Sviatlana Kuhan

заместитель декана экономического факультета УО «Брестский государственный технический университет», к.э.н., доцент, доцент кафедры менеджмента

LOGISTIC INFRASTRUCTURE AND ITS ROLE IN ECONOMIC SECURITY OF REGIONS

INFRASTRUKTURA LOGISTYCZNA I JEJ ROLA W BEZPIECZEŃSTWIE GOSPODARCZYM REGIONÓW

ЛОГИСТИЧЕСКАЯ ИНФРАСТРУКТУРА И ЕЕ РОЛЬ В ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ РЕГИОНОВ

Introduction

Effective operation of the logistics infrastructure is a prerequisite for the further development of the regional and, as a result, the national economy, its transition to an innovative development path. Often, the prospects for the development of the territories largely depend on the state of the logistics infrastructure of the regions. At the same time, the infrastructure forms an aggregate of production and non-production branches and facilities that constitute the material and technical basis for the formation and development of clusters, in particular, logistics, research and production complexes, free economic zones and other forms of spatial organization of the region's economies. The most important elements of the regional infrastructure are automobile and railway transport, which provide republican and international communications of the territories of the region.

Being one of the key factors in the implementation of interregional relations, the logistics infrastructure actively influences the growth of economic and social indicators of the regions of the republic. The sustainable functioning of transport and logistics enterprises guarantees the unification of the economic space where the movement of people, goods and services is free and rhythmic. In addition, free

competition, integration into the world community through the implementation of logistics processes, as a rule, improves the conditions and living standards of the population, while ensuring integrity and national security.

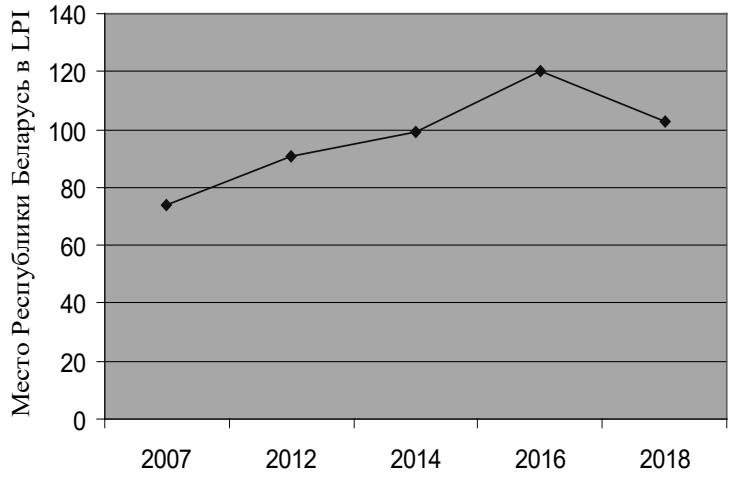
The World Bank's research shows the disappointing results of the Logistics Performance Index (LPI) of the Republic of Belarus. In the overall rating, the Republic of Belarus ranks 110th (out of 168 possible) with a score of 2.57. The data on individual indicators of RB in LPI for 2007–2018 are presented in table 1.

Table 1. Dynamics of the ranking of the Republic of Belarus in the logistics efficiency index and its performance in 2007–2018 [1].

Identifiers	2007	2012	2014	2016	2018
LPI index	2,53	2,61	2,64	2,40	2,57
Place of the Republic of Belarus	74	91	99	120	103
Customs	2,24	2,67	2,50	2,06	2,35
Place of the Republic of Belarus	121	50	87	136	112
Infrastructure	2,63	2,78	2,55	2,10	2,44
Place of the Republic of Belarus	54	65	86	135	92
International shipment	2,13	2,58	2,74	2,62	2,31
Place of the Republic of Belarus	126	107	91	92	134
Logistics competence	2,13	2,65	2,46	2,32	2,64
Place of the Republic of Belarus	120	89	116	125	85
Tracking & tracing	2,71	2,58	2,51	2,16	2,54
Place of the Republic of Belarus	66	98	113	134	109
Timeliness	3,00	2,87	3,05	2,04	3,18
Place of the Republic of Belarus	78	114	93	96	78

For the period from 2007–2018 the Republic of Belarus both increased and reduced its positions in the ranking (picture 1). During this period, the best indicator is the level of 2007.

In subsequent years, there is a drop in the rating, which in the context of the globalization of the world economy, the expansion of international cooperation can lead to very significant negative consequences and requires the immediate development and implementation of a national strategy for integrated development of both the logistics and its infrastructure.



Picture 1. The place of the Republic of Belarus in the LPI rating in 2007–2018

After analyzing the main indicators of LPI, we can conclude that there are certain positive trends in the problematic positions traditional for the republic: in the processes of customs clearance, the quality of trade and transport infrastructure, the quality of logistics services and the ability to track cargo. These indicators in the preceding 2018 periods had a pronounced negative trend.

Against the background of a general positive trend, the indicator of simplicity and availability of international supplies is still a problem area, which is associated with the weak participation of the Republic of Belarus in the process of forming the pan-European distribution system, which includes several supporting European logistics centers and regional logistics and distribution centers interacting with them.

More active participation in the international distribution system would accelerate the promotion of commodity flows throughout the republic, ensuring the continuity of the distribution process. Taking into account the fact that with the development of the trans-European network of logistics centers and the expansion of international routes of product movement, projects are being developed related to the European logistics system, participation in them will allow the Republic of Belarus not only to reduce the cost of export and import deliveries, but also to reduce the cost of implementing customs procedures, reducing transport downtime at border crossings, as well as reducing stocks in transit and in enterprises. In this connection, it seems necessary to analyze cargo traffic and the distribution of productive forces, which will determine the problem areas in terms of ease of organization and competitiveness of international transport, as well as possible regions to accommodate large logistics infrastructure complexes.

Such a low rating in the current conditions of expanding international cooperation can lead to very significant negative consequences and requires the immediate

development and implementation of a national strategy for integrated development, both logistics itself and its infrastructure.

To characterize the concept of "logistics infrastructure", it is necessary to systematize approaches to its definition, considering the author's interpretations of scientific researchers in this field. In the scientific literature, we have identified the following approaches:

1) Logistics infrastructure as a system category. E.V. Krikavsky believes that the logistics infrastructure "is a set of elements that fulfill important tasks that are an integral part of logistics processes." Considering the infrastructure as an integral management system, it represents it as a set of buildings, structures with the equipment required for the implementation of functional actions for storing products. And also transport and handling equipment, means of packaging, methods of obtaining, as well as collection, processing and transmission of information [2]. In addition, E.V. Krikavsky and N.V. Chernokiska defines the logistics infrastructure as a system of means for spatio-temporal transformation of logistical flows, as well as a set of enterprises of different organizational and legal forms that create the organizational and economic conditions for the passage of these flows by building the potential of appropriate logistics services [3].
2) Functional approach. In the framework of this approach, V.V. Klimenko, characterizes the logistics infrastructure as a set of types of activities through which the process of movement of material and financial flows or the process of movement of goods is carried out and maintained [4]. Separating the position of the functional approach, V.S. Kolodin represents the logistics infrastructure as a set of functions, forms, methods and means of all subjects of the logistics process that participate in the organization of goods flow. In his opinion, such an infrastructure is the only whole and includes elements of organizational, information, communication support of the regional large-scale economic system [5].
3) Elemental approach. Sharing the position of this approach, L.L. Kovalska represents the logistics infrastructure as a complex of objects that have a certain geographical location and different characteristics [6]. Bauerox Donald J. refers to manufacturing facilities, facilities, handling terminals and retail stores, including all logistical functions within their competence [7].

S.A. Taran claims that all the infrastructure in this area can be divided into two groups:

- material objects of the logistics infrastructure: structures, production, transport facilities;
- common for all objects transport function – transportation [8].

N.G. Kuvayev in the logistics infrastructure allocates transport, warehousing and maintenance elements, which are associated with additional processing of goods, with the provision of trade, household and administrative servants who are provided with the necessary resources - natural, material, technical, information, human, institutional and financial [9]. M.M. Kuznetsov considers the logistics

infrastructure as a set of elements that take part in the movement of the material flow from the producer to the consumer. It can be: an organizational base, which consists of supply-marketing, brokerage, and other intermediary organizations; The material base consists of transport systems, warehousing and tare economy, information system and communication facilities; credit and settlement base in the banking and structural institutions [10].

In the framework of the elemental approach, V.I. Sergeyev outlines the following sections of the logistics infrastructure:

- warehousing (compositions of different types and purposes, terminals and terminal complexes);
- transport units of different types of transport;
- transport communications (roads and railways, access roads, etc.);
- repair and support units that serve the transport and storage facilities;
- telecommunication system;
- computer information system [11].

The above set of approaches and definitions allows us to note the fact that the logistics infrastructure has its own characteristics that affect its formation and functioning. The conducted researches allow to group opinions of the authors presented above concerning the composition of the logistics infrastructure:

The first group is logistic parks or centers. The so-called "objects of local importance" associated with the management of commodity flows of individual firms and their networked associations. The second group is regional logistics centers. They represent an extended range of logistics services on the territory with a well-developed transport infrastructure. Using the great opportunities of the information system create conditions for more efficient management of incoming and outgoing streams of various types of products in the national and regional markets.

The third group is international logistics centers. Being concentrated on a relatively large area of complex infrastructure facilities and being built in close proximity to important facilities of transport infrastructure, they carry out the necessary coordination with the aim of qualitatively performing a full range of logistics services. Using modern information and communication technologies, they significantly reduce the time for selling products throughout the supply chain and attracting transit commodity flows across the country.

The composition of typical objects of the logistics infrastructure can vary in a fairly wide range. These can be warehouses of manufacturing companies, logistics centers, various terminals or distribution centers. Determination of the required number of objects of each type, their location and economic functions is an essential element of all activities for the formation (design) of the logistics infrastructure of any company.

Logistics centers provide a wide range of additional non-transport and non-transport services to all participants of logistics activities. In conditions of dynamic competitive environment, the important issue remains the possibility of changing the

logistics infrastructure for production needs and demand. Choosing the best location for the logistics network can be the first step for the company to gain competitive advantages. Given the parameters of the infrastructure network and the information capacity of the logistics system, the geographical location of the enterprise's reserves is determined by its transport capabilities. In our opinion, due to the fact that transportation and the obvious costs associated with it are at the heart of any field of activity, they are of great importance. The very process of transport of goods can be organized in accordance with the capabilities of the company. It can be own transport or outsourcing of transport services. Involvement of a third-party organization specializing in the provision of transportation services will reduce the costs associated with maintaining its own transport. An interesting variant of combining different modes of transportation, which provide a combination of transport services (multimodal, intermodal and combined schemes), which allows you to meet the individual needs of customers.

Another important task of the logistics infrastructure management process is inventory management. The presence of own warehouses for many enterprises is not only a high risk, but also a fairly high cost. Therefore, many enterprises are moving along the path of reducing total costs, providing the desired level of service with a minimum amount of reserves.

The logistics strategy is aimed at reducing the amount of monetary assets "frozen" in stocks. Because the turnover of stocks in the process of realizing the requirements of the consumer market has been and remains an important task of management. The inventory management policy should consider:

1) segmentation of the consumer market;
2) the need for an assortment of products;
3) the possibility of combined schemes of cargo transportation;
4) the influence of competitors;
5) seasonality.

When creating a logistics system based on four main components: the organization of the logistics infrastructure, information exchange, transportation and inventory management, we can use a variety of ways. Each of them potentially will allow to reach a certain level of service to consumers with corresponding common costs. In essence, these functions combine to form an integrated logistics solution system. Other activities within the logistics infrastructure - warehousing, cargo handling and packaging are also part of the logistics system, but are not fundamental. Their effective integration into the logistics system of the enterprise will significantly accelerate and facilitate the movement of commodity-material flows.

Often, the operation of the warehouse is associated with a certain specialization, which is reflected both in the functions and tasks of the warehouse. In this case, as V.V. Dybskaya, "the nature of the functional area of the logistics system influences the solution of the warehousing logistics tasks: the choice of the warehouse's form of

ownership, the location of the warehouse network, the technical equipment of the warehouse, the storage system and the organization of the warehouse process" [12].

An assessment of the current state and trends in the development of the domestic business sphere shows that the Republic of Belarus needs to speed up the creation of a basic transport network, the basis of which should be logistics centers with an infrastructure that meets the modern economic formats, which makes it possible to rationally apply the logistics tools of the organization of commodity circulation. The presence of such infrastructure increases the economic activity and economic security of the regions, and also positively affects the cost of transportation services.

According to experts' estimates, by the end of 2018 the area of warehouses of class "A", "B" of logistics centers will increase by 40 thousand m^2 and will amount to more than 710 thousand m^2. It is planned to further increase the warehouse space and achieve by 2020 about 900 thousand m^2.

Despite the fact that the complexity and quality of logistics services remains low, tariffs for these services provided by logistics centers and logistics operators remain higher than those of neighboring countries.

The Republic of Belarus occupies a special geographical and geopolitical position, which predetermines the widespread use of transport communications for the transit of goods along the shortest route with the minimum number of crossings of the state border. This allows you to significantly reduce the risk of transit of goods, both in the European part of the continent, and in the CIS countries and abroad. Located in the center of the European continent, the republic has become a link between the countries of Europe and Asia and ensures unimpeded movement of freight traffic along the main transport corridors passing through its territory.

In the conditions of globalization of economy, creations of large multinational corporations and integration of transport of row of the states the intensive process of forming of international transport corridors providing speed-up advancement of large товароматериальных streams between different countries and continents on the basis of introduction of modern logistic technologies of delivery of loads goes to a world transport system.

In accordance with the definition of the expert group of the UNECE Transport Committee, the International Transport Corridor (ITC) is understood as "part of the national or international transport system that provides significant international freight and passenger traffic between individual countries and continents, including rolling stock and fixed installations of all types of transport operating in this direction, as well as a set of technological, organizational and legal conditions for the implementation of these transport" [13, p.210]. In most studies, international transport corridors (ITC) are interpreted as a set of main communications. It does not take into account that their functional structure includes terminals, warehouses and international transport and logistics centers (ITLC), as well as the type of traffic along transport corridors.

In [14, p. 10], the above disadvantages are already taken into account, and the notion of ITC is considered as a set of multifunctional linear and nodal objects of the transport and logistics infrastructure (transport routes, vehicles, navigation and telecommunications equipment) located in two or more countries used for intermodal or unmodal transport of goods circulating in international trade.

The purpose of the formation and development of the ITC on the territory of the Republic of Belarus is:

- providing conditions for improving the reliability and efficiency of foreign trade;
- involvement of additional transit cargo flows on the country's transport communications;
- attracting domestic and foreign investment in the development of transport infrastructure;
- creation of conditions for accelerating the development of the regions of the country located in the zone of the ITC.

To assess the transit potential, it is necessary to turn to the essence of the notion "transit potential", as well as to the factors that influence it. From an economic point of view, the transit potential consists of two components. On the one hand, this is the cumulative ability of all types of transport to ensure efficient maintenance of international cargo flows, and on the other, it is the possible volume of demand from foreign shippers for the transportation of goods across the country. Thus, in order to assess the transit potential of the country and its regions, it is first necessary to estimate the volume of goods that can be transported via the ITC taking into account the ability of two types of transport – road and rail – that serve these corridors.

Consider external and internal factors that positively or negatively affect the transit potential. Of the external factors, the first is the geo-economic group. It includes general trends in the development and interaction of international economic systems, an advantageous geographical position, the presence of capacious developing markets in neighboring countries, the position and role of a country in the international economic community, the territorial and specific structure of international transport, the degree of integration of the national transport system into the international transport system. For transport corridors of the Republic of Belarus, first of all, it is necessary to consider tendencies of interaction with such countries as Russia, China, Poland, Germany and other EU countries.

Studying the issue of reducing the volume of international transit traffic made it possible to formulate the following geopolitical factors that have a negative impact on the transportation of this type:

1. The operation of the licensing system of international road transport between the countries of the Eurasian Economic Union, which quotes the number of traffic (including transit) by national carriers on the territory of a third country. Structural analysis of transit through the territory of the republic is represented

by the following ratio: Russian carriers - more than 50%, Polish – about 23%, Belarusian 0 14%, other – 13%.

2. The principle of residence prevents the free movement of goods across the territory of the Eurasian Economic Union. The essence of the principle is that the declarant has the right to submit a goods declaration to the customs authorities only of the country of which he is a resident. At the moment, it is becoming necessary to conclude an international agreement that allows the submission of a customs declaration to any customs body of the Eurasian Economic Union, but the abolition of the "residency principle" will entail the unification of very many related legal norms, to which the countries - participants of the Eurasian Economic Union are not yet ready.
3. Bilateral approvals. A new barrier appearing at transportations of loads transit through territory of Republic of Belarus in Russian Federation and further in the third countries, - it the positions contained in the norms of the Russian legislation in relation to prohibition of import of certain bill of goods. Transit of approval commodities through territory of Russian Federation in the third countries is possible only through the Russian area of border of Eurasian Economic Union (in the indicated railway and motor-car points of admission). Thus, motor-car ferrymen from Republic of Belarus lost possibility to move this category (approval) of commodities transit through territory of Russian Federation.

Most ponder able, from the point of view of influence on the state of transit transportations a sub-group in the internal group of factors, there is an economic and legal group. Her negative influence can be presented in a next kind:

1. Delays on a border. The average daily run of freight transport in EU makes 700 km, in Belarus are a 275 km Simple transport mainly consists of time of crossing of border, registration on a border, passing of control, registration of transit procedures and т. of д. One of material points that accelerate crossing of borders is the use of the system of electronic advance notice customs that began to be used on the Belarusians custom transitions.
2. Aspects of tax law of countries - participants of Eurasian Economic Union. On this stage possibility of unitization of rate of tax is examined value-added and declines of the tax loading on the certain list of legal entities (authorized economic operators, proprietors of custom storages and storages of temporal storage et al).

The geographical location of country stipulated percent correlation of export of services, where 52% is on a transport, other in greater part it is computer service and high-tech business.

According to statistical data of the National bank, in 2016 Belarus increased the export of services as compared to 2015 on 2,2%. Volume of foreign trade by services the turn of services on results a year made 11,016 milliards of dollars (100% to the level of previous year).

Exports of services amounted to 6.779 billion US dollars (102.2%), imports - 4.236 billion dollars (96.8%). The main partners of Belarus in trade in services

are Russia (about 43% of exports, 38% of imports) and the EU (30% of exports, 35% of imports).

According to customs statistics in the Republic of Belarus, the volume of foreign trade in goods (foreign trade turnover) in January-December 2017 amounted to $ 63.2 billion, which is 23.9% more than in January-December 2016. Trade with the CIS countries amounted to $ 38.3 billion (60.7% of the total trade) and increased by 23.5%. Trade with non-CIS countries increased by 24.4% and amounted to US $ 24.8 billion [15].

Belarus maintains trade relations with more than 200 countries of the world. The most important export positions are oil and refined products, potash and nitrogen fertilizers, metal products, trucks and cars, tractors, tires, dairy and meat products, and furniture.

In an import a most place is occupied by энергоресурсы (oil and natural gas), raw material, properties and complete (metals and wares from them, raw material for a chemical production, parts of machines), technological equipment.

A basic trade partner of Belarus is Russia, there was 39,2% of the belarusians export and about 59,2% import on her stake. The second place in commodity turnover occupies the European union on the stake of that there is 34,4% of the belarusians export and almost fifth of import. Exports to all Eurasian Economic Union member countries increased: to Kyrgyzstan – 2 times, to Kazakhstan – by 58%, to Armenia – by 64%, to Russia – by 10.2%.

Belarus has a favorable economic and geographical position, being in the center of Europe at the crossroads of the most important trade and communication systems between the economically developed Western European countries and the regions of Eurasia that possess the richest natural resources.

Belarus is located at the crossroads of trans-European transport corridors:

1. No. 2 – West-East direction (Berlin – Warsaw – Brest – Minsk – Moscow – Nizhny Novgorod);
2. No. 9 – North-South direction (Helsinki – St. Petersburg – Vitebsk – Mogilev – Gomel – Kiev – Chisinau – Bucharest – Dmitrovgrad – Alexandroupolis (Greece);
3. The branch of corridor No. 9 B is the direction Gomel – Zhlobin – Minsk – Molodechno – Vilnius – Kaunas – Klaipeda / Kaliningrad.

Of great importance are transport routes that ensure the international relations of Belarus with Poland, Ukraine, the Baltic states, and regions of Russia.

The logistic potential and the potential of services inherent in this area is of great importance for the transport and logistics sector, but due to the underdeveloped and under-utilized infrastructure, it still remains largely untapped.

Trans-European and international transport routes are complemented by national and regional transport communications connecting the network of urban and rural settlements of the country and ensuring their foreign economic relations.

In world practice, there is a steady trend towards the improvement of freight transport technology associated with the concentration of traffic and container traffic

along intermodal transport corridors, which should become the basis of a single global transport network of the 21st century, the creation and operation of which is one of the main objectives of the Eurasian transport policy. In Western and Central Europe, where communications are more developed than in East Asia, the formation of a basic system of transport corridors has already been largely completed.

The Republic of Belarus needs to expand mutually beneficial cooperation with all neighboring and other countries, taking into account its national interests, especially in solving common regional socio-economic and environmental problems that are important for the transition to sustainable development. The territory of Belarus is a watershed for the basins of the Baltic and Black Seas. The richness of natural diversity, the presence of numerous lakes and preserved wetlands determine the importance of Belarus as an integral part of the ecological network of Europe.

In addition, the border areas are far from fully using existing competitive advantages. Cross-border cooperation should turn into a real factor of the dynamic and natural inclusion of Belarus into the world economy. Moreover, the external relations of the regions in the medium term should be transferred to the category of fundamentally important components of the economic security of the Belarusian state, an integral component of the implementation of the foreign policy and foreign economic interests of the latter. At the same time, the problems that significantly reduce the effectiveness of cross-border cooperation at the local level can be attributed to the limited channels of information on the practice of interregional cooperation, as well as the lack of significant amounts of funds for co-financing cross-border projects provoked by the crisis.

Therefore, the efficiency and quality of the entire transport process, its safety, to a large extent depends not only on the consignor and carrier, but also on a number of intermediaries involved in international transport. Such intermediaries in international transport operations are specialized enterprises, firms, associations that perform various functions on behalf of the owner of the cargo during its movement from the moment the goods are prepared for transportation until they are handed over to the consumer.

The pace of development of industrial and agricultural production, significant volumes of capital construction, increased trade increased the role of intercity freight traffic in the region. Road transport in this type of transportation has several advantages compared with other types of transport: speeding up the delivery of goods, reducing the number of transshipments, and increasing the degree of cargo safety.

Increasing volumes of long-distance traffic have led to the need to organize them according to a principle that would ensure the acceleration of cargo delivery and safety, the best service to shippers-consignees taking into account their modes of acceptance and delivery of goods and highly efficient use of rolling stock.

The most important indicator of the integration of the transport system of the Republic of Belarus is the rational use of existing transport networks, the realization of the advantages of their geographical location and communication

capacity, which provides the shortest way for European countries with the Eastern and Asian continents.

But in order for the transport systems of Belarus as quickly as possible transformed into world-class transport systems, it is necessary to carry out a comprehensive modernization of the entire transport industry. The basis of modernization should be based on the principle of building a rational transport complex using modern knowledge, anticipating the implementation of comprehensive basic research aimed at solving the primary problems of the formation of a national transport complex.

Conclusions

The main reason for the decline in production and trade efficiency, low competitiveness of enterprises and organizations of the country is a high level of logistics costs. Activities within the framework of the Republican Program for the Development of the Logistics System and Transit Potential for 2016-2020 should help to reduce the level of logistics costs, increase the rating of Belarus in the Logistics Performance Index (LPI), and develop transit potential.

Summary

The logistics infrastructure actively influences the growth of economic and social indicators of the regions of the republic. The effectiveness of efforts to ensure economic security and competitiveness of the regions depends critically on the rationality and coherence of the organizational and economic regulators used by the direct subjects of transport and forwarding services, as well as by the bodies of the republican and regional government.

Key words: logistic infrastructure, logistics system, regions, warehouses.

Streszczenie

Infrastruktura logistyczna aktywnie wpływa na wzrost wskaźników ekonomicznych i społecznych w regionach republiki. Skuteczność wysiłków zmierzających do zapewnienia bezpieczeństwa ekonomicznego i konkurencyjności regionów zależy w sposób krytyczny od racjonalności i spójności regulatorów organizacyjnych i gospodarczych wykorzystywanych przez bezpośrednie podmioty transportu i usług spedycyjnych, a także przez organy rządu republikańskiego i regionalnego.

Słowa kluczowe: logistyczna infrastruktura, logistyczny system, regiony, magazyny.

Аннотация

Логистическая инфраструктура активно влияет на рост экономических и социальных показателей регионов республики. Эффективность усилий по обеспечению экономической безопасности и конкурентоспособности регионов в решающей степени зависит от рациональности и согласованности

организационно-экономических регуляторов, используемых непосредственными субъектами транспортно-экспедиторского обслуживания, а также органами республиканского и регионального управления.

Ключевые слова: логистическая инфраструктура, логистическая система, регионы, склады.

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