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Peculiarities of Legal Regulation of Transport and Logistics Activities in the Context of Digitalization

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ABSTRACT

The digitalization of transport and logistics activities changes the methods of organizing transportation, documentation, information interaction and state control, without changing the civil-legal nature of the transportation obligation. The relevance of the study is due to the fragmentation of the regulatory regulation of electronic transport documents, the uncertainty of the status of digital participants in the transportation process, as well as the need to ensure the evidentiary value, integrity and accessibility of electronic data. The purpose of the article is to determine the features of the legal regulation of transport and logistics activities in the conditions of digitalization, identify problems of the legal regime of electronic transport documents and substantiate the directions of improving the legislation of Ukraine in this area. It has been established that transport and logistics activities are a complex of civil, economic, transport, information and public-legal relations. National legislation does not contain a universal definition of an electronic transport document, using specific structures for road, rail and multimodal transportation. It is proposed to define it as an electronic document of special functional purpose, which records legally significant circumstances of the occurrence, performance, change or termination of a transport obligation. It is substantiated that e-TTN combines the private law function of confirming transportation with the public law functions of accounting, control and information interaction. Problems of regulatory delimitation of the status of a carrier, forwarder, logistics operator, operator of an electronic document management platform, technical administrator and trust service provider are identified; risks of technical inaccessibility of systems, violation of data integrity and insufficient interoperability with European digital systems are identified. Further development of legal regulation should provide for the unification of the regime of electronic transport documents, regulatory consolidation of their legal force and evidentiary value, special rules of liability for digital document management and backup procedures in case of technical failures. Strengthening cyber protection of transport information and harmonization of national legislation with international and European standards of electronic transport document management are also necessary.

KEYWORDS

transport and logistics activities, digitalization, electronic transport document, e-TTN, transport obligation, electronic document flow, legal regulation, logistics entities.



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Особливості правового регулювання транспортно-логістичної діяльності в умовах цифровізації

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Цифровізація транспортно-логістичної діяльності змінює способи організації перевезень, документального оформлення, інформаційної взаємодії та державного контролю, не змінюючи цивільно-правової природи перевізного зобов'язання. Актуальність дослідження зумовлена фрагментарністю нормативного регулювання електронних транспортних документів, невизначеністю статусу цифрових учасників перевізного процесу, а також потребою забезпечення доказового значення, цілісності та доступності електронних даних. Метою статті є визначення особливостей правового регулювання транспортно-логістичної діяльності в умовах цифровізації, виявлення проблем правового режиму електронних транспортних документів і обґрунтування напрямів удосконалення законодавства України у цій сфері. Встановлено, що транспортно-логістична діяльність є комплексом цивільних, господарських, транспортних, інформаційних і публічно-правових відносин. Національне законодавство не містить універсального визначення електронного транспортного документа, застосовуючи видові конструкції для автомобільних, залізничних і мультимодальних перевезень. Запропоновано визначати його як електронний документ спеціального функціонального призначення, що фіксує юридично значущі обставини виникнення, виконання, зміни або припинення перевізного зобов'язання. Обґрунтовано, що е-ТТН поєднує приватноправову функцію підтвердження перевезення з публічно-правовими функціями обліку, контролю та інформаційної взаємодії. Виявлено проблеми нормативного розмежування статусу перевізника, експедитора, логістичного оператора, оператора платформи електронного документообігу, технічного адміністратора й постачальника довірчих послуг; визначено ризики технічної недоступності систем, порушення цілісності даних і недостатньої інтегруєбельності з європейськими цифровими системами. Подальший розвиток правового регулювання має передбачати уніфікацію режиму електронних транспортних документів, нормативне закріплення їх юридичної сили та доказового значення, спеціальні правила відповідальності за цифровий документообіг і резервні процедури на випадок технічних збоїв. Необхідними є також посилення кіберзахисту транспортної інформації та гармонізація національного законодавства з міжнародними й європейськими стандартами електронного перевізного документообігу.

КЛЮЧОВІ СЛОВА

транспортно-логістична діяльність, цифровізація, електронний транспортний документ, е-ТТН, перевізні зобов'язання, електронний документообіг, правове регулювання, суб'єкти логістичної діяльності.

1. Introduction

The transport and logistics system is an important element of the functioning of the national economy, the continuity of supply chains and the implementation of economic relations. The digitalization of transportation entails the use of electronic transport documents, electronic identification means, qualified electronic signatures, digital platforms and automated data exchange. Such technologies contribute to the efficiency of transportation registration, the availability of information for participants in the transportation process and the development of electronic interaction with regulatory authorities.

Digitization does not change the civil-legal nature of the transportation obligation. Still, it transforms the methods of its documentary registration, confirmation of performance and the use of relevant data in claims and judicial practice. In Ukraine, the functioning of the electronic consignment note is regulated by special by-laws that set out the procedure for operating the e-TTN system, its participants, electronic document flow platforms, and technical administration. At the same time, the development of digitalized transport relations requires further coordination of transport, civil, economic, information and procedural regulation.

The purpose of the article is to determine the features of the legal regulation of transport and logistics activities in the context of digitalization, identify problems of the legal regime of electronic transport documents and substantiate the directions of improving the legislation of Ukraine in this area.

2. Literature Review

Analysis of recent research and publications shows that the legal issues of transport and logistics activities in the context of digitalization are formed at the intersection of several scientific directions. The economic and legal and transport and legal direction is represented by the works of E. M. Derkach, E. M. Fedelezh, I. E. Pidbereznykh, A. A. Ivanishchuk, E. V. Serdyuk, I. S. Pokhilenko and V. V. Petrov. In particular, E. M. Derkach [1] argues that transport law should be considered as a complex regulatory subsystem that covers the legal status of business entities in the transport sector, commercial transport contracts and economic and legal liability. E. M. Fedelezh [2] draws attention to the fact that national legislation does not contain a proper definition of a logistics operator as a special business entity, which complicates the legal qualification of its activities. I. E. Pidbereznykh, A. A. Ivanishchuk and E. V. Serdyuk [3] consider freight transportation through a combination of administrative and economic principles, in particular licensing, state control, contractual relations, consignment note and carrier liability. I. S. Pokhilenko [4] analyzes transport activities under martial law, emphasizing the need for a balanced legal mechanism that takes into account defense needs, citizens' rights and the international context. V. V. Petrov [5] considers logistics activities as a complex inter-sectoral legal category that covers the organization, implementation and control of the movement of material, information and financial resources.

A separate direction is the study of state and institutional regulation of transport and logistics systems, in particular the works of I. S. Lutsenko [6], S. O. Mashkantseva [7] and B. V. Samoilenko [8], which prove the need for state support, legal support for logistics processes, development of transport infrastructure, institutional coordination and harmonization of national regulation with European standards. At the same time, the works of O. V. Kopylova and Yu. V. Pichugina [9] and K. V. Sukhetska [10] substantiate that the transport and logistics system of Ukraine in conditions of martial law becomes an element of national security, critical infrastructure, defense capability and continuity of supply. The research of S. Yu. Boyarchuk, B. V. Shtogrinets [11], V. S. Shepelev, N. M. Vdovenko [12], A. Komar, Y. Remyga [13] and O. I. Kokhan [14] reveals the technological aspects of the digitalization of logistics and transport, in particular electronic document management, digital platforms, artificial intelligence, Big Data, blockchain, digital twins and automated management systems.

However, most of the existing works focus mainly on the economic, managerial, institutional or technological aspects of transport and logistics activities, while its complex legal aspect in the context of digitalization remains underdeveloped. In particular, further scientific analysis is required to form a coordinated legal mechanism capable of ensuring the legal certainty of electronic transport documents, proper protection of the rights of participants in the transport process, the reliability of digital

information, and the compatibility of national regulation with international and European standards of electronic transport document flow.

3. Problem Statement

The current legislation of Ukraine contains regulatory provisions on electronic documents, electronic identification, electronic trust services and the functioning of the e-TTN system in the field of domestic freight transportation. At the same time, it does not form a single legally enshrined legal regime of an electronic transport document, which would comprehensively cover various types of transportation and multimodal transport and logistics operations.

The legal nature of electronic transport documents, the procedure for confirming their authenticity, integrity and evidentiary value, as well as the relationship between electronic documents, electronic messages and technical data, in particular time stamps, event logs and geolocation information, require further scientific and regulatory clarification. Although the by-laws of the e-TTN system define the functions of the operator of the electronic document management platform, the technical administrator and other participants, the issues of their civil liability for technical failures, loss of access to data, violation of information integrity or improper functioning of the digital infrastructure require greater regulatory certainty.

A separate problem is ensuring the interoperability of the national e-TTN system with international and European digital transport solutions. Regulation (EU) 2020/1056 establishes an approach for EU Member States to the electronic submission of regulatory transport information, certification of eFTI platforms, data protection and technical interoperability of platforms. For Ukraine, this Regulation does not have direct effect, but can be a guideline for harmonizing national regulation and developing cross-border electronic document flow.

Therefore, the scientific problem lies not in the complete absence of legal regulation of e-TTN, but in the need for its systematization, legislative development and coordination with international approaches to digital transport information, electronic evidence, cyber security and interoperability of digital platforms.

4. Methods and Materials

The study is based on the analysis of national, international and European regulatory legal acts regulating transport, freight forwarding activities, electronic document management and electronic identification in the context of digitalization. The materials of the study were the laws of Ukraine "On Transport", "On Freight Forwarding Activities", "On Electronic Documents and Electronic Document Management", "On Electronic Identification and Electronic Trust Services", by-laws on the functioning of the electronic consignment note (e-TTN) system, the Additional Protocol to the CMR Convention on the electronic consignment note and EU Regulation 2020/1056 on electronic transport information. Formal-legal, systemic, comparative-legal and functional methods were used. The formal-legal method was applied to interpret regulatory provisions and determine the legal features of electronic transport documents; systemic – to establish the relationships between civil, economic, transport, information and administrative legal elements of digitalized transport and logistics relations; comparative legal – to compare Ukrainian regulation with international and European approaches to e-CMR, electronic transport information and interoperability; functional – to assess the evidentiary, control, information and contractual functions of e-TTN and other electronic transport documents.

5. Results and Discussion

Transport and logistics activities in the legal dimension should be considered not only as an organizational and economic process of moving goods, but as a complex of transport, economic, civil law and informational legal relations that arise in connection with the organization, provision and implementation of cargo transportation. The central element of the relevant relations is the transportation obligation, which should be understood as a civil law binding legal relationship that arises based on a cargo transportation contract and covers the mutual rights and obligations of the carrier, the consignor, and, in terms of the delivery of the cargo, the consignee. Its main content is the

obligation of the carrier to accept the cargo, ensure its proper preservation, deliver it to the destination and issue it to an authorized person, as well as the obligation of the consignor to provide the cargo and appropriate information about it and pay the freight.

In the scientific literature, transport activity is considered as an independent object of economic and legal regulation. Thus, E. M. Derkach [1] argues that the legal regulation of transport activity should cover the legal status of participants in transport relations, contractual forms of transportation organization, economic and legal liability, state regulation and protection of the rights of business entities in the transport sector. This approach allows us to consider transport and logistics activity as a system of interrelated legal relations, within which cargo transportation is combined with forwarding, organizational, informational and auxiliary obligations. E. M. Fedelezh [2] rightly draws attention to the fact that a logistics operator as a provider of complex logistics services must take into account the requirements of regulatory legal acts that regulate various components of logistics activity, and at the same time, national legislation does not contain a proper definition of such a business entity as a "logistics operator".

Thus, one of the key features of the studied relations is the presence of a plurality of subjects: carrier, forwarder, consignor, consignee, logistics operator, operator of the electronic document management platform, regulatory authority and other participants in the transportation process. The peculiarity of transport and logistics activities is also that it combines private and public law elements. On the one hand, its basis is contractual obligations: a cargo transportation contract, a transport forwarding contract, warehouse storage contracts, contracts for the provision of related logistics services. On the other hand, this activity is subject to public law influence through licensing, state control, requirements for transportation safety, documentary support of cargo, customs clearance and compliance with special transportation rules. In this context, I. E. Pidbereznykh, A. A. Ivanishchuk and E. V. Serdyuk consider freight transportation in Ukraine through a combination of administrative and economic principles, covering licensing, contractual mechanisms, control, consignment note and carrier liability [3]. The regulatory and legal framework for regulating transport and logistics activities in the context of digitalization is complex and cross-sectoral in nature. It covers the norms of transport, economic, civil, administrative, information and international law. The Law of Ukraine "On Transport and Forwarding Activities" [15], which defines the legal and organizational principles of transport and forwarding activities in Ukraine, is of fundamental importance for the area under study. It is this law that allows us to consider transport and logistics activities as activities related to the organization and provision of cargo transportation, and not only to their physical movement. The Law of Ukraine "On Transport" [16] also plays an important role, defining the general legal, organizational and economic principles of the functioning of the unified transport system of Ukraine. For transport and logistics activities, road, rail, sea, inland waterway and air transport are of the greatest importance, since it is their combination that forms the basis of multimodal transportation and digitalized logistics chains.

The civil and economic legal basis of transport and logistics activities is formed by the provisions of the Civil Code of Ukraine and the Economic Code of Ukraine on the contract of carriage, transport forwarding contract, economic obligations, liability for breach of contractual terms and compensation for damages. They provide a general contractual framework for relations between the carrier, forwarder, consignor, consignee and customer of logistics services. At the same time, special transport legislation details the rules of carriage, execution of transport documents, obligations of the parties and grounds for liability.

The current legislation of Ukraine does not contain a universal legal definition of an electronic transport document. Instead, regulatory legal acts use specific constructions: "electronic transport document" in the field of railway transport, "goods and transport invoice in electronic form" in domestic road transport, as well as "multimodal cargo transport document" and "single transport document" in the field of multimodal transport.

In view of this, it is advisable to define an electronic transport document as an electronic document of special functional purpose, which is formed during the organization or implementation of transportation, contains the details established for the relevant type of transport document and records the legally significant circumstances of the occurrence, performance, change or termination of the transport obligation. Such a document ensures the identification of the participants in the transport, the integrity and accessibility of data and can be used for accounting, state control, claim work and judicial evidence.

General requirements for the legal force, details, integrity and circulation of such documents are determined by the Law of Ukraine “On Electronic Documents and Electronic Document Management”, which establishes the organizational and legal principles of the creation, transfer, storage and use of electronic documents [17]. For the transport and logistics sector, this is of fundamental importance, since an electronic transport document must have legal force, ensure authenticity, integrity and the possibility of use as evidence. The Law of Ukraine “On Electronic Identification and Electronic Trust Services” forms the legal basis for electronic identification, electronic signature, electronic seal and trust services [18]. In transport document flow, these tools provide confirmation of the will of the parties, identification of participants in the transport process and legal significance of the electronic consignment note.

In the context of digitalization, the transport obligation acquires a new form of fixation and execution through electronic transport documents, electronic signature, e-TTN, digital platforms and automated data exchange. An electronic transport document in the field of transport and logistics should be considered as a legally significant form of fixation of the transport process, which provides documentary confirmation of the occurrence, change, execution or termination of the transport obligation. Its legal nature is that it combines the features of an electronic document and a special transport document, which reflects essential legal facts: acceptance of cargo for transportation, identification of the parties to the transportation process, cargo characteristics, route, delivery conditions, transfer of cargo to the recipient and possible comments on its condition.

The scientific literature draws attention to the fact that the digitalization of transport activities changes the forms of management of transport flows, logistics operations and document flow, but does not eliminate the need for legal confirmation of the actions of the parties [13, 14]. Therefore, an electronic transport document is not only a technical digital record, but it should act as a functional equivalent of a paper document if it ensures authenticity, integrity, accessibility and the ability to verify the origin of data.

The digitalization of domestic cargo transportation in Ukraine is implemented through the formation of an electronic document flow system e-TTN, which combines regulatory regulation, state information infrastructure and authorized electronic document flow platforms.

Currently, we have a gradually formed regulatory framework for the e-TTN system. By Resolution of the Cabinet of Ministers of Ukraine dated May 30, 2024, No. 629 [19], a two-year pilot project was launched to introduce an electronic consignment note in the field of domestic freight transportation. This act defined the e-TTN system as an information and communication system that includes a database of electronic consignment notes, data exchange software, information protection mechanisms, and interaction with electronic document management platforms. The resolution also designated the Ministry of Community and Territorial Development of Ukraine as the coordinator and holder of the system, the SE “Industrial Center for Digitalization and Cybersecurity” as its technical administrator, and Ukrtransbezpeka as the subject of e-TTN verification.

Further detailing of the system’s operation procedure was carried out by the Order of the Ministry of Development of Ukraine dated December 27, 2024 No. 1491 [20], which approved the Procedure for the operation of the electronic document flow system “electronic consignment note”. The procedure defines the rules for maintaining the e-TTN database, signing and registering electronic consignment notes, operating EDO platforms, authorizing their operators, protecting and storing information, as well as access by Ukrtransbezpeka officials through the inspector’s office. Operators of the electronic document flow platform provide users with the creation, signing, transfer and storage of e-TTN, as well as data exchange with other platforms via the system’s API.

The state component of the system consists of centralized administration, control and electronic interaction of e-TTN with other state information resources. Such interaction is carried out, in particular, through the Trembita system and involves integration with the information systems of Ukrtransbezpeka, the weighing-in-motion system, the register of consignment notes for the movement of alcoholic beverages and the electronic timber accounting system. Therefore, e-TTN is not only a digital form of a transport document, but an element of the state digital infrastructure for control and information support of domestic freight transportation.

The Resolution of the Cabinet of Ministers of Ukraine dated June 4, 2026, No. 720 [21] provided the legal prerequisites for the functioning of the system after the completion of the two-year pilot project. E-TTN ceases to be considered exclusively as a technological result of the experiment and

acquires the features of a stable state digital infrastructure for domestic freight transportation. At the same time, the system is implemented in a mixed organizational model: the Ministry of Development of Communities and Territories of Ukraine and the Ministry of Digital Transformation of Ukraine provide state coordination, the SE “Industrial Center for Digitalization and Cybersecurity” performs the functions of a technical administrator, and private operators of EDO platforms provide applied user interaction with the system.

Draft Law No. 6534 on Amendments to the Law of Ukraine “On Road Transport” dated January 21, 2022 regarding the implementation of e-TTN is important for the transition from an experimental to a legally regulated model of digital transport document flow. It proposes to establish the priority of the electronic form of the consignment note, define the e-TTN system as an information and communication system with a database and information protection mechanisms, clarify the mandatory details of the consignment note, provide for the electronic reproduction of the paper TTN in case of technical impossibility of its creation in digital form, and also give the Cabinet of Ministers of Ukraine the authority to determine the procedure for the functioning of the system and cases of use of the paper form [22]. Therefore, draft law No. 6534 has doctrinal and political and legal significance as one of the first systemic legislative models for establishing the e-TTN. Although it was withdrawn from consideration on September 5, 2023, the approaches proposed in it can be taken into account during the further improvement of transport legislation.

The digitalization of transport document flow in international and multimodal transport is more complex than in domestic road transport, as it involves the interaction of different modes of transport, transport participants, customs and control authorities, as well as the use of international transport documents. In such relations, an electronic document performs not only the function of confirming the conclusion and execution of a transport contract, but also the function of information support for customs procedures, security control, transfer of cargo between carriers and coordination of a multimodal route.

In international road transport, the legal basis for the use of an electronic consignment note is the Additional Protocol to the Convention on the Contract for the International Carriage of Goods by Road of 1956 on the Electronic Consignment Note. It recognizes the electronic consignment note as a functional equivalent of a paper CMR consignment note, provided that its authenticity, integrity and the possibility of establishing the identity of the party who made the electronic confirmation are ensured. In rail transport, digitalization is associated with the development of electronic CIM/SMGS consignment notes, which are of particular importance for transport between legal systems. Their use is aimed at eliminating duplication of documents during the transfer of cargo between different railway networks, ensuring electronic interaction with customs authorities and reducing the risks of loss or untimely transmission of transport information. In air transport, the key digital document is the electronic air waybill – e-AWB. It is used as an electronic form of the air transport contract between the consignor and the air carrier and allows you to abandon the mandatory paper registration in the presence of an agreed procedure for electronic data exchange. For sea transport, digitalization is primarily associated with the gradual transition from paper bills of lading, cargo manifests and port documents to electronic data exchange systems.

Multimodal transport combines the above types of digital documents within a single logistics chain. Its main legal problem is not so much the creation of a separate electronic document, but rather ensuring interoperability between different transport platforms, carriers, customs authorities and other entities. In this context, the EU Regulation 2020/1056 on electronic transport information is relevant, which forms the legal basis for the electronic transmission of regulatory information to competent authorities regarding road, rail, inland waterway and air transport [23].

The legal status of a multimodal transport operator requires special attention in the context of digitalization. Under modern conditions, its functional purpose is not limited to the organization of transportation using two or more modes of transport, as it increasingly ensures the integration of digital logistics services, electronic document flow, coordination of participants in multimodal transportation and the circulation of transport information. Due to the use of electronic transport documents, in particular e-CMR and e-AWB, a multimodal transport operator acquires the characteristics of a complex entity that simultaneously organizes the movement of cargo, ensures information interaction between participants in the transport process, generates or uses electronic transport data and bears the risks associated with their reliability, integrity and availability. Such transformation necessitates the

regulatory clarification of its legal status, the limits of contractual and tort liability, powers regarding the use of electronic documents, as well as obligations to protect data and ensure the continuity of digital document flow. In this context, a multimodal transport operator should be considered not only as an organizer of mixed transportation, but as an independent participant in digitalized transport and logistics legal relations, the legal status of which requires special legislative regulation [2].

The electronic consignment note is important in claims work, as it records legally significant circumstances of transportation: the composition of participants, information about the cargo, the moment of its acceptance and release, delivery conditions, as well as comments on the quantity, condition or terms of transportation. In the event of a dispute, the e-TTN, together with a qualified electronic signature, time stamps, corrective documents and electronic platform data, can confirm the fact of violation of the transportation obligation. Its evidentiary value depends on the ability to establish the origin of the document, the authority of the signatory, the integrity of electronic data and the connection of the document with a specific transportation. That is why the contract of carriage or freight forwarding should determine the procedure for electronic document flow between the parties: types of electronic documents, authorized persons, the method of their signing, the moment of receipt of the document, the procedure for making changes, as well as the actions of the parties in the event of technical unavailability of the platform. The electronic signature in this mechanism ensures the identification of the signatory, confirms his will and the integrity of the document, which allows the use of e-TTN, correction acts, time stamps and other electronic data to substantiate the claim and further judicial evidence.

Analysis of the current state of legal regulation of transport and logistics activities in the context of digitalization gives grounds to identify several interrelated regulatory and law enforcement problems:

- current legislation contains fragmentary definitions and procedural rules regarding e-TTN, but does not form a unified legislative regime for an electronic transport document suitable for all types of transportation and multimodal logistics operations;

- the legal status of such participants in digitalized transport and logistics legal relations as an operator of electronic document flow, an operator of a digital logistics platform, the limits of their responsibility and the procedure for interaction with other participants in transportation require clarification;

- the subordinate legislation provides for separate technical mechanisms for continuity of operation, in particular, data backup and recovery, but does not establish an exhaustive special regime for the civil legal consequences of the technical inaccessibility of the system, loss of access to an electronic document, errors in details, unauthorized use of an electronic signature and violation of the integrity of electronic transport data;

- insufficient consistency of national regulation with European approaches to electronic transport information and the use of e-CMR complicates the mutual recognition of electronic transport documents, cross-border data exchange and integration of Ukrainian digital transport systems with the European information environment.

In view of this, it is advisable to legislate the concept and types of electronic transport documents, define e-TTN as a full-fledged electronic transport document with a clear legal regime, which requires legislative systematization and clarification of the limits of responsibility of the EDO platform operator, technical administrator and other digital participants in the transport and logistics process. It is also necessary to detail the evidentiary value of electronic transport documents in litigation, provide for backup procedures in case of technical unavailability of the system, and ensure the compatibility of national digital solutions with European platforms.

Digital transport information concerns not only commercial document flow, but also the continuity of transportation, state control and the functioning of transport infrastructure in conditions of military risks. The legislation of Ukraine refers to transport as a critical infrastructure, and cyber protection of such systems is a component of national security. In view of this, it is advisable to establish special requirements for the protection of e-TTN databases, electronic document flow platforms and data exchange channels, in particular regarding access delimitation, backup, recording of operations, detection of cyber incidents, restoration of system operation and notification of participants in the transport process about security breaches.

6. Conclusions

The regulatory and legal regulation of transport and logistics activities in the context of digitalization has a complex and multi-level structure, which is due to the combination of contractual, information, control and procedural relations. Within its framework, it is advisable to distinguish the transport and legal block, which regulates transportation, transport forwarding, the activities of carriers and transport documents; the information and legal block, which determines the legal regime of electronic documents, electronic signature, electronic identification and electronic interaction; the civil and economic legal block, which covers contractual obligations, liability of the parties and proof; as well as the international and European block, represented by the CMR, the Additional Protocol to the CMR Convention on the electronic consignment note and EU Regulation 2020/1056.

In the digitalized transport and logistics process, it is advisable to distinguish between electronic transport documents, electronic notifications and confirmations, as well as electronic data that may acquire evidentiary value. The first group includes e-TTN, e-CMR, electronic applications for transportation and acts of correction; the second – confirmation of acceptance and release of cargo, notification of remarks, refusal or change in the conditions of transportation; the third – GPS tracks, time stamps, event logs, platforms, metadata and data of weighing systems in motion. Such a distinction is of fundamental importance for determining the legal regime of the relevant information, the procedure for its storage, authentication and use in claims work and judicial evidence. This entails the transformation of existing and the emergence of new information and organizational legal relations between the carrier, forwarder, consignor, consignee, logistics operator, operator of the electronic document management platform and regulatory authorities.

Therefore, further development of legal regulation of transport and logistics activities should be aimed not only at the spread of the electronic form of transport documents, but also at the formation of a holistic legal regime of digital transport information. Such a regime should cover the legal force and evidentiary value of electronic documents, the legal status of EDI platform operators, rules for the backup operation of the system, the allocation of responsibility for technical failures and data integrity violations, as well as cyber security requirements and technical compatibility of national digital solutions with European approaches to electronic transport information.

References

1. Derkach, E. M. (2021). Kontseptualni osnovy ekonomiko-pravovoho rehuliuвання transportnoi diialnosti [Conceptual foundations of economic and legal regulation of transport activities]. Vasyl Stus Donetsk National University. <https://lnk.ua/5PVMzCvpW> (in Ukrainian)
2. Fedeleš, E. M. (2024). Pravove rehuliuвання hospodarskoi diialnosti lohistychnykh operatoriv za natsionalnym zakonodavstvom [Legal regulation of economic activity of logistics operators under national legislation]. *Hospodarske pravo i protses – Legal Novels*, (23), 58–65. <https://doi.org/10.32782/ln.2024.23.08> (in Ukrainian)
3. Pidbereznykh, I. Ye., Ivanyshchuk, A. A., & Serdiuk, Ye. V. (2025). Administratyvno-ekonomichni zasady vantazhnykh perevezen v Ukraini [Administrative and economic principles of freight transportation in Ukraine]. *Pravova pozytsiia – Legal Position*, 2(47), 137–142. <https://doi.org/10.32782/2521-6473.2025-2.25> (in Ukrainian)
4. Pokhilenko, I. S. (2025). Pravovi rezhymy transportnoi diialnosti v umovakh voiennoho stanu [Legal regimes of transport activity under martial law]. *Aktualni pytannia u suchasni nauki – Current Issues in Modern Science*, 7(37), 531–542. [https://doi.org/10.52058/2786-6300-2025-7\(37\)-531-542](https://doi.org/10.52058/2786-6300-2025-7(37)-531-542) (in Ukrainian)
5. Petrov, V. V. (2025). Shchodo stymuliuвання lohistychnoi diialnosti v umovakh voiennoho stanu: ekonomiko-pravovyi aspekt [On stimulating logistics activity under martial law: Economic and legal aspect. Scientific Notes of Lviv University of Business and Law]. *Naukovi zapysky Lvivskoho universytetu biznesu ta prava. Serii ekonomichna. Serii yurydychna – Economic Series. Legal Series*, (47), 247–255. <https://nzlubb.org.ua/index.php/journal/article/view/1873> (in Ukrainian)
6. Lutsenko, I. S. (2021). State support of the transport and logistics system of Ukraine in the geopolitical aspect. *Pryazovskyi Economic Herald*, 1(24), 40–43. <https://doi.org/10.32840/2522-4263/2021-1-6>
7. Mashkantseva, S. O. (2019). Transport and logistics system of the region: The state and functions of functioning. *Ukrainian Journal of Applied Economics and Technology*, (3), 324–329. <https://doi.org/10.36887/2415-8453-2019-3-36>

8. Samoilenko, B. V. (2024). Institutional basis for state regulation of the logistics services market in Ukraine and its regions. *Ukrainian Journal of Applied Economics and Technology*, 9(3), 78–86. https://ujae.org.ua/wp-content/uploads/2024/09/ujae_2024_r03_a14.pdf
9. Kopylova, O. V., & Pichuhina, Yu. V. (2024). Problems and prospects for the development of transport and logistics systems of Ukraine. *Black Sea Economic Studies*, (86), 92–97. <https://doi.org/10.32782/bses.86-15>
10. Sukhetska, K. V. (2026). Main obstacles and ways of adapting the transport and logistics system during martial law. *Actual Problems of Sustainable Development*, 3(5), 216–224. [https://doi.org/10.60022/3\(5\)-26S](https://doi.org/10.60022/3(5)-26S)
11. Boiarchuk, S. Yu., & Shtohrinets, B. V. (2024). Upravlinnia lohistychnymy biznes-protsesamy v umovakh tsyfrovizatsii [Management of logistics business processes in the context of digitalization]. In *Innovative science: Searching for answers to contemporary challenges* (pp. 225–237). <https://doi.org/10.62731/mcnd-06.12.2024.004> (in Ukrainian)
12. Shepieliev, V. S., & Vdovenko, N. M. (2025). The impact of digital technologies on the organizational and economic mechanism of transport services for agricultural producers under extraordinary challenges. *Ukrainian Journal of Applied Economics and Technology*, 10(2), 209–212. <https://doi.org/10.36887/2415-8453-2025-2-41>
13. Komar, A., & Remyha, Y. (2026). Tsyfrovizatsiia upravlinskykh rishen u transportnii haluzi [Digitalization of management solutions in the transport industry]. *Upravlinnia zminamy ta innovatsii – Change Management and Innovation*, (17), 173–178. <https://doi.org/10.32782/CMI/2026-17-27> (in Ukrainian)
14. Kokhan, O. I. (2025). Mizhnarodni tendentsii tsyfrovizatsii lohistyky: rol shtuchnoho intelektu v transformatsii biznes-protsesiv [International trends in logistics digitalization: The role of artificial intelligence in the transformation of business processes]. *Efektivna ekonomika – Effective Economy*, (9). <https://doi.org/10.32702/2307-2105.2025.9.93> (in Ukrainian)
15. Verkhovna Rada of Ukraine. (2004). Law of Ukraine “On transport and forwarding activity” No. 1955-IV from 01.07.2004. <https://zakon.rada.gov.ua/laws/show/1955-15#Text> (in Ukrainian)
16. Verkhovna Rada of Ukraine. (1994). Law of Ukraine “On transport” No. 232/94-VR from 10.11.1994. <https://zakon.rada.gov.ua/laws/show/232/94-%D0%B2%D1%80#Text> (in Ukrainian)
17. Verkhovna Rada of Ukraine. (2003). Law of Ukraine “On electronic documents and electronic document flow” No. 851-IV from 22.05.2003. <https://zakon.rada.gov.ua/laws/show/851-15#Text> (in Ukrainian)
18. Verkhovna Rada of Ukraine. (2017). Law of Ukraine “On electronic identification and electronic trust services” No. 2155-VIII from 05.10.2017. <https://zakon.rada.gov.ua/laws/show/2155-19#Text> (in Ukrainian)
19. Cabinet of Ministers of Ukraine. (2024). Issues of implementation of the experimental project on introducing an electronic consignment note in domestic freight transportation (Resolution No. 629 from 30.05.2024). <https://zakon.rada.gov.ua/laws/show/629-2024-%D0%BF#Text> (in Ukrainian)
20. Ministry for Communities and Territories Development of Ukraine. (2004). On approval of the procedure for functioning of the electronic document management system “Electronic consignment note” (Order No. 1491 from 27.12.2004). <https://zakon.rada.gov.ua/laws/show/z0259-25#Text> (in Ukrainian)
21. Cabinet of Ministers of Ukraine. (2026). Certain issues of introducing an electronic consignment note in domestic freight transportation (Resolution No. 720 from 04.06.2026). <https://zakon.rada.gov.ua/laws/show/720-2026-%D0%BF#Text> (in Ukrainian)
22. Verkhovna Rada of Ukraine. (2022). Draft law on amendments to the Law of Ukraine “On road transport” regarding the introduction of an electronic consignment note No. 6534 from 20.01.2022. <https://itd.rada.gov.ua/20e1ee41-37df-42f5-90bc-24749b0994c3> (in Ukrainian)
23. European Parliament and Council of the European Union. (2020). Regulation (EU) 2020/1056 of the European Parliament and of the Council on electronic freight transport information. *Official Journal of the European Union*, L 249, 33–48. <https://eur-lex.europa.eu/eli/reg/2020/1056/oj/eng>