YAMAL CORRIDOR: BASIS OF TRANSPORT INFRASTRUCTURE OF THE ARCTIC ZONE

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ABSTRACT

The Yamal Peninsula, the adjacent Arctic zone in recent years get more and more economic value and at the same time demonstrate the urgent need for forced development of the transport network, infrastructure reforms and state-level policy decisions. The author shows conceptual approaches to program goals and objectives when creating key regional systems, including transport corridors, railway lines and port facilities, transport and logistics center of the Northern Sea Route. Priority measures and steps are highlighted, which can accelerate the implementation of such large-scale projects.

Keywords: Arctic, Yamal, development strategy, geopolitics, resource potential, transport corridor, Yamal Railway running, Northern latitudinal running, the Northern Sea Route, infrastructure, projected traffic flows.

Background. *Exploration and development of the Arctic zone is a key strategic objective, fixed by federal and regional strategies and programs. However, despite enormous geopolitical significance and unique natural resources potential of the northern polar areas, their development is extremely complicated by the lack of necessary transport infrastructure.*

The unique position of Yamal enables to create on its territory the largest logistics center of the country and a flexible logistics model, providing a year-round transportation of goods to the world markets via **the Northern Sea Route**. *The peninsula can become a multi-functional terminal that opens to all regions of Russia the shortest way to trade channels in Europe, North America and the Asia-Pacific region.*

Based on the current state and prospects of development of **core transport network of the Arctic zone**, *it is possible to divide three basic areas – Western, Central and Eastern (Pic. 1), combining ports of the Arctic coast and basic transport grid, in the meridional direction resting on railway lines, areas of inland waterways and roads.*

In the Central region the basic inter-regional infrastructure forms **the Yamal transport corridor**, *fully located in the Yamalo-Nenets Autonomous District.*

In this transport corridor the basis of interregional multimodal rail infrastructure is a railway direction **the Yamal Railway running «Obskaya – Bovanenkovo – Sabetta»** *(hereinafter – the Yamal Railway running) with access to the multifunction Arctic seaport Sabetta, representing a conceptual development of construction project for* **the Northern latitudinal running «Obskaya – Salekhard – Nadym – Pangody – Novy Urengoy – Korotchaevo»** *(hereinafter – the Northern latitudinal running) (Pic. 2).*

The Yamal Railway running involves the shortest access to enormous hydrocarbon reserves, making the country's presence in this region a particularly promising, strengthening Russia's position as a leading Arctic power. In addition the creation of an integrated railway infrastructure is provided by connecting the Northern Railway in the west with Sverdlovsk railway in the east, which later will bind the federal transportation system with infrastructure of the Arctic region, will help to preserve the internal unity of regions of the Russian Federation and the territorial integrity of the state.

The Northern Sea Route, *being a natural integrating element of the entire transport system in the Arctic, cannot be in itself crucial for economic and integrated socio-economic development, even offshore and coastal areas, and therefore in its development it should be based on a system of ports, supported by basic land transport network, primarily rail.*

Objective. *The objective of the author is to investigate prospects of transport development of the Arctic zone of Russia at the example of the Yamal transport corridor.*

Methods. *The author uses analysis, statistical method, comparison, simulation, evaluation approach.*

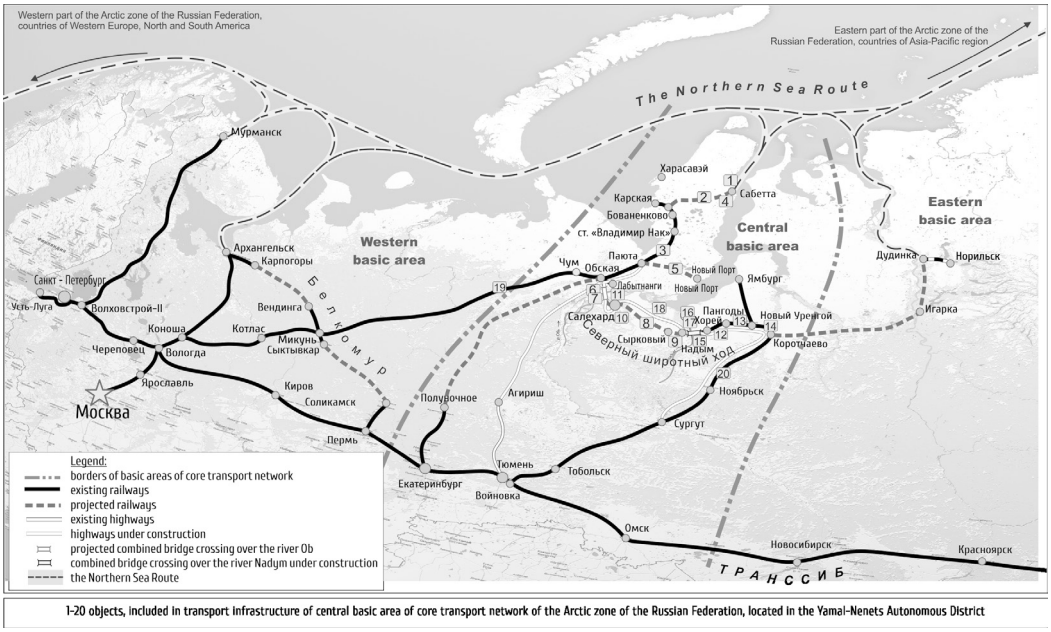
Results. *The construction of a deepwater port Sabetta, originally initiated in connection with the implementation of projects for extraction of hydrocarbons in the case of confirmation of its status as a multi-functional will radically positive influence prospects for the Northern Sea Route, and will make obvious adjustments in the assessment of prioritization for development of sections of the rail network. In this situation, it becomes necessary to conduct complex research on assessment and forecast of cargo flows on the entire range of influence of the Yamal Railway running in parallel with the planned projects «Belkomur», the railway line Salekhard-Nadym, followed by access to Korotchaevo-Igarka, Bovanenkovo-Sabetta, Polunochnaya- Obskaya (in the longer term) et al. (Pic. 3).*

Considering the concept of the Yamal transport corridor (Pic. 2), it is necessary to take into account as the projects for the purposes of phased implementation and development of optimal financing schemes:

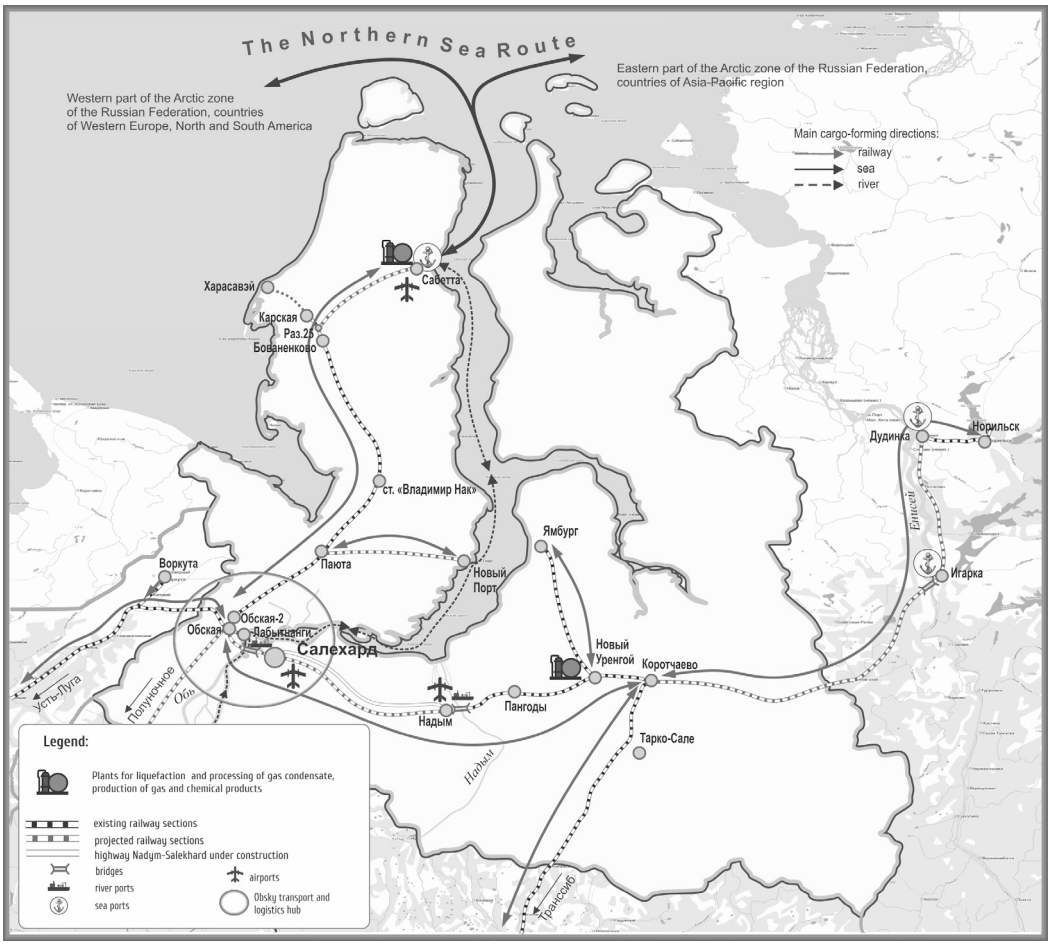
– railway transport infrastructure facilities of the Northern latitudinal running:

- *transport and logistics hub of Obskaya station;*
- *railway section Obskaya- Salekhard;*
- *combined bridge crossing over the river Ob near Salekhard;*
- *railway section Salekhard – Syrkovy;*
- *railway section Syrkovy – Khorey;*
- *combined bridge crossing over the river Nadym;*
- *railway section Khorey – Pangody;*
- *railway section Pangody – Novy Urengoy;*
- *railway section Novy Urengoy – Korotchaevo;*
- *railway line Obskaya- Bovanenkovo;*
- *railway section Bovanenkovo – siding 25 of the railway line Bovanenkovo-Karskaya;*
- *railway line siding 25 of the railway line Bovanenkovo- Karskaya- Sabetta.*

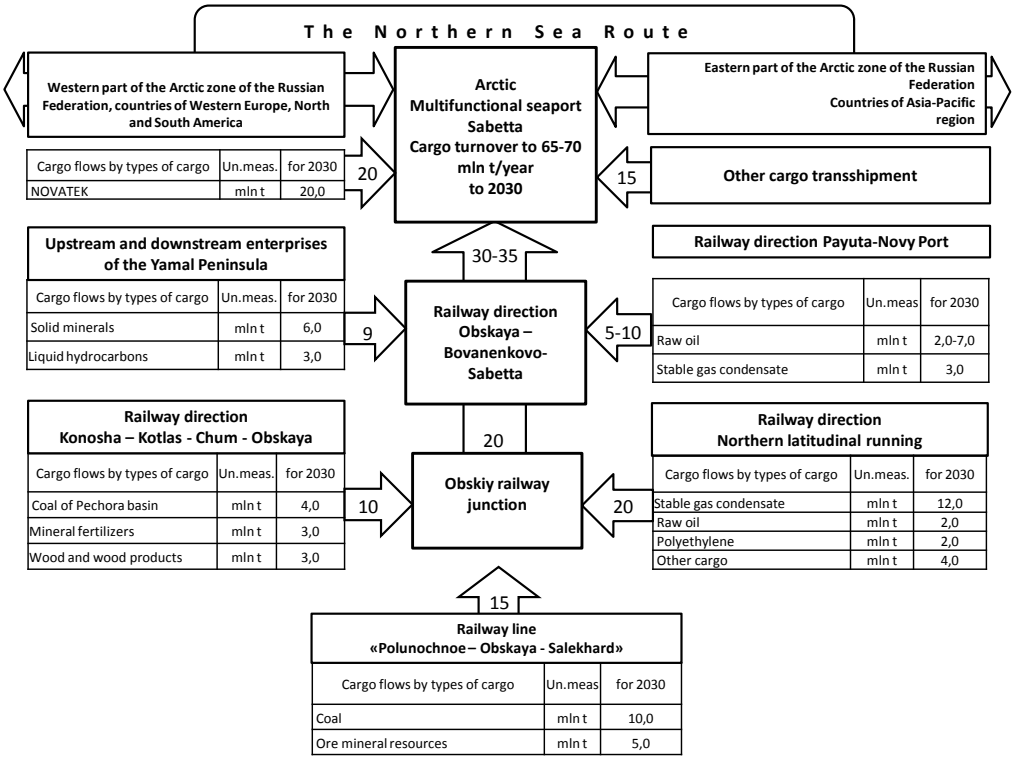
Development of the Yamal transport corridor concept is initiated by following circumstances:



Pic. 1. The main transport infrastructure of the central basic area of core transport network of the Arctic zone.



Pic. 2. The Yamal transport corridor with main cargo- forming directions.



Pic. 3. Predicted traffic flows through the Yamal Railway running towards multi-functional Arctic port of Sabetta.

– Changes in the economic situation in Russia, the economic crisis.

– Abolition of the Investment Fund.

– Repeated adjustment of the federal target program «Development of Transport System of Russia (2010–2015)».

– Sequestration of the federal budget in terms of budgetary allocations to finance the construction of transport infrastructure.

– The need for a permanent acknowledgment of source data used in calculating the financial model of the project «Ural Industrial – Ural Polar» of Northern latitudinal running.

– Change in the volume of cargo base (in connection with the shippers' search for alternative ways of cargo transportation).

– The emergence of new promising cargo directions, forming freight traffic of the transport infrastructure of the central part of the Arctic zone, due to the implementation of a major new project of seaport Sabetta.

– Measures taken by the government to intensify commercial traffic along the Northern Sea Route, including the modernization of the Arctic icebreaker and auxiliary fleet, reconstruction of existing and construction of new seaports, highway management, establishment of Federal State Institution «Administration of the Northern Sea route».

The advantages of the concept of the Yamal transport corridor include:

– possibility of its phased implementation with establishment of prioritization for construction and use of income for reinvestment, use of various financing schemes for each stage in interests of the investor;

– involvement of adjacent territories with probability of increasing cargo volumes (Pic. 3);

– establishment of transport and logistics centers;

– maximization of supply chains efficiency;

– involvement in the process of already existing or under construction facilities: Sabetta port, railway Obskay-Bovanenkovo, station Obskaya, bridge crossing over the river Nadym;

– possibility of involvement in the project of other transport infrastructure of Yamal: ports, airports, highways.

Formation and structuring of the Yamal transport corridor concept, adequate to growing problems, will allow:

– To create near village and port of Sabetta a major key Arctic transport and logistics center of the Northern Sea Route, that fully meets objectives of innovative variants of development of transport system of Russia for the period up to 2030.

– To implement projects of infrastructure facilities construction on the basis of established phasing, making it possible to use different financing schemes– direct investments, bond issues, concession, leasing, etc., depending on the cost efficiency of each stage, resource base of potential investors.

– To raise the interest of shippers to the prospects of the Yamal Railway running, not to force them to seek alternative forms for transportation of their cargo.

– To reduce approximately by 500 km the shoulder of «northern delivery» to the Taimyr Peninsula, the Republic of Sakha-Yakutia and Chukotka, to form a strategic meridional corridor «Northern Sea Route – Trans- Siberian main line» and thus to initiate the denser inter-regional integration.

– To ensure functioning of the port of Sabetta as a base of the Russian military presence in the western sector of the Arctic.

Indicator	Un.meas.	Value
Length of a building section	km	3,100
incl. approach section	km	1,765
incl. bridge crossing	km	1,335
Category of railway line	-	II
Category of road	-	III
Length of bridge	m	1334,17
Scheme of railway part of a bridge	m	6*(2*110)
Scheme of road part of a bridge	m	12*110,75
Number of tracks of a railway line		single-track
Dimension of an automobile crossing		G-10
Width of pavements	m	1*1,0
Roadway of a bridge;		
railway line	-	balastlless
automobile crossing	-	asphalt-concrete

Pic. 4. Combined bridge crossing over the river Nadym and its main technical characteristics.

– To secure position and further progress of Russia in the Arctic, to establish state control over the activity of business entities in this area, subject to the state border and customs regimes.

– To make steady process of generating new jobs, both direct and indirect, on the regional level and at the expense of the multiplier effect of employment in the country.

– To increase the attractiveness of the region for the inflow of the economically active population, to improve qualification level of labor migration.

The general management of the implementation of the concept of the Yamal transport corridor and action coordination of its members with partners, including federal ministries and agencies and state corporations is carried out by the Government of the Yamal-Nenets Autonomous District.

Within the project «Ural Industrial-Ural Polar» and development project of the Northern latitudinal running:

• Project documentation for railway lines Salekhard-Nadym, Polunochnaya-Obskaya-Salekhard, bridge crossing over the river Ob near Salekhard, bridge crossing over the river Nadym was developed and approved in Glavgosexpertiza.

• The construction of a bridge crossing over the river Nadym (Pic. 4) is conducted.

• Working group to develop optimal financing schemes for Northern latitudinal running project was formed.

To implement the concept of the Yamal transport corridor it is required firstly:

1. To provide for the timely disbursement of funds from the federal budget for the construction of a bridge crossing over the river Ob near Salekhard to the extent provided by subprogram «Rail transport» of the federal target program «Development of Transport System of Russia (2010–2015)».

2. To provide with participation of owners of a number of facilities (JSC «Gazprom» and JSC «Russian Railways»), making the required funds in the investment program for 2015–2018 years for their completion in order to increase the carrying capacity of lines in the amount of not less than 20 million tons of cargo per year.

3. To start no later than in 2015, taking into account ongoing construction of the bridge crossing over the river Nadym, construction of railway section Syrkovy-Khorey with access to the infrastructure of the section Nadym-Pangody (JSC «Gazprom») and then to the general network of JSC «Russian Railways».

4. To make amendments to the legislation regulating relations of carriers of different ownership forms in order to optimize the conditions for rail freight cargo transportation for cargo owners and carriers.

Conclusions. *Expansion and active development of hydrocarbon resource base of the Arctic zone promotes national security, and the formation and further development of the railway network in the Arctic increases transport independence of Russia.*

Indicator	Unit meas.	Value
Length	km	8,632
Automobile approaches	km	4,704
Designed speed (for road)	km/h	120
Category of railway line	-	II
Category of road	-	II
Length of a bridge	m	2439,8
Schemed over-water length of a bridge	m	4*(2*110)+7*220
Number of tracks of a railway line	-	single track
Dimension of automobile crossing	m	G-11,5
Width of pavement	m	2*1,0
Roadway of a bridge:		
railway line		ballastless, on reinforced concrete slabs
automobile crossing		asphalt-concrete

Pic. 5. Combined bridge crossing over the river Ob near Salekhard and its main characteristics.

The Yamal transport corridor, which is being created in the Yamalo-Nenets Autonomous District, will be another base for the expansion of relations between the Russian Federation and the rest of the world, will increase its share in the world trade.

Transport accessibility in the Yamal region is the most important condition for the development of the Russian economy, a strong impetus for its growth due to the intensification and diversification of market processes. The new transport infrastructure on the Yamal Peninsula will help to remove a number of territorial restrictions, will lead to the formation of new jobs, increase own tax base of the region, improve the quality and standards of living of the population, intensive settlement and development of the northern lands of the country.

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