



CREATION OF REGIONAL LOGISTICS HUBS BY RAIL

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Annotation: *This article is aimed at developing a strategy for the formation of railway hubs with a large logistics potential for cargo delivery in Uzbekistan, their effective use through digital management systems and rational use of resources. Within the framework of the topic under consideration, effective nodes (hubs) regulating cargo flows in domestic and international directions are analyzed and their location, technological equipment and management mechanism are improved. It is also envisaged to develop centers connected to international transit routes, expand economic cooperation and ensure innovative growth of the transport sector through the railway system.*

Introduction. The scientific article is aimed at creating a system for the formation and management of strategic hubs in order to more effectively organize freight transportation in the railway transport system of Uzbekistan. Through this, cargo flows will be directed to specific centers, logistics processes will be optimized, resources will be used economically, and international transit potential will be increased. As a result of the project, railway nodes with modern infrastructure will be created, ensuring the competitiveness of the transport sector. A lot of scientific research has been conducted on improving infrastructure, developing transport networks, improving the cooperation of transport modes, ensuring safety in the freight transport system, mathematical modeling of transportation processes, selecting the best routes, and optimizing technical and technological operations in the transport sector [1-7].

Tashkent, Syrdarya, Samarkand, Navoi and Bukhara regions are located on strategic transport routes and are important nodes of international and regional cargo

flows. The railway transport network of the Republic of Uzbekistan (in particular, within the main highway route “Tashkent - Syrdarya - Samarkand - Navoi – Bukhara”) is the main economic infrastructure.



Figure 1. Uzbekistan’s rise as the transport and logistics hub of Central Asia

Tashkent, Samarkand and Bukhara regions, where the proposed work is planned to be implemented, are the most important economic, industrial and transport centers of Uzbekistan. These regions have high population density, production potential and cargo flows, and the existing railway infrastructure faces resource and technological shortcomings in fully covering them.

Main part. The creation of an intelligent digital platform for the design, modeling and management of railway logistics hubs in Uzbekistan is one of the urgent issues. The following tasks should be performed for this platform:

Development and testing of concepts for creating strategically important nodes at key points of the railway network, taking into account cargo flows, transport convenience and the possibility of integration into international corridors;

Creation of a software product (hub analyzer) that allows assessing the location and efficiency of the hub using clustering algorithms, analytics and artificial intelligence forecasting;

Preparation of scientifically based schemes for the development of hubs, including technical and economic parameters that can be used for investment projects;

The creation of hubs involves not only the modernization of the internal logistics system, but also the sustainable development of the transport sector through

increasing the international transit potential of Uzbekistan, the formation of a competitive transport system and rational use of resources.

Table 1. Problems solved by the formation of strategic railway hubs:

1. Uneven development of railway infrastructure in some regions
2. Chaos and decentralized logistics flows in shipping processes
3. Inefficient use of resources, ineffective management system
4. Underutilization of international transit potential

The role and scope of the work are as follows: Centralization of cargo flows and simplification of their management through the formation of cargo transportation centers (hubs); Optimization of resource management through the introduction of digital technologies; Development of regional logistics infrastructure; Creation of a developed, stable and efficient infrastructure base for international cargo transit; Increasing economic activity and increasing the level of investment in the regions.

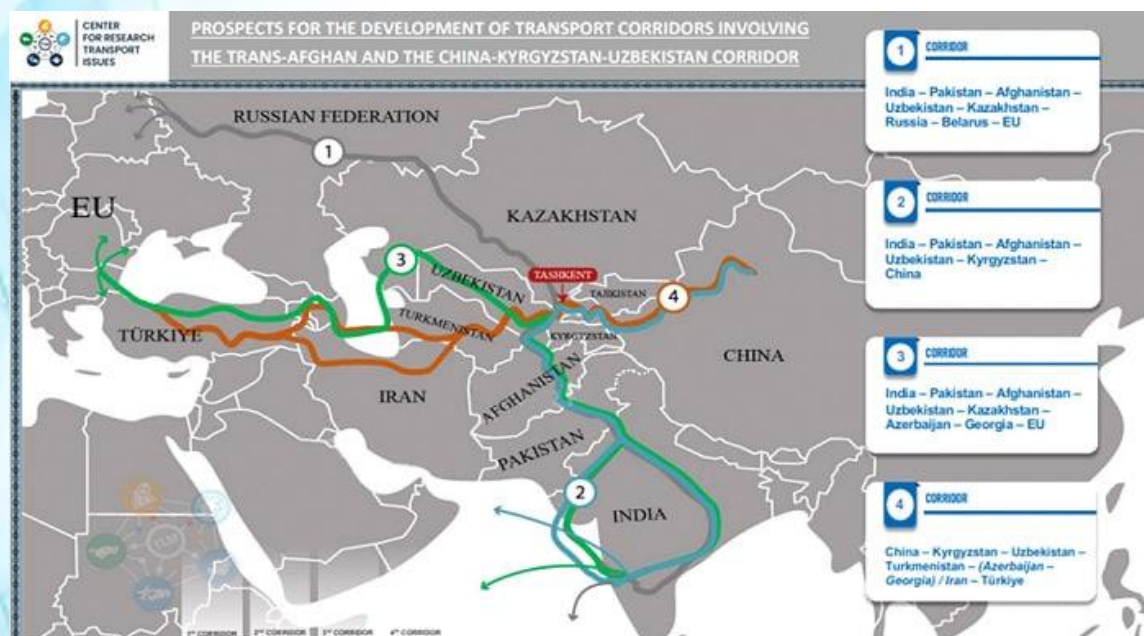


Figure 2. New Uzbekistan: Modern Strategies of Transit Corridors for Regional Connectivity

A complete solution to the problem can achieve a number of economic results:

Reduction in transportation costs;

Logistics convenience for local manufacturers;

Increase in export and transit revenues from railway services.



Figure 3. The Central Asian region is located at the intersection of two main trade routes: North-South and East-West

Social results: New services and opportunities for professional development in the logistics sector; Ensuring territorial equality - development of even remote districts.

- JSC “Uzbekistan Railways” has all the necessary resources and technical capabilities to successfully implement the innovations introduced under the project. The organization plans to support efforts aimed at increasing transit capacity by improving railway infrastructure and develop effective cooperation in this area.
- It is considered an important initiative to stimulate economic development by modernizing the transport network in domestic and international transit.

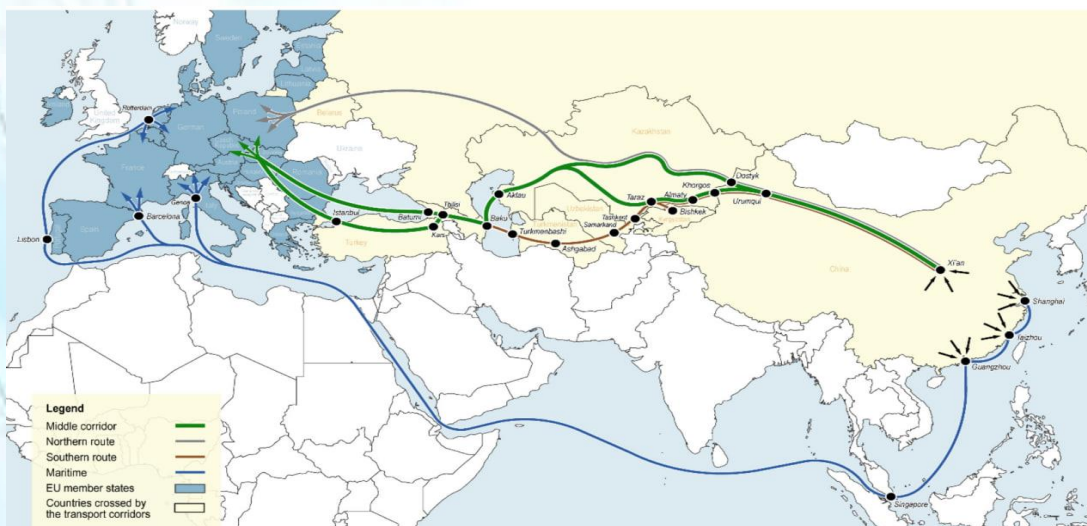


Figure 4. South Caucasus Using the territory of Central Asian countries with high transit potential to connect China and Europe

The article proposes the introduction of a number of modern technologies to modernize the railway infrastructure and optimize the freight transportation system. These technologies will not only increase the efficiency of freight transportation, but also optimize resource use, ensure safety, and speed up transit.

Smart sensors and digital tracking systems will be installed in railway and freight transport systems. These systems will allow for real-time monitoring of cargo location, movement, and vehicle status. These technologies are new to the Uzbek railway system and provide high-precision data collection and analysis capabilities, which will reduce transportation costs and increase efficiency.

- Blockchain technology can automate cargo tracking and documentation processes. This, in turn, reduces document errors and increases security. This technology provides a new, secure, and efficient approach to providing dynamic and real-time data.

- By analyzing cargo flows and the performance of the railway system, it is possible to optimize freight routes and increase operational efficiency.

- The provided forecasts and analyses will allow for the creation of highly optimized freight transport systems.

- By using innovative systems in the process of placing and transporting goods, it is possible to make movement more efficient, as well as to organize a system for quickly placing and retrieving goods. This technology is an innovation in the widespread introduction of automated systems in society, especially in the transport sector.

Conclusion. These technologies and intellectual property protection measures will have a significant impact on the success of the project, and their implementation will contribute to increased efficiency in the transport system and government support. Capital and operating costs are expected to pay for themselves within 3-5 years. During this period, the initial investment costs of the project (infrastructure modernization, technological upgrades, development and



construction processes) will be amortized, and the expected revenues (revenues from logistics services, freight transportation, increased transit, etc.) will cover the project costs.

REFERENCES

1. Ziyoda Mukhamedova, Diyor Boboev. Research on improving the modern transport system in the process of cargo delivery. Railway transport: current issues and innovations, 3(1), 2022/3/28, 15–24.
2. J. Shihnazarov, D. Boboev, M. Dehkonov, D. Ikramova. Choice of an efficient mode of transport on the basis of comparison of technical and economic indicators of types of transport. - E3S Web of Conferences, 2023, 1-7
3. Ziyoda Mukhamedova, Diyor Boboyev, Shukhrat Saidivaliev, Rustam Abdullaev, Jamshid Kobulov, Sardorbek Akhmedov, Sherzod Fayzibayev. Mathematical modeling of fastening conditions in piggyback transport: ensuring safety and stability across different transport modes. Discover Applied Sciences: 2025/6/8, 619. <https://link.springer.com/article/10.1007/s42452-025-07188-7>
4. Bozorov R. Sh, Boboev D. Sh. Methods of installation of wire rope and binder when securing loads. Pedagogics: 2025/5/30, 76-84.
5. Do‘lobov D., Boboyev D. Sh. Stages of development of the organization of wagon flows. Editorial board: 2024/10/7, 219.
6. Ziyoda Adilova, Diyor Boboyev, Navruz Axtamov. Mathematical model of fastening conditions in container transportation taking into account various conditions. Transport bulletin: 2024/9/30, 98-103.
7. Boboyev Diyor Shomurotovich. Placing vehicles on the railway platform when organizing counter-trailer transportation. Journal of new century innovations: 2022/12/7, 17-21.