

Motor transport in Russia: current state and problems in context of improving economic efficiency of state

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Abstract—The article discusses the current state of motor transport in Russia. The main problems associated with motor transport are identified, their impact on the efficiency of the state economy is determined. A comparative analysis of the development of motor transport in Russia and foreign countries is carried out.

Keywords — motor transport, the law of advance of transport development rates, problems of development of motor transport.

I. INTRODUCTION

The main function of motor transport is not only transporting passengers and goods. Efficient transportation provides the development of the economy. Hence it is important to maintain transport links within the country and from abroad to ensure the efficiency of the economy as a whole [1]. Motor transport is a vital component at all stages of the productive process: the supply of raw materials, transportation of finished products, etc. The transportation of employees to work also does not do without vehicles [1]. At short distances, motor transport saves time and material costs. As a result, with an efficient system of organizing transport logistics, enterprises have an additional source of development and ensuring competitiveness.

According to the proposed law “Advance of transport development rates”, “economic interests require advance development of transport in comparison with the development of the sectors served by it. This advance is a necessary condition for the high efficiency for public production in general”.

“Violation of the law of advance of transport development rates leads to a violation of the rhythm in the work of production facilities, imbalances and other negative consequences, accompanied by losses in the economy” [2].

Therefore, the analysis of the characteristics of motor transport and the problems associated with it allows you to understand the phenomena and processes that need to be adjusted and changed to improve the efficiency of the country economy. The purpose of the study is to assess the state of Russian motor transport in modern conditions, to identify the main problems and their consequences for the Russian economy, to compare the development of transport in our country with foreign countries.

Issues related to transport are considered in the works of Kantorovich L.V. [3], Razdorozhny A.A. [4], Miloslavskaya S.V. [5], Efimova E.G. [6], Kononova G.A. [7], Velmozhin A.V. [8], Penshin N.V. [9] Trofimenko Yu. V. [10], Zharekeeva M.T. [11].

Today the world exists under rapidly changing conditions. Studies that characterize the state of motor transport for a certain period of time may become irrelevant in connection with the changes that have occurred because of incomplete information, insufficient study of statistical data. The conducted research will allow one to supply information on the state of the country motor transport and its problems typical for today's time with consequences for the development of the Russian economy as a whole.

II. RESULTS AND DISCUSSION

Let us analyze the state and problems of road transport in Russia.

1) The structure of motor vehicle fleet.

According to the analytic agency AUTOSTAT on July 1, 2017, the Russian motor vehicle fleet includes approximately 42 million light vehicles, 3.7 million trucks and about 400,000 buses (Figure 1).

The main part of the national motor vehicle fleet is represented by light cars (91%); the lowest segment is buses (1%).

2) The number of cars per 1000 people.

An important economic indicator for analyzing the characteristics of motor transport is the number of cars per 1000 people in the country. The dynamics of this indicator in the Russian Federation from 2013 to 2017 is presented in Table 1.

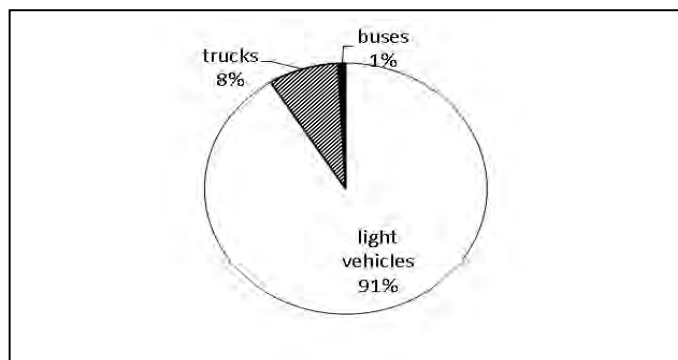


Fig. 1. The structure of motor vehicle.

TABLE I. DYNAMICS OF THE INDICATOR OF THE NUMBER OF LIGHT VEHICLE CARS PER 1000 PEOPLE OF THE RUSSIAN FEDERATION IN 2013-2017

Year	Number of cars per 1000
2013	273
2014	283
2014 to 2013, %	103,7
2015	288
2015 to 2014, %	101,8
2016	294
2016 to 2015, %	102,1
2017	296
2017 to 2016, %	100,7

During the period from 2013 till 2017 in Russia, the number of cars per 1,000 people annually grows. From 2013 till 2016, the annual growth rate was within 1.8% - 3.7%. This indicator increased slightly in 2017, when the number of cars increased by only 0.7% compared to 2016. In general, for the five-year period from 2013 till 2017, the indicator increased by 8.4%. Despite the growth trend in the number of passenger cars per 1000 people, Russia currently lags behind the developed countries in terms of vehicle provision (Figure 2). According to the data provided in the "Automotive market of Russia and the CIS", the number of cars in Russia per 1,000 adult population was 351 units in 2017, which is 43% lower than the average in Western Europe (617 units), and 55% lower than in North America (783 units).

3) The average age of vehicles.

TABLE II. THE AVERAGE AGE OF VEHICLES IN RUSSIA IN 2017 (DRAWN UP BY THE AUTHORS OF THE ARTICLE ACCORDING TO DATA)

Type of transport	The average age, years
Light vehicles	12,5
Trucks	19,7
Buses	15,5

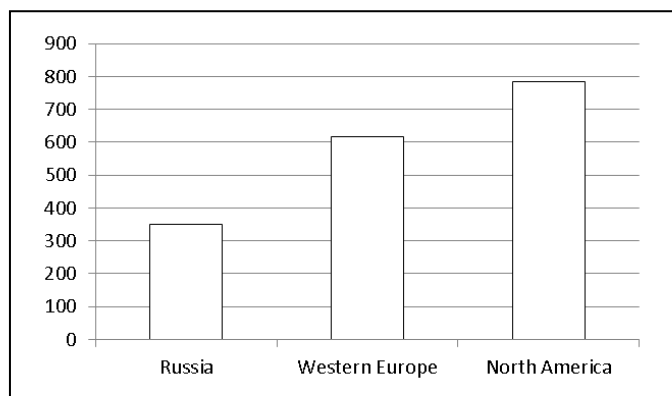


Fig. 2. The number of passenger cars in Russia per 1000 adult population in 2017

3) The average age of vehicles.

Trucks carry out transportation and delivery of goods in all sectors of the economy, providing the activities of many enterprises. The worn-out state of freight transport can cause negative consequences such as disruption of supplies of raw materials and finished products, high maintenance and repair costs, which in its turn affects the sale value of goods and services. The noted problem is especially urgent because, according to the statistics, cargo transportation by trucks of large and medium-sized enterprises increased by 2.8% in 2017 as compared to 2016. This indicates that the load on freight transport continues to increase with a growing worn-out rate.

The average age of passenger cars and light commercial vehicles in Russia is more than 12 years. In Western Europe, this indicator is much lower - it is 9 years. That is, the park of passenger cars and light commercial vehicles in the Russian Federation is much older in comparison with the countries of Western Europe.

As you can see from the data in Table 2, the bus fleet in Russia is also quite old - the average age is 15.5 years.

The high worn-out state of the motor vehicle fleet in the Russian Federation causes a number of problems:

- increasing the risk of road accidents;
- an increase in the maintenance and repair costs of vehicles, which increases the cost of finished products and services provided.

Also the main problems of motor transport in Russia are:

- low level of development of the traffic system [1] and poor quality of highways;
- low average speed on roads in comparison with developed countries;

- traffic jams cluttering the traffic;
- the growing fuel cost;
- negative impact on the environment;
- road safety, etc.

The stretch of roads in Russia amounted to 1498.8 thousand kilometers at the end of 2016, which is significantly less than that of the leader country - the USA; its index is 6572 thousand kilometers (according to 2010 data). The undeveloped road network in the northern and agricultural areas of the country makes it difficult to get there in the autumn and spring [1]. Due to the low stretch of roads and the increase in the national motor vehicle fleet, existing roads are reloaded and deteriorate quickly. The quality of Russian roads is ranked 123d among 138 countries according to the report prepared by the World Economic Forum 2016-2017, "On the state of the economy in the world." The United Arab Emirates (UAE) rank first, Singapore and Hong Kong rank second and third accordingly.

Due to the underdevelopment of the network and the poor condition of highways, the average speed of vehicles in the Russian Federation is much lower than in industrialized countries, and in major cities; the problem of traffic jams has thrown into sharp relief. It is also important to note that the constructional details wear out before the fixed time; as a result, the owners of vehicles and businesses bear additional material costs.

The growing fuel cost is another problem related to road transport in Russia. Only in 2017 the cost of motor fuel increased by 7.3%. The rate of fuel price increase was 3 times higher than the inflation rate for the previous 2017. For the first 5 months of 2018, the situation at cost has not changed. The price increase continues for the following reasons:

- seasonality: in the spring the cost of fuel increases, as it is growing in demand due to the start of agricultural labour and increase of automobile activity in the country;
- high oil prices;
- increase of excise taxes

The cost of automobile fuel is one of the most important factors that form the cost of finished goods and services.

The fuel and economic crises taking place in Russia affect the development of motor transport and the welfare of the population.

Ecologically adverse impact on the environment is a problem related to the operation of vehicles. Automobiles emit a large amount of toxic substances into the environment. As a result, atmospheric air and soil are polluted. The negative impact on human by vehicles is also manifested by increased noise and vibration. The composition of motor transport emissions includes more than 200 components, among which the largest share falls on carbon monoxide, nitrogen oxides, unburned hydrocarbons, aldehydes and soot [12]. As the motor vehicle fleet of the Russian Federation increases, environmental problems are further exacerbated and require decisions on their settlement.

Ensuring road safety is an important direction of the state policy of any country in the world. Compared with foreign countries, where the problems of road safety are solved or being solved successfully, the indicators of losses in road accidents are much higher in Russia. 271 thousand people died in road accidents in Russia for the period from 2007 to 2016; 2.5 million people were injured; 227 thousand children under the age of 16 were injured, 9 thousand of them got fatal injuries. At the same time, approximately 20% of the victims become disabled. And the annual losses of the Russian economy from road accidents are about 2% of gross domestic product [13].

The causes of road accidents on the territory of Russia are directly related to problems of poor quality, underdevelopment of the traffic network and the reloading of highways, the worn-out state of national automobile fleet.

For a more complete analysis of the state and problems of motor transport in Russia, it is necessary to consider a number of features.

Transport services are not available for lots of remote regions of the country. There are a number of reasons why it is unprofitable for road transport companies to provide services in the direction of some settlements in Russia. Weather and climatic conditions in Russia are severe, so the delivery of goods to remote areas cannot be organized continuously throughout the year. In this case, the shipment of goods to remote settlements is possible only several times a year and with the use of special equipment.

The difficulties in arranging the delivery of goods to remote destinations are not only related to the insufficient development of the road network. On the way of delivery, there are often no automobile service centers or they are located at great distances from each other, telephone communication is not available. For these reasons, there is a high risk to be blocked without specialized care. Consequently, there are additional risks for non-fulfillment of delivery deadlines to remote settlements [1].

The state of road transport in Russia is directly influenced by the development of a network of automobile service centers. Today the role of enterprises providing services for the maintenance and repair of vehicles is growing significantly. The design of modern transport is constantly improving and becoming more complicated, which requires a competent and qualified approach to its maintenance, which is becoming more complex. The mileage indicator of the annual fleet in Russia is about 16 thousand km, the Russian Federation is the leader in this indicator, and if we take into account the low quality of highways and the considerable deterioration of vehicles, it is clear that there is a high probability of contacting car service centers. Without them, it is impossible to maintain motor transport in good technical condition. There are 2 service centers for 1000 cars in the world, in Russia this indicator is much lower than 0.9 centers. The existing number of car-care centers in Russia cannot fully meet the needs of private owners of automobiles and enterprises with a large fleet of vehicles.

The Russian market of services for repair and maintenance of motor transport is as follows: 9% (more than 4 thousand enterprises) - services of official dealers, about a third (or 15.5 thousand enterprises) - independent service stations, the remaining 58% - highly specialized service companies (tire shops, car washes, body repair shops, specialized workshops for repairing engines, running gear, electronics, tuning workshops, etc.). The capacity of this market exceeded 1.5 trillion roubles (the sum of the joint volume of the services provided). Despite such a scale and wide geography of development, the market for servicing and repairing vehicles in Russia cannot be called established. The development of automobile service is of great importance for solving some problems related to transport of the Russian Federation. Maintenance of cars in good technical condition will allow reducing the number of accidents in the country, the risks of disruptions in the supply of goods, the cost of fuel, which will guarantee better prices for final products produced by enterprises.

The scale and indicators of the development of the automobile market have a significant impact on the state of transport in the country.

By the end of 2017, as well as in 2016, the Russian car market ranked fifth among European countries, following the markets of Germany, Britain, France and Italy. The volume of sales of passenger cars and light commercial vehicles in Russia for the period from 2005 to 2016 is presented in Figure 3 [14]. According to Figure 3, we can assess the state of the automotive industry in Russia. The car market has quickly recovered at the beginning of this decade. However, in 2012, growth rates declined. In 2013, the stagnation of the automotive market in Russia began due to the deterioration of macroeconomic indicators, which had a direct impact on the decline in sales of vehicles in Russia.

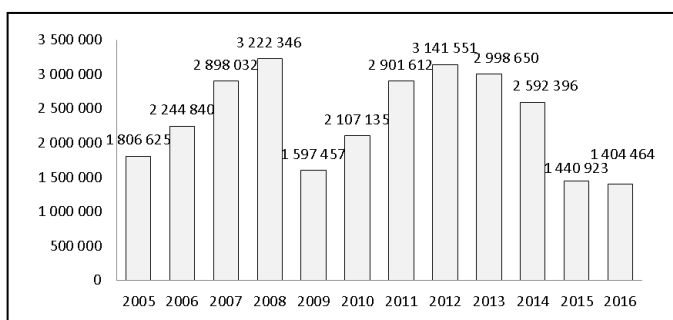


Fig. 3. The volume of vehicles sales in Russia, pcs.

In 2016, sales of passenger cars and light commercial vehicles approached the minimum point for the past 10 years, amounting to 1,404,464 pieces. At the same time, a completely different trend in vehicle sales was observed worldwide (Fig.4).

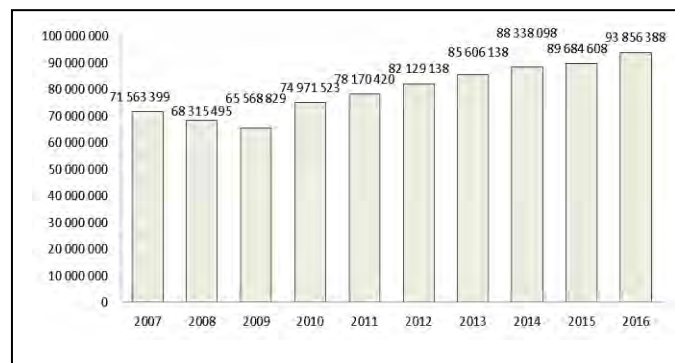


Fig. 4. The volume of vehicles sales worldwide, pcs.

As can be seen from Fig. 4, beginning from 2009, vehicle sales grew worldwide year by year, reaching the volume of 93,856,388 units by 2016.

In Russia, the situation changed only in 2017 when the growth of vehicle sales began amounting to 11.9% as compared to the previous year. Significant growth potential of the Russian automotive market was due to the deterioration of the country's automobile fleet, its low density, accumulated and postponed for 2013-2016 by low consumer demand. It is also necessary to note the restoration of macroeconomic indicators that contribute to the development of the Russian automotive market: the price of oil, GDP, real monetary incomes of the population, the availability of automobile loans, consumer activity. These positive trends in the development of the Russian automotive market following the results of 2017, with their preservation for a further period of time, should positively influence the motor transport, namely, the renewal of the domestic fleet, the increase in the level of motorization in the country and the overall development of the economy.

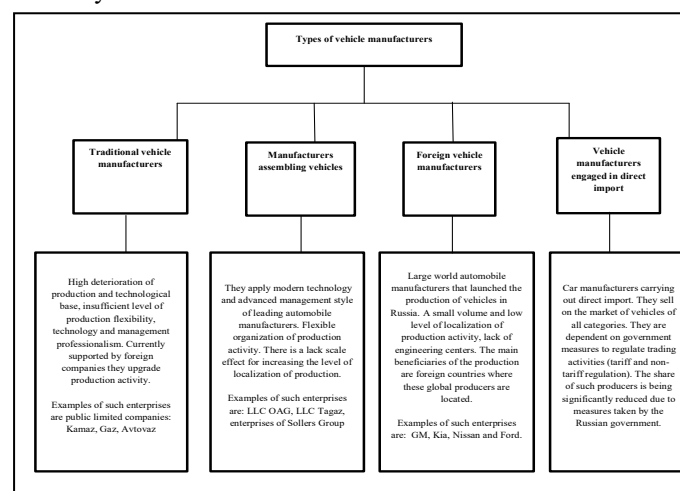


Fig. 5. Russian vehicle manufacturers.

To finish the analysis, we will consider automobile manufacturers in Russia and the structure of vehicle production. (Figure 5, 6). [14].

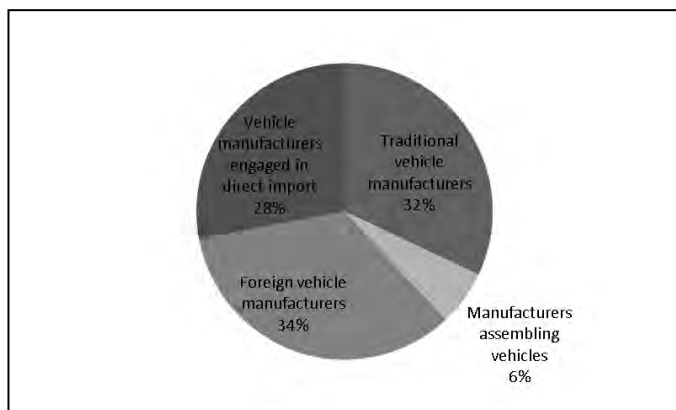


Fig. 6. Structure of vehicles production by types of automobile manufacturers, %.

The main problems of Russian vehicle manufacturers are related to low quality of certain materials and parts. It is important to note obsolete production technologies, high equipment deterioration, inefficient human resources management, a modest product range, and low sales volumes abroad. The noted features of the automotive industry in Russia affect the road transport, its condition and further technological improvement.

III. CONCLUSION

The study shows the way that the state of road transport and the problems, associated with it, affect the values of economic indicators of the national development. The law that the development of transport should take place at a faster pace than the sectors of the economy served by it is confirmed by the factual data given in the study.

Russia is still behind the developed countries in terms of motorization. The motor vehicle fleet is highly worn out; this adversely affects the freight and passenger transportation in the country. The problems of the development of the network and the quality of roads remain urgent for the Russian Federation for many years, and the territory of Russia is very large, so the establishment and development of transport infrastructure is one of the most important directions for the economic development of the state. The Russian economy is significantly influenced by the constantly growing fuel cost, which is the basis for increasing the cost of all goods produced

and services provided in the country. While the problems of road safety, adverse impact on the environment, traffic jams in large cities have not been completely solved.

The solution of the problems of motor transport development in Russia will help to improve the economic efficiency of the country as a whole.

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