

PROBLEMS OF TRANSPORT ACCESSIBILITY AND CONNECTIVITY IN THE NORTHERN REGIONS

Part II. How to Avoid the Syndrome of Isolation from «Big Land»

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ABSTRACT

The article, published in two issues of the journal, addresses the problems of development of transport infrastructure in the northern regions of Russia (Part I: Priority of roads, land communications, Part II: How to avoid the syndrome of isolation from «metropolis»). The conclusion is substantiated that in order to ensure their attractiveness, comfort of living, increasing the population density, creating conditions for long-term sustainable social and economic development of the territories, it is necessary to deal more with the

infrastructure of land transport and, above all, the railway, which would be of a supporting nature and would strengthen the position of the transport complex in the north. It requires strategic planning for development of each type of transport, taking into account the prospects for industrial development of low-income arctic regions and long-term needs of people in creating a comfortable environment and favorable conditions for active and full-fledged life, in conjunction with the natural and climatic features of the region and their projected changes.

Keywords: transport, northern regions, social and economic development, land transport infrastructure, natural and climatic conditions.

Objective. The objective of the authors is to consider transport problems, which arise in the northern regions of Russia.

Methods. The authors use general scientific methods, statistical method, retrospective method, scientific analysis.

Strategy for railway infrastructure

Russia has, perhaps, the world's largest experience in construction and operation of railways in the Far North. Suffice it to say that the total operating length of public railways in twelve analyzed northern regions of the country is about 9,5 thousand km, and this is approximately twice the size of the railway networks of such northern countries as Norway and Finland (however, a considerable part of their territories does not belong to the regions of the Far North), and is more than 11 % of the total length of Russian railways.

At the same time, Russia is one of three countries in the world, along with Norway and Sweden, which have railways in the Arctic. (The railways of Finland and Canada, as well as the Alaska railway in the USA, lie to the south of the Arctic Circle). It is noteworthy that the construction of the first domestic railway that goes beyond the Arctic Circle, Murmansk – Petrozavodsk, was completed a century ago, in November 1916. The mainline with a length of 1045,5 km was built in the conditions of wartime, in harsh natural conditions in a record short time – during 1 year and 8 months [13, p. 548].

Initially, Murmansk railway was built on the basis of military and strategic considerations – to ensure Russia's transport links with its allies through the ice-free Kola Bay. In 1923, during the restoration of our country's economy from the devastation caused by the world war, the revolution and the civil war that followed, the northern railway became the basis of the «Transport-Industrial-Colonization Combine», which task was to «colonize the Karelian-Murmansk Territory», i.e. its settlement and active economic development. At that time, during the NEP period, it was economic, market-based instruments that stimulated interest in production and trade. Thus, «Administration of Murmansk Railway received at its disposal for a period of 10 years 3 million «dessiatines» (measure of land = 2.7 acres. Editorial note) of forest territory with all its wealth within Karelia and Murmansk District ...», and «the right to invest in

the special colonization fund of the road all payments for the industrial exploitation of the given land» [13, p. 549]. For a number of imported goods imported through the Murmansk commercial port for the needs of the colonization combine, lower duties were imposed. This is a very remarkable example of stimulating the economic growth of the northern regions, and not only them.

The combine was engaged in the development of mining and other industries, completed the local commercial port, was in charge of its work and activities of other nearby ports, built residential houses and attracted migrants from neighboring regions, providing them with material assistance and benefits. Thus, «Murmansk Railway has brought to life the economy of the giant land» [13, p. 550]. At the same time, the funds raised by «Transport-Industrial-Colonization Combine» from economic activities in the allotted territory were invested in the development of the railway [13, p. 549]. There is a synergy of transport and socio-economic development of one of the most important regions of the North, achieved not at the expense of «megaprojects» financed from the budget, but due to the economic initiative stimulated within the framework of the state policy.

The colonization combine of Murmansk railway operated during six years. Then a new era of accelerated development began on the basis of centralized planning and mainly administrative methods of management, which had a peculiar effect on the activities of domestic railways, showing the extreme cost and ineffectiveness of such methods [14]. The experience of effective «colonization» in the 1920s of Karelian-Murmansk region on the basis of economic incentives and the priority of transport, encompassing its various types in the complex, is very valuable for formation of policies aimed at the promising development of the economy and transport of the northern regions.

That is, in the long-term development of the railway infrastructure, which stimulates the development of the North, our country can rely not only on the rich technical and technological, but also the economic experience of solving this task.

The strategy for development of railway transport in the Russian Federation until 2030 (Strategy-2030)



provided for a number of significant projects for construction of new railway lines in the northern regions. Among them, lines are mainly of three categories.

Firstly, «strategic lines designed to strengthen the transport integrity of the Russian Federation» [15, p. 15], primarily such as Tommot–Kerem–Yakutsk (Nizhny Bestyakh), which goal is to ensure the stable supply of goods to the Republic of Sakha (Yakutia) and establishment there of a supporting transport network, and, according to the maximum strategy variant, the line Nizhny Bestyakh–Moma–Magadan. The goals of the latter are railway communication with distant regions of the country – the North-East of Yakutia and Magadan region, development of mineral and energy resources of these places. It should be noted that during the formation of the Strategy-2030, the expediency (beyond the year 2030) of construction of strategic railway lines extending this line in the direction of Kamchatka and Chukotka with access to the Bering Strait (Moma–Dachny–Uelen, Dachny–Petropavlovsk–Kamchatsky) was justified also by creating a perspective for railway communication with North America [16].

The second category is «technological lines designed to optimize the railway network for development of economic and interregional relations» [15, p. 15]. They include, for example, Right Lena–Yakutsk, aimed at ensuring a sustainable northern importation, communication with Yakutsk and creation of a supporting transport network; line Karpogory–Vendinga and Syktyvkar–Perm (Solikamsk), which assumes an alternative transport route from the Urals to the ports of the White and Barents seas, as well as assistance in developing forest resources in the north of the European part of Russia.

Thirdly, the «cargo-generating lines intended for transport support for development of new

deposits of minerals and industrial zones» [15, p. 15]. Among them is the line Polunochnoe–Obskaya–Salekhard, which aims to create a direct railway exit from the industrialized Urals to the Yamal Peninsula fields and the development of minerals from the eastern slope of the Urals (within the framework of the project «Urals Industrial – Ural Polar»), as well as the line Kyzyl–Kuragino in the Republic of Tyva, planned for development of the Elegest coking coal deposit. Strategy-2030 also provided for a number of other cargo-forming lines in the northern regions.

As can be seen even from the examples given, each line solves various problems, including social, and referring it to one or another category is somewhat arbitrary. Nevertheless, in the strategy directly related to the number of socially significant lines aimed primarily at improving transport services for the population of the northern regions, three lines are assigned:

- Khanty–Mansiysk–Salym, designed to enter the railway network to ensure transportation of goods and passengers to the city of Khanty–Mansiysk – the administrative center of the autonomous district;
- Tygda–Zeya, designed to ensure a sustainable transport connection with the city of Zeya and the creation of infrastructure conditions for socio-economic development of the surrounding areas;
- Selikhin–Nysh, with construction of a bridge or tunnel passage between the mainland and the island of Sakhalin – to establish an uninterrupted rail communication here.

All three socially important lines are located in the southern parts of the northern regions, where the natural and climatic conditions are not extremely unfavorable for people's lives and already relatively (by northern standards) dense population exists. It seems that this approach requires even more systematic development.



Perspective approaches to transport development

It is necessary to abandon the view of the northern regions as a sole source of natural resources, which has dominated for many decades and is still manifested when, for example, the acceleration of implementation of projects for the development of the Arctic zone is justified by the fear of not having time to «divide the cake» in the form of oil reserves and gas [1]. Of course, it is necessary to force the extraction of minerals in the northern regions, but within the framework of the sustainable development principle adopted by the UN General Assembly, according to which «sustainable development means meeting the needs of the modern generation without threatening the ability of future generations to meet their own needs» [17, p. 15]. This, in particular, means that mining operations should be conducted without negative consequences for the ecosystem, especially «fragile» in the Arctic, and the northern territories should not be considered solely as a resource extraction zone, but harmoniously developed (including transport).

In the North, it is necessary to create conditions that are as comfortable as possible for people's lives and various types of human activity, conditions not for the temporary stay of resource producers, but enabling new generations to fully live and develop without destroying the natural environment and harmoniously transforming it into more suitable for people.

What does this mean for the transport system of the North?

Firstly, increased requirements for the environmental friendliness of transport. In this respect, railways have undoubted advantages, especially in comparison with road transport. It is not without reason that a long-term program is being implemented in Western Europe to encourage the shift of transportation from road to rail (Shift2Rail) [18]. And in the regions of the North, where construction and maintenance of roads is hampered by a number of specific factors [19], the more logical is the priority of the construction of railways.

Secondly, the North can become a testing ground for introduction of innovative modes of transport, which are being actively developed in the world and often have development prospects in cooperation with railways [20, 21]. Without going into their description and technical aspects, it is necessary to formulate socio-economic requirements for innovative transport systems that take into account the specifics of the northern regions:

- high environmental friendliness;
- high speed, which is especially important for overcoming huge «northern» distances at an acceptable time;
- regularity and reliability of communication, which will avoid the syndrome of isolation from the «Big Land», e.g. «metropolis» or a sort of mainland, of geographical «loneliness»;
- relative cheapness of construction and operation.

Thirdly, it seems expedient to single out zones with different degrees of favorableness for people's lives in the North, and primarily from the point of view of natural and climatic conditions (for example, with relatively favorable, unfavorable and extremely unfavorable conditions) and to predict changes in their boundaries, taking into account the trends

observed by the scientists – at least until 2050 and the end of this century. After all, development of the territory and construction of new transport (pioneer) mainlines and terminals in poorly developed areas should be carried out proceeding from the perspective of at least several decades, and even a century-long period. With such zoning, local factors, such as the presence of hot springs in Kamchatka, must also be taken into account.

In areas belonging to a zone with relatively favorable climatic conditions (taking into account the predicted changes in these conditions), it is advisable to provide comprehensive socio-oriented development of all modes of transport, while ensuring the supporting role of railways. Each transport project, of course, should be linked to the economic prospects of the surrounding areas and is confirmed by an assessment of the economic return on investment. At the same time it is desirable to maximize the participation of private investors, who should be interested in possible freedom (limited only by environmental parameters) of economic activity on the territories adjacent to the transport mainline, by analogy with the example of Murmansk Railway. This approach was also used to stimulate the construction of railways in the United States in the 19th century, and the prospects for its use in modern Russian conditions are substantiated in the article [22].

As for state investments for construction of pioneer transport mainlines, they are very appropriate, but should be implemented taking into account the missed effects from possible alternative investments of these funds [23].

In areas with unfavorable and extremely unfavorable climatic conditions, it is advisable to build railways for perspective cargo flows related to industrial development of territories or transit traffic. There must be a well developed air, and where possible – sea and river transport. But the areas related to these zones should not be developed on the principle of «pumping out» natural resources. In points of perspective economic growth, albeit not numerous, reliable regular transport communication is necessary, and development of territories, including transport activity, should be conducted with obligatory observance of ecological standards.

In any case, the transport development of the northern regions should receive a social vector, that is, be aimed at creating an enabling environment for live and activity of people, stimulating the growth of population density. And this does not contradict economic criteria, because «without people there will be no economic life» [19].

Natural and climatic trends

Solving the problem of creating a more favorable environment for the lives and activities of people in the northern regions, of course, it is impossible to abstract from the natural and climatic conditions and their changes. Moreover, long-term planning of development of the northern zones should be carried out taking into account not only the existing natural and climatic conditions, but also trends that are fixed and recalled with concern by science!

It is known that for a long time in the world there is a trend of global warming. According to the International Climate Change Research Program [24], an increase in the average global temperature at the surface of the Earth according to observations for the period 1880–2012 was 0,65–1,06°C, while in 2003–2013 it was 0,78–0,85°C. In other words, the trend of warming has intensified, and this is reflected in the

outlook for the future. According to modeling data for various scenarios of climate change, the temperature increase in 2046–2065 can be 1,4–1,8°C, and in 2081–2100 1,0–3,7°C.

The world community is taking active measures to minimize further warming, which can lead to a significant increase in such abnormal natural phenomena as hurricanes and floods, and other negative consequences. At an international conference on climate held in Paris in December 2015, certain measures were identified in this regard, the core of which is decarbonization of the world economy [25]. The result of collective efforts should be the reduction of the scale of warming, but even with their relative success, the very tendency of a certain temperature increase is likely to persist.

It should be noted that the most severe warming occurred and is expected in the northern regions of Eurasia, to which the North of our country belongs. The main reason for this is an increase in the content of greenhouse gases (carbon dioxide, methane and aerosols) in the atmosphere, and the consequence is a reduction in the area of sea ice in the Arctic, increasing melting of glaciers and rising sea levels, the speed of which increases. As a result of warming, the area of snow cover and permafrost decreases, and conditions for navigation in the Arctic, including along the Northern Sea Route, can improve.

We can say that under the influence of heat, the northern regions from a climate point of view are moving to the south. One of the largest researchers of the Arctic V. Yu. Vize drew attention to it already in 1930s [5, p. 30]. According to his observations, during the 20–30s of the 20th century, the average temperature on Spitsbergen increased by 2°C, and on Franz Josef Land – by 3,5°C, as if these territories moved 300 km to the south [26]. In conditions of increasing warming in the future this trend has progressed, which has somewhat improved the living conditions of people in many northern regions.

It turns out that global warming, creating serious problems for the world as a whole, has opened up some new opportunities for development of the northern regions, and these opportunities should be used.

Tendencies of climate change should be taken into account when planning economic and general human activities in the northern regions, the development of transport routes and the construction of infrastructure there. Undoubtedly, there is a need for an in-depth study of these trends and clarification of long-term forecasts.

Conclusions. Taking into account the territorial predominance of the northern regions of Russia, their inevitable and sustainable development, the creation there of a comfortable environment for life and work of people is of strategic importance for the country. A key role in formation of such an environment is played by transport support. Of particular importance is the railway communication – all-the-year-round, regular, reliable, environmentally friendly and providing a relatively low cost of transportation. It is necessary to strategically plan the development of rail and other

modes of transport in the northern regions, primarily based on the long-term needs of people in creating favorable conditions for their livelihoods. And it should be done taking into account natural and climatic trends and predictable changes in the environment.

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