Indicators representing the level of provision of transport services and infrastructure of the region

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Annotation: *In the article, the indicators representing the level of provision of transport services and infrastructure of the region in the field of transport services management in Uzbekistan in recent years have been researched. In the course of the research, scientific proposals were made for the development of a system of indicators representing the level of transportation infrastructure of the region and their evaluation.*

Keywords*: transport, transport services, transport infrastructure, transportation, availability level, availability ratio, transport network, regional transport.*

Introduction

The problem of assessing the provision of transport services and infrastructure of individual regions has become quite relevant recently. The growth of freight circulation, the development of interregional and international relations creates the need to search for optimal directions of transport. In this case, the insufficient level of development of transport infrastructure can reduce the efficiency of sending resources and finished products and increase their final value. In order to further develop the regional transport infrastructure, it is necessary to develop a method of assessing its current state.

Analysis of literature on the topic

The study of transport services and infrastructure problems in the scientific literature raises the question of the level of infrastructure provision of a given area. Indeed, it is important to determine the level of development of the transport infrastructure, its compatibility with the socio-economic requirements of the region, as well as the potential for future development, such as the analysis of road connectivity, freight or passenger traffic.

In the scientific literature, the issues of determining the level of transport infrastructure of the regions are discussed by N.M. Bolshakov and others, N.V. Svistelnik, N.V. Volkova, Ya.L. Gorchakov, D.F. Dabiev, U.M. Dabieva, M. It is studied by P. Deruzhinskaya, E.V. Zander, V.V. Kistanov, A.M. Kudryavtsev, L.N. Rudieva, M.A. Sarancha, A.A. Chernyshev and many other authors [1,2,3,4,5,6,7,8,9].

It should be noted that in many works relevant indicators and coefficients are studied for different regions and the whole country. The use of a single assessment methodology for different regions represents the possibility of using them as an indicator of the provision of transport infrastructure.

Analysis and results

Abroad, the interaction between the transport network and socio-economic development of regions and agglomerations is usually analyzed. According to the analysis of foreign sources, there is a certain dependence of the standard of living of the population on various economic indicators and the convenience of the transport infrastructure. In addition, the most developed countries of Europe have a well-developed transport network of land and water transport modes (including inland waterways). The study of the problems of assessing the provision of transport infrastructure of the regions, in general,

The series of coefficients listed in Table 1 are used [10,11,12,13,].

Table 1

The main coefficients of the study of provision of transport infrastructure

Name of the coefficient	Formula	Designation

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Engel coefficient Kei = L/√SH L-length of roads in this area, km;	Engel coefficient Kei = L/√SH L-length of roads in this area, km;	Engel coefficient Kei = L/√SH L-length of roads in this area, km;
S-region area, 〖km〗^2;	S-region area, 〖km〗^2;	S-region area, 〖km〗^2;
H-population, people	H-population, people	H-population, people
Holtz coefficient Kei = L/√SN N- the number of residential areas, unit	Holtz coefficient Kei = L/√SN N- the number of residential areas, unit	Holtz coefficient Kei = L/√SN N- the number of residential areas, unit
Uspensky coefficient Kyi =L/√(8&SHQ) Q- gross product of production enterprises in this area, soums.	Uspensky coefficient Kyi =L/√(8&SHQ) Q- gross product of production enterprises in this area, soums.	Uspensky coefficient Kyi =L/√(8&SHQ) Q- gross product of production enterprises in this area, soums.
Vasilevsky coefficient Kyi =L/√(8&SHt) total weight of goods shipped in t-region, t	Vasilevsky coefficient Kyi =L/√(8&SHt) total weight of goods shipped in t-region, t	Vasilevsky coefficient Kyi =L/√(8&SHt) total weight of goods shipped in t-region, t
Road network density factor Kp=L/S See above	Road network density factor Kp=L/S See above	Road network density factor Kp=L/S See above

In our opinion, one of the shortcomings of the indicated coefficients is the impossibility of estimating the share of the region in the gross indicator of the provision of transport infrastructure by each type of transport. If the length of roads in a certain area is calculated separately for each type of transport, there may be differences in the assessment of the provision of transport infrastructure of the region, for example, for the road or railway network. We suggest using the following formula to estimate the availability of transport infrastructure in individual regions:

$$Kob= \frac{Lk}{\sqrt{S*k*v}}*100$$

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Here, Kob is the coefficient of provision of transport infrastructure; Lk - length of roads of a particular type of transport (car, railway, water), km; S- area of the region, 〖km〗^2; k - the share of a particular type of transport in the total freight turnover of the region; v – shipped volume of privately produced goods, works and services, soums [14,15,16,17,18].

A feature of this formula is to take into account the share of a particular type of transport in the total freight turnover of the region. In addition, the indicator of the volume of shipped goods of private production, performed works and services is taken into account, since the sale of products is carried out through the existing transport network.

This coefficient determines the compatibility of the area of the region with the existing infrastructure, taking into account the volume of transported products.

The data of the regions of Uzbekistan were used as an example for calculating the coefficient of provision of transport infrastructure. In Table 1, the share of road transport in the total volume of passenger transport was calculated. The analysis of Table 1 allows us to draw a number of conclusions.

In a number of regions, road transport accounts for a large share of cargo transportation. Because the main types of transport in Uzbekistan are road and rail transport, other types of transport (aviation, water) are excluded. Pipeline transport is not studied in studies due to the specificity of the transported goods [19,20,21,22,23].

The volume of privately produced, loaded goods, self-made works and services by types of economic activity (minerals, processing production, production and distribution of electricity, gas and water) and production of agricultural products.

According to the calculations, the greater ratio of transportation infrastructure provision is observed in Tashkent (88.5%) and Bukhara (71.6%) regions: the territory of this region is sufficiently provided with highways for the placement of manufactured and sold products. Samarkand (11.4%), Navoi (15.2%), Jizzakh (16.3%) regions have the lowest coefficient - the region needs optimization of the road transport network, taking into account the goods flows [24].

The use of this coefficient is necessary to perform a comparative analysis of the transport infrastructure of individual regions, districts, and cities in the future. For example, the presence of a developed transport infrastructure in the future is an integral factor of sustainable socio-economic growth. In addition, the coefficient can be used for passenger transport research: for this, it is necessary to replace in the formula the indicator of the volume of privately produced, shipped goods corresponding to the number of transported passengers.

Conclusions and suggestions

In our opinion, there is no single opinion about the impact of transport services and infrastructure on the socio-economic indicators of regional development. On the one hand, in conditions of a high level of development of the transport message, there is an increase in the turnover of goods and the economic efficiency of the shipment increases. On the other hand, investments in transport in order to support the necessary level of coverage of the territories will lead to additional costs by the state.

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