



Problematic Issues of Legalisation of Concepts Used for the Purpose of Legal Regulation of Transport Relationships Involving Self-Driving Cars



Alexander I. ZEMLIN

Alexander I. Zemlin

Russian University of Transport, Moscow, Russia.

✉ zemlin.aldr@yandex.ru.

ABSTRACT

The needs for innovative development of the transport system, which is not only the most important, but also an indispensable condition for implementation of the Transport Strategy of the Russian Federation until 2030 with a forecast until 2035, determine the necessity for a important change in fundamental approaches to building a system of legal support for organisation of road traffic, historically based on the postulate of obligation the driver to ensure constant control over the traffic situation for the entire period of the vehicle's movement. In this situation, the problem of legal regulation of admission to operation and subsequent operation of vehicles equipped with an automated driving system that does not provide for participation of the driver in the dynamic control of the car acquires special theoretical and practical significance.

The objective of the study, some of the results of which are suggested in the article, was a critical comprehension of the problems of legislative environment referring to the use of cars with

an automated driving system, those problems being associated with ambiguities and gaps in the legislation in terms of codifying the basic terms and definitions.

The tools of formal dogmatic analysis were used to investigate the problematic issues of legalising the concept of «automated driving system», which is the most important, basic category in the system of legal regulation of the relations under study.

On this basis, the application of methods of systemic legal analysis contributed to identification of possible options for eliminating the identified gaps and contradictions in legislation, to formulate author's definitions and to suggest guidelines for building an ordered system of legal terms to be entrenched in legal acts regulating the use of highly automated vehicles.

The implementation of the proposals formulated by the author can contribute to the improvement of the system of legal regulation of relations related to the use of highly automated vehicles.

Keywords: transport, legal environment, legal regulation, driverless vehicle, highly automated vehicle, automated driving system.

Financial support: the study was financially supported by the Russian Science Foundation within the framework of the scientific project No. 22-28-20334 «Legal means of ensuring the safety of the use of driverless vehicles in a metropolis», <https://rscf.ru/project/22-28-20334/>.

For citation: Zemlin, A. I. Problematic Issues of Legalisation of Concepts Used for the Purpose of Legal Regulation of Transport Relationships Involving Self-Driving Cars. *World of Transport and Transportation*, 2022, Vol. 20, Iss. 5 (102), pp. 149–153. DOI: <https://doi.org/10.30932/1992-3252-2022-20-5-4>.

The text of the article originally written in Russian is published in the first part of the issue.
Текст статьи на русском языке публикуется в первой части данного выпуска.

INTRODUCTION

The wide-spreading adoption of highly automated vehicles based on the use of an automated driving system that minimises the participation of the driver in the dynamic control of the vehicle, and that, in relation to driverless vehicles, complete excludes the driver from this process, which assumes changing his legal status from the category of the «driver» to the «passenger», suggests the need to change the paradigm of the legal regulation of road traffic.

If the current system of legal regulation of relations related to organisation and provision of road safety is focused on operation of low-automated vehicles, which implies the obligation of the driver to control the traffic situation and drive the car for the entire period of the vehicle's movement, then the use of highly automated vehicles requires not only cardinal changes in approaches to defining the system of road users, clarifying their legal status, but also the development of a new categorical series of concepts used for the purpose of legal regulation of transport relations involving cars with an automated driving system.

The results of the study have highlighted the inconsistency with the requirements of formal logic and legal technique of the definitions and concepts contained in the current legal acts and draft laws and used for the legal regulation of transport relations involving cars with an automated driving system, that does not allow for solving the problems of effective legal regulation of the implementation of innovative technologies in transport system of Russia.

RESULTS

The Role of Legal Regulation in Implementation of New Technologies for Innovative Transport Developments

It is legitimately noted that revolutionary technological changes inevitably require legitimisation by bringing the legal framework in line with the new realities of socio-economic development. As nowhere else, this dependence is especially clearly pronounced in the field of transport [1, p. 45; 2].

According to the results of historical and legal analysis, representatives of the scientific school in the field of transport law note a pronounced relationship between the emergence of new modes of transport (rail, road, air transport, etc.) and the intensification of rulemaking to legally regulate relations arising in connection with the introduction of new technologies [3, p. 405; 4, p. 263; 5, p. 67].

Besides, along with the need to manage new technological processes regulated by updated or

specially developed legal norms, there emerges a need to revise and update the content of legal disciplines taught to a future transport specialist, the study of which will help shaping his professional legal culture that meets the new requirements [6, pp. 249–250; 7, p. 4963; 8, p. 4075].

International experts actively demonstrate their interest in scientific development of these issues, and the understanding that the lack of legal regulation is a significant deterrent to the development of innovative transport [9, p. 618]¹.

The dynamics of developments within the system of legal regulation in the field of introduction of highly automated vehicles is evidenced by the results of a comparative legal analysis carried out by representatives of the scientific school in the field of transport law. If just two years ago, the legislation of the PRC basically ruled out any possibility of testing autonomous vehicles on expressways, then by the beginning of 2021, 2,000 km of public roads were opened for testing intelligent connected vehicles, more than 400 licenses were issued to companies for self-driving tests. At the same time, the total mileage of vehicles during road tests exceeded² million km².

It is noted that the impetus for accelerating the formation of a system of legal regulation in the field of the use of highly automated vehicles was given by the spread of the COVID-19 coronavirus infection pandemic, since, as the experience of the PRC has shown, the use of driverless cars makes it possible to ensure the delivery of medicines and other necessary goods to areas with a high risk of infection, minimising the risk of «cross-contamination»³ [10, pp. 18–19; 11].

The beginning of 2022 witnessed further intensification of the trend towards acceleration of law-making to faster move from the stage of experimental regulation to a fundamentally new stage of limited introduction of universal regulation in the field of highly automated vehicles.

So, on March 11, 2022, the US National Highway Traffic Safety Administration removed

¹ Siddiqui, F. Waymo to launch fully driverless service to the public – a first just in time for the pandemic. The Washington Post, 8 October 2020. [Electronic resource]: <https://www.washingtonpost.com/technology/2020/10/08/waymo-driverless-rides/>. Last accessed 23.09.2022.

² China to let self-driving cars be tested on highways. [Electronic resource]: <http://www.chinadaily.com.cn/a/202101/12/WS5fd3657a31024ad0baa209c.html>. Last accessed 24.09.2022.

³ Zemlin, A. I., Zemlina, O. M., Klyonov, M. V. [et al]. Organisational and legal foundations for functioning of the transport system in a difficult epidemiological situation: Textbook. Ed. by A. I. Zemlin, I. V. Kholikov. Moscow, Rusayns publ., 2020, 310 p. ISBN 978-5-4365-6523-1.

the main obstacle to introduction of fully autonomous vehicles by amending the Federal Motor Vehicle Safety Standards in terms of eliminating the requirement for the mandatory presence of a steering wheel in a vehicle design⁴.

On July 6, 2022, Regulation (EU) of the European Parliament and of the Council 2019/2144 on vehicle safety requirements⁵ came into force in the EU, establishing basic safety requirements for highly automated and fully automated vehicles (Article 11).

Starting August 1, 2022, the Shenzhen Special Economic Zone (China) Regulation on Smart and Connected Vehicles came into force, which introduces permanent regulation for highly automated vehicles with a behind-the-wheel driver, and also allows the use of fully automated vehicles in specially designated zones⁶.

The Russian system of legal regulation of relations involving highly automated vehicles is currently still at an experimental stage. The regulatory act governing the testing of highly automated vehicles is the Decree of the Government of the Russian Federation of 09.03.2022 No. 309 «On the establishment of an experimental legal regime in the field of digital innovations and the approval of the Program for the experimental legal regime in the field of digital innovations for the operation of highly automated vehicles».

Further lag in this area may become irreparable, which requires taking prompt measures to solve the problem of legal regulation of the use of highly automated vehicles.

State and Problems of the Process of Legitimation of Concepts used to Ensure Operation of Highly Automated Vehicles

The regulation on conducting an experiment on trial operation of highly automated vehicles on public roads defines the territories and terms of the

experiment⁷ (hereinafter for brevity is called Regulation). The essential feature of this kind of vehicle is quite logically associated with the presence of an «automated driving system», which, in turn, is defined as «software and hardware that controls the vehicle without physical impact from the driver». There is no definition of software and hardware in the text of the Regulation.

In the process of legislative activities, the authors of legal initiatives are also making attempts to identify highly automated vehicles.

Thus, the draft Federal Law «On highly automated vehicles and on amendments to certain legislative acts of the Russian Federation»⁸, developed in pursuance of paragraph 1 of the Set of measures for testing and phased commissioning of highly automated vehicles on public roads without the presence of a test engineer in the cabin of the vehicle, providing for their trial commercial operation in certain constituent entities of the Russian Federation, dated March 12, 2021, No. 2189-P50 and aimed at regulating relations arising in connection with the manufacture and operation of highly automated vehicles⁹, offers the following definition of a highly automated vehicle: this is «a vehicle equipped with an automated driving system and allowed to participate in road traffic on the territory of the Russian Federation».

With the fact that the presence of an automated driving system is an essential and, in fact, the only feature of a highly automated vehicle that makes it possible to distinguish it from other vehicles, in principle, and with some assumptions, one can agree with that definition.

However, from the point of view of formal logic, the definition of an automated driving system proposed in the bill as a technical tool that provides

⁴ The US will finally allow fully autonomous vehicles that do not require human control. [Electronic resource]: <https://news.myseldon.com/ru/news/index/268434013>. Last accessed 23.09.2022.

⁵ Regulation (EU) 2019/2144 of The European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users. [Electronic resource]: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R2144>. Last accessed 24.09.2022.

⁶ Shenzhen Special Economic Zone Provisions on Smart and Connected Vehicle Driving (2022). [Electronic resource]: <https://www.globaltimes.cn/page/202207/1269924.shtml>. Last accessed 23.09.2022.

⁷ Decree of the Government of the Russian Federation of November 26, 2018, No. 1415 «On conducting an experiment on trial operation of highly automated vehicles on public roads» (as amended and supplemented). [Electronic resource]: <http://publication.pravo.gov.ru/Document/View/0001201811270008>. Last accessed 23.09.2022.

⁸ Prepared by the Ministry of Transport of Russia on June 10, 2021. Project ID 02/04/06-21/00116763 (not submitted to State Duma as of 10.06.2021). [Electronic resource]: <https://www.doclist.ru/news/politics/2706967.html>. Last accessed 23.09.2022.

⁹ At the moment when the article was prepared, the draft law was undergoing a regulatory impact assessment procedure in accordance with Decree of the Government of the Russian Federation dated December 17, 2012, No. 1318 «On the procedure for the federal executive authorities to assess the regulatory impact of draft regulatory legal acts, draft amendments to draft federal laws and draft decisions of the Council of the Eurasian Economic Commission, as well as on amendments to certain acts of the Government of the Russian Federation». [Electronic resource]: <https://base.garant.ru/70285758/>. Last accessed 23.09.2022.



dynamic control of a vehicle seems more than doubtful.

In addition, the stated version contradicts the definitions legalised both in the legal documents in force at the time of development and in the current legal documents.

Let us substantiate this thesis in more detail.

It should be assumed that, according to the definition contained in GOST 30372-95 «Electromagnetic compatibility of technical means. Terms and definitions»¹⁰, technical means is «a product, equipment, apparatus or their components, the functioning of which is based on the laws of electrical engineering, radio engineering and (or) electronics, containing electronic components and (or) circuits that perform one or more of the following functions: amplification, generation, transformation, switching and storage [recording]».

Further, Interstate standard GOST 34.003-90 «Information technology. Set of standards for automated systems. Automated Systems»¹¹ (hereinafter referred to as the Interstate Standard), which was in force at the time of preparation and submission for consideration of the draft law, established that an automated system is understood as a system consisting of personnel and a set of means for automating its activities, implementing information technology for performing established functions. Also, the Interstate Standard establishes that the automated system is formed by the following structural elements: the user of the automated system; operating personnel; organisational support of the automated system; methodological support; technical support; linguistic support; legal support, etc.

It was also established there that the totality of all technical means used in the operation of an automated system constitutes technical support.

Thus, a technical tool is only one of the elements of technical support, which, in turn, is just one of the types of support for an automated system.

Accordingly, the content of the concept of «automated system» is much broader and includes technical means as one of the elements.

As a result, we can conclude that when defining an automated driving system, the authors of the draft did not take into account and include in the definition such important components of an automated system as: software, defined as a set of programs on data carriers and of program documents, designed for debugging, operating and system performance checks; information support, defined in the Interstate Standard as a set of forms of documents, classifiers, regulatory framework and implemented decisions on the volume, placement and forms of existence of information used in an automated system during its operation; organisational support of the system, as a set of documents that establish the organisational structure, rights and obligations of users and operating personnel of the automated system under the conditions of operating, testing and ensuring the operability of the system.

From January 1, 2022, GOST 34.003-90 «Terms and Definitions» has been replaced by the National Standard of the Russian Federation, GOST R 59853-2021 «Information Technologies. Set of standards for automated systems. Automated systems. Terms and Definitions»¹² (hereinafter referred to as the National Standard), which applies to automated systems used in various activities (research, design, management, etc.), including their combinations.

According to the National Standard, an automated system is a system consisting of a set of automation tools that implements information technology for performing established functions, and personnel that ensures its operation. At the same time, depending on the type of activity, along with others, automated control systems (ACS) are singled out. The National Standard highlights such types of automated system support as linguistic; mathematical; methodical; organisational; legal, as well as other elements that form the structure of an automated system.

The legal support of an automated system is considered according to the National Standard as «a set of legal norms regulating legal relations during the operation of an automated system and the legal status of the results of its operation».

APPROBATION OF THE RESULTS

The main results of the study described in the work were presented in the author's report at the

¹⁰ GOST [State standard] 30372-95 «Electromagnetic compatibility of technical means. Terms and definitions». [Electronic resource]: <https://docs.cntd.ru/document/1200015869>. Last accessed 24.09.2022.

¹¹ GOST [State standard] 34.003-90 «Information technology. Set of standards for automated systems. Automated systems. Terms and definitions». Approved and put into effect by the Decree of the USSR State Committee for Product Quality Management and Standards of December 27, 1990 No. 3399. [Electronic resource]: <https://docs.cntd.ru/document/1200006979>. Last accessed 24.09.2022.

¹² GOST R [Russian state standard] 59853-2021 «Information technology. Set of standards for automated systems. Automated systems. Terms and definitions». Approved and put into effect by order of the Federal Agency for Technical Regulation and Metrology dated November 19, 2021, No. 1520-st. [Electronic resource]: <https://docs.cntd.ru/document/1200181819>. Last accessed 24.09.2022.

plenary session of the International Scientific and Practical Forum «Transport of the Future: Challenges for Law» (dedicated to the 90th anniversary of Russian Society of Inventors and Innovators), held in Ulyanovsk on September 16, 2022. The Forum was held by Ulyanovsk State University, Institute of State and Law of the Russian Academy of Sciences, Perm State National Research University, Yurist Publishing Group, Russian Society of Inventors and Innovators, Ulyanovsk Regional Branch of the Association of Lawyers of Russia, and some other educational, scientific, and non-governmental organisations. The forum was moderated by D.Sc. V. M. Kononov.

CONCLUSIONS

Consideration of the approaches implemented in the National Standard can contribute in the course of further work on the draft Federal Law «On highly automated vehicles and on amendments to certain legislative acts of the Russian Federation» to development of a single, scientifically based approach to the definition of a highly automated vehicle that has an essential and meaningful nature.

Amendments and additions to the text of the draft Federal Law «On highly automated vehicles and on amendments to certain legislative acts of the Russian Federation» should be based on the results of scrupulous scientific study on legal problems arising in connection with the introduction of highly automated vehicles, on the achievements of transport and legal science.

As stated in the introduction, the article highlights and partly systematises some of the problems referring to legal regulation of the operation of cars with an automated driving system. Naturally, the conclusions made by the author, offered to the interested reader, need further verification, they are not absolute, complete, and, moreover, final. However, in the author's opinion, they can become the basis for a scientific discussion. More detailed, scientifically and practically substantiated conclusions, expressing the position of the author on the problem raised in this article, could be presented in subsequent publications, based on the results of currently ongoing research.

REFERENCES

1. Bazhina, M. A. The main trends in development of legal regulation of transportation in the context of digitalisation [*Osnovnye tendentsii razvitiya pravovogo regulirovaniya osushchestvleniya perevozok v usloviyakh tsifrovizatsii*]. *Yurist*, 2021, Iss. 11, pp. 44–50. [Restricted access to electronic resource]: <https://lawinfo.ru/journals/57/yurist>.
2. Zemlin, A., Kholikov, I., Mamedova, I., Zemlina, O. Problems of Ensuring Security of Transport Infrastructure Facilities. IOP Conference Series: Earth and Environmental Science, Vol. 666, International science and technology conference «Earth science», 8–10 December 2020, Vladivostok, Russian Federation, 042002. DOI: 10.1088/1755-1315/666/4/042002.
3. Zemlin, A. I., Kholikov, I. V. Axiological approaches to formation of the legal culture of a transport specialist in modern conditions [*Aksiologicheskie podkhody k formirovaniyu pravovoi kultury spetsialista-transportnika v sovremennykh usloviyakh*]. *Collection of scientific papers IZISP «Legal values in the light of new paradigms of development of modern civilization»*. Moscow, Infra-M publ., 2020, pp. 403–411.
4. Petrov, Yu. I., Zemlin, A. I., Zemlina, O. M. The Genesis of the System of Administration of the Transport Routes and of the Transport Law in Russia (9th to 18th centuries). *World of Transport and Transportation*, 2019, Vol. 17, Iss. 3 (82), pp. 260–277. DOI: 10.30932/1992-3252-2019-17-3-260-277.
5. Kharlamova, Y., Pishchelko, A., Zemlin, A. Problems of realisation of public oversight in the field of transport counterterrorism policy. *Kutafin University Law Review*, 2020, Vol. 7, Iss. 1, pp. 67–78. DOI: 10.17803/2313-5395.2020.1.13.067-078.
6. Zemlin, A. I., Petrov, Yu. I. Experience of Legal Regulation and Organisation of Transport Specialists Training at the Imperial Moscow Engineering School: 1896–1913. *Herald of an archivist*, 2021, Iss. 1, pp. 248–258. DOI: 10.28995/2073-0101-2021-1-248-258 [access restricted for subscribers only].
7. Bagreeva, E. G., Zemlin, A. I., Shamsunov, S. K. Does Environmental Safety Depend Upon the Legal Culture of Transport Specialists? *Ekoloji*, 2019, Vol. 28, No. 107, pp. 4961–4965.
8. Bagreeva, E. G., Shamsunov, S. K., Zemlin, A. I. Environmental Safety Conditions in the Transport Sector by Improving the Culture of Lawmaking. *Ekoloji*, 2019, Vol. 28, No. 107, pp. 4071–4076.
9. Cabral, T. S. Liability and artificial intelligence in the EU: Assessing the adequacy of the current Product Liability Directive. *Maastricht Journal of European and Comparative Law*, 2020, Vol. 27 (5), pp. 615–635. DOI: 10.1177/1023263X20948689.
10. Zemlin, A. I. Some aspects of ensuring transport safety in the context of the spread of infectious diseases (on the example of the Covid-19 coronavirus pandemic). *Voennoe pravo*, 2020, Iss. 6 (64), pp. 15–29. [Electronic resource]: <https://elibrary.ru/item.asp?id=44286698>. Last accessed 23.09.2022.
11. Chernogor, N., Zemlin, A., Kholikov, I., Mamedova, I. Impact of the spread of epidemics, pandemics and mass diseases on economic security of transport. *E3S Web of Conferences*, 2020, Vol. 203 (107), art. 05019. DOI: 10.1051/e3sconf/202020305019.

Information about the author:

Zemlin, Alexander I., D.Sc. (Law), Ph.D. (Philosophy), Professor, Honoured Scientist of the Russian Federation, Head of the Department of Transport Law of Law Institute of Russian University of Transport; Scientific Leader of the Transport Safety and Security Board of the Scientific Expert Council of the Centre for Research of Security Problems of the Russian academy of sciences, Moscow, Russia, zemlin.aldr@yandex.ru.

Article received 23.09.2022, approved 12.10.2022, accepted 21.10.2022.

