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Issue Article

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ANALYSIS OF THE MODERN STATE OF THE TRANSPORT SYSTEM ON THE NUKUS – KARAKALPAKSTAN SETTLEMENTS ROUTE

Abstract: *The article examines the current state of the Nukus – Karakalpakstan settlement transport system, analyzing the characteristics of passenger transportation, the state of road infrastructure, the level of transport accessibility, and existing problems in organizing the transportation process. Particular attention is paid to the role of road transport in ensuring the socio-economic stability of remote rural areas in the Republic of Karakalpakstan. An analysis of factors affecting transport communication efficiency was conducted, including the condition of highways, rolling stock, seasonal fluctuations in passenger flow, and the level of logistical integration. Directions for improving the route's transport system based on modern logistical approaches have been proposed.*

Key words: *transport system, passenger transportation, logistics, road transport, Karakalpakstan, transport infrastructure, Nukus – Karakalpakstan route.*

Language: *English*

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Introduction

The development of the transport system is one of the most important factors in the socio-economic growth of the regions. This problem remains particularly relevant for the remote rural areas of the Republic of Karakalpakstan, where transport accessibility directly affects the population's standard of living, labor mobility, trade development, and the provision of social infrastructure.

The Nukus – Karakalpakstan settlement route represents an important direction of regional passenger transportation, ensuring the connection between the administrative center of the Republic of Karakalpakstan and rural settlements. This route is of not only transport but also socio-economic importance, as it provides access to educational, medical, and administrative services for the population.

In recent years, Uzbekistan has been implementing large-scale reforms in the field of transport infrastructure, aimed at modernizing highways, updating rolling stock, and improving the quality of transport services. However, in remote areas, problems with transport accessibility, irregular transportation, and insufficient infrastructure development remain.

The purpose of this article is to analyze the current state of the Nukus – Karakalpakstan settlement transport system, identify existing problems, and

determine prospects for increasing the efficiency of passenger transportation.

The transport system of the Republic of Karakalpakstan includes road, rail, and air transport. The main role in ensuring domestic passenger transportation is played by road transport, which is the most accessible means of communication between the region's settlements.

The city of Nukus serves as the region's largest transport hub. Modern bus stations operate in the city, providing regular flights to the districts of Karakalpakstan and other regions of Uzbekistan. An international airport and the republic's largest railway station are also located in Nukus.

According to statistical data, a steady increase in passenger transportation volumes is being observed in the Republic of Karakalpakstan. The number of passengers transported increased from 131.3 million people in 2020 to 149.9 million people in 2023. Passenger turnover during the same period increased from 3611.2 million passenger-km to 4391.5 million passenger-km.

The increase in transport activity indicates increased population mobility and increased demand for transport services. At the same time, the increasing load on the road network requires further modernization of infrastructure and improvement of the quality of transport services.

Characteristics of the Nukus - Karakalpakstan settlement route

The Nukus – Karakalpakstan settlement route belongs to the category of inter-district passenger routes. The bulk of transportation is carried out by road transport—buses and fixed-route taxis.

A feature of the route is its social orientation. A significant portion of passenger traffic is formed through the labor commutes of the population, the trips of students and students, access to medical services, transportation to administrative centers, and trade and domestic trips.

The route is characterized by medium traffic intensity and a pronounced seasonality of passenger flow. During the summer period, an increase in travel is observed, which is linked to labor migration and an increase in the business activity of the population.

An important factor in the functioning of the route is the condition of the highways. In recent years, work has been carried out in Karakalpakstan to reconstruct individual sections of highways, including those connecting with Nukus. Nevertheless, part of the road network continues to require major repairs.

Analysis of route transport system issues

Despite certain positive changes, the transport system on the Nukus – Karakalpakstan settlement route faces a number of problems.

1. Wear and tear of rolling stock

One of the main problems remains the high level of wear and tear of buses and fixed-route taxis. A significant portion of vehicles is operated for a long time, which leads to:

- decrease in security levels;
- increase in operating expenses;
- deterioration of passenger service quality;
- an increase in the number of technical malfunctions.

The insufficient level of rolling stock renewal reduces the efficiency of the transportation process and negatively impacts passenger comfort.

2. Low quality of road pavement

Defects in the road surface are observed in certain sections of the route, leading to:

increasing travel time;
an increase in transport maintenance costs;
reduction of average traffic speed;
to increase the accident rate.

For rural areas, the problem of road condition is particularly relevant, as transport accessibility directly depends on the quality of road infrastructure.

3. Irregularity of transport movement

The route periodically encounters problems related to irregular flights, especially in the evening and during periods of unfavorable weather conditions.

The main reasons are:

insufficient number of vehicles;
low profitability of individual flights;
seasonal fluctuations in passenger flow;
technical malfunctions in transport.

Irregular transportation reduces the transport accessibility of rural settlements and worsens the quality of transport services for the population.

4. Insufficient digitalization of the transport system

Modern transport systems are increasingly utilizing digital transport management technologies. However, the implementation level of digital solutions remains limited on the route under consideration.

Not sufficiently developed:

- GPS monitoring systems;
- electronic ticket sales;
- dispatch control;
- information services for passengers.

The lack of modern digital tools complicates the effective management of passenger flows.

Modern research on transport networks shows that the efficiency of transportation depends directly on the level of integration between transport and logistics infrastructure.

To increase the efficiency of the Nukus – Karakalpakstan settlement route, it is advisable to apply the logistical approach shown in Figure 1.

One of the promising areas is the implementation of digital vehicle monitoring, which allows for monitoring traffic schedule compliance and prompt response to changes in the road situation.

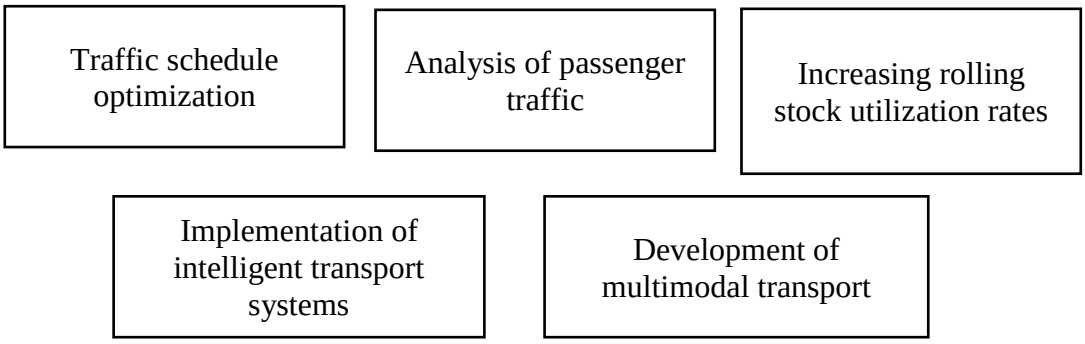

Figure 1. Methods for increasing logistics flow in Karakalpakstan

Another important direction is the development of transport infrastructure in Nukus as the region's main transport hub.

In the coming years, the development of the Nukus – Karakalpakstan settlement route must be linked to the implementation of comprehensive measures to modernize the transport system.

The main promising areas are:

- Updating the bus fleet with modern vehicles.
- Reconstruction of regional highways.
- Development of digital transport management technologies.
- Increasing the investment attractiveness of the transport sector.
- Development of logistical models for organizing passenger transport.
- Increasing the environmental sustainability of transport.

The development of Uzbekistan's international transport corridors also creates additional opportunities for modernizing the region's transport infrastructure.

Conclusion

The conducted analysis showed that the Nukus – Karakalpakstan settlement route plays an important role in ensuring the transport accessibility of rural areas in the Republic of Karakalpakstan.

The current state of the transport system is characterized by a gradual increase in passenger transport volumes and the development of infrastructure. At the same time, problems remain related to the wear and tear of rolling stock, insufficient quality of roads, irregular traffic flow, and low digitalization levels.

To increase the efficiency of the transport system, it is necessary to implement modern logistical approaches aimed at optimizing the transportation process, modernizing infrastructure, and improving the quality of transport services for the population.

The implementation of the proposed measures will increase the stability of the transport system, improve the quality of passenger transportation, and ensure the socio-economic development of remote areas of Karakalpakstan.

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