

## INTEGRATION OF TRANSIT: ART OF COUNTERPOISE

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**REVIEW OF THE BOOK:** *Larin, O.N., Mirotin, L.B., Goryaev, N.K., Almetova, Z. V. Scientific basis for organization of transit terminals: monograph. Chelyabinsk, publ. centre of SUSU, 2014, 147 p.*

**ABSTRACT OF THE BOOK.** The book considers scientific principles related to creation of transit terminals within boundaries of the region's transport system for optimal integration of freight flows going abroad. Particular attention is paid to reduction of uneven traffic volumes in areas of transit routes, reduction of empty runs and idle time of equipment. The book is addressed to specialists, scientific and technical staff engaged in development and operation of transport systems, efficiency improvement of transit transportation hubs and terminals, optimization of interaction between different modes of transport.

**ABSTRACT OF THE REVIEW.** Solving a problem of efficient functioning of transport system elements, provision of coordination and cooperation among various modes of transport, growth of intermodal freight transportation, and implementation of transit potential of Russia under the conditions of market globalization require fundamentally new approaches. They should be based on the priority of developing logistics infrastructure and formation of integrated transport and logistics systems at all levels – regional, interregional and international. Modern scientific and methodological solutions for improving the efficiency of transit traffic do not fully take into account the totality of relevant factors to justify a sustainable level of freight capacities of transport systems, resulting in significant losses in the form of empty runs of transit transport in the areas of inter-terminal sections of supply chain. This leads to the

need to create transport and logistics centers, able to integrate transit flows. And the main difficulty here is the absence of adequate scientific and methodological basis for justification of such infrastructure facilities and their location. In the monograph the authors analyzed the influence of uneven inter-terminal cargo flows on empty runs of transit transport and the formation of excess freight capacities of transport systems. Designed theoretical principles on expediency of integration of inter-terminal cargo flows in transit terminals are confirmed by experimental data on the low load of transit transport in inter-terminal traffic and considerable empty runs in connection with unevenness of freight flows. The book describes a method of placing a transit terminal in the existing configuration of the transport network of transit region, which enables to take into account the costs of transit transport on empty runs at an appropriate unevenness of inter-terminal traffic. The research findings, presented by the authors have an applied character and can be used in the activities of transport and forwarding companies to improve the efficiency of transit transportation, and the heads of transport hubs and terminals can use them to optimize their work, state transport authorities of different levels – for development and modernization of transport and logistics infrastructure facilities. The proposed models and methods are universal, which suggests the possibility of their wide application in systems of various modes of transport for the purpose of improving transit traffic.

**Keywords:** *transport, transit, freight transportation, terminals, scientific bases, organization, management, infrastructure, logistics.*

*The transport strategy of the Russian Federation for the period up to 2030 identified as one of the main goals of the national transport system development the need for its integration into the global transport environment, particularly by improving the efficiency of transit transportation, system organization of transport and logistics centers in the country and regions.*

*Solving a problem of efficient functioning of transport system elements, provision of coordination and cooperation among various modes of transport, growth of intermodal freight transportation, and implementation of transit potential of Russia under the conditions of market globalization require fundamentally new approaches. They should be based on the*

*priority of developing logistics infrastructure and formation of integrated transport and logistics systems at all levels – regional, interregional and international.*

*In recent years, many countries have effectively used their transit location as a leverage to solve economic and political problems. In the Netherlands, the share of income from the transit is more than 40% of the total income from the export of services. Baltic countries, the Ukraine and Belarus operate in a very profitable way territory and transport infrastructure, which they own. For them, the transit is an essential article of budget revenues and a tool of political influence. Baltic ports with government support have*





shifted to the processing of Russian foreign trade cargo and provide 66% (Latvia) to 75–78% (Estonia) foreign exchange earnings in national budgets. The share of transit in the Estonian economy remains at the level of 25–30% of GDP. At the same time Russia annually loses about \$ 600 million in transportation and handling of its cargo in the Baltic Sea area.

The Russian Federation has a great transport potential to implement a national transit potential of the scale of existing Euro-Asian relations. The country, which occupies more than 30% of the continent, has a well developed transport system, but its transit potential is low-used. For example, the transit in container transportation until recently was only about 1% of its total volume.

Each year, Russia loses approximately \$ 800 billion since the main flow of «through» products does not reach it. Russian carriers can transport via international transport corridors in the directions Europe-Asia and North-South about 1 million containers with revenues around 60–70 billion rubles and corresponding revenues to budgets of all levels. The most important constraint on the transit remains transportation cost. For comparison: shipment of one container TEU by sea from China to Moscow via Finnish ports costs about \$ 5 000 and by rail – almost \$ 7 000.

Significant reserves of the transport system of the country and its regions are associated with an increase in the efficiency of not only international but also inter-regional transit communications, the effectiveness of which also remains not so high as desirable.

Although in recent years the state has provided support for the transport industry, the average rate of transit communications is low, there is still a high proportion of empty runs on road and rail transport. According to the Ministry of Transport of the Russian Federation, the share of transport costs in the cost of transported products is almost two times higher than in countries with developed market economy. And this problem is complex, and it requires economic support and scientific and methodological support.

Modern scientific and methodological solutions for improving the efficiency of transit traffic do not fully take into account the totality of relevant factors to justify a sustainable level of freight capacities of transport systems, resulting in significant losses in the form of empty runs of transit transport in the areas of inter-terminal sections of supply chain. This leads to the need to create transport and logistics centers, able to integrate transit flows. And the main difficulty here is the absence of adequate scientific and methodological basis for justification of such infrastructure facilities and their location.

In the monograph the authors analyzed the influence of uneven inter-terminal cargo flows on empty runs of transit transport and the formation of excess freight capacities of transport systems. Designed theoretical principles on expediency of integration of inter-terminal cargo flows in transit terminals are confirmed by experimental data on the low load of transit transport in inter-terminal traffic and considerable empty runs in connection with unevenness of freight flows.

The book describes a method of placing a transit terminal in the existing configuration of the transport network of transit region, which enables to take into account the costs of transit transport on empty runs at an appropriate unevenness of inter-terminal traffic.

When creating a transit terminal it is necessary to determine the optimal volume of new supply, to calculate an optimum amount of handling equipment and loading and unloading stations designed to perform specified kinds of work with minimal costs rendered by transit terminals and carriers. However, experience has shown that existing methods for calculating the optimum volume of supplies of goods in inter-terminal traffic do not always take into account the peculiarities of formation of cost of cargo transportation and storage in the reserve, including the discrete nature of accumulation and disposal of inventory reserves.

The book provides a model of formation of costs of goods transportation and storage of stocks depending on the number of enlarged discrete batches



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of transit cargo of fixed volume (cargo modules, which are structurally or technologically separate consignments placed in a vehicle, trailer, wagon, container, bolster etc.). Practical interest is paid to allocation of three subspecies in the costs of storage of goods at the terminal, which are dependent on the ratio of the volume of delivered and shipped transit cargo and ratio of the value of motion intervals and frequency of batches shipped from the transit terminal.

Organization of supplies of goods in transit in the amount calculated on the basis of the methodology proposed in the book, can provide an effect of reducing the total cost of transportation and storage in the reserve with unconditional fulfillment of requirements of recipients of goods to the volume and timing of deliveries.

In addition, dependencies of total cost of works and unproductive downtime for loading and unloading complexes, losses of carriers due to downtime of rolling stock for corresponding operations on the number of loading and unloading equipment and loading and unloading stations are investigated. The authors of the monograph evaluated dependencies of the duration of downtime of transport and handling

equipment on the ratio of motion intervals and the planned time of unloading on the basis of which ways of finding the optimal number of loading and unloading facilities and transit stations terminals, providing a minimum total overhead costs, are designed. Optimization models correctly take into account the possible restrictions on the number of supportive equipment and posts at the terminal.

The research findings, presented by the authors have an applied character and can be used in the activities of transport and forwarding companies to improve the efficiency of transit transportation, and the heads of transport hubs and terminals can use them to optimize their work, state transport authorities of different levels – for development and modernization of transport and logistics infrastructure facilities. The monograph is intended to help teachers in training students for transport specialties and advanced training of specialists, in the process of scientific research on the topic stated in the book. The proposed models and methods are universal, which suggests the possibility of their wide application in systems of various modes of transport for the purpose of improving transit traffic.

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