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REFORMS IN THE RAILWAY SECTOR OF KASHKADARYA REGION

Surayyo Eshqobilovna Abdurahmonova
Assistant Lecturer at Karshi State Technical University
Karshi, Uzbekistan

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Abstract:

This article examines the major reforms implemented in the railway transport sector of Kashkadarya Region during the years of Uzbekistan's independence, with particular emphasis on infrastructure modernization, railway electrification, digital transformation, investment policies, and the development of transport and logistics services. The study analyzes the modernization of the Karshi–Kitab, Toshguzar–Oqrabot, and Karshi–Kumkurgan railway lines, highlighting the introduction of advanced communication technologies, microprocessor-based control systems, and electronic document management. Particular attention is devoted to the expansion of railway infrastructure, improvements in freight and passenger transportation, and the establishment of modern logistics facilities. The article also discusses the significance of institutional reforms and investment programs in strengthening regional economic connectivity, enhancing operational efficiency, and increasing the competitiveness of railway transportation.

Keywords: Kashkadarya Region, railway transport, railway infrastructure, transport reforms, railway electrification, infrastructure modernization, digital transformation, transport logistics, investment policy, freight transportation, passenger transportation, regional economic development, institutional reforms, multimodal transportation.

INTRODUCTION. Modern economic infrastructure creates the necessary conditions for ensuring the uninterrupted operation of production and service sectors, strengthening economic relations, and promoting sustainable economic development. The development of transport and communication networks is a key factor in strengthening economic ties between regions, ensuring the efficient utilization of production potential, supporting the operation of industrial and logistics facilities, and accelerating the modernization of the national economy.

The Action Strategy implemented during 2017–2021 [1] marked the beginning of a transitional period in the development of railway transport, characterized by the integration of infrastructural modernization with managerial and institutional reforms. Within the framework of the Strategy, priority objectives included establishing an interconnected interregional transport network, improving the efficiency of railway services, and strengthening the role of railway infrastructure in transport connectivity.

MAIN PART. In Kashkadarya Region, the modernization process was particularly evident along the Karshi–Kitab railway line. By 2018, modernization and electrification works on the approximately 124-kilometer-long railway line had been completed. Railway terminals were renovated, stations were reconstructed, two bridges and approximately 20 engineering structures were constructed, an overhead contact system was installed along a 94-kilometer section, and a traction substation was commissioned. Technical trials of an electric locomotive and the Afrosiyob electric train also commenced along this route [2]. These developments not only contributed to the technical modernization of railway transportation within Kashkadarya Region but also created favorable conditions for the gradual adaptation of passenger transport services to modern electric railway technology.

Reconstruction activities in the southern regions were not limited solely to electrification. In 2021, major track rehabilitation works were carried out on certain sections of the electrified Toshguzar–Oqrabot railway line in Kashkadarya Region. These activities included replacing worn-out rails with new ones and installing modern reinforced concrete sleepers. During 2021, a total of 16.2 kilometers of railway track underwent major rehabilitation between Toshguzar, Qayirma, and Bo‘zaxo‘r stations [3]. The direct outcome of these measures was associated with ensuring the reliable and safe operation of freight and passenger trains.

The period from 2017 to 2021 can be characterized as a transitional stage from railway electrification to comprehensive technological modernization in the

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history of the railway systems of Uzbekistan's southern regions. In Kashkadarya Region, the technical modernization of the Karshi–Kitab and Toshguzar–Oqrabot railway lines, together with the electrification of the Karshi–Termez railway line in Surkhandarya Region, strengthened the energy and infrastructure foundations of the integrated transport system.

The introduction of an electronic document management system made it possible to organize railway transport management processes more efficiently and promptly. The monitoring of freight transportation operations was strengthened, while the time required for document processing was reduced. Beginning in 2018, electronic management systems were gradually introduced at railway enterprises in Kashkadarya Region, resulting in a substantial reduction in paper-based documentation and administrative procedures [4].

The modernization of railway infrastructure in Kashkadarya Region was accompanied by the gradual upgrading of digital communication networks, management systems, and station technologies. According to the 2020 business plan of Uzbekistan Railways Joint-Stock Company (JSC), fiber-optic communication lines had been established along the Karshi–Kumkurgan, Marakand–Karshi, and Karshi–Kitab railway routes, while transmission systems based on Synchronous Digital Hierarchy (SDH) technology had been deployed on certain sections.

The introduction of microprocessor-based interlocking systems, computer technologies, and information systems connected to the Internet at Karshi railway station improved the technological foundations for coordinating freight operations, accelerating information exchange, and managing transportation processes. The plans announced in 2020 to replace electrical interlocking and automatic block signaling systems at railway stations with modern microprocessor-based systems, as well as to upgrade mainline communication networks in accordance with contemporary technological requirements, demonstrate the continued implementation of railway digitalization initiatives [5].

During 2017–2021, the modernization of railway infrastructure in Kashkadarya Region continued through the upgrading of technical equipment, improvement of communication and control systems, and enhancement of transportation reliability. Fiber-optic communication lines and digital transmission systems were utilized along the Karshi–Kumkurgan, Marakand–Karshi, and Karshi–Kitab railway routes, while microprocessor-based interlocking systems and computer technologies were implemented at Karshi railway station. The 2021 State Program identified specific projects for the development and reconstruction of railway infrastructure, indicating that technological modernization had acquired a systematic and coordinated character [6].

International experience indicates that the introduction of digital management systems in railway transportation can improve operational safety by 20–25% and significantly enhance operational efficiency [7]. The innovative reforms implemented in Kashkadarya Region established a foundation for increasing the competitiveness of both regional and national transport systems.

RESULT AND DISCUSSIONS. The achievements recorded in the railway transport sector of Kashkadarya Region between 1991 and 2022 are clearly reflected in statistical data. The increase in the total length of railway lines from 361 kilometers in 1991 to 584 kilometers in 2022 demonstrates a substantial expansion of regional transport infrastructure. Electrified railway sections reached an entirely new stage of development, increasing from virtually zero kilometers to 584 kilometers, a transformation regarded as an outcome of the technological modernization of the railway system [8].

The infrastructure of railway stations and terminals developed rapidly. The number of stations increased from 12 to 24, while the number of modern railway terminals rose from 3 to 8. After 2010, modernization activities intensified at Karshi railway station and adjacent stations, and new passenger service facilities were commissioned [9]. Transportation indicators also demonstrated significant growth. Freight transportation volume increased from 2.5 million tons in 1991 to 12.8 million tons in 2022, while passenger transportation volume rose from 0.8 million to 3.2 million passengers. These figures indicate the growing importance of railway transport in the regional economy. Freight turnover increased from 320 million ton-kilometers to 1,560 million ton-kilometers, while passenger turnover rose from 120 million passenger-kilometers to 580 million passenger-kilometers, reflecting improvements in the performance and operational capacity of the transport system.

These substantial growth trends were closely associated with investment policies. It was reported that a total of USD 1.2 billion in investments was attracted to the railway sector between 1991 and 2022. These investments contributed to the creation of more than 12,000 new jobs and had a significant impact on regional socioeconomic development [10]. According to the results for 2022, exports of railway transport services amounted to USD 45 million, while tax revenues generated by the sector reached UZS 180 billion [11]. These indicators demonstrate the increasing importance of railway transportation in both domestic and international economic activities.

Establishing a regulatory and legal framework to ensure the required quality standards in railway transport

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operations represents an essential initial step toward improving the efficiency of business processes. One of the key policy documents defining strategic objectives, institutional responsibilities, quality management principles, resource utilization, the introduction of production technologies, and the principal goals and instruments for improving the effectiveness of corporate governance in economic and social development was the "Action Strategy on Five Priority Areas of Development of the Republic of Uzbekistan for 2017–2021" [12].

Uzbekistan's adopted Action Strategy reaffirmed the country's commitment to consistently establishing and developing national and regional platforms aimed at ensuring sustainable economic growth. For Uzbekistan, a landlocked country, developing alternative routes for international integration and transport connectivity represents one of the most urgent and strategically important tasks shaping its future development.

The objectives of the development strategy include continuing the formation and advancement of the railway industry, enhancing the country's transport and transit potential, creating new employment opportunities, increasing the localization of production, and implementing coordinated policies in the fields of transportation and technical regulation. Furthermore, the strategy aims to improve railway operational safety and passenger comfort while increasing the investment attractiveness of the railway transport sector.

The development of railway transportation in Kashkadarya Region brought about significant changes in the regional economy. The construction of new railway lines and the modernization of existing infrastructure enhanced the region's transport and logistics potential. New industrial enterprises and production facilities were established, trade and economic relations with neighboring regions and countries expanded, and the region's investment attractiveness increased. These developments also contributed to higher employment levels and improvements in the population's living standards and overall well-being.

The reforms implemented in the railway transport sector of Kashkadarya Region during the years of Uzbekistan's independence contributed to the establishment of a modern, technologically advanced, and efficient transportation system. At the same time, institutional reforms undertaken within the region's railway sector were aimed at improving management mechanisms, restructuring enterprises, and expanding private sector participation to ensure greater operational efficiency and economic sustainability throughout the transport system.

During 2021–2022, a total of USD 300 million in investments was attracted to Kashkadarya Region under newly adopted investment programs aimed at modernizing railway infrastructure. These funds were allocated to priority areas, including extending the total length of railway lines to 584 kilometers, increasing the number of railway stations to 24, and expanding freight transportation volume to 12.8 million tons [13]. The introduction of smart logistics and multimodal transportation systems contributed to the advancement of the region's transport and logistics sector to a more modern stage of development.

The Karshi Logistics Center was established on an area of 25 hectares and developed into a major logistics hub with an annual cargo handling capacity of 2.5 million tons. Modern loading and unloading equipment and multifunctional terminals were introduced at the Guzar and Kitab logistics complexes [14]. The development of railway transportation in Kashkadarya Region is closely connected with the industrial, mining, and agricultural sectors of the regional economy. Mineral raw materials, construction materials, sulfur, agricultural commodities, and other industrial products account for a significant proportion of the region's freight transportation structure.

The activities of freight railway stations in the region, including Karshi, Kashkadarya, Kitab, Dehkanabad, Kengsoy, and Shurtan, were primarily aimed at connecting industrial and production areas with domestic and international markets.

In 2021, the introduction of computer-based and microprocessor-based interlocking systems at Karshi railway station, the operation of its freight yard, and the expansion of export and import activities strengthened the technological and organizational foundations of logistics service provision. During the same year, sulfur, animal feed, cotton, and other commodities were exported through the station, while construction materials, machinery, and spare parts were imported.

During the first four months of 2020, a total of 115.27 thousand tons of freight was loaded, whereas the corresponding figure for January–April 2021 reached 117.471 thousand tons. The implementation of the "single-window" principle, which enabled freight documentation and financial transactions to be processed directly at the railway station, contributed to simplifying logistics procedures and improving operational efficiency [15].

The projected indicators for the development of railway transportation in Kashkadarya Region over the following five years reflect a consistent upward trend. Freight transportation volume, which amounted to 12.8 million tons in 2024, is planned to reach 15 million tons by 2029, representing an increase of 17.2%. Passenger transportation volume is also expected to grow significantly. The number of passengers, recorded at 3.2 million in 2024, is projected to reach 4 million by 2029, corresponding to a 25% increase [16].

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The export value of railway transport services is projected to increase steadily. It is expected to rise from USD 45 million in 2024 to USD 60 million by 2029, representing an increase of 33.3% [17].

CONCLUSION. In conclusion, the reforms implemented in the railway system of Kashkadarya Region during the New Uzbekistan development period encompassed not only the modernization of the sector's technical and infrastructural foundations but also comprehensive improvements in railway management, operational safety, digitalization, and logistics.

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