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ECONOMIC ASSESSMENT OF TRANSPORT AND LOGISTICS SYSTEM'S CONTRIBUTION TO NATIONAL ECONOMIC GROWTH

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***Abstract.** The article provides a comprehensive analysis of the transport and logistics system (TLS) of the Republic of Azerbaijan as a strategic component of sustainable economic growth and diversification. The research highlights the country's efforts to develop its non-oil sectors and transform its advantageous geographic position into a key transit hub between Europe and Asia through large-scale infrastructure projects, including the Baku–Tbilisi–Kars, North–South, Trans-Caspian, and Zangezur corridors. The study aims to assess the institutional, infrastructural, economic, and environmental factors influencing the performance and competitiveness of Azerbaijan's TLS.*

The methodological framework is based on the works of domestic and international scholars, as well as statistical, comparative, and factor analysis using national transport data for 2020–2024. The study identifies the main global trends shaping the logistics sector, such as digitalization, automation, environmentally friendly technologies, and multimodal integration. Quantitative analysis of freight transportation volumes, costs, and revenues by transport mode reveals a steady increase in road and pipeline transport, improving operational efficiency despite cost fluctuations. The SWOT analysis confirms that Azerbaijan's strengths lie in its strategic location, modernizing infrastructure, and state support, while weaknesses include limited qualified personnel and the need for further environmental adaptation.

The results show that the TLS plays an essential role in enhancing Azerbaijan's economic competitiveness by facilitating trade, attracting investment, and reducing transaction costs. Strategic priorities include strengthening institutional coordination, digital transformation, human capital development, and the transition to green logistics. The study concludes that sustainable progress in Azerbaijan's transport and logistics system will depend on the effective integration of infrastructure modernization, innovation, and environmental policy. Future research should focus on developing quantitative models to measure the TLS's contribution to GDP growth and long-term economic sustainability.

Key words: transport and logistics system, logistics, socio-economic development, transport, logistics services.

Statement of the problem. Although Azerbaijan is an oil and gas producing country, with its primary source of income coming from oil and gas exports, in recent years the country has invested heavily in stimulating the development of sectors such as agriculture, alternative energy sources, tourism, and various industrial sectors. Azerbaijan has joined and initiated transport routes of regional and international significance, such as the Baku-Tbilisi-Kars, North-South, Trans-Caspian International Transport Route, Zangezur Corridor and others. These multi-million dollar projects envisage the development of the transport logistics market in Azerbaijan.

Transport logistics has always experienced rapid growth, but trends in this business sector are changing over time. The following five trends are clearly visible in the field of transport logistics: environmentally friendly delivery methods, comprehensive services from logistics companies, mobile warehouse operations, expedited deliveries, and the use of artificial intelligence to optimize delivery conditions. Currently, 50% of all logistics costs are spent on transport operations. Therefore, the transport and logistics process should be structured in such a way as to minimize transportation costs, while increasing the speed of delivery and minimizing damage to cargo during transportation [1].

The methodological basis of the study was the works of domestic and international economists on various aspects of assessing the state of transport logistics, as well as materials from specialized journals and periodicals. The article utilized general scientific research methods: statistical, comparative, and factor analysis, as well as a systems approach.

In today's environment, transport logistics, which is responsible for organizing the delivery of goods from one point to another at minimal cost and along an optimal route, is a dynamically developing industry. Given the highly competitive logistics market, the speed of cargo transportation is critical. Therefore, in many countries, it is important to develop optimal routes for cargo movement to prevent cargo from languishing in intermediate warehouses. But even with a perfectly planned cargo transportation route and without automated warehousing processes, cargo can become stuck mid-transit at an intermediate warehouse. Therefore, automation of transport logistics, environmentally friendly methods of cargo delivery, and the use of mobile robots in route planning are modern trends in the development of transport logistics.

Analysis of recent researches and publications. In recent decades, the transport and logistics system (TLS) has been recognized as a critical driver of sustainable economic growth, regional integration, and global competitiveness. Numerous international and regional studies have investigated the economic contribution of transport and logistics infrastructure to GDP growth, trade expansion, and investment attraction. However, despite the growing body of research, there remains no unified methodological approach to assessing the quantitative impact of logistics performance on national economies – particularly for emerging transit countries such as Azerbaijan.

According to Rodrigue and Notteboom [2], the TLS functions as a “circulatory system” of the economy, ensuring spatial interaction between production and consumption and directly affecting the efficiency of value chains.

The World Bank’s Logistics Performance Index (LPI) repeatedly confirms that higher logistics efficiency correlates with greater competitiveness and export potential [3]. Yet, these global studies often focus on advanced economies, while their implications for developing transit-oriented states require contextual adaptation. For Azerbaijan, which aspires to become a key logistics hub between Europe and Asia, the relevance of these findings is undeniable but demands empirical verification under national conditions.

Arvis et al. [4] and the OECD [5] emphasize that well-governed investment in transport infrastructure reduces transaction costs and enhances long-term productivity by improving accessibility, multimodal integration, and connectivity. Nevertheless, as several researchers note, infrastructure investment alone does not automatically ensure economic return unless accompanied by institutional reforms, trade facilitation, and digitalization of logistics processes.

In the post-pandemic and geopolitical context, the literature has increasingly focused on resilience and digital transformation. Ivanov and Dolgui [6] proposed a model of supply chain viability, highlighting flexibility and risk management as key resilience factors. This approach is particularly applicable to Azerbaijan, whose logistics sector faces both opportunities and vulnerabilities due to its participation in large-scale transnational initiatives such as the Middle Corridor and Zangezur Corridor.

From a regional perspective, empirical research confirms that Azerbaijan's TLS demonstrates stable progress supported by continuous investment in road and rail infrastructure. Cross-country data indicate that capital investment in transport infrastructure contributes significantly to expanding networks and electrification, yielding delayed but sustained effects on sectoral growth [7; 8]. However, comparative analyses also show that the effectiveness of such investments largely depends on governance quality, public-private partnership mechanisms, and the integration of digital technologies into logistics management.

The environmental dimension of transport logistics is also becoming increasingly important. Rushton, Croucher, and Baker [10] link green logistics initiatives – energy-efficient fleets, route optimization, and carbon footprint reduction – to national sustainability strategies. In Azerbaijan, strategic documents target a 35% reduction in greenhouse gas emissions by 2030, expansion of electric transport, and the integration of digital systems into transport planning [11–13]. Yet, the challenge lies in aligning ecological objectives with economic efficiency, ensuring that the “green transformation” of transport does not compromise sectoral competitiveness.

In summary, the reviewed literature demonstrates a multidimensional understanding of TLS development – combining infrastructure, digital, institutional, and environmental factors. Nevertheless, a research gap remains concerning the economic assessment of the TLS's direct and indirect contribution to Azerbaijan's national growth. Addressing this gap requires integrating international methodological approaches with local statistical evidence to determine how effectively the transport and logistics system stimulates GDP growth, trade expansion, and investment attraction in the national context.

The formulation of the objectives of the article. The objective of the article is to examine the theoretical foundations of the transport and logistics system, analyze the specific features of transport logistics in Azerbaijan, evaluate international experience, and propose strategies for improving the efficiency of the national transport and logistics system.

Statement of the main material of the research. By definition, a transport and logistics system is a set of elements (transport modes, infrastructure, information systems) that are interconnected and work together to efficiently and cost-effectively organize the movement of

material goods from the point of origin to the point of destination. An important goal of such a system is to ensure the delivery of goods at the right time, in the right quantity, and at minimal cost.

Key indicators for assessing the effectiveness of a transport and logistics system include: service quality; logistics costs; time spent on transportation; productivity; profitability; investment efficiency; and risk management [1].

At the same time, international studies on this issue [14-18] suggest the following set of stimulating factors influencing the transport and logistics system:

- Developed infrastructure: countries with advanced logistics systems invest in modern ports, airports, rail and road networks, ensuring fast and reliable delivery of goods.

- Innovation and technology: the active use of information systems, cargo tracking systems, automation and digitalization of processes allows for the optimization of routes and increased transparency of supply chains.

- Government support: governments of leading countries actively support the development of the logistics industry through investment in infrastructure, the creation of favorable regulatory conditions, and the stimulation of innovation.

- Effective integration: the ability to integrate various modes of transport (sea, air, rail) and create seamless supply chains is one of the key factors for success.

- Economic strength: the United States and China, as major economic powers, have a powerful logistics infrastructure commensurate with the scale of their economies and production.

- Stability and efficiency: despite its smaller size, Switzerland demonstrates high efficiency and stability in logistics thanks to its unique economic conditions and highly skilled workforce.

- Strategic geographic location: Germany is the hub of European logistics, Singapore is a key gateway to Asia, and the UAE is an important hub between Asia, Europe and Africa.

Based on an analysis of the motivating factors, we believe it makes the most sense to draw on the experience of countries that have succeeded in developing transport logistics. According to the World Bank's logistics ranking, the leading countries in transport logistics are

the United States, Germany, Japan, France, the Netherlands, China, and the United Kingdom.

These countries succeed thanks to their strategic advantages: developed infrastructure, location at the intersection of trade routes, the implementation of innovation and technology, government support, and the effective integration of various modes of transport [19].

The 2022 Review of Measures Taken to Stimulate Multimodal Transport between Asia and Europe [20] emphasizes that to increase freight volumes and, especially, to attract additional freight flows, it is advisable to apply not only direct investment in infrastructure projects but also comprehensive measures aimed at reducing transportation costs and increasing the competitiveness of transport.

However, it is necessary to take into account the fact that the effect of international transport facilitates international trade, contributes to the economic growth of countries, expanding sales markets for exporting countries and reducing costs for importing countries [21].

Regulation of the transport and logistics system in Azerbaijan

In the current development environment, regulation of Azerbaijan's transport and logistics system is carried out through regulatory legal acts establishing rules for the movement of goods, including customs legislation, taxation, and import/export control. Key regulatory factors include:

- Customs legislation. The state regulates the import and export of goods, sets customs tariffs, and determines the procedure for declaring currency and other valuables when crossing the border.

- Tax system. The state establishes taxes on vehicles and other logistics operations, influencing the cost of transportation and the investment attractiveness of the industry.

- Infrastructure development. The state actively participates in the development of transport infrastructure, regulating and encouraging the construction of ports, railways, and highways to optimize logistics chains and increase their efficiency.

- Creation of a favorable environment. The state regulates measures aimed at simplifying bureaucratic procedures, stimulating the influx of foreign investment, and strengthening the competitiveness of the national logistics industry.

- Regulatory support. In the area of regulation of the activities of all types of transport and logistics companies, a regulatory framework is developed and approved, including laws, regulations, and orders.

An assessment of the development of transport logistics in Azerbaijan

The Republic of Azerbaijan was one of the founding members of the international TRACECA program and currently actively supports all initiatives. In order to implement a unified, flexible, and transparent tariff policy for transit cargo transportation through Azerbaijan via railways, maritime transport, seaports, and marine terminals, and to simplify border crossing procedures and transportation processes, the Coordination Council for Transit Cargo Transportation was established in October 2015 by Decree of the President of the Republic of Azerbaijan. It was empowered to act as a single government agency for the implementation of the “Single Window” principle for transit cargo transportation. In December 2016, the government of Azerbaijan approved the “Strategic Roadmaps for the National Economy and Key Economic Sectors” [22].

The main goal is to utilize the country's strategically advantageous location at the intersection of trade routes from the north, south, east, and west to promote domestic investment, ensure free trade and open competition, enhance human resources, and develop other areas for the development of non-oil sectors.

Target indicators for the development of the transport sector are contained in the “Strategic Roadmap for the Development of Logistics and Trade in Azerbaijan” [23] and divided into three stages: short-term (2016-2020), medium-term (2021-2025), and long-term (from 2025). The Ministry of Transport, Communications, and High Technologies of Azerbaijan, which, along with the Ministry of Economy, is responsible for implementing the tasks outlined in the sectoral Roadmap, noted that Azerbaijan's transit transport policy, as a landlocked country, is aimed at creating new infrastructure and diversifying transport links, rationally utilizing transit opportunities, providing state support for transport projects, bringing the legal and institutional framework closer to international standards, and the widespread implementation of transport and logistics systems that facilitate the transportation and movement of goods.

Azerbaijan's transport and logistics system is actively developing, particularly as part of its strategy to transform the country into a major transit hub, which contributes to GDP growth, attracts investment, creates new jobs, and strengthens trade ties. Key elements of this system include a well-developed road network, railways connecting major cities

and ports on the Caspian Sea, and expanded airport infrastructure. The system is focused on using digital technologies to optimize freight transportation, reduce costs, and develop international transit, particularly through projects such as the East-West Transport Corridor.

Freight transportation along Azerbaijan's transport corridors is carried out along key routes, including the TRACECA transport corridor, the East-West corridor linking Asia and Europe via the Caspian Sea, and the North-South corridor connecting Russia with Iran and further afield. The main modes of transport are sea, rail, and road [24].

To comprehensively assess the dynamics of Azerbaijan's transport and logistics sector, it is essential to analyze quantitative indicators of freight transportation by mode of transport over recent years. This analysis helps to identify structural changes in cargo flows, evaluate the efficiency of different transport modes, and determine their contribution to the country's overall transport performance. The statistical data summarized in Table 1 illustrate the distribution and dynamics of freight transportation in Azerbaijan between 2020 and 2024.

Table 1

**Freight transportation in the transport sector of Azerbaijan
by type of transport, thousand tons**

Freight transportation by type of transport	2020	2021	2022	2023	2024
Total	188629	193903	218716	229897	238886
Railway	14631	15058	18730	18276	18565
Sea	5982	5468	7519	9011	8622
Air	458	557	407	357	419
Pipeline:	111318	112522	126025	134216	143477
Oil pipeline	56040	60298	66035	68037	67803
Gas pipeline	34720	35018	37782	39753	38752
Road transport	21320	25280	28253	28284	29051

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

As Table 1 shows, freight transportation volumes in Azerbaijan increased by 1.2 times between 2020 and 2024. Moreover, during the period under review, road transport accounted for the largest share of freight. In 2024, 60 % of total freight was shipped by road, 28.4 % by pipeline, 7.8 % by rail, 3.6 % by sea, and 0.2 % by air.

As shown in Fig. 1, the dynamics of freight transportation by different modes in Azerbaijan demonstrate a steady upward trend, particularly in road and oil pipeline transport, which show the highest growth rates during 2020–2024.

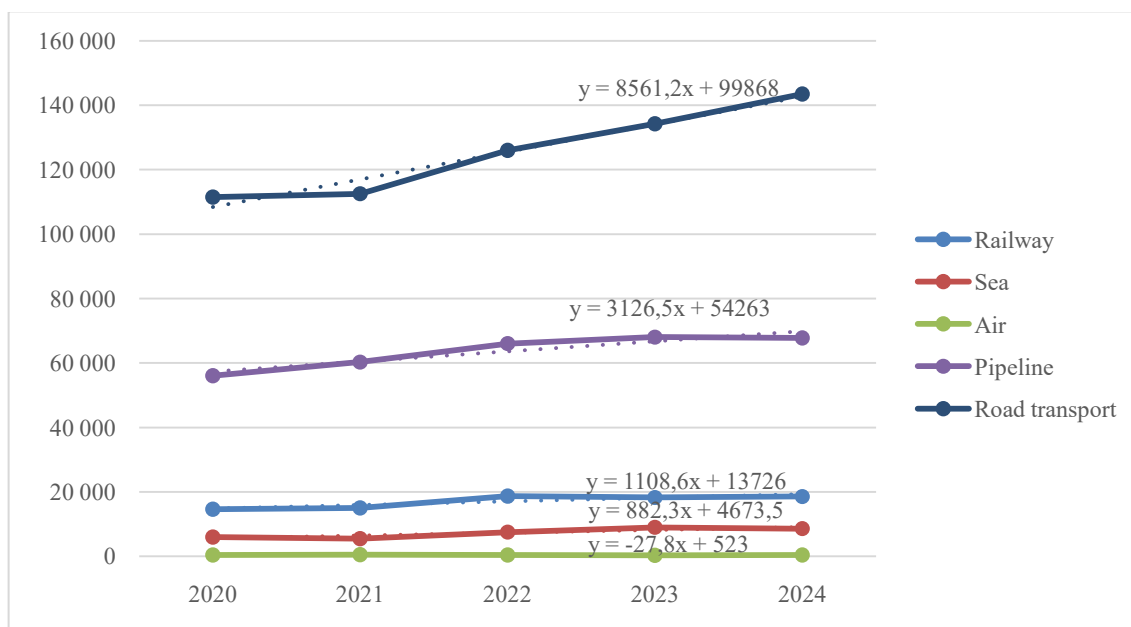


Fig. 1. Dynamics of freight transportation in Azerbaijan by mode of transport, 2020–2024, thousand tons

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

It should be noted, that freight transportation costs include freight, loading and unloading fees, forwarding services, as well as customs duties and additional expenses such as storage, warehousing, and insurance.

The main factors influencing transportation costs are distance, cargo type, mode of transport, and the availability of additional services.

The analysis of freight transportation dynamics should be complemented by an assessment of cost efficiency across transport modes. Understanding the cost structure of freight operations allows identifying the most and least resource-intensive types of transport and evaluating their contribution to the overall economic performance of the sector. A summary of transport cost data is presented in Table 2.

As Table 2 shows, sea freight has the lowest cost compared to other modes of transportation. In 2024, total transportation costs amounted to 4,021.9 million manats, an increase of 36.6 million manats compared to

2023. The analysis of transport cost distribution by mode of transport is presented in Fig. 2.

Table 2

Costs of freight transportation in the transport sector, thousand manats

Freight transportation by type of transport	2020	2021	2022	2023	2024
Total	3382887	4468545	5192048	3546099	4021903
Railway	273927	247469	251589	326202	427422
Sea	165743	173744	217667	202304	211906
Air	2354497	2831815	3323161	1835553	2123704
Pipeline:	411830	1021213	1158408	925185	901346
Oil pipeline	243661	240720	218571	256391	301801
Gas pipeline	168169	780493	939837	668794	599545
Road transport	176890	194304	241223	256855	357525

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

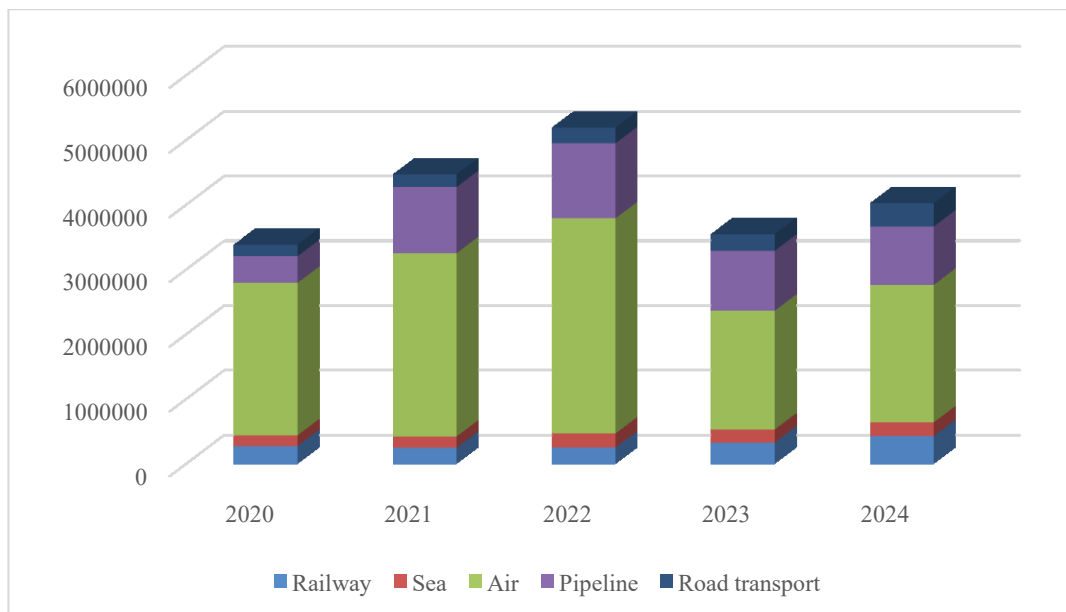


Fig. 2. Dynamics of total transport costs in Azerbaijan by mode of transport, 2020–2024, thousand manats

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

As shown in Fig. 2, total transport costs in Azerbaijan during 2020–2024 demonstrate notable fluctuations. Air transport consistently represents the largest share, accounting for more than half of total expenditures, while pipeline transport shows moderate and stable cost

levels. Meanwhile, rail and road transport costs have been steadily increasing, reflecting rising operational expenses and infrastructure maintenance. Such dynamics suggest a gradual shift toward enhancing cost efficiency and strengthening multimodal integration in Azerbaijan's transport system. Despite the overall decline in total transportation costs after 2022, freight volumes have continued to grow steadily (Table 1), indicating higher operational productivity and more efficient resource utilization. This trend reflects the expanding use of modern infrastructure, digital management tools, and multimodal transport solutions, which together contribute to reducing unit transportation costs while supporting sustainable sector growth.

Freight transportation revenues consist of freight charges, additional fees, and services. The detailed distribution of revenues by mode of transport is presented in Table 3.

Table 3

Income from freight transportation in the transport sector, thousand manats

Freight transportation by type of transport	2020	2021	2022	2023	2024
Total	6093602	7390633	8633943	7292103	8097298
Railway	270579	282914	394140	430317	424006
Sea	167859	175601	242634	248998	239032
Air	2691846	3240291	3642938	2152229	2657351
Pipeline	2323741	3049506	3567157	3617825	3765682
Oil pipeline	1127013	1197650	1238914	1101742	1058073
Gas pipeline	1196728	1851856	2328243	2516083	2707609
Road transport	639577	642321	787074	842734	1011227

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

As Table 3 shows, sea freight generates the lowest revenue compared to other modes of transportation. In 2025, total transportation revenue across all modes amounted to 11,522 million manat, an increase of 15.9 million manat compared to 2024. It should be noted that although rail transport carries a large volume of cargo, revenue from rail transportation is lower than that from air and road transport. The dynamics of freight transportation revenues by transport mode in Azerbaijan for the period 2020–2024 are visualized in Fig. 3, which illustrates the structural shifts and growth trends across the analyzed years.

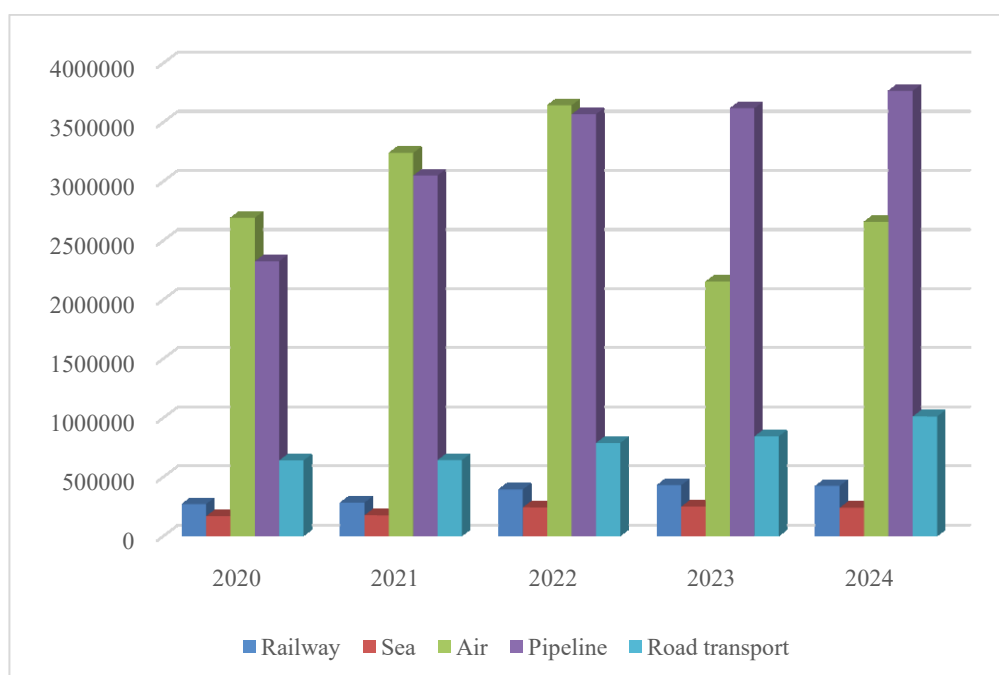


Fig. 3. Revenue from freight transportation in Azerbaijan by mode of transport, 2020–2024, thousand manats

Source: compiled by the authors based on data from Azerbaijan Transport Statistics [25]

As can be seen from Fig. 3, the overall structure of freight revenues in Azerbaijan's transport sector remains dominated by pipeline and air transport, which together account for the majority of total income. The steady growth of road transport revenues indicates an increase in domestic logistics activity and diversification of freight flows, while the relatively low share of sea transport suggests the need for further development of maritime infrastructure and port services.

Freight transportation within Azerbaijan's regions is carried out by transport companies offering delivery services by various modes of transport: road, rail, water, and air, as well as through specialized platforms for finding carriers. The choice depends on the type of cargo, its volume, and the urgency of delivery [26].

Rail transportation. In Azerbaijan, this includes passenger and freight transportation, covering an extensive network of roads connecting Baku with other cities in the country and also forming part of international corridors such as the Europe-Caucasus-Asia (TRACECA) corridor. Freight transportation is characterized by the transportation of a wide range of goods, while passenger transportation covers routes to neighboring countries.

Key Features:

- Developed network: Azerbaijan has one of the largest broad-gauge railway networks (1520 mm) in the Caucasus, with a total length of 2,125 km, of which 1,278 km are electrified.

- Passenger transportation: trains connect the capital Baku with regional centers such as Ganja, as well as with other countries, such as Russia (Moscow, St. Petersburg), Ukraine (Kyiv, Kharkov), and Georgia (Tbilisi).

- Freight transportation: rail transport is used to transport a variety of goods, including automobiles, petroleum products, grain, and construction materials, as well as to create transit corridors.

- Transit potential: Azerbaijan Railways plays an important role in the transit of goods along the international corridor Europe-Caucasus-Asia (TRACECA), connecting the countries of the Caucasus, Europe, and Asia.

- Current development: work is underway to modernize the railway infrastructure, including improvements to the Baku-Astara section.

- Important nodes: Baku is a major industrial and economic center, as well as a key transportation hub where domestic and international routes intersect.

Road transportation in Azerbaijan includes both domestic and international freight and passenger transportation, carried out by 208 commercial carriers. The country has a well-developed road network, including highways. Special conditions apply for international transportation, such as electronic permits for transportation between Turkey, Uzbekistan, and Kyrgyzstan [11].

Key features of road transportation in Azerbaijan include an extensive road network, including highways and expressways, the flexibility and efficiency of door-to-door delivery, and the need to adhere to strict restrictions on the size and weight of vehicles, which requires obtaining special permits. Important aspects also include the ability to handle international transportation, including groupage cargo, consideration of climatic conditions, environmental requirements, and customs clearance requirements.

Infrastructure and Roads:

- Extensive network: Azerbaijan has over 60,000 km of roads, including modern highways and expressways, as well as regular roads connecting cities within the country and with neighboring countries.

- Key highways: highways such as the M-1 (Baku-Guba), M-2 (Baku-Alat-Ganja), and M-3 (Alat-Astara) are of strategic importance, connecting major transport hubs and borders.

Sea freight through the Port of Baku is primarily handled within the Caspian Sea, as well as via bulk carriers and ferries. The country's main port, Alat, is located on the Caspian coast and has 12 berths for various types of vessels, including bulk carriers and ferries. There are also large oil terminals in Dubendi and Sangachal. Air freight from Azerbaijan is available for both passengers and cargo, with the main departure airports in Baku (GYD) and Ganja (KVD). Freight shipments are handled by logistics companies offering shipping, customs clearance, and warehousing services, using scheduled flights for fast delivery. These services enable fast cargo delivery to Russia and other countries, including Moscow, St. Petersburg, Tbilisi, Sharm el-Sheikh, Tehran, and other cities. To arrange air freight, contact logistics companies that offer delivery and customs clearance services and can select the optimal rate.

Evaluation of the current state of transport logistics in Azerbaijan

An important aspect of transport logistics is reducing the negative environmental impact of cargo transportation through the application of environmentally friendly practices, such as sustainable transport and route optimization. In the context of Azerbaijan, this area is actively developing, especially given the country's commitment to sustainable development and participation in international environmental initiatives, including "green" trade and transport [27, 28].

In this regard, the transition to low-emission transport modes, the modernization of logistics infrastructure, and the integration of digital management systems are becoming key strategic priorities. These measures contribute not only to environmental sustainability but also to improving the efficiency and competitiveness of the national logistics system. To better analyze the current state of transport logistics and identify key internal and external factors influencing its development, a comprehensive SWOT analysis was conducted (Table 4).

As Table 4 shows, given the availability of railway lines and its advantageous geographic and historical location, it is quite feasible for the Republic of Azerbaijan to expand freight transportation, gaining momentum in strictly economic terms and increasing the efficiency of railway terminals. Rail transport allows for the large-scale transportation of oversized cargo, given its low-cost, low-cost nature and the ability to transport it over long distances.

Table 4

SWOT analysis of the transport and logistics sector in Azerbaijan

<i>Strengths</i>	<i>Opportunities</i>
<p>1. The country's strategic geographic and historical location for freight transit between Europe and Asia, including the East-West and North-South corridors.</p> <p>2. Access to railway infrastructure and the establishment of railway connections with neighboring countries.</p> <p>3. The implementation of a number of key infrastructure projects in the country.</p> <p>4. The construction of new ports, railways, and hubs facilitates the development of logistics services.</p> <p>5. The legislative enshrinement of various preferential mechanisms.</p> <p>6. The country's authorities are interested in developing the transport and logistics sector and attracting investment.</p>	<p>1. Opportunities for creating added value for transit cargo;</p> <p>2. The possibility of establishing a free economic zone within the Baku International Sea Trade Port and a logistics hub within the Heydar Aliyev International Airport;</p> <p>3. State support for the development of logistics and trade in the country;</p> <p>4. Opportunities to attract foreign investors to implement planned projects;</p> <p>5. The country's favorable geographic location and the potential to become a regional logistics and trade hub;</p> <p>6. Increased trade volumes and increased competition in the region and globally;</p> <p>7. Proximity to major regional markets;</p> <p>8. Investments in solar and wind energy can provide "green" energy for logistics operations [28]</p> <p>9. The growing global trend toward environmentally sustainable transportation is creating demand for cleaner modes of transport.</p>
<i>Weaknesses</i>	<i>Threats</i>
<p>1. Insufficient supply of qualified personnel in the logistics sector;</p> <p>2. Low potential cargo capacity of vessels navigating the Caspian Sea basin;</p> <p>3. The prevalence of windy days in the Caspian Sea and the shallow sea depth.</p> <p>4. Some sections of the transport infrastructure require modernization to meet modern environmental standards.</p>	<p>1. Delays in completing infrastructure projects;</p> <p>2. High costs for small-scale shipments.</p> <p>3. Complexity of cargo clearance.</p> <p>4. External risks.</p> <p>5. High costs of railway construction and relatively slow return on investment.</p> <p>6. Azerbaijan competes with other countries in the region for investment and transit cargo.</p> <p>7. Global economic instability and downturns could lead to a decline in cargo flow, which will negatively impact the development of green logistics.</p>

In the future, Azerbaijan will continue to modernize its railway infrastructure, implementing digital technologies to improve traffic management and enhance service levels. Particular attention will be paid to the development of international transport corridors, which will allow the country to strengthen its position in the global transportation services market.

In summary, the transport and logistics system of Azerbaijan demonstrates significant progress in developing multimodal infrastructure and strengthening its position as a key transit hub between Europe and Asia. The implemented reforms, modernization of port and railway infrastructure, and the government's active policy toward international integration have created a solid foundation for sustainable growth. Nevertheless, based on the findings of previous studies [24; 26–33], the analysis reveals that to achieve long-term competitiveness and environmental sustainability, further strategic measures are required.

First, it is essential to strengthen the institutional framework for transport and logistics management by fostering coordination between ministries, private operators, and international partners. Establishing an integrated logistics coordination center could improve transparency, optimize cargo flows, and enhance the monitoring of environmental performance indicators.

Second, investment in digitalization should become a core strategic direction. The development of a unified digital logistics platform integrating customs, port, and railway operations would allow for real-time cargo tracking, reduce administrative barriers, and facilitate data exchange within international corridors.

Third, human capital development remains a critical challenge. The creation of specialized educational and training programs in logistics and supply chain management – aligned with international standards – will ensure the availability of qualified personnel capable of managing complex multimodal systems and implementing “green” logistics principles.

Fourth, the transition to environmentally sustainable logistics requires an integrated approach combining infrastructure modernization, incentives for low-emission vehicles, and the use of renewable energy in transport operations. Introducing a system of “green certificates” for logistics companies could stimulate eco-innovation and align national practices with the European Green Deal.

Finally, Azerbaijan should enhance regional cooperation within the Trans-Caspian International Transport Route and the Middle Corridor by

harmonizing customs procedures, improving cross-border interoperability, and promoting the country as a reliable partner in global supply chains. Such initiatives will strengthen Azerbaijan's strategic role as a bridge between East and West, ensuring sustainable growth, competitiveness, and environmental balance in its transport logistics system.

The conducted assessment confirms that the development of Azerbaijan's transport and logistics system has a measurable economic impact, strengthening its role as a regional growth driver. The following conclusions summarize the key research findings.

Conclusions. The transport and logistics system contributes significantly to Azerbaijan's national economic growth by increasing GDP through trade facilitation, reducing transaction costs, and improving export competitiveness. The sector's share in gross value added and investment attraction has shown a steady upward trend, confirming its role as a strategic driver of diversification and sustainable economic development.

The conducted analysis confirms that Azerbaijan's transport and logistics system is actively developing, relying on the country's advantageous geopolitical position as a transit hub for the East–West and North–South corridors. Key factors include the modernization of port infrastructure, the development of rail and road transport, the introduction of digital technologies for flow management, and the creation of favorable conditions for attracting investment in the logistics sector. The system's effectiveness also depends on deeper integration with international logistics networks and improvements to the legislative framework aimed at simplifying transit cargo procedures.

The main research findings can be summarized as follows:

1. Azerbaijan's unique geopolitical location makes it a key link in international transport corridors, particularly within the TRACECA (Transport Corridor Europe-Caucasus-Asia).

2. Active modernization and development of port, rail, and road infrastructure is underway, including the construction of new terminals, expansion of the road network, and the renewal of rolling stock.

3. The introduction of digital platforms and modern information systems for managing logistics operations contributes to increased efficiency, transparency, and speed of cargo transportation.

4. Further growth of the logistics sector requires continuous investment in the creation and modernization of logistics centers and warehouse complexes.

5. Improving the regulatory framework and simplifying customs procedures are important factors for attracting transit cargo and creating a favorable investment climate in logistics.

6. Further integration of Azerbaijan into global transport and logistics networks will maximize its transit potential and enhance the country's competitiveness.

7. Active development of multimodal transportation, combining rail, road, sea, and air transport, increases the flexibility and efficiency of the system.

Future research should focus on developing a quantitative model to measure the direct and indirect contribution of the transport and logistics system to Azerbaijan's GDP, employment, and trade performance. Such an approach would provide deeper insights into the long-term economic efficiency of transport and logistics investments.

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ЕКОНОМІЧНА ОЦІНКА ВНЕСКУ ТРАНСПОРТНО-ЛОГІСТИЧНОЇ СИСТЕМИ У НАЦІОНАЛЬНЕ ЕКОНОМІЧНЕ ЗРОСТАННЯ

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***Анотація.** У статті представлено всебічний аналіз транспортно-логістичної системи (ТЛС) Азербайджанської Республіки як стратегічного чинника сталого економічного зростання та диверсифікації національної економіки. Дослідження висвітлює зусилля держави, спрямовані на розвиток не нафтогазових секторів і трансформацію вигідного географічного положення країни у ключовий транзитний вузол між Європою та Азією шляхом реалізації масштабних інфраструктурних проєктів, зокрема транспортних коридорів Баку–Тбілісі–Карс, «Північ–Південь», Транскаспійського та Зангезурського. Метою дослідження є оцінка інституційних, інфраструктурних, економічних і екологічних чинників, що впливають на ефективність функціонування та конкурентоспроможність ТЛС Азербайджану.*

Методологічну основу роботи становлять наукові праці вітчизняних і зарубіжних учених, а також статистичний, порівняльний і факторний аналіз із використанням національних транспортних даних за 2020–2024 рр. У статті визначено основні глобальні тенденції розвитку логістичного сектору, серед яких цифровізація, автоматизація, екологізація технологій та розвиток мультимодальної інтеграції. Кількісний аналіз обсягів, вартості та доходів від вантажоперевезень за видами транспорту засвідчив стабільне зростання автомобільних і трубопровідних перевезень, що сприяє підвищенню операційної ефективності попри коливання витрат. Результати SWOT-аналізу підтверджують, що ключовими перевагами Азербайджану є стратегічне розташування, модернізована інфраструктура та державна підтримка, тоді як слабкими сторонами залишаються обмежений кадровий потенціал і потреба в подальшій екологічній адаптації галузі.

Отримані результати свідчать, що ТЛС відіграє провідну роль у підвищенні економічної конкурентоспроможності Азербайджану шляхом сприяння торгівлі, залучення інвестицій та зниження транзакційних витрат. Серед стратегічних пріоритетів визначено зміцнення інституційної координації, цифрову трансформацію, розвиток людського капіталу та перехід до «зеленої» логістики. Зроблено висновок, що сталий прогрес транспортно-логістичної системи Азербайджану залежатиме від ефективної інтеграції процесів модернізації інфраструктури, інновацій та екологічної політики. Перспективи подальших досліджень пов'язані з розробленням кількісних моделей оцінки внеску ТЛС у зростання ВВП і довгострокову економічну стійкість країни.

Ключові слова: транспортно-логістична система, логістика, соціально-економічний розвиток, транспорт, логістичні послуги.

