https://www.sworldjournal.com/index.php/swj/article/view/swj33-03-002
DOI: 10.30888/2663-5712.2025-33-03-002

УДК 656(477):338.47:339.9

INTERNATIONAL ASSESSMENT OF THE DEVELOPMENT OF UKRAINE'S TRANSPORT SECTOR

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Abstract. *This article presents an analysis of the development of Ukraine's transport sector in an international context. Key transport performance indicators are assessed and compared with those of EU member states and neighboring countries. The study identifies the main barriers and opportunities for the integration of Ukraine's transport system into the European space. Strategic directions for the modernization of transport infrastructure under conditions of digital transformation and geopolitical instability are proposed. The research explores the development of Ukraine's transport sector in accordance with international standards and benchmarks, taking into account contemporary geopolitical challenges and the country's aspirations for European integration.*

The purpose of the study is to identify the strengths and weaknesses of the national transport system by benchmarking it against European Union countries, as well as to outline prospects for modernization and digital transformation. The paper analyzes key international indices, including the Logistics Performance Index (LPI), the Transport Infrastructure Quality Index, and indicators of digital maturity in the transport sector. The study finds that despite Ukraine's declining positions in global rankings, the country retains strategic importance as a transit hub and demonstrates positive progress in the development of the Danube logistics cluster. It is substantiated that effective recovery of the sector requires integration into the TEN-T network, attraction of international investments, implementation of digital logistics solutions, and harmonization of the regulatory framework with EU directives.

The research findings can be used in the formation of national transport policy, the design of infrastructure projects, and the assessment of the investment attractiveness of the sector in the context of post-war recovery.

Keywords: *transport, infrastructure, development of the transport sector, international assessment, logistics, integration, innovation, digitalization.*

Introduction

For every country, the transport sector is one of the leading economic sectors, as it ensures the mobility of goods, people, services, and capital, and also plays a strategic role in national security, integration into the global economy, and regional development. In the context of globalization and the digitalization of economies, the effective functioning of the transport system determines a country's competitiveness, its participation in international logistics supply chains, and its attractiveness to investors.

For Ukraine, the transport system holds not only economic but also political significance. The country's geographical location between the European Union and Asia, at the crossroads of global transit routes, creates potential for transforming Ukraine into an important transport and logistics hub of the region. Until 2022, the country actively developed rail, road, air, and maritime connections, striving for harmonization with EU standards within the framework of the Association Agreement. However, the full-scale war initiated by Russia caused widespread destruction of transport infrastructure, changed logistics routes, reduced investment attractiveness, and increased dependence on Western border crossings and Danube cluster ports.

At the same time, international partners are actively supporting the restoration of Ukraine's transport sector, notably through EU initiatives aimed at integrating Ukraine into the TEN-T network, financing programs by the EBRD and the World Bank, as well as through the implementation of the national Recovery Plan. In this context, international assessment of the transport sector's development is crucial, as it allows determining Ukraine's level of adaptation to global requirements, identifying gaps, and formulating priorities for reconstruction and integration into the European transport space.

The purpose of this article is to evaluate the state and development dynamics of Ukraine's transport sector in an international context, based on a comparative analysis with EU countries and the use of international indices. Special attention is given to analyzing prospects for the digital transformation of the transport system and Ukraine's role in global logistics amid post-war recovery.

Research results

In the current context of integration into the European space, an important prerequisite for the development of Ukraine's transport sector is its recognition and comparative evaluation at the international level. International organizations provide objective verification of progress by highlighting the sector's strengths and problem areas.

To assess the effectiveness of transport systems, international organizations such as the World Bank, the United Nations Economic Commission for Europe (UNECE),

and the International Transport Forum (OECD/ITF) propose a number of indicators [1; 3; 4]. These include:

- the Logistics Performance Index (LPI) — covering customs clearance, infrastructure, quality of logistics services, cargo tracking, and timeliness of delivery [1];
- the Infrastructure Quality Index, calculated based on expert assessments and analytical data [4];
- the Global Value Chain Integration Index (GVC Index) [3];
- indicators of freight turnover, passenger turnover per capita, corridor efficiency, and accessibility of transport hubs [2].

Based on these indicators, transport systems are ranked and recommendations are formulated for countries with transition economies.

Ukraine possesses a strong but outdated transport complex. Until 2022, it had one of the densest railway networks in Europe, a well-developed network of seaports, and a favorable transit location [2; 5].

However, according to the Logistics Performance Index 2023, Ukraine ranked 61st out of 139 countries, which is 20 positions lower than in 2016 [1]. This indicates a decline in the competitiveness of logistics infrastructure due to the following reasons:

1) destruction of critical infrastructure, including bridges, railway stations, ports, and roads [5];
2) changes in logistics flows — reorientation towards Western borders (Poland, Slovakia, Hungary, Romania) [6];
3) wear and tear of fixed assets — over 80% of railway rolling stock requires renewal [5];
4) lack of adequate digitalization of logistics processes [7].

At the same time, the Danube cluster ports — Izmail, Reni, Kiliya — demonstrated record growth rates in 2023–2024, handling over 30 million tons of cargo annually [6].

To assess the level of development of the transport sector according to internationally recognized criteria and to identify structural differences, infrastructure

constraints, and potential integration directions, a comparative analysis will be conducted. It is advisable to use a system of key indicators covering transport infrastructure, logistics efficiency, digital readiness, and the level of environmental sustainability. Specifically, the analysis will be based on indicators of the Logistics Performance Index (LPI), the Transport Infrastructure Quality Index, the Digital Economy and Society Index (DESI), as well as indicators of European transport integration according to the European Commission data [1; 2; 3; 4]. (Table 1)

Table 1. Comparison of Ukraine's Transport System with EU Countries

No.	Country	LPI Ranking (2023)	Infrastructure Quality (0–5)	Share of Digital Services in Transport, %
1	Germany	1	4.3	92%
2	Poland	28	3.7	85%
3	Romania	43	3.4	71%
4	Ukraine	61	2.8	49%

Source: compiled based on [1-4]

The Logistics Performance Index (LPI), calculated by the World Bank, is a comprehensive assessment that takes into account six components: customs efficiency, infrastructure quality, ease of arranging international shipments, cargo tracking capabilities, timeliness of deliveries, and availability of logistics services [1]. In 2023, Germany ranked 1st, Poland 28th, Romania 43rd, and Ukraine 61st out of 139 countries [1].

Germany's high ranking is explained by its extensive infrastructure, a high level of digital integration in logistics processes, and stable regulatory policies. Poland actively modernizes its logistics within EU programs, which allows it to maintain consistently high performance [2]. Despite Ukraine's potential as a transit country, it lags behind due to the ongoing war, logistical constraints, and outdated infrastructure [3].

The assessment of transport infrastructure quality is typically based on expert data from the World Economic Forum (WEF) and is partially reflected in some components of the LPI [1; 4]. It covers road and rail networks, seaports, airports, as well as service levels and integration of transport hubs.

In the table, Germany scores 4.3 points, reflecting a high level of transport network organization, convenience, efficiency, and reliability. Poland (3.7) and Romania (3.4) show results consistent with the development level of Eastern European infrastructures, with noticeable improvement dynamics due to participation in TEN-T programs and EU structural funds [2; 5]. Ukraine receives only 2.8 points, indicating significant wear and tear of facilities, war-related losses, and insufficient modernization [3; 6].

The share of digital services in transport (%) is based on the assessment of the implementation of digital technologies in transport and logistics processes, including:

- the availability of electronic document management systems (e-CMR, e-TIR),
- implementation of GPS monitoring,
- automation of cargo handling,
- integration into EU digital platforms (e.g., NCTS, SafeSeaNet, RailData).

According to ITF and the European Commission [2; 7], the digitalization level of Germany's transport sector reached 92%, Poland 85%, and Romania 71%. Ukraine is at approximately 49% (based on aggregated data from the Ministry of Recovery, Ukrzaliznytsia, and analysis of carrier digital platforms) [3; 6; 8]. This indicates fragmented implementation of digital solutions, low inter-agency integration, and limited availability of electronic services for logistics operators.

Thus, the analysis shows that Ukraine significantly lags behind even less economically developed EU countries such as Romania in all three indicators. The main factors are:

- lack of a systematic approach to transport digitalization;
- critical infrastructure damage;
- slow reform of logistics and border regulations;
- insufficient integration into TEN-T and absence of fully functional multimodal

hubs.

At the same time, recent trends — including the development of Danube ports, activation of digital initiatives at Ukrzaliznytsia, and Ukraine's participation in the TEN-T program — create a foundation for the strategic recovery of the transport sector [6; 7].

According to the National Recovery Plan of Ukraine (2023) and the «Rebuild Ukraine» documents, the following are planned:

1.Integration into the TEN-T core network, including modernization of East-West routes and improvement of border crossing points [6; 7];

2.Investments in the development of Danube ports, transforming them into critical logistics centers (supported by the EU, EBRD, World Bank) [5; 6];

3.Deployment of digital infrastructure: e-TIR, e-CMR, GPS control, blockchain tracking [3; 7];

4.Harmonization of safety and transport standards in line with EU directives (rail transport, road transport, intermodal transport) [2].

Conclusions As a result of the conducted study, it was established that Ukraine's transport sector significantly lags behind Central European standards in many key indicators. Particularly critical remain issues of infrastructure provision, quality of road networks, integration into trans-European transport corridors, and the digital maturity of management and logistics processes. According to the World Bank data, Ukraine's position in the Logistics Performance Index shows unstable dynamics, while the Digital Economy and Society Index (DESI) assessments indicate limited digital integration of the transport sector compared to EU countries.

At the same time, the research demonstrated that Ukraine's geostrategic location, active participation in infrastructure recovery programs supported by international partners (notably the EBRD, World Bank, EIB), as well as the gradual expansion of involvement in TEN-T projects, open real prospects for strengthening Ukraine's position as a transit country within the European transport space. Further digitalization of transport processes, development of multimodal hubs in the western part of the country, and stimulation of innovation through investments in sustainable and «green»

transport aligned with the UN Sustainable Development Goals and the European Green Deal remain especially relevant.

Considering the current challenges, the formulation of a strategy for the recovery and modernization of Ukraine's transport sector should be based on systematic international analysis, benchmarking with EU countries, and consistent implementation of best practices. To this end, it is advisable to expand the analytical base, intensify state transport policy regarding digital transformation, transport safety, and sustainable development, as well as establish effective institutional mechanisms for managing the reconstruction of transport infrastructure. Only through comprehensive sectoral reform can synergy be achieved among the country's economic, logistical, environmental, and integration goals in the medium term.

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Article submitted: August 10, 2024