NOT ONLY LIKE BALLS IN THE BEARING

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ABSTRACT

Each of the traffic problems is closely linked to the economy, its needs and development prospects. Somewhere transport priorities coincide with market conditions, and somewhere they are in conflict with the interests of the producing industries and regions (megacities), consumer expectations. In the published polemical notes not everything is equally convincing, but the issues involved are relevant and have a universally significant character.

ENGLISH SUMMARY

Background. *Transport problems have always had their economic subtext and very significant impact on the prospects of social development. Selection of vehicles, their primary energy, has invariably been refracted, in accordance with the convenience, profit, competition in the market.*

For a long time the movement of people and goods in the renewable space was provided by: muscular strength of men and animals, wind force. A particular role was played by the energy of river flows, but against the current and through the channels ships were moved by live traction or under sail [1, 2]. Wind energy has created a global economy with its center in Europe by the end of XVIII century. Ships of Europeans, including Russian, ploughed the oceans, including the Arctic, cast anchor in the harbors of Japan, China and Australia. In the XIX century locomotives quickly captured the market of cargo transportation on land, and ships began to dominate on the sea. Sailboats came to naught just after World War I; at the same time began the offensive of oil fuel, gradually replacing coal.

As for the electrification of railways, after the Second World War, the process went everywhere, and on highways with low traffic density locomotives were replaced by diesel locomotives. Road transport to the end of the twentieth century was guided by liquid fuel, but in the last decade there was a serious competition by electric cars and cars with hybrid engines. Internal combustion engines with fuel oil dominate at air transport, although there are efforts to use reduced methane as fuel for aero turbines.

It should be noted that the experience in use of compressed and reduced gas at car transport is quite successful from a commercial point of view, but this environment- friendly fuel is consumed by only about one percent of cars and buses. Gas fuel has huge prospects for water and rail transport, but there are no real steps in this direction, although technically gas has excellent positions because there are no significant restrictions on the weight and dimensions of power plants.

Objective. *The author aims at evaluating different aspects of modern transport sector functioning in relation to economic issues.*

Methods. *The author uses methods of analysis and comparison.*

Results.

1. Production of vehicles

Our country is proud of turbulent growth of road transport, including personal. The fact is that the reforms resulted in a profound crisis of the domestic automobile and tractor industry. A number of plants (for example, AZLK in Moscow) are simply eliminated, others turned into assembly lines for the production of cars. AvtoVAZ, despite the colossal state investment, suffered a financial and technical crash, fell (partially) under foreign control and is doomed to produce licensed cars. New «KamAZ» is equipped with American engine, and it is a general trend: accessories for domestic cars are imported.

Foreign tires and automotive chemicals are made from our own oil in Europe and China. Source of currency are oil, gas, ammonia, oil and metals in raw form. So, it turns out that road transport is not so much to the economy as it contributes to the raw material orientation. Voluntary Russia's accession to WTO deprived it of the opportunity to defend the domestic market and to stimulate its own production. Such initially weak position of the Russian Federation, as clearly overvalued exchange rate and low profitability of the manufacturing industry, will only lead to increased fuel and commodity dependence of the economy.

2. Car is not a luxury

Auto «herd» in Russia grows and comes close to 40 million «heads» (more precisely, motors). Like any herd, it needs food, drink, waste disposal, treatment (repair), lodging and intelligent shepherds. Such a huge team requires skilled management, since the mass of the «iron cattle» in case of loss of control begins to live by its own laws. And that happened in Russia. It is curious that a hundred years ago the number of horses in the Russian Empire was about the same (25 million in 1914).

Now cars are moving slower, they are caught in traffic jams, causing deterioration of drivers' mental state, and they are tired, although they have not yet begun to work, and this is detrimental to the growth of GDP. Average travel time from home to work in metropolitan areas over the past 15 years has increased by 50 percent or more, and this despite the fact that up to half of employees enjoys personal transport, very expensive and fast by its specifications.

Public transport, except the metro and trains spends time in traffic jams, suffers losses, passengers lose time senseless as car owners, and it is the fault of the latter, because the main cause of the congestion is personal transport. It is appropriate, perhaps, to remember the American saying «Time is money». Our citizens clearly do not live according to this formula: their time stupidly killed in transport, will not be paid, moreover, they are spending more money on transport services.

As for urban freight transport, its performance has fallen sharply; hence there is growth of transport component in construction costs, production costs and retail prices of goods. Transport situation worsens in all major cities of the Russian Federation, and there is no end in sight, although the costs for road construction in some regions, for example in Moscow, even overtake the growing number of cars.

Enormous centralization of finance in the capital attracts millions of people there. Haphazard development of the central districts of the city by office and residential skyscrapers attracts every morning traffic flows, turning streets into parking lots. Ultrahigh metropolitan housing prices cause people to settle outside the city limits, sometimes hundreds of kilometers away, and car becomes the only opportunity to get to work.

By the way, attempts to consolidate the municipal public transportation by private capital did not have much success. Thousands of taxi drivers filled city streets, only increasing traffic chaos. Private buses are usually old vehicles bought in Korea, Germany or Scandinavia. It is especially characteristic of provincial towns.

The volume of international and long distance road transport in the XXI century is continuously growing, overtaking road construction. According to statistics, the length of public roads in Russia is 825 thousand km. But federal highways are only 51 thousand km, regional – 494 thousand km (44 thousand of them – ground), 280 thousand km – local (116 thousand – ground). It is clear that the state budget spends money on federal roads. Therefore, the budget for 2010–2014 allocated one trillion 416 billion rubles for repair of 100% of federal highways.

However highway from the airport to Vladivostok, which cost 30 billion rubles, began to ruin after the first rains, and this has become history. Many remembered TV plot with a new road bridge across the Volga, which went on the waves of the north wind gusts, and not hurricane force. That is, huge costs for road construction do not guarantee the quality of work.

3. Oily bitumen or petrol: what is more harmful?

Road transport is undoubtedly harmful to the environment. It turns expensive fossil fuels into toxic exhaust fumes. In Russian climate problem is compounded by the need for warming up the engine in winter when it is idling a few minutes. Moreover, the engine deteriorates. For smooth operation of tens of millions of internal combustion engines millions of tons of oil and lubricants, hundreds of thousands of tons of antifreeze, tens of thousands of tons of brake and shock absorber fluids are required. Consumables are tens of thousands of tons of shampoo and winter windshield fluid, as after use they are immediately thrown out. All of the above applies to products of petrol chemistry, besides mineral raw materials for their production a lot of energy is required that is expended in the chain of chemical reactions.

Oddly enough, roads are also made of oil as oily bitumen is the main component of asphalt – a product of oil refining, the most severe and partially oxidized petroleum fractions. This is a dangerous substance, carcinogen, which exudes a distinctive scent. Therefore, in the cities of Western Europe stone pavements and sidewalks are preferred.

Anti-icing agents cannot be ignored. The application is based on the cryoscopy phenomenon, i. e. decreasing the crystallization temperature in brines compared to pure water. As a result, the salt reacts with the snow, causing it to melt at low temperatures. If there is a lot of snow, it turns into snow porridge, and to provide traction, sand or other abrasive materials are added to the mixture. Usually the base material of an anti-icing agent is crushed rock salt (sodium chloride), a substance harmless in small doses, but in reality huge doses are used on the roads. As a result, plants on roadsides die, shoes are spoiled, corrosion of car bodies and underground pipelines increases dramatically, liquid mud requires the use of windshield fluids, which are not useful. Sand clogs storm water drains.

Creativity in practical use of these agents only exacerbates the situation.

As for personal injury, primarily it is necessary to talk about the number of victims of road accidents, which for many years exceeds 20 thousand people.

The most reliable strategy is the redistribution of cargo flows by less hazardous types of transport, more economical, which use alternative energy sources. The last point is absolutely real, since electric traction on transport is well-developed in Russia, and twenty years ago Russia was the world leader in this field, and the loss of the championship is primarily concerned with decrease in scientific research. Thus, the expansion of traffic on electric vehicles is the right way to avoid oil dependence.

Very promising way is to increase traffic on the highly efficient modes of transport, although with the use of liquid fuels. These include a fleet. In some cases, technically and economically attractive are atomic power plants and steam engines for solid fuels. Such exotic sources of traffic, such as wind and sun, are also seriously considered by the innovators of the world of science and business.

Of course, it is ideal in terms of energy saving and good for health is movement by the power of own muscles. Reserves are present, but primarily the safety of pedestrians should be ensured. Repeated increase in the number of pedestrian crossings at different levels, above and below ground is necessary, as only they provide security to citizens. Such crossings save time and petrol of motorists, protect health and lives of citizens. It is highly desirable to provide these crossings with escalators.

After analysis of a considerable amount of information, the author comes to a paradoxical conclusion: saving liquid fuels for transport must begin with development of pedestrian lines of communication, which is equally true for megacities and villages, especially when the last are crossed through road and railway lines.

4. Projection of a metropolitan city

Of course, muscle vehicles will not provide mass passenger transportation. Moreover, there is unplanned urbanization. The Russian Federation has 15 megacities, Voronezh became the fifteenth one. In terms of demographic crisis this trend is clearly unhealthy, but the situation has to be taken for granted.

One hundred years ago, the city transportation was very primitive. It is essential that water and sewer cover a small part of urban development, the central heating was a rarity, electricity was mainly used for lighting, and even then not everywhere. As a result, wheeled vehicles, mainly horse-drawn, were responsible for delivery of water, fuel (wood, coal, kerosene) and waste disposal. The railways were rescue, their network was quite thick, technical level was high; they provided long-distance and partially intercity transportation.

The starting point of the economy after the Civil War and the intervention was complete devastation. In such circumstances, the country's leaders have made a bold move, putting at the forefront technical development (innovation) based on electrification of all branches. Large-scale reconstruction of Moscow began in the late 1920s based on this plan.

Most of the citizens are unaware of the fact that the main form of transport in modern cities is pipeline transport, which main source of energy is electricity. Even the water in Moskva River is a result of electrification. Now the river traffic is one of the few reserves of transport in the city.

But the main achievement was undoubtedly the construction of the subway. Its developed network allowed removing from the city center part of the tram lines together with wires, braces, columns and noise. Already in the 1930s, on the streets appeared numerous buses and trolleybuses. After the war, taxis

were affordable mode of transportation. Suburban railways moved to electric traction, speed increased, soot disappeared. Even before the war air transport received extensive development, and the central airport was inside the city limits.

Naturally, the old architecture suffered losses, but the transport problem has been solved for 40 years ahead, and this is a brilliant result for the metropolis. Now the capital has more than 4 million cars, each year at least another 300,000 are added to them. At the same time solutions to traffic problems are faithful: the creation of new subway lines, laying 250 km of high-speed passenger trains, commuter railways reconstruction in conjunction with the construction of highways. But the effect will be in the distant future, but now investments are huge, and transport situation improves a little.

In such a situation it is necessary to resort to administrative measures. In the world there are various administrative measures to organize the traffic, and they are quite efficient, particularly efficient is allocation of available traffic lanes for public transport.

Actually, any passenger transport, including taxis, must be licensed. The authorities should worry about garages for private cars. Express car washes and heating of the engine are desirable.

Transport problems in other large cities in Russia are basically the same as in the capital, with the difference that the conclusions about the crisis of traffic are not done. The city authorities have understood the main causes of traffic impasse, refused to develop the city spontaneously and have focused on the electric rail transport as the most economical, environmentally friendly and fast. Most large cities in the country are characterized by blatant energy wastage. Electric transport lags behind the needs of passengers; road transport devours fuel and time due to traffic jams.

The author gives some proposals. Principle 1: Transportation line shall conform to geometric form of agglomeration. Principle 2: Increased use of electric traction – both within the city and outside the city limits.

5. «Russia's territory is very big…»

So ... it needs a reliable means of transportation and communication, the development of which has always been a mandatory task of the state. A huge role is undoubtedly played by rail tracks. Moreover, nothing could shake the dominance of the railways in the life of Russia in the last 100 years. Besides steel lines are less dependent from the vagaries of weather (snow, ice, fog) than roads and airfields. But in Russia only 85,000 km of railways are in operation, in the U.S. this number is higher, but the territory is smaller. However, turnover of the U.S. roads is two times lower, i. e. the intensity of their use in Russia is 4 times higher. But the main technical level of American highways is high, accident rate is low, rolling stock is modernized.

Environmental damage from the railways is small, largely due to the use of electric drive trains. «Russian Railways» are one of the largest consumers of electricity. But the pace of electrification today is disappointingly low.

The main activities in the field of railway transport in the last decade are to carry out numerous reforms. In turn, the reform reduced to structural changes and commercial schemes, not directly related to the main task of railways – fast, reliable and cheap delivery of goods and people in every region of the country. In the second place is provision of international transportation.

In general, railroads are becoming more expensive and less accessible. Volume of commuter and long-distance passenger transport reduces, and the struggle for «economic efficiency» is often performed by very barbaric methods. Staff of small stations reduces; abandoned buildings are destroyed, taken away and set on fire by vandals. Passengers, who have purchased tickets for a decent fee, sit on the ground under the sun, rain and snow. This leads to an outflow of customers and death of settlements near stations.

In some regions, the price of train tickets is higher than that of the bus at the same distance routes. This allows managers to «milk» the local budgets, as price increase for tickets and cancellation of commuter trains lead to social and economic problems in the field. And such a financing scheme has nothing to do with market relations, for the payer (the budget) cannot control their spending of funds or resources to influence the compensation of revenues.

Conclusion. *For a quarter of a century there have been talks in our country about the laws of the market, but so far they have not been formulated and tested in practice. The majority does not see any difference between greed of particular individuals (dangerous for society) and competition (enabling development and cost reduction). In any case, the control laws are higher in the rank than competition laws. In less than two centuries, the control schemes of domestic railways are developed tested and to change them means only to spoil them.*

If saving of liquid fuel on the transport is not ignored, which is important in setting priorities, the railways are the only means of communication, which are saving it now, and at total electrification they can generally abandon it in the main lines. And their global economic task is the interception of goods and passengers from energy wasting modes of transport. Only then it will be possible to reduce energy intensity of our economy, the share of transport in which it is constantly growing.

Keywords: transport, transport market, economic benefit, investment, region, metropolitan area, electrification, energy intensity of the economy.

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