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Issue Article

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STRATEGY FOR THE DEVELOPMENT OF THE MARINE INFRASTRUCTURE OF THE RUSSIAN ARCTIC

Abstract: *in the article, the authors argue that the implementation of the Fundamentals of the State Policy of the Russian Federation in the Arctic for the period up to 2035 will ensure outstripping all-Russian growth in the quality of life and incomes of the population of the Arctic zone of the Russian Federation (AZRF), including people belonging to small peoples. Today, the main trend in the development of social infrastructure facilities in the regions of the North and the Arctic of the Russian Federation is an increase in disproportions, causing a decrease in the availability of quality social services in cities that are not administrative centers, in remote and small settlements. The implementation of the Strategy is designed to respond to the main demographic challenge of the long-term development of the Russian Arctic. In conditions of rather high mobility of the population, people choose to live in those regions where they can realize their potential. The answer to this should be an appeal to the needs and capabilities of each inhabitant of the Russian Arctic and positioning the state as an assistant, the role of civil society in governance should be radically changed, mechanisms for effective feedback from residents should be established. Therefore, at the center of the Strategy are people and their problems.*

Key words: *seaports, competitiveness, structure, infrastructure, sea berths, strategic development, profitability, profit, financial condition, profit, priority, Stable TEP.*

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Introduction

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The importance of seaports for the development of the AZRE economy is extremely high. A modern seaport is a major transport hub that connects various types of transport: sea, river, rail, road, pipeline, etc. Port activities are a strategic aspect of the development of the state's economy and one of the key links in the functioning of the transport system. Ports play a significant role in ensuring transport independence, defense capability, foreign trade, as well as in ensuring the transportation of national economic goods, the development and use of Russia's transit potential. In the seaports, the national maritime, customs and border policy is implemented, and state port control is carried out. The Russian Federation has the longest coastline of the sea coast in the world.

Today, the sea port economy of Russia is more than 900 port complexes with a capacity of about 800 million tons, a mooring front length of about 150 thousand linear meters, located in 63 sea ports included in the Register of the country's sea ports, where more than half a billion tons of various cargoes are handled.

The volume of cargo handling in Russian ports over the past decade has more than doubled and for the first time in the history of domestic seaports in 2021 exceeded the five hundred billion mark.

The structure and volumes of cargo transshipment in seaports are largely determined by the trends in the development of the country's economy. In this regard, we will analyze the trends in the development of seaports in different periods.

Thus, in the period of the USSR, under the conditions of a planned economy, in the structure of cargo flows in the 80s, as a result of a significant increase in foreign trade cargo turnover, a disproportion was formed between the carrying capacity of the fleet and the throughput of ports. Due to the lack of port facilities during the period of mass receipt of goods, especially during the transshipment of imported grain and other food products, up to 400 units were idle in the roadsteads of seaports, waiting for unloading. transport ships, which led to the death of material values, the loss of currency, the delay in the delivery of goods to consumers and the loss of their commercial condition.

But, despite the significant shortage of port facilities in the period from 1980 to 1990. there was an increase in the cargo turnover of the seaports of the USSR from 392.6 million tons in 1980 to 456.0 million tons in the peak year of 1984 (by 1.2 times) and up to 403.4 million tons in 1990.

By the end of the 90s of the twentieth century, Russian seaports had a throughput capacity of 360 million tons of cargo per year and fully satisfied the country's needs for reloading foreign trade and national economic cargo, and in terms of tonnage, the transport fleet occupied one of the leading places in the world.

The collapse of the USSR led to a sharp decline in production, disruption of existing economic ties and cargo flows, a significant deterioration in the provision of transport services for Russia's domestic needs and foreign trade, and the loss of foreign investors. At the same time, within a short period of time, the integration of Russian foreign trade transportation into a single world transport system took place.

The period of modern Russia (1991-2025).

The main result after the crisis development for the Russian financial market is that, despite serious crisis shocks, it managed to survive and ensure gross growth in cargo transshipment.

The development of Russian seaports from 1991 to 2011 can formally be divided into three stages.

The first stage (1991-2011) is the solution of tasks to overcome the crisis state of the domestic port economy caused by the division of maritime transport between the former Soviet republics. With the collapse of the USSR, Russia lost free access to a significant part of the port facilities that the former USSR had. As a result of this division, most of the seaports of the former USSR in the Baltic and Southern basins ended up outside of Russia. These included the youngest, and therefore technically well-equipped ports of Novotallinsky and Yuzhny, high-performance specialized complexes for reloading oil and mineral fertilizers in Ventspils, sea rail ferry crossings Klaipeda - Mukran and Ilyichevsk - Varna.

For these reasons, in the early 1990s of the twentieth century, more than half of Russian foreign trade cargo was handled in the ports of Ukraine and the Baltic countries. The current situation created a threat to the transport independence of Russia.

The specialization of the ports located on the territory of Russia did not fully correspond to the nature of Russian cargo flows, and their production capacity was insufficient to handle the rapidly growing volumes of Russian cargo, especially export ones.

These problems were generally resolved during the implementation of the Program "Revival of the Russian Merchant Fleet for 1993-2000". Over the years of the Program implementation, the volume of transshipment of Russian cargo in seaports increased by 56% (from 176.1 million tons in 1993 to 275.1 million tons in 2001), including in Russian ports by 82% (from 113 .0 million tons to 205.6 million tons).

Until 1998, the volumes of coastal cargo transshipped in the ports were constantly decreasing. After 1998 there was a turning point. The volumes of transshipment of coastal cargoes began to grow as a result of the intensification of production activities in the regions of the Far North and the Far East.

It is important to note that over the specified period, the volumes of transshipment of Russian cargo in the ports of neighboring countries also increased, but their share in the total Russian maritime foreign trade turnover decreased from 50.7% to 26.7%.

As a result, the threat of transport isolation of Russia was eliminated. Since the beginning of the 2000s, the seaports of neighboring countries have been considered as ordinary competitors of Russian ports in the transport services market.

The second stage of development of seaports (2012-2020) was accompanied by the Sea Transport Subprogram of the Federal Target Program Modernization of the Russian Transport System (2002-2010).

The task of this stage was to meet the needs of the Russian economy and foreign trade in the transshipment of export-import, transit and coastal cargo at a high technical, technological and organizational level in close cooperation with related

modes of transport and cargo owners.

The growth in the cargo turnover of seaports is associated, first of all, with the development of port facilities.

As a result of the implementation of the activities of the Federal Target Program "Modernization of the Transport System of Russia" in 2012-2020, modern high-tech mechanized transshipment complexes with a capacity of 317 million tons were introduced, including transshipment:

1. Hydrocarbons - by 140 million tons (ports of Arkhangelsk, Varandey, Vitino, Vysotsk, Primorsk, Ust-Luga, Novorossiysk, Taman, Kozmina Bay, Prigorodnoye, De-Kastri);
2. Dry cargo ships - for 177 million tons, including: coal (ports of Murmansk, Vysotsk, Ust-Luga, Vanino (Muchke Bay), mineral fertilizers (ports of Murmansk, St. Petersburg, Ust-Luga, Taman, Tuapse, Novorossiysk, Vladivostok), grain (ports of Novorossiysk, Tuapse, Rostov, Vladivostok), as well as container complexes and universal berths for the processing of general cargo (ports of Murmansk, St. Petersburg, Ust-Luga, Baltiysk, Novorossiysk, Vladivostok).

The ratio of budgetary and private investments under this subprogram was 1:7.

Almost all major Russian seaports have been modernized: they have upgraded transshipment equipment, reconstructed berths, and carried out dredging.

At this stage, there was a decrease in the share of ports of neighboring countries in the total volume of transshipment of Russian foreign trade cargo. In 2009, their share was already 18% (for comparison, in 2006 - 20.8%, in 2001 - 26.7%, in 1992 - 50.7%).

Domestic seaports in this period were in the lead both in terms of total cargo turnover and in transshipment of each cargo of the established nomenclature. Only for bulk cargo (coal, ore and mineral fertilizers), as well as oil products, the share of foreign ports still remained relatively large (from 30.0% to 45.0%), although significantly lower than the share of Russian ports.

However, an analysis of the cargo turnover by individual basins reveals some cargoes, the transshipment of which is carried out mainly in foreign ports. So, in 2019, 32.3% of coal and 50.5% of oil products gravitating to the Baltic basin were transshipped in the ports of the Baltic countries, and 21.0% of coal and 38.8% of oil products gravitating to the Black Sea-Azov basin were transshipped in the ports of Ukraine . These data confirm the need to further increase the corresponding production capacities in Russian ports.

It should also be noted the change in trends in the transshipment of coastal cargo. In 2019, coastal cargo transshipment volumes amounted to 30.4 million tons, which is 4 times higher than in 2018.

The cargo turnover of Russian seaports in the period from 2012 to 2019 increased by 47.4% to 496.4 million tons.

The third stage of the development of Russian seaports (2019 - 2025) is accompanied by the implementation of activities of the Sea Transport subprogram of the Federal Target Program "Development of the Russian Transport System (2019-2025)".

The cargo turnover of Russian seaports in the period from 2019 to 2021 increased by 18.7% and amounted to 589.1 million tons. During this period, a turning point in the volumes of liquid cargo transshipment is characteristic - in 2018, there was a peak in the transshipment of liquid cargo (314.0 million tons), and since 2019 a decline has begun (in fact, in 2020, 301 million tons, in 2021 - 315 million tons).

The main reason is the drop in oil exports, which in turn, according to experts, is due to two factors. One of them is the growth of domestic processing. The volume of crude oil sent for processing in Russia in 2021 increased by 3.4% (by 8.4 million tons) to 256.8 million tons. Another reason is the reduction in oil production at a number of fields oriented to sea transport, or the reorientation of volumes to pipeline transport. So, oil transshipment through the Varandey terminal decreased almost 2 times (by about 3.8 million tons) - to 3.91 million tons due to a decrease in production at the South Khylchuyu field located in Timan-Pechora (Nenets Autonomous Okrug), whose reserves turned out to be less than predicted. The volume of oil pumped through the CPC-R terminal in Novorossiysk also decreased (by almost 9% - 31.8 million tons (by 3 million tons). In the port of Primorsk, the volume of oil transshipment decreased by 2%. Oil exports through LLC Spetsmornefteport Kozmino decreased by almost 1% (to 15.2 million tons). However, oil transshipment through the port of De Castries (from Sakhalin fields) increased by 11.7% (up to 7.8 million tons), which is associated with the active development of Sakhalin fields and the development of exports to the countries of the Asia-Pacific region. A feature of Sakhalin oil is its low sulfur content, and a short transport distance allows it to compete with Middle Eastern oil in the Asia-Pacific region. In 2021, the volume of liquid cargo transshipment slightly increased due to the commissioning of the second stage of the BPS-2 pipeline in the port of Kozmino, as well as the liquid cargo transshipment terminal in the port of Ust-Luga. tons). However, oil transshipment through the port of De Castries (from Sakhalin fields) increased by 11.7% (up to 7.8 million tons), which is associated with the active development of Sakhalin fields and the development of exports to the countries of the Asia-Pacific region. A feature of Sakhalin oil is its low sulfur content, and a short transport distance allows it to compete with Middle Eastern oil in the Asia-Pacific region. In 2021, the volume of liquid cargo

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As for the transshipment of dry cargo, the increase in cargo turnover in the analyzed period was primarily due to the growth in transshipment of cargo in containers in the Baltic direction, grain in the ports of the Black Sea basin, and ore in the Arctic basin. In 2021, coal transshipment increased by 13.3%.

It should be noted that the downward trend in the share of transshipment of domestic foreign trade cargo through the ports of neighboring states continues. Every year, due to the lack of specialized capacities, the high cost of cargo transshipment and ship calls, and a number of other reasons, about 90-110 million tons of Russian cargo goes to foreign ports. The share of Russian cargo transshipment in 2021 in the direction of the ports of the Baltic countries and Ukraine in the total volume of Russian cargo transshipment decreased and amounted to 13.3%. However, the share of transshipment of Russian cargo and mineral fertilizers in the seaports of the Baltic States and Ukraine remains quite high and amounts to 49.6% and 46.8%, respectively.

The increase in volume indicators is the result of the development of ports through the construction of new and reconstruction of existing facilities, as well as the intensification of stevedoring activities.

The top ten largest seaports in terms of cargo transshipment in 2021 include Novorossiysk, Primorsk, Ust-Luga, the Big Port of St. Petersburg, Vostochny, Murmansk, Vanino, Nakhodka, Tuapse, and Prigorodnoye. They account for about 77% of the total volume of transshipment through Russian seaports.

More than half of the cargo processed in domestic ports is liquid - 333.3 million tons, or 56.6%. Dry cargo ships account for 43.4% of the total volume of processing, or 255.7 million tons.

An analysis of the cargo turnover of seaports by type of transportation shows that the main share is export cargo - 78%, imports account for 8.3% of cargo turnover, transit - 7.6%, cabotage - 6.1%.

Since 2010, projects of the federal target program "Development of the transport system of the Russian Federation (2010-2020)" have been implemented, which is formed according to the project principle.

As a result of the implementation of the activities of the Federal Target Program "Development of the Transport System of Russia" in 2010-2020, modern high-tech mechanized transshipment complexes with a capacity of 454 million tons will be introduced, including transshipment:

1. Hydrocarbons - by 286 million tons (Peninsula Yamal, Murmansk (village Teriberka), Ust-Luga (BTS-2), Taman, Tuapse, Olya, ESPO);

2. Dry cargo ships - for 168 million tons, namely: coal (ports of Murmansk, Vysotsk, Taman, Olya, Vostochny, Vanino), grain (ports of Ust-Luga, Taman, Olya, Vladivostok, Vanino), as well as container complexes and universal berths for the processing of general cargo (ports of Arkhangelsk, St. Petersburg, Ust-Luga, Baltiysk, Taman, Tuapse, Sochi, Olya, Vanino, Sakhalin, Petropavlovsk-Kamchatsky).

A significant number of measures will be aimed at the integrated development of transport hubs, where both the construction of transshipment complexes and railway and road approaches to ports (Murmansk, Kaliningrad, Ust-Luga, Novorossiysk, Taman, Rostov transport hub, Olya, Vostochny, Vanino) are envisaged.

According to the federal target program "Development of the transport system of the Russian Federation (2010-2020)" by 2035, it is planned to ensure the transshipment of goods in the amount of about 770-780 million tons per year, including the creation of a 15% reserve capacity of seaports, which will allow redirecting Russian foreign trade cargo from the ports of neighboring states to Russian ports, as well as using it at times of peak loads in the general transport network of the Russian Federation.

Particular attention will be paid to the development of the deep water ports of Murmansk, Ust-Luga, Kaliningrad, Taman, Vostochny and Vanino. These ports are planned to be developed as hub ports, including for servicing international transport corridors.

It is planned to ensure the flow of extra-budgetary investments through the advanced preparation of project documentation and the development of mechanisms for financing projects on the terms of public-private partnership. Concession arrangements are expected to be of great use. This form of investment is widely used and recognized in the world as the most successful form of participation of private capital.

At the same time, in order to determine further growth points and potential opportunities for the use of port infrastructure, we will analyze the use of existing transshipment complexes.

As of the beginning of 2022, the Russian port complex included 846 berths with a capacity of 860 million tons, including 149 berths for liquid cargoes with a capacity of 494 (57.4%) million tons, and 697 berths for dry cargo ships with a capacity of 366 million tons. (42.6%).

Of the existing berths, only 793 berths with a capacity of 589.2 million tons (or 68.5%) are used, including: for liquid cargo - 126 berths with a capacity of 329.4 million tons (or 55.9%), for dry cargo - 667 berths with a capacity of 259.8 million tons (or 44.1%).

An analysis of the use of berths (by capacity) shows that the ports of the Caspian basin are used by 32.4%, the Arctic by 64.3%, the Baltic by 70.2%, the Azov-Black Sea by 66.1%, the Far East by 75.3%.

In large seaports with a design capacity of more than 20 million tons, a fairly high percentage of idle port capacities is observed in the port of Tuapse (54.0%), Ust-Luga (33.3%), the Big Port of St. Petersburg (29.7%). Murmansk (21.7%) (Table 1).

Table 1. Use of berths in seaports as of January 1, 2022

Swimming pool	Total berths			
	Quantity, units	Rated power, million tons	Actual used capacity in the reporting year, million tons	% idlecapacities
Arctic	113	71.9	46.2	35.7
Baltic	210	307.8	216.1	29.8
Azov-Chernomorsky	221	264.0	174.5	33.9
Caspian	41	24.4	7.9	67.6
Far Eastern	261	191.9	144.5	24.7
Total in Russia	846	860.0	589.2	31.5

About 75% of the total volume of processed cargo in Russian seaports is transshipped at specialized berths, which shows their high role in the work of seaports. Including for dry cargo, this figure is slightly less than half (47%) of the total volume of dry cargo (for coal - 57.1%), and for liquid cargo, it is close to 100%.

Despite the active development of seaports in recent years, it should be recognized that in Russia, in the presence of demand, there are practically no modern berths capable of receiving vessels with a draft of up to 18 meters, with a loading capacity of up to 3500 tons per hour or 150 containers per hour per 1 vessel , modern refrigerated terminals, LNG terminals, etc. Especially there is a shortage of coal, container berths, as well as berths for servicing fishing vessels. Recently, the situation of dissynchronization of the development of ports with the possibilities of railway and automobile approaches has sharply worsened.

Main part

The main share of cargo transshipment of Russian seaports falls on the Baltic and Azov-Chernomorsky - in 2021, respectively, 36.7% and 29.6% of the total transshipment volume. The ports of the Far East Basin account for 24.6%, the Arctic Basin - 7.8%, the Caspian - 1.3%.

With the unconditional unity of all seaports as part of a single transport system, the work and development of ports in each sea basin have their own characteristics.

arctic basin

Seventeen Russian seaports are located on the basin. Ports are occupied mainly with the transshipment of foreign trade and coastal cargo. Coastal cargo accounts for 26.6% of their cargo turnover (according to 2021 data).

In 2021, the ports of the basin handled 46.2 million tons of cargo (7.8% of the total cargo turnover of Russian ports), including 12.3 million tons of coastal cargo (34.2% of the total transshipment of coastal cargo in the country). The ports of the basin transship 6.5% of liquid and 9.6% of dry cargo from the total turnover of these types of cargo of all ports of the country.

The ports of the basin can be roughly divided into three groups. The first includes the ports of Murmansk, Arkhangelsk, Vitino and Kandalaksha,

which have railway approaches connected with the country's transport system. These four ports handle 83.8% of the cargo passing through the basin. To the second - ports serving the needs of one company. These are Varandey and Dudinka.

The third group includes the remaining 11 ports, which are located in areas where there are no land communications, and which currently provide transshipment of goods to ensure the life of the settlements in which they are located with their immediate surroundings. Their capacity is used by 5-50%, and there are no prerequisites for increasing the cargo base and increasing cargo turnover.

All ports of the Arctic Basin (except for ice-free Murmansk) operate most of the year in conditions of low temperatures and ice-covered waters. Therefore, port icebreakers are needed to ensure normal operation. And the delivery of goods to the ports is carried out under the ice assistance of linear icebreakers, including nuclear ones.

Cargoes of the “northern delivery” pass through the Arctic ports, which are necessary to ensure the livelihoods of the small peoples of the North and the development of the natural resources of the vast northern territories.

Finally, another feature of the Arctic ports is their functions for servicing the Northern Sea Route, which will become significantly more complicated with the planned growth in the transportation of goods in international transit along the NSR, as an international transport corridor. Ports will be forced to significantly expand their ship servicing functions (bunkering, supply, emergency repairs, etc.).

In the future, the Arctic ports will be focused on transshipment of fuel and energy resources (crude oil, oil products, coal, liquefied gas). At the same time, oil and gas will be supplied to ports from the shelves of the northern seas. For their transshipment, the ports of Varandey, Kharasavey (port point) were built and new ports of Sabetta and Teriberka are being built. The construction of new ports is carried out in hard-to-reach areas, which requires much more investment than the construction of ports in other basins.

The creation of a port special economic zone (PSEZ) in the largest port of the Northern Basin, Murmansk, should also be attributed to the number of features. There are currently only two such zones in Russian seaports (the second one is in the port of Sovetskaya Gavan).

Baltic basin

As noted, in terms of the total volume of transshipped cargo, the ports of the Baltic basin rank first among the ports of other sea basins. They will retain their leadership in the long term until 2035. Proximity to the most developed industrial regions of Russia and, at the same time, to European countries, contributes to the fact that the flows of the entire range of goods pass through these ports.

There are seven Russian seaports in the basin: Bolshoy Port St. Petersburg, Primorsk, Vysotsk, Vyborg, Ust-Luga, Kaliningrad, and the Passenger Port of St. Petersburg. The Baltic ports are mainly occupied with the transshipment of foreign trade and coastal cargo. Transit cargo accounts for less than 1% of their cargo turnover.

In 2021, the ports of the basin handled 215.9 million tons of cargo (36.7% of the total cargo turnover of Russian ports), including 3.1 million tons of coastal cargo (8.6% of the total transshipment of coastal cargo). The ports of the basin transship 40.1% of liquid cargo and 32.1% of dry cargo from the total cargo turnover of all ports of the country.

The ports of the Baltic Basin are the end points of the Russian sections of the international transport corridors "East-West" and "North-South". If these corridors provide promising international transit cargo turnover (this will be mainly cargo in containers), the total cargo turnover of these ports will increase significantly. Already in the short term, the main cargo flows will go through the ports of Ust-Luga (mainly dry cargo and partially liquid cargo) and Primorsk (liquid cargo).

Meanwhile, the largest port of the Baltic Basin, St. Petersburg, is limited by city buildings and highways and does not have the opportunity to expand its territory. Therefore, the development of the port of St. Petersburg is carried out at the expense of outports (Bronka, Lomonosov, Kotlin Island).

A feature of the Baltic basin is also the presence of the enclave Kaliningrad region, with which communication is carried out using the sea railway crossing Ust-Luga - Baltiysk - ports of Germany.

Azov-Black Sea basin

In terms of the total cargo turnover of seaports, the Azov-Black Sea basin ranks second after the Baltic basin. Twelve Russian seaports are located on the basin. The ports of the Azov-Black Sea basin are the end points of the Russian section of the international transport corridor "North-South".

The ports of the basin transship cargoes of the entire range (liquid, bulk, general). The Black Sea ports are mainly engaged in transshipment of foreign trade and transit cargo. Coastal cargoes make up about 1.0% of their cargo turnover.

In 2021, the ports of the basin handled 174.4 million tons of cargo (29.6% of the total cargo turnover of Russian ports). The ports of the basin transship 33.6% of liquid and 24.5% of dry cargo from the total turnover of these types of cargo of all ports of the country.

The ports of the basin are divided into three unequal groups:

The first includes ports located on the Black Sea coast, ice-free, capable of receiving large-capacity sea vessels and having the potential for further development.

The second group includes the ports of the Sea of Azov. Freezing, shallow, as a rule, located in cities

and having no development prospects associated with an increase in cargo turnover.

The third group consists of ports located in the Black Sea resort towns.

The bulk of the basin's cargo is handled in the ports of Novorossiysk (64.6%), Tuapse (10.2%), Rostov-on-Don (6.2%), Taman (5.5%) and Kavkaz (4.5%). The remaining 7 ports in the basin process only 9.2% of cargo. As capacities are put into operation in the new Black Sea port of Taman, the share of Azov ports in the basin's cargo turnover will continue to decline.

The seaports of the basin (first of all, the port of Sochi) faced a special burden during the Winter Olympic Games. On the coast of the Black and Azov Seas, it is planned to develop a recreation area, sports, resort and health facilities. Seaports play an important role in the development of maritime tourism.

The work of domestic maritime transport in the Azov-Black Sea basin is complicated by Turkey's attempts to unilaterally change the mode of navigation through the Bosporus and Dardanelles. Ship delays in the Black Sea Straits lead to serious financial losses. This indirectly affects the work of seaports.

Caspian basin

There are three Russian seaports on the basin: Astrakhan, Olya and Makhachkala. Ports reload mainly foreign trade and transit cargo. Coastal cargoes account for 4.3% of their cargo turnover.

In 2021, the ports of the basin handled 7.9 million tons of cargo (1.3% of the total cargo turnover of Russian ports), including 3.4 million tons of transit cargo (7.6% of the total transshipment of transit cargo). Through the Caspian ports, 1.4% of liquid and 1.2% of dry cargo from the total cargo turnover of all ports of the country are reloaded.

The features of the Caspian basin are due to the fundamental change in the status of the Caspian Sea after the collapse of the USSR. If in the past the water area, seabed, biological and raw material resources of the Caspian belonged to only two countries - the Soviet Union and Iran, then at present there are five countries on the Caspian coast: Russia, Azerbaijan, Kazakhstan, Turkmenistan, Iran. The interests of these countries do not coincide in many respects, and therefore their coordination requires a long negotiating process.

The Caspian basin ended up in a region where several “hot spots” are concentrated at once (the Russian Caucasus; Karabakh, which serves as a bone of contention between Armenia and Azerbaijan; Iran, which has come into conflict with the world community over nuclear weapons). These circumstances impede the development of the seaports of the Caspian basin and the organization of transportation along the international transport corridor "North-South".

According to some experts, the potential transit cargo flow along the North-South ITC between India and Iran, on the one hand, and the countries of Northern and Central Europe, on the other, can amount to 35-40 million tons per year, of which about half will for cargo in containers.

Far Eastern Basin

Twenty-two Russian seaports are located on the basin. Ports are occupied mainly with the transshipment of foreign trade and coastal cargo. Coastal cargoes account for 12.3% of their cargo turnover.

More than 84% of the cargo turnover is carried out by the main ports located in the Khabarovsk and Primorsky Territories - these are Vostochny, Vanino, Nakhodka, Prigorodnoye Vladivostok. The first four ports are among the ten largest ports in Russia and are the main elements of the railway-sea transport hubs. The Vanino-Kholmsk ferry service provides a stable connection between Sakhalin Island and the mainland: more than 90% of the cargo handled at these ports is handled by the rail-sea system.

In 2021, the ports of the basin handled 144.8 million tons of cargo (24.6% of the total cargo turnover of Russian ports), including 17.8 million tons of coastal cargo (49.4% of the total transshipment of coastal cargo in the country). The ports of the basin transship 18.4% of liquid cargo and 32.6% of dry cargo from the total turnover of these types of cargo in all ports of the country.

The ports of the basin can be roughly divided into three groups:

The first includes the ports of Vostochny, Vanino, Nakhodka, Vladivostok, and Posyet, connected to the country's transport system by railway approaches or pipelines. These five ports handle 76% of the cargo passing through the basin.

To the second - ports connected by pipelines with the offshore fields of Sakhalin - Prigorodnoye, De-Kastri, and serving the needs of one company. Their cargo turnover is 16% of the cargo turnover of the ports of the basin.

The third group includes the remaining 15 ports, which are located in areas where there are no land communications, and which currently provide transshipment of goods to ensure the life of the settlements in which they are located, with the immediate surroundings. Their capacity is used by 10-50%, and there are no prerequisites for increasing the cargo base and increasing cargo turnover.

The port of Zarubino stands apart, which has railway and automobile approaches, a good location, opportunities for development and almost completely unloaded capacities.

The ports of the Far Eastern Basin provide for the transshipment of cargoes necessary for the population of vast territories, including hard-to-reach ones, of the Russian Far East, as well as the export of goods from this region and coming from other regions of Russia to the domestic and foreign markets.

Features in the work and development of the

ports of the Far Eastern basin are due to their remoteness from the central regions of Russia. At the same time, these ports are located near the rapidly developing countries of the Asia-Pacific region (China, Japan, South Korea), with which Russia seeks to strengthen foreign trade and other ties. The ports of Primorye are the terminal points of the International Transport Corridor "East-West".

In addition to the above, it is necessary to note the features that are characteristic of not one, but two or three marine basins.

Thus, earlier it was said about the need for powerful linear icebreakers to ensure maritime transportation in the Arctic basin. In other basins, transportation and port operation in winter also require ice assistance, although not on the same scale as in the Arctic basin. For example, in the winter of 2020-2021. the number of ships stuck in the ice of the Gulf of Finland reached 150. For the ice assistance of these ships, 14 diesel-electric and one nuclear-powered icebreaker Vaigach were involved. In late January - early February 2012, an abnormally heavy ice situation for this region developed in the Sea of Azov. Ice pilotage of the vessels was carried out by four FSUE “Rosmorport” icebreakers.

The peculiarities of the seaports of the Baltic and Black Sea-Azov basins are that they operate in conditions of competition with the ports of Ukraine and the Baltic countries (Lithuania, Latvia, Estonia, Finland).

A feature of the ports of the Arctic and Far Eastern sea basins is the transshipment of large volumes of coastal cargo compared to the ports of other basins.

In order to assess the place of domestic ports on the world stage, conduct a comparative analysis and identify their strengths and weaknesses, we will consider the dynamics of the world container turnover, and also use one of the strategic planning methods - SWOT analysis.

In total, according to the Port Guide Fairplay, there are about 9,400 seaports and terminals in the world, the total cargo turnover of all seaports in the world in 2020 is estimated by UNCTAD at 14.23 billion tons. Russian ports, respectively, occupy less than 1% in terms of the number of terminals and about 4% in terms of cargo turnover. Taking into account the volume of Russian cargo annually transiting through the ports of neighboring states (the Baltic countries and Ukraine), the share of Russian ports in the world cargo turnover is approaching 5%. Consequently, in terms of the cargo potential of maritime trade, Russia is among the 6 leading countries in the world (along with China, the USA, Japan, Great Britain and Australia) (Table 2).

Table 2. Volumes of cargo transshipment through the seaports of the countries of the world

Port cargo turnover	Countries
Over 1 billion tons/year	China, USA
From 500 to 1000 million tons/year	Japan, UK, Australia, Russia
From 300 to 500 million tons/year	Italy, Netherlands, Singapore, Spain, France, India, Brazil
From 100 to 300 million tons/year	Germany, Norway, South Africa, Turkey, Belgium, Sweden, Denmark, Greece, Ukraine, Mexico, Saudi Arabia
From 50 to 100 million tons/year	Canada, Finland, Ireland, Portugal, Poland, Latvia, Estonia, Argentina, Chile, Colombia

The change in the world container traffic reflects the general dynamics of world trade volumes. One of the global trends is to increase the level of containerization of the world's seaborne transportation of general cargo. In many of the world's leading ports, containers provide the vast majority of all gene transshipment. cargo: in Rotterdam - 80%, in Hong Kong - 87%, in Singapore - 92%, in Hamburg - 96%, in Long Beach - 99%.

For the countries of the Far East region, the countries of South and Southeast Asia and the countries of Western Europe in 2020-2025 more than 70% of the world's maritime container traffic will remain. The contribution of other regions to the world sea container turnover is much more modest and does not exceed 10%.

At the same time, the share of Russian ports in the world sea container cargo turnover is still extremely insignificant: out of 610.4 million TEU in the world sea container cargo turnover in Russian seaports in 2019, 3.6 million TEU or less than 1% were processed.

At the moment, the competitive struggle of the world's leading ports for attracting container traffic has reached a high level of tension. An increasingly important success factor is the quality of services provided and the level of logistics services (Table 3).

Table 3. The quality of services provided and the level of logistics services

	Turnover of containers, million TEU per year
Port of Shanghai (Shanghai, China)	32.5
PSA Port of Singapore (Singapore)	31.7
Port of Rotterdam (Rotterdam, Netherlands)	11.9
Port of Los Angeles (Los Angeles, USA)	8.1
Port of New York & New Jersey (New York, USA)	5.7
Ports of Russia	5.1

Thus, it seems appropriate to pay special attention to improving the quality of services provided in seaports and building up port capacities, including specialized ones, focusing on modern world achievements and developments.

In order to achieve the target indicators for the development of the transport complex and remove transport infrastructure restrictions on the development of the country's economy, it is necessary to ensure the rapid development of the transport complex. According to the estimates of the Ministry of Economic Development of Russia and the Ministry of Transport of Russia, the growth rate of investments in the transport complex should be higher than the average for the economy by 5-7 percentage points. In the long term, it is predicted to maintain state support for the development of the transport complex. One of the tools for developing infrastructure and overcoming the gap in financing investments in the development of transport will be an increase in the corresponding expenditures from the federal and regional budgets from 1.2% of GDP in 2020 to 2-2.1% in 2035.

The development of seaports is modeled on the basis of scenarios for the development of the transport complex, developed in two versions - conservative (energy) and innovative.

Along with the fact that in many respects the basic conditions of both scenarios for seaports are identical, a number of features can be identified that characterize certain trends. First of all, by the nature of the cargo base, as well as by related restrictions and financial support.

The analysis shows that, with a high degree of probability, there will be no significant structural changes in the world commodity market until 2035, and Russian hydrocarbons will remain the main cargo processed in seaports. In this regard, the prevailing trend in the development of seaports until 2035 will be the development of port infrastructure, mainly for transport support for the development of new mineral deposits and the increase in fuel and raw materials exports, the realization of Russia's competitive potential in the field of transport and the growth of exports of transport services. At the same time, the conservative (energy-resource) option (En) assumes the following features:

implementation of large-scale projects (including within the framework of public-private partnerships) that ensure the development of mineral deposits in new mining areas, mainly in Siberia, the Far East and the continental shelf;

continued diversification of export destinations for Russian hydrocarbons and the creation of an appropriate infrastructure;

growth in LNG exports to the European market and Asia-Pacific countries;

development of transport infrastructure that ensures the implementation of the country's transit potential;

increase in domestic transportation of coal in connection with the development of power generating capacities and metallurgical production;

increase in transportation volumes and assortment of products of fuel processing and raw materials (petroleum products, concentrates, chemical cargoes, metals, etc.), as well as engineering products;

An additional impetus will be given to the development of transport in the Arctic zone.

The implementation of this scenario will be carried out mainly within the framework of a system of large projects for the development of a transport system of energy and raw material specialization (Lower Angara, Chita region, BAM zone) and the development of access roads to ports and port areas. At the same time, this scenario takes into account the lower demand for energy resources from the world economy, as well as the slowdown in the growth of world trade due to the continued impact of the global crisis and the low degree of realization of Russia's transit potential.

The innovative option (Inn) involves the accelerated and balanced development of the country's transport complex (including seaports), which, along with the achievement of the goals envisaged in the implementation of the energy and raw materials option, will provide transport conditions for the development of the innovative component of the economy, improving the quality of life of the population, transition to a polycentric model of Russia's spatial development.

For the innovative option, a number of features characteristic of the energy-raw material option are retained. At the same time, the distinctive features of the development of the transport system according to the innovative option will be:

a significant increase in export transportation of highly processed goods, primarily products of high-tech sectors of the economy, the growth rate of which will be 2.5 times higher than the growth rate of transportation of similar imported goods;

increasing the role of transport and logistics infrastructure in organizing the movement of goods;

The development of seaports, along with the tasks of ensuring the transportation of bulk cargo, including export ones, will increasingly focus on improving the quality of transport services for cargo owners and strengthening interaction in the framework of ensuring effective logistics chains of goods movement.

At the same time, the "infrastructural effect" of the formation of urban agglomerations associated with the implementation of projects for the construction of large transport complexes, multimodal logistics centers and information hubs, including those based on seaports, will be of paramount importance. Such seaports will serve as the basis for the formation of territorial production clusters and "growth points" of the regions.

Seaports will develop according to the so-called "Rotterdam model", when the port is inextricably linked with remote railway junctions and transport and logistics complexes. This will require the development of access roads to ports and port production and storage areas focused on the processing of cargo, the formation of port zones that ensure the processing of incoming cargo.

Regional aspects of the development of the country's transport system will be associated with the creation of a network of competitive innovation clusters, new regional centers of economic development in the Far East and South of Russia, overcoming the backlog of depressed regions, the development of tourist and recreational areas on the Black Sea coast (especially in connection with the holding of the XXII Olympic Winter Games in Sochi), in the regions of the North, etc.

An important role will be played by the development of the Northern Sea Route, primarily for commercial transportation, with the creation of an appropriate infrastructure on the northern coast of Russia.

The differences in the scenarios for the development of seaports mainly lie in the presence of such limiting facts as: the synchronism of the development of adjacent modes of transport (railway, road and inland waterways), resource provision (maintaining or reducing the existing rates, primarily budget financing) and investment climate (willingness of investors to implement large infrastructure projects).

The innovative scenario is characterized by a significant increase in costs for the development of transport infrastructure, and, consequently, the removal of restrictions in the land zone on approaches to ports. At the same time, this scenario assumes a much more complex model of managing the development of transport for both the state and business. It is associated with investing in high-tech projects and human development with parameters far beyond the medium-term payback limits that have developed on the market.

The innovative scenario is characterized by a significant increase in the requirements for environmental friendliness and energy efficiency of transport development.

The implementation of the innovative scenario will allow not only to overcome the infrastructural limitations of economic growth, but also to ensure the balanced development of the country's transport system and meet the growing demand for transport services.

It should be noted that, most likely, significant structural differences between the considered scenarios will appear after 2025.

With the same degree of probability, under different scenarios, much attention will be paid to ensuring the integrated safety and sustainability of the operation of seaports, including improving the safety of navigation, as well as reducing the harmful impact of transport on the environment.

In accordance with the considered scenario options, the parameters of the long-term development of seaports for the long term are determined, which are given in the next section.

The main goal of implementing the Strategy for the Development of Seaports Infrastructure is to meet the needs of the Russian economy, foreign trade and the population in transshipment of goods and ensuring the safety of navigation in seaports and on approaches to them by forming an innovative infrastructure of seaports, integrating them into transport hubs with the stimulating role of the state in their comprehensive development.

Competitiveness is understood as an increase in port capacities and volumes of cargo transshipment through domestic ports, an increase in the quality of services provided, a reduction in the unit cost of transshipment of a ton of cargo and the cost of ship calls at domestic ports.

Achieving this goal will make it possible to satisfy the needs of the Russian economy in the services of seaports to ensure the transshipment of goods in all directions (export, import, transit, cabotage) through the reconstruction of existing and construction of new facilities, attracting investments to Russian ports and ensuring their integrated development.

The provision of all port services by 2035 should reach a qualitatively new level, primarily on the issues of integrated safety of navigation in the waters of seaports and on the approaches to them. The implementation of this goal will make it possible to achieve a safe level of functioning of the port

infrastructure that meets international and national requirements, improve the safety of navigation in the waters of seaports and on the approaches to them, environmental and anti-terrorist security.

To achieve the main targets of the Strategy, it is necessary to solve the following main tasks for the development of Russian seaports:

1. Increasing port capacities and ensuring the effective development of port infrastructure;
2. Ensuring the safe functioning of the sea port infrastructure and maritime transport;
3. Creation of conditions that increase the competitiveness of domestic seaports;
4. Improving public administration in the field of sea port facilities.

Task 1. Increasing port capacities and ensuring the efficient development of port infrastructure

Further increase in the production capacity of Russian seaports is due to the following reasons:

- the growing need of the developing and expanding foreign trade relations of the Russian economy in the sea transportation of goods and, accordingly, in their transshipment in ports, the volume of which, according to forecast estimates, will reach 1.0-1.3 billion tons by 2035;
- the necessity and expediency of reorienting a certain part of cargo flows from the ports of neighboring countries to Russian ports;
- the probable forthcoming growth in the transportation of goods in international transit along the Russian sections of the international transport corridors (ITC) in the directions "East-West" and "North-South", as well as along the routes of the Northern Sea Route (NSR).

In this regard, one of the most important tasks for the development of seaport infrastructure is to increase the capacity of berths, berthing depths, improve the mechanization and automation of loading and unloading equipment, develop the port network of rail transport, roads, conveyor and pipeline transport, providing the most rational interaction between modes of transport in transport hubs, direct cargo operations.

It is extremely important to increase the utilization factor of existing berths by rational distribution of cargo flows and reconstruction of capacities for certain types of cargo.

Task 2. Ensuring the safe functioning and development of the sea port infrastructure and maritime transport.

To improve the integrated security and sustainable development and functioning of the transport system, it is necessary to ensure the reliability and safety of the functioning of maritime transport:

− achieve modern world standards in the field of infrastructure security in ports, modern world standards in the field of navigation safety (including uninterrupted icebreaking support in freezing ports and revision of the legal framework and organization of the icebreaking fleet, taking into account climatic and geographical conditions);

− increase the effectiveness of countering terrorist attacks, form a security and anti-terrorist protection system in accordance with the requirements of the International Maritime Organization;

− ensure the protection of transport infrastructure facilities and vehicles from acts of unlawful interference;

− to ensure the safety of the functioning of the sea port infrastructure under the impacts of man-made and natural nature.

All this will improve the safety of navigation on sea routes, approach channels and in port waters, reduce the number of accidents in maritime transport and minimize their consequences.

Increasing the level of safety of navigation and transport security in the territories and water areas of seaports is carried out in the following areas:

1) In the field of ensuring the safety of navigation:

Development and maintenance at a high level of navigational and hydrographic support for the approaches and water areas of seaports, including regular hydrographic work (sounding) and optimization of vessel traffic routes, operation of ship reporting systems (GOFREP, BarentsRep).

Optimization of pilotage areas and provision of seaports with pilotage services.

Commissioning of the required number of vessels of the supporting fleet (icebreakers, tugboats, emergency rescue vessels, hydrographic, pilotage, pilotage, environmental, etc.), creation and maintenance of coastal systems for ensuring the safety of navigation, search and rescue, communications.

Creation of a system of medium-term and long-term forecasting of hazardous phenomena that disrupt the normal functioning of ports, in order to improve the system of long-term planning of sea and port operations and improve the coordination of actions of various port services to ensure the normal functioning of the port (icebreaking fleet, pilotage service, towing service, etc.).

Creation and maintenance at the proper level of information systems for monitoring shipping (RISS, MoRe, etc.), international cooperation in the field of global monitoring of shipping (SafeSeaNet, HELCOM-AIS, BlackSea - AIS).

Creation of a modern organizational and technical system of emergency and rescue support in the water area of the Northern Sea Route.

Development of the material base for the training of qualified specialists in the field of maritime transport operation in accordance with international standards.

2) In the field of ensuring anti-terrorist security:

Development and implementation of a reliable and effective system of measures to protect transport infrastructure facilities and vehicles in seaports from

potential, immediate and direct threats of acts of unlawful interference in the activities of maritime transport.

Harmonization of Russian legislation in the field of ensuring transport security with the 1974 International Convention for the Safety of Life at Sea ratified by the Russian Federation.

Widespread introduction of advanced technologies, specialized equipment and innovative engineering and technical means to identify and prevent security threats to transport infrastructure facilities and vehicles.

Development of the material and technical base for the professional training of personnel directly related to the provision of anti-terrorist protection of maritime transport infrastructure facilities.

3) In the field of increasing the level of environmental protection:

Ensuring the implementation of the requirements of international treaties in the field of protection of the marine environment, one of the contracting parties of which is the Russian Federation.

Increasing the responsibility of the administrative authorities of seaports for the state and quality of the marine environment in the port water area.

Responsibility for the administrative bodies of seaports to monitor and control the quality of the provision of services for the receipt of ship-generated waste in seaports, develop and periodically update management plans for the disposal of ship-generated waste in seaports.

Development of a legal document on the procedure for organizing industrial environmental control and monitoring in seaports, consistent with the federal law "On Environmental Protection" and the Technical Regulations on the safety of maritime transport facilities, contributing to their implementation.

Development of a system of hydrometeorological, hydrochemical and environmental observations (including using remote methods) in the water area and in close proximity to the port water area, to provide data for environmental monitoring activities.

Development of a procedure for the use of funds received from the environmental fee for the maintenance and updating of technical means for the reception and processing of shipboard waste.

Creation of a response system to oil spills and other harmful substances in the eastern region of the Arctic.

Development of economic mechanisms for stimulating the transition of industry entities to environmentally friendly and energy-saving technologies, including the transition to alternative energy sources, coastal power supply of transport ships when moored in the port.

Use of the mechanism of public-private partnership in investment projects for the creation of technical facilities in ports for the reception of ship-generated waste.

Carrying out a comprehensive assessment of the compliance of the current situation in the Russian Federation with the provisions of the International Convention for the Safety of Life at Sea (SOLAS), the results of the implementation of the ISPS Code in Russia.

Conducting periodic comprehensive exercises to work out the actions of all interested state and regional authorities, law enforcement and commercial structures to prevent and neutralize non-military security threats at sea and in coastal areas in all sea basins.

Task 3. Creation of conditions that increase the competitiveness of domestic seaports.

Increasing the level of competitiveness of domestic seaports is possible by:

− Strengthening the innovative component in the development of seaports, equipping them with the latest technical means, advanced technologies, modern electronic systems for managing technological and information processes, updating the auxiliary fleet.

One of the most effective areas in the field of innovation is the active introduction of logistics transport and technological systems. The transport system of Russia is still far behind the advanced countries in the field of transportation of goods by enlarged units according to the “door-to-door” scheme. For example, the production capacity of container terminals in Russian seaports is only 30% of the total capacity of transshipment complexes for handling general cargo, which, as a rule, is subject to containerization. This implies the need for the active introduction of advanced technologies for the transportation and transshipment of goods in ports in enlarged places. In addition, an urgent task is to update the handling equipment in the ports and increase the share of Russian-made equipment.

In the future, such mechanisms as the creation of technological platforms and the formation of regional territorial clusters based on seaports will acquire a special place.

One of the ways to increase the competitiveness, and mainly, the safety of navigation in the port is the construction, renovation and "rejuvenation" of the vessels of the auxiliary fleet, bringing the average age of the vessels up to 15 years.

− Formation of infrastructure for handling large-tonnage vessels.

An increase in the range of vessels handled will allow cargo owners to choose the most profitable transport and logistics schemes for cargo delivery, which increases the attractiveness of the port in terms of reducing transaction costs.

− Organizations of Port Special Economic Zones (PSEZ).

Tax incentives applied in the SEPZ contribute to attracting investments in the development of port infrastructure and the introduction of advanced equipment and advanced technologies. And this, in turn, is an important factor in attracting cargo flows to the port. To date, SEPZs have been established only in two Russian ports - Murmansk and Sovetskaya Gavan. It is necessary to extend this experience to other ports through which the most important cargo flows that are of strategic importance for the Russian economy pass.

− Improvement of the tariff policy.

Developing port infrastructure, thereby creating attractive conditions for ships to enter domestic ports. Maintaining port dues, tariffs for loading and unloading operations and related services and other services provided in the seaport at a level that ensures the competitiveness of ports, contributes to an increase in ship calls to ports. Improvement of tariff and price regulation for the entire range of services of natural monopoly entities in seaports should be based on the following principles:

- at present, state regulation of prices in seaports applies only to services provided in the areas of activity of subjects of natural monopolies;
- full transition from the “cost-plus” model (full reimbursement of all reasonable costs incurred plus ensuring profitability) to a model for determining the price cap (“pricecaps”) for a long period;
- separate accounting of income and expenses by types of activities of subjects of regulation;
- in the near future - a gradual refusal to regulate tariffs for loading and unloading operations, in connection with the development of competition in the markets, as well as services for the provision of berths and storage of goods in seaports.

− Attraction to domestic ports of a rational share of the domestic cargo base transshipped in the ports of neighboring states.

Despite the relatively low share of the ports of neighboring countries in the total volume of transshipment of Russian cargo (17.1% in 2021), for individual cargo this share is still unreasonably high. Thus, in 2021, about 56% of coal and 54% of mineral fertilizers gravitating to the ports of the Baltic basin were transshipped in the ports of the Baltic countries, and more than 48% of coal and 51% of mineral fertilizers gravitating to the ports of the Black Sea basin were transshipped in the ports of Ukraine. Significant volumes of Russian oil products and packaged cargo are also handled in the ports of neighboring countries.

At the same time, the need to switch all Russian cargo flows from the ports of neighboring countries to Russian ports is not so obvious. Currently, the ports of Ukraine and the Baltic countries do not pose a threat to the transport independence of Russia, as it was in the 90s. Today these ports are regarded as ordinary competitors in the transport services market. Therefore, there is no need to bring their share in the transshipment of Russian cargo to a meager, and even more so zero, value.

The Transport Strategy of the Russian Federation until 2035 (updated version) provides for a more than twofold increase in the volume of cargo turnover of domestic seaports (up to 1013.4 - 1196.1 million tons, depending on the development scenario) and an increase in port capacities by 408-758 million tons (to the base of 2013). These values are taken as key indicators, based on which target indicators for the implementation of the Strategy have been developed, corresponding to the tasks set.

Task 1. Increasing port capacities and ensuring the effective development of port infrastructure:

volume of cargo transshipment in seaports, million tons;

volume of port capacities, million tons;

coefficient of use of transshipment complexes (in fractions of a unit or in %);

Task 2. Ensuring the safe functioning of the sea port infrastructure and maritime transport:

level of coverage of seaports and approaches to them:

coastal means of ensuring the safety of navigation %;

means of ERA and OSR readiness %;

waste collection and disposal facilities %;

Task 3. Creation of conditions that increase the competitiveness of domestic seaports:

total gross tonnage of ships calling at seaports, GT;

the ratio of port dues per 1 ton of cargo turnover of seaports, rubles/tons;

the share of Russian foreign trade cargo handled in the ports of neighboring states (Ukraine, the Baltic States), in the total volume of cargo handled in the ports of Russia and neighboring states %;

the ratio of budgetary and non-budgetary sources in investments in berths and infrastructure rub.;

Task 4. Improving public administration in the field of seaports:

budget efficiency of public investments in port infrastructure (internal rate of return of budget investments), %.

All target indicators imply a more detailed division and elaboration, taking into account the specifics of the basins and the main types of cargo, of which a macroeconomic forecast of the main indicators was formed.

- Strategy for the development of the forest complex of the Russian Federation for the period up to 2035
- General scheme for the development of the gas industry for the period up to 2035
- General scheme for the development of the

oil industry for the period up to 2035

- Program for the Development of Infrastructure and Logistics for the Grain Market of the Russian Federation for 2021-2035.

The volumes of products produced by these industries must be divided into products for domestic consumption and products for export. In turn, in export products, it is necessary to separate the volumes intended for transportation by sea from the volumes for transportation by other modes of transport.

To obtain reliable forecasts in terms of foreign trade transportation, close interaction between industrial and transport sectors is necessary. In the pre-reform period, such interaction was carried out through state associations of the Ministry of Foreign Trade under the conditions of a monopoly of foreign trade activities. At present, due to the transition to market relations and the abolition of the monopoly of foreign trade, these ties have significantly weakened, which negatively affects the forecasting of cargo flows, and, consequently, the operation of maritime transport. It is necessary to overcome this shortcoming and resume a full-fledged information exchange between industry and transport in matters of managing the movement of goods in the long-term, current (annual) and operational (quarterly, monthly) sections.

One of the elements of the forecast is to determine the country's needs for imported goods, which are determined by many factors, in particular:

- the need to purchase imported equipment, machine tools, instruments, some materials for the developing Russian industry, since the quality of domestic products in most cases is still inferior to similar foreign samples (for example, seaports are mainly equipped with imported handling equipment).
- constant purchases of a large number of imported consumer goods (clothing, footwear, household appliances, perfumes, furniture, etc.). Cars of foreign brands are in great demand in Russia;
- an unjustifiably high share of imported food products. Despite the backwardness of Russian agriculture, the share of domestic food products on the Russian market could be much higher with a reasonable organization of agricultural production, timely purchases and proper storage of agricultural products. But for now, the situation is as it is today, when forecasting the cargo base, it is necessary to provide for the cargo flows of imported food products, including perishable ones, requiring refrigerated ships, wagons, warehouses, and containers for their transportation and storage.

In the total volume of Russian foreign trade cargo, exports in different years exceeded imports by 8-13 times. If only dry cargo ships are taken into account, then the excess of exports over imports was 5.0-5.5 times.

Another factor in forecasting cargo flows is the analysis of changes in world commodity markets that occur constantly, affect any parameters (types of goods, sales volumes, prices, etc.) and are due to many reasons. Below are some examples:

- the huge range of fluctuations in oil prices is well known. These prices depend on the growth rate of industrial production (fuel consumption is higher at high rates), the season and temperature regime (more fuel is consumed in the cold season than in the warm season, more in frosty winters than in mild ones), progress in the development of alternative types of energy (solar, wind, etc.), strong-willed decisions of the main oil exporters (primarily OPEC) and many other reasons. In addition, competition for oil from coal and gas is intensifying;
- markets for food products, especially grain, depend on the harvests in exporting and importing countries;
- the sale of mineral fertilizers depends on the agricultural policy of specific countries. Thus, developing countries use mineral fertilizers in large quantities in order to increase crop yields, while developed countries focus on the ecology of food and therefore limit the use of mineral fertilizers.

The factor of competition is very significant when promoting any product to the world market. So, at one time, when exporting coal to European countries, Russian exporters faced competition from Poland. In recent years, China has become an increasingly powerful competitor in a number of goods. Tough competition is constantly taking place in the market of food products, especially grain.

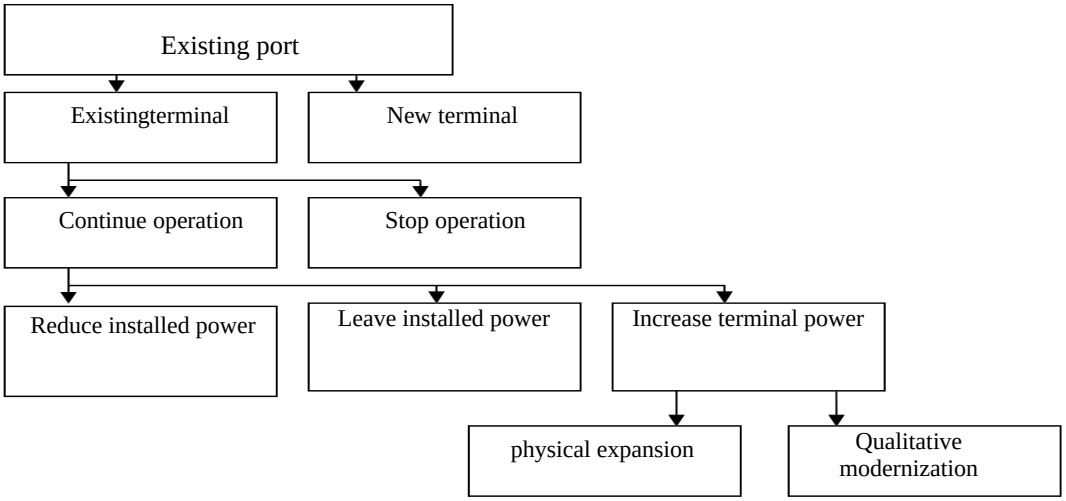
The most important role in forecasting cargo flows is played by observations of fluctuations in world prices for various types of products. It is prices that primarily determine the volume of goods entering the market. At the same time, there is an inverse relationship: an increase in the volume of goods entering the market usually leads to a decrease in prices, and a decrease in volumes can provoke their growth.

Based on data on prospective cargo flows, a detailed analysis of supply and demand, the most preferable location of capacities for handling cargo transported by sea to / from Russia is determined, including decisions are made on the following issues (Figure 1):

– construction of new seaports;
– construction and reconstruction of transshipment complexes in existing seaports;
– development of elements of transport hubs adjacent to seaports (port stations, railway and auto approaches, access roads, etc.);
– redistribution of cargo flows between Russian ports, as well as between the ports of Russia and neighboring countries.

At the first level, there is a choice between existing and new ports. In the event that there is a

more suitable available location for port development on the Russian coastline than existing ports, or where existing ports cannot be developed, the formation of new ports may be considered.



Picture. 1 Strategic direction development tree

At the second level, a choice is made: whether to continue using the existing terminals in the port or whether new ones need to be developed.

For all terminals for which it is decided to continue using them, it is necessary to consider whether the terminal capacity should be:

– reduced (for example, due to environmental restrictions);

– increased (due to physical expansion or increased efficiency);

– or maintained at the same level (for example, due to the inability to expand or improve efficiency).

It should be noted that the increase in terminal capacity can be achieved through physical expansion and quality upgrades. Among the main physical improvements that increase the capacity of terminals are the expansion of approach channels;

– acceleration of icebreaking assistance in freezing ports;

– increase in operational efficiency (use of efficient equipment);

– increase in work efficiency (use of a greater length of the quay wall);

– improvement of road and railway approaches to the port (elimination of bottlenecks in the transport infrastructure).

The main quality improvements to increase the throughput of terminals are:

– improvement of customs procedures;

– elimination of administrative barriers;

– improvement of operational procedures in terminals.

The choice of the most preferred locations for the development of port facilities is based on an analysis of the quality and reliability of the three components of the logical chain:

1) navigation accessibility.

It is assessed as the ability of a port located in a given territory to receive ships typical for a given region. Thus, for each basin, the typical configuration of the prevailing vessels determines the requirements for the development of the port's navigation infrastructure. Two characteristics largely determine navigational accessibility: the physical dimensions of the approach channel (depth, width, length) and climatic conditions (freezing of the port, etc.);

2) Possibility of developing port facilities.

In the development of port infrastructure, one of the paramount importance is the efficient and reliable operation of port facilities. The most important is the efficient operation of the loading and unloading complex, where ships are loaded and unloaded, the ability to receive and process waste from ships. However, other infrastructure facilities, such as customs and screening terminals, also need to operate at high levels of efficiency. In this sense, projects that involve the expansion of existing ports with developed routes and a well-functioning cargo handling mechanism and possible territories for secondary development have certain advantages over projects involving construction in an "open field".

In addition to the existing services provided by the port, the ability to expand the volume of services and their quality is an important factor in choosing the most preferred port locations. Ports (territories) with physical and / or environmental restrictions cannot provide investors with a perspective for long-term and stable development;

3) internal availability.

In order to guarantee the efficient transportation of goods located inland, ports must be connected by a network of roads or railways, inland waterways. Without a stable and reliable connection between the

port and the hinterland, ports cannot provide cargo owners and operators with services of the proper quality. Therefore, the availability and quality of internal accessibility of a port are very important characteristics that affect the assessment of the competitiveness of ports.

Strategic development directions determine where and what kind of seaport infrastructure should be developed. The tree below illustrates the development of strategic development directions for a particular type of cargo for each basin.

After the development of strategic directions for the development of the seaport infrastructure, specific activities (projects) are selected that correspond to the developed strategic directions.

The structure of the document allows a step-by-step analysis of the main trends affecting the functioning of the Russian port industry. Starting with a review of the global macroeconomic situation and trends in world trade, as well as the domestic resource base, the methodology allows you to gradually go down to the selection of specific projects in specific Russian ports.

Based on the analysis carried out for each type of cargo within the framework of regional directions, proposals were formulated for the optimal development of Russian seaports, taking into account their competitive advantages. The list of seaports with indication of forecast cargo flows by types of cargo and promising development projects is presented in Appendix 5 to this Strategy.

As part of the development and application of the methodology and tools for forecasting the dynamics of the cargo base in the context of the directions of cargo flows, with the allocation of individual basins (ports), types of cargo and regions of destination/departure, short-, medium- and long-term forecasts of development were carried out. At the same time, key indicators of federal, sectoral, departmental, and regional development programs were taken into account.

When developing the forecast, the program activities in terms of the development of seaports were also taken into account, provided for by the Transport Strategy of the Russian Federation for the period up to 2035 and the federal target program "Development of the transport system of Russia (2020-2035)" (subprograms "Sea transport" and "Development of export of transport services").

Also, the methodology for forecasting the commissioning of port facilities was supplemented by the data available at FSUE “Rosmorport” on the business proposals of investors for the development of ports for the period up to 2035.

The cargo base in this document is understood as a comprehensive description of cargo flows in the direction of seaports with distribution according to the established nomenclature of goods and types of transportation (export, import, international transit, cabotage), indicating the areas of their origin, destination and ports of transshipment.

Usually, foreign trade and, accordingly, maritime transport of foreign trade goods develop more or less synchronously with the development of the country's economy. However, an inverse relationship is often observed. So, in the 90s of the last century, Russia lived in a deep crisis, a sharp decline in industrial production. At the same time, the cargo turnover of seaports increased annually at a fairly high rate. Over the period from 2019 to 2021, the total volume of cargo transshipment in Russian ports increased by 1.6 times (from 113.0 million tons to 182.2 million tons). Russia exported products of the fuel and energy complex and raw materials industries in order to purchase the necessary goods and food with the proceeds.

Another very typical example. Due to the decline in production in the Russian domestic market, the demand for metals dropped sharply. And then all the surplus metals were exported, especially since the demand for metals on the foreign market was quite high. Over the period from 2019 to 2021, the volume of transshipment of export metals in Russian ports increased 4 times (from 3.8 million tons to 15.5 million tons).

Therefore, when developing the forecast, not only macroeconomic indicators were used, but also specific situations in the global and domestic markets were analyzed for each type of cargo of the established nomenclature.

Despite the potential of the ports of the Russian Federation, primarily in providing export-import flows, Russian ports often lose competition for their own traffic to the ports of neighboring countries. Thus, in particular, the share of the ports of the Baltic countries and Ukraine has been gradually decreasing in recent years, but, nevertheless, in recent years it has been at a relatively high level of 15-20% of the total maritime traffic oriented to Russia. At the same time, for some cargoes, such as mineral fertilizers and ore, traffic oriented to Russia is distributed approximately equally between the ports of Russia and the ports of the Baltic countries and Ukraine. It should be noted that Russian ports have a much better location relative to the Russian centers of production and consumption of goods, which, with significantly lower costs of transporting goods by sea,

Along with the geographical position in relation to consumers and producers, one of the most important factors in choosing a port of unloading is the speed and quality of cargo handling. Another important indicator of the attractiveness of Russian ports is the cost of a ship call. Without Russian ports reaching the level of best international practice in terms of these indicators, it is difficult to talk about a fundamental change in the state of the industry.

In general, the results of forecasting the cargo base of seaports are characterized by the following

indicators.

The total volume of cargo transshipment in the seaports of Russia for the period from 2019 to 2035 will increase according to various scenarios by 1.8 - 2.1 times and is estimated at 1013.4 million tons - 1196.1 million tons (tables 5 - 6 - 7).

Development scenarios The conservative (energy-resource) scenario is based on the dynamics of cargo flows, which will mainly be provided by domestic cargo generating sectors of the economy. High growth rates under the innovation scenario are associated with the potential for growth in world trade in the direction of the Asia-Pacific region and the development of Arctic deposits.

Table 5. Forecast of cargo transshipment through Russian seaports for the period up to 2015-2025-2035

Type of cargo	2013 fact	2025		2030		2035	
		En	Inn	En	Inn	En	Inn
TOTAL CARGO, including:	589.2	637.7	683.6	832.8	915.1	1013.4	1196.1
bulk	333.4	364.0	377.0	427.0	435.0	464.0	477.0
bulk carriers	255.8	273.7	306.6	405.8	480.1	549.4	719.1

The share of ports of neighboring countries in the total volume of transshipment of Russian foreign trade cargo will decrease from 15% at present to 4% by 2035.

Table 6. Volumes of transshipment of Russian foreign trade cargoes through the seaports of Russia and the ports of neighboring states according to the conservative (energy and raw materials) option

Cargo flows	2013	2025	2030	2035
	fact	forecast	forecast	forecast
TOTAL CARGO, including:	674	698.8	877.8	1053.6
1. Coastal	35.9	38.0	44.7	59.9
2. Foreign trade	638.1	660.8	833.1	993.7
Of them:				
2.1. through Russian ports	553.3	599.7	788.1	953.5
2.2. through the ports of neighboring states	84.8	73.2	45.3	40.2
Share of ports of neighboring countries in the total volume of transshipment of foreign trade cargo	13%	9%	5%	four%
Total via Russian ports (1+2.1.)	589.2	637.7	832.8	1013.4

In the study period, the basis of cargo turnover is stilly will be products of the fuel and energy complex (crude oil, oil products, liquefied gas, coal) and raw materials industries (ore, chemical and timber cargoes), as well as metals not in business. At the same time, there will be some structural changes.

Table 7. Forecast of volumes of cargo transshipment through seaports in the context of the main nomenclature items for 2025-2030-2035

Type of cargo	2013	2025 forecast		2030 forecast		2035 forecast	
	fact	En	Inn	En	Inn	En	Inn
Total cargo	589.2	637.7	683.6	832.8	915.1	1013.4	1196.1
including							
1. Bulk	333.4	364.0	377.0	427.0	435.0	464.0	477.0
1.1. crude oil	207.5	226.0	235.0	255.0	258.0	260.0	265.0
1.2. oil products	111.7	116.0	120.0	120.0	125.0	122.0	130.0
1.3. other bulk	14.2	22.0	22.0	52.0	52.0	82.0	82.0
2. Bulk carriers	255.8	273.7	306.6	405.8	480.1	549.4	719.1
2.1. Bulk	132.2	122.8	146.0	166.3	198.5	234.1	296.9

2.1.1. coal and coke	101.1	90.2	110.0	100.7	115.4	136.0	166.0
2.1.2. ores and concentrates	7.4	10.9	11.5	24.5	29.8	32.2	39.2
2.1.3. chemical (mineral fertilizers)	12.9	12.8	14.5	29.0	35.1	51.4	60.7
2.1.4. sugar	1.0	2.4	3.0	2.7	4.1	3.7	6.5
2.1.5. other bulk	9.8	6.5	7.0	9.4	14.1	10.8	24.5
2.2. Corn	18.3	24.6	28.1	34.2	39.9	37.6	46.0
2.3. Forest	4.4	8.1	9.5	12.3	17.8	21.0	27.5
2.4. General	100.9	118.2	123.0	193.0	223.9	256.7	348.7
2.4.1. metals are out of business	32.6	33.6	34.0	51.2	55.0	67.8	85.1
2.4.2. cars and equipment	5.2	4.5	5.0	6.9	8.2	7.0	12.4
2.4.3. perishable	3.7	5.5	6.0	8.2	10.9	8.2	15.1
2.4.4. containers	44.4	48.3	50.5	90.5	106.8	135.5	183.0
2.4.5. ferries	6.5	12.4	13.0	18.0	23.9	19.2	29.7
2.4.6. others	8.5	13.9	14.5	18.2	19.1	19.0	23.4

If in 2013 the share of liquid cargo transshipped in Russian seaports was 56.6% of the total cargo turnover, then in 2035 it will decrease to 45.8% (energy and raw materials scenario) - 39.9% (innovative scenario).

It is planned to "ennoble" foreign trade maritime transport. If in 2013 the share of general cargo was 17.1% of the total cargo turnover of domestic ports, then in 2035 this share will reach 24.1% (energy and raw materials scenario) - 25.5% (innovative option), i.e. . will increase by 5.5-6.9 points.

When developing a forecast for the cargo flows of crude oil, oil products and liquefied gas exported from Russian seaports, the main provisions of the following documents were taken into account:

- Energy strategy of Russia for the period up to 2035 (2009);

-General scheme for the development of the oil industry for the period up to 2025 (report on October 28, 2010);

- Scenario conditions for a long-term forecast of the socio-economic development of the Russian Federation until 2035 (March 2020).

According to these documents, oil production in the country after 2025 will stabilize at around 510-515 million tons per year, i.e. the volumes of 2018-2020 will practically remain.

The projected volumes of exports of Russian hydrocarbon resources given in these documents are slightly different, which is explained by the difference in the time of issuance of documents. However, in all three documents one and the same trend can be clearly seen - stabilization and even some reduction in exports of crude oil and oil products.

Thus, in accordance with the latest document (Scenario Conditions), the export of crude oil in the first years of the forecast period grows at a low rate and, having reached 252 million tons by 2020, then decreases and after 2025 stabilizes. The export of petroleum products reaches a peak already in the period 2018-2020, after which it will stabilize or slightly decrease to 247 million tons by 2035 due to a slight decrease in European demand for Russian oil. The share of exported oil will be about 48% in 2030.

The export of liquefied natural gas (LNG) under both scenarios remains at the level (14 billion cubic meters) until 2025, after which it grows rapidly and reaches 42 billion cubic meters by 2035. m. Further, according to the innovative scenario, it remains at this level, and according to the energy and raw material scenario, it continues to grow, reaching 54 billion cubic meters by 2025. m and remains at this level until 2035.

The reasons for such a cautious (one might even say, pessimistic) forecast for oil and oil products are the following factors:

-depletion of initial oil reserves. The degree of depletion of reserves of large, actively developed oil fields is approaching 60%. Newly developed reserves are mainly concentrated in medium and small deposits and are, as a rule, difficult to recover;

- a decrease in the demand for energy resources in the foreign market due to a decline in production during the global economic crisis;

-use of alternative, renewable energy sources (solar, wind, tidal, etc.), gradually increasing their share in the energy balance;

-modernization of the Russian economy, providing for the priority development of science-intensive industries rather than raw materials, producing means of production and consumer goods.

At the same time, a deeper and more detailed consideration of these factors allows us to draw conclusions that differ from those presented in the above documents. As some experts note, the next wave of the global crisis will end by 2021. After the crisis, there usually comes a surge in business activity and a rapid increase in production, which, in turn, leads to an increase in energy demand.

The use of alternative energy sources is certainly a progressive phenomenon, but it will not be possible to replace traditional sources soon. In any case, oil, gas and coal will remain the main energy resources until 2030.

Modernization and further development of the Russian economy will not only not lead to a decrease in the need for energy resources, but, on the contrary, will significantly increase this need because, firstly, the growing economy requires additional energy supply, and secondly, modernization requires large financial resources, which can be obtained the country is still able only through the sale of oil and other resources.

It should be noted that the above scenario conditions are preliminary and can be changed in the direction of increasing or decreasing export volumes. However, in the present work, the values indicated in the documents cited above are generally taken as limitations. However, a more versatile analysis shows that in practice these values will be exceeded, and the size of the excess will increase as the forecast horizon increases.

Particular attention should be paid to plans for the construction of complexes for coal transshipment. The long-term program for the development of the coal industry for the period up to 2035, approved on January 24, 2018, provides for an increase in coal production and exports to 140 million tons in 2018, 150 million tons in 2025, 170 million tons in 2035.

According to statistics, 90-95% of export coal is transported by sea. Consequently, in 2035, seaports must transship about 155 million tons of coal for export. The volume of cabotage is estimated at about 2.5 million tons.

There will be a slight, but still some leveling of transshipment of export and import cargoes. In 2018, in terms of transshipped cargo, exports exceeded imports by 9.5 times; in 2035 this excess will be reduced to 6.9 times (under the energy and raw materials scenario) - 6.6 times (under the innovative scenario).

The growth of cargo transshipment in the period up to 2035 will be observed in all basins. In the forecast period, transshipments of liquefied gas, as well as general and bulk cargo (coal, ores, cargo in containers) will grow at the highest rates. It is planned to strengthen Russia's leadership as a grain exporter on the world market. Therefore, transshipment of grain in Russian seaports will almost double.

For individual basins, the situation can be characterized as follows.

In the Baltic basin, by 2035, demand for cargo transshipment is projected to grow to the level of 332.4 million tons in the energy and raw materials scenario (382.2 in the innovative one).

In 2035, the Baltic basin will become the main seaport for the export of Russian hydrocarbons and mineral fertilizers, as well as the largest Russian sea basin in terms of refrigerated and containerized cargo turnover. The basin will retain its leadership in cargo transshipment among all destinations. The main challenge facing the seaports of the Baltic will be the transfer of goods oriented towards Russia from the Baltic and Scandinavian ports.

In the Azov-Chernomorsky direction, by 2035, an increase in demand for cargo transshipment is forecasted to reach the level of 289.1 million tons in the energy and raw materials scenario (348.3 million tons in the innovative one).

In general, in 2035 the Azov-Black Sea basin, along with the Baltic, will remain the largest sea basin in Russia in terms of cargo handling volumes. 36.6% of oil, 31% of oil products, 95% of sugar and grain and 55% of the country's Ro-Ro cargo is planned to be transshipped in the ports of the Azov-Black Sea basin. According to the forecast for the turnover of containers, the Azov-Black Sea basin will be inferior to the Baltic and Far Eastern basins, and in terms of hydrocarbon exports it will be comparable to the Baltic.

One of the main tasks facing the seaports of the Azov-Black Sea basin will be the transfer of goods oriented towards Russia from Ukrainian ports.

In the Caspian Basin, by 2030, demand for cargo transshipment is projected to grow to the level of 23.9 million tons in the energy and raw materials scenario (42.7 million tons in the innovative one). The share of the ports of the Caspian basin in the total volume of cargo transshipment will increase from the current 1.3% to 2.4-3.6% by 2035.

In connection with the decision of the Government of Russia on the accelerated socio-economic development of Siberia and the Far East, freight traffic will shift somewhat to the east. This will also be facilitated by the strengthening of Russia's foreign economic relations with the rapidly developing countries of the Asia-Pacific region. In 2018, the share of seaports in the Far East basin was 24.6% of the total volume of transshipment of Russian cargo, by 2035 it will be 23.2% (energy and raw materials scenario) - 22.6% (innovative scenario).

In general, in 2035 the cargo base of the ports of

the Far Eastern Basin will be provided with mineral and raw materials and forest resources of Eastern Siberia and the Far East, as well as the functioning of the East-West transport corridor (containers). However, there is a possibility that the further development of the capacities of the ports of the Far Eastern Basin will be limited by the capacity of the railway.

In the Far East direction, by 2035, demand for cargo transshipment is projected to grow to the level of 234.7 million tons in the energy and raw materials scenario (270.5 million tons in the innovative one).

In the ports of the Arctic Basin, by 2035, an increase in demand for transshipment of liquid cargo is forecasted to reach 133.3 million tons in the energy and raw materials scenario (152.4 million tons in the innovative one), mainly due to LPG. The ports of the Arctic Basin will be focused on the transshipment of hydrocarbons produced on the Arctic shelf, as well as timber and mineral resources of the Russian north. The share of Arctic ports in the transshipment of goods will increase significantly, from the current 7.8% to 13.2% (energy and raw materials scenario) - 12.8% (innovative scenario) by 2035 (tables 8 - 9 - 10).

Table 8. Distribution of cargo transshipment volumes in the seaports of Russia by sea basins in the peri

Pools	2013 report		2035 forecast			
			En		Inn	
	million tons	%	million tons	%	million tons	%
Total	589.2	100	1013.4	100	1196.1	100
including:						
Arctic	46.2	6.8	133.3	13.1	152.4	12.8
Baltic	215.9	36.5	332.4	32.8	382.2	31.9
Azov-Chernomorsky	174.4	31.2	289.1	28.5	348.3	29.1
Caspian	7.9	1.8	23.9	2.4	42.7	3.6
Far Eastern	144.8	23.7	234.7	23.2	270.5	22.6

Table 9. Distribution of cargo transshipment volumes in Russian seaports by types of transportation and sea basins in the period up to 2035 (energy cheese)

Pools	2013 report		2025 forecast		2030 forecast		2035 forecast	
	million tons	%	million tons	%	million tons	%	million tons	%
Total	589.2	100	637.7	100	832.8	100	1013.4	100
including								
Arctic	46.2	6.8	50.1	7.9	95.4	11.5	133.3	13.2
Baltic	215.9	36.5	223.8	35.1	271.3	32.6	332.4	32.8
Azov-Chernomorsky	174.4	31.1	195.1	30.6	257.8	31.0	289.1	28.5
Caspian	7.9	1.9	14.3	2.2	22.5	2.7	23.9	2.4
Far Eastern	144.8	23.7	154.4	24.2	185.8	22.3	234.7	23.2
Export	506.4	86.0/ 100	533.8	83.7/ 100	695.7	83.5/ 100	831.2	82.0/ 100
including								
Arctic	33.3	6.6	31.3	5.9	70.9	10.2	98.9	11.9
Baltic	187.3	40.2	187.9	35.2	221.9	31.9	265.1	31.9
Azov-Chernomorsky	160.6	28.1	177.8	33.3	233.1	33.5	258.5	31.1
Caspian	6.6	0.8	8.6	1.6	14.1	2.0	14.5	1.7
Far Eastern	118.6	24.3	128.2	24.0	155.7	22.4	194.2	23.4
Import	46.9	8.4/ 100	66	10.5/ 100	92.4	11.1/ 100	122.2	12.1/ 100
including								
Arctic	0.6	1.5	2.5	3.8	3.6	3.9	4	3.3

Baltic	25.5	50.7	32.7	49.5	45.6	49.4	62.4	51.1
Azov-Chernomorsky	11.6	29.9	15.5	23.5	22.6	24.5	27.8	22.7
Caspian	0.8	1.3	5.2	7.9	7.8	8.4	8.6	7.0
Far Eastern	8.4	16.6	10.1	15.3	12.8	13.9	19.4	15.9
Cabotage	35.9	5.6/ 100	37.9	5.8/ 100	44.7	5.4/ 100	60	5.9/ 100
including								
Arctic	12.3	26.7	16.3	43.0	20.9	46.8	30.4	50.7
Baltic	3.1	7.9	3.2	8.4	3.8	8.5	4.9	8.2
Azov-Chernomorsky	2.2	7.5	1.8	4.7	2.1	4.7	2.8	4.7
Caspian	0.5	3.5	0.5	1.3	0.6	1.3	0.8	1.3
Far Eastern	17.8	54.4	16.1	42.5	17.3	38.7	21.1	35.2

Table 10. Distribution of cargo transshipment volumes in Russian seaports by types of transportation and sea basins in the period up to 2035 (innovative scenario)

Pools	2013 report		2025 forecast		2030 forecast		2035 forecast	
	million tons	%	million tons	%	million tons	%	million tons	%
Total	589.2	100	683.6	100	915.1	100	1196.1	100
including								
Arctic	46.2	6.8	88.7	13.0	115.4	12.6	152.4	12.7
Baltic	215.9	36.5	221.9	32.5	284.6	31.1	382.2	32.0
Azov-Chernomorsky	174.4	31.1	198.8	29.1	274.8	30.0	348.3	29.1
Caspian	7.9	1.9	15.3	2.2	33.8	3.7	42.7	3.6
Far Eastern	144.8	23.7	158.9	23.2	206.5	22.6	270.5	22.6
Export	506.4	86.0/ 100	555.1	81.2/ 100	770.9	84.2/ 100	983.4	82.2/ 100
including								
Arctic	33.3	6.6	63.3	11.4	90.7	11.8	125.6	12.8
Baltic	187.3	40.2	182.8	32.9	238.6	31.0	316.2	32.2
Azov-Chernomorsky	160.6	28.1	175.2	31.6	246.4	32.0	291.4	29.6
Caspian	6.6	0.8	7.6	1.4	24.2	3.1	26.8	2.7
Far Eastern	118.6	24.3	126.2	22.7	171	22.2	223.4	22.7
Import	46.9	8.4/ 100	78.9	11.6/ 100	95.5	10.5/ 100	158.5	13.3/ 100
including								
Arctic	0.6	1.5	2	2.5	2.2	2.3	2.7	1.7
Baltic	25.5	50.7	36.6	46.4	43.6	45.7	63.4	40.0
Azov-Chernomorsky	11.6	29.9	21.7	27.5	26.5	27.7	54.6	34.4
Caspian	0.8	1.3	7.2	9.1	9.1	9.5	15.3	9.7
Far Eastern	8.4	16.6	11.4	14.4	14.1	14.8	22.5	14.2
Cabotage	35.9	5.6/ 100	49.5	7.2/ 100	48.7	5.3/ 100	54.2	4.5/ 100
including								
Arctic	12.3	26.7	23.3	47.1	22.5	46.2	24.1	44.5
Baltic	3.1	7.9	2.5	5.1	2.4	4.9	2.6	4.8
Azov-Chernomorsky	2.2	7.5	1.9	3.8	1.9	3.9	2.3	4.2
Caspian	0.5	3.5	0.5	1.0	0.5	1.0	0.6	1.1
Far Eastern	17.8	54.4	21.3	43.0	21.4	43.9	24.6	45.4

The development of seaports in each time period had its own characteristics. For example, in the early 1990s In the 20th century, there was a question about the increased construction of new ports in the Baltic in order to ensure the economic security of Russia and prevent the transfer of foreign trade cargo flows to the ports of neighboring states. In the 2000s, mechanisms for attracting investments in port infrastructure were actively developed, and mechanisms for managing the sea port economy were structured.

At present, the task is to integrate all types of transport and increase the efficiency of their interaction in order to realize the competitive advantages of Russia and strengthen its transit potential.

In accordance with the subprogram "Development of the export of transport services" of the Federal Target Program "Development of the transport system of Russia (2018-2035)"), the following projects are expected to be implemented:

comprehensive development of the transport corridor "West - East" in the direction of Europe - the Russian Federation - Japan with branches from the Russian Federation to Kazakhstan, Mongolia and China. The key links of this corridor should be 1) a double-track and fully electrified Trans-Siberian Railway, 2) strategic seaports, 3) multimodal transport hubs and 4) inter-regional logistics centers that will allow switching the transport flows of the Asia-Pacific region to the West-East transport corridor »;

comprehensive development of the North-South corridor in the direction of Northern Europe Russian Federation-Iran-India with branches to the Caucasus, the Persian Gulf, and Central Asia. As part of the North-South corridor, work will be carried out to develop main lines of communication and complex transport hubs, the expansion and construction of approaches to sea and river ports (Novorossiysk, Taman, Rostov universal port), railway stations, airports and multimodal terminals will continue.

Today, the tasks are set to develop and increase the competitiveness of seaports located in places of maximum concentration of export and transit cargo flows. Russian seaports in all basins are "entry points" of international transport corridors ("Trans-Siberian", "North - South", route "Europe - Western China"). To ensure the accelerated development of cargo transportation in containers, it is planned to build container and transshipment terminals in the ports of Novorossiysk and Murmansk, create an integrated transport hub based on the port of Taman and the Rostov universal port.

Of decisive importance in the future will be the specialization of seaports through the creation of so-called "layered ports" following the Rotterdam model, when the port system will include remote railway junctions and transport and logistics complexes. This will require the development of access roads to ports and port production and storage areas focused on the processing of cargo, the formation of port zones that ensure the processing of incoming cargo.

It is necessary to significantly expand regional transport cooperation in the field of transport to realize the interests of the Russian transport business:

in the north-west of Russia - within the framework of the Council of the Barents Euro-Arctic Region and the Council of the Baltic Sea States;

in the south - within the framework of the Black Sea Economic Cooperation;

in the east - within the framework of the Shanghai Cooperation Organization and the Asia-Pacific Economic Cooperation.

To ensure the growth of transportation of goods and passengers on socially significant routes, it is planned to build ferry complexes to provide communication with the Kaliningrad Region and Sakhalin Island, and build infrastructure for servicing passengers.

The use and development of modern innovative and information technologies in maritime transport is envisaged.

In modern conditions, effective management is an essential factor in strengthening the economic growth rates of regions and the state as a whole. The role of regions as places for the formation of a competitive environment for economic entities located there, in particular, seaports, is significantly enhanced.

The development of seaports has a stimulating effect on the economic growth of territorial entities, entrepreneurial activity and competition in the market, the influx of investments and qualified personnel, and the development of innovative technologies. Often, seaports are city-forming enterprises of social importance for the region. Maritime transport provides about 60 percent of Russia's foreign trade economic relations, plays a significant role in realizing Russia's transit potential and an indispensable role in the transport provision of hard-to-reach areas and the delivery of goods to the Far North.

The task set at the state level to increase the country's export opportunities can be solved in the unity of increasing the foreign economic potential of the state and the integrated development of regions, including the social component.

An analysis of strategic documents for the development of ports at the regional level allows us to conclude that both the development of individual ports directly and some forecasts of their activities (of course, implying their development) are affected in almost every region of the Russian Federation bordering the sea. At the same time, the northern regions are more focused on the development of ports that provide exploration and production of hydrocarbons on the Arctic shelf, and on the development of the Northern Sea Route, the organization of northern delivery to hard-to-reach

regions, etc. In the Baltic, within the framework of regional strategies, the development of the Big Port of St. Petersburg, Kaliningrad, Baltiysk is envisaged. It implies the development of a system of rear terminals that ensure the transfer of the maximum possible volume of cargo operations outside the port. One sees the functioning of sea cargo terminals in the area of the Bronka railway station, the city of Lomonosov and the city of Kronstadt. In the ports of the South Basin, much attention is paid to the development of the transport potential of the region through the integrated development of regional transport hubs, in particular, the creation of port special economic zones in the ports of Olya and Taman. In the Far East basin, the most diversified development of ports is planned, based both on the implementation of the import-export and transit potential of the country, and on the solution of regional social problems (development of cabotage transportation, organization of wholesale fish exchanges in ports). In the ports of the South Basin, much attention is paid to the development of the transport potential of the region through the integrated development of regional transport hubs, in particular, the creation of port special economic zones in the ports of Olya and Taman. In the Far East basin, the most diversified development of ports is planned, based both on the implementation of the import-export and transit potential of the country, and on the solution of regional social problems (development of cabotage transportation, organization of wholesale fish exchanges in ports). In the ports of the South Basin, much attention is paid to the development of the transport potential of the region through the integrated development of regional transport hubs, in particular, the creation of port special economic zones in the ports of Olya and Taman. In the Far East basin, the most diversified development of ports is planned, based both on the implementation of the import-export and transit potential of the country, and on the solution of regional social problems (development of cabotage transportation, organization of wholesale fish exchanges in ports).

A comprehensive analysis shows that, unfortunately, with the simultaneous implementation of all the identified strategic initiatives, it is possible, on the one hand, to develop excess capacity (different regions in the development of ports, in fact, count on the same market), on the other hand, insufficient capacity (certain important aspects seem unattractive to all regions, but they need to be implemented by those who have the lowest costs). For a full-fledged, coordinated and unified approach to the development of the entire domestic port infrastructure, these regional initiatives must be considered at the federal level. Evaluation and analysis of these initiatives, especially in terms of realizing the country's import and export potential, should be carried out in the context of the main directions for the development of seaport infrastructure developed in the Strategy. Thus, the relevant initiatives should be considered and included, in case of a positive assessment, into the Strategy on the same terms as other activities. Accordingly, the subjects of the Federation are the initiators of these events.

Transportation or organization of fish markets in the port, it is only necessary to have an agreement on the consistency of the general principles of the event with the principles of the Strategy. A detailed analysis of the economic feasibility or sources and amounts of funding at the federal level can be omitted, these decisions are given to the regional level.

Despite intensive plans for the development of regional sea port complexes, there are systemic constraints that hinder the development of port activities and reduce their competitiveness:

- lack of effective interaction between the state and private business in the development of port infrastructure;
- features of the geographical position of the ports: shallow depths, long approach channels, ice conditions, remoteness from the main directions of world shipping;
- inconsistency with world practice of the regime and procedures for the operation of checkpoints;
- unsettled land and property relations in ports;
- the absence of tax and customs preferences accepted in world practice, including for the creation of port special economic zones.

A separate priority of the Strategy for the Development of Maritime Port Infrastructure is cooperation between ports and within them, which will contribute to the overall effective development. Cooperation in this Strategy is understood as a specific interaction between the parties that participate in the activities of the port. According to the level of interaction, cooperation can be of an intercountry, regional or intra-port character. According to the types of interaction, cooperation can be conditionally divided into institutional (for example, institutional exchange of experience at the country level), industrial (for example, exchange of experience in practical work at the level of individual ports) and commercial (for example, the creation of joint ventures). Events involving inter- and intra-port cooperation for the exchange of best practices, knowledge, creation of mutually beneficial regional platforms for interactions have an additional priority within the framework of the Strategy. In doing so, we single out the following types of special priority areas:

- exchange of information and experience in the work of the port economy;
- holding exhibitions and organizing working platforms for the exchange of best practices and discussion of cooperation opportunities;
- facilitating the introduction of intra-port

electronic document management;

- creation of industrial parks and development of regional multimodal links to reduce the costs of movement of goods through supply chains;
- consolidation of all-Russian standards for maintaining port statistics in accordance with accepted international practice;
- training of personnel for the port industry.

It is worth dwelling in particular on the development of the Arctic zone of the Russian Federation (territories located mainly to the north of the 60th parallel).

The fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2020 and beyond define the main goals, main tasks, strategic priorities and mechanisms for implementing the state policy of the Russian Federation in the Arctic, as well as a system of strategic planning measures for the socio-economic development of the Arctic zone of the Russian Federation and ensuring Russia's national security.

The state policy in relation to the Northern Sea Route is based on the following principles: the state supports the priority sectors of the Arctic economy that can increase cargo flows in a short time; creates favorable regulatory legal and financial and economic conditions for the activities of Russian commercial enterprises and foreign investment in these industries; develops the federal transport infrastructure (icebreakers, hydrographic fleet, means of navigation, hydrometeorology, communications, rescue) as the basis for a unified national transport communication in the Arctic. Commercial enterprises and constituent entities of the Russian Federation, as economic activity develops and the cargo base grows, create their own transport fleet or use the services of shipping companies, develop the port economy and take a share in the development of the infrastructure of the NSR, which ensures the activities of these entities. As a result, a self-sustaining Arctic maritime transport system is being created.

The main goals of the state policy of the Russian Federation in the Arctic are supposed to be achieved by solving, among other things, the following tasks:

- to ensure the restructuring of the volume of cargo transportation along the Northern Sea Route, including through state support for the construction of icebreaking, rescue and auxiliary fleets, as well as coastal infrastructure;
- to form a system of control over ensuring the safety of navigation, managing traffic flows in areas of heavy vessel traffic, including through the implementation of a set of measures for hydrometeorological and navigational support in the Arctic zone of the Russian Federation.

According to the plans for the development of the Arctic, it is planned to radically modernize the Northern Sea Route and increase the cargo turnover on its routes by 2020 to 30-35 million tons annually through transportation from new offshore facilities and transit flows from Europe to the countries of the Asia-Pacific region.

Estimated volumes of cargo turnover will be created due to the transportation of hydrocarbons from new fields of the Arctic shelf, the Timan-Pechora province, partial switching of cargoes of Russian manufacturers that are transported through the Suez Canal, connection of the first transit cargo transportation between the ports of Western Europe, North America, the Far East and the South East Asia (in the event that foreign shippers switch part of their cargo flows from southern to northern routes).

The modernization of the Arctic transport system is a priority for the development of the Arctic zone of the Russian Federation.

Restoring the functions of the NSR for safe navigation along its routes involves the modernization of the Arctic ports of Khatanga, Tiksi, Pevek, Dudinka, Dikson and the creation of new port (transport and logistics) complexes / offshore shipping terminals Indiga, Kharasavey, Murmansk, Varandey.

The development of the backbone transport network of the Arctic territories to ensure transportation through it also provides for the development of the infrastructure of the Arctic ports of Tiksi and Zeleny Mys. It is planned to build estuarine transshipment complexes at the mouths of the Lena, Yana, Indigirka and Kolyma rivers.

In order to implement plans for the development of the Arctic shelf and the delivery of hydrocarbons to Europe and the USA, as well as the use of the NSR for transit transportation between the countries of North-Western Europe and the Asia-Pacific region (Japan, China, the USA, Canada), it is planned to develop the navigation safety infrastructure along the Northern Sea way. A cardinal renewal of the icebreaking fleet, construction of specialized ice-class and reinforced ice-class vessels, double-hull tankers with additional emergency equipment is planned.

The modernization of the Arctic fleet leads to the expansion of the role of dual-purpose and multi-purpose vehicles, which are the most effective in the conditions of the modern Arctic, as well as small and medium-sized river-sea vessels, dry-cargo tankers, vessels for the transportation of transit container cargo, ice-class tankers , specialized vessels for the fishing, research fleet.

For the effective development of maritime transport, it is proposed to legislate the preservation of the icebreaker fleet, navigation systems, hydrography, hydrometeorology, communications and navigation management as the basis of Russia's unified national transport communications in the Arctic. The development of the icebreaking and transport fleet, ports and navigation safety systems will be aimed at year-round mass export of oil, gas and condensate from fields on the coast and shelf of the Barents and Kara Seas, regular transportation, transit along the

Northern Sea Route, northern delivery of energy resources and consumer goods consumption, as well as the export of products.

Creation of transport vessels of ice categories, in particular tankers, will be carried out at the expense of joint-stock production and transport enterprises that develop the natural resources of the Arctic. The development of the coastal port infrastructure is supposed to be provided at the expense of the interested cargo owners and the Arctic regions of the Russian Federation on the principles of public-private partnership. Creation of new port transport and technological complexes in the area of the Kola Peninsula, terminal ports Indiga, Kharasavey, Yasya (Ob Bay); new road offloading terminals for liquid cargo (Varandey, Prirazlomnoye, Lipatnikovo/Igarka, container terminals in the ports of Murmansk, Tiksi, Egvekinot, Provideniya) are provided at the expense of commercial enterprises' own funds. The port of Egvekinot is considered as the base receiving and supply port of the Chukotka Autonomous Okrug with the organization in the near future (after the completion of the construction of the Egvekinot - Cape Schmidt - Pevek highway) year-round navigation in the direction of Vladivostok (Nakhodka, Vostochny, Vanino) - Egvekinot. All ports should be provided with waste collection and disposal facilities and environmental facilities.

The development of individual Arctic projects will be carried out as follows.

Murmansk region. Of particular importance is the implementation of the project "Integrated Development of the Murmansk Transport Hub", which is included in the federal target program "Development of the Transport System of Russia (2010-2020)". Its goal is to use the potential of the Murmansk transport hub to service the traffic flows of the Northern Sea Route, the Barents-Euro-Atlantic Transport Corridor, as well as hydrocarbon cargoes associated with the development and operation of offshore fields. As part of the project, it is planned to build new port transshipment complexes, sea container and logistics terminals, develop a network of access railways and roads, as well as other facilities.

Arhangelsk region. As part of the implementation of the first phase of the project for the exploitation of hydrocarbon reserves of the continental shelf, primarily the Shtokman gas condensate field, in the Arkhangelsk region, the possibility of locating a logistics and distribution center and an integrated support base is opening up.

The presence of free capacities of the Northern Railway is a strategic reserve, allowing a significant increase in the volume of freight traffic in the northern directions in a short period of time. The development of the transport sector of the Arkhangelsk region will be directed to the implementation of a priority project for the construction of a deep-water area of the seaport of Arkhangelsk. To ensure the processing of cargo traffic, by 2035 it is planned to build and put into operation a new deep-water area "Severny" of the Arkhangelsk seaport in the Dry Sea Bay, which will be able to receive ships with a carrying capacity of up to 70-80 thousand tons.

On the territory of the Taimyr (Dolgano-Nenets) municipal district of the Krasnoyarsk Territory, a project will be implemented for the construction of a pipeline - tanker, transport and technological system for the export of crude oil from the Nizhne-Yenisei fields. The construction of an oil pipeline to the port of Dikson will create a sustainable local economy in the Dikson region. It will be possible to involve oil production from the fields of neighboring regions in this transport scheme.

Based on the implementation of the transport scheme Krasnoyarsk - Lesosibirsk - Turukhansk - Igarka - Dudinka, it will be possible to attract new cargo to the Northern Sea Route as a result of the access of enterprises of the Siberian Federal District to export markets and the import of imported equipment. The radical modernization of the Dudinsk seaport will reduce the annual costs of restoration work to put the port's berths into operation, reduce the period between floods and reduce the forced downtime of the port.

Nenets Autonomous Okrug. Railway transport corridors and the port of Naryan-Mar will play a huge role in the transformation of the Okrug's economy. These systems provide a transcontinental connection between the ports of the White, Barents and Kara Seas with the ports of the Pacific Ocean, determine new directions for the entry of the raw materials regions of the Urals and Siberia to the markets of Western Europe and North America, and contribute to the formation of new mineral resource flows. The port of Naryan-Mar is of great importance in providing cabotage transportation.

There will be a creation of a sea deep-water multifunctional port - the Indiga hub, a gas chemical and oil refinery complex, a natural gas liquefaction plant, the development of a pipeline system with access to the Indiga, including the Kumzhinskoye - Indiga gas pipeline. This project will ensure the creation of a new reliable transport system in the western part of the Arctic zone of the Russian Federation.

Amderma will be used as a modern port (subject to the construction of a railway to the port). The potential port and transshipment function of Amderma creates the conditions for placing here a modern processing mining complex, oriented to both internal and external cargo flows. A coal sea terminal will also be located here to receive 15-25 million tons of coal from the deposits of the district and the Komi Republic.

The construction of the port, access to the coast of the railway, the resumption of the operation of the airfield, which can be used as the main and alternate,

as well as for aviation support in the development of the continental shelf, will ensure the transformation of Amderma into one of the most important strategic transport hubs of Russia on the Arctic coast.

Indiga will become another promising port-hub of a wide profile, which has favorable conditions for the entry of a large-capacity fleet from the Atlantic in a year-round navigation mode with the involvement of icebreaking facilities for 3-4 months, and the water area is sufficiently protected from the effects of extreme weather conditions. The construction of a multifunctional port-hub in Indiga will create favorable conditions for the development of pipeline transport according to the Kharyaga-Indiga scheme with the organization of an export terminal in the area of Cape Bolshoy Rumyanichny. Currently, the issue of laying the Sosnogorsk-Indiga railway to the port in the future until 2035 is being worked out.

Arctic regions of the Republic of Sakha (Yakutia). It is planned to modernize the fleet of the Lensky, Yansky and Kolyma shipping companies, the seaport of Tiksi, and restore the coastal service infrastructure.

Within the limits of the Chukotka Autonomous Okrug and the shelves of the seas washing it, six promising oil and gas bearing basins with significant hydrocarbon reserves have been identified. The oil and gas bearing structures of this zone are little studied and require significant investment in exploration. Preliminarily estimated reserves make it possible to predict the production of about 500 thousand tons of oil and 70 million cubic meters by 2025. m of gas, which will meet the needs of the district in oil products and energy resources, reduce budget expenditures on the northern delivery of oil products and increase the tax base of the regional budget. To this end, an oil refinery with a capacity of 350,000 tons per year will be built in Anadyr with the appropriate infrastructure, including a heated oil pipeline, a head pumping station, an oil depot and a new berth at the seaport. Cargoes arrive at seaports by all modes of transport. At the same time, the shares of individual modes of transport change over the years. However, traditionally and predominantly, cargo is delivered by rail and pipeline transport (in approximately equal shares). Rail transport delivers dry cargo and oil products to ports, pipeline transport delivers crude oil. Over the period from 2018 to 2021, the share of railway transport increased by 4.4 points, pipeline transport - by 1.8 points.

The share of road transport significantly increased in terms of departure - by 8.2 points. This is due to the fact that many small and medium-sized enterprises have appeared in the market conditions, for which road transport is the most convenient means of delivering goods, despite the high cost of transportation.

The share of river transport both in the delivery of goods to the ports and in the export of them from the ports is reduced. At the same time, taking into account the reform of the inland water transport management system, in the future, we can expect an increase in the corresponding share of the Russian inland water transport.

The import and export of goods by sea is insignificant - mainly liquid cargo in the Arctic basin.

In the future, the distribution of shares in the import and export of goods between modes of transport will not undergo major changes. The share of road transport may increase somewhat. The share of river transport will increase provided that all the measures laid down during the reform are implemented.

Despite the potential of the ports of the Russian Federation, primarily in providing export-import flows, Russian ports often lose competition for their own traffic to the ports of neighboring countries. At the same time, it should be noted that Russian ports have a significantly better location relative to Russian centers of production and consumption of goods, which, with significantly lower costs of transporting goods by sea compared to land, should orient Russian export-import flows to Russian ports. Along with the geographical position in relation to consumers and producers, one of the most important factors in choosing a port of unloading is the speed and quality of cargo handling (Table 12). However, the primary constraint to the development of ports is land infrastructure,

Table 12. Arrival and departure of cargoes to/from seaports of Russia by different modes of transport forshipments by sea %

Types of transport	2013		2018		2019		2020		2021		2035 forecast	
	P	O	P	O	P	O	P	O	P	O	P	O
Railway	43.6	29.3	44.0	34.9	44.5	25.1	46.6	23.8	48.0	21.0	46.9	21.8
Automotive	5.7	54.8	5.1	54.0	5.3	52.4	6.8	61.5	6.0	63.0	7.4	55.8
River	5.0	7.5	3.7	3.3	2.9	2.9	2.8	3.1	2.0	3.0	1.8	0.4
maritime	0.0	0.0	0.2	2.2	3.6	11.5	1.9	2.3	0.0	1.0	2.5	5.8
Pipeline one	45.7	8.2	47.2	7.9	43.7	8.2	42.0	9.2	41.0	10.0	41.3	6.2

P-arrival

O-departure

Almost half (at the end of 2021 - 47%) of cargo (upon arrival) is delivered to ports by rail. In this regard, the well-established work of port workers and railway workers, as well as infrastructure capabilities, are fundamental factors for the integration of these modes of transport (Table 12).

The analysis shows that in all sea basins of the Russian Federation there is an urgent need to develop railway approaches to seaports, both near and far.

This problem is exacerbated by the fact that the country's economy already requires significant volumes of cargo to be transported, while the deficit of Russian Railways' own investment program does not allow the full range of measures to develop the railway infrastructure to be carried out at its own expense.

In 2021, the volume of cargo transportation by railway transport of Russian Railways in the direction of Russian seaports amounted to 245.3 million tons (+2.8% growth compared to 2020). In the General scheme for the development of railway transport for the period up to 2025, the volume of cargo transportation by rail to seaports is forecasted in volumes from 357.5 million tons (according to the conservative option) to 422.8 million tons (according to the innovative option). To ensure the transportation of the indicated volumes of cargo in communication with ports, it is necessary to implement measures to develop the railway infrastructure with the required amount of investment funds from 834 to 1798 billion rubles.

This Strategy is based on the full implementation of a set of measures provided for by the Federal Target Program "Development of the Transport System of Russia (2018-2021)" and the General Scheme for the Development of Railway Transport for the period up to 2035, aimed at the integrated development of transport hubs, including railway approaches to seaports. However, if the activities of the subprogram "Railway transport" are not implemented in full, then with a high degree of probability we can talk about the failure to fulfill the projected volumes of rail transport in the direction of seaports. In this regard, the question arises of the effective regulation of cargo flows in the direction of seaports. For example, the question of the expediency of switching part of the cargo from the railway to other modes of transport (for example, internal waterway) - it is irrational to underuse the potential of seaports for the country's economy. Apparently, the issues of effective regulation, rational use of the possibilities of the transport system and the synchronous development of all modes of transport, together with the use of new forms of management and improvement of rule-making at the junctions of modes of transport, should become the subject of state policy in the field of transport at the present stage of development.

Comparing the increase in railway-oriented port capacities and the increase in railway capabilities, we can conclude that the latter will have a deficit of 39.9 million tons by 2035, and 155.0 million tons by 2035. The total deficit will be 194.9 million tons.

At the same time, the most significant shortage of railway carrying capacity to seaports will be observed in the North-West and the Far East - a shortage of about 40 million tons in each basin.

For example, consider the situation with the port of St. Petersburg (Baltic basin). The St. Petersburg railway junction within the administrative boundaries of St. Petersburg currently serves the areas of the Big Port of St. Petersburg, located in the vicinity of the port stations Avtovo and Novy Port. The total railway freight turnover of port stations in recent years has tended to increase and in the period 2018-2021. increased from 20.6 million tons to 26 million tons, i.e. growth over the period amounted to about 30%.

When analyzing the infrastructure of the Big Port of St. Petersburg and comparing its development plans with plans for the development of railway approaches, a discrepancy was revealed. In particular, it is planned to increase the capacity of the port of St. Petersburg by 11.2 million tons by 2021, while the increase in railway capacity during this period is limited to only 0.9-2.5 million tons (including Bronka and Oranienbaum). According to the forecast of cargo transshipment volumes in seaports arriving and departing by rail, compiled on the basis of projects implemented by FSUE "Rosmorport" and private stevedoring companies, in 2021 the Big Port of St. Petersburg will reach the volume of transshipment of such cargo at the level of 50 million tons . At the same time, according to JSC "Institute for Economics and Development of Transport" and JSC "Russian Railways", the volume of cargo transportation by rail through the Big Port of St. Petersburg in 2021 will amount to just under 30 million tons (20-27 million tons). The difference, as we can see, is 20 million tons, which requires the development of additional measures and the adoption of agreed decisions on the development of railway approaches to the port.

The situation is similar in the port of Ust-Luga. The forecast for the volume of transshipment of goods delivered to the port by rail for 2021, according to port workers, is ahead of a similar forecast made by railroad workers: 77 million tons (port workers) against 63 million tons (railway workers). And by 2035, this gap, according to forecasts, will increase by another 4 million tons.

As noted, the problem of shortage of railway approaches is especially acute in the Far Eastern basin, and in the future it may become even more aggravated.

The capacity of the Vostochny port is planned to be increased by 26.2 million tons by 2025 and another 24 million tons by 2035. While the increase in railway capacity to the Vostochny Port, according to the Institute for Economics and Transport Development

OJSC and Russian Railways OJSC, will amount to 11.0 million tons by 2025 and another 5.0 million tons by 2035 (according to the innovative version).

The main barrier limiting prospective freight traffic on the Baikal-Amur Mainline is practically the entire eastern section of the BAM, from Khani station to Komsomolsk-on-Amur and further to Sovetskaya Gavan, including the Kuznetsovsky tunnel at the Komsomolsk-on-Amur-Vanino section. In the light of the current state of the transport infrastructure of the region, the priority areas for the development of transport in the Far Eastern Federal District are the strengthening of the Trans-Siberian Railway and the Baikal-Amur Mainline in conjunction with the development of transshipment capacities of the main mainland ports and ports on Sakhalin Island.

The implementation of plans for the development of mineral deposits in the Far Eastern and Siberian Federal Districts, the construction of port export facilities at the Vanino transport hub and the ports of Primorsky Krai will cause the largest increase in cargo traffic volumes at the BAM and Transsib sections. Thus, at the BAM, on the approaches to the Komsomolsk railway junction, by 2021, the traffic density is predicted to increase by 3.3 times, and by 2030 - by almost 4.5 times against the existing level. In accordance with the forecast, the total load of the railway network on the approach to Vanino is projected as follows: by 2021 it will be more than 41 million tons, and by 2030 almost 60 million tons. If we talk about the Primorsky Territory, then by 2021 this volume will amount to more than 91 million tons, and by 2035 more than 100 million tons of all types of cargo. In this way,

In the South, the opposite situation will be observed and significant unevenness in the construction of port facilities and related railway infrastructure. By 2021, the increase in railway capacity will outstrip the increase in port capacity, mainly due to the commissioning of 33.9 million tons of railway line to the port of Taman by 2025. And the commissioning of port facilities in Taman is scheduled only by 2035 in the amount of more than 60 million tons.

Thus, the analysis shows that the implementation of the announced plans for the development of seaports directly depends on the balanced development of railway approaches and is possible provided that all activities provided for by the General Scheme for the Development of Railway Transport for 2025 and 2035 are fully implemented.

The issue of synchronous development of related modes of transport - seaports and railways - should be addressed at the interdepartmental level using such planning mechanisms as the development of transport and economic balances, balanced schedules, road maps and others.

As noted, the role of road transport in the activities of seaports is extremely important. Road transport is the main mode of transport by which cargo is exported from ports (more than 60% of cargo shipped). The problem of interaction between seaports and automobile approaches is especially typical for large port cities such as St. Petersburg, Novorossiysk, Vladivostok.

For example, the share of road transport in servicing the terminals of the Big Port of St. Petersburg in 2021 amounted to 44% of the total volume of transshipped cargo. According to ZAO Scientific Research and Design Institute for Territorial Development and Transport Infrastructure (St. Petersburg), at present, the capacity of the city's street and road network is the limit to ensure the existing traffic.

The existing access routes to the ring road create a significant load on the city's road network, the load factor of which reaches its maximum value and is 1.0. Highways that provide transport links between port terminal complexes and federal highways, in general, cannot cope with the current load. The most difficult traffic conditions are formed in the following transport hubs:

- South emb. Obvodny canal - Staro - Petergofsky pr.;
- South emb. Obvodny canal - Liflyandskayaul;
- South emb. Obvodny canal - Mitrofanevskoe highway;
- st. Marshal Govorov - st. Trefoleva;
- Kubanskaya st. - Blagodatnaya st. – WHSD;
- Avtomobilnaya st. (near Stachek Ave.);
- Kubinskaya st. - Krasnoputilovskaya st.;
- Vitebsky pr. - st. Salova.

To ensure satisfactory traffic conditions, it is necessary to provide for a number of measures aimed at increasing throughput.

The construction of the Western High-Speed Diameter is designed to solve the problem of transport approaches to the Big Port. The Western High-Speed Diameter route will also pass through the territory of the port, which will allow trucks to arrive at the terminals and leave them non-stop. It is planned to switch transit traffic flows to the new highway, including those passing through the port, which will significantly increase the capacity of the city's street and road network, allow the historical center of St. Petersburg to be unloaded from vehicles, and improve the environmental situation.

With regard to the Novorossiysk transport hub, the following problems exist today:

- Insufficient capacity of the road network of Novorossiysk, leading to systematic traffic jams on the main highways of the city;
- The negative impact of the growing transit car flows passing through the central streets of the city, following the M-4 Don and M-25 highways, on

existing traffic;

- Depletion of the throughput capacity of the Novorossiysk station, leading to the impossibility of mastering promising cargo flows without reconstruction and expansion.

An analysis carried out by Center for Applied Logistics LLC (St. Petersburg) showed that the level of loading of the city's main highways during peak periods reaches the level of 80% -100%, which leads to a drop in the average speed of movement through the city network to 14.4 km / hour, and the insufficient number of railway sidings in the marshalling yard for the collection of wagons and the formation of shunting gears is estimated at more than 40 sidings.

In order to improve the situation, the following design solutions can be proposed:

1) The reconstruction of the Novorossiysk railway station provides for the construction of:

- additional main tracks on the Gaiduk section - the Kirillovsky checkpoint - the Nizhny park;
- receiving-departure park "B" (19 receiving-departure tracks);
- additional paths in parks and connecting paths between parks.

These solutions will ensure the processing of promising volumes of cargo transportation through the seaport. The construction of Park "B" and additional tracks will make it possible to master the estimated cargo flows of the station, increase the efficiency of the existing parks, and optimize the technology of the station.

2) The development of the road network provides for the construction of:

- highway Tsemdolina - st. Port;
- road junction on the section of the Sukhumi highway in the area of JSC "Novorossiysk Shipyard", YuGVR of the port;
- overpass from st. Main to st. Sudostalskaya.

The flow of trucks generated by the seaport, in the current situation, exerts a traffic load, mainly on the Anapa Highway, Sukhumi Highway and Methodievskaya Street. Design solutions for the development of road infrastructure will redistribute traffic flows, reducing the share of transit traffic through the main highways of the city. In the future, traffic flows will be redistributed to the new highways Tsemdolina - Portovaya st. and the North-Eastern bypass of the city of Novorossiysk, while partially unloading Mefodievskaya Street and Anapa Highway. It is expected that the proposed solutions will improve the ecological situation in the city.

High-quality modernization of seaport infrastructure services underlies the economic, transport, logistics and social efficiency of Russian ports. Increasing international competitiveness is unthinkable without putting into practice the best international experience in providing port services.

International competition and the development of new technologies formulate new requirements for the safety, quality and speed of cargo handling in the port. In order to work effectively and comply with the best international practice in the development of ports, the Russian Federation should be at the forefront of optimizing and improving the efficiency of ship services.

The priorities for the development of the maritime port infrastructure services market are:

- improving the quality and speed of service;
- reducing the cost of moving goods through the port for the end user of services;
- construction of modern multi-modal logistics centers capable of high-quality and fast processing of consolidated transit and domestic cargoes;
- interconnection of the functions and powers of the main regulators of foreign economic activity with the goals of fast, safe and efficient passage of export-import, and especially transit cargo flows through Russian ports;
- improving the environmental safety of the port;
- automation of algorithmic operations;
- openness of the port and the procedure for the provision of infrastructure services;
- promoting the development of a competitive environment.

Currently, the speed of processing ships and cargoes in most domestic ports remains lower compared to the ports of other states. At the same time, in modern conditions, this parameter is a key factor in increasing their attractiveness and comes out on top in relation to factors such as distance and cost of transportation. Especially - for such ports that specialize in the processing of goods that require fast delivery (containers, refrigerated cargo, packaged goods).

Factors affecting the speed of servicing ships and cargoes in the seaport can be divided into internal and external. Internal factors will include measures to improve the technology of cargo transshipment and ship handling processes, the use of mechanization and automation, optimization of operations in ports, reducing their number, and increasing the innovative component. The external ones include improving logistics schemes, optimizing interaction with the railway, as well as coordinating the work of state bodies in the port on the principle of a “single window”.

The introduction of automated or semi-automated ship and cargo handling systems in the port will contribute to the release of jobs directly from loading and unloading operations in favor of monitoring the implemented systems. Automation of algorithmic operations improves the quality and speed of work and reduces occupational injuries.

In international practice, tools are widely used to increase the speed of servicing ships in seaports and

other qualitative parameters of the provision of services in seaports, in particular:

Operations planning system. At the Port of Shanghai, port personnel use the system, which was first developed and implemented in 1988, to automatically prepare berthing and container unloading plans and all other essential resource planning. Based on these plans, on a just-in-time basis, the required number of shore cranes are provided to the appropriate berth and the required number of trucks are provided in advance for loading / unloading (in case the port is the starting / ending point of cargo dispatch) . If the containers are intended for transshipment (trans-cement), the necessary and convenient place for their intermediate storage at the container site is provided in advance. If necessary, in the interval between unloading a container from one vessel and loading it onto another, special cranes on the container platform once again shift the containers in such a way as to ensure the fastest possible loading onto the next vessel (s). The laying order is also planned in the operations planning system, which has a direct interface with automated crane control systems. At each moment, the operations planning system stores all the information about where the container with a given number is located, when it was unloaded and when its further movement is planned. The laying order is also planned in the operations planning system, which has a direct interface with automated crane control systems. At each moment, the operations planning system stores all the information about where the container with a given number is located, when it was unloaded and when its further movement is planned. The laying order is also planned in the operations planning system, which has a direct interface with automated crane control systems. At each moment, the operations planning system stores all the information about where the container with a given number is located, when it was unloaded and when its further movement is planned.

In addition, key subsystems provide optimal planning for the order in which containers will be loaded or unloaded from the ship, as well as the sequence of operation of shore cranes; the subsystem minimizes the number of physical operations with containers due to their optimal location and order; thanks to this, a record speed of loading and unloading is ensured - up to 280 containers from one vessel per hour, (minimum unloading time for a vessel with 1400 containers is 6 hours). The average loading and unloading speed is 100 containers per hour.

■ Electronic document management and data exchange system for trade operations, automating the entire cycle of processing operational, trade and customs documents in electronic form;

■ Intelligent vessel traffic control system based on a network of radars and radio stations, united in a single dispatch center;

■ Integrated container terminal management system MES CTMS, which allows real-time management of the loading and unloading of ships, the gate of container trucks and their movement through the port area, collect and store information about the location of containers and ensure the movement of relevant documents, etc. The system uses wireless technologies for information transfer and communication with the staff of the port and transport companies. Thanks to the use of this system, high labor productivity indicators are achieved in the port:

- average loading/unloading speed - 12000 TEU/day;
- average loading/unloading volume per meter of berth - 3028 TEU/m;
- the average speed of the cranes is 31 operations/hour.

■ Electronic system for providing data on containers and vessels - allows interested companies and their employees directly to make inquiries about the location and time of arrival of vessels and containers of interest to them both through the Internet site and through an automated telephone answering machine around the clock;

■ The system of automatic control and prevention of failures in cargo handling equipment, using a network of sensors and gauges, analyzes the condition and operation of the equipment, and in case of failures, transmits the relevant information wirelessly to the dispatch center, which can significantly reduce the recovery time of equipment after accidents and failures and, ultimately As a result, increase the average speed of cargo handling.

In Russia, it is advisable to apply such practices, including the creation of geographic information transport systems that allow the formation of unified information and logistics centers and automated data exchange systems between participants in the transportation process (working online). The creation of such information and logistics centers is aimed at improving the interaction between seaports and other modes of transport (rail, road, inland water).

As noted above, among the external factors contributing to an increase in the speed and other quality parameters of ship servicing in seaports, there are issues of customs clearance and operation of checkpoints.

The lack of a unified system for the exchange of information on ships and cargo in Russian ports significantly slows down both the speed of cargo handling in ports and tracking the passage of potentially dangerous cargo, containers, the arrival of unwanted foreigners and other factors affecting national and port security. To date, the Ministry of Transport of Russia, together with other interested departments, are working on the issue of creating a single electronic customs database, which will simplify the document flow and reduce the time for processing customs declarations. Analogues of such a system exist today in all developed ports of the world.

An important problem in the field of port activity in Russia can be considered the imbalance of sectoral and departmental interests. The main problem is that the regulatory framework used by customs and border organizations has the status of a federal law, while the regulatory framework used by stevedoring and shipping companies is fixed at the level of orders of the Russian Ministry of Transport.

The currently issued acts of customs legislation do not take into account the specifics of transshipment of goods in seaports.

One of the latest examples is the decision of the Federal Customs Service, according to which cargoes that have passed customs control in seaports must be stored separately from goods that are under customs control. In this regard, the time of cargo handling at sea terminals, according to market participants, will increase by 30-40%. In addition, the cost of handling cargo may increase by about a third due to its movement and re-warehousing. The distraction of equipment and personnel for additional operations will ultimately reduce the throughput of the terminals.

An important condition for the provision of quality services for servicing export-import and transit cargo flows, as well as passengers traveling in international traffic, is the fast and efficient operation of checkpoints across the state border of the Russian Federation located in sea and river ports.

The main directions of development of the system of checkpoints are optimization of the number of checkpoints; modernization of infrastructure and increase in the capacity of checkpoints; development and implementation of modern technologies that reduce the time for performing state control procedures when crossing the state border of Russia.

At present, coordinating boards of checkpoints have been organized and function on a permanent basis in seaports, new technological schemes have been approved for the passage of persons, vehicles and cargo across the state border, aimed at clearing ships without commission and allowing loading cargo work immediately upon arrival of ships at ports .

At the same time, until now, in most seaports, checkpoints have not been opened in accordance with the established procedure (out of 75 sea checkpoints in Russian ports, only 22 are officially open), and work is carried out according to temporary schemes agreed with state regulatory authorities. This is a significant obstacle to the daily and uninterrupted passage of persons, vehicles, cargo, goods and animals across the State Border in functioning seaports.

This circumstance excludes the possibility of allocating budgetary funds for the maintenance and development of the property complex of checkpoints. Often, all the expenses for the arrangement and maintenance of state regulatory bodies at the Checkpoints are forced to be borne by the operators of sea terminals. At the same time, the Law on the State Border provides for the only option for the transfer of property from a private investor - a gratuitous transfer.

To create conditions for ensuring the investment attractiveness of the construction, reconstruction and equipment of checkpoints, it is necessary to amend the legislation, providing for other ways of transferring property or providing tax benefits.

Along with the speed of cargo handling, another qualitative parameter of the attractiveness of Russian ports is the cost of a ship call and environmental safety.

In relation to Russian ports, a stable reputational myth has developed about their serious high cost, in terms of port dues and other expenses of ship owners for servicing all “non-cargo” activities at the time of ship calls.

The analysis showed that the cost of a ship call is largely influenced by “other expenses of shipowners” - bunkering, ship chandler services and agency fees, which are purely the subject of an agreement between private business entities.

The port dues themselves are comparable to the port dues of other states. For example, let's give the data of shipping agents on specific ships of different types.

Price ship calls for STK (river-sea class vessel) DWT 1669; GRT 1573:

according to the agency company Transmarine Hundested (Denmark) - 1738.83 euros Liepaja (Latvia) - 3004.40 euros

Nip House (Great Britain) - 3230.56 euros Fyrou (Germany) - 2685.00 euros Klaipeda (Lithuania) - 3582.93 euros

Gdansk (Poland) - 2132.62 euros Kaliningrad (Russia) - 1545.00 euros

Cost of ship calls for bulk carrier m/v Grumant - 15878 GT

Hamburg - 29,620 euros

St. Petersburg - 27,208 euros

The cost of such a bulk carrier calling at the Baltic ports is even more expensive. The cost of ship calls for Aframax m / v Petrodvorets - 59,731 GT Hamburg - 71,740 euros

Primorsk - 98,231 euros.

It is obvious that the difference between the training camps in Primorsk and Hamburg falls on the ice training camp, which simply does not exist in Hamburg.

Thus, the analysis shows that in reality there are no problems with the cost of a ship call in Russian ports. The myth grows rather from the total amount of expenses of cargo owners for stevedoring services, where he invests the costs of the port (more precisely, the shipowner does this for him, issuing a general invoice, which combines private stevedoring services and state port dues).

In accordance with the forecast values of the volumes of cargo transshipment through seaports, the commissioning of port facilities should be provided

taking into account the best world achievements in the field of ecology and only if ecosystems are preserved and the appropriate quality of the environment is maintained.

In order to assess the nature of the problematics of the issue under consideration, a number of main negative factors affecting the state of the environment should be noted.

This is primarily pollution of the port waters with oily and bilge waters, household and technical waste, waste from processing fish products on ships and coastal enterprises, littering the seabed with sunken ships, fragments of nets, trawls, and discharge of untreated sewage and storm water.

The issue of reducing air pollution by emissions from ships and port infrastructure is becoming increasingly urgent.

Obviously, in order to minimize the negative impact on the environment in the port, it is necessary to increase environmental requirements for visiting ships, as well as to have the forces and means to ensure its environmental safety. First of all, these are receiving port facilities for the collection and further processing of ship waste, treatment facilities for oily and domestic waters, specialized vessels to ensure preparedness for responding to incidents causing pollution (oil and garbage collectors, bilge water collectors, booms), berths for their service and parking.

An important factor is the organization of the effective use of the entire complex of forces and means. There is a need for constructive cooperation with municipal and regional self-government bodies, communal services of settlements and business entities in terms of sharing production capabilities that can be used to receive and process shipboard waste.

An indispensable condition for the construction and reconstruction of facilities in seaports is to obtain a positive conclusion from the state environmental review, with a mandatory procedure for approving projects at public hearings.

The activities of domestic ports must comply with world practice and meet the so-called "green standards". Important points such as rational water use, stormwater management, pollution prevention, energy saving and energy efficiency, the use of environmentally friendly materials and the application of the zero waste principle are reflected in the requirements of these standards.

The use of "Green Standards" in construction will minimize the destructive impact of anthropogenic factors on the environment during the construction and subsequent operation of the facility, and will serve as the basis for the development of uniform mandatory standards for economic activity in the future.

Due to the international nature of shipping, port activities in terms of environmental protection are regulated by the state in accordance with the requirements of international treaties. First of all, these are global conventions adopted within the framework of the activities of the International Maritime Organization.

The key document in this sense is the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 to it (MARPOL), one of the requirements of which is the obligation of the port state to provide in its ports the necessary facilities for the reception of waste from ships, without leading to their excessive downtime.

In order to reduce illegal discharges from ships in the ports of the Baltic region, in the framework of the Convention for the Protection of the Marine Environment of the Baltic Sea Area, since 1992, a “non-special-fee” system has been introduced for receiving ship-generated waste at reception port facilities. In accordance with it, the cost of receiving, collecting and disposing of ship-generated waste generated during the normal operation of ships is included in port dues or paid by the ship, regardless of whether it delivers the waste or not.

Domestic companies, in particular FSUE “Rosmorport”, apply this principle not only to the Baltic Sea region, but also in seaports of other regions. Environmental duty rates depend on the type of vessel (tanker, ro-ro, etc.), type of navigation (foreign voyage, cabotage) and range from 0.11 to 5.5 rubles for different ports per vessel's gross tonnage.

Thus, Russian ports must continue to integrate into the global space in order to ensure the environmental attractiveness of shipping and compliance with international requirements.

Below are the current trends that have either relatively recently been introduced into the practice of the most efficient foreign ports, or are planned for implementation in the near future (Table 13).

Table 13.

1. Infrastructure services in the maritime zone	
1.1. Servicing larger ships	Ports need to adapt to the increasing tonnage trend of the ships they use. This imposes increased requirements on the speed of basic operations, infra and port superstructure. The priorities are: • dredging to receive large-tonnage vessels; • maintenance dredging; • construction of terminals with the removal of berthing facilities to natural depths; • increase in the number of berths; • technical modernization of equipment (gantry cranes, container ships, loaders); • increasing the speed of loading and unloading and non-cargo operations and reducing the total time spent by large-capacity vessels in the port; • increasing the speed of ship repair operations; • providing the port with the necessary number of icebreakers.
1.2. Development and use of AtoN, GMDSS VTS, KKS, GLONASS (GPS) systems	Effective interaction between ground services and ships in the modern world is impossible without automated systems necessary to improve the safety of navigation, safety of life at sea and environmental protection from possible negative consequences of navigation, as well as increase the efficiency of navigation and cargo transportation. Creation of assistance systems for maneuvering and warning of accidents during the movement of ships are an intermediate step in the implementation of E-navigation (E-Navigation).
1.3. Adequate (proportional) development of the technical and auxiliary fleet	The issues of construction and modernization of the service and auxiliary fleet should be one of the highest priorities in the development and modernization of port facilities. At the same time, approaches to providing ports with ships may differ both depending on the size
	port, and from its specialization. In small ports and ports, the operation of which serves to solve social problems to a greater extent, one should follow the path of providing multifunctional vessels that can combine icebreaking, pilotage, clearing, bunkering and other functions. In large and economically strong ports, specialization of the auxiliary fleet is necessary to provide the full range of services with high standards of quality and speed. At the same time, special attention should be paid to the timely renewal of the fleet and its compliance with the development of port facilities. The average age of the auxiliary fleet in the Russian Federation is over 26 years. The main priority of measures for the adequate development of the fleet is to create a sufficient number of it, through renewal and modernization, in accordance with the current and future needs of the ports to provide appropriate services to the best international standards. In addition, sufficient and adequate provision of ports with vessels of the auxiliary fleet, in particular, icebreakers, is required to ensure the proper and timely movement of vessels in the port waters during the winter navigation period, as well as a revision of the legal framework and organization of the work of the icebreaker fleet, taking into account climatic and geographic conditions.
2. Infrastructure services in the port area	

2.1. Automationloading and unloading operations	Implementation of modern loading and unloading systems: • control system for the operation of automated cranes (Automatic Crane Control); • system of automatic self-propelled vehicles (Automated Guided Vehicles); • system of automatic stacking cranes (Automated Stacking Cranes); • robotic container handling system (Robotic Container Handling); • a system for receiving and processing waste from ships. The introduction of automated or semi-automated systems of this level will contribute to the release of jobs directly from loading and unloading operations in favor of monitoring the implemented systems. Automation of algorithmic operations will improve the quality and speed of work and reduce occupational injuries.
2.2. Optimization of work and traffic in the port area	Modern systems for managing the movement of goods in the port area: • electronic document management system, including customs, certification and other documents (Electronic Data Interchange); • electronic cargo identification (Cargo Card System); • system of online tracking and monitoring of the movement of cargo in the port (On-Line Tracking and Tracing System); • warehouse management system (Warehouse System). With the introduction of these systems, it is expected to improve the quality of the work of the entire port, improve the conditions of employment of personnel, reduce the number of errors and waste of time and space.
3. Infrastructure services in the land zone	
3.1. Optimization Efficient operation of approaches to the port	Modern practice is the creation in the port area transport and logistics centers for planning the arrival and departure of goods. The first priority, on the one hand, is an analytical work to optimize the work of the port in terms of interaction with railway, road and inland waterway approaches to the port, on the other hand, the introduction of modern equipment and systems that are directly responsible for loading and unloading cargo (analogues of foreign systems such as floating container 'pick-up'). A qualitative increase in the work of this component will, first of all, reduce the total costs of moving cargo and increase the speed of cargo exit from the port. Unfortunately, in almost all Russian ports there are restrictions and problems that are imposed by insufficient or not harmonized with the development of the port, the development of suitable road and rail infrastructure. One of the priority areas for the development of infrastructure services in the land zone is the synchronized development of rear infrastructure. When developing specific measures corresponding to the developed strategic directions, the development of approach routes for each transport hub should be taken into account separately. It also requires the development of the necessary land infrastructure of ports, including: reservation of land to ensure the development of ports and the creation of the necessary land infrastructure; ensuring proper transport support of ports, construction of the necessary road and railway access roads, maintaining them in proper condition, construction of car parking lots and sidings for railway transport.

The presented priority directions for the development of infrastructure services are of a general nature and are not presented in the context of various types of cargo due to the highly specialized nature of the issues.

The basic infrastructure of the port should provide the necessary level of navigation safety, environmental safety, emergency preparedness and other aspects. Based on the analysis of the current situation, the analysis of problems in the functioning of the industry and the best world experience in ensuring the security of sea port infrastructure, the following strategic directions for development can be taken as a basis both as implementation in the form of separate activities, and as guidelines on security issues during development (construction) of new objects of

sea port infrastructure.

The economic and social effect from the implementation of the Strategy for the development of sea port infrastructure is formed due to:

1) Meeting the national need for trade and transport;

2) Achieving a billion-dollar milestone in terms of cargo transshipment in Russian ports and making Russia one of the leading countries in the field of port infrastructure;

3) Creation by 2030 of port capacities in the amount of at least 1.4 billion tons and ensuring the effective development of port infrastructure;

4) Increasing the utilization rate of transshipment complexes to the level;

5) Increasing the role of seaports in ensuring the transit potential of Russia, especially in the direction of the countries of the Asia-Pacific region, increasing transit cargo flows;

6) Switching part of the volume of foreign trade flows of the Russian Federation to Russian ports from Ukraine and the Baltic countries and reducing the share of neighboring states in the total volume of transshipment of foreign trade cargo to 5% or less;

7) Increasing the level of integrated safety of navigation in the water areas of seaports and approaches to them, the quality of the functioning of seaports by achieving a 100% level of coverage of coastal navigation safety equipment, DRA and OSR-preparedness equipment and waste collection and disposal facilities;

8) Ensuring the attractiveness of seaports by preventing discrimination in relation to the ports of neighboring states in terms of conditions for rail transportation, as well as maintaining the amount of port dues per ton of cargo transshipment, at a level comparable to the ports of neighboring states;

9) Increasing the role of sectoral education and science, organizing the continuity of the process of vocational training from primary to higher education, including the system of additional education;

10) Bringing the services of participants in port activities to a qualitatively new level in terms of both ensuring Russian foreign trade flows and competition of the industry at the international level, increasing the percentage of use of specialized complexes, “ennobling” domestic exports, increasing the share of processed products in the total cargo turnover;

11) Increasing innovation in the activities of seaports through the use of new technologies, taking measures to save resources, reduce the negative impact on the environment, and strengthen the industry's human resources;

12) Improvement of public administration in the field of maritime port facilities, sectoral legislation, application of new organizational mechanisms (SEPZ, concessions, management companies, technological platforms and territorial clusters). An additional effect from the implementation of the Strategy is the development of the entire economy of the Russian Federation by reducing the total transport costs, developing production and the social sphere, increasing employment, and solving regional social problems.

13) Strict adherence to the main directions of development laid down in the Strategy will make it possible to bring the domestic industry to a competitive (international) level, thereby laying a reliable foundation for Russia's sustainable development and securing it among the world's transport powers.

14) The evaluation of the effectiveness of the Strategy is calculated integrally based on the evaluation of the effectiveness of individual activities, taking into account multiplicative synergistic effects. Efficiency is assessed on the basis of indicators of public, commercial and budgetary efficiency.

15) Evaluation of the effectiveness of spending budgetary funds allocated for the implementation of the Strategy is based on the main provisions of the methodological recommendations for evaluating the effectiveness of investment projects (approved by the Ministry of Economy of the Russian Federation, the Ministry of Finance of the Russian Federation and the State Committee of the Russian Federation for Construction, Architecture and Housing Policy).

Conclusion

The mechanism for implementing the Strategy provides for the use of a set of organizational, economic and legal measures necessary to achieve the goal and objectives of the Strategy. The mechanism was developed in accordance with the provisions of the legislation of the Russian Federation.

Current management and control over the implementation of the Strategy is carried out by the state customer-coordinator of the Strategy and state customers in accordance with the Procedure for the development and implementation of federal target programs and interstate target programs in which the Russian Federation participates, approved by the Decree of the Government of the Russian Federation. The selection of the executors of the Strategy activities takes place in accordance with the legislation of the Russian Federation. The implementation of the measures of the Strategy is:

in planning actions (events); which are consistent with the directions of the strategic development of the sea port infrastructure, laid down in the Strategy for the socio-economic development of the Russian Arctic;

in the implementation of planned activities;

in the subsequent monitoring of target indicators and production resources for the implementation of the activities of the Strategy;

in adjusting (if necessary) the activities of the Strategy and their subsequent planning - both on the

basis of the adjustment made and on the basis of taking into account current trends.

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