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COMPREHENSIVE ASSESSMENT METHODOLOGY OF THE COMPETITIVENESS OF FREIGHT TRANSPORT SERVICES

Summary. The strategic goal of development of the transport system is to meet the needs of socially oriented development of the economy and society in competitive high-quality transport services. The method of determining the competitiveness of freight transport services developed by the authors is based on the system of indicators for assessing the competitiveness of freight transport services and includes natural and cost indicators that collectively reflect the competitiveness of each operator's services for railway, airway and roadway networks.

1. INTRODUCTION

Policy-makers are often interested in making improvements to transportation in their region to improve the competitiveness of their economy. The link between competitiveness as it is popularly understood and the terms and concepts used by economists is worthy of further clarification. “Competitiveness,” as such, is not an established term in the lexicon of economics. It came into common use in the 1980s, when there was considerable public discussion about the rise of Japan as an exporting power and the rising tide of imports of manufactured goods began flowing into the United States. The term was generally used to mean the ability to compete with manufacturers in other countries. It was never precisely defined in economic terms; however, it is important to define competitiveness in clear economic terms so that it becomes measurable. Also, thinking of economic performance only in terms of international competition is too narrow a concept [1].

The markets for freight transportation and other logistics services are undergoing rapid transformation: concentration of demand and supply in the hands of fewer, larger shippers and service providers, new business models of highly integrated intermodal, ‘‘fourth-party’’ and supply-chain-wide logistics service offerings and a dramatically increasing volatility in the general economic environment are among the reasons for the changes. As a consequence, the ‘‘strategic’’ task of assessing the opportunities and power of certain players in the markets and the important political and judicial task of assessing and maintaining competition in those markets have become very difficult.

At different policy levels, from local to European, the concept of competitiveness is used to stimulate or promote a region. Often, it is assumed that regions can compete with each other on aspects such as labor market, education, investments or human capital. This is also true for investments in transport infrastructure. Investments in transport infrastructure are assumed to have a positive impact on the competitiveness of regions. The question is whether this assumption is true and how it can be measured [2]. As reported by Matijošius et al. [3], with increasing demand for transportation services, the number of enterprises offering these services increases as well. In order to survive in this tough competitive environment, Lithuanian road freight carriers should take any

possible steps to ensure that they have a competitive advantage over carriers from other countries. Statistics of European countries reveal that for the majority of EU member states, road transport plays a dominating role in the freight transport market [4, 5]. Ensuring the efficiency of the transport sector in general (especially the road freight transport sector) is one of the key prerequisites of the development of national economies, since this sector is important for tackling the problem of mobility.

However, ensuring high-quality and reliable transport services is also a key issue in Central Asia (CA). Regional cooperation has long been viewed as a necessity to tackle a wide range of common challenges faced by the deeply interdependent CA countries, including border disputes, trans-boundary water management, common infrastructure arrangements, trade and communications, and security concerns. They have participated in several regional organizations and signed numerous bilateral and multilateral agreements on different issues. However, they seem to have paid little more than lip service to meeting their commitments. The agreements provisions are rarely complied with and organizations are often considered for their geopolitical importance and as instruments serving the political interests of member states rather than as a means to fulfill the immediate mandates of promoting cooperation across different fields [6]. Commitments to cooperation (which are much more frequent in international fora than in national discourses) do not prevent CA countries from simultaneously acting in non-cooperative ways with each other.

Nevertheless, the new foreign policy of Uzbekistan has created a more optimistic atmosphere in Central Asia. In dynamically developing international relations, creation of a powerful transportation infrastructure is a political matter for Central Asia. The implementation of Uzbekistan's initiative to develop the Central Asian system of international transport corridors will help strengthen rationality in the region and increase its competitiveness in the global transportation services market [7].

This paper aims to develop the extensive assessment methodology of the transport services in freight transportation in Central Asia. A case study analysis was performed in Uzbekistan's transport market. The methodology includes the different categories of the competitiveness index of transportation and proposes classification of the indicators of the competitiveness of freight transportation.

2. STRATEGIC OBJECTIVE AND CREATION OF AN EFFECTIVE COMPETITIVE TRANSPORT SYSTEM

In the classical conception, according to M. Porter [8], competitiveness defines the state of the economy in which the possibility of total usage of its potential competitive advantages is created. In defining the competitiveness of the country's transport and logistics services at the macro level, the emphasis is not only on the macroeconomic environment (tax burden, foreign trade barriers, cross-country relations, availability of credit resources, etc.) but also on industry and inter-industry factors.

The strategic goal of the development of the transport system is to meet the needs of innovative socially oriented development of the economy and society with competitive high-quality transport services. Achieving this strategic goal should be ensured through the effective development of a competitive environment in the transport industry, as well as the creation of optimal reserves in the development of transport infrastructure, development of an advanced level of engineering and technology, focusing attention on social and environmental factors of the transport system. In order to create an effective competitive transport system, it is necessary to have three main components:

1) competitive high-quality transportation services;
2) high-performance safe vehicles and transport infrastructure, which are necessary to the extent that they provide competitive, high-quality transport services; and
3) creation of conditions for exceeding the level of supply of transport services over demand; otherwise, there will be no competitive environment.

To create high-quality transport services, it is necessary, first of all, to determine the parameters and quality standards, to provide incentives for their implementation and the creation of highly efficient technologies that meet quality standards. At the same time, it is necessary to create conditions for the development of both internal competition (between carriers, modes of transport) and external competition (with international transit systems). Internal competition will increase the rhythm and

accelerate the movement of goods, reduce transport costs, increase the availability of transport services, improve the investment climate and develop market relations. This will have a positive impact on the external competitive ability and realization of the country's transit potential.

3. METHODS OF DETERMINING THE COMPETITIVENESS OF FREIGHT TRANSPORT SERVICES

To date, a number of studies have been conducted to define methods of assessing the competition of freight transportation [18-19]. However, they have not addressed the classified indicators to assess the service competitiveness in freight transportation. This research proposes a method developed by the authors to determine the competitiveness of freight transport services between railway, airway and roadway transportation. The competitiveness of freight transport services is determined by the system of natural (A) and cost (B) indicators that reflect the basic requirements of consumers for transport. Combination of natural and cost indicators allows to define more broader view of service competitiveness in freight transport market. It is recommended that the assessment of the competitiveness index of the services of competing carriers be performed by the ratio of the results achieved to improve competitive conditions for the delivery of cargo by carriers (P) to the cost of transportation (Ct), taking into account damage (Cd) from incomplete and poor-quality transport services to market entities. The symbols used in Table 1 indicate that all the criteria have the same weight in the overall score.

4. CLASSIFICATION OF THE INDICATORS OF COMPETITIVENESS OF TRANSPORT SERVICES

Competitive relations in the field of the freight transportation market are based on criteria for evaluating the functioning of the carrier-operator, characterizing the degree to which they satisfy the needs of freight customers, both quantitatively and qualitatively. The system of indicators for assessing the competitiveness of freight transport services includes natural and cost indicators, which together reflect the competitiveness of the services of each operator. Below, the methods of determining the main indicators that determine the competitiveness of the enterprise’s services are highlighted.

4.1. Natural indicators

Availability and completeness of services. It characterizes the degree of satisfaction of market demand entities in transport services, determined by the level of development of transport-carrying capacity for goods transportation and the quality of organization of its movement in accordance with their needs. It also reflects the degree of provision of the regions with a transport network, the equipping of highways from the point of view of their throughput and carrying capacity, the degree of introduction of progressive transportation technology and other aspects of the technical level of transport development. Accessibility in purchasing transportation services in each region is characterized, on the one hand, by the availability of vehicles and transport infrastructure and, on the other, by the affordable cost of cargo delivery. It is known that the level of security of various regions with a transport network does not always correspond to their real needs. In certain regions, the lag in the development of railways hinders the development of their productive forces, interregional and interstate ties. The level of the transportation security as a whole or of a particular region with a particular type of transport can be judged in isolation for each type of transport separately, but it is more accurate to consider them comprehensively, because each type of transport complements the other within the framework of a single transport system of the country.

The level of customer information service. Consumers, in accordance with Art. 4 of the Law of the Republic of Uzbekistan “On Protection of Consumer Rights,” have the right to free choice and proper quality of goods (work and services), security of the service, to receive reliable and complete information about the service and its manufacturer as well as to full compensation for material losses,

non-pecuniary damage caused by the service with deficiencies dangerous to life, health and property, and unlawful actions (inaction) of the manufacturer [9].

Table 1

Methodology for calculating the competitiveness index of transport services

No.	Service competitiveness indicators [*share of units*]	Calculation formula of indicators	Service Competitiveness Score	Characteristic of damage from incomplete and poor-quality transport services
1	2	3	4	5
1	Availability and completeness of services **(k_1)**	$k_1 = \frac{C_a}{C_r}$	P_1	Damage from incomplete transport services (C_1)
2	Customer Information Service Level **(k_2)**	$k_2 = \frac{\sum_{j=1}^{z} I_{ja}}{\sum_{j=1}^{z} I_{jn}}$	P_2	Damage from the complete or partial lack of awareness of customers about the properties of services (C_2)
3	Reliability and uninterrupted operation of transport **(k_3)**	$k_3 = \frac{(n_r - n_{un})}{n_r}$	P_3	Unreliable Transport Service Damage (C_3)
4	Delivery speed **(k_4)**	$k_4 = \frac{T_m^a}{T_m^n}$	P_4	Damage due to excessive delivery time (C_4)
5	Cargo safety during transportation **(k_5)**	$k_5 = 1 - p_{nm}$ sh. of units.	P_5	Damage from non-safety cargo during transportation (C_5)
6	Transport safety **(k_6)**	$k_6 = \frac{N_{tp}^f}{n_{tot}}$	P_6	Damage from non-observance of traffic safety requirements (C_6)
7	Eco-friendliness of transportation **(k_7)**	$k_7 = \frac{E_a}{E_n}$	P_7	Damage from environmental degradation (C_7)
	Total points:		$\sum_{1}^{7} P$	
8	**The total cost of transportation (C_t), with additional costs (C_{add}), points (C)**	$C = C_t + C_{add}$	**C**	**Total damage from incomplete and low-quality transport services $C_{add} = C_1+C_2+ C_3+C_4+ C_5+C_6+ C_7$**
	Service Competitiveness Index (Y_k)	$Y_k = \frac{\sum_1^7 P}{C}$		

where:

- C_a, C_r - the actual and required level of transport capacity;
- N_{tot} - the total number of planned routes of trucks for a year, units;
- N_{vio} - the number of runs with violations of traffic safety requirements for a year, units;
- N_{fail}- the total number of failures and deviations from the planned schedule of vehicles per year, units;
- I_{ja}, I_{jn} - respectively, the actual and normative levels of information support for customers with transport services; j = 1, ..., z. J and z - type and number of varieties of information about transport services;

- T_{ma}, T_{mn} - respectively, actual and normative levels of time spent on transportation, including the time that is taken to deliver the goods to the departure point, transport downtime for accumulation and actual movement time of the transport, including downtime at intermediate points and to transport goods from the final station to the destination, numbers;
- P_{np} - the actual level of non-preservation of goods during their delivery, the share of units; and
- E_a, E_n- the actual and normative levels of exhaust emissions by the transport for a year, t.

Reliability and uninterrupted operation of transport shows the degree of clarity in fulfilling the obligations of the carrier in accordance with the contract for the carriage of goods. It characterizes the level of smooth operation, expressed as the ratio of the trouble-free number of completed runs on the route to their total number of planned ones. The reliability of the transportation process depends on many factors, which, first of all, include [10-12] service life, degree of wear and technical condition of vehicles, condition of communications and roads; service resources of vehicles; organization level and certification quality of services for the repair and maintenance of vehicles and permanent devices; MTBF (Mean Time Between Failure) of vehicles; the probability of transport failure-free operation, the organization level of transportation and the monitoring state of the measures implemented to ensure traffic safety; the organization level of labor discipline monitoring at all stages of the transportation process; solving social issues at transport enterprises, etc. Among these factors, in most cases, the reliability of transport is determined by the technical condition of vehicles, the organization level and the certification quality of repair and maintenance of rolling stock.

Delivery time characterizes the time spent on cargo delivery. This indicator is one of the most common criteria in the current practice for evaluating transport services in the form of time spent on moving cargo “from the door of the consignor to the door of the consignee”. The accepted criterion directly or indirectly includes such basic indicators as the density of the transport network, speed, simple rolling stock under cargo operations and under accumulation at stations, cargo reloading from one type of transport to another, etc. The total time spent on cargo delivery includes the following elements: time of cargo delivery to the departure station; time of waiting for unloading and loading of cargo into the vehicle; travel time; container reloading time to another mode of transport; and the time of the export of goods from the station to the final destination. The acceleration of cargo delivery is facilitated by improving the design of rolling stock; design quality and improved location configuration of the communications and roads; introduction of advanced transportation technology and traffic management; and advanced training and professional skills of the vehicles’ crew and workers of the control services for traffic control and regulation.

Cargo safety during transportation is an integral part of the attribute of consumer properties of transport product services. Often, the loss, spoiling or damage of cargo during transportation negates the efforts of transport companies to improve the quality of transportation, even at a fairly high speed of vehicle movement. The current rules of goods transportation by appropriate means of transport provide for liability measures of transport companies for loss, spoiling and cargo damage during transportation [13]. Cargo safety during their delivery by rail is facilitated by strengthening the material and technical base of railway stations, equipping cargo yards with a modern terminal, warehouses for storing goods and containers, weighing instruments, loading and unloading machines and mechanisms, etc.; professional development of railway workers; labor productivity growth; and reduction and simplification of the processing of various fees during storage and containers delivery.

Transport safety is one of the primary requirements for transport. Ultimately, it represents the level of guarantees provided by the carrier for cargo safety and for ensuring the health and safety of workers during transportation. Transport safety is indirectly determined by a statistical method: the number of accidents during the reporting period to the total number of planned runs for a given period. Therefore, in 2018, the highest level of road traffic accidents (RTA) per each 100,000 population was observed in Tashkent and Tashkent region (49.1 and 40.6 cases, respectively), and it decreased (from 36.2 to 27 cases) as a whole for the country in the 2011–2018 period, i.e., decreased by an average of 10%, although in Jizzakh, Syrdarya, Samarkand and Bukhara regions, the level increased [14]. The level of transport safety depends on many factors, the main ones [15] being reliability of the vehicle

operation; technical readiness of vehicles for specific transportation (manning, rescue equipment, necessary regulatory documentation, route maps, inventory, devices, etc.); and professional suitability of transport service executors (length of service in the position held, qualification level, frequency of professional development, number of violations of management rules and job descriptions for a certain period).

Eco-friendly transportation includes the level of environmental pollution during the process of transport. Transport is one of the main sources of environmental pollution in each specific region. Use of trucks, auto-loaders and gas-powered truck cranes with a service life of more than 10-15 years within the city limits poses a major environmental threat. Here, the level of exhaust emissions released into the atmosphere of 20 - 25% exceeds the established emission standards for vehicles with a normal period (up to 8 - 10 years) of operation. Environmental friendliness of transport can be established on the basis of reported data on the emission of harmful substances released into the atmosphere. Environmental pollution occurs through the emission released by vehicles into the atmosphere of exhaust gases and other solid household wastes and substances; draining water into water bodies after washing of vehicles and exceeding of the standard noise level from the operation of transport. Permissible noise levels are set in accordance with the applicable law (in dBA) as follows: cars - 70-80; trucks - 80-85; freight railway trains - 85-90; from jet aircraft operating on local airlines - 90-95, and from jet aircraft operating on international airlines - 130-140 [16]. Improvement of the environmental friendliness of transportation is facilitated by accelerating the pace of updating and modernizing the fleet of vehicles, loading and unloading machines and mechanisms; re-equipment of transport for work on other less energy-intensive fuels; scaling up electrification; implementation of targeted programs to save fuel and electricity during transportation and in the process of performing cargo operations at stations; and increasing the technical level of production.

4.2. Cost indicators

The cost of transportation is one of the key indicators that determine the competitive position of transport enterprises. The competitiveness of transport services is in inverse proportion to the cost of transportation, i.e., the higher the cost of transportation of the carrier, other terms being equal, the lower the competitiveness of its services. Low cost transportation is derived from the art of transport logistics management. The management strategy determines the optimal level of expenses and the levels of transportation quality offered to the client and the corresponding level of tariff for transport services. All of this ultimately determines the ability to attract a client. With a small volume of traffic, the actual cost of delivering a container by rail is significantly higher than the paid portion of the cost of transportation. For private vehicles, there is virtually no gap between the tariff rate and the actual cost of transportation. Therefore, when comparing various options for the delivery of goods, the calculation of the competitiveness of transport services should be carried out with the actual cost of transportation.

Damage arising from incomplete and low-quality transport services. Economic damage from incomplete and low-quality transport services associated with customer awareness in each region is shown in Table 2. Compliance with transportation by operators on the basis of the above basic requirements of service consumers ultimately determines the choice of the buyer in favor of a particular carrier operator. For a cumulative assessment of all the above particular indicators of the service competitiveness of a particular carrier, it will be necessary to determine a generalized indicator of their competitiveness. For this purpose, a comprehensive assessment of the natural and cost indicators of the services competitiveness of transport enterprises is carried out, which is dictated by the need to more fully account for all the factors affecting the competitiveness of services.

At present, companies in the freight sector do not pay proper attention to the study of the competitive position of various operators in the market. In addition, the current accounting system does not allow one to accurately determine the cost of transportation of goods by type of messages - export, import, transit and international communications with other countries, by type of dispatch - small wagon, route, by type of rolling stock (e.g., in tanks, gondola cars, covered wagons, etc.), and according to the speed of communications - ordinary, accelerated, high-speed or passenger trains.

Table 2

Economic losses due to incomplete and low-quality transport customer services

	Source of low-quality transport services	Reason
1.	**From an incomplete level of transport service**	- due to the refusal of customers to transport (deferred demand); - due to the absence or inaccessibility of transport; - additional costs for the cargo client due to overpayments from use of a more expensive mode of transport.
2.	**From incomplete awareness of cargo customers**	- additional costs when the client uses expensive types of transport services; - from loss of funds due to full or partial lack of information about his or her rights and opportunities made available by the law when purchasing transport services;
3.	**From incomplete awareness of cargo customers**	- additional costs when the client uses expensive types of transport services; - from loss of funds due to full or partial lack of information about the rights and opportunities made available to him or her by the law when purchasing transport services;
4.	**From unreliable operation of transport**	- additional costs in the form of shortage of production capacities due to use by the client of another type of transport; - loss of income of the carrier as a result of the client's refusal of services and use of the services of another transport company.
5.	**From the excessive duration of the goods delivery**	- losses of the enterprise due to reduced productivity of rolling stock; - loss of customer income in the field of material production due to an increase in inventories on the way;
6.	**From non-safety of goods during transportation**	- losses of reimbursement by the carrier of the fully or partially lost value of the goods;
7.	**From non-compliance with traffic safety requirements**	- amount of material and non-material damage caused to the client and the carrier as a result of transportation accidents; - Losses of the carrier's income as a result of outflow of customers to other transport companies that have higher rates of ensuring transport safety.
8.	**From environmental pollution during transportation**	- pollution caused by water flow into water bodies after washing of vehicles and their parts and assemblies, as well as when draining oil and other liquids during repair and maintenance of vehicles (according to statistical reports); - damage caused by emission of harmful substances into the atmosphere during transport (determined according to statistical reporting); - damage due to discomfort as a result of exceeding the established noise standards from mobile and stationary sources, which is determined on the basis of a comparison of the actual noise level with the normative indicators and the cost of implementing noise isolation measures.

Only indirectly, using the unit expense rate method, is it possible to calculate the cost of transporting individual goods in specific types of rolling stock with the rates obtained for the use of cars and locomotives. However, even for these calculations, extensive data are needed: indicators of the weight and speed of movement by type of traction, norms of fuel consumption or electric energy per 10 thousand ton-km gross by type of movement, unit expenditure rates of measuring units of

operational units: 1 freight shipment, shipped freight, freight-h, freight-km, locomotive-h, locomotive-km, brigades-h of locomotive crew, locomotive-h of shunting work, ton-km gross, kg conv. fuel (kWh of electric energy) for 10 thousand ton-km gross, etc. The methodology for calculating the cost of cargo transportation using the unit expense rates methods is described in the studies of A.S. Chudov, V.N. Orlova, A.P. Abramova, T.V. Eliseeva N.G. Smekhova and A.M. Shulgi and others [17].

The current database for calculating the real costs of transportation of goods cannot provide complete information about the freight transportation by the railway company. Moreover, these data are not updated systematically. Under these conditions, it is difficult for enterprise management to determine the advantages and disadvantages of their economy in the market; their elaborated discussions about the strengths and weaknesses of competitors are unconvincing for investors. Errors in assessing the situation in the freight transportation market can result in large losses in the competitive position of freight enterprises. It is necessary to create conditions for the development of both internal competition (between carriers, modes of transport) and external competition (with international transit systems). Internal competition will increase the rhythm and accelerate the movement of goods, reduce transport costs, increase the availability of transport services, improve the investment climate and develop market relations. This will have a positive impact on the external competitiveness and realization of the country's transit potential.

In this paper, it is proposed methods for calculating the competitiveness index of freight transport services, where it is recommended to evaluate the natural rates of transportation according to a 0-10 points scale, where 0 is the lowest value and indicates the lowest qualitative meaning, 10 is the highest or best qualitative meaning. However, the cost indicators of transportation according to a 0-100 points scale. Service competitiveness index calculation for a short and long distances freight transportation is given in Tab. 3 and Tab. 4 respectively. Tab.3, 4, 5 and 6 illustrates the first results of experimental validation in the case of cargo transport services in Uzbekistan.

Visualization reports of the competitiveness index are shown, respectively, for short and long-distance delivery within the country in Fig. 1. As a result, fixed railway wagons have significant sensitivity in terms of cost and competitiveness with respect to different transportation distances. In addition, trucks represent more competitive and cheaper transportation over a shorter distance, whereas railways have reasonable advantages in terms of cost and competitiveness for long-distance distribution. Service competitiveness index and transportation cost scoring data are presented for long- and short-distance shipping in Tables 5 and 6. The competitiveness index and transportation cost trade-off diagram is shown in Fig. 2. Railway transport provides a higher competitive index in international transportation in both long and shorter distance delivery. Container shipping through trucks is not a feasible solution for customers for delivery of their products across short and long distances.

5. CONCLUSIONS AND RECOMMENDATIONS

Studies of the carrier operators' competitive positions operating on the market of specific service types in terms of their specific features and operating conditions of each type of transport which is given in the Table 3, have enabled us to formulate the following conclusions and recommendations:

When transporting goods over relatively short distances a higher competitiveness index of services is available for road carriers using MAN trucks with a carrying capacity of 25 tons semi-trailers than for deliveries in covered wagons. At the same time, when transporting goods over long distances - in international and interregional railroad positions are more preferable in comparison with other carriers.

Strengthening of the position of railways in the market will be facilitated by the organization of the movement of freight trains with more flexible weight standards and speeds depending on market demand. Thus, from the customers' point of view, fixed trains with weight rates of more than 5000 tons gross with speeds of up to 90-100 km/h are very effective when transporting a mass flow of heavy cargo over long distances. However, it is advisable to organize the transportation of high-value and perishable goods in relatively small batches in expedited freight trains or as part of passenger services with gross weights of up to 1600 - 2000 tons, but with higher speeds of at least 120 - 140 km/h.

Table 3

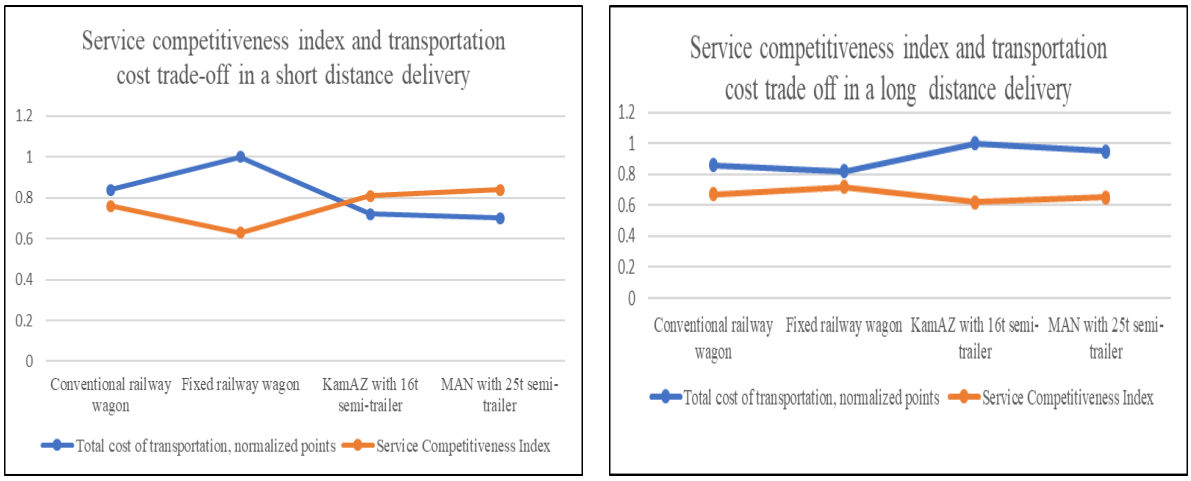
Cargo transportation in domestic communications over a short distance (<200 km)

Directions of transportation routes, properties of services	**COMPETING OPERATORS**			
	A	**B**	**C**	**D**
Tashkent - Bekabad: transported goods: *(manufactured goods, cement)*	Railway rolling stock (180km) covered wagon, 60t		Trucks (130 km)	
	Conventional (0-10)	Fixed (0-10)	KamAZ with a 16t semi-trailer	MAN with a 25t semi-trailer
Completeness and availability of services	8	8	9	9
Reliability and uninterrupted operation	10	10	9	10
Transport safety	10	10	6	6
Eco-friendliness of transportation	10	10	5	5
Delivery time	8	7	9	9
Information level of customer service	8	8	10	10
Cargo safety during transportation	10	10	10	10
Total points (0-100)	**64**	**63**	**58**	**59**
Total cost of transportation, points (0-100)	**84**	**100**	**72**	**70**
Service Competitiveness Index	**0.76**	**0.63**	**0.81**	**0.84**

Table 4

Cargo transportation in domestic communications over a long distance (>200 km)

Directions of transportation routes, properties of services	**COMPETING OPERATORS**			
	A	**B**	**C**	**D**
Tashkent - Urgench, transported goods: *equipment + rice, sugar*	Railway rolling stock (1093km) covered wagon, 60t		Trucks (980 km)	
	Conventional (0-10)	Fixed (0-10)	KamAZ with 16t semi-trailer	MAN with 25t semi-trailer
Completeness and availability of services	9	9	8	8
Reliability and uninterrupted operation	10	10	8	8
Transport safety	10	10	8	8
Eco-friendliness of transportation	10	10	5	5
Delivery time	6	6	8	8
Information level of customer service	7	7	8	8
Cargo safety during transportation	8	8	10	10
Total points (0-100)	**60**	**60**	**55**	**55**
Total cost of transportation, points (0-100)	**86**	**82**	**100**	**95**
Service Competitiveness Index	**0.67**	**0.72**	**0.62**	**0.65**



a) b)

Fig. 1. Visualization of service index and transportation cost from Tables 3 and 4

Table 5

Container shipping in international shipment (long distance)

Directions of transportation routes, properties of services	**C O M P E T I N G O P E R A T O R S**			
	A	**B**	**C**	**D**
Chirchik - Urumchi, transported goods: *compound fertilizers + manufactured goods*	Railway rolling stock (2262km) 40-foot container		Trucks (1630 km)	Avia (1300 km)
	Conventional (0-10)	Fixed (0-10)	MAN, with 25t semi-trailer	Boing767
Completeness and availability of services	8	8	7	7
Reliability and uninterrupted operation	9	9	8	8
Transport safety	10	10	8	8
Eco-friendliness of transportation	10	10	5	5
Delivery time	9	7	9	10
Information level of customer service	7	7	7	10
Cargo safety during transportation	9	9	9	9
Total points (0-100)	**62**	**60**	**53**	**57**
Total cost of transportation, points (0-100)	**92**	**88**	**94**	**100**
Service Competitiveness Index	**0.67**	**0.68**	**0.56**	**0.57**

Table 6

Container shipping in international traffic (short distance)

Directions of transportation routes, properties of services	**C O M P E T I N G O P E R A T O R S**			
	A	**B**	**C**	**D**
Pitnyak - Krasnodar, transported goods: *DAMAS cars + equipment, timber*	Railway rolling stock (664km) 40-foot container		Trucks (662km)	
	Conventional (0-10)	Fixed (0-10)	KamAZ with 16t semi-trailer	MAN with 25t semi-trailer
Completeness and availability of services	8	7	7	7
Reliability and uninterrupted operation	9	9	8	8
Transport safety	10	10	8	8
Eco-friendliness of transportation	10	10	5	5
Delivery time	9	7	9	9
Information level of customer service	7	7	7	7
Cargo safety during transportation	10	9	9	9
Total points (0-100)	**62**	**59**	**53**	**53**
Total cost of transportation, points (0-100)	**68**	**66**	**100**	**95**
Service Competitiveness Index	**0.91**	**0.89**	**0.53**	**0.56**

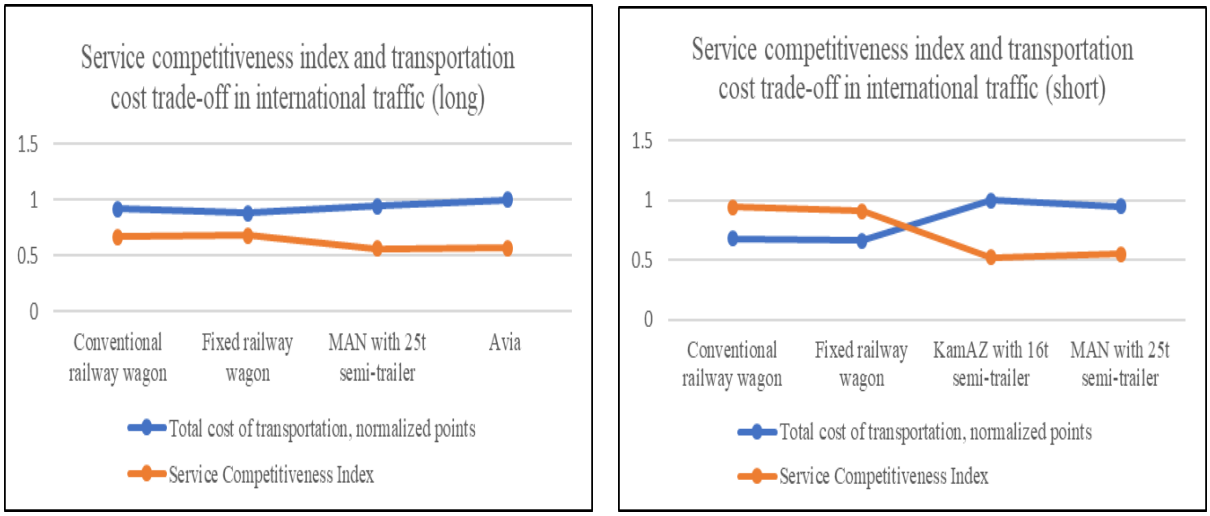


Fig. 2. Visualization of the service index and transportation cost from Tables 3 and 4

The competitiveness of railways in the market can also be greatly enhanced by the rational and integrated distribution of productive forces in the regions, which will reduce the empty runs of wagons and vehicles, which can significantly reduce the cost of goods delivery. Solving the problem requires a more competent approach in terms of the transport factor when developing master plans for urban development for the long term considering the influence of demographic and environmental factors.

Based on the concentration of freight work at larger support stations, it is possible to significantly reduce the cost of cargo handling at freight yards and production sites of freight facilities and thereby increase the competitiveness of railways in the market. At the same time, real conditions are created for reducing transport costs by reducing the downtime of wagons, containers and vehicles, and new opportunities are opening up for expanding integration and improving coordination of industry and transport. Therefore, current study proposes that the freight transportation at the larger railway stations has to follow an integrated logistics, and it should become one of the important tasks of the railway company.

The competitiveness of carrier operators can also be enhanced by improving the level of information services for consignors and consignees and other market participants. The relevance of this task is due to the deepening and expansion of integration processes in transport. Strengthening the competitive position of freight enterprises involves increasing the level of transport safety, quality and reliability of transport in compliance with international standards of quality and management as well.

From a strategic point of view, the complexity of transport communications of the Republic of Uzbekistan is limited because of its geographical remoteness, limited access to transport corridors in both inside and outside the country. Therefore, Uzbekistan to regional integration, consistent and balanced national economy transport policy provides opportunities for expanding traffic flows both domestically internationally getting access to the main Eurasian logistic centers. The presented methodology can be used in practice to assess the competitiveness of the transport services at the national level.

Recommendations. The definition of the evaluation criteria indicators of the competitiveness of freight transport services can legitimately be seen as the development of a narrowly specialized regulatory framework (although by itself, the establishment of appropriate standards in supply chain is very important from the point of view of monitoring the market of transportation services) and primarily as a tool for assessing the competitive environment on the freight transportation market and guarantor of the solution of the major socio-economic problems of transport maintenance in various regions of the country. Moreover, the proposed methodology can also be used for assessing the competitiveness of passenger transportation in future studies.

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