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Disputable Questions of the Use of Digital Technologies in Transportation

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ABSTRACT

The article is devoted to the implementation of digital technologies in transportation. Nowadays the necessity and advantage of their use are not argued. However, along with the positive effect of the digital technologies in the sphere of transportation there is the other side of the coin. Firstly, it is the absence of common approach to the legal regulation of implementation of digital technologies in different countries. According to analysis, the national legislations operate with notions that sometimes are not used in other legislations or have some differences in the meaning. Such approach is not appropriate in international transportation as it creates obstacles that disturbs the transportation itself. The difference is intensified by the technical aspect. Each country has its own companies that elaborate the technical issues of the digital technologies' implementation. Nowadays there is no single criteria for the developers of the software used in technical objects. Different approaches in the creation can leads to the situation when intelligent objects could not recognize each other and as the result there will be not any connection and interaction between vehicles and infrastructure itself that are deemed to the core objects of digital technologies in transportation. Secondly, there is a phenomenon that shows that on the one hand, modern society depend on appeared digital technologies. On the other hand, the majority of people are afraid of new technologies as they bring uncertainty and unknown. Moreover, digital technologies in transportation are the easy target for violation right and interests of users. This problem requires the consolidation of forces of all countries to overcome it and protect certain person, society, and the state itself from the threat created by implementation of digital technologies.

In spite of great number of articles written in this field, there is no single approach for the solving of the problem. This fact makes the topic of research topical and worth of attention.

Keywords: digital technologies, transportation, automated vehicles, cyber crime

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1. INTRODUCTION

Digital technologies have an incredible potential for every sphere of our life. Orientated on safety, security, quality, and efficiency, they suggest new opportunities for different branches of economy, including transportation. Among the most discussable technologies are artificial intelligence, Internet of things (IoT), BIG DATA, 5G, technologies in the field of robotics etc. None of these developments exists in isolation. They are used in combination forming a new product that can be efficient for the state and the society.

Digital technologies, being ameliorating in a wide range of situations with transportation system, open new horizons for the acceleration of transport various goods from one place to another, decrease of costs on transportation, raising the level of security on the roads and enhancement of ecological situation not only in one country, but also all over the world. Along with the named benefits, digital technologies are fraught with danger not only to the certain person, but also to the society itself. Therefore, analyzing the impact of digital technologies in this or that sphere it is necessary to speak about their positive and pernicious influence on the economy, environment [5], social life and the certain person. The main idea of this research is to find the balanced approach to and treatment of facilitation and security issues alike.

2. KEY ISSUES IN DIGITAL TECHNOLOGIES USED IN TRANSPORTATION

To show the effect of digital technologies in transportation it is necessary to view several aspects.

1. The influence of digital technologies on the process of transportation. Nowadays the transportation companies offer the traditional way of transport goods and people. But the great desire to become the leaders in this sector of market push them to invest money in the elaboration of new technologies that can be helpful in the increasing of the security level, acceleration of transportation speed and decreasing of the companies' costs. These goals can be reached because of the elimination of human behavior factor. The lion's share of control over transportation is given to new technologies such as artificial intelligence [4], internet of things etc. Moreover, the central part of transportation management is work with Big Data and analytics that can be done only by modern computers with the sophisticated software. The mixture of these technologies produces tools for the further development of transportation.

The key tool aimed to reach the above-mentioned goals is the intelligent transport system (ITS). The notion of ITS is used all over the world. Almost all countries have developed Strategies or Concepts devoted to the implementation of ITS. Let us bring the **definition of the notion of ITS**.

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Article 4 of the European Commission Directive 2010/40/EU of July 7, 2010, defines that ITS is a system that uses information and communication technologies in the field of motor transport, including infrastructure, vehicles, users, traffic management, as well as interaction with other modes of transport. UNESCAP Report on Intelligent Transportation Systems for Sustainable Development in Asia and the Pacific underlines that ITS is, generally speaking, a combination of technologies for increasing efficiency in vehicular traffic.

Intelligent transport systems Handbook on Land Mobile (including Wireless Access) Volume 4 (2021 edition) [3] defines ITS as systems utilizing the combination of computers, communications, positioning and automation technologies to improve the safety, management, and efficiency of terrestrial transportation.

The notion of ITS is used in the current Russian legislation. In accordance with section 2 of GOST R 56829-2015 “National standard of the Russian Federation. Intelligent Transport Systems” dated June 1, 2016, ITS is understood as a management system that integrates modern information and telematics technologies and is designed for automated search and adoption of the most effective scenarios for managing the transport and road complex of the region, a specific vehicle or group of vehicles in order to ensure a given mobility of the population, maximizing the indicators of the use of the road network, improving the safety and efficiency of the transport process, comfort for drivers and transport users. The definition of this concept is duplicated in the Concept of Ensuring Road Safety with the Participation of Unmanned Vehicles on Public Roads, approved by the Decree of the Government of the Russian Federation No. 724-r, dated March 25, 2020.

In the Concept of the introduction of intelligent transport systems in urban agglomerations, approved by the Federal Road Agency “Rosavtodor”, the above definition is repeated.

In addition, this definition is the basis for other standards. For example, in January 2021, a Preliminary National Standard of the Russian Federation was developed. Intelligent transport systems. Requirements for the feasibility study of the creation of intelligent transport systems on highways (PNST514-2021).

The definition presented above is also used without any adjustments in Article 2 of the draft Federal Law on Highly Automated Vehicles and on Amendments to Certain Legislative Acts of the Russian Federation (Project ID 02/04/06-21/00116763).

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Road Safety Strategy in the Russian Federation for 2018 – 2024, approved by the Decree of the Government of the Russian Federation No. 1-r, dated January 8, 2018, contains a point of view that ITS is a kind of new technology. ITS involves a wide range of technological and organizational systems, applications, and services.

The analyze of above-mentioned definitions of the notion of ITS allows us to say that ITS is some kind of automated system that includes all the existing variety of achievements of modern technologies (for example, multifunctional software and hardware complexes, data exchange systems between vehicles, as well as with transport infrastructure, working with the help of 5G technologies), allowing for efficient and safe movement of goods, people, as well as management, control of the road situation, ensure reliable and sustainable interaction between vehicles (V2V), as well as with transport infrastructure (V2I). Even though the existing legal regulation mostly concerns road transport, the definition of ITS should apply to all types of transport, starting from land and rail, ending with sea and air.

The modern transportation needs require not only automatization of the separate parts of the transportation and transportation infrastructure, but also the automatization of the whole process. ITS is the great tool to combine the automated vehicles and infrastructure together. Some elements of intelligent transportation system have been applied now. For instance, some countries use the roadside equipment for speed enforcement. On Italian and Russian motorways there are such kind of systems that can measure the driver's speed in two different points to estimate the average speed. In case the average speed is lower than the maximum speed limit for the section then the data is deleted. Otherwise, the images are made available to the traffic police for enforcement procedures. However, such modern technology is created only for the control of road's security. Using such equipment does not mean the existence of intelligent transportation system. ITS is much more complicated including not only the automatization if the separate functions but also the interaction of vehicles and infrastructure as well. Regarding the technology of Internet of Things, the interaction between objects is possible only when they are equipped with the special systems that allow them to operate by themselves.

The development of scientific thought has moved the transportation industry much more ahead. The famous brands have **the modern versions of vehicles** that can move by themselves without the control of a person. In accordance with the classification made by the Society of Automotive Engineers (SAE) in J3016 Standard "Taxonomy and Definitions for Terms related to On-Road Motor Vehicle Automated Driving System" there are three levels of automatization: Level 3 – conditionally automated vehicle, Level 4 – highly automated vehicle, Level 5 – fully automated vehicle. All vehicles of these levels

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can transfer the function of monitoring to the SDS (Self-Driving System) or ADS (Automated Driving System).

Based on the above-mentioned classification the definition of each kind of automated vehicle differs by the description of what system and driver are allowed to do. Let us consider them in detail.

1. Conditionally Automated Vehicle is an automobile, which has SDS (ADS) that match with third level (L3) of classification made by Society of Automotive Engineers. The ADS recognizes times restrictions of the Operating Design Domain (ODD) and gives a transfer demand to the driver. Driver is a fall-back ready user while he or she do not need to uninterrupted control traffic environment. Nevertheless, they must be ready and able to renew the dynamic driving task (DDT) in case of system request or system failure.

2. Highly Automated Vehicle is an automobile, which has SDS (ADS) that match with fourth level (L4) of classification made by Society of Automotive Engineers. System recognizes all driving tasks. It is capable to monitor the driving environment. Under certain conditions, the System may issue a transfer demand to the chauffeur. The driver must undertake the dynamic driving task to continue the trip without Operating Design Domain. However, SDS (ADS) can execute the total dynamic driving task if the chauffeur is unable to satisfy the transfer demand. The driver does not need to uninterrupted control the driving environment.

There are some uncertainties against the status of the driver. Some consider that all those who present in the vehicle are considered to be passengers while the SDS (ADS) is involved though they may still be executing the strategic driving task. Others consider the user still as chauffeur while the SDS (ADS) is involved. Thus, it is important to continue further deliberation on this point as the determination of the driver's position influences on the legal consequences (especially in determine the liable person in case of losses).

3. Fully Automated Vehicle is an automobile, which has SDS (ADS) that match with fifth level (L5) of classification made by Society of Automotive Engineers. According to it, none of those who are in the vehicle is expected to execute any part of the dynamic driving task. In other words, driver may not be present. When the SDS (ADS) is engaged all occupants are viewed as passengers. It means that the driver intervention is not needed. However, the driver may have the option to control the driving under the following conditions: 1) if the vehicle contains appropriate equipment and 2) if the driver has the required skills and qualifications (licenses). In this case, human occupants may choose to perform the

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DDT. On the whole, according to the details of term "fully automated vehicle", it can be assumed that the term "driverless" is equivalent to the term "fully automated vehicle".

This classification is applied not only by SAE. This document is the basic one taken by UNESE as the core to allocate types of automated vehicles. Therefore, this article also uses the elaborated classification. This means that under automated vehicles man can understand highly automated and fully automated vehicles. Only these levels of automatization can allow vehicles to interact with other objects.

Moreover, to make the implementation of automated vehicles possible it is necessary to have vehicle connected with the infrastructure via exchanging data and information relevant for the specific road segment to increase overall road safety and enable cooperative traffic management.

The mentioned digital technologies introduced into transportation seem to have positive influence on the development of transportation relationships. Nevertheless, **the implementation of these technologies is rather disputable as there are some negative aspects of their use**. Let us view the negative aspects of the transportation digital technologies implementation.

First, there is no common legal base for the use of digital technologies. Each country elaborates their own terminology, provisions of regulation. Even the same notions may have differences in their definitions. This is a serious problem for the whole world. Countries cannot be isolated in the questions of transportation as international transportation is the key tool to develop worldwide trade. Therefore, the trade with the use of automated vehicles requires the elaboration of the rules that can be applied in different countries. The presence of different approaches leads to difficulties in the implementation of international transportation and the development of international transport links, which negatively affects international trade turnover. In this regard, some interstate entities are developing various concepts of interaction of national ITS. For instance, we can name the Recommendations of the Board of the Eurasian Economic Commission, dated December 22, 2020, No. 27 "On coordinated approaches to the interaction of national intelligent transport systems, including in order to improve transport (automobile) control", Order of the Intergovernmental Council, dated August 20, 2021, No. 15 "On the action plan (roadmap) for the implementation of the Main Directions and stages of the implementation of the coordinated (coordinated) transport Policy of the member States of the Eurasian Economic Union for 2021-2023". The main objectives of the adoption of such documents are to determine the possibilities of interaction with European and world institutions for standardization in the field of ITS that meet international requirements, the development of measures aimed at improving information interaction in the field of

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transport control in terms of information exchange, as well as the preparation of a unified legal framework for the creation, development, provision of ITS. As the result the main issue of the modernization of the current legislation is the convergence of legal regulations of different countries.

Second, digital technologies in transportation are vulnerable and increases the risk of invasion by law violators. This issue requires the joint participation of all states, namely: issues of information security (including cybersecurity) of the use of information transport systems. Transport systems capable of functioning autonomously are quite vulnerable to attacks from intruders. They are at risk due to the fact, that the technologies used (for example, inertial sensors – sensors that determine speed), functioning using various communication channels, software, are an easy target for cyber-attacks. The report entitled "Cyberattacks against an Intelligent Transport System: Assessment of upcoming threats to ITS", prepared by organization "Trend Micro", examines possible threats from cybercriminals, namely: interference in the work of ITS to create accidents, traffic jams, obstructing traffic and causing losses to individuals, legal entities and public authorities and local self-government. There are headlines in mass media that have been stipulated the existence of cases of interference in automated processes in the transport sector.

2. The influence of digital technologies on transportation documentation.

Coming to the first aspect concerning *the implementation of digital documents* it is worth mentioning that there is no single approach to this question among all countries. The reason for such situation goes deep into the peculiarities of legal regulation. There are two levels of regulation of transportation relationships: international and domestic levels, which differs from each other.

International conventions give rules only for international transportation for those countries who are members of these agreements. For instance, the Additional Protocol on electronic CMR, made to Convention on the contract for the international carriage of goods by road (CMR, 1956) [1]. It was entered into force on the 5th of June 2011. Today about 26 countries joined this agreement devoted to the introduction of e-CMR, such as Russia, Czech Republic, Bulgaria, Denmark, Estonia, France, Spain, Switzerland, Sweden, Turkey, Slovenia, Spain etc. The official implementation of e-CMR was in January 2017 when the first international carriage of goods between Spain and France was fulfilled. E-CMR is proved to be an effective instrument that is used in international turnover. Electronic form of the document has its invaluable advantages. Firstly, the use of the e-CMR reduces expanses. It is proved that processing costs were cut by 3 – 4 times. It is connected with the acceleration of administrative work namely: the reduction of paperwork, the cancellation of the necessity to make copies and scans. Secondly,

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implementation of e-CMR increase the transparency because of the accuracy of data, control of the dispatch and receiving of sending, the access to the information about the sending in real-time mode. These benefits support the improvement of logistic in the carriage of goods. Therefore, the competitiveness of all parties engaged into the carriage of goods with use of e-CMR increases. Thirdly, using of e-CMR helps to provide traffic security. E-CMR is bound with the eCall. In case of emergency a massage is automatically sent to the Emergency services.

Despite the above stated advantages, not all countries are using such electronic documents. Nevertheless, some countries give only their official support, but do not ratify the protocol. According to the Regulation on electronic information about carriage of goods (eFTI) adopted by the Committee on transport and tourism of European Parliament on the 4th of May 2020, all members of EU must move to the e-CMR not later than 2025. However, this demand does not mean that carriers are limited by the implementation of only electronic documents. The paper form of documents is not excluded. This results in the conflict of using different forms of documentation in international relations by various countries.

The above given example shows that the effectiveness of introduction of electronic documents depends on the number of states involved into its use. Only globe use of electronic transport documents would lead to the transparency, accuracy, and acceleration of document turnover.

Proceeding to the national level of transportation regulation it is found that electronic documentation exchange in transportation of different countries has diverse stages of development. Let us consider some examples of transportation legislation systems.

In Russia, there is no single system of electronic transport document turnover. There is a complex chain of restraining reasons. The first obstacle relates to the system of legal regulation of transport relationships itself. There is no one act devoted to the transport regulation. Each kind of transport has its own codified act (codes or charters):

- transportation by road is regulated by Federal Law “Charter of road transport and urban land electric transport”, dated November 8, 2007, No. 259-FZ;

- transportation by air is based on Federal Law “Air Code of the Russian Federation”, dated March 19, 1997, No. 60-FZ;

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- transportation by rail is governed by the Federal Law "Charter of Railway Transport of the Russian Federation", dated January 10, 2003, No. 18-FZ;

- transportation by water has two acts: the Merchant Shipping Code of the Russian Federation, dated April 30, 1999, No. 81-FZ, Code of Inland Water Transport of the Russian Federation, dated March 7, 2001, No. 24-FZ.

The absence of the single act regulated transportation relationships leads to the enlargement of juridical acts [2]. The same issues on different kinds of transport are governed by different acts, including subordinate legislation. The fragment regulation of transport relationships means that there are different forms of consignment depending on the kind of transport. Moreover, the number of documents and their titles are not the same for various kinds of transport. The same applies to the electronic document turnover: legislation on each kind of transportation has its own rules.

Thus, road transportation is regulated by the Decree of the Government of the Russian Federation "On approval of the Rules for the carriage of goods by road and on amending paragraph 2.1.1 of the Road Traffic Rules of the Russian Federation", dated December 21, 2020, No. 2200. In air transport, the Order of the Ministry of Transport of Russia "On approval of the form of an electronic consignment note in civil aviation", dated August 10, 2018, No. 300, is applied. The possibility of using an electronic waybill on railway transport is established by clause 113 of the Rules on goods, empty freight wagons carriage by rail, containing the procedure for redirecting the transported goods, empty freight wagons with a change in the consignee and (or) railway station of destination, drawing up acts on the goods, empty freight wagons carriage by rail, drawing up a railway waybill, terms and procedure for storing goods, containers at the destination railway station, approved by Order of the Ministry of Transport of Russia, dated July 27, 2020, No. 256.

The above-mentioned examples show that differences in legal paperwork cause overwhelming majorities of obstacles existing on transportation and logistics. Especially in multimodal transport this isolation according to the kind of transport impedes the performance of transportation and logistics operations. The need to reissue documents when using various types of transport significantly complicates the turnover of goods.

Thus, it seems appropriate to develop the unified form for all types of transport. In the Russian legislation, this goal is declared in the document approved by Order of the Government of the RF No. 1734-r. (November 22, 2018), known as the Transport Strategy that is applied till 2030.The act emphasizes

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the need to introduce electronic document management according to the "single window" principle. This means that the documents should be available not only to the direct participants in the legal relationships, but also to state bodies (for example, tax authorities) that exercise control over transport activities. Achievement of this goal would allow solving the following problems in the transport sector. First, the introduction of electronic document management would make the transportation process more transparent and accessible. Currently, in practice, situations arise when carriers (in particular, large companies) refuse to submit documents to court nitration, citing the fact that this is impossible due to the special nature of their maintenance and storage or for other reasons. Such circumstances may negatively affect the establishment of the circumstances of the case and, consequently, the determination of the responsible persons. Secondly, the introduction of such innovations would make it possible to increase the turnover of goods carried out through multimodal transport, in particular, intermodal transport, in which only a container with cargo is reloaded from one vehicle to another in specially equipped centers. At the same time, re-registration of documents is not required, which significantly reduces time costs. Thus, we are talking not only about changes related to the form of documents, but also about a qualitatively new approach to the regulation of document flow. The foregoing substantiates the need for unification of documents drawn up for multimodal transport, as well as for transport by various modes of transport. However, the Russian Federation has not yet adopted a law regulating multimodal transport. Even though the Ministry of Transport of Russia has already prepared five draft laws of the Federal Law "On direct mixed (combined) transportation" (project ID 02/04 / 05-20 / 00102210): the draft law of January 26, 2009, the draft law of March 30, 2015, the draft law of February 21, 2019, the draft law of January 9, 2020, the draft law of May 22, 2020, none of them was adopted. The reason for this is that none of the draft laws regulates fundamental issues among others the procedure and mechanism for the application of a single document during transportation. Thirdly, the introduction of electronic document management would create a basis for the unification of management of electronic documents.

Thus, the construction of common (single) system of electronic document turnover in transportation sphere is a chance for Russia to build a safe, reliable, and sophisticated transportation and logistics system.

According to the European legislation, the efficacy and effectuality of transport can be essentially increased by using communication technology including the integration of electronic documentation turnover in countries – members of EU. The open access for all participants of transportation relationships to the transport-related information must improve the traffic management and simplify administrative

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procedures. Such provisions are stated in the Regulation "On Union guidelines for the development of the trans-European transport network and repealing Decision No. 661/2010/EU", adopted by the European Parliament and of the Council of EU, dated December 11, 2013, No. 1315/2013.

It is very clear from the observation that there are bi-leveled differences in transportation regulation. On the one hand, different kinds of transport have their own rules including electronic document turnover. On the other hand, the national systems of transportation legislation are not equal to the international legislation. These doubled differences are the obstacle for the development of ecosystem of transportation document turnover.

Presented in the national and European Union strategies, this vision proposes measures that will streamline the creation of the unified system of electronic documentation. According to the analyze of international and national legislation we tend to underline as the sample of successful documentation turnover the experience of the International Federation of Freight Forwarders Association (FIATA)[2]. FIATA has elaborated a document used by a freight forwarder within the framework of an international freight forwarding agreement. This document is called FBL (Negotiable FIATA Multimodal Transportation Bill of Landing – multimodal bill of lading). A distinctive feature of the document is the ability to be negotiable, that is, act as a security (like a bill of lading issued for the carriage of goods by sea). This bill is an example of single document that can be used on different modes of transport. The unified form brings the benefit for the development of new generation of transportation: free of paperwork and human mistakes, time-consuming process of administrative work etc. An electronic version of the FBL already exists. However, the problem remains on the development of a mechanism for monitoring, issuing, and checking such an electronic waybill to existing requirements. Following the tendencies of digitalization, FIATA is looking forward to facilitating interoperability system of documentation relied on open and collaborative approach.

Thus, the creation of the single environment of electronic document turnover requires the unification of international and national legislation in the sphere of transport documents exchange. This tendency of building ecosystem of e-documentation has to correlate with the idea to create the more interoperable transport system.

[2]It is stated to be nongovernmental membership-based organization. According to the Art. 2 of FIATA Statutes it is acknowledged to be an umbrella organization ("central coordinating body") for associations of freight forwarders all over the world / URL: https://fiata.com.

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Along the problem of doubled level regulation of transportation documentation turnover, it is necessary to underline that the enhancement of transport and logistic traffic depends on the standardization and harmonization of transportation and trade documentation. At the first glance, trade and transport are two separate branches of economic activity. However, these two areas are very close to each other as carriage of goods is the kind of instrument to fulfil the obligation on goods supply. Therefore, transport operations are usually inside the contractual obligation of goods supply. Using metaphoric language, we can say that these two contracts is a kind of "Russian Matreshka": relationships on supply contain relationships on carriage of goods inside. This explanation presents the necessity to enable the "partnership" between two systems of documentation. The integration of two systems of documentation may leverage its strength to make the transportation faster, transparent, more clear, secure etc. This will result in the intensification of territorial, economic, social cohesion.

From results of the research of the first issue of the article, it is concluded that to build up a system of transport documentation that can support the development of transportation (so called "ecosystem"), there is a need to step up action at multivarious levels.

3. CONCLUSION

Thus, digital technologies are known to be the great step forward. They are regarded as the main source to improve the safety, management, and efficiency of existing systems, including transportation systems. Being a rapidly developing sector digital technologies suggest modern solutions for current problems, such as cause traffic congestion, safety issues and air pollution. Nevertheless, providing with the decisions of the existing problems digital technologies also create new challengers that society must overcome. However, the new questions are more global and are not the matter of only one country. The idea is that the implementation of digital technologies requires consolidation to prevent unwilling consequences.

https://doi.org/10.54934/ijlcw.v1i1.13

REFERENCES

[1] Bryukhov, R.B., & Kovalenko, K.E. (2018). International legal regulation of road transportation (features of the legal consciousness of legislators). *MATEC Web of Conferences*. vol. 239. TransSiberia

[2] Dmitrieva, O.A., & Nikolaeva, I.G., & Rudakova, E.N., & Morkovkin, D.E., & Vlasov, A.V. (2020). Digitalization of the EAEU Transport and Logistics Sector and Its Role in Improving the Euro-Asian Cargo Transportation. *Advances in Social Science, Education and Humanities Research*. vol. 416. pp. 1296 – 1302.

[3] Intelligent transport systems/Handbook on Land Mobile (including Wireless Access). vol. 4 (2021 edition). Retrieved October 12, 2021, from https://www.itu.int/dms_pub/itu-r/opb/hdb/R-HDB-49-2021-PDF-E.pdf.

[4] Okrepilov, V.V., & Kovalenko, B.B., & Getmanova, G.V., & Turovskaj M.S. (2022). Modern Trends in Artificial Intelligence in the Transport System. *Transportation Research Procedia*. vol. 61. pp. 229–233.

[5] Rotaris L. & Tonelli S. & Capoani L. (2022). Combined transport: Cheaper and greener. A successful Italian case study. *Research in Transportation Business & Management*. https://doi.org/10.1016/j.rtbm.2022.100792.