

**EVALUATION OF THE EFFECTIVENESS OF RAIL TRANSPORTATION  
BETWEEN KAZAKHSTAN AND UZBEKISTAN****Abstract**

Transport infrastructure is a crucial component of Kazakhstan's socio-economic development. The current state of Kazakhstan's railway infrastructure is a critical factor to consider when evaluating the effectiveness of new railway routes in increasing freight traffic. The railway network of Kazakhstan is extensive, covering thousands of kilometres and connecting various regions of the country. Infrastructure railways include a diverse range of lines, terminals, and stations, as well as related facilities such as maintenance depots and warehouses. Additionally, the railway infrastructure plays a crucial role in promoting international trade, as Kazakhstan serves as a vital transit corridor for cargo transportation between Europe and Asia.

The development of new railway routes plays a key role in increasing the volume of freight traffic, especially in the context of transit and international trade. In recent years, there has been a significant increase in cargo flows, which is attributed to the improvement of infrastructure and the optimisation of logistics processes.

In Kazakhstan, it is essential to study the effectiveness of new railway routes in increasing freight traffic within the country in terms of the continuous development and modernisation of railway infrastructure. The purpose of this scientific article is to develop practical recommendations for enhancing the efficiency of new railway routes in increasing freight transportation, using the example of JSC NC KTZ. Importance of the study: It is anticipated that the construction of a new railway route will increase cargo flows passing through Kazakhstan's territory.

**Keywords:** railway, KTZ, digitalization, economy, railway route

**Introduction**

Transport infrastructure is an essential component of Kazakhstan's socio-economic development. The current state of Kazakhstan's railway infrastructure is a crucial factor considered when assessing the effectiveness of new railway routes in increasing freight traffic. Kazakhstan's railway network is extensive, spanning thousands of kilometres and connecting various regions of the country. The infrastructure encompasses a diverse range of railway lines, terminals, and stations, as well as related facilities such as maintenance depots and warehouses. Additionally, the railway infrastructure plays a crucial role in facilitating international trade, as Kazakhstan serves as a vital transit corridor for freight transport between Europe and Asia.

The development of new railway routes plays a crucial role in increasing freight traffic, especially in transit and international trade conditions. In recent years, there has been a significant increase in cargo flows, which is attributed to the improvement of infrastructure and the optimisation of logistics processes. It is essential to consider the available capacity and capabilities of Kazakhstan's railway infrastructure. This includes an assessment of the condition of roads, alarm systems and rolling stock, as well as the level of technological integration and automation. The analysis should consider the efficiency of logistics operations, the availability of intermodal connections, as well as the overall reliability and safety of the railway network. In addition, it is necessary to carefully examine the existing regulatory framework, investment climate and management practices to identify opportunities for solving problems and challenges in the railway sector. One of the primary tasks is the construction of new railway lines within the framework of the concept for developing the Republic of Kazakhstan's transport and logistics potential by 2030. As part of the concept, it is planned to build and reconstruct approximately 2,500 km of new railway lines. This increases network bandwidth and improves connectivity between regions [1].

The purpose of this study is to analyse the current state of rail freight transportation between Kazakhstan and Uzbekistan within JSC NC KTZ.

Railways, highways and other types of transport are under the control of the Ministry of Industry and Infrastructure Development (MIID). JSC NC «Kazakhstan Temir Zholy» (KTZh) is responsible for the operation of Railways, Railway infrastructure, rolling stock fleet and terminal operations. KTZ will play a key role in the development of new railway routes in Kazakhstan, contributing to the expansion of transport infrastructure and increasing the volume of cargo transportation. KTZ actively participates in the modernisation and construction of new railway routes. Within the framework of plans to develop Kazakhstan's leading network, approximately 5,000 kilometres of secondary roads are planned to be constructed, which will significantly increase capacity and improve logistics.

By 2029, KTZ will increase the volume of transit traffic through Kazakhstan by 35 million tons, in the pursuit of an increase to a ton. To do this, the company is working on creating new routes and improving existing ones, including updating border posts and developing transport and logistics centers. This will enhance the attractiveness of trans-Kazakhstan routes for international shippers. KTZ actively collaborates with global partners to implement joint projects. For example, within the framework of the TCC, Kazakhstan signed roadmaps with Azerbaijan, Turkey and Georgia. This cooperation will optimize cargo transportation and increase their efficiency.

KTZ introduces modern technologies to improve the efficiency of railway transport. The establishment of a Competence Centre at KTZ aims to develop new logistics products and reorient transit cargo flows to trans-Kazakhstan routes, thereby contributing to more efficient transportation management. The development of new railway routes will also impact the economic development of Kazakhstan's regions. For example, the launch of new passenger and cargo routes will enhance the accessibility of remote areas and stimulate local economic growth by increasing tourist flows and improving logistics. According to the 2023 results, the volume of transit traffic through Kazakhstan totalled 27.3 million tons. Tons (+18% compared to 2022), including 1,282.3 thousand TEU (+14% compared to 2022) in the container transportation segment [1].

According to the data of the final annual report of KTZ for 2023, the main directions for increasing transit traffic include:

- To continue the growth of oil products and oil transportation from Russia to Central Asia and Afghanistan;
- Increase in grain transportation from Russia to Kyrgyzstan;
- Change in logistics for the transportation of chemical goods from China to Russia and Central Asian states;
- A significant increase in the transportation of potash fertilisers from Belarus to China in containers.

To increase the flow of cargo on TITR, work is underway to improve logistics services both within the Republic of Kazakhstan and abroad. In October 2023, within the framework of the «Tbilisi Silk Road Forum» Forum, which was held in Tbilisi, the railway administrations of Kazakhstan, Azerbaijan and Georgia signed the Constituent documents on the creation of a joint venture TCHB based on the International Financial Center in Astana. The joint venture will provide services on the principle of «one window», guarantee the delivery time and cost, as well as conduct an agreed policy for the development of multi-modal service.

To attract additional cargo volumes and develop a digital corridor within the framework of the TITR, KPMC Ltd, a company based in Singapore and a subsidiary of PSA Eagle Pte Ltd, was established in the Astana International Financial Centre.

With the growing demand for scheduled transportation and the rapid development of global trade, the main component of supply chain management and logistics is the efficiency of rail freight transit. At the same time, it is crucial to evaluate the factors affecting the efficiency of rail freight transport by analyzing the research results. Numerous studies demonstrate the impact of improving railway infrastructure on freight transportation efficiency. The Asian Development Bank's report, «Unlocking the potential of railways» states that the creation of a single, open legal system governing rail transportation will help all market participants interact more effectively with one

another [2]. This enables the unification of tariffs and conditions of carriage, reducing uncertainty and fostering trust between carriers and shippers.

### **Materials and methods of research**

The eastern route of the International Transport Corridor «North-South» is considered by shippers as an alternative route for transporting their products to the markets of Iran, India and the Persian Gulf. Together with OJSC RZhD and the Turkmen Railways, a technical audit of the junction points and adjacent railway infrastructure in Kazakhstan, Russia, and Turkmenistan was conducted to identify difficulties and technological barriers. Based on the results of the audit, a joint action plan to improve the efficiency of Interstate junction points was approved (March 31, 2023). Additionally, work is underway to establish a joint venture with Abu Dhabi Ports Group, aiming to expand the cargo base along the North-South Corridor and provide additional access to foreign markets. The Treaty on the establishment of a joint venture within the framework of the UN Climate Change Conference 2023 (COP28) was signed in December 2023.

The issue of creating a joint venture between RZhD Logistics JSC, KTZ Express JSC, and Turkmenistan Transport Logistics Centre OJSC is being worked out, which will act as a single logistics operator on the eastern branch of the North-South international transport corridor along the route 1,520 kilometres. Negotiations are underway to develop organisational documents and determine the terms for establishing a joint venture. KTZ plays a key role in the construction of the Darbaza-Maktaaral railway route, aimed at developing Kazakhstan's transport infrastructure and improving relations with Uzbekistan.

KTZ is responsible for implementing the project, which involves the design and construction of a 152-kilometre railway line with nine stations. Currently, preparatory work is underway, including topographic and hydrological studies.

KTZ actively cooperates with the Akimat of the Turkestan region, signing a memorandum of understanding to coordinate efforts in implementing the project. This cooperation will provide support from local authorities and guarantee the implementation of all necessary measures for the successful completion of construction. According to KTZ, about 90% of the cargo turnover in the regulated relations of the holding, excluding transit transportation, was carried out at Tariffs below the cost. Losses from domestic traffic in freight and passenger traffic are currently compensated by international transit traffic. Additionally, tariffs are differentiated based on the type of cargo. Such an approach to tariff policy will enable the government to utilise the profit of KTZ to subsidise rail transportation in specific sectors of the economy, such as food and coal transportation. It is worth noting that railway tariffs for cargo transportation in Kazakhstan are the lowest among the CIS countries. Regular government subsidies for rail transportation negatively impact the industry's efficiency.

Currently, the railway industry of Kazakhstan is fully controlled by the National Holding KTZ. Unfortunately, today, there are no specific plans to reduce state intervention in market relations in this sector, as in countries with developed market economies. Additionally, KTZ faces several challenges that impact the activities and development of railway transport in Kazakhstan. The main ones include:

1. infrastructure restrictions. Infrastructure degradation: the level of wear and tear on railway highways exceeds 50%, requiring significant investments in modernisation. Additionally, especially in the context of increased transit, it becomes increasingly challenging to fulfil the growing volume of Transportation. Low throughput: throughput problems in key sections, such as Dostyk - Moynty, limit the possibilities of increasing freight traffic volume and require the development of solutions to eliminate these obstacles.

2. financial difficulties. Debt burden: An increase in net debt is associated with the attraction of debt financing for the modernisation of rolling stock and the implementation of infrastructure projects. This puts pressure on the company's financial stability, especially in conditions of limited public resources. Tariff regulation: State regulation of tariffs for railway transport services hinders

revenue growth and industry modernisation. Low tariffs for certain types of cargo, such as coal and grain, do not cover the costs of their transportation.

3. geopolitical risks. Disruption of logistics chains: changes in the geopolitical situation, including sanctions and changes in international trade, lead to the destruction of traditional transport routes. This creates the need to develop alternative logistics solutions and routes.

Competition with other modes of transport: increased competition from road and sea transport, as well as the need to improve service quality and reduce prices to attract customers, poses a serious obstacle for KTZ.

4. the need for digitalization. Weak development of digital technologies: insufficient digitalization of management and logistics processes limits the efficiency of KTZ. The introduction of modern technologies is necessary to optimise operations and increase transparency.

«NC «Kazakhstan Temir Zholy» JSC faces a complex of challenges, including infrastructure constraints, financial difficulties, geopolitical risks and the need for digitalization.» To successfully overcome these problems, an integrated approach is necessary to modernise the railway network, refine tariff policy, and introduce innovative technologies.

The project for the construction of the Darbaza–Integra Construction KZ is implementing the Maktaaral railway line in the Turkestan region. Integra Construction KZ was established in 1998 as a state-owned subsidiary within the framework of Kazakhstan's restructuring program for railway transport. Integra Construction KZ has achieved significant success in the railway sector of Kazakhstan, introducing modern technologies into several major projects. Integra Construction KZ, as the main contractor, strives to bring considerable benefits to both Kazakhstan and Uzbekistan and is responsible for implementing this vital infrastructure project.

The current state of cargo transportation by rail between Kazakhstan and Uzbekistan exhibits positive dynamics, driven by infrastructure development and an increase in transit volumes. However, to achieve sustainable growth, it is necessary to continue investing in updating the system and optimising logistics processes.

Transit corridors: the main transit routes are the Trans-Caspian International Transport Route (TITR) or Middle Corridor, which connects Kazakhstan with Uzbekistan and other countries. The volume of transit transportation along these routes has increased by 50% over the past five years and now exceeds 23 million tons per year.

The Middle Corridor is a strategically important 6,180 km long multimodal corridor with a capacity of 6 million tons, including a container carrying capacity of 80,000 TEUs (twenty-foot equivalent units). This route connects China with Europe through Kazakhstan, Azerbaijan and Georgia, providing access to international markets.

Table 1-The value of the middle corridor for the zone

Importance	Description
Geopolitical significance	The middle corridor plays a crucial role in the geopolitical balance of the countries in Central Asia. It offers an alternative to the traditional routes through Russia and Iran, which may not be as reliable due to political instability and sanctions.
Economic development	It is expected that, due to the right investments, the volume of cargo transportation along the middle corridor will triple by 2030, and travel time will be halved. This creates additional opportunities for the economic growth of countries along the route.
Note - [3] taken from sources	

In 2023, 2.76 million tons of cargo were transported in the Middle Corridor, the forecast for 2024 is up to 4.2 million tons. This indicates the growing interest of shippers in this direction [4]. Between 2017 and 2022, the number of containers transported along this route increased from 9,000 to 33,600. However, the increase in volume also revealed problems, such as significant congestion at the borders and insufficient integration of logistics processes.

Sanctions against Russia and changes in trade flows, as well as the situation in the international arena, create new opportunities for the Middle Corridor as an alternative route for cargo transportation from China to Europe. The World Bank and other international organisations are prepared to support the development of the Middle Corridor, which will enhance its attractiveness to shippers.

The Middle Corridor is a crucial strategic direction for Central Asian countries, offering access to international markets and fostering economic development. However, to reach its full potential, it is necessary to address existing management and infrastructure issues and ensure effective coordination among all participants in the logistics chain.

By simplifying customs and border procedures at the external borders of the EAEU, it is possible to contribute to increasing the volume of international trade and transit traffic across the Union's territory.

The growing interest in the middle corridor confirms its potential as a crucial transport route in the context of a shifting geopolitical landscape. The Middle Corridor, also known as the TCC, is a vital transportation artery that has a significant impact on the economic development of Central Asian countries.

Kazakhstan and Uzbekistan are the primary beneficiaries of the Middle Corridor; however, the rest of the countries in Central Asia also benefit from improved transport infrastructure and increased transit traffic volumes. The development of this direction will contribute to the integration of the region's countries into the global economy and enhance their competitiveness in the international arena. The main cargo transported between Kazakhstan and Uzbekistan is coal, iron ore, grain and oil products. These goods account for about 58% of the total cargo volume. The development of multimodal transportation, along with the integration of sea and rail transport, will lead to an increase in cargo transportation volume. Tkb is actively promoting container transportation services from China through Kazakhstan to Uzbekistan and further to Europe.

Rail transportation plays a crucial role in the logistics system of Central Asia, connecting Kazakhstan and Uzbekistan. As of 2023, Uzbekistan ranks 7th among Kazakhstan's trading partners. Trade with Uzbekistan accounts for more than 57% of our country's trade with the countries of Central Asia. According to the 2023 results, the bilateral trade turnover totalled \$ 4.418 billion. US dollars, their exports-3, 130 billion. US dollars, and imports-1, 288 billion. US dollars. Considering current trends and plans for the development of trade and investment cooperation, further growth in trade turnover between Kazakhstan and Uzbekistan is anticipated. In particular, the authorities of Kazakhstan intend to increase the volume of trade with Uzbekistan to \$ 10 billion in the coming years.

Trade relations between the two countries largely depend on the quality of logistics services provided by various Kazakhstani companies, among which JSC NC «Kazakhstan Temir Zholy» occupies a special place. This company operates railway transport in Kazakhstan and provides cargo transportation to Uzbekistan both within the country and abroad. Thanks to its developed railway infrastructure, Kazakhstan is a key transportation hub in the region. The railway lines between Kazakhstan and Uzbekistan transport goods, including raw materials and finished products, quickly and reliably. The central part of the cargo passes through the Saryagash Interstate Junction station, which currently operates at its maximum capacity. Through the Saryagash Interstate junction (MATP) there is an increase in the dynamics of train exchange. In 2022, the Saryagash MATP carried 32 million tons of cargo per year, equivalent to 24 pairs of freight trains per day. In 2023, this figure increased to an average of 27 trains per day. The volume of cargo transportation between Kazakhstan and Uzbekistan for the 11 months of 2023 amounted to 25.8 million tons. it was a ton. In November 2023, the construction of a new railway line, Darbaza – Maktaaral, with a length of 152 km, began in the Turkestan region. As trade between Kazakhstan and Uzbekistan expands, rail transportation is becoming increasingly preferred. The creation of new networks and the improvement of existing ones should increase the volume of cargo transportation. This, in turn, contributes to the economic development of the two countries. Construction of the new darbaza-

Maktaaral railway is one of the projects aimed at improving the transport infrastructure and increasing the volume of cargo transportation. This route connects the Maktaaral and Zhetysay districts of the Turkestan region in Kazakhstan with the country's leading railway network. The project aims to optimise existing stations and enhance logistics in the area. The construction of the new line will contribute to the development of the Turkestan region and increase the volume of export traffic to Uzbekistan. Additionally, freight traffic will be redirected from the existing Saryagash-Tashkent Line [6].

### Results and its discussion

In the Turkestan region of Kazakhstan there are Maktaaral and Zhetysay districts. These regions are strategically important because they are situated at the intersection of key transport corridors that connect Central Asia with other countries, such as China and Europe. An increase in cargo flows and an improvement in logistics capabilities result from the development of railway and road infrastructure in these areas.

Thus, the construction of the Darbaza-Maktaaral railway line is an essential step towards the sustainable development of the Maktaaral and Zhetysay districts in the Turkestan region. The project not only enhances the transport infrastructure and creates new jobs, but also boosts economic activity and improves the quality of life for the population.

To achieve maximum efficiency, it is essential to continue monitoring the project's impact on the regional economy and ecology, as well as actively engage the local population in decision-making processes.

Taking into account the construction of a new railway line from Darbaza to Maktaaral, which will connect two remote districts of the Turkestan region with the main line of Kazakhstan's railways, it is expected that several new industrial projects will emerge in Maktaaral and Zhetysay districts.

To improve the efficiency of new railway routes between Kazakhstan and Uzbekistan, the following proposals were grouped (Table 2).

Table 2 - Proposals to improve the efficiency of new railway routes in the direction of Kazakhstan – Uzbekistan

Events	Recommendations
Investment in infrastructure	
Updating existing networks	To increase capacity and reduce travel time, it is necessary to conduct a technical inspection and upgrade of the existing railway lines. In particular, it is worth paying attention to projects on the expansion of the Dostyk-Moynty line and the construction of new sites, such as Darbaza-Maktaaral
Construction of New Road branches	The implementation of projects such as Kyzylorda-Uchkuduk is a crucial step in enhancing transportation links. Attracting investments from international financial organisations such as the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank can help finance such projects.
Optimization of logistics processes	
Creating a single operator	The formation of a single operator to manage cargo transportation along the middle corridor will simplify procedures and reduce logistics costs. This can be achieved by creating a company that operates on the principle of a single window, which will increase transparency and operational efficiency.
Digitalization of processes	The introduction of digital technologies to automate the processing of cargo documentation (for example, e permit systems) will help speed up the transportation process and reduce the likelihood of errors
Improving Interstate Cooperation	
Agree on tariffs and rules.	To agree on transportation tariffs and unify the rules, it is necessary to negotiate between Kazakhstan and Uzbekistan, which will make the routes more attractive for shippers

Regular meetings at the highest level	Establishing regular meetings between the ministries of transport of the two countries will help maintain dialogue on current issues and find joint solutions to improve transport infrastructure
Development of multimodal transportation	
Integration with other modes of transport	The development of multimodal transport corridors connecting rail transport with road and sea transport will optimize logistics chains and increase the overall efficiency of cargo transportation
Improving competitiveness	
Competitiveness analysis	Conducting a regular analysis of the competitiveness of the middle corridor compared to other routes (for example, the Northern Corridor) can help identify its weaknesses and develop strategies to improve its attractiveness for shippers
Marketing and promotion	Actively promoting the advantages of using the middle corridor in the international arena can attract new customers and increase the volume of cargo transportation
Note - [7] taken from sources	

These proposals aim to create a more efficient and competitive system of cargo transportation between Kazakhstan and Uzbekistan through the development of new railway routes. Investments in infrastructure, optimisation of logistics processes and the development of interstate cooperation are key factors in achieving this goal.

### Conclusion

As trade between Kazakhstan and Uzbekistan expands, rail transportation is becoming increasingly preferred. The creation of new networks and the improvement of existing ones should increase the volume of cargo transportation. This, in turn, contributes to the economic development of the two countries. Construction of the new Darbaza-Maktaaral railway is one of the projects aimed at improving the transport infrastructure and increasing the volume of cargo transportation. This route connects the Maktaaral and Zhetysu districts of the Turkestan region in Kazakhstan with the country's leading railway network. The project aims to optimise existing stations and enhance logistics in the region.

The construction of the new line will contribute to the development of the Turkestan region and increase the volume of export traffic to Uzbekistan. In addition, freight traffic will be redirected from the existing Saryagash-Tashkent line.

The project will be implemented in two stages. At the initial stage, it is planned to build a railway line «state border of Uzbekistan — Yerdaut — Maktaaral» with an exit to the Syrdarya station. At the second stage, it is planned to build a road branch «Zhetysai-the state border of Uzbekistan».

Thus, the construction of the Darbaza-Maktaaral railway line is vital for the sustainable development of Maktaaral and Zhetysay districts of the Turkestan region

step by step. The project will not only enhance transport infrastructure and create new jobs, but also boost economic activity and improve the quality of life for the population. To achieve maximum efficiency, it is essential to continue monitoring the project's impact on the regional economy and ecology, as well as actively engage the local population in decision-making processes.

Taking into account the construction of a new railway line, Darbaza-Maktaaral, which will connect two remote districts of the Turkestan region with the main line of Kazakhstan's railways, it is expected that several new industrial projects will emerge in Maktaaral and Zhetysay districts.

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## ОЦЕНКА ЭФФЕКТИВНОСТИ ЖЕЛЕЗНОДОРОЖНЫХ ПЕРЕВОЗОК МЕЖДУ КАЗАХСТАНОМ И УЗБЕКИСТАНОМ

### Аннотация

Транспортная инфраструктура является важной составляющей социально-экономического развития Казахстана. Текущее состояние железнодорожной инфраструктуры в Казахстане является важным аспектом, который следует учитывать при оценке эффективности новых с для увеличения грузопотока. Железнодорожная сеть Казахстана обширна, охватывает тысячи километров и соединяет различные регионы страны. Инфраструктура железной дороги включает в себя разнообразный спектр линий, терминалов и станций, а также сопутствующие объекты, такие как депо технического обслуживания и склады. Кроме того, железнодорожная инфраструктура играет важную роль в содействии международной торговле, поскольку Казахстан служит важным транзитным коридором для перевозки грузов между Европой и Азией.

Развитие новых железнодорожных маршрутов играет ключевую роль в увеличении объема грузопотоков, особенно в контексте транзита и международной торговли. В последние годы наблюдается значительный рост грузопотоков, что связано с улучшением инфраструктуры и оптимизацией логистических процессов.

В Казахстане очень важно изучить эффективность новых железнодорожных маршрутов в увеличении грузопотоков внутри страны в условиях постоянного развития и модернизации железнодорожной инфраструктуры. Целью научной статьи является разработка практических рекомендаций по повышению эффективности новых железнодорожных маршрутов в увеличении грузоперевозок на примере АО «НК «КТЖ». Значимость исследования: ожидается, что строительство нового железнодорожного маршрута приведет к увеличению грузопотоков, проходящих через территорию Казахстана.

**Ключевые слова:** железная дорога, КТЖ, цифровизация, экономика, железнодорожный маршрут

## ҚАЗАҚСТАН МЕН ӨЗБЕКСТАН АРАСЫНДА ТЕМІР ЖОЛ ТАСЫМАЛЫНЫҢ ТИІМДІЛІГІН БАҒАЛАУ

### Андатпа

Көлік инфрақұрылымы Қазақстанның әлеуметтік-экономикалық дамуының маңызды құрамдас бөлігі болып табылады. Қазақстандағы теміржол инфрақұрылымының ағымдағы жай-күйі жүк ағынын ұлғайту үшін жаңа теміржол маршруттарының тиімділігін бағалау кезінде ескеру қажет маңызды аспект. Қазақстанның теміржол желісі ауқымды, мыңдаған шақырымды қамтиды және еліміздің түрлі өңірлерін байланыстырады. Теміржол инфрақұрылымы әртүрлі желілерді, терминалдар мен станцияларды, сондай-ақ техникалық қызмет көрсету депосы мен қоймалар сияқты байланысты нысандарды қамтиды. Бұдан басқа, теміржол инфрақұрылымы халықаралық саудаға жәрдемдесуде маңызды рөл атқарады, өйткені Қазақстан Еуропа мен Азия арасындағы жүктерді тасымалдау үшін маңызды транзиттік дәліз ретінде қызмет етеді.

Жаңа теміржол маршруттарын дамыту, әсіресе транзит пен халықаралық сауда контекстінде жүк ағындарының көлемін арттыруда шешуші рөл атқарады. Соңғы жылдары жүк ағындарының айтарлықтай өсуі байқалды, бұл инфрақұрылымды жақсартумен және логистикалық процестерді оңтайландырумен байланысты.

Қазақстанда теміржол инфрақұрылымын тұрақты дамыту және жаңғырту жағдайында ел ішінде жүк ағынын ұлғайтуда жаңа теміржол маршруттарының тиімділігін зерделеу өте маңызды. Ғылыми мақаланың мақсаты «КТЖ «ҰК» АҚ мысалында жүк тасымалын ұлғайтуда жаңа теміржол маршруттарының тиімділігін арттыру бойынша практикалық ұсынымдар әзірлеу болып табылады. Зерттеудің маңыздылығы: жаңа теміржол бағытын салу Қазақстан аумағы арқылы өтетін жүк ағындарының ұлғаюына әкеледі деп күтілуде.

**Негізгі сөздер:** темір жол, КТЖ, цифрландыру, экономика, теміржол бағыты



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