

**Assessment of transportation and logistics potential of the territory of the Southern Federal District of Russia - Kyrgyz Republic**

**Avaliação do potencial de transporte e logística do território do Distrito Federal Sul da Rússia – República Kyrgyz**

**Evaluación del potencial de transporte y logística del territorio del Distrito Federal Sur de Russia - República Kyrgyz**

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**Abstract**

In the face of the changing global market space, the problem of organizing new international transport corridors reaches a new level. The new conditions of scientific examination call for the role of macroregions to be reevaluated and their transportation and logistics potential to be evaluated. The study aims to assess the transportation and logistics potential of the territory of the Southern Federal District of Russia. The employed research methods include theoretical analysis of scientific literature, analysis of statistics and expert opinions, and analysis of the information presented by online periodicals. The study analyzes key trends describing the condition of cargo transportation and cargo turnover by road transport in the regions of the Southern Federal District. Proceeding from an analysis of the opinions of Internet media researchers, conclusions are drawn about the reasons behind the observed trends. Among the factors inhibiting the development of the transportation and logistics potential of Southern Federal District regions are political and administrative (decisions by federal enterprises), organizational and technological (condition of the transport and logistics infrastructure), and climatic factors (seaports freezing in winter). The study concludes that the transportation and logistics potential of the territories of the Southern Federal District cannot be realized fully without overcoming infrastructural limitations first.

**Keywords:** potential, logistics, transportation, spatial economics, Caspian regions, export, international transport corridor.

## Resumo

Diante da mudança do espaço do mercado global, o problema de organizar novos corredores de transporte internacional atinge um novo nível. As novas condições de exame científico exigem que o papel das macrorregiões seja reavaliado e seu potencial de transporte e logística seja avaliado. O estudo visa avaliar o potencial de transporte e logística do território do Distrito Federal do Sul da Rússia. Os métodos de pesquisa empregados incluem análise teórica da literatura científica, análise de estatísticas e opiniões de especialistas e análise das informações apresentadas por periódicos online. O estudo analisa as principais tendências que descrevem a condição do transporte de carga e a movimentação de carga por transporte rodoviário nas regiões do Distrito Federal do Sul. Partindo de uma análise das opiniões de pesquisadores de mídia da Internet, são tiradas conclusões sobre as razões por trás das tendências observadas. Entre os fatores que inibem o desenvolvimento do potencial de transporte e logística das regiões do Distrito Federal do Sul estão fatores políticos e administrativos (decisões de empresas federais), organizacionais e tecnológicos (condição da infraestrutura de transporte e logística) e climáticos (portos marítimos congelando no inverno). O estudo conclui que o potencial de transporte e logística dos territórios do Distrito Federal do Sul não pode ser totalmente realizado sem superar as limitações de infraestrutura primeiro.

**Palavras-chave:** potencial, logística, transporte, economia espacial, regiões do Cáspio, exportação, corredor de transporte internacion



## Resumen

En el contexto de los cambios en el mercado mundial, el problema de la organización de nuevos corredores de transporte internacionales alcanza un nuevo nivel. Las nuevas condiciones de investigación científica exigen una reevaluación del papel de las macrorregiones y una evaluación de su potencial logístico y de transporte. El objetivo de este estudio es evaluar el potencial logístico y de transporte del territorio del Distrito Federal Sur de Rusia. Los métodos de investigación empleados incluyen el análisis teórico de la literatura científica, el análisis de las estadísticas y las opiniones de los expertos, así como el análisis de la información presentada por las publicaciones periódicas en línea. El estudio analiza las tendencias clave que describen el estado del transporte de mercancías y la rotación de mercancías por carretera en las regiones del Distrito Federal Sur. A partir del análisis de las opiniones de los investigadores de los medios de comunicación de Internet, se extraen conclusiones sobre las razones de las tendencias observadas. Entre los factores que frenan el desarrollo del potencial logístico y de transporte de las regiones del Distrito Federal Sur se encuentran los factores políticos y administrativos (decisiones de las empresas federales), organizativos y tecnológicos (estado de la infraestructura de transporte y logística) y climáticos (los puertos marítimos se congelan en invierno). El estudio concluye que el potencial de transporte y logística de los territorios del Distrito Federal Sur no se puede aprovechar plenamente sin superar primero las limitaciones de infraestructura.

**Palabras clave:** potencial, logística, transporte, economía espacial, regiones del Caspio, exportación, corredor de transporte internacional.

## 1. INTRODUCTION

The irregular nature of the development of the Russian economic space manifests in imbalances in the development of spatial economics (Abdurakhmanov et al., 2024; Fedchenko et al., 2023; Solopova et al., 2022). This pattern defines the differentiation of regions by the level of economic development. For this reason, a critical task of public authorities is to improve the quality of territorial governance, as it determines the accessibility and location of logistics objects, as well as land use practices. It is in the framework of logistics operations that the spatial factor plays a crucial role in addressing the objectives of socio-economic development. Thus, clarification of the role of the transportation system in territorial socioeconomic development defines the importance of assessing the transportation and logistics potential of individual territories.

The organization of logistics and economic connections between Russian macroregions and South Asian countries affects the benefits of the geographical position of the Southern

Federal District (SFD). The capacity of the district's transportation and logistics system enables uninterrupted multimodal service of transit cargo flows. Sanctions imposed on Russia by "unfriendly" states have changed the principles of the formation of the global and macroregional markets and the transportation and logistics space. The stability of the latter ensured the stability of sustainable energy and food security in Russia and Asian countries for a long time (Sergeeva et al. 2023). Now, global import and export chains are blocked. In this situation, the country faces the task of developing alternative logistics and forming a joint economic space with several countries without the involvement of unfriendly states (Rybak et al. 2023; Mirzabalaeva et al. 2019).

In this connection, the possibilities offered by the North-South international transport corridor are acquiring particular importance. In this respect, the territory of the SFD macroregion is a critical transportation and logistics link in the organization of international transport (Dukhovnaya et al., 2023; Voronina et al., 2023; Vydashenko & Vydashenko, 2023). There is a considerable amount of exports passing through this territory (Bagomedova, 2021). Analysis of the opinions of experts shows that the development of the transportation and logistics potential of the SDF is significantly hindered by several factors (customs delays, uneven development of different modes of transport, and insufficient infrastructure capacity) (Kokra, 2010). The underdeveloped infrastructure of sea and river ports limits the multimodal possibilities of using railroad transportation. Thus, the insufficient level of transport infrastructure in SFD regions enters conflict with the growing intensity of cargo turnover through them and the real carrying capacity of the territories (Ministry of transport of the Russian Federation, 2022). The relatively low regional transportation product is thus quite natural. In addition, a separate challenge is to consider the climatic factors that block the operation of certain Caspian Sea ports.

Due to the above, the transportation and logistics potential of the SFD requires scientific analysis with consideration of its historically and socially established conditions, as well as management of new factors allowing to improve the capacity of transportation logistics and support the socio-economic development of SFD territories.

**The research goal** of this study is to assess the transportation and logistics potential of territories in the SFD of Russia.

## 2. METHODS

The reliability and validity of the obtained results are ensured by theoretical analysis of scientific literature and analysis of statistical data, experts' opinions, and information from Internet periodicals.

The term "transportation and logistics potential of a territory" is interpreted as the ability of the transportation and logistics infrastructure to satisfy the demand for the services of these industries at a certain level of efficiency. This category characterizes the production capacity of transportation and logistics subsystems. Several studies indicate that the primary purpose of research on this problem is the development of territories, so it needs to include both the analysis of current transportation and logistics resources and directions for their improvement.

## 3. RESULTS AND DISCUSSION

Given the new vector of development of transportation logistics through the North-South international transport corridor opened in 2023, the problem addressed in this article gave an impetus for new studies. However, the assessment of the transportation and logistics potential of the SFD in the new conditions is given insufficient attention by researchers. The main idea is to analyze trends in the development of the transportation and logistics potential of SFD territories. The primary criteria employed in this assessment are cargo turnover and cargo transportation. Analyzing scientific literature, we note that although this problem has been considered by researchers, the opening of the international transport corridor was not examined as a factor in these studies. More attention has been given to the possibilities of the Azov-Black Sea transport corridor, which passes through the river systems of the SFD and Black Sea regions (without much interest in the transportation and logistics possibilities of the Caspian Sea).

Researchers argue that the new possibilities opened by the North-South transport corridor provide for the region's integration into the global economic and transport space, a

balanced development of the macro-regional transport space of the SFD, and the development of its transit potential in the regions belonging to it. This is largely promoted by the operation of free economic zones with special tax regimes in key sections of the North-South transport corridor and associated transport hubs. For example, significant volumes of high-tech products with high added value pass through the Lutos Special Economic Zone (Kriukova, 2021).

The features of operation of different modes of transport have a considerable influence on the organization of multimodal transportation. Insufficient possibilities and capacities for intermediate storage of goods in the process of servicing cargo flows cause downtime in the work of various types of transport, ultimately increasing transportation costs. The balance of cargo flows is also disturbed by several additional factors, including the use of railway transport for storage, disruptions in the rhythm of loading operations, and the dependence of warehouse operations on the price situation in the transportation market (Kommersant, 2022). A possible solution to this problem can be found in the creation of automated logistics centers to coordinate unloading and loading in multimodal transportation by various types of transport.

The described reasons greatly contribute to the poor use of the advantages of SFD's geographical location. Because of this, our study pursues the objective of analyzing current trends in the development of cargo turnover and cargo transportation.

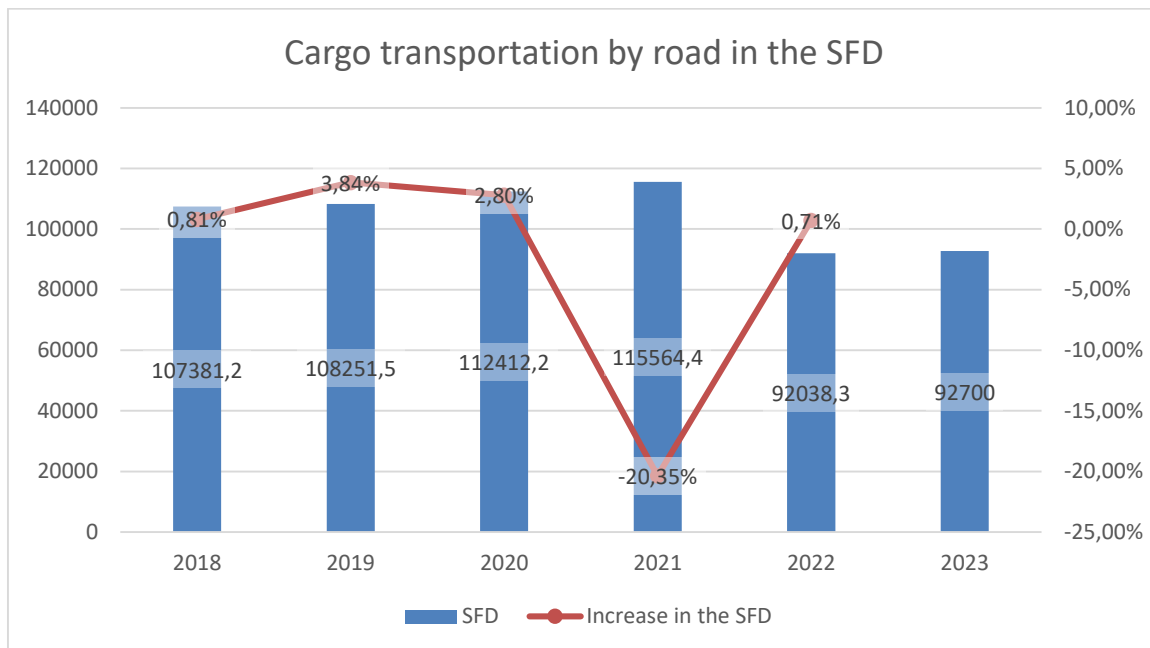
Figure 1 below presents data on the transportation of cargo by road transport through the territory of the SFD.

**Table 1**

Volumes of cargo transportation by road transport through the territories of Russian Federal Districts: analysis of dynamics for 2018-2023

|                     | 2018        | 2019        | 2020        | 2021        | 2022      | 2023    | Increase, % |
|---------------------|-------------|-------------|-------------|-------------|-----------|---------|-------------|
| Russian Federation  | 1,318,372.6 | 1,292,531.0 | 1,299,776.7 | 1,215,460.2 | 913,608.5 | 927,000 | -29.68      |
| SFD                 | 107,381.2   | 108,251.5   | 112,412.2   | 115,564.4   | 92,038.3  | 92,700  | -13.67%     |
| Increase in the SFD | 0.81%       | 3.84%       | 2.80%       | -20.35%     | 0.71%     |         |             |

Source: Ministry of Transport of the Russian Federation.



**Figure 1.** Dynamics of cargo transportation by road in the SFD

Source: Ministry of Transport of the Russian Federation.

Analyzing the data in Figure 1 and Table 1, we observe varying dynamics in the considered indicator: from 2021 to 2022, the volume of cargo transportation by road transport in the SFD dropped by 20.35%. This dynamic can be explained, on the one hand, by the severing of logistics connections due to the coronavirus pandemic, and on the other hand – by the onset of the Special Military Operation in Ukraine, followed by political and economic sanctions against the Russian Federation and the consequent breakdown of logistical ties. As of 2022-2023, the SFD accounts for 10% of the entire volume of cargo transportation by road transport. Although the change in this indicator in the SFD is negative (-13.67%), this is the least reduction compared to other regions. Specifically, over the same period, the volume of cargo transportation in the North-Western Federal District lowered by almost 50% and in the Ural Federal District – by 41.68%.

Next, we should identify the dynamics of cargo turnover in the SFD by individual regions. The respective data are provided in Figure 2.



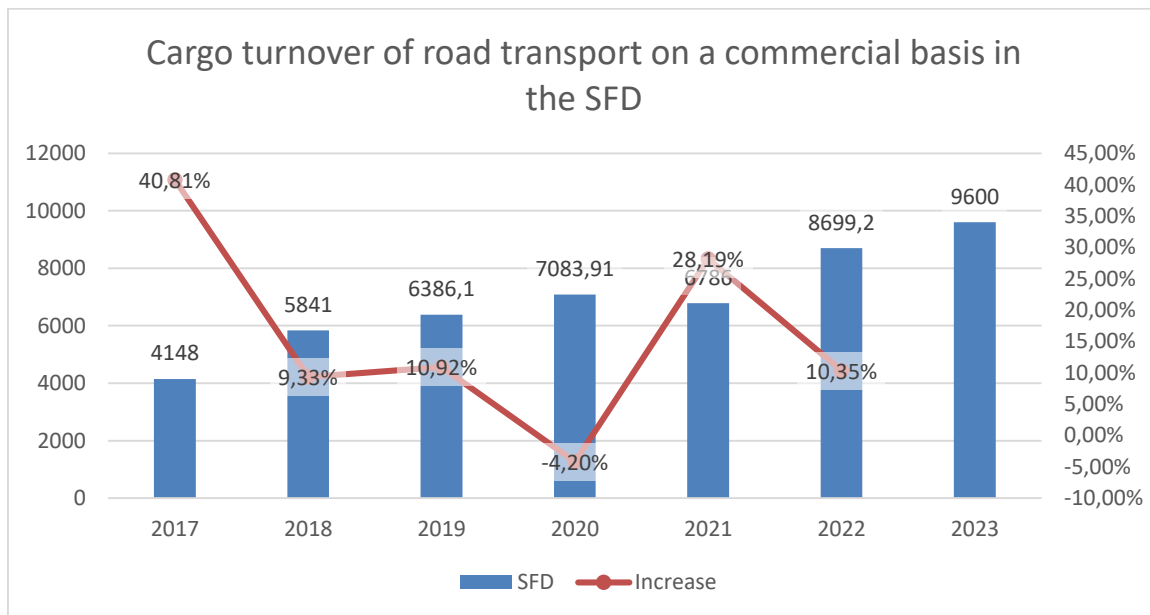
**Figure 2.** Dynamics of cargo turnover of road transport in different regions of the SFD in 2020-2022

Source: Ministry of Transport of the Russian Federation.

The data in Figure 2 indicate that there have emerged three leading regions by road transport turnover, which acts as a connecting link between other modes of transportation: Krasnodar Krai – 10,320 mln. tkm, Rostov Oblast – 6,873 mln. tkm, and Volgograd Oblast – 2,572 mln. tkm. The weakest positions are held by Caspian regions, which are not included in the top 5 regions that account for 20,539 mln. tkm of cargo turnover (or 93.32% of the total across the SFD). Thus, it can be concluded that the distribution of cargo turnover in the SFD is uneven and that the potential of the Caspian regions is underused.

Next, Figure 3 shows the dynamics of cargo turnover in road transport on a commercial basis.





**Figure 3.** Dynamics of cargo turnover of road transport on a commercial basis in 2017-2023, mln. tkm

Source: Ministry of Transport of the Russian Federation.

Of great importance for the study of spatial economics is the analysis of the dynamics of commercial cargo turnover. Summary data from the Federal State Statistics Service (Figure 3) for 2017-2023 demonstrate varying dynamics of this parameter. Similar to the previous indicator, the top-5 here is formed by regions of the Azov-Black Sea basin, while the Caspian Sea regions lag behind. Over the 7 years, commercial cargo turnover increased annually by an average of 14-15% (except for 2020).

Experts predict that with the opening of the North-South transport corridor, the transport and logistics potential of the Caspian Sea regions of the SFD will grow by +31.7 mln. tons of cargo by 2030 (Vedomosti, 2023). Attainment of this indicator requires that the problem of railway, water, and sea transport and transport containers be overcome already at the present stage. The capacities of the Caspian regions of the SFD are currently insufficient to fully service the annually growing transport flows, while the regions of the Azov-Black Sea basin are heavily overloaded. It was established that unresolved problems of railway infrastructure in the coastal regions of the SFD make other transport sectors (maritime transport, ports, road transport) dependent on this infrastructure in the framework of international multimodal transportation.

Official statements by authorities give reason to conclude that despite the advantageous geographical position of the Caspian regions of the SFD, their transportation and logistics potential is utilized very poorly in some cases. Representatives of the Federal Agency for Sea and Inland Water Transport suggest that transport infrastructure facilities in the Caspian regions of the SFD should not compete with other territories. Thus, competition between transportation and logistics infrastructure facilities is restricted by administrative methods. A similar position is held by other enterprises of federal subordination (JSCo "RZD", United Shipbuilding Corporation, etc.), whose decisions cannot be influenced by the regional public authorities in any case (Maksimov, 2020).

#### 4. CONCLUSIONS

The conducted analysis indicates that infrastructure limitations in all modes of transport in SFD regions make it impossible to take full advantage of the favorable geographical location and transportation and logistics potential of these territories. This factor strongly affects cargo turnover and the volume of cargo transportation. The uneven development of transport infrastructure thus constrains the growth of demand for international multimodal transport.

The analysis of cargo transportation volumes and cargo turnover by road transport as a key connecting link between other modes of transportation shows that cargo transportation and turnover are distributed among the regions within the SFD unevenly: some regions are extremely overloaded (regions of the Azov-Black Sea basin), while others do not have enough capacities to fully service the growing transport flows (Caspian regions of the SFD), meaning that the potential of these territories is underused.

Furthermore, the restriction of competition between transportation and logistics infrastructure facilities in different regions by transport enterprises of federal subordination acts as a negative factor affecting regional spatial economics and the transportation and logistics potential of the SFD.

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