

KAZAKHSTAN'S TRANSPORT AND LOGISTICS POTENTIAL IN THE CONTEXT OF CHANGING INTERNATIONAL TRADE ROUTES

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Abstract

The purpose of this study is to assess Kazakhstan's transport and logistics potential amid the transformation of international trade routes and to identify the main directions for strengthening its role as a Eurasian transit hub. The research applies statistical, comparative, systemic, and structural analysis, together with a comparison of freight volumes, transit times, and capacity indicators across major international transport corridors. The information base includes data from the Bureau of National Statistics of the Republic of Kazakhstan, official government materials, and reports published by the World Bank, the OECD, and other international organizations. The findings indicate that geopolitical instability, increased risks associated with the Northern Corridor through Russia, and disruptions to shipping in the Red Sea have stimulated demand for alternative routes crossing Kazakhstan. The rapid development of the Trans-Caspian International Transport Route, the expansion of the Aktau and Kuryk seaports, railway infrastructure modernization, and the digitalization of customs procedures are strengthening Kazakhstan's competitive position in Eurasian logistics. However, the study identifies several constraints, including infrastructure bottlenecks, insufficient coordination between transport modes, inconsistent tariffs, lengthy border procedures, and risks associated with the declining level of the Caspian Sea. The study concludes that the full utilization of Kazakhstan's transit potential requires further development of multimodal infrastructure, deeper digital integration, coordinated international tariff policies, improved logistics services, and greater private investment in transport facilities.

Keywords:

Transport and logistics potential, international trade routes, international transport corridors, Trans-Caspian International Transport Route, transit transportation.

Authors' individual contribution:

Conceptualization — Z.B.; Methodology — Z.B.; Data Collection — Z.B.; Data Analysis — Z.B.; Interpretation — Z.B.; Writing — Original Draft — Z.B.; Writing — Review & Editing — Z.B.; Visualization — Z.B.; Supervision — Z.B.; Funding Acquisition — Z.B.

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1. Introduction

The geography of international trade is undergoing a significant transformation. Geopolitical tensions, sanctions, armed conflicts, disruptions to maritime transport, climate-related risks, and growing uncertainty in global supply chains have increased the importance of route diversification and transport resilience. For governments, carriers, and international businesses, the efficiency of a transport corridor is increasingly determined not only by distance and transportation costs, but also by the reliability of border procedures, infrastructure capacity, multimodal connectivity, digital interoperability, and the ability to maintain stable freight flows during external disruptions. As a result, alternative land-based and multimodal corridors connecting Asia and Europe have acquired greater strategic and economic importance. In this context, the Trans-Caspian International Transport Route, or Middle Corridor, is gaining strategic importance as a link between China, Central Asia, and Europe. According to the World Bank, coordinated investment and policy reforms could triple freight volumes along the route and halve travel time by 2030 (World Bank, 2023).

Kazakhstan occupies a central position within this evolving transport architecture. Its geographical location between China, Russia, the Caspian region, and the markets of Central Asia allows the country to participate simultaneously in major east–west and north–south transport corridors. An extensive railway network, road infrastructure, the Caspian ports of Aktau and Kuryk, border crossings with China, and growing logistics and terminal capacity provide a substantial physical basis for the country’s transit specialization. At the same time, geographical location alone does not create a sustainable competitive advantage. The economic value of transit depends on the capacity and utilization of infrastructure, the speed and predictability of freight movement, coordination between transport modes, the efficiency of customs and border procedures, tariff consistency, and the capacity of the domestic economy to generate value added from international freight flows.

The relevance of the study is reinforced by the national goal of transforming the country into a leading logistics hub between Europe and Asia. In 2026, new road projects with a total length of 774 kilometers were announced, expected to create more than 10,000 jobs and increase annual freight traffic to 13.2 million tonnes by 2029. Therefore, the purpose of this study is to assess Kazakhstan’s transport and logistics potential and identify the measures required to strengthen its competitiveness under changing international trade conditions.

From a research perspective, existing studies provide valuable insights into individual components of this process, including transport infrastructure, international corridors, regional cooperation, digital logistics, multimodal transportation, and supply-chain resilience. However, these dimensions are frequently examined separately. Relatively limited attention has been devoted to an integrated assessment of how the transformation of international trade routes is reflected simultaneously in Kazakhstan's transit performance, transport and warehousing activity, infrastructure utilization, railway and port capacity, containerization, digitalization, and the spatial distribution of logistics activity. This creates a need for an empirical assessment that connects observable changes in transport-sector indicators with the institutional and infrastructural transformation currently taking place in the country.

The present study addresses this gap through a descriptive-analytical and comparative assessment of Kazakhstan's transport and logistics potential in the context of changing international trade routes. Rather than treating transit potential solely as a consequence of geographical location or infrastructure availability, the study considers it as a multidimensional capacity shaped by freight dynamics, infrastructure utilization, multimodal connectivity, institutional arrangements, digitalization, and integration with international transport networks. The quantitative analysis focuses primarily on official statistical data for 2021–2025, while information for 2026 is used to characterize recently announced infrastructure projects and policy measures.

Accordingly, the purpose of this study is to assess Kazakhstan's transport and logistics potential under the transformation of international trade routes and to identify the principal factors that strengthen or constrain its competitiveness as a Eurasian logistics hub. The study is guided by the following research questions:

1. How have recent changes in international trade routes affected Kazakhstan's transport and logistics performance and transit role?
2. Which infrastructural, institutional, and digital factors currently strengthen or constrain Kazakhstan's development as a Eurasian logistics hub?

2. Literature Review

Academic research considers Central Asia's transport and logistics system an important component of the changing architecture of international trade. Khasanov and Nurmetova (2022) argue that the gradual shift of global economic activity towards Asia increases the importance of Central Asian countries in international production, trade, and supply chains. However, the region's transit potential remains underutilized because of high transportation costs, inadequate infrastructure, limited access to maritime routes, and insufficient coordination of cross-border procedures.

Kazakhstan has a particularly important position in this system due to its extensive railway network and location at the intersection of Eurasian transport corridors. Kulyntay et al. (2025) examine Central Asia's transport and communication potential from the perspective of European Union interests and conclude that the competitiveness of regional corridors depends on infrastructure development, route diversification, customs simplification, harmonized technical standards, and digital integration. Similarly, Augan et al. (2025) demonstrate that international transport corridors contribute not only to trade and investment but also to economic security, geopolitical stability, employment, and regional integration. Verchenkova and Volkovich (2026) further characterize Kazakhstan's transport and transit potential as a multifunctional catalyst for Eurasian integration and economic growth.

Another group of studies focuses on the operational and institutional constraints affecting logistics cooperation. Cui and Valentinovna (2025) identify regulatory differences, inconsistent standards, administrative procedures, and insufficient institutional coordination as major barriers to transport and logistics cooperation between China and Kazakhstan. These constraints increase transaction costs and prevent the full utilization of growing bilateral freight flows. Osmonkulova et al. (2025), analyzing agricultural foreign trade in Kyrgyzstan, establish a strong positive relationship between investment in logistics infrastructure and foreign trade turnover. Their findings show that modern transport, storage, and logistics facilities can reduce costs and improve the export competitiveness of agricultural products, while bureaucratic barriers continue to limit integration into global supply chains.

Although the study focuses on Kyrgyzstan, its conclusions are relevant to Kazakhstan and the wider Central Asian region. Using agent-based simulation, Khussanov et al. (2025) provide a more detailed assessment of Kazakhstan's multimodal transport system. Their model integrates railway, road, maritime, terminal, and border-crossing operations and demonstrates that congestion at terminals and checkpoints directly affects delivery times, vehicle utilization, and logistics-hub capacity.

The latest research increasingly emphasizes digital transformation and supply-chain resilience. Imasheva et al. (2026) examine the implementation of digital platforms, the Internet of Things, tracking technologies, and intelligent transport systems in Kazakhstan. The authors conclude that digitalization can optimize routes, improve cargo visibility, reduce operating costs, and strengthen coordination among logistics participants.

At the same time, its wider implementation is constrained by high financing costs, insufficient digital competencies, and the absence of unified regulatory and standardization frameworks. Kamysbayeva et al. (2026) analyses agricultural intermodal logistics under changing export demand

and infrastructure constraints through a hybrid model combining system dynamics and discrete-event simulation. Their results show that reductions in transport or border capacity lead to cargo accumulation, unfulfilled export demand, and lower service levels.

Despite these contributions, the reviewed studies generally examine geopolitical, institutional, infrastructural, agricultural, or digital dimensions separately. The literature still lacks an integrated economic assessment of how changing international trade routes affect Kazakhstan's transit flows, infrastructure utilization, containerization, non-resource exports, regional development, and domestic value creation.

Overall, the reviewed studies show that Kazakhstan and the wider Central Asian region possess significant transport and logistics potential, but its realization remains constrained by infrastructure bottlenecks, high transport costs, fragmented regulation, insufficient cross-border coordination, limited multimodal integration, and uneven digitalization. Existing research also demonstrates that transport corridors can support trade, investment, regional integration, economic security, and supply-chain resilience, while recent studies increasingly emphasize the role of digital platforms, intelligent transport systems, and intermodal infrastructure in improving logistics performance.

However, the literature remains fragmented: geopolitical, institutional, infrastructural, agricultural, and digital dimensions are generally examined separately, while relatively little attention is paid to their combined impact on Kazakhstan's changing role within Eurasian trade routes. In particular, there is a lack of an integrated descriptive-analytical assessment linking changes in transit flows, transport and warehousing output, railway and port capacity, containerization, infrastructure modernization, digitalization, and regional concentration of logistics activity. The present study addresses this gap by providing a comprehensive assessment of Kazakhstan's transport and logistics potential under the transformation of international trade routes. Accordingly, the study is guided by the following research questions:

- (1) How have recent changes in international trade routes affected Kazakhstan's transport and logistics performance and transit role?
- (2) Which infrastructural, institutional, and digital factors currently strengthen or constrain Kazakhstan's development as a Eurasian logistics hub?

3. Materials and Methods

This study adopts a descriptive-analytical and comparative research design to assess Kazakhstan's transport and logistics potential under the transformation of international trade routes. The quantitative component is based primarily on official statistical data for 2021–2025, while

information for 2026 is used to characterize recently announced infrastructure projects, policy measures, and sectoral development targets rather than as part of the historical statistical series. The main data sources include the Bureau of National Statistics of the Republic of Kazakhstan, the Ministry of Transport, the Ministry of Trade and Integration, the World Bank, the WTO, the Asian Development Bank, and peer-reviewed academic publications.

The quantitative analysis focuses on the dynamics and structure of transport-sector indicators. It includes absolute and relative changes, year-on-year growth rates, compound annual growth rates, regional shares, freight-volume dynamics, container-throughput growth, and comparisons of railway capacity and capacity utilization along selected sections of the Middle Corridor (ADB, 2024). These indicators are used to identify the scale, direction, concentration, and infrastructure constraints of transport and logistics development. In particular, changes in gross output of transport and warehousing services are assessed both nationally and regionally, while railway, maritime, container, and transit indicators are compared across time and infrastructure segments.

The quantitative assessment is complemented by comparative and qualitative document analysis. Official transport-development programmes, infrastructure announcements, corridor-development initiatives, digitalization measures, and international institutional reports are examined to identify the principal factors affecting Kazakhstan's competitiveness as a Eurasian transit hub. The study therefore does not attempt to estimate causal relationships between infrastructure investment and freight flows. Instead, it evaluates observable statistical trends together with institutional and infrastructural developments and interprets their implications for transport capacity, connectivity, and logistics performance.

4. Results

The results demonstrate that Kazakhstan's transport sector continued to expand in 2025, strengthening the country's position within the changing system of Eurasian trade routes. Total transit freight reached 36.9 million tonnes, representing an increase of 6.6% compared with 34.6 million tonnes in 2024. This growth reflects the coordinated development of railway, road, maritime, and air transport, as well as the expansion of international logistics cooperation. Kazakhstan's participation in the East–West, North–South, and Trans-Caspian corridors enables the country to diversify transit flows and reduce dependence on a single geographical direction.

The growing economic importance of the transport and logistics sector is also reflected in its output dynamics. According to the Bureau of National Statistics of the Republic of Kazakhstan, the gross output of transport and warehousing services increased from approximately KZT 6.1 trillion in 2021 to KZT 12.0 trillion in 2025, representing an increase of nearly 98% over the period. This

sustained expansion reflects the growing role of transport and logistics in national economic activity and provides a consistent statistical basis for the regional analysis presented in Table 1. Separately, the Ministry of Transport reported that the gross output of the transport industry is expected to reach KZT 14.3 trillion in 2026, indicating the continuation of strong sectoral growth.

Table 1. Gross Output of Transport and Warehousing Services by Region, 2021–2025, KZT million

Region	2021	2022	2023	2024	2025
Republic of Kazakhstan	6 070 568,6	6 824 513,2	8 245 397,7	9 422 568,8	12 007 955,8
Abay	106 236,0	121 275,4	134 135,7	185 671,2	219 108,0
Akmola	148 509,6	174 049,8	216 648,7	268 608,3	334 940,4
Aktobe	278 987,1	354 551,9	413 926,6	488 085,7	546 937,9
Almaty	365 524,4	380 937,9	389 924,6	502 879,0	297 000,2
Atyrau	651 319,1	591 412,2	608 867,6	709 003,4	858 528,4
Batys Kazakhstan	147 130,3	150 470,8	172 959,4	217 110,7	235 469,5
Zhambyl	472 701,0	476 706,1	533 045,6	563 442,0	295 295,2
Zhetisu	143 038,7	153 078,9	150 790,4	220 751,4	224 038,9
Karagandy	220 428,6	308 889,4	351 473,0	426 869,2	588 876,5
Kostanay	208 343,6	267 934,6	275 856,3	338 130,5	521 669,9
Kyzylorda	260 610,4	253 610,3	270 920,4	294 609,2	276 533,8
Mangystau	441 823,1	385 395,2	451 090,0	527 067,3	539 341,9
Pavlodar	147 658,0	181 846,8	238 072,0	299 790,6	372 501,8
Soltustik Kazakhstan	168 028,1	229 870,5	219 436,2	233 675,9	303 320,8
Turkistan	427 914,4	426 647,5	423 753,0	486 942,3	280 559,6
Ulytau	73 792,5	75 154,5	103 715,2	190 979,1	191 843,9
Shygys Kazakhstan	73 863,9	96 330,4	115 334,8	147 502,3	159 453,5
Astana city	853 296,9	972 761,5	1 709 297,5	1 638 667,6	2 106 660,5
Almaty city	751 092,1	1 042 590,0	1 231 445,4	1 403 948,5	3 219 852,3
Shymkent city	130 270,9	180 999,3	234 705,3	278 834,7	436 023,2

Source: Compiled by the author based on data from the Bureau of National Statistics of the Republic of Kazakhstan.

The national data indicate substantial but uneven expansion of transport and warehousing activity. Gross output increased from KZT 6.07 trillion in 2021 to KZT 12.01 trillion in 2025, corresponding to cumulative growth of approximately 97.8% and a compound annual growth rate of about 18.6%. Annual growth was also uneven, amounting to approximately 12.4% in 2022, 20.8% in 2023, 14.3% in 2024, and 27.4% in 2025. The acceleration recorded in 2025 therefore represents the strongest annual increase during the observed period.

The regional distribution also demonstrates a high degree of spatial concentration. In 2025, Almaty city accounted for approximately 26.8% of national transport and warehousing output, while Astana city represented approximately 17.5%. Together, the two largest urban centers generated about 44.4% of the national total. This concentration suggests that the expansion of Kazakhstan's transport and logistics sector is increasingly associated not only with transit corridors and resource-

producing regions but also with major metropolitan distribution, warehousing, commercial, and service centers.

At the same time, the regional dynamics were heterogeneous. While several regions recorded substantial increases between 2021 and 2025, others experienced declines in the most recent year. Consequently, national growth should not be interpreted as uniform territorial development. The observed pattern points to differences in logistics specialization, infrastructure utilization, industrial structure, transit accessibility, and the concentration of distribution functions across regions.

Contracts for 775 locomotives and 2,700 fitting platforms will further support container and transit traffic. At the same time, the modernization of 124 railway stations may improve passenger services and regional accessibility. These results show that Kazakhstan is gradually removing internal infrastructure bottlenecks, although the economic return on new capacity will depend on its actual utilization and coordination with neighboring transport systems.

Maritime transport and the Trans-Caspian International Transport Route demonstrated particularly strong growth. In 2025, Kazakhstan's maritime transport carried 8 million tonnes of cargo, 7% more than in the previous year. Container handling through national seaports increased by 29% to 90,637 twenty-foot equivalent units, while container traffic along the Trans-Caspian route grew by 36%.

The completion of the Aktau container hub, the acquisition of two ferries, and the deployment of an additional dry-cargo vessel on the Kuryk–Baku route strengthened the Caspian segment of the corridor. Kazakhstan's port container capacity has increased to approximately 200,000 TEU per year, while current freight traffic along the Middle Corridor exceeds 4.5 million tonnes and may reach 10 million tonnes in the future (Ministry of Transport of the Republic of Kazakhstan, 2026; MyGorod News, 2026). However, the projected increase will require synchronized development of railways, ports, vessels, terminals, border infrastructure, and logistics services across all participating countries.

New projects in the Mangystau region indicate a transition from basic transit infrastructure towards a more diversified logistics and industrial ecosystem. A modern shipyard is planned on the Caspian coast, with annual capacity to construct up to eight vessels and repair up to 24 vessels. The minimum investment in the project is expected to reach KZT 125 billion. A multimodal aviation and logistics hub at Aktau Airport is also planned, with capacity for more than 200 aircraft maintenance operations and up to 60 painting operations annually.

In addition, the first stage of a multifunctional terminal at Kuryk Port will be developed with an investment of approximately KZT 470 billion. These projects may reduce Kazakhstan's dependence on foreign repair and maritime services, create permanent employment, localize

production, and increase domestic value added. Their contribution will therefore extend beyond transit revenues and support the industrial development of western Kazakhstan.

The announced construction and reconstruction of the Kyzylorda–Saksaulsk, Ulgaysyn–Saksaulsk, and Beineu–Saksaulsk highways further strengthen horizontal transport connectivity. The Kyzylorda–Saksaulsk and Ulgaysyn–Saksaulsk sections have a combined length of 774 kilometers. Their implementation is expected to create more than 10,000 jobs and increase annual freight traffic by 2.5 times to 13.2 million tonnes. The projects are intended to transform previously peripheral routes in the Aral Sea region into important intersections of Eurasian transport corridors and must be completed by 2029 (Mukhamediyarova, 2026).

The expected effects include not only higher transit capacity but also improved regional accessibility, tourism development, business activity, and employment. Nevertheless, the achievement of these outcomes will depend on compliance with construction deadlines, effective cost control, infrastructure quality, and the integration of the new roads with railway, port, and border facilities.

Digitalization has become another significant factor in improving transport efficiency. The e-Joldar system is being used to create digital road passports containing information on technical condition, traffic intensity, and operational characteristics. Artificial intelligence technologies are applied in annual road diagnostics, while more than 70 automated weighing and measurement stations have been integrated into transport-control systems.

Kazakhstan has also introduced electronic permit exchange with China and Uzbekistan, resulting in the digitalization of approximately 65% of foreign road-transport permits. The Smart Cargo platform provides a single digital window integrating customs, logistics, and commercial services. These measures can reduce administrative costs, accelerate border procedures, improve cargo tracking, and limit unauthorized overloading. However, the full effect of digitalization requires interoperability with the information systems of Azerbaijan, Georgia, Türkiye, China, and other trading partners.

The aviation sector also contributed to Kazakhstan's international connectivity. In 2025, the national commercial aircraft fleet reached 109 aircraft, including eight new Airbus A320 aircraft and four Boeing 737 MAX 8 aircraft. Air services connected Kazakhstan with 30 countries through 135 international routes and 626 weekly flights. More than 35 new international routes were opened, including services to Budapest, Munich, Seoul, Shanghai, and Guangzhou.

Major investment initiatives included the USD 362 million development programme for Almaty Airport and the KZT 250 billion cargo and passenger airport project in the Khorgos–Eastern Gate Special Economic Zone. The aviation sector employed approximately 25,000 people, while

Kazakhstan's compliance with international aviation safety and facilitation standards reached 95.7%. These developments strengthen passenger and high-value cargo connectivity and complement the country's land-based transport corridors.

Railway transport remains the principal mode for long-distance and transit freight transportation in Kazakhstan. Figure 1 presents the volume of cargo transported by rail in December between 2021 and 2025. The data reveal a pronounced increase in late 2024: railway freight reached approximately 46.5 million tonnes in December 2024, about 30% above the December 2023 level of 35.8 million tonnes. This increase should not be interpreted as a data error or an isolated monthly fluctuation, as railway freight volumes were also unusually high during the fourth quarter of 2024.

The late-2024 increase coincided with exceptionally strong agricultural production and intensified post-harvest freight movements. Kazakhstan recorded a historically high grain harvest in 2024, while railway shipments of new-crop grain during September–November increased substantially compared with the previous year. These developments suggest that seasonal agricultural freight contributed to the increase in railway activity during the final months of 2024 (Figure 1).

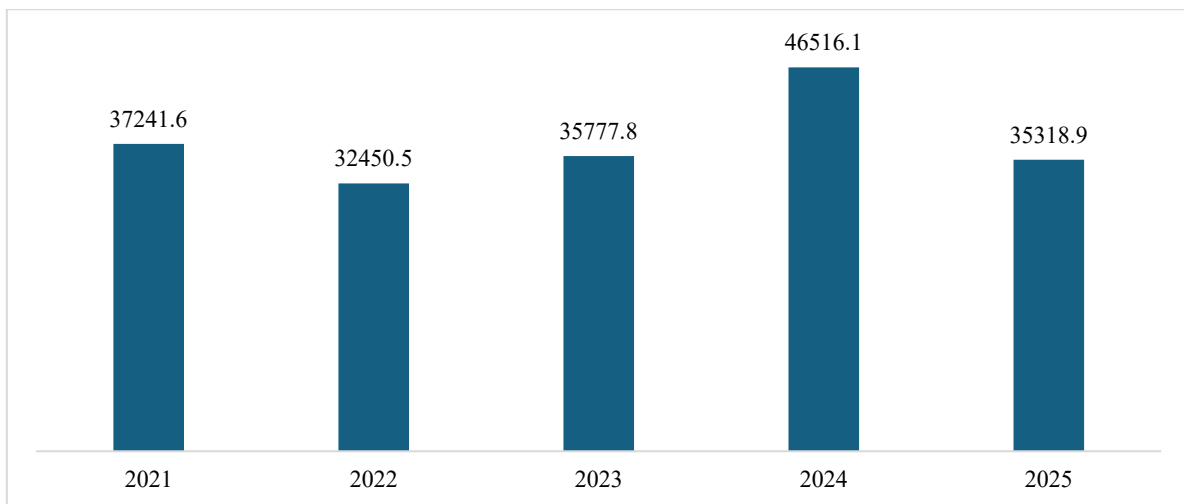


Figure 1. Freight Transported by Rail in Kazakhstan in December 2021–2025, *thousand tons*

The efficiency of the Middle Corridor depends not only on freight volumes but also on the capacity and utilization of its railway sections. As Kazakhstan forms the central land segment of the route, internal railway bottlenecks directly influence transit time, service reliability, and the overall competitiveness of transportation between Asia and Europe. Figure 2 presents the distribution of railway capacity and capacity utilization along the Middle Corridor and identifies the sections experiencing the greatest infrastructure pressure.

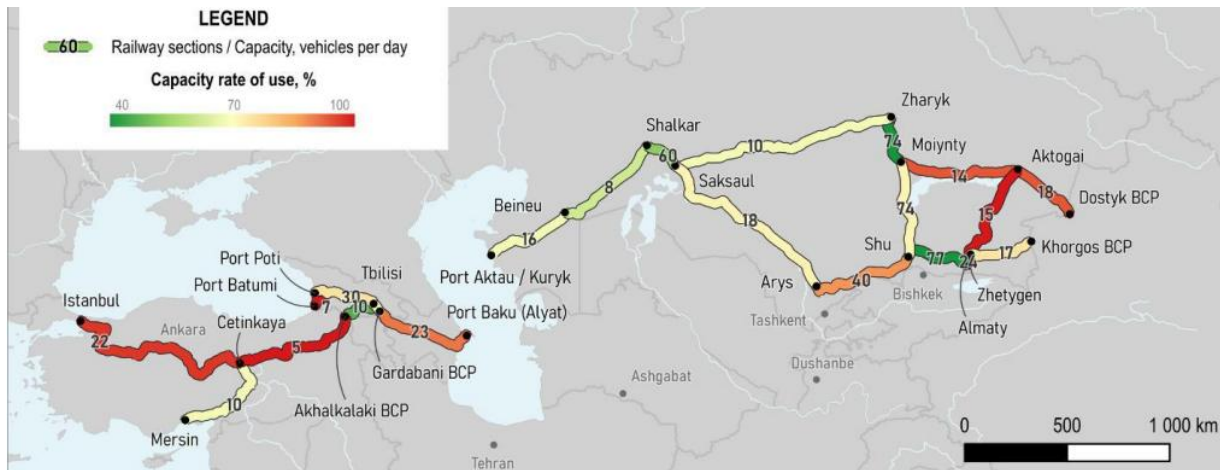


Figure 2. Railway capacity and capacity utilization along the middle corridor

As shown in Figure 2, the most heavily utilized railway sections in Kazakhstan are Dostyk–Moynty and Shu–Shymkent, where infrastructure capacity is approaching its operational limits. These bottlenecks may increase congestion and reduce the predictability of freight delivery along the Middle Corridor. To address these constraints, Kazakhstan has commissioned the second track of the Dostyk–Moynty railway and is developing the new Bakhty–Ayagoz railway line connecting the Chinese border with the national railway network (WTO, 2026). These projects are expected to redistribute freight flows, expand east–west railway capacity, and improve the resilience of Kazakhstan’s transit system. However, the effectiveness of additional capacity will also depend on the coordinated development of border crossings, terminals, rolling stock, Caspian ports, and railway infrastructure in other corridor countries.

The identified railway bottlenecks are broadly consistent with the simulation results reported by Khussanov et al. (2025), who show that congestion at terminals, railway sections, and border-crossing points can increase delivery times and reduce the effective capacity of Kazakhstan’s multimodal transport system. The present findings complement their modeling approach with observed infrastructure-capacity indicators, demonstrating that the Dostyk–Moynty and Shu–Shymkent sections have operated close to their capacity limits. This comparison suggests that infrastructure constraints are not only theoretical risks identified through simulation but are also visible in the actual utilization of key railway sections. Consequently, the expansion of railway capacity is likely to improve corridor performance only if investments in tracks are coordinated with border terminals, rolling stock, ports, and neighboring railway systems.

Overall, the findings indicate that Kazakhstan is moving from the development of separate transport facilities towards an integrated multimodal logistics system. The combination of railway expansion, road modernization, port development, aviation investment, international terminals, and digital platforms strengthens the country’s ability to serve trade flows between China, Central Asia,

the Caucasus, Europe, and the Middle East. At the same time, increasing physical capacity does not automatically ensure economic efficiency. Kazakhstan's long-term competitiveness will depend on predictable transit times, coordinated tariffs, simplified border procedures, container availability, digital interoperability, private investment, and the creation of domestic value added.

Therefore, the effectiveness of transport policy should be assessed not only by kilometers constructed or tons transported but also by transit revenues, logistics costs, infrastructure utilization, private investment, employment, non-resource exports, and regional economic growth.

5. Discussion

The findings indicate that Kazakhstan's growing transport and logistics role is driven not only by its geographical position but increasingly by the simultaneous expansion of freight flows, infrastructure capacity, and multimodal connectivity. The increase in total transit freight to 36.9 million tonnes in 2025, together with the near doubling of transport and warehousing output between 2021 and 2025, confirms that the sector is becoming a more significant component of the national economy. At the same time, the strong concentration of transport and warehousing activity in Almaty and Astana demonstrates that the economic benefits of logistics development remain spatially uneven. This finding extends the conclusions of Khasanov and Nurmetova (2022) and Kulyntay et al. (2025), who emphasize the strategic importance of Central Asia within changing Eurasian trade networks, by showing that the realization of Kazakhstan's transit potential is closely linked to the concentration of logistics, distribution, and service functions in major urban centers. Therefore, transport-corridor development should be considered not only as an instrument for increasing international freight volumes, but also as a mechanism for stimulating regional economic activity, investment, employment, and domestic value creation.

The results also demonstrate that infrastructure expansion alone cannot guarantee a sustainable improvement in corridor competitiveness. The rapid growth of the Trans-Caspian International Transport Route, increasing container traffic through the Aktau and Kuryk ports, and ongoing railway modernization significantly strengthen Kazakhstan's position within east–west trade flows. However, high-capacity utilization on the Dostyk–Moyynty and Shu–Shymkent railway sections reveal the persistence of critical infrastructure bottlenecks. This observation is consistent with the simulation results of Khussanov et al. (2025), who show that congestion at railway sections, terminals, and border crossings can substantially increase delivery times and reduce the effective capacity of Kazakhstan's multimodal transport system. The present study complements these findings with observed infrastructure-capacity indicators and suggests that investment effectiveness depends on synchronized development across the entire transport chain. Additional railway capacity will generate limited benefits if port infrastructure, border crossings, terminals, rolling stock, or neighboring

transport systems remain constrained. Consequently, the competitiveness of the Middle Corridor should be assessed as a system-wide outcome rather than as the sum of individual infrastructure projects.

A further important finding concerns the growing role of institutional and digital factors in determining logistics efficiency. Kazakhstan's introduction of electronic transport permits, the Smart Cargo platform, digital road passports, automated weighing systems, and artificial intelligence-based road diagnostics demonstrates a shift from predominantly physical infrastructure development towards integrated digital transport management. These developments support the conclusions of Imasheva et al. (2026), who identify digital technologies as an important instrument for improving cargo visibility, route optimization, and coordination among logistics participants. Nevertheless, the effectiveness of national digital solutions remains dependent on interoperability with the customs and transport information systems of partner countries, particularly Azerbaijan, Georgia, Türkiye, China, and other states participating in Eurasian corridors. Thus, Kazakhstan's long-term competitive advantage will depend on the combination of physical capacity, predictable border procedures, coordinated tariffs, digital interoperability, and efficient multimodal management. From this perspective, transport policy effectiveness should be evaluated not only through kilometers of infrastructure constructed or tonnes of freight transported, but also through reductions in transit time and logistics costs, infrastructure utilization, private investment, employment, non-resource exports, and the amount of domestic value added generated by international transport flows.

6. Conclusion

The study confirms that Kazakhstan's transport and logistics sector is becoming an important driver of economic diversification and Eurasian connectivity. In 2025, total transit freight reached 36.9 million tonnes, while the gross output of transport and warehousing services increased to KZT 12.0 trillion, almost twice the 2021 level. The expansion of railway, road, maritime, and aviation infrastructure has strengthened Kazakhstan's participation in the East–West, North–South, and Trans-Caspian transport corridors.

The results also show that the Trans-Caspian International Transport Route has become a key element of Kazakhstan's logistics strategy. The growth of maritime and container traffic, the development of the Aktau and Kuryk ports, the commissioning of new railway lines, and the modernization of road infrastructure are increasing the country's capacity to handle international freight flows. At the same time, the most heavily utilized railway sections, particularly Dostyk–Moyynty and Shu–Shymkent, remain potential bottlenecks that may reduce delivery reliability and increase transit time.

Kazakhstan's long-term competitiveness will therefore depend not only on increasing physical capacity but also on improving corridor management. Priority measures should include the coordination of tariffs and schedules, simplification of border procedures, expansion of container capacity, digital interoperability with partner countries, attraction of private investment, and integration of transport corridors with regional production and logistics centers. The economic effectiveness of transport policy should be measured through transit revenues, delivery time, logistics costs, infrastructure utilization, private investment, employment, non-resource exports, and domestic value added rather than only through kilometers constructed or tonnes transported.

Overall, Kazakhstan has significant potential to become a major logistics hub connecting Europe and Asia. However, transforming its geographical location into a sustainable competitive advantage requires coordinated development of infrastructure, digital systems, logistics services, and international institutions. Further research should assess the causal relationship between transport investment, regional economic growth, export diversification, and logistics performance, as well as examine the actual costs and barriers faced by domestic exporters and transport companies.

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Ethics Approval / Informed Consent Statement

This study did not require ethics committee approval, as it did not involve human or animal subjects.

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Халықаралық сауда маршруттарының өзгеруі жағдайындағы Қазақстанның көлік-логистикалық әлеуеті

Замира Башу*

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Түйін:

Зерттеудің мақсаты – халықаралық сауда бағыттарының өзгеруі жағдайында Қазақстанның көлік-логистикалық әлеуетін бағалау және елдің Еуразия құрлығындағы транзиттік хаб ретіндегі рөлін күшейтудің негізгі бағыттарын айқындау. Зерттеу барысында статистикалық, салыстырмалы, жүйелік және құрылымдық талдау әдістері, сондай-ақ халықаралық көлік дәліздерінің өткізу қабілетін, жүк тасымалдау көлемін және транзит мерзімдерін салыстыру тәсілі қолданылды. Ақпараттық база ретінде Қазақстан Республикасының Ұлттық статистика бюросының деректері, мемлекеттік органдардың ресми материалдары, Дүниежүзілік банк, ЭЫДҰ және басқа да халықаралық ұйымдардың зерттеулері пайдаланылды. Зерттеу нәтижелері геосаяси тұрақсыздық, Ресей арқылы өтетін Солтүстік дәлізге қатысты тәуекелдер және Қызыл теңіздегі тасымалдардың бұзылуы Қазақстан арқылы өтетін балама бағыттарға сұранысты арттырғанын көрсетті. Транскаспий халықаралық көлік бағыты бойынша тасымал көлемінің өсуі, Ақтау және Құрық порттарының дамуы, теміржол инфрақұрылымының жаңғыртылуы және кедендік рәсімдердің цифрландырылуы Қазақстанның бәсекелестік артықшылықтарын күшейтуде. Сонымен қатар инфрақұрылымдық шектеулер, көлік түрлері арасындағы үйлестірудің жеткіліксіздігі, тарифтердің біріздендірілмеуі, шекаралық рәсімдердің ұзақтығы және Каспий теңізі деңгейінің төмендеуі негізгі тәуекелдер ретінде анықталды. Қазақстанның транзиттік әлеуетін толық іске асыру үшін мультимодальды инфрақұрылымды дамыту, цифрлық интеграцияны тереңдету, халықаралық тарифтік саясатты үйлестіру және жеке инвестицияларды тарту қажет деген қорытынды жасалды.

Түйін сөздер: көлік-логистикалық әлеует, халықаралық сауда маршруттары, халықаралық көлік дәліздері, Транскаспий халықаралық көлік бағыты, транзиттік тасымалдар.

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Транспортно-логистический потенциал Казахстана в условиях изменения международных торговых маршрутов

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Аннотация:

Цель исследования заключается в оценке транспортно-логистического потенциала Казахстана в условиях трансформации международных торговых маршрутов и определении направлений укрепления его роли как евразийского транзитного хаба. В работе применены методы статистического, сравнительного, системного и структурного анализа, а также сопоставление пропускной способности, объемов грузоперевозок и сроков доставки по основным международным транспортным коридорам. Информационную базу исследования составили данные Бюро национальной статистики Республики Казахстан, официальные материалы государственных органов, а также исследования Всемирного банка, ОЭСР и других международных организаций. Полученные результаты показывают, что геополитическая нестабильность, возросшие риски использования Северного коридора через Россию и перебои в судоходстве в Красном море усилили спрос на альтернативные маршруты, проходящие через Казахстан. Рост перевозок по Транскаспийскому международному транспортному маршруту, развитие портов Актау и Курык, модернизация железнодорожной инфраструктуры и цифровизация таможенных процедур укрепляют конкурентные преимущества страны. Вместе с тем выявлены инфраструктурные ограничения, недостаточная координация между видами транспорта, несогласованность тарифов, продолжительность пограничных процедур и риски снижения уровня Каспийского моря. Сделан вывод, что полноценная реализация транзитного потенциала Казахстана требует развития мультимодальной инфраструктуры, углубления цифровой интеграции, согласования международной тарифной политики, повышения качества логистических услуг и привлечения частных инвестиций.

Ключевые слова: транспортно-логистический потенциал, международные торговые маршруты, международные транспортные коридоры, Транскаспийский международный транспортный маршрут, транзитные перевозки.

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