or automatically braking to avoid obstacles). The Society of Automobile Engineers (SAE International) has developed a taxonomy and definitions for terms related to autonomous systems that have become widely used. SAE identified six automation levels, from Level 0 (no automation) to Level 5 (full automation). Levels provides by SEA are compatible with The United States National Highway Traffic Safety Administration (NHTSA) framework, useful to help thinking through the implications of these technology developments [Nhtsa.gov, 2018]. Level 0 is the No-Automation level when the driver fully controls the vehicle. The driver is in complete and sole control of the primary vehicle controls (brake, steering, throttle, and motive power) at all times, and is solely performs all driving tasks. Examples include systems that provide only warnings (e.g. forward collision warning, lane departure warning, blind spot monitoring) as well as systems providing automated secondary controls such as wipers, headlights, turn signals, hazard lights, etc. Level 1 is the Driver Assistance when vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design. An advanced driver assistance system (ADAS) on the vehicle can sometimes assist the human driver with either steering or braking/accelerating, but not both simultaneously. The driver has overall control, and is solely responsible for safe operation, but can choose to cede limited authority over

a primary control (as in adaptive cruise control), the vehicle can automatically assume limited authority over a primary control (as in electronic stability control), or the automated system can provide added control to aid the driver in certain normal driving or crash-imminent situations (e.g. dynamic brake support in emergencies). Examples of function-specific automation systems include: cruise control, automatic braking, and lane keeping. Level 2 is a Partial Automation involves automation of at least two primary control functions working in unison (e.g. adaptive cruise control in combination with lane centring). On this level of driving automation, a driver is temporarily relieved from these driving functions. Vehicle has combined automated functions, like acceleration and steering but the driver must remain engaged with the driving tasks and monitor the environment at all times. An advanced driver assistance system (ADAS) on the vehicle can itself actually control both steering and braking/accelerating simultaneously under some circumstances. The human driver must continue to pay full attention (monitor the driving environment) at all times and perform the rest of the driving task. The driver is still responsible for monitoring the roadway and safe operation and is expected to be available for control at all times and on short notice. The system can relinquish control with no advance warning and the driver must be ready to control the vehicle safely. An example of combined functions enabling a level 2 system is adaptive cruise control in combination with lane centring. Level 3 is a Conditional Automation enables all safety-critical functions to be automated (including steering, throttle, brake). The driver is a necessity but it is not required for him to monitor the environment. The driver must be ready to take control of the vehicle at all times after notice. The vehicle monitors any changes in conditions that require a transition back to driver control. The vehicle is designed to ensure safe operation during the automated driving mode. An Automated Driving System (ADS) on the vehicle can itself perform all aspects of the driving task under some circumstances. In those circumstances, the human driver must be ready to take back control at any time when the ADS request the human driver to do so. In all other circumstances, the human driver performs the driving task. An example would be an automated or self-driving car that can determine when the system is no longer able to support automation, such as from an oncoming construction area, and then signals to the driver to reengage in the driving task, providing the driver with an appropriate amount of transition time to safely regain manual control. Level 4 is the High Automation level where the vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle. An Automated Driving System (ADS) on the vehicle can itself perform all driving tasks and monitor the driving environment – essentially, do all the driving – in certain circumstances. The human need not pay attention in those circumstances. The most advanced in driving automation level 5 – Full

Automation level is when the vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle. An Automated Driving System (ADS) on the vehicle can do all the driving in all circumstances. The human occupants are just passengers and need never be involved in driving. The very important notice is that only level 4 and level 5 requires the regulatory changes. There are no legal barriers for using cars with automation from level 0 to level 3.

2. Legal Perspective of Poland

Trying to characterize the legal landscape of using and testing autonomous cars in Poland we have to reach the very "fresh" Act on Electromobility and Alternative Fuels, dated on 11 January 2018 [Journal of Laws of 2018, item 317] and signed by the Polish President on 5 February 2018 after a rapid passage through both chambers of parliament. The Act is mainly aimed at promoting and speeding up the development of electric infrastructure for electric cars in Poland, but there is another almost unnoticed additional aspect of this regulation – enabling testing of autonomous vehicles on Polish roads. The Act also provides the legal definition of autonomous vehicle giving up dated 26 April 2017 proposal of the Polish Ministry of Energy that an autonomous vehicle is an electric vehicle, making impossible testing autonomous vehicles with different drive than electric on Polish roads. Thus, the electromobility does not necessarily have to be associated with autonomy. Act on Electromobility and Alternative Fuels provides the amendment to the Polish Road Transport Act of 20 June 1997 [Journal of Laws of 2017, item 1260 as amended] and according to Article 55 adds the section 6 titled "The use of roads for research works on autonomous vehicles" defining in Article 65k the autonomous vehicle. According to the definition, autonomous vehicle is a motor vehicle, equipped with the systems that control the movement of this vehicle and allow its movement without the interference of the driver, who can take control of the vehicle at any time. A first remark shall be, that Polish legislator tends to define the autonomous vehicle as a fully-automated (level 5 according to SEA/NHTSA levels) when the vehicle is capable of performing all driving functions under all conditions and the driver may have the option to control the vehicle. Therefore, it is allowed to test autonomous vehicles at all levels of automation. The second note is, what was mentioned before, that the use of an adjective "autonomous" is not entirely correct, because it suggests the independence of the system responsible for steering the vehicle, when in reality it is just the opposite – "autonomous" driving is the result of a series of interconnected elements. The third remark on the definition is, that on Polish public roads only motor vehicle can be tested. According to the Road Transport Act, the motor vehicle it is equipped with a mo-

tor means of transport intended to move on the road and a machine or a device adapted to it, the design of which enables driving at a speed exceeding 25 km/h, this term does not include agricultural tractors, mopeds and rail vehicles. The conclusion is that not only passenger cars but also e.g. autonomous lorries may be tested on Polish roads, but vehicles not reaching the speed of 25 km/h may not be tested. The fourth remark is that the autonomous vehicle must be equipped with systems that control the movement of this vehicle and allow its movement without the interference of the driver. It has not been clarified what kind of systems should be, so there are no minimum technical requirements in this area. The only technical requirement results from the further part of the definition, indicating that the driver must be able to take control of the vehicle at any time. So, tested vehicles must be equipped with steering and other elements necessary for the physical takeover of control by man. According to the definition, it is not allowed to test vehicles not equipped with steering wheel and gas and brake pedals. Another, the fifth comment is on the definition of a driver. Accordingly, to the Polish regulation under the Road Transport Act there are two understandings of the "driver". First, the driver is the person who drives a vehicle, or a set of vehicles and it is distinguished from the driver, which means the person authorized to drive a motor vehicle or moped. In the autonomous vehicle definition, Polish legislator uses the "driver" in the first functional sense what is consistent with two international traffic conventions in Poland, signed in Geneva on September 19, 1949, and drawn up in Vienna on November 8, 1968. Both predict that the vehicle should have a driver able to control the vehicle permanently.

Act on Electromobility and Alternative Fuels also states that public roads may be used for carrying out research activities related to testing autonomous vehicles when certain safety requirements are met, and a special decision was issued to this activity organiser [Article 65^{l} of the Road Transport Act]. To obtain the approval, the organiser of autonomous vehicles testing must submit a formal written application to the appropriate road authority where the tests will take place. The application must meet all formal and legal requirements provided by the Act, and include all required attachments, such as a document confirming the conclusion of a compulsory insurance contract for civil liability of the organizer of research works for damages arising in connection with conducting research related to driving autonomous vehicles, which comes into force in the case of obtaining a permit for conducting research works, proof of payment for this insurance and a copy of the professional decision registration of vehicles issued on the basis of Article 80t paragraph 2 of the Road Transport Act (requirement that will come into force on 1 July 2019). The organizer of the research activities can be anyone (both a natural person and an organizational entity) because the law does not specify any criteria that such an entity should meet, which should be assessed negatively. After submit-

ting the correct and complete application, the appropriate road authority consults with the residents of the commune (district), in the area of which research will be carried out, application for research works, placing this application on its website and setting a deadline for submitting comments. This period cannot be shorter than 7 days. In the course of consultations, the owner of the real estate located along the planned route, on which the autonomous vehicle will move, may object. After this stage, the appropriate road authority issues the permission for carrying out research activities after obtaining the consent of the competent road administrator, on which the research works are to be carried out and the opinion of the competent provincial police officer regarding the impact of research on the traffic flow on the planned route along which the autonomous vehicle will move. The organizer of the research activities also has certain duties specified in the Act. According to Article 65n of the Road Transport Act, the organizer is obliged to (1) enable the Police to perform the activities necessary to ensure road safety and protect human life and health and property while conducting research activities; (2) ensure that during the conduct of research activities in an autonomous vehicle, in a place intended for the driver, there is a person with driving licenses who can at any time take control of the vehicle, in particular in the event of a safety hazard in road traffic; (3) to publicly disclose information about the planned research works and the course of the route on which the autonomous vehicle will move; (4) provide the Director of the Transport Technical Supervision with a report on the research carried out related to the testing of autonomous vehicles and their equipment, in accordance with the form set out in the regulations issued on the basis of Article 65n paragraph 2, within 3 months from the day of completing the tests.

3. The Issue of Responsibility for Accidents Caused by the Autonomous Vehicles

Today, the legal basis for liability in road accidents is civil concept of negligence. Traditionally, car accidents are assessed through the lens of driver negligence, with the potential for product liability only when a defect in the car causes the accident or is alleged to have exacerbated the injuries. A driver that fails to exercise due care can be liable in negligence for certain losses that arise as a result of an accident. But now in the new era of self-driving or in fact entirely autonomous cars the very first question is what the “driver” actually means.

The law essentially needs to clarify where responsibility lies, who would be responsible if the technology fails and places drivers and passengers at great risk. A manufacturer has never had a duty to design an accident-proof or fool-proof vehicle. Wheth-

er it bears some responsibility for the crash may ultimately turn on the degree of control it had over the car. Today the biggest question is about the responsibility of the autonomous car accident. Is responsible the car manufacturer, the manufacturer of the software that failed to prevent the accident or the "driver". National laws (if exist) the most commonly places liability for any accident on the operator of the autonomous vehicle, defining the operator as the person behind the controls or who causes the technology to engage. Under general tort law principles, the element of control is likely to be determinative in national laws. For example in the United States civil law system, there are theories of the producer responsibility and the operator responsibility enough to overcome the issue of autonomous cars movement responsibility [Schellekens, 2015]. In short, the responsibility can be borne by the producer and by the operator. The driver could be responsible for negligence, no-fault liability and strict liability and the producer responsibility is a mix of contractual responsibility and product liability. This responsibility can be based on two foundations: theories of liability and the theory of defects (types of defect) [Kalra, et al., 2009]. Today, in the United States no-fault liability-based systems become attractive due to protection of producers who avoid the liability caused by their fault. On the other hand, due to the fact, that this solution is not widespread, it can discourage consumers in the United States, because they would be burdened with a responsibility they had not previously incurred. Therefore, the problem is not the lack of regulation but the question whether possible solutions are in fact desirable solutions. A number of complicated liability questions arise in relation to car accidents involving autonomous vehicles. For example, what if the vehicle had made a choice that the driver would never have chosen – should the driver be responsible? It is also impossible to apply the liability to the driver who has no control over the vehicle due to the disability, such as blindness or who falls asleep and the vehicle had driver monitoring systems that failed to wake up the driver. Can a driver legally rely on this feature (or lane or brake assist) and sue the manufacturer when the car did not alert the driver of a hazard? Should the driver be absolved of its own negligence? Can a manufacturer be subject to liability for not preventing an accident, even though its technology did not cause the harm? Added to the complexities of whether the manufacturer or driver takes responsibility, is the fact that connected vehicles could be vulnerable to hacking. Legislation in many countries looks at hacking as a criminal action. However, a responsibility will undoubtedly also rest with the car manufacturers to make sure adequate precautions have been taken to prohibit unauthorized access or use. It will not be as clear as saying that any unauthorized hacking generates a liability on the car manufacturer, but responsibility will likely arise where the protections put in place to prevent it are not appropriate.

Conclusion

In fact, automated vehicles can avoid some of the bad behaviours seen on the road today such as texting, distraction or being impaired while driving. Development of autonomous cars is also a chance to decrease fatality on public roads and to reach all advantages of mass-use autonomous vehicles. As manufacturers race to get autonomous vehicles on the road, specific regulations on use of those vehicles are slow to follow. In fact, now the legal and sociological barriers to autonomous cars are even greater than the technological challenges. The problem of autonomous cars is complicated and multifaceted. Problems related to autonomous vehicles are important part of public discourse related to the introduction of new technologies. Significant social benefits connected with a new type of transport tend to accelerate the legislative work on using and testing autonomous cars. Lawyers should start a broader discussion on possible legal solutions. Internationally there is a great deal of thought being given to what laws will be necessary for the general operation of autonomous vehicles. Many fields of law are not prepared for driving automation and although a handful of countries have passed specific laws related to the new technology, most still have not. That most of the national regulations have to catch up with the technology. The immediate question for national governments, legislatures, and courts to decide is how to treat liability over the next twenty or so years as society transitions to widespread use of fully-automated cars. Shared by both the human driver and autonomous vehicle technology providers roads will bring complex questions of liability and in the short term, courts will need to work through these thorny issues, and determine and allocate liability, on a case-by-case basis. In fact, the reasoning for the flexibility in laws is that a lot of lives have not been lost and a lot of accidents have not yet occurred. Once we reach the point where real people incur injuries and lawyers begin to closely examine national laws and possible litigation, there will be more clarity in the law. Polish example of attempting to regulate testing autonomous vehicles and conducting research activities on autonomous vehicles shows that although the very idea of regulating the issue of using and testing autonomous vehicles on public roads deserves approval, its implementation is the most important thing. The Polish government is determined to speed up the development and implementation of available technology for individuals and businesses to use autonomous driving by expressly allowing testing of autonomous vehicles on public roads. The currently proposed regulations do not regulate all issues related to autonomous driving in Poland, however, it is a step in the right direction which may make Poland much friendlier for testing autonomous vehicles by allowing tests to be performed on public roads and setting out the legal framework for these tests.

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