

Innovative development of domestic transport logistics

Nabokov V.I.

Department of Management and law
Ural State Agrarian University
Ekaterinburg, Russia
nv1472@yandex.ru

Nekrasov K.V

Department of World economy and logistics
Ural State University of Railway Transport
Ekaterinburg, Russia
ekonn@bk.ru

Abstract — The domestic transport system is considered to be a key factor of social and economic growth of the country in terms of economy transition to an intensive, innovative way of development. The branches of the Russian transport sector ensure complex interaction of the national economy sectors; increase the efficiency of natural resources use, social and economic potential of the regions, development of entrepreneurship and expansion of interregional and international transport and economic relations. In recent years the Russian transport sector has received support from the state. And it gives the results: freight turnover of the Russian transport and volume of transportations of freights have grown. At the same time the transport system of the country has serious problems hindering its development. These are: low level of development of the country's transport infrastructure; a small number as well as a low proportion of public-private and private projects in transport infrastructure; low maturity of organizations internal process participating in the transport market; low balance in the development of the country's and regions' transport system. In addition, there is a lack of coordination in the activities of different transport modes. The high average age of technical equipment in all sectors of the transport is also a serious problem. The development of the country's transport system requires modernization and adequate state support. The main directions of domestic transport innovative development are: the creation of high-speed railway transport; integration of machine-building and information technologies in means and infrastructure of transport; creation of railway transport infrastructure, for high-speed traffic; production of high-speed traffic means; design of essentially new transport system on magnetic suspensions; personnel training for high-speed traffic. Thus, it is necessary to solve the following problems: to overcome the disproportion of the domestic transport system ensuring the predictability and transparency of measures for its state regulation; to attract investments for accelerated development of transport infrastructure; to implement incentives for the introduction and development of digital technologies; to improve transport legislation minimizing the load on the industry; to integrate domestic transport in the transport space of the world.

Keywords- *transport logistics; innovative development; transport sector; freight turnover; railway transport; road transport; transport development problems.*

I. CHARACTERISTICS OF RESEARCH METHODS

A study of the Russian Federation transport sector activities engaged in freight transport is conducted. The following modern methods of research have been applied: abstract and logical, monographic, economic and statistical, review, and expert.

II. INTRODUCTION

The development of modern transport logistics in the Russian Federation is taking place in very difficult conditions primarily due to the negative influence of a number of foreign policy and foreign economic factors. Despite of it the transport and logistics system of the country that has a rather complex and branched structure should ensure the comprehensive development and interaction of all sectors of the economy [1].

This is the main condition for the development of transport and logistics system; it requires significant efforts on the part of the state and organizations of all modes of transport to improve competitiveness [2]. The fact is that in the context of globalization and membership in the world trade organization, only a high level of competitiveness can allow taking a leading position in the world economy which today has a customer-oriented direction and strong information technology dependence [3].

III. THE RESEARCH RESULTS

It should be noted that this task of the country's transport and logistics system development in recent years has received significant support from the state.

The implementation of the planned transport strategies has already provided positive results. Thus, the freight turnover of Russian transport according to Rosstat in

2017 amounted to 5.5 trillion of t / km; this is 5.4% more than the turnover of the previous year, 2016. The total volume of cargo transportation reached 7.99 billion tons (an increase of 11.5%) [4].

This trend in 2017 was observed during the first 10 months with a significant increase in January, April, and May. Unfortunately, at the end of last year the turnover of domestic transport and the volume of cargo transportation have slightly decreased [5].

The following are the data on cargo transportation in 2017:

- rail transport – the traffic volume is 1.27 billion tons (1 % increase), the freight turnover is 2.3 trillion. t/km (2.3% decrease);
- road transport – the traffic volume is 5.4 billion tons (the level of 2016), the freight turnover is 250,8 billion tons/km (1.2% increase);
- pipeline transport - the traffic volume is 1.1 billion tons (4.6% increase), the freight turnover is 2.6 trillion. tons/km 5% increase);
- inland waterway transport - the traffic volume is 110.4 million tons (6.4% decrease), freight turnover is 64.5 billion tones/km (4% decrease);
- maritime transport – the traffic volume is 24.5 million tons (the level of 2016), the freight turnover is 45.8 billion tons/km (6.4% increase);
- air transport - the traffic volume is 1.1 million tons (15.5% increase), the freight turnover is 7.6 billion tons/km (15.5% increase) [6].

These good indicators were influenced by the positive dynamics of developing and developed economies, favorable political and weather factors in general created good conditions for the export of raw materials from the Russian Federation [10].

The maximum growth in exports was coal (9%) and metal ores (14%). In addition, grain exports also increased significantly (30%). However, despite the current trends in the world economy development exports of petroleum products and oil did not have a noticeable increase compared to 2016 due to restrictions on oil production and other reasons.

In addition, last year there was an increase in the volume of foreign investment - the maximum for the last 4 years in the Russian economic sphere (the volume of direct investment reached 25.3 billion dollars for 3 quarters of last year). This is 2.1 times higher than the corresponding period of 2016 [6]. By the way, this growth was mainly due to the low base volume of this indicator and other reasons. In previous years there was a decline in foreign investment. In 2015 it was 31%. The positive dynamics in 2016 was largely the result of a one-time purchase of 19.5% of Rosneft shares. It was implemented by a consortium consisting of QIA and Glencore [11].

The positive dynamics of domestic products exports and foreign investments contributed to a slight increase in the ruble exchange rate, and this created favorable conditions for increasing the imported goods transport (with an increase in imports by 24.1% in General).

It should be noted that different elements of the Russian Federation transport system have their own specific problems. However, there are common problems that hinder the development of transport. They are the following:

- a low level of country's transport infrastructure development;
- a small number and a low share of public-private and private projects in transport infrastructure;
- a low maturity of internal process of domestic transport and logistics organizations participating in the market;
- a low balance in the development of the Russian Federation transport system.

In addition, there is a lack of coordination in the activities of different types of domestic transport, rail transport and sea terminals in particular.

As a result of these factors a vicious circle is formed: the low efficiency of transport affects the growth of transport and the demand for transport services negatively. In turn, the low growth rates of transportation and marginality lead to a drop in the domestic transport investment attractiveness and the lack of investment adversely affects its efficiency and innovative activity.

The high average age of technical equipment in all sectors of the domestic transport sector should be also mentioned. Thus, in recent decades the level of domestic technology in this area began to lag significantly behind the corresponding level of the advanced countries of the world. This gap in technical equipment and the level of technology has a negative impact on the domestic transport sector competitiveness.

Thus, the fleet of domestic universal railway platforms is the oldest of all types of rolling stock. About a third of all platforms has extended service life (28%) and 12% of covered wagons have exceeded it. 45% of locomotives also have an extended service life, the average age is about 30 years.

Herewith there are very few modernized and new innovative locomotives in the fleet. It leads to a decrease in the technical readiness of locomotives and an increase in the cost of rail transportation [7].

An important element of the logistics infrastructure of domestic railway transport is the terminal and warehouse complex of JSC "Russian Railways". It consists mainly of open areas. At the same time the share of covered areas is only about 11% of the area of all warehouses. Herewith the depreciation of fixed assets of the complex is very high - from 43 to 71% [8].

The technical condition of the domestic truck transport also remains low. Thus, the average age of trucks of the Russian Federation is 19.2 years. About 80% of their fleet is older than 10 years. The fleet of these vehicles is updated very slowly.

In addition there is a structural mismatch between existing vehicles and actual consumer demand. Thus, the proportion of share of on-board vehicles of large and medium automobile companies is 27% that exceeds the reasonable proportion 3 times. The fleet of these enterprises is dominated by medium-duty cars with a shortage of heavy vehicles [8].

The solution of these problems is determined by the Transport strategy of Russia until 2030, approved by the Government of the Russian Federation on June 11, 2014 №1032-p, developed taking into account the strategy of country's innovative development until 2020. The transport system development is one of the priority directions of development in Russia approved by the President of the Russian Federation.

The successful implementation of the strategy should be facilitated by the technology of high-speed means of transport and intelligent control systems. A "high-speed intellectual railway transport" technological platform should be first and foremost method of these priorities implementation. It was initiated by open society RZHD and is an important part of its innovation development Program [5].

The most important tasks in terms of this technology platform addressed in the coming years are the following:

- the preparation of regulatory documents on the creation and use of high-speed rail transport that will allow the process of transportation at the world level;
- the integration of machine-building and information technologies, automation means in infrastructure, and means of transport that will provide safety and efficiency of transportation process and high quality of services;
- the implementation of railway infrastructure projects for high-speed movement of domestic rolling stock;
- the design and manufacture of fundamentally new technical means of rolling stock for high-speed traffic and corresponding infrastructure;
- the development of scientific, technical, and other bases for the creation of a radically new transport system using magnetic suspensions;
- the personnel training at all levels for the organization of high-speed traffic.

Some work is already underway in these areas. Thus, the share of fundamentally new locomotives purchased by Russian Railways in 2016 was already 47.8% of the total volume of purchased locomotives [4]. 82 new locomotives of 804 ones are innovative.

In addition, the domestic industry has mastered shunting diesel locomotive TEM 19 with gas engine and gas turbine locomotive GT 1h-002. Two head samples of the main cargo electric locomotive using alternating current and asynchronous drive are 2ES5 providing an axle load of 25 tons. There is also a project of a cargo electric locomotive developed with dual power and asynchronous traction drive, - 2ЭС20 involving axle load of 25 tons.

Due to the use of innovative wheeled trolleys new cars of Amsted Rail have very high performance characteristics. Their overhaul mileage increased up to 500 thousand kilometers. At the existing models it was 200 thousand kilometers. Axial load increased to 25 tons. It allows increasing the load capacity of the car up to 75 tons. Almost all of these cars can be manufactured in domestic plants. This generation of railway cars can be characterized by the use of new design trolleys with spring suspension systems and automatic brakes, maintenance-free designs of natural friction pairs before the overhaul providing load reduction in the load-bearing units and in the elements of the upper layer of the track [6].

Increasing the technical level of these cars can successfully solve the following problems:

- increase the service life of the most important parts and components of these cars for transportation of goods up to 1.5-2 times;
- significant increase in overhaul life of parts (rubbing) - from 400 thousand up to 1 million km;
- reduce the frequency of receipt of these cars for unscheduled repairs (up to 0.3 times a year).

Intermodal freight transport is developing that largely uses international transport corridors (ITC) and the country's transit potential.

The development of international transit through the Trans-Siberian railway as an element of the Eurasian international transport corridor "West-East" is underway. It makes possible to increase financial revenues significantly from transportation to intensification of Siberia and the Far East development as well as to continue the development of transport infrastructure in the regions with the largest and richest deposits of fuel and raw materials.

At the same time, another Euro - Asian meridional international transport corridor - "North-South" will provide communication through the Russian Federation of Europe with India and the Gulf States [11].

The construction of the ferry "Ust-Luga-Baltiysk-German ports" is underway. It will greatly facilitate transport and economic ties of the very remote Kaliningrad region with the main part of our country and the world.

Modern satellite technologies are being introduced as an essential element of the organization and management system of traffic safety on railways. Thus, the rolling stock has

already installed more than 13 thousand sets of GLONASS satellite navigation.

JSC "Trans Container" together with JSC "Russian Railways" successfully implements a major project "Transsib for 7 days". It involves the use of accelerated container trains with a route speed of about 1050 kilometers per day.

Fundamentally new products based on the basic transportation services, transport and logistics products with the involvement of business units of transportation and logistics units are brought to the market.

IV. CONCLUSION

Further innovative development of the transport and logistics system of the Russian Federation requires early modernization and adequate state support. For this purpose it is necessary to solve the following problems:

- to implement measures overcoming the disproportion of the domestic transport system, ensuring predictability and transparency of measures for its state regulation for a long period;
- to attract investments including private ones for accelerated development of Russian transport infrastructure. To do this it is necessary to create mechanisms that help domestic and foreign investors to manage risks;
- to implement incentives for the development, implementation, and use of modern, world-class digital technologies in the industry;
- to improve the national transport legislation;
- to minimize the fiscal burden on the industry;
- to integrate domestic transport into the transport space of the world, in particular through the implementation of projects to use the Russian transit potential;

- to implement structural reforms, the transition from raw materials exports to exports of goods, which will significantly increase the demand for transport services with high added value.

The implementation of measures aimed at the innovative development of domestic transport logistics will provide significant competitive advantages, the ability to compete in the domestic and global markets.

V. INTERESTS' CONFLICT

The authors confirm that the presented data do not contain a conflict of interest.

References

- [1] Nabokov V. I., Nekrasov K. V. (2017). Innovation activity management of AIC organizations under modern conditions // *Agri-food policy of Russia*. №1. P. 30–32.
- [2] Nabokov V. I., Nekrasov K. V., Zueva O. N., L. Donskova (2016). Industry features as a factor of formation and development of logistics systems in agriculture. *Agrarian Bulletin of the Urals*. № 12 (154). pp. 102-104.
- [3] Nabokov V.I., Nekrasov K. V. (2012). Increase of AIC organizations competitiveness on the basis of innovation activity // *Agricultural Bulletin of the Urals*. №1. P.83 – 86.
- [4] http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/transport
- [5] Rosstat (2016) Russia in numbers. 2016: *Krat.stat.SB./ - M.*, – 543 p.
- [6] Rosstat: online collection "Russia in numbers" - 2017 issue.
- [7] Shuravina E. N. Problems of modern transport system of Russia // (2011). *Bulletin of Samara University. Economics and management*. No. 9. P. 58-62.
- [8] Fedorenko I. (2015). Development of innovations in the transport and logistics complex // *MIR (Modernization. Innovations. Development.)*. No. 1 (21). P. 60-70.
- [9] Bubnova G. V., Levin, B. A. (2017). *International journal of open information technologies* ISSN: 2307-8162 vol. 5, No.3, 2017.
- [10] Chakrabarti, Sandip. (2018). Can highway development promote employment growth in India? *Transport policy* Volume: 69 Pages: 1-9
- [11] Okyere, Stephen; Yang, Jiaqi; Aminatou, Monde; et al. (2018). Multimodal Transport System Effect on Logistics Responsive Performance: Application of Ordinal Logistic Regression *European transport*. Issue: 68 Article Number: 4 .