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# Analysis of Methods for Assessing the Logistics Potential of the Region

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**ABSTRACT:** Modern conditions for market development are characterized by the globalization of economic relations in the world economic system, an undoubted factor of which is the level of development of logistics systems. The formation of market economic relations requires a reassessment of the implemented territorial strategies of socio-economic development from the point of view of the state of the logistics infrastructure, the market of transport and logistics intermediaries, and their readiness to operate in new market conditions.

**KEYWORDS:** logistics, transport and logistics activity, economic activity, macrologistics.

## I. INTRODUCTION

The logistics potential of a territory largely determines its competitiveness against the background of other regions of the country or other cities that can also be centers of transport and logistics activity. The problem lies not only in the state of the logistics system of a single territorial unit, but also in the system of its assessment.

The development of a strategy for the development of logistics in a region, industry, or country should be based on a unified methodology, focus on given criteria and take into account the peculiarities of the spatial distribution of the territory, the peculiarities of the location of productive forces. This is the essence of effective management of territorial logistics.

Assessing the effectiveness of regional development is related to issues of investing in areas of economic activity, which include the activities of transport and logistics structures. Particular attention is paid to the issues of forecasting the region's potential in the field of transportation and warehousing services, the implementation of which allows the territories to recoup their investments. Thus, there is a need to clarify the concept of "logistics potential" for a more accurate description, analysis of indicators related to the efficiency of logistics activities and the formation of logistics development strategies in the region.

## II. MATERIALS AND METHODS

The emphasis on logistics management issues at the level of interests of macrologistics is also explained by the trend of development of transport corridors between Uzbekistan and foreign countries, the development of a multimodal transportation system and the need to find an optimal system of transport services for regional logistics systems as a factor in maintaining the investment interest of foreign countries.

Progressive preparatory work carried out in the area of Uzbekistan's accession to the WTO has entailed large-scale changes in the formation of the development strategy for regional cities. The expansion of international cooperation and the integration of foreign capital into many areas of economic activity will inevitably reorient the role functions of regional authorities. In this regard, many territories of Uzbekistan should strengthen their integrating function and become transit areas in relation to foreign partners. In fact, the formation of directions and strongholds of transport corridors depends on the definition of territories as transit-attractive.

The development of logistics in the era of market reforms in Uzbekistan made new changes in the interpretation of the concept of logistics potential, which was based primarily not on the analysis of microsystems, but on the analysis of the interrelations of the regional and interregional levels. The impact of the factor of increasing interregional and international contacts has led to the need to form mobility characteristics of individual territories, one of which is logistics potential.

## III. DISCUSSION

The constituent elements of the logistics potential and logistics infrastructure of the region that require

quantitative measurement are:

- transport potential;
- warehouse potential;
- transit potential;
- human resources potential;
- attractiveness potential of an economic-geographical location , or spatial potential.

*Transport potential* is the capacity of the region's transport system , which in its entirety reflects the density of the transport system , the presence and number of points intended for multimodal transportation, the number of parallel transport routes for different types of transport and for different types of transportation. Characteristics of the development of a transport system are inherently a characteristic of potential.

*Warehouse potential* is an indicator of the capacity of the region's warehousing system, with the help of which the prospects for growth of warehouse space, their equipment, and quality structure can be assessed. For territories that position themselves as transit areas, the development of high-level warehouse systems and the creation of transport and logistics centers are especially relevant. For territories aimed at internal supply, the development of a retail warehouse system will be most relevant. It follows from this that for regions with different directions of positioning, the criterion boundaries of the warehouse potential indicator should be differentiated.

*The transit potential of a region* is the volume of cargo flows passing through the region in transit per unit of time. This value has a double meaning for analysis. It shows how much cargo can be transported at a time across the territory under study, but in this case we will equate transit potential with throughput, leveling its true meaning. Therefore, the transit potential should reflect not only the number of goods transported over the period of time under study, but also the number of transit goods transported across the territory in accordance with the terms of the contract. Thus, transit potential can be expressed as the share of transit cargo transported in accordance with the terms specified in the contract (or in accordance with time standards) in the total volume of transit cargo turnover.

*Personnel potential* is an indicator that reflects the ability to provide transport and logistics infrastructure facilities with its own specialists of various levels and profiles, as well as to research and analyze logistics systems and processes, and develop programs for their improvement. To do this, the indicator of personnel potential should reflect not only the number of educational institutions and the number of specialists in the profile we are interested in, but also the presence of research institutes and departments leading developments in the direction of improving the logistics management system of regional enterprises.

And finally, *the attractiveness potential of an economic - geographical location (spatial potential)* is an integrated indicator that combines a number of factors that are regularly measured . First of all, such factors include convenience and features of the climatic -geographical location, which can be assessed using the expert scaling method. The system of indicators for assessing the attractiveness of the social sphere must include population dynamics, dynamics of net risk events, dynamics of export and import indicators, as well as indicators reflecting the level of development of industry, construction and agriculture.

It should also be noted that *the market for logistics intermediaries* is an important component in assessing logistics potential. The development of the retail network or the development of the market for intermediary services has a dual meaning from the point of view of their quantitative assessment. For example, the positive dynamics of the number of logistics intermediaries in the region does not indicate either the quality of their work, or the speed of logistics processes and the efficiency of material flow management. For this reason, the assessment of the market for logistics intermediaries and their work should be based on an assessment of the market structure and the types of operations offered.

Logistics research at the regional level may include several areas . The following are proposed:

- research of transport and logistics systems, which is carried out in the case when there is no clearly developed concept for the development of logistics in the region, but activities have been organized to invest and create transport and logistics facilities;
- study of the logistics potential of the territory, which is fundamental for the development of the final logistics strategy , the inclusion of this strategy in the general plan for the socio-economic development of the region or in the development plan for sectors of the national economy;
- research of logistics processes, which is carried out to monitor the effectiveness of logistics management.

Measuring the capacity of the logistics system becomes an argument for making decisions in the field of

investing in regional infrastructure from the point of view of maintaining an effective policy of socio-economic development. The fact that the construction of logistics centers today is carried out on the basis of public-private partnership necessitates the formation of an evidence base confirming the effectiveness of investments not only from the standpoint of financial and economic analysis, but also from the standpoint of characterizing the growth opportunities and management efficiency of the logistics infrastructure.

There are a number of opinions on the interpretation of the concept and methods of measuring the logistics potential of a territory. If the concept of the logistics potential of a territory was previously equated to the amount of transported and processed goods, now the scope of the concept has been significantly expanded and covers both the quantitative and qualitative aspects of the logistics processes carried out in the regions. So, for example, when determining the logistics potential of the Nizhny Novgorod region, the volume of trade turnover was determined as the main volume indicator and the following formula was used:

$$S_{log} = k_1 T_{mo} + k_2 T_{in} + k_3 T_{mp} + k_4 \sum_{trans \cdot comrade} + k_{log} \sum_{op} + k_5 T_{there},$$

where  $S_{log}$  ~ annual logistics potential of the region;

$k_1$  - coefficient of reduction in costs for interregional goods distribution (calculated step by step during the formation of the regional logistics system);

$T_{mo}$  - interregional trade turnover;

$k_2$  - coefficient of reduction in costs for intra- regional distribution of goods (similar calculations give a value of 0.055);

$T_{vo}$  - intraregional trade turnover ;

$k_z$  - coefficient of reduction in costs for the distribution of goods of small enterprises and entrepreneurs (calculated value 0.015);

$T_{mp}$  - trade turnover of small enterprises and entrepreneurs;

$k_4$  - coefficient taking into account regional characteristics of revenues from transit (0.0015);

$\sum_{trans \cdot comrade}$  ~ transit trade turnover;

$k_{log}$  is the coefficient of increase in production volumes as a result of the separation of logistics functions ( 0.002);

$\sum_{op}$  - increase in production volumes;

$k_5$  - coefficient of growth of customs revenues as a result of the formation of a logistics system (0.015);

$T_{there}$  ~ the amount of customs revenue.

As can be seen from the presented calculation methodology, the logistics potential has cost units of measurement, which entails a certain error in its assessment associated with inflation and price factors. Consequently, the problem of comparative assessment of the logistics potential of a territory arises; factor connections are not taken into account in this model for calculating the potential; it is difficult to assess the quality of work of logistics operators. Another disadvantage of this model is the calculation of correction factors associated with the territorial features of the development of logistics systems and the subjectivity of the assessment arising in connection with this.

A generalization of various areas of measurement and assessment of logistics potential can be presented in the form of an aggregated indicator that takes into account individual territorial correlation coefficients, already calculated indices or ratings

$$L_p = a_1 E_g + a_2 E_t + a_3 E_s + a_4 E_{hr} + a_5 E_{tc},$$

where  $L_p$  is an indicator of the logistics potential of the territory. It is assumed that formulas for calculating the components of logistics potential will take into account the direction and closeness of the factor relationship. The proposed model for assessing logistics potential is based on performance indicators of various elements of the region's logistics system. At the same time, for each subsystem, evaluation criteria that are most important for the implementation of the applied logistics strategy are selected.

We present the following structure for calculating indicators:

1.  $E_g$  ( *geographical location efficiency* ) - assessment of the attractiveness of the economic and geographical location: assessment of the possibility of building additional (parallel) railway networks and strengthening service points on sections of the track; assessment of the possibility of constructing logistics centers - the number of territories suitable for construction; assessment of seismic activity in cargo transportation and storage zones as a reverse impact factor; assessment of the accessibility of transport routes related to the climatic conditions of the functioning of the



region's transport system.

All indicators of this block can be determined by experts and in this case will receive a rating characteristic. However, to include them in an integrated indicator, an index assessment or assessment as a relative indicator is required.

2.  $E_{tc}$  ( *efficiencyoftransitcapacity* ) - an indicator of the transit potential of a territory is a combination of the following criteria for foreign economic and interregional relations: efficiency of customs operations; throughput of customs points during cargo inspection (tons per day, average daily); dynamics of the transit time of cargo flows through the study area, expressed by the index of changes in the average transit time of goods; average speed of cargo passage through the region in various supply directions (in days); average speed of cargo service (in days); number of downtimes (in days).

3.  $E_t$  ( *efficiencyoftransportsystem* ) - assessment of the efficiency of the transport infrastructure includes the following characteristics of the transport and logistics system: dynamics of the time of transport operations, expressed by the index of change in delivery time; assessment of transaction costs expressed as total downtime ; criterion for transportation costs, expressed by a cost index by type of transport operations; number of operating routes and developed multimodal routes; the number of transport companies providing services for multimodal transportation.

4.  $E_s$  ( *efficiencyofstoragesystem* ) - assessment of the efficiency of the region's warehouse infrastructure. Based on the following criteria: inventory capacity of the city (region) warehouse system; indicator of the structure of warehouse space, expressed in the dynamics of the share for each type of class; the level of efficiency in terms of the location of warehouses on the territory, expressed in a score for the preference of location .

5.  $E_g$  ( *geographicallocationefficiency* ) - assessment of the attractiveness of an economic-geographical location, otherwise interpreted as an assessment of spatial potential: assessment of the possibility of building additional (parallel) railway networks and strengthening service points on sections of the track; assessment of the possibility of constructing logistics centers - the number of territories suitable for construction; assessment of seismic activity in cargo transportation and storage zones as a reverse impact factor; assessment of the accessibility of transport routes related to the climatic conditions of the functioning of the region's transport system.

Thus, the use of a monitoring system for a group of presented indicators will create conditions for improving the quality of logistics services and making rational choices in financing the construction of logistics infrastructure facilities.

Today, the concept of logistics potential is integrated and includes the region's capabilities in the field of processing and transporting a certain volume of cargo with certain quality indicators of logistics processes and taking into account the existing level of risks.

In addition, the magnitude of the logistics potential is determined by the level of development of the logistics infrastructure, namely the market of logistics operators and the development of transport and information systems. It is also impossible to exclude the influence of such factors as development scientific and human resources potential of logistics in the region, as it is decisive for the implementation of any regional programs.

Thus, measuring logistics potential only on the basis of a quantitative assessment of cargo turnover reflected in the works of a number of scientists and specialists is not objective enough for the following reasons:

- assessment of trade turnover and cargo turnover involves the inclusion in the calculation system of cost indicators that are subject to inflationary processes, which does not allow for a correct assessment of their dynamics;
- quantitative assessment of volumetric indicators of regional development is not makes it possible to judge the qualitative state of the infrastructure and excludes the possibility of conducting factor analysis, which is the basis for formation of a strategy for the development of the logistics complex;
- the lack of assessment methods related to the managerial, that is, target efficiency of the functioning of logistics systems can lead to both strategic and tactical errors in the management of regional logistics;
- assessment of the state of logistics within the framework of an international integrated indicator based on expert methods is not always objective, since it is aimed primarily at measuring the speed of cargo passage through border trade centers and does not characterize the development and quality of work of transit territories located within the country.



#### IV.CONCLUSION

Thus, there is a need to search for new methods for measuring the logistics potential of a region that would collectively characterize the following aspects of the logistics system:

- the capacity of transport and warehouse complexes, the quality of their work and the efficiency of logistics processes in the warehouses of the region;
- economic and managerial efficiency of logistics infrastructure components, the ability to solve problems set by regional authorities at optimal costs and in the shortest possible time;
- dynamics and forecast indicators of growth in demand for the services of the region's logistics system, including the services of logistics operators;
- the level of total risk of transport and logistics processes in the region and beyond in the field of established integrated supply chains.

The forecasting of cargo flows should be based on the volumes of cargo shipments by direction, and on their basis, a transit cargo turnover index should be compiled. To construct the index, it is proposed to use the following values:

- volume of cargo turnover for the i- th type of cargo;
- share of the i-th type of cargo in the total volume of cargo turnover;
- share weight of the i-th direction of cargo delivery in transit.

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