Strategic Legal Regulation in the Field of Implementation of Intelligent Transport Systems in Russia

Viacheslav N. Voronin[a,b], Arseniy A. Bimbinov[a,b] and Alla L. Blagodir*[a]
[a]Kutafin Moscow State Law University (MSAL)
Moscow, Russian Federation
[b]The Kosygin State University of Russia
Moscow, Russian Federation

Abstract. This paper focuses on the potential problems of the introduction of digital technologies in transport in the socio-economic and legal dimension based on the assessment of the current state and development trends of the info and communication in the transport infrastructure in Russia, foreign experience. Moreover, it performs specific proposals for legal and financial regulation of issues and minimization of risks of liability for harm in conditions development of information transport systems.

The paper analyses the role of the programs "Digital Economy of the Russian Federation" and "Safe and High-Quality Roads" in the development of intelligent transport systems that constitute some promising areas of the use of unmanned vehicles to improve the quality of life of people. Furthermore, we assess the development of entrepreneurial activity, high-tech industries, and the increase the investment attractiveness of Russia and analyse the strengthening of its position in the international arena. When it comes to the methodology, we use legal analytics, legislative technology, comparative law, and expert assessments.

The results of this research reveal the features of the legal regulation of new and promising emerging relations in the digital economy. This is a strategic legal planning and legal experiment. Based on this conclusion, a system of prerequisites for the development of intelligent transport systems based on the analysis of national programs is formulated. The system of prerequisites includes three levels: I) technological prerequisites, II) infrastructural; and III) regulatory.

Keywords: intelligent transport systems, legal strategy, legal experiment, unmanned vehicles, digital city.

The reported study was funded by RFBR, project number No. 19-29-06069 mk.

Research area: law.

* Corresponding author E-mail address: v.w.n@yandex.ru, bimbinov@yandex.ru, alblagodir@msal.ru
ORCID: 0000-0003-0760-7211 (Voronin); 0000-0002-7440-293X (Bimbinov); 0000-0003-1639-2486 (Blagodir)

Стратегическое правовое регулирование в области внедрения интеллектуальных транспортных систем в России

В.Н. Воронин[а, б], А.А. Бимбинов[а, б], А.Л. Благодир[а]
*[а]Московский государственный юридический университет
им. О. Е. Кутафина (МГЮА)
Российская Федерация, Москва
[б]Российский государственный университет им. А. Н. Косыгина
(Технологии. Дизайн. Искусство)
Российская Федерация, Москва*

Аннотация. На основе оценки текущего состояния и тенденций развития инфокоммуникационной транспортной инфраструктуры в России, зарубежного опыта выявлены потенциальные проблемы внедрения цифровых технологий на транспорте в социально-экономическом и правовом измерении, сформулированы конкретные предложения по юридическому и финансовому регулированию вопросов и минимизации рисков ответственности за причинение вреда в условиях развития информационных транспортных систем. Проанализирована роль программ «Цифровая экономика Российской Федерации» и «Безопасные и качественные дороги» в развитии интеллектуальных транспортных систем, в качестве результатов выявлены перспективные направления использования беспилотных автотранспортных средств для улучшения качества жизни людей, развития предпринимательской деятельности, технологичных отраслей промышленности, повышения инвестиционной привлекательности России и укрепления ее позиций на международной арене. *Использованы методы:* правовой аналитики, законодательной техники, правовой компаративистики, экспертных оценок. В качестве основных *результатов* исследования выявлены особенности правового регулирования новых и перспективных возникающих отношений в условиях цифровой экономики. Это стратегическое правовое планирование и правовой эксперимент. С учетом данного вывода сформулирована система предпосылок развития интеллектуальных транспортных систем на основе анализа национальных программ. Система предпосылок включает три уровня: технологические предпосылки, инфраструктурные и нормативные.

Ключевые слова: интеллектуальные транспортные системы, правовая стратегия, правовой эксперимент, беспилотный транспорт, цифровой город.

Научная специальность: 12.00.00 – юридические науки.

1. Introduction

At various levels of government, for some time, work has been underway to create a system of legal regulation of the digital economy based on a flexible approach in each area, as well as the introduction of legal regulation and regulatory environment based on digital technologies. A flexible model of legal regulation of issues of human interaction with various components of the digital space does not currently exist integrally in any of the areas.

Currently, in the current conditions, it is necessary to create a new conceptual and comprehensive science-based approach to legal regulation of the digital society, which may require the reform and revision of some conceptual legal foundations. The transition to the digital world and the availability of new technologies opens up enormous opportunities and prospects for society; at the same time, diverse risks and threats are growing incredibly; criminology is becoming one of the important tools for their analysis, forecasting and prevention.

Since law in general, including criminal law, should contribute to digital progress and the formation of a digital society, without creating unnecessary obstacles, the current approach related to assessing the social danger of any behaviour and its criminalization will not be effective. It is necessary to introduce the new term "criminal legal risk" into the mechanism of legal regulation and assess on the basis of a new concept of risks of all digital technologies developed by means of establishing their potential danger to society.

This paper aims at assessing the leading role of the national government-funded programs in the development of intelligent transport systems. We focus on the case study of Russia and the country's specific programmes deriving their impacts and outcome.

2. Literature Review

Despite the recognition of the importance of the digital transformation of roads as the basis of life safety, social and economic development of the country, the issues of technical, legal and financial regulation of the digitalization of the transport complex at the federal and regional levels, a detailed assessment of the impact of digital technologies on transport on social and economic processes in modern Russian society.

In the recent years, the Russian doctrine has been conducting studies in general on the formation and development of the digital economy in Russia, which point to and only in general terms mention intelligent transport systems without a comprehensive analysis – see for example the works of Neznamov (2018) or Serova (2018). There are more studies in the Anglo-American doctrine, however, they are mainly devoted to military unmanned vehicles, unmanned aerial vehicles, but regarding the legal regime of unmanned vehicles, the impact of digital technologies on transport on public roads on modern society and the economy are also not enough. The main ones are Davis (2011), Hubbard (2014), Beard (2018), Ford and Williams (2018), Strielkowski et al. (2019), or He et al. (2020) just to name a few.

3. Materials and Methods

The following methodological principles were used in the study: the principle of objectivity, the principle of determinism, the principle of historicism, the principle of integrity, the principle of systemisation, the principle of structuralising, the principle of functionality, the principle of hierarchy, the principle of pluralism of explanation and understanding of law, the principle of comparative studies. The study used private methods: legal analytics, legislative techniques, legal comparative studies, expert assessments.

Today, the importance of the digital transformation of roads as a basis for life safety, social and economic development of the country is being discussed. But the issues of technical, legal and financial regulation of the digitalization of the transport complex at the federal and regional levels, a detailed assessment of the impact of digital technologies on transport on social and economic processes in modern Russian society remain completely unexplored. In connection with the identified problem, in the context of the need to transform legal regulation in connection with the development of digital technologies, it is justified to use another relatively new method of legal regulation, which

is conventionally called the "legal experiment". Thence, Pashentsev (2019) analysed the impact of digitalization on the Russian law-making tradition and identifying promising directions for its further development, noted among the identified trends the more active use of legal forecasting and legal experiment in legislative activity. Zhuravleva (2018) makes a distinction between the legal regulation of pilot projects and a legal experiment based on the following criterion: "the question of whether an idea will be accepted or rejected is not posed or decided during the implementation of pilot projects. At the same time, the idea of legal regulation as a whole is tested in a legal experiment, it can be rejected as a result of the experiment, if the corresponding hypothesis about regulation and its effectiveness has not been confirmed. Thus, the distinction from other types of temporary regulation, including the regulation of pilot projects, should be carried out considering teleological differences that determine other characteristic features of this social phenomenon".

Hence, strategic legal planning and a legal experiment are the main promising models for regulating public relations in the context of digital transformation.

Speaking about the regulatory environment in the development of intelligent transport systems, one can see that intelligent transport system is an intelligent system that uses innovative developments in the modelling of transport systems and regulation of traffic flows, providing end users with greater information and security, as well as qualitatively increasing the level of interaction of traffic participants compared to conventional transport systems (Tyagi et al., 2012). Next, we consider the main directions in the implementation of basic national programs and their influence on the formation of a system of prerequisites for ensuring the functioning of intelligent transport systems.

4. National Digital Economy Program

In the framework of the implementation of the Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period until 2024", including with the aim of solving the problem of ensuring the accelerated implementation of digital technologies in the economy and social sphere, The Government of the Russian Federation, on the basis of the program "Digital Economy of the Russian Federation", has formed the national program "Digital Economy of the Russian Federation" approved by the minutes of the meeting of the Presidium of the Council under the Pres Russian Federation dente for Strategic Development and National Projects of June 4, 2019.

One of the directions in the implementation of the program is the development of artificial intelligence technologies, which involves the implementation of a set of measures for the development of artificial intelligence to achieve leading positions in the world, including providing personnel and the necessary hardware, supporting promising scientific research, increasing the availability and quality of data, stimulating demand for products using technology. The tasks of software development and development, which use artificial intelligence technologies, popularization and development of a community of specialized specialists, are also being addressed.

In general, this program, in conjunction with intelligent transport systems, plays for the most part a system-forming role, since before speaking about the implementation of experiments on the introduction of intelligent transport systems on roads in the smart city system, the creation of infrastructural prerequisites for this is necessary. It is such systemic prerequisites that will be laid down as a result of the implementation of the program. Concrete measures and their regulatory regulation can be traced in some of the key areas highlighted by the program. The first area is called "Normative regulation of the digital environment". Within the framework of this component of the program, industry regulation should be formed, which is necessary for the development of the digital economy in terms of regulating legal relations in the field of robotics and the application of artificial intelligence technologies. To date, documents ensuring such regulation have not been adopted, only strategic documents exist, the main of which can be considered

Presidential Decree of 10.10.2019 N 490 "On the Development of Artificial Intelligence in the Russian Federation", which approved the "National Strategy for the Development of Artificial Intelligence for the period up to 2030" (Decree of the President of the Russian Federation of 10.10.2019 N 490). This situation corresponds to world experience in solving the problems of establishing the regulatory regulation of artificial intelligence: most states provide for strategic documents that cannot be considered as regulating legal relations, rather providing for the main directions of activity in this area. For example, Japan's Robotics Development Strategy "A New Robot Strategy. Japanese Robot Strategy: Overview, Strategy, Action Plan of 2015 (HJER, 2015); Artificial Intelligence in Singapore Program (AI Singapore (2020), UAE Strategy of October 2017 in the Field of Artificial Intelligence (UAE, 2017), State Council of the People's Republic of China Document of July 20, 2017 "New Generation of Artificial Intelligence Development Planning" (State Council of PR China, 2017) and others.

A reliable information infrastructure is also needed, within which intelligent transport systems will operate. For this, it seems important to approve the Concept for the construction and development of narrow-band wireless networks of the Internet of Things in the Russian Federation. In the field of transport, narrow-band wireless networks implement the tasks of tracking the location of a vehicle, obtaining data on its condition, which leads to the optimization of technical processes. The "Internet of Things" (Mattern and Floerkemeier, 2010) is used by the state to organize the transport system in Russia. The obligation to establish systems for remote monitoring and control of traffic for the commercial transport of passengers and the transport of dangerous goods is normatively fixed. Also, the examples of the state policy of transport digitalization include the obligation of car manufacturers to equip all cars with the ERA-GLONASS emergency warning system from January 1, 2017.

The next step in ensuring regulatory and information infrastructure is the approval of the Concept for the creation and development of 5G / IMT-2020 networks in the Russian Fed-

eration. It is planned to create a large-scale inter-machine communication system (MIoT). In addition to the national project indicated in the same direction, the following infrastructural transformations are envisaged: determination of radio frequency ranges for the creation of 5G radio networks in the Russian Federation; development of a plan for the introduction of 5G networks in the cities of the Russian Federation with a population of more than 1 million people; fulfilment of the conditions for the creation of 5G communication networks in the Russian Federation on the territory of at least 10 cities with a population of more than 1 million people.

In the framework of the Information Infrastructure section of the national program, the following prerequisites can be identified for the creation of intelligent transport systems: approval of the Concept and technical requirements for transport infrastructure coverage by communication networks for data transmission systems, including GLONASS coordinate-time information; coverage of priority transport infrastructure facilities, including road, with communication networks with broadband wireless data and voice capabilities necessary for the development of modern intelligent logistics, transport technologies and narrowband networks for collecting telemetry information constructed using LPWAN technology (Sanchez-Iborra and Cano, 2016): providing radiotelephone communication coverage of federal roads (with providing emergency calls) in accordance with the schedule for 3 12/12/2020 – 97.5%.

It is also necessary to create a regulatory framework for the formation of the Smart City ecosystem (Hernández Gracia and Corichi García, 2018), the Minstoy has already approved the departmental project for the digitalization of urban space "Smart City" (Minstroy, 2018). As part of the creation of a smart city in connection with the development of intelligent transport systems, for example, a few years ago the possibility of the appearance of road signs was announced that independently will begin to change the maximum permitted speed, while the functioning of such means of displaying dynamic information is already pos-

sible in accordance with GOST "Highways" and high-speed roads. Organization and traffic safety called "General requirements".

5. National Program "Safe and High-Quality Roads"

If the project "Digital Economy" provides for the creation of a system of prerequisites for the implementation of intelligent transport systems in Russia, then according to the passport of the national project "Safe and high-quality roads", specific measures and steps aimed at their actual implementation and active use by 2024 can be traced. If you pay attention to the main targets of the program, then the development of intelligent transport as a goal is not indicated. Target indicators are identified that are associated with an increase in the number of regional roads that meet regulatory requirements, as well as a significant decrease in the following indicators: the number of federal and regional roads operating in reloading mode, the number of concentration points for traffic accidents (hazardous sections) on the road network, and one of the most basic targets is to reduce the number of fatalities in traffic accidents.

When one turns to specific tasks, the solution of which will help in the implementation of intelligent transport systems, then, firstly, we should turn to the federal project "Road Network" which is precisely aimed at bringing the regional or inter-municipal network of public roads into normative condition values and other importance of the project is that in order to start the introduction of ITS on public roads, they must comply with the normative state. The federal project "System-wide measures for the development of the road economy" as one of the main measures provides for the strengthening of weight and size control of vehicles on roads of various subordination, increased responsibility for violation of regulatory indicators, in particular, the emergence of automatic points of weight and size control. An automatic weight-control complex is understood as a combination of permanently installed equipment and software that provides measurement of the weight and size parameters of a vehicle without reducing the speed set on a given section of the road and transferring data in the es-

tablished format to an automated system. Such a system solves the problem of observing the operating regulations and increasing the service life of roads, as it provides auto-fixation of the image and recognition of the vehicle license plate number, the establishment of the fact of an administrative offense in the field of cargo transportation rules. In general, the system provides remote monitoring for the passage of heavy and oversized vehicles. Such a system, according to the established requirements, operates autonomously and with a minimum participation of personnel in its work, provides round-the-clock and year-round operation, all measurements and data processing are carried out without stopping traffic. In general, the system of automatic control when achieving the necessary results should become one of the subsystems of the general intelligent transport system that operates on highways.

A number of changes are envisaged in the field of regulatory and technical regulation, as one of the tasks is the introduction of new technical requirements and standards for the arrangement of roads, including on the basis of digital technologies aimed at eliminating the concentration of road accidents. Undoubtedly, there is a need to develop a unified technical policy at all levels of road management, therefore, a Schedule for updating standards and technical requirements in the field of the road sector has been developed, which will allow the formation of a new modern system of industry standardization in the field of road sector by 2024. The development of legal and technical standards should take place with the active participation of the professional industry community, since the regulation of relations such as "man – technical means" is taking place. This fundamental requirement has been taken into account, the Technical Committee for Standardization No. 418 "Road Facilities" (TC 418) is involved in the development of standards, which is an association of interested enterprises and organizations, representatives of executive authorities, which was created on a voluntary basis in order to organize and conduct work on national, regional (interstate) and international standardization in the field of road facilities. It is important to coordinate all newly adopted

documents with the provisions of the Technical Regulations of the Customs Union "Road Safety". Also, during the development, all existing acts should be monitored for compliance with the provisions of Article 14 of the Federal Law of June 29, 2015 N 162-ФЗ "On Standardization in the Russian Federation", since after September 1, 2025 standardization documents that are not provided for are not allowed article or federal law of December 27, 2002 N 184-ФЗ "On technical regulation" also in the form of links in regulatory legal acts, design, design and other technical documentation. Therefore, you will have to refuse t of such documents as "Industry Road Norms", "Industry Road Methodological Document", "Republican Building Norms", "All-Union Building Norms", "Resource Estimated Norms", etc. Instead of these documents, it will be necessary to adopt the relevant GOST R or PNST.

An important step in order to introduce the operation of unmanned vehicles is the approval of the approval of the concept of road safety with the participation of unmanned vehicles on public roads, currently there is only a draft Government Decree, which states that intelligent road infrastructure is able to take on part tasks facing the unmanned vehicle and to distribute responsibility, concentrate the bathroom currently in the vehicle onto a system including the vehicle and infrastructure. In this case, the unmanned mode of vehicles moving in the traffic stream is not only supported by the infrastructure, but actually provided by it.

The most important areas of the program's implementation are the development and adoption of normative legal acts ensuring the use of unmanned vehicles driving technologies (see Taeihagh et al., 2019) on sections of public roads, which will provide conditions for the introduction of intelligent transport systems oriented on public roads including to ensure the movement of unmanned vehicles. To date, we have not been able to identify specific results in this direction, it is assumed that the result will be achieved as a result of the program, however, on December 5, 2018, a decree of the Government of the Russian Federation "On conducting an experiment on the pilot operation of highly automated vehicles on public roads" be-

gan to apply, defining the goals and procedure for conducting an experiment on the operation of unmanned vehicles on public roads, which should be carried out by Mar 1 and in 2022 on the territory of Moscow and the Republic of Tatarstan. This experiment is carried out in accordance with the action plan ("roadmap") to improve legislation and remove administrative barriers in order to ensure the implementation of the National Technology Initiative in the "AutoNet" direction.

The main objective of the experiment is to develop and establish safety requirements for highly automated vehicles and test methods for such vehicles based on the results of testing their movement in an automated mode of control on public roads. The results of the project will be used to create technical regulations and standardization documents, including for the purposes of the Eurasian Economic Union.

The analysed Government Decree of the Russian Federation approved the Regulation on an experiment on the pilot operation of highly automated vehicles on public roads. This position determines the conditions and order of the experiment. In it, in particular, definitions are given of the main categories used in the experiment (automated control mode, automated driving system (Thrun, 2010), owner, driver of a highly automated vehicle, etc. In addition, the provision determines the basic principle of the distribution of responsibility among road users traffic accidents on roads using a highly automated vehicle as part of an experiment.

Also, as a concrete result of the solution of one of the project objectives, Methodological recommendations were adopted to conduct measures to improve traffic conditions and improve road safety in order to eliminate the concentration of road traffic accidents, including standard solutions that, for example, include types of accidents and indicate the most probable factors of road conditions that contribute to the occurrence of accidents of this type.

The next important task is the introduction of intelligent transport systems focused on the use of energy-saving technologies for lighting roads (Boyce et al., 2009), several provisions of the project provide for final indicators in a given direction.

In the area of implementing automated and robotic technologies for organizing traffic and monitoring compliance with traffic rules, it is planned to do the following: develop a regulatory framework and introduce a free-flow charging system (Kelly, 2006), which involves fixing the vehicle's passage on toll roads without using checkpoints and barriers, exclusively using cameras (Shirodkar and Uchil, 2015), and the operator will be charged automatically from the account, if they were made in advance, in the absence of money in the account an administrative offense will be recorded.

A prerequisite for the functioning of intelligent transport systems is to ensure control of the traffic situation with the help of photos and videos, therefore serious measures are proposed related to the development of a methodology for redistributing the locations of cameras for video and video recording of traffic violations, as well as a significant increase in the number of stationary cameras for video and video recording.

6. Results and discussion

As the main results of the study, it can be pointed out that in the context of the digital transformation of social relations, the main way to streamline new social relations is not at all the regulatory method inherent in law from the very beginning. There is a transition from legal regulation to strategic legal planning of possible ways of influencing new social relations that have arisen in the conditions of rapid scientific and technological progress. Also, one of the ways to streamline social relations, we consider a legal experiment.

The indicated methods of legal regulation are based on the fact that they influence the developing relations, establishing not so much boundaries as predicting the directions of their further development. Based on the results of the implementation of the goals and objectives of strategic regulation, as well as on the basis of evaluating the effectiveness of a legal experiment, a regulatory function is implemented and regulatory legal acts are adopted. Therefore, this approach can be called pre-regulation.

The author considered strategic regulation in the field of one of the most important innova-

tions – the introduction of intelligent transport systems, the use of which on public roads will solve the problems of mortality, congestion and traffic accidents.

Based on the analysis of the goals, objectives, indicators and results of the national program "Digital Economy of the Russian Federation" in relation to the development of intelligent transport systems, we can conclude that it contains a system of technological prerequisites for the development of artificial intelligence systems in general and the creation of intelligent transport systems based on them. The technological prerequisites include: the development of narrowband wireless communication networks of the "Internet of things"; creation and development of 5G / IMT-2020 networks; coverage of the transport infrastructure with communication networks for data transmission systems, including GLONASS coordinate-time information; introduction of narrowband networks for collecting telemetric information built on LP-WAN technology; development of the Smart City urban space digitalization project (Strielkowski et al., 2020).

Based on the analysis of the goals and results of the national program "Safe and high-quality roads", we can conclude that it is aimed at creating a system of infrastructural prerequisites for the implementation and development of intelligent transport systems. Such infrastructural prerequisites, unlike technological ones, are not related to the development of innovative breakthrough technologies; to a greater extent, they ensure the availability of ordinary infrastructure; innovations here are associated with the forms of arrangement of such infrastructure. Infrastructure prerequisites include: bringing into a normative state a network of public roads; Strengthening the weight and size control of vehicles on roads; introduction of new technical requirements and standards for the arrangement of roads; taking measures to improve traffic conditions and improve road safety in order to eliminate places of concentration of traffic accidents; introduction of a free flow charging system; a significant increase in the number of stationary cameras for photo and video recording.

The next group of premises, which we identified as a result of the study, can be called regulatory premises. They include the need for regulatory support of all technological and infrastructural solutions in the implementation of intelligent transport systems. At present, it is not possible to assess the effectiveness of the functioning of the regulatory environment, since the activities of the programs are provided for up to 2024, the acts adopted to date can also be called acts of strategic regulation, which are preliminary in nature. These acts develop certain provisions of national programs.

7. Conclusions

The results of the study confirm the hypothesis that the transformation of legal regulation in the digital economy has different directions and needs further study. We came to this conclusion by the example of the influence of the provisions of national programs on the implementation of intelligent transport systems.

However, only the first stage of the implementation of measures stipulated by the programs has been studied, further study involves evaluating the effectiveness of such legal experiments and establishing experimental legal regimes for unmanned vehicles and the widespread dissemination of intelligent transport systems.

An assessment of the risks and vulnerabilities of the identified technical and infrastructural prerequisites is also necessary from the standpoint of the current legislation, including criminal law risks. This approach will ensure the stability and security of intelligent transport systems, this determines the main direction of further research in this area.

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