

L. Krysiuk,

*PhD, Associate Professor of the Department of Management and Marketing,
Odessa National Maritime University, Ukraine*

ORCID ID: <https://orcid.org/0000-0002-3979-0842>

I. Moskvichenko,

*PhD, Associate Professor at the Department of Management and Marketing,
Odessa National Maritime University, Odessa, Ukraine.*

ORCID ID: <https://orcid.org/0000-0001-5223-1212>

M. Kovalenko,

*Postgraduate student of the Department of Management and Marketing,
Odessa National Maritime University, Odesa, Ukraine*

ORCID ID: <https://orcid.org/0009-0001-4898-4083>

M. Terlets'kyi,

*Postgraduate student of the Department of Management and Marketing,
Odessa National Maritime University, Odesa, Ukraine*

ORCID ID: <https://orcid.org/0009-0005-4518-715X>

DOI: 10.32702/2306-6814.2026.4.200

STRATEGIC DEVELOPMENT OF MARITIME LOGISTICS IN UKRAINE: INNOVATIONS, GEOPOLITICAL RISKS, AND SUSTAINABLE SUPPLY CHAIN PRACTICES

Л. М. Крисюк,

к. е. н., доцент, доцент кафедри "Менеджмент і маркетинг", Одеський національний морський університет

І. М. Москвіченко,

к. е. н., доцент, доцент кафедри "Менеджмент і маркетинг", Одеський національний морський університет

М. О. Коваленко,

аспірант кафедри "Менеджмент і маркетинг", Одеський національний морський університет

М. В. Терлецький,

аспірант кафедри "Менеджмент і маркетинг", Одеський національний морський університет

СТРАТЕГІЧНИЙ РОЗВИТОК МОРСЬКОЇ ЛОГІСТИКИ В УКРАЇНІ: ІННОВАЦІЇ, ГЕОПОЛІТИЧНІ РИЗИКИ ТА ПРАКТИКА СТАЛИХ ЛАНЦЮГІВ ПОСТАЧАННЯ

Актуальність дослідження зумовлена стратегічною роллю морської логістики у розвитку транспортної системи України, а також її визначальним значенням для забезпечення ефективного здійснення експортно-імпортних операцій. Так, до повномасштабного вторгнення РФ в Україну морські вантажні перевезення були основним каналом забезпечення безперервного функціонування міжнародної торгівлі держави, адже понад 90 % вантажів, у тому числі сільсько-господарської продукції, експортувалося через Чорне море. Сучасні показники також підтверджують значущість морської логістики для економіки України. Відтак, метою цієї статті є аналіз стратегічних напрямів розвитку морської логістики в Україні в контексті інноваційних трансформацій, геополітичних ризиків та практик сталого управління ланцюгами постачання. У межах

дослідження констатовано, що Українська морська логістика зазнала системної трансформації через повномасштабне вторгнення РФ, що призвело до суттєвого зниження обсягів перевезень та втрати стійкості традиційної моделі розвитку "ефективність через масштаб". Доведено, що для забезпечення безперервності та адаптивності вантажних потоків сформувалася нова стратегічна модель "стійкість через диверсифікацію маршрутів", яка включає: мультимодальну логістику з розподілом вантажопотоків між різними портами та видами транспорту; використання альтернативних морських, річкових та сухопутних маршрутів; підвищення стійкості ланцюгів постачання до зовнішніх шоків і геополітичних ризиків; інтеграцію українських портів у європейську транспортну мережу TEN-T. Констатовано, що впровадження цієї моделі забезпечує: гнучкість і надійність перевезень; зниження залежності від окремих портів та маршрутів; підвищення ефективності та стійкості логістики в кризових умовах; інтеграцію у міжнародний транспортний простір і підвищення конкурентоспроможності. Цінність дослідження полягає у доведеності того факту, що окреслена стратегічна трансформація морської логістики України має бути спрямована на реалізацію комплексного підходу, що поєднує стійкість, ефективність, інновації та практики сталого управління ланцюгами постачання.

The relevance of this research is determined by the strategic importance of maritime logistics in the overall development of Ukraine's transport system, as well as in the implementation of export and import operations. Before the full-scale invasion of Ukraine by the Russian Federation, maritime cargo transportation was the primary channel for ensuring the uninterrupted operation of the country's international trade (as over 90% of cargo, including agricultural exports, was shipped through the Black Sea). Current indicators also confirm the significance of maritime logistics for Ukraine. Thus, the aim of this article is to analyze the strategic directions of maritime logistics development in Ukraine in the context of innovative transformations, geopolitical risks, and sustainable supply chain management practices. Within the study, it is noted that Ukrainian maritime logistics has undergone a systemic transformation due to the full-scale Russian invasion, which led to a significant decline in cargo volumes and the loss of resilience of the traditional "efficiency through scale" development model. It is demonstrated that to ensure continuity and adaptability of cargo flows, a new strategic model, "resilience through route diversification," has emerged, which includes: multimodal logistics with the distribution of cargo flows across different ports and modes of transport; the use of alternative maritime, river, and overland routes; enhancing supply chain resilience to external shocks and geopolitical risks; and integrating Ukrainian ports into the European TEN-T transport network. It is concluded that implementing this model ensures: flexibility and reliability of transportation; reduced dependence on individual ports and routes; increased efficiency and resilience of logistics under crisis conditions; integration into the international transport space; and enhanced competitiveness. The value of the research lies in demonstrating that the outlined strategic transformation of Ukraine's maritime logistics should be directed toward implementing a comprehensive approach that combines resilience, efficiency, innovation, and sustainable supply chain management practices to ensure the stability and development of maritime transport amid contemporary geopolitical and economic challenges.

Key words: maritime logistics transformation; "efficiency through scale"; "resilience through route diversification"; supply chain management.

Ключові слова: трансформація морської логістики; "ефективність через масштаб"; стійкість через диверсифікацію маршрутів; управління ланцюгами постачання.

PROBLEM STATEMENT

The relevance of this study is determined by the strategic importance of maritime logistics in Ukraine's transport system and in facilitating export and import operations. Prior to the full-scale Russian invasion, maritime cargo transport was the primary channel for ensuring uninterrupted international trade, with over 90% of goods, including agricultural products, exported via the

Black Sea. In 2024, Ukrainian seaports handled 97.2 million tons of cargo, approximately 80% of which was transported by sea [6].

Maritime logistics development currently faces unprecedented challenges, including port blockades, infrastructure destruction, and the loss of traditional transport routes due to the war. These disruptions have triggered significant restructuring of global supply chains,

Table 1. Characteristics of the new "resilience through route diversification" model

Direction / Component	Description	Expected Effect / Benefits
Multimodal logistics	Distribution of cargo flows across multiple ports and modes of transport (maritime, river, rail, road).	Increased transport flexibility; reduced dependence on a single port or mode of transport.
Alternative export routes	Utilization of new maritime, river, and overland routes for cargo delivery.	Ensures continuity of exports even if traditional corridors are blocked; reduces the risk of delays.
Supply chain resilience enhancement	Implementation of measures that minimize the impact of external shocks and geopolitical risks (military threats, port blockages).	Lowers the likelihood of supply disruptions; maintains stable logistics operations under crisis conditions.
Integration into the European transport network (TEN-T)	Connecting Ukrainian ports to the standards and routes of the European transport network.	Ensures continuity of cargo flows; provides access to new markets; enhances international competitiveness.

Source: created by the authors based on [3—4; 6—7].

forcing carriers and businesses to seek alternative solutions to maintain international trade. For instance, agricultural exports fell by more than 90% after the invasion, although the establishment of a humanitarian corridor subsequently enabled the transportation of over 55 million tons of cargo despite ongoing attacks on port facilities. Exports of metallurgical and mining products, traditionally Ukraine's second-largest export segment, also declined sharply: iron ore and concentrates fell by approximately \$4.1 billion, steel semi-finished products by \$3.17 billion, pig iron by \$1.14 billion, and nitrogen fertilizers by \$605 million.

Current sectoral priorities include demining sea routes, restoring port capacities, modernizing the shipbuilding industry, and integrating Ukraine into the European transport network to expand the cargo base, attract new flows, and diversify transport types. In this context, digitalization, artificial intelligence, multimodal logistics, and integration into international transport networks are key to enhancing efficiency and resilience.

Thus, the strategic development of Ukraine's maritime logistics requires a comprehensive approach combining innovative technologies, effective risk management, and sustainability principles to ensure continuity, adaptability, and long-term sectoral growth.

ANALYSIS OF RESEARCH AND PUBLICATIONS

Certain aspects of the strategic development of maritime logistics in Ukraine have been examined by researchers such as Hurenko A.V., Zubov S.V. [1], Melnyk M., Leshchukh I., Prytula K., Ivaniuk U., Ohinok S. [3], and Yurieva V. [4]. Specifically, these authors analyzed:

- the efficiency of port logistics and optimization of cargo flows;
- the development of transport corridors and integration of ports into international logistics networks;
- the organization of multimodal transportation and supply chain management;

— the impact of external economic and geopolitical factors on the operation of seaports.

However, the strategic directions for the development of Ukraine's maritime logistics, considering innovative transformations, geopolitical risks, and sustainable supply chain management practices, remain insufficiently explored in the scientific literature. As a result, logistics systems involving maritime transport lack a comprehensive approach that ensures stability and adaptability under contemporary geopolitical and economic challenges.

FORMULATION OF THE ARTICLE'S OBJECTIVES

The aim of this article is to analyze the strategic directions for the development of maritime logistics in Ukraine in the context of innovative transformations, geopolitical risks, and sustainable supply chain management practices.

THE PAPER MAIN BODY

After the beginning of the full-scale invasion by the Russian Federation, Ukrainian maritime logistics entered a phase of systemic transformation, driven by the need to adapt to new geopolitical and economic realities. In particular, the traditional development model, oriented toward "efficiency through scale"—that is, the principle that the larger the transport volumes, the lower the unit cost of cargo, and which assumed maximum utilization of port capacities, concentration of cargo flows through major seaports, and a focus on scale and volume rather than flexibility or route diversification—sharply lost its resilience due to the blocking of key corridors, destruction of infrastructure, and increasing risks [3; 6].

According to a UN study (UNCTAD), at the initial stage of the full-scale invasion, the number of weekly ship departures from Ukrainian Black Sea ports dropped from approximately 160 to around 10 vessels per week—a reduction of over 90% compared to the pre-war level. Although part of the traffic recovered after the conclusion of the "Grain Initiative" (starting in August 2022), the number of shipments remained at roughly 30—100 vessels per week, still significantly below pre-war levels (~160) [6—7].

In response to these changes, a new maritime logistics development model emerged: "resilience through route diversification," which involves (see Table 1): distributing cargo flows across multiple ports and modes of transport (multimodal logistics); creating alternative maritime, river, and overland export routes; enhancing the resilience of logistics chains to external shocks and geopolitical risks; integrating Ukrainian ports into the European transport network (TEN-T) to ensure the continuity of cargo flows.

Thus, the strategic transformation of Ukraine's maritime logistics is aimed not only at ensuring transport efficiency but also at enhancing resilience and adaptability, driven by a systemic interplay of factors shaped by geopolitical risks (particularly their impact on maritime logistics), innovative transformations, the growing importance of sustainable supply chain practices, and the pursuit of cargo flow diversification through integration into the European transport space [2].

The main strategic priority for the development of maritime logistics in Ukraine is mitigating the consequences of geopolitical instability, including military threats to ports, mining of sea routes, and the blocking of key transport corridors. These risks have already led to [4; 6—7]:

— Increased insurance premiums: For example, in November-December 2025, insurance premiums for voyages in the Black Sea increased threefold compared to pre-war levels ($\sim 0.25\text{--}0.3\% \rightarrow \sim 0.75\%$), and by January 2026, rates for some vessels exceeded 0.8—1%, marking the highest levels since 2023.

— Reduced accessibility of maritime transport: In particular, sea area mining and the threat of attacks limited vessel access to major ports, forcing exporters to redirect cargo flows to less efficient alternative routes (e.g., Danube river ports and overland corridors through Poland, Romania, and Hungary).

Accordingly, the strategic priority for Ukraine's maritime logistics development is the diversification of transport infrastructure and integration of Ukrainian ports into the European transport network (TEN-T), which ensures flexibility and continuity of cargo flows (see Table 2).

It should be noted that the development of maritime logistics under current conditions is focused on mobility and flexibility, which became particularly evident after the initial blockade of deep-water Black Sea ports [2]. From April-May 2022, Ukrainian companies temporarily utilized ports along the Danube River (Izmail, Reni, Ust-Dunaysk) for transshipment of grain, oil, and other goods. From July 2022 to July 2023, the Black Sea Grain Initiative ("Grain Corridor") partially restored the capacity for maritime exports through Black Sea ports. However, following Russia's withdrawal from the agreement, domestic exports once again shifted in part to alternative routes, including via the Danube, overland corridors, and transit through neighboring ports in Romania, Poland, Bulgaria, and elsewhere [6].

In fact, it was after July 2023—following the termination of the Grain Initiative—when Russia declared parts of the Black Sea "dangerous," that the most active phase of transport infrastructure diversification and integration of Ukrainian ports into the European transport network began. Ukrainian export cargoes increasingly relied on Danube river ports (Izmail, Reni, Ust-Dunaysk), as well as overland routes through Poland (Lviv — Przemysl — Baltic ports), Romania (ports of Constanta, Giurgiu, etc.), and other borders, including Bulgaria and Turkey (Burgas — Varna — Iskenderun).

The flexibility outlined (see Table 3) demonstrates that, while the operational Black Sea ports still serve as the core of export logistics—providing 40—50% of pre-war throughput—and the occupied or blocked ports

Table 2. Features of the strategic development of maritime logistics in Ukraine aimed at mitigating the consequences of geopolitical instability

Strategic priority	Features of maritime logistics development within the strategic priority	Expected outcome of implementing the strategic priority
Diversification of transport infrastructure	Includes distribution of cargo flows across multiple ports and modes of transport (maritime, river, rail, and road). Includes creation of temporary and permanent alternative routes for exports and imports.	Increased resilience of supply chains to external shocks, such as port blockages or geopolitical risks.
Integration of Ukrainian ports into the European transport network (TEN-T)	Ensures continuity of cargo flows and minimizes idle time. Enhances the efficiency of multimodal transport. Provides access to new markets and customers in the EU. Supports adaptation to sustainable and secure supply chain management requirements.	Improved compliance of Ukrainian ports with European standards, including EU directives on port security (ISPS Code), environmental management standards (ISO 14001), and TEN-T regulations.

Source: created by the authors based on [4; 6—7].

represent a deferred asset with high CAPEX requirements, there has been a significant shift of flows toward alternative routes during the wartime period. Within this context, Danube ports and multimodal routes function as both a compensatory mechanism and a "buffer."

Specifically, instead of direct maritime exports through Ukrainian ports, cargo can be transported by rail or road to Danube ports → transshipped → delivered via river transport → to an EU port, or transported by rail to Poland/Romania → shipped from their ports, or a combination of both approaches can be used as needed [6].

Given that the contemporary development of maritime logistics is focused on flexibility, it is occurring alongside

Table 3. Main routes facilitating the development of contemporary Ukrainian maritime logistics

Main and multimodal (involving sea transport) route	Description of the route in contemporary Ukrainian maritime logistics	Advantages of the route in contemporary Ukrainian maritime logistics
River routes via the Danube (ports of Izmail, Reni, Ust-Dunaysk)	Cargo is transshipped at Danube ports and then delivered by river vessels to seaports of neighboring countries, partially to the Black Sea, or overland to EU ports.	Alternative for exports when maritime ports are blocked.
Multimodal access to Europe — Overland corridors through Poland (Lviv — Przemysl — Baltic ports)	Products are transported via rail and road corridors to Poland, and from there to Baltic ports (e.g., Gdańsk) or directly to EU ports.	Bypasses maritime risks; ensures export to the EU without partial interruptions.
Routes through Romanian ports (ports of Constanta, Giurgiu, etc.)	Cargo is transported through Romanian ports, especially Constanta—the largest Black Sea port in the region—via rail or road connections.	Secure routes; high infrastructure capacity (large port).
Via Bulgaria and Turkey (Burgas — Varna — Iskenderun)	Cargo is transported to ports in Bulgaria or Turkey for loading onto sea vessels.	Access to Mediterranean routes; bypasses coastal risk areas.

Source: created by the authors

Table 4. Features of strategic development of maritime logistics in Ukraine under active implementation of digital technologies and innovative solutions

Strategic priority	Features of maritime logistics development within the strategic priority	Expected outcome of implementing the strategic priority
Automation of port operations and documentation	- Implementation of electronic cargo and container tracking systems. - Integrated terminal platforms for automatic cargo allocation and electronic documentation. - Use of automated systems for vessel security control and access management.	- Reduction of cargo handling time by 20–30%. - Decrease in documentation errors and increased operational transparency. - Increased terminal throughput capacity.
Implementation of digital platforms for cargo flow management	- Use of real-time cargo tracking systems. - Coordination of multimodal transport and optimization of vessel loading. - Integration of data from port, rail, and road logistics operators.	- Reduction of vessel waiting times at voyages and terminals by 15–25%. - Improved planning and control of cargo flows. - Reduced transportation and handling costs.
Supply chain forecasting and optimization based on big data analytics	- Use of predictive algorithms for port and terminal workload. - Optimization of routes and shipping schedules. - Data analysis for strategic decision-making in cargo flow management.	- Reduction of container vessel delays by 10–15% (example: Port of Odesa). - Improved cargo handling efficiency. - Increased transparency and reliability of supply chains.

Source: created by the authors based on [2–3; 5].

the active implementation of digital technologies and innovative solutions. Importantly, digital technologies can enhance cargo handling efficiency, reduce idle times, optimize route management, and provide greater transparency across supply chains under complex and unstable conditions.

Table 5. Features of strategic development of maritime logistics in Ukraine under the implementation of sustainable supply chain management principles

Strategic priority	Features of maritime logistics development within the strategic priority	Expected outcome of implementing the strategic priority
Decarbonization of shipping	Use of modern technologies to reduce greenhouse gas emissions; implementation of alternative fuels (e.g., hydrogen and ammonia); electrification of cargo handling equipment and internal terminal transport.	Reduction of the carbon footprint of maritime transport; increased energy efficiency and environmental sustainability of shipping.
Route optimization	Reduction of unnecessary shipments; digital planning of cargo flows (e.g., at the Port of Chornomorsk) to minimize vessel idle times and unnecessary voyages.	Improved operational efficiency; reduced vessel dwell time in ports; decreased environmental impact.
Development of "green ports" and environmentally oriented logistics corridors	Use of renewable energy sources; modernization of terminal systems; implementation of environmental cargo handling standards (e.g., solar panels and rainwater collection systems at the Ports of Odesa and Pivdennyi).	Ensures economic, environmental, and operational sustainability of port infrastructure; reduces negative environmental impact.

Source: created by the authors based on [4; 6–7].

Key directions for the strategic development of maritime logistics in Ukraine include [1–2]:

— Automation of port operations and documentation, including the introduction of electronic cargo tracking systems, automated container control systems, and integrated terminal platforms.

— Implementation of digital platforms for cargo flow management, which allow real-time tracking of shipments, coordination of multimodal transport, and optimization of vessel loading.

— Supply chain forecasting and optimization based on big data analytics, which enables more precise route planning, reduces idle times, and increases port throughput capacity.

These strategic directions improve maritime transport efficiency, reduce delays, and enhance supply chain transparency (see Table 4). For example, in May 2025, the DocPort digital platform was launched at the Port of Odesa, automating documentation, managing entry queues, and integrating information among logistics chain participants. From the outset, it became evident that using this system reduces vessel processing times by 1–6 hours, increases operational transparency, and enhances port

throughput by 3–5% without additional infrastructure investments.

Given the high risks, it is evident that the development of Ukrainian maritime logistics currently requires the implementation of sustainable supply chain management principles. In fact, the main strategic priorities in this area include [4–6]:

— Decarbonization of shipping, which involves using modern technologies to reduce greenhouse gas emissions;

— Route optimization, aimed at minimizing unnecessary transport and reducing environmental impact;

— Development of "green ports" and environmentally oriented logistics corridors, including the use of renewable energy sources, modernization of terminal systems, and implementation of environmental cargo handling standards.

An analysis of these priorities clearly indicates their focus on ensuring economic, environmental, and operational sustainability (see Table 5).

For example, within the framework of greening port infrastructure in Ukraine, projects are being considered for the creation of production and logistics hubs for "green" hydrogen and ammonia, which would supply shipping with alternative fuels and help reduce the carbon footprint of maritime transport [2; 4]. Additionally, current port practices include electrification of cargo handling equipment and internal terminal transport, aligning with global trends in decar-

bonization and improving the energy efficiency of port logistics.

The implementation of sustainable supply chain management principles not only helps reduce the environmental impact but also enhances the competitiveness of Ukrainian maritime logistics in European and global markets, ensuring compliance with international standards and the requirements of modern supply chains.

Furthermore, a strategic priority is the expansion of the cargo base and the attraction of new cargo flows, provided it reduces dependence on traditional markets and increases the resilience of the system to external shocks. Integration into the European transport space ensures standardized procedures, development of multimodal transport, and access to long-term contracts with international partners.

CONCLUSIONS

Within the scope of the study, the authors note that Ukrainian maritime logistics has undergone a systemic transformation due to the full-scale invasion by the Russian Federation, which resulted in a significant reduction in transport volumes and the loss of resilience of the traditional "efficiency through scale" development model.

It has been demonstrated that to ensure the continuity and adaptability of cargo flows, a new strategic model—"resilience through route diversification"—has emerged, which includes:

- Multimodal logistics with distribution of cargo flows across different ports and modes of transport;
- Utilization of alternative maritime, river, and overland routes;
- Enhancement of supply chain resilience to external shocks and geopolitical risks;
- Integration of Ukrainian ports into the European transport network (TEN-T).

It has been observed that implementing this model ensures transport flexibility and reliability; reduces dependence on individual ports and routes; increases efficiency and resilience of logistics under crisis conditions; enables integration into the international transport space; and enhances competitiveness.

The value of this study lies in demonstrating that the outlined strategic transformation of Ukrainian maritime logistics should focus on implementing a comprehensive approach that combines resilience, efficiency, innovation, and sustainable supply chain management practices to ensure the stability and development of maritime transport under contemporary geopolitical and economic challenges.

Література:

1. Гуренко А.В. Зубов, С.В. провадження інтелектуальних логістичних технологій в інфраструктурний комплекс морського транспорту. Економічний вісник Донбасу. 2020. № 3 (61). С. 146—153.
2. Демченко Б., Кононенко Ж. Трансформація логістичних ланцюгів України в умовах воєнного стану. Економіка та суспільство. 2025. № 80. <https://doi.org/10.32782/2524-0072/2025-80-68>

3. Melnyk M., Leshchukh I., Prytula K., Ivaniuk U., Ohinok S. Logistics potential to ensure the resilience of the Ukrainian economic system facing global challenges. *Problems and Perspectives in Management*. 2024. № 22 (2). Pp. 399—418.

4. Юр'єв В. вплив розвитку транспортної логістичної системи промислового ринку на економіку України. Київський економічний науковий журнал. 2025. № 10. С. 153—161.

5. Ogli I. Development of digital platforms for services of transport-logistics providers. *The American Journal of Engineering and Technology*. 2023. № 5 (11). pp. 93—99. DOI: <https://doi.org/10.37547/tajet/volume05-issue11-13>

6. Портово-морська інфраструктура України в умовах війни: трансформація логістики та інвестиційні можливості. InVenture. 2026. URL <https://inventure.com.ua/uk/analytics/investments/portovo-morska-infrastruktura-ukrayini-v-umovah-vijni-transformaciya-logistiki-ta-investicijni-mozhливosti>

7. Стійкість українських портів: вантажообіг у 2024 році сягнув 97 млн тонн. Водний транспорт. URL <https://mindev.gov.ua/news/36333-stiikist-ukrayinskix-portiv-vantazoobig-u-2024-roci-siagnuv-97-mln-tonn>

References:

1. Gurenko, A.V. and Zubov, S.V. (2020), "Introduction of intelligent logistics technologies into the infrastructure complex of maritime transport", *Ekonomichnyy visnyk Donbasu*, vol. 3 (61), pp. 146—153.
2. Demchenko, B., and Kononenko, Zh. (2025), "Transformation of Ukrainian logistics chains under martial law", *Ekonomika ta suspil'stvo*, vol. 80. <https://doi.org/10.32782/2524-0072/2025-80-68>
3. Melnyk, M., Leshchukh, I., Prytula, K., Ivaniuk, U., and Ohinok, S. (2024), "Logistics potential to ensure the resilience of the Ukrainian economic system facing global challenges", *Problems and Perspectives in Management*, vol. 22 (2). pp. 399—418.
4. Yuryev, V. (2025), "The impact of the development of the transport logistics system of the industrial market on the economy of Ukraine", *Kyivskyi ekonomichnyy naukovyy zhurnal*, vol. 10, pp. 153—161.
5. Ogli, I. (2023), "Development of digital platforms for services of transport-logistics providers", *The American Journal of Engineering and Technology*, vol. 5 (11), pp. 93—99.
6. InVenture (2026), "Ukraine's port and maritime infrastructure in wartime: logistics transformation and investment opportunities", available at: <https://inventure.com.ua/uk/analytics/investments/portovo-morska-infrastruktura-ukrayini-v-umovah-vijni-transformaciya-logistiki-ta-investicijni-mozhливosti> (Accessed 4.02.2026).
7. Vodnyy transport (2025), "Sustainability of Ukrainian ports: cargo turnover in 2024 reached 97 million tons", available at: <https://mindev.gov.ua/news/36333-stiikist-ukrayinskix-portiv-vantazoobig-u-2024-roci-siagnuv-97-mln-tonn> (Accessed 4.01.2026).

Отримано редакцією журналу / Received: 09.02.26

Професійно рецензовано / Revised: 12.02.26

Схвалено до друку / Accepted: 17.02.26