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INFRASTRUCTURE AND CONCEPTUAL BASIS OF TRANSPORT LOGISTICS

Metelenko N.G., Kovalenko O.V. Infrastructure and conceptual basis of transport logistics. The article, as a result of the research, raises the role of logistics in increasing the efficiency of transport use; the properties of transport in the logistics system are determined. A set of tasks related to the organization of transport movement is outlined; the advantages of combined transport; the problems of the transport sector, in particular the water transport industry, and the problems of the area of water transport and industrial enterprises of Ukraine are identified. Considerable attention is paid to intermodal logistical systems, the principles of operation of intermodal transportation systems in logistics systems, advantages, in particular, the possibility of reducing the cost of transport services, are formulated.

Key words: infrastructure, transport logistics, water transport, combined transport, transport system, port, fleet, vessel, transportation technology, intermodal system, logistics costs.

Метеленко Н.Г., Коваленко О.В. Інфраструктура та концептуальні основи транспортної логістики. У статті в результаті проведеного дослідження обґрунтовано роль логістики у підвищенні ефективності використання транспорту; визначено властивості транспорту в логістичній системі. Окреслено комплекс завдань, пов'язаних з організацією переміщення транспортом; переваги комбінованих перевезень; проблеми транспортної галузі, зокрема галузі водного транспорту, та виявлено ідентичність проблем галузі водного транспорту та підприємств промисловості України. Значна увага приділена інтермодальним логістичним системам, сформульовано принципи функціонування інтермодальних систем перевезення в логістичних системах, переваги, зокрема можливість зниження собівартості транспортних послуг.

Ключові слова: інфраструктура, транспортна логістика, водний транспорт, комбіновані перевезення, транспортна система, порт, флот, судно, технології перевезення, інтермодальна система, логістичні витрати.

Метеленко Н.Г., Коваленко А.В. Инфраструктура и концептуальные основы транспортной логистики. В статье, в результате проведенного исследования, обоснована роль логистики в повышении эффективности использования транспорта; определены свойства транспорта в логистической системе. Определен комплекс задач, связанный с организацией перемещения транспортом; преимущества комбинированных перевозок; проблемы транспортной отрасли, в частности отрасли водного транспорта, и выявлены идентичность проблем отрасли водного транспорта и предприятий промышленности Украины. Значительное внимание уделено интермодальным логистическим системам, сформулированы принципы функционирования интермодальных систем перевозки в логистических системах, преимущества, возможность снижения себестоимости транспортных услуг.

Ключевые слова: инфраструктура, транспортная логистика, водный транспорт, комбинированные перевозки, транспортная система, порт, флот, судно, технологии перевозки, интермодальная система, логистические расходы.

Formulation of the problem in general and its connection with important scientific or practical tasks. The integration processes taking place in the Ukrainian economy, the development of the world economy, help to increase the volumes of cargo flows, that is, transport is the most important element of the system of movement of goods (cargo). Transport is characterized by a multitude of interconnected parameters, taking into account the peculiarities of which is a prerequisite for the effective use of all modes of transport (rail, sea, inland water-

way (river), automobile, air, pipeline). Today's market infrastructure is a complex and changing system in which new organizations are created; in connection with integration processes, the European Trade Community develops new organizational and legal forms of organizations, expands the list and volume of services, changes the technology of service between the partners, continues to search for new forms and methods of work, improve the material and technical base and staff qualifications, form the updated relations with the state and other market

participants. That is, new requirements are put forward to the transport industry, and the destroyed system of allocation and division of productive forces does not allow forming the appropriate economic relations in full.

Thus, an important element of stabilization and creation of the updated economic system is the establishment and optimization of restored economic ties, in particular, rational transport routes, in order to optimize transportation costs, which in recent years have cost more than 50% (this applies, in particular, to individual extractive industries), therefore the urgency of the introduction of logistics in the transportation processes is obvious.

The purpose of the article is to study the infrastructure and conceptual foundations of transport logistics in the context of finding technologies to increase the efficiency of the use of the transport system in Ukraine.

Analysis of recent research and publications.

The world economic community is gradually formed as a holistic economic system, the establishment and optimization of economic ties, which it is expedient to implement with the help of logistics technologies. Studying the theoretical and practical aspects of logistics, in particular transport, were given much attention by foreign and domestic scientists, such as A.I. Semenko, V.A. Shumaiev, V.V. Dybs'ka, O.O. Karpenko, O.Ye. Babina, K.M. Tan'kov, O.M. Trydid and others. But the change in market infrastructure, economic, politics and the financial crisis in Ukraine caused a number of negative phenomena, the impact of which has contributed to the breach of economic ties, which requires new scientific developments both in theory and in the methodology of logistics.

Presentation of the main research material. Logistics of modern economic systems is aimed at creating perfect industrial-commercial systems and industrial relations. In different models of the economy (depending on the degree of monopolization, the conditions of competition, the share of the public sector), there are various objective preconditions (factors) of expediency (necessity) and the effectiveness of the application of the logistic approach as a method of organizational and analytical optimization of production and commercial activity [1, p. 54]. The effectiveness of the «market economy» is associated with the degree of concentration of production, its functioning is always characterized by the organic interaction of the centralized and decentralized components of the organization of economic processes; the relationship between suppliers and consumers is increasing; the importance of completeness and timeliness of information about the results of the work of adjacent systems for the normal functioning of each enterprise increases. Logistics management is based on choosing the best solution from several possible ones.

Transport is a sphere of material production, the main tasks of which are the connection into a single technological process of various industries, as well as ensuring the full satisfaction of the needs of the population in transportation.

To the attributes of transport in the logistics system should be included the following: it is a mandatory component of the functional areas of logistics, namely procurement, production, distribution; transport is the branch of economy, in which, along with all others, entrepreneurial activity (transport services), which receives income and aims to receive profit, develops. The features of this industry impose their imprint on the structure and operation of the logistics system of transport logistics. Transport logistics solves a complex of tasks associated with the organization of the transfer of public transport, the main of which is the choice of type and type of transport event; optimization of the transport process from the time of mixed transport; definition of rational delivery routes; ensuring the technological unity of the transport and warehouse process and coordinating the transport and production process.

The processes of integration with the global economic system require the integration of the domestic trade and transport complex into a single international logistics network with the relevant legislative and informational areas. Particular attention is needed to combined transport, which takes into account the advantages and disadvantages of transport infrastructure. Thus, it is advisable to include as advantages of combined transport the following [2, p. 132]:

- economy and rational use of fuel and energy resources (rail and inland water transport are of high fertilization capacity under substantially lower fuel consumption compared to other modes of transport, primarily with motor vehicles);
- better conditions for the use of vehicles and national transport infrastructure, more effective control over the transport network and the use of new transport technologies;
- promotion of export competitiveness and expansion of foreign trade;
- simplification of customs procedures, shortening of time for execution of documents and fulfillment of other formalities;
- creation of conditions for leaving the country a greater share of freight payments by, in particular, expanding participation in operations of national insurance companies, reducing the amount of insurance premiums, etc.

Uniform transport system of Ukraine, according to the Law of Ukraine «On Transport» consists of [3]: public transport (rail, sea, river, automobile and aviation, as well as urban electric transport, including subway); industrial rail transport; departmental transport; pipeline transport; public lines of communication. Art. 21 of the Law of Ukraine «On Transport» states that the Uniform Transport System of Ukraine must meet the requirements of social production and national security, have a ramified infrastructure for providing the whole complex of transport services, including for warehousing and technological preparation of cargoes for transportation, to provide foreign economic relations of Ukraine.

The main problems of the transport industry, in particular, the area of water transport, are as follows [4]:

- inconsistency of the level of development of ports, efficiency and quality of management and functioning of modern international requirements, to demand for their services;

- low rates of fleet renewal and maritime infrastructure. This has resulted in aging of fixed assets, the average age of domestic vehicles is over 20 years that does not allow many ships to go to foreign ports;

- domestic shipbuilding works predominantly for export deliveries, when foreign customers are instructed by the factories to carry out only environmentally-dirty and metal-intensive operations. Equipment for these ships is installed, as a rule, by the customers themselves, since they do not produce it in Ukraine, and import is subject to high duty rates. At the same time, orders for the construction of vessels for domestic carriers (users) are practically not received;

- only 5-7% of the cargo processed in the sea commercial ports (SCP) or berths is transported by domestic vessels. According to technical and technological data, seaports with their infrastructure can potentially convert up to 160 million tons of cargo per year, but this potential is actually used no more than 50-60%, including due to lack of own fleet;

- The level of effectiveness of the management of SCP activities (all of them state-owned enterprises) does not meet current international requirements and demand for port services. The rates of renewal of fixed assets of SCP due to both their own and borrowed funds are too low;

- unsatisfactory technical characteristics of the ports: the depth of the approach channels and water areas, the technical state of the berths, loading and unloading mechanisms, automation and computerization systems remain at the level of 90-ies of the last century;

- problems of improving and accelerating the movement of containers through SCP are slowly solved. Unresolved issues are the development of customs posts by modern control and diagnostic equipment, the problems of controlling containers in accordance with established international norms are not regulated;

- imperfection of customs legislation, which needs to be reformed taking into account international standards.

Summarizing the above-mentioned problems, one can state that the problems of the water transport sector of Ukraine in most cases coincide with the problems of the industrial enterprises due to the presence of sufficiently «heavy» fixed assets on both sides that require upgrading and more than 70% worn out. The poor technical and technological condition of fixed assets and the lack of sufficient amount of own financial resources slow down the development of the water sector, in particular, the marine environment. Under such conditions, in particular, for water transport it is rational to use various combined transportations. Taking into account the advantages and disadvantages of each mode

of transport, in such conditions, it allows to level off the negative tendencies of the quality of vehicles.

Research of international experience of modern transportation technologies [5, c. 520] indicates the use of such basic methods of transportation under the criterion of «type of carrier's liability»: unimodal, mixed, combined, intermodal, terminal, multimodal, etc., each of which in the logistics procedure is chosen their criteria and restrictions in the organization of transportation. So, the practice of international transportation of intermodal transportation is the movement of goods using various types of transport; the customer works with one company, while multimodal delivery uses 2-3 types of transport: rail, road and river (marine). The undoubted advantage of this method is cooperation with one person (agent). A transport company engaged in cargo transportation undertakes to organize all loading and unloading operations, is responsible for the storage and storage of goods, and also organizes transshipment points. That is, this method of transportation is aimed at unification of the transaction units of physical distribution in the part of transportation; simplification of customs formalities; introduction of standard commercial cargo and transport documents of international standard.

In general, in the modern market economy, the creation of various types of integrated structures, the construction of integrated processes is one of the factors of adaptation of enterprises to market conditions on the path to increasing competitiveness through the cooperation of labor and concentration of the advantages of the potential of each of the enterprises (processes) in order to achieve strategic business goals.

The main principles of the operation of intermodal transportation systems in logistics systems are as follows:

- uniformed commercial-legal regime;
- an integrated approach to solving financial and economic issues of transportation organization;
- maximum use of telecommunication networks and electronic document management systems;
- uniformed organizational and technological principle of transportation management and coordination of actions of all logistic intermediaries involved in transportation;
- cooperation of logistic intermediaries;
- complex development of infrastructure of transportation by various types of transport.

It is clear that one of the reasons for the distribution of intermodal transportation systems in logistics is a significant reduction in the cost of combined use of several types of transport. Today, the reduction of the cost of transport services is a priority task on the path of rationalizing transport services and optimizing transport costs. As to the factors that impede the development of intermodal transportation systems, many customs formalities remain as barriers that cause unplanned simple, additional costs, and so on. Problems of registration of transport documents and customs formalities can be solved by introducing modern infor-

mation systems. The creation and development of comprehensive databases, systems and standards at the international level would allow the creation of transport corridors that are linked by a single information space. Thus, the reduction of logistics costs in the implementation of intermodal transport through seaports is due to the following factors:

- closer interaction with the customs will lead to a reduction in unproductive downtime of the fleet due to customs clearance, primarily due to the preliminary declaration of import cargo;

- reconciliation of working hours of port works and customs work;

- For the sea port, the acceleration of export-import and transit cargo will contribute to reducing the demand for storage facilities and will increase the throughput capacity of transshipping complexes.

Logistic processes involving material and information processes, individual elements of financial processes, lead to the emergence of costs that in economic practice are not always identified with costs in the narrow sense of the concept. However, they have an impact on the overall performance of the enterprise due to their impact on financial performance. The following groups of economic decisions related to logistics that affect the financial performance of the enterprise could be allocated:

- use of labor, tools and labor, third-party services related to the implementation of logistics processes;

- real estate taxes and vehicles; payments for the use of natural resources; interest expense for using borrowed funds;

- penalties for non-fulfillment of parameters of logistic processes; losses and losses of capital, etc.

For efficient management of logistics costs, it is necessary to allocate them according to different groups and to classify by type and quantity, caused by the following prerequisites: high specific gravity in total expenses of the enterprise; variation of quantitative measurement of expenses in different periods of time; distribution of responsibility for costs between the plurality of organizational units from which the organizational system is built; complexity of measures related to the definition of their total volume. With regard to the transport sector, the use of management accounting technologies in managing logistics costs is particularly relevant, namely the use of such combined features as a phase decomposition as a sign of the separation of logistics costs; place of cost; relation to financial results when making specific logistic decisions.

Conclusions. Thus, based on the logistics strategy and realizing that the transport company is a production enterprise, in the transport material flows chain, a new logistics strategy for transport production should be an integral part of the hierarchy of the overall strategy of the enterprise, focused on logistics and the use of transport services. In order to increase the efficiency of the use of transport, the infrastructure of Ukraine's transport, in particular water, requires the renewal of fixed assets (movable and immovable property) by investing or providing long-term preferential loans to transport enterprises, developing state support programs, simplifying customs procedures and developing loyal tax policies. Logistics technologies and the direction for cooperation with the EU are the key to effective changes in the management of Ukraine's transport infrastructure.

References:

1. Semenenko, A.Y. Serheev, V.Y. (2003), *Logistika. Osnovy teorii [Logistics. Fundamentals of Theory]*, Soyuz, SpB, Russian Federation.
2. Shumaev, V.A. (2001), *Logistika tovarodvizhenija [Logistics of goods movement]*, «Izdatel'skij dom «NOVYJ VEK», Moscow, Russian Federation.
3. The Verkhovna Rada of Ukraine (1994), *The Law of Ukraine "On Transport"*, available at: <http://zakon3.rada.gov.ua/laws/show/232/94-%D0%B2%D1%80>. (Accessed 17 June 2018).
4. Karpenko, O. O. Babyna, O. Ye. (2012) *Directions of the state policy in the transport industry of Ukraine*, *Analitichno-informatsijnyj zhurnal «Skhid»*, vol 1 (115), pp. 7-12.
5. Dybskaja, V.V. Zajcev, E.I. Sergeev, V.I. Sterligova. A.N. (2008), *Logistika [Logistics]*, Eksmo, Moscow, Russian Federation.