The Main Directions of Increasing the Economic Efficiency of Transport Infrastructure

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Abstract: **This article presents suggestions for modern ways of managing a single transport system, the creation of complex organizational and technical facilities, the application of logistical engineering principles for effective infrastructure management, and the use of proactive (preventive) management in single transport systems.**

Keywords: Single transport system, logistics engineering, complex organizational and technical facilities, management methods, proactive (preventive) management.

I. INTRODUCTION

The importance of transport infrastructure in the globalization process is increasing. Effective establishment of an integrated transport system in developed countries will have a structural impact on the development of all sectors, including the real sector and the social sector. Therefore, it is important to apply modern management techniques to improve international shipping, to align and operate transport infrastructure in line with international standards [1]. The development of international economic relations requires carriers to focus on optimizing their operations in the face of intense competition. Creation and functioning of modern transport and logistics infrastructure, including transport and logistics centers (TLM) and complexes, providing free access to goods in Uzbekistan and foreign markets, are becoming an important issue for the modern stage of development of the transport complex of Uzbekistan.

In the 21st century, state models of formation and use of the state innovation system are developing as complex organizational and technical facilities designed to integrate flexible information technologies and high-efficiency supply chains. From this point of view, the issue of interaction with various sectors of the economy is very important in terms of improving the efficiency of management and ensuring its stable operation with the transport system of Uzbekistan, its infrastructure, and the system of multimodal transportation.

II. LITERATURE REVIEW

A number of scholars who have studied the effective management of transport and logistics infrastructure, its content and its impact on other sectors of the economy have expressed different views on the management of transport and logistics infrastructure.

According to D.Bauersoks, he paid particular attention to the problems of the organization of multimodal and intermodal freight, including the benefits and cost-effectiveness of the organization of cargo transportation in comparison with traditional methods. The author also highlights transportation and logistics infrastructure, including transportation networks, vehicles and transport companies [2].

A.L.Nosov, in the present conditions investigates the problems of establishment and optimal functioning of international transport and logistics systems. Prospects for the development of mixed cargo transportation with a focus on improving the organization of mixed foreign trade on international flights [3].

S.M.Rezer, in his work, addresses the models and challenges of managing regional transport systems in the context of changes. The production and transport system of the country has analyzed in detail the methods of interaction of modes of transport, the methodology of forecasting of the market of transport operations and the principles of planning the work on trunk road transport [4].

Taking into account the above considerations, it is possible to consider the economic and technological feasibility issues, including identifying the needs for the development of transport and logistics infrastructure, developing the infrastructure using modern management techniques to improve the efficiency of management.

III. RESEARCH METHODOLOGY

In order to effectively manage a single transport system in the country, to solve problems in this process, we have analyzed the logistics index of developed countries, modern methods of management of the transport system, provided directions for the development of their activities by means of comparison, analysis and synthesis.

IV. ANALYSIS AND RESULTS

New opportunities are created for the development of multimodal and intermodal freight delivery services in the single transport system and the integration of various participants in freight forwarding. The need for logistics technologies and high-speed transport systems to serve consignors and consignees is becoming a driving force in global transport systems. This increases the complexity of the organizational and technical facilities. Integration processes also aim to improve transport performance, which is reflected in improving customer service, reducing overall costs and transport risks. The application of logistical engineering principles is seen as one of the most important conditions for improving the efficiency of integrated supply chains.

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Table Freight turnover by types of transport in 2012-2017 and shipping [3]

Types of transport	2012 y.		2013 y.		2014 y.		2015 y.		2016 y.		2017 y.		2018 y.	
	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km	Mln.tons.	Billion t.km
Including by transport														
Railway	61,5	22,7	63,7	22,8	65,7	22,9	67,2	22,9	67,6	23	68,1	22,9	68.4	23.1
Automotive	1203,2	27,5	1258,3	29,2	1327,4	31,5	1399,8	33,9	1473,7	13,3	1013.1	13,9	1015.5	14.1
Pipe	64,5	33,0	65,0	31,5	65,8	31,2	60,0	30,0	62,2	28,9	30,2	65,1	31.2	65.9
Air	24,0	121,9	22,2	116,3	23,0	125,1	24,6	131	26,5	132,2	156,9	26,4	157.2	27.1
Total	1329,3	83,4	1387,1	83,7	1458,9	85,7	1527,0	86,9	1603	88,0	1146,2	66,9	115.2	67.1

Delivery of goods and passengers in the transport is characterized by the specificity of life-cycle processes. Different types of vehicles, production and distribution systems are not sufficiently interconnected, which results in lower efficiency, quality and reliability of transport services, which is especially reflected in the operation of supply chains, including their infrastructure. For example, there has been an increase in rail freight traffic in recent years, and there is a risk of loss of access to operating assets (rolling stock, containers).

To assess the role of the railway network in the economy of the country, to study the prospects and trends in the sector, to carry out research on forecasting, to develop material and technical resources, labor and financial status, directly affecting the medium and long-term strategy, the current policy. and developing a long-term strategy.

Therefore, the main issue today is to study the performance of the rail transport system, the stages of development of the transport and logistics infrastructure, and to develop recommendations to address the existing problems in the system. Table 1 presents data on freight turnover and volume of transportation by types of transport in 2012-2018.

Table 1 shows that in 2012-2018, the total volume of freight transported by German railways increased 1.6

times compared to 2000, and the total passenger traffic by 1.3 times. In total, by 2018, railroad transport will reach 68.4 million tonnes. The freight traffic testifies to the development of this sector from year to year in our country. As a result of the measures taken, in 2017 the volume of freight increased by 42% compared to 2012, including by 44% on automobile and by 73% on air transport. The total freight turnover in 2017 amounted to 66.9 million tonne-km. The highest share in total freight turnover falls on road transport (40.11%), pipeline transport (34.96%) and rail transport (25.5%). [4].

As a result of the measures taken, the volume of freight traffic in 2018 increased by 5.5% compared to the previous year, including by 5.3% and by 8.8% on air transport. The volume of freight turnover was 91172.6 million ton-km, with the highest share in total freight turnover (39.4%), pipeline transport (35.0%) and railway transport (25.4%). %). Estimating the prospects for the development of Uzbekistan's economy and the development of other types of transport, it is envisaged that the growth in rail transport will be 5% or 2.3% annually on average, to $ 83.7 million in 2016. tons to 146 million tonnes in 2030 tons per year [5].

It is estimated that the 1% increase in investment in the transport sector will increase the volume of freight transport by 0.94%. It should be focused on further optimizing the management of the consumer-oriented transport logistics system while ensuring better diversification of transport routes for improving the quality of services and transportation.

One of the most important tasks is to reduce the share of transport costs in the cost of production, as the increase in transport costs in the cost of industrial production has a direct impact on the competitiveness of domestic goods. Domestic shipping costs, such as the cost of international shipping services (including transit services), remain relatively high and have been increasing rapidly in recent years.

The high cost of freight is also typical of the railway sector. Specifically, a comparative price analysis shows that manufacturers in Uzbekistan pay $ 5.15 for 1 kilometer of freight (60 tons of textile products) per kilometer. In Kazakhstan, this figure is $ 0.93, in Kyrgyzstan - $ 2.65, in Tajikistan - $ 6.83, and in Turkmenistan - $ 2.65. In Uzbekistan, shippers pay $ 2.51 for a distance of 500 to 1,000 kilometers, $ 0.68 in Kazakhstan, $ 2.60 in Turkmenistan [5].

The transport system is characterized by the fragmentation of the supply chain, the overloading and unloading of goods from the supplier to the recipient, which results in increased costs for integrated logistics services. This is due to the underdeveloped transport and logistics companies and related infrastructure. Most of the transport and logistics operations in the country occur in 1PL and 2PL, with some companies providing limited services in 3PL format. There is a lack of large operators capable of establishing effective cooperation between road, rail and aviation.[9]

The main constraints to increasing freight traffic are:

- underdeveloped transport and logistics system;
- Significant pace of development of the road network is lower than the rate of automation of the society;
- underdeveloped transport infrastructure (border crossings);
- limited capacity of rail companies;
- unreasonable high cost of aviation fuel.

Large transport links are underdeveloped with a network of multimodal terminal logistics centers (TLMs) across Uzbekistan's railways network. As a result, it is impossible to ensure the speed of container turnover, as well as the large number of freight connections, and the increased distribution of freight flows in the transport infrastructure of various types of transport [6].

As mentioned above, one of the ways to increase the efficiency of establishing and managing Transport Logistics Systems (TLTs) is logistics engineering. Some projects do not use logistical engineering or all the processes required to organize projects within the infrastructure, but the principle of 'joining many'. As an example, the transport process can be considered in the direct supply chain linking the manufacturer, TLM, and consumer (Figure 1).

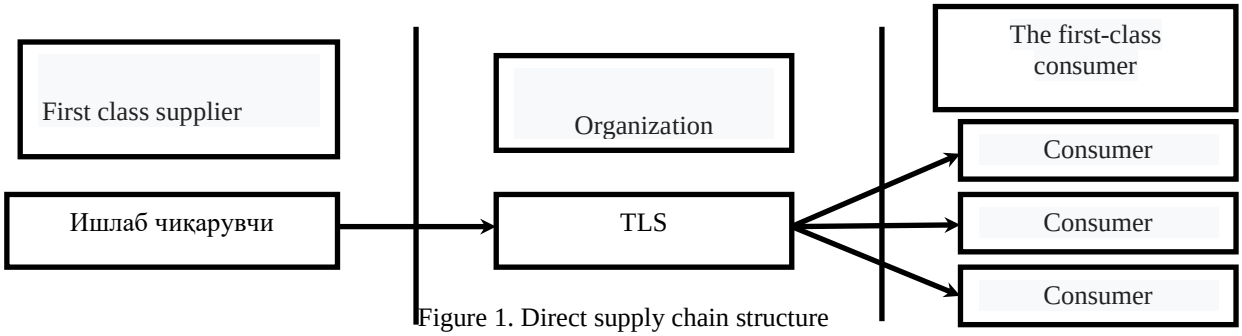

Figure 1. Direct supply chain structure
Source: Author's development

Such a supply chain fully meets the requirements of technological integrity, which is crucial for determining the impact of transport-specific processes on the end of the chain. Technological integrity is achieved by combining intermediate links so that the product "outputs" from one syndicate to another at the same time as the delivery time is reasonable.[8]

In this case, the transport acts as a conveyor, which completes the continuous technology process and provides service to all supply chains. However, this approach requires up-to-date information, mathematics, and software that allow for the evaluation of a holistic transport process. It is considered as a mobile technology bridge in digital logistics based on the standard of electronic data interchange in management, commerce and transport.

Under current economic conditions, manufacturing, warehousing, customer placement, and flexible delivery of traditional (functional) logistics processes modeling the supply chain to optimize costs and orders. Not only does a supply chain, but also a separate enterprise based on the logistics mechanism of integrated management in intellectual and Internet technologies (such as the Internet of Things), require a new firm approach.

It is difficult to imagine the modern production and service systems that are currently distributed across the territories of international corporations and holdings that are not yet integrated into the transport system. The systems, tools and complexes used are often multifaceted, ambiguous in operation, hierarchy, superfluous elements and connections, versatility and complexity of tasks and processes.

Under current conditions, life-cycle infrastructure can facilitate the creation of conditions for innovative development of robotic load-handling equipment and advanced technology solutions, including international engineering and transport construction. For example, it is difficult to imagine the principle of a systematic approach to warehouse activities in railroad transport without the use of logistical engineering technologies in commercial use [7].

It is important to keep in mind that due to resource shortages it is impossible to maintain the required level of operation of modern organizational and technical facilities that should be designed to be used in the event of failures, accidents and even disasters. (in a wider sense).

To this end, new processes of proactive (alert) management can be recommended, which include targeted procedures for changing the structure of organizational and technical facilities and providing a comprehensive systematic forecasting of the system's performance and enhancing its performance [6].

In contrast to reactive management, which is traditionally used in proactive (alerting) management infrastructure of organizational and technical facilities, the latest predictor and stimulus in formulating and implementing management effects based on the concept of systematic (integrated) modeling in relevant monitoring and management systems. preventing accidents by creating opportunities. The proactive (alert) management and monitoring technology of complex organizational and technical facilities can be considered as promising technology for complexity management for multi-structured systems (logistics facilities), whereby, in the event of (predicted) situations, the objects can achieve the required tasks with a required level of stability. [10].

V. CONCLUSIONS AND SUGGESTIONS

In short, the expanded logistics engineering model and the lifespan model for the single-vehicle infrastructure and development require adaptation, which will lead to the emergence of innovative recovery modeling in the 21st century. Such development must be based on the concept of complex organizational and technical facilities aimed at the merging and merging of enterprises to overcome the problem of uncertainty and chaos. The multimodal and intermodal methods of freight forwarding based on trends are considered to be the most important locomotive for the development of transport infrastructure and will create new opportunities for productive integration of the participants.

While "digital logistics" is the burden of electronic data readiness for infrastructural redundancy, it is important to focus on the complexity of forecasting complex logistics and logistics infrastructure when misleading ministries come to fruition. . Innovative logistics technologies in the transport market of Uzbekistan will allow to improve the multimodal and intermodal transport development and the degree of impact on the efficiency.

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