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## **THE ROLE OF DOMESTIC TRANSPORT LOGISTICS IN THE WORLDWIDE SERVICE MARKET: CONTEMPORARY CHALLENGES**

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### **РОЛЬ ВІТЧИЗНЯНОЇ ТРАНСПОРТНОЇ ЛОГІСТИКИ НА СВІТОВОМУ РИНКУ ПОСЛУГ: ВИКЛИКИ СЬОГОДЕННЯ**

The article presents transport logistics as a cornerstone of the overall state economic policy, serving not only domestic but also transit, export-import cargo transportation. The characteristics, advantages, and disadvantages of road, air, maritime, and pipeline transportation have been identified from the perspective of logistics management. It has been established that after the full-scale invasion by the aggressor country began in 2022, the significance and the pivotal role of rail transportation has only been magnified, as it is the railway that carries out the main export shipments, the conveyance of essential supplies for our Armed Forces as well as humanitarian aid, moreover, production enterprises owe their continuous operation to the railways. Therefore, the article focuses specifically on problem-solving and advancing the modernization of rail freight transportation. To eliminate the infrastructure constraints of railway transport between Ukraine and its neighboring countries, the article presents promising projects that require investment and deserve attention. As an example, in 2022, JSC "Ukrainian Railways" (Ukrzaliznytsia) initiated the restoration of a railway section on the Ukrainian-Romanian border that had remained neglected and unused since 2003. The complete restoration of this railway section will allow for the effective use of it for transporting goods from Ukraine to Romania.

A number of foreign infrastructure projects that offer opportunities to enhance the transportation of cargo from Ukraine has been analyzed, and it is essential for Ukraine to actively participate in these initiatives. These projects include the reconstruction of the European gauge railway through the Lviv region; the establishment of a new terminal for transporting Ukrainian goods by the Polish intermodal group Laude; proposals for transshipment of Ukrainian grain in the Polish port of Kolobrzeg, as well as its transportation through Croatia and Slovakia; repair of railways from the Ukrainian border to Romania.

У статті представлено транспортну логістику як основову загальної державної економічної політики, що обслуговує не тільки внутрішні, але і транзитні, експортно-імпортні перевезення вантажів. Рух товарів від продавця до споживача є дуже важливою ланкою бізнес-процесу, саме тому транспортний ринок був, є і буде актуальним, через що з'являється все більше операторів ринку вантажних перевезень, які готові задовільнити потреби споживачів в усіх видах транспорту. З точки зору логістичного менеджменту визначено особливості, переваги і недоліки автомобільного, авіаційного, морського, річкового, трубопровідного транспорту. Встановлено, що після повномасштабного вторгнення країни-агресора у 2022 році важливість і роль залізничного транспорту стала тільки сильнішою, так як саме залізничним транспортом здійснюються основні експортні перевезення, перевезення вантажів для потреб ЗСУ, а також гуманітарних вантажів, окрім того, саме завдяки залізничному транспорту здійснюється обслуговування виробничих підприємств. Тому, у статті зосереджено увагу саме на вирішенні проблем та модернізації вантажних перевезень у сфері залізничних перевезень. Для усунення інфраструктурних обмежень залізничного транспорту України з її країнами-сусідками у статті представлено перспективні проекти, що потребують інвестування і на які обов'язово потрібно звернути увагу. Наприклад, "Укрзалізниця" у 2022 році розпочала ремонт ділянки залізничної колії на українсько-румунському кордоні, яка до того була забута та не використовувалась з 2003 року. Повне відновлення цієї ділянки дозволить ефективно використовувати її для перевезення вантажів у Румунію з України.

Проаналізовано низку зарубіжних інфраструктурних проектів, які будуть сприяти можливості перевезення більшого обсягу вантажу з України і у яких обов'язково потрібно приймати активну участь. Такими проектами є: реконструкція Євроколії через Львівщину; введення польською інтермодальною групою Laude нового терміналу для транспортування вантажів з України; пропозиції щодо перевалки українського зерна у польський порту Колобжег, а також їх транспортування за допомогою Хорватії та Словаччини; ремонт залізничних колій від кордону України до Румунії.

*Key words: logistics, transport, transportation, cargo, export-import transportation.*

*Ключові слова: логістика, транспорт, перевезення, вантаж, експортно-імпортні перевезення.*

## INTRODUCTION

Cargo transportation is an important element of any logistics system, and it plays an important role in economic relations both within the country and abroad. It is thanks to freight transportation that enterprises and companies have access to new markets by transporting goods over long distances. Such transportation is widely used both domestically and internationally. It plays an essential part in the development of all foreign economic relations, especially with non-CIS countries.

## PROBLEM DEFINITION

On the other hand, freight transportation also presents disadvantages, including high costs and challenges related to accessibility in certain locations, and due to martial law, additional obstacles arise in this domain. Therefore, enhancing transportation infrastructure and minimizing the challenges associated with it become vital tasks to ensure the timely delivery of products and the continued operation of enterprises.

## OBJECTIVE

The aim of this paper is to analyze the freight transportation services in the pre-war period and

to identify the changes caused by martial law, to study the problems faced by users and providers of such services, as well as to find ways to improve the efficiency of freight transportation.

## FINDINGS

Transport is a significant aspect of the economy, and the level of overall economic development of each country heavily depends on the efficient operation of transport. Prior to the war, this sector was witnessing a rapid growth in competition among freight service providers, which encouraged carriers to introduce innovative technologies and other ways to improve the quality of services and to seek the development of transport relations.

Transport is the main pillar of the overall state economic policy, it includes not only domestic but also transit and export-import cargo transportation.

Ukraine has various types of transportation: road, air, maritime, and pipeline. Logistics management includes taking into account the characteristics, advantages, and disadvantages of each type of transport, which are illustrated in table 1 [1].

The movement of goods from the seller to the consumer is a very important element of the business process, which is why the transportation market has been, is and will be relevant. As a result, an increasing number of operators in the freight market are emerging, prepared to meet consumer needs and provide a wide range of transportation services. Market development trends can be observed using the data of the State Statistics Service of Ukraine in the section "Volume of transported cargo by type of transport". In 2021, the volume of cargo transported by rail reached 314.3 million tons, by maritime — 5.3 million tons, by road — 224 million tons, by air — 0.1 million tons, by pipeline transportation — 77.6 million tons [2].

According to these data, in 2021, rail transportation accounted for the largest share of transportation compared to other types (more than 50% of all transportation). However, such a dominant position of rail transportation is not typical for our neighboring countries, where the share of such transportation does not exceed 30%, and the most significant share is taken up by road transportation.

In 2021, railroad transportation accounted for 50.5% of all transportation, road transportation for 36%, pipeline transportation for 12.4%, maritime transportation for 0.85%, and air transportation for only 0.016%, as we can see in the chart.

The pricing policy of transport companies plays an important role in selecting the right vehicle for freight transportation. For example, in 2018, the cost of road transportation was 17 UAH/km on national and 13 UAH/km on international routes, with prices around 20 UAH/km in both cases. The breakdown of expenses is as follows: 47% — fuel costs; 17% — vehicle costs; 17% — driver costs; 13% — driver costs; 6% — other expenses.

When discussing rail transportation, it is worth mentioning JSC "Ukrainian Railways" (Ukrzaliznytsia), which in 2018 actively implemented a policy of dumping, as the price was below the market price and was set by the state. However, this year the Resolution of the Ministry of Infrastructure No. 209 was canceled and prices were set in accordance with market prices.

Meanwhile, sea transportation prices in Ukraine are considerably higher when compared to international standards. The expenses associated with international sea transportation exceeded that of Germany and France by 40%, and were also more than 30% higher than in the United States.

**Table 1. Advantages and disadvantages of the various types of transportation**

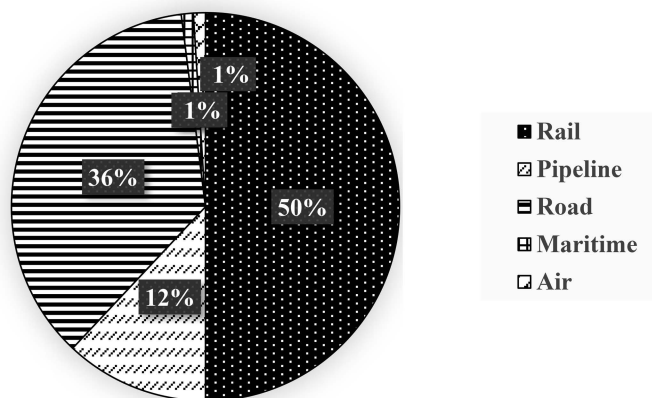
Type of transportation	Advantages	Disadvantages
Road	- a wide range of carriers; - less stringent requirements for cargo packaging; - transportation of small quantities of goods is possible; - fast delivery.	- high costs of long-distance transportation; - dependence on weather and road conditions; - low level of productivity.
Air	- high reliability; - the highest level of delivery speed; - possibility of long-distance transportation.	- high cost of long-distance transportation; - dependence on weather conditions.
Sea	- low cost of long-distance transportation; - possibility of long-distance transportation; - high carrying capacity; - high throughput.	- low delivery speed; - infrequent shipments; - strict packaging requirements; - the availability of equipped ports is required; - dependence on natural conditions.
River	- low cost; - high throughput.	- seasonality of work; - limited capacity; - dependence on weather conditions.
Pipeline	- high safety; - low cost.	- inability to transport small amounts of cargo; - limited number of transportable types of cargo.

Air cargo transportation is more commonly used in foreign markets than in domestic ones, as evidenced by statistics for 2021, where air transportation did not exceed 0.1 million tons.

The war in Ukraine has had a significant impact on the freight transportation industry. Moreover, it is not just Ukraine that is experiencing problems, but the entire trade flow between China and Europe. Currently, sea lanes are blocked, some logistics companies are temporarily shutting down their operations, and air transportation is becoming increasingly expensive.

Currently, all road transportation passing through Ukraine is experiencing major delays either because it is "stuck" in the country or because it has to be redirected through neighboring countries. In the latter case, increased border controls may cause further delays.

Numerous global logistics companies have completely ceased all operations in Ukraine, thereby significantly complicating the further



**Fig. 1. Transportation Types in Ukraine's Total Freight Transportation in 2021**

movement of any cargo through the country [3—5].

Some of the main changes caused by the war include the transformation of the logistics sector and the distribution of the supply chain. Railroad transportation is unable to cope with the increase in the transportation of Ukrainian grain. Capacity is too low, and long-term investments in this area are too risky and therefore unattractive. At present, queues for some cargoes for rail transit are estimated on a monthly basis.

Another significant change was the revocation of road transportation licenses. On April 28, 2022, the Agreement on Road Freight Transportation was signed, according to which Ukrainian road carriers have the right to temporarily transport goods to the European Union without a special transportation permit.

In the meantime, the number of carriers in Ukraine has increased significantly due to the simplification of requirements for obtaining a special carrier license. Thus, now anyone who has a driver's license of a sufficient category and wants to provide freight transportation services can easily obtain the necessary documents to carry out such activities. The simplification of this requirement was indeed imperative, as a number of the drivers, who provided the relevant services were recruited for military service and are now defending our country, meaning that their number has decreased, while the demand for transportation has increased significantly due to the fact that all cargo transportation overseas is now carried out by road.

Ukraine is one of the largest exporters of grain, but since the main route through which this product was previously exported, the Black Sea, is now inaccessible and there are no alternatives to sea transportation, it greatly harms the country's economic situation.

After the full-scale invasion by the aggressor country began in 2022, the significance and the pivotal role of rail transportation has only been magnified, as it is the railway that carries out the main export shipments, the conveyance of essential supplies for our Armed Forces as well as humanitarian aid, moreover, production enterprises owe their continuous operation to the railways. Therefore, we decided to focus our attention precisely on solving problems and modernizing cargo transportation in the field of railway transportation.

In our opinion, an important aspect for solving such problems is to refer to the experience of other countries in the past years, their actions to reform freight transportation by railway after the II World War.

In the latter half of the 20th century, numerous countries faced the fact that railway systems were unable to compete with alternative modes of transportation and failed to adequately fulfill the demand for high-quality logistics services.

The United States of America decided to respond to this challenge by implementing a strategy of tariff policy liberalization, aimed at enticing fresh players into the railroad industry and motivating them to enhance their services. This policy centered on guaranteeing adequate revenues for the railroads, diminishing the state's control over pricing rates, permitting individual agreements between railroads and their clientele, and mandating that prices established for one customer be uniformly applicable to all customers.

The initiation of this reform proved to be a decision yielding positive outcomes for the country: while the number of railroad lines decreased, their profitability significantly increased; the railways' share in national cargo transportation surpassed the 40% mark, and cargo turnover experienced a remarkable growth of 57%.

When it comes to the European Union, there was no unified system of railroad reforms until the 1980s. Their approach to addressing this issue involved the establishment of distinct infrastructure companies, with one entity serving as a transportation operator and the other assuming responsibilities for infrastructure management. This separation persisted even in cases where both companies fell under the governance of a state-owned holding entity, as observed in countries such as Poland, Germany, Belgium, and Austria.

Four components of the legal framework for European railway reforms have been formulated thus far. While the outcomes of these reforms cannot yet be unequivocally assessed as positive or negative, it can be observed that the railway sector's role within the EU transportation landscape is gradually expanding [4].

It is crucial to consider Ukraine's unique circumstances and its current status when contemplating modifications to the railway system, but the changes are very necessary. With a total projected decline in GDP of 30—50% as a result of Russia's military invasion, the decline in rail transportation is currently 70%. Meanwhile, the redirection of cargo from Ukrainian ports to railroads spanning from the northern regions of Ukraine towards the European Union appears to not be particularly effective for the following reasons [6—10]:

- the inability of the EU rail systems to handle large volumes of freight traffic, due to the very

considerable difference in the share of rail transportation within the modal structure of freight transportation in the EU and Ukraine;

— different widths of railway gauge used in Ukraine (1520 mm) and the EU (1435 mm), resulting in the need to replace bogies or move cargo to wagons with the required wheel gauge at border crossing points, thus causing significant downtime and delays, leading to additional costs and hindering the optimal utilization of available crossing capacity.

— different dimensions of Ukrainian and EU rolling stock. Often, large Ukrainian railcars may encounter restrictions when operating on European railways due to potential issues with damaged tunnels and bridges.

To eliminate infrastructural limitations of railway transport of Ukraine with its neighboring countries, there are, in our opinion, promising projects that require investment and that must be paid attention to.

As an example, in 2022, Ukrzaliznytsia initiated the restoration of a railway section on the Ukrainian-Romanian border that had remained neglected and unused since 2003. This ongoing effort aims to revitalize the track and will enable efficient transportation of goods between Ukraine and Romania.

Furthermore, there is a project to restore the 20 km-long Chop-Uzhhorod European gauge railway. This initiative will facilitate direct connections between the regional center of Zakarpattia and several European cities, including Vienna, Bratislava, Belgrade, Budapest, Prague, and Dresden, with minimal time and logistical costs.

The construction of a 42 km-long European railway line from Vadul to Siret to Chernivtsi will advance the development of rail transportation connections with Romania, Turkey, and Bulgaria.

The extension of the 1435 mm railroad track from Kovel to Lutsk and from Mostyska station to Lviv offers significant potential for establishing unobstructed rail connections with Poland and the Baltic States, enhancing regional transportation networks.

Furthermore, there are several foreign infrastructure projects that offer opportunities to enhance the transportation of cargo from Ukraine, and it is essential for Ukraine to actively participate in these initiatives. These projects include the reconstruction of the European gauge railway through the Lviv region; the establishment of a new terminal for transporting Ukrainian goods by the Polish intermodal group Laude; proposals for transshipment of Ukrainian grain in the Polish port of Kolobrzeg, as well as its transportation through

Croatia and Slovakia; repair of railways from the Ukrainian border to Romania.

Additionally, an impactful initiative for the modernization and efficient development of railways is the Free Rail plan, which Lithuanian Railways (Lietuvos geležinkeliai) and Ukrainian Railways (Ukrzaliznytsia) agreed to implement on May 11, 2023. This plan aims to establish a railway operation model tailored to the Baltic region, aligning with EU standards while accommodating the wider gauge used in Lithuania, Ukraine, and other former Soviet countries. LTG (Lithuanian Railways) envisions full integration into the Western European transportation system by 2030.

## CONCLUSION

This study underscores the pivotal role of transportation in driving the economic development of Ukraine, both during times of peace and in the context of wartime. Within the diverse landscape of goods transportation, each transport system plays a unique and vital role, contributing to the overall modal structure of freight logistics within the country. Given the significance of rail transport in the broader freight network, optimizing its potential emerges as a critical imperative. Exploring international best practices offers valuable insights into the optimization of our railway system. This can be achieved through a range of strategies, including tariff policy liberalization, attracting fresh talent and expertise to the railway industry, encouraging self-improvement, and establishing dedicated and distinct infrastructure companies. Additionally, a crucial aspect is the revival of previously dormant rail connections between Ukraine and neighboring nations, as well as active participation in foreign infrastructure initiatives.

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