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Analysis of the current state and medium-term forecast of transport system development parameters up to 2028¹

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ABSTRACT The article presents an analysis of the dynamics of key indicators of the development of the Russian transportation industry in 2023–2025. It provides forecast values for the period up to 2028, taking into account current trends and exogenous macroeconomic parameters defined in the latest Forecast of the Social and Economic Development of the Russian Federation for 2026 and for the Planning Period of 2027 and 2028, as well as in other strategic documents.

KEYWORDS: freight and passenger transportation; financial performance of transport organizations; fixed capital investment; employment; wages; workforce productivity; SME development indicators; scientific and technological potential of the transport sector

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Научная статья

Анализ состояния и среднесрочный прогноз параметров развития транспортного комплекса на перспективу до 2028 года¹

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¹ Evseev O.V., Vdovin S.N., Zhashkova K.D., Romanenko A.O., Siniukovich N.A. et al. Analysis of the Current State and Medium-term Forecast of Transport System Development Parameters up to 2028. *Transport in the Russian Federation. Journal of Science, Practice, Economics*. 2025;6(121):5-16. EDN: VCPXHI. Евсеев О.В., Вдовин С.Н., Жашкова К.Д., Романенко А.О., Синюкович Н.А. и др. Анализ состояния и среднесрочный прогноз параметров развития транспортного комплекса на перспективу до 2028 года // Транспорт Российской Федерации. Журнал о науке, практике, экономике. 2025. № 6 (121). Р. 5–16. EDN: VCPXHI.

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АННОТАЦИЯ Проведен анализ динамики основных показателей развития транспортного комплекса России за 2023–2025 гг. Приводятся результаты прогнозирования показателей на период до 2028 г. с учетом их трендов и экзогенных макроэкономических параметров, заданных в актуальном прогнозе социально-экономического развития Российской Федерации на 2026 г. и на плановый период 2027 и 2028 гг., других стратегических документах.

КЛЮЧЕВЫЕ СЛОВА: перевозки грузов и пассажиров; финансовые результаты деятельности организаций транспортного комплекса; инвестиции в основной капитал; численность занятых; заработная плата; производительность труда; параметры развития малого и среднего предпринимательства; научно-технический потенциал транспортного комплекса

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INTRODUCTION

Forecasting the transport system development parameters is important for government regulation of the transportation industry, strategic planning, managing the modernization and development of transport infrastructure, and planning the operations of transportation market participants.

The key projected parameters of the transportation industry include:

- Freight and passenger traffic volumes, freight turnover (tonne-kilometres), and passenger turnover (passenger-kilometres);
- Financial performance (revenues, expenditures, profits) of organizations;
- Investment activity parameters;
- Social development parameters, including employment numbers, wages, and workforce productivity;
- Parameters of small and medium-sized businesses, including the number of companies, average headcount, and sales volumes;
- Parameters of the transport sector scientific and technical potential development.

Analysis of trends in the values of these parameters, the factors and reasons for their change, as well as a study of external macroeconomic indicators and scenarios for the social and economic development of the Russian Federation in the

medium term made it possible to make a forecast for the development of the transportation industry in the period until 2028.

FORECASTING PROCEDURE

The forecasting method is based on the analysis of the current state and dynamics of changes in the transport sector performance over the past periods^{1,2}, as well as scenarios and macroeconomic parameters included in the Forecast of the Social and Economic Development of the Russian Federation for 2026 and the Planning Period of 2027 and 2028 published by the Ministry of Economic Development of Russia on September 26, 2025³.

The most significant macroeconomic factors influencing the forecast of the transport sector performance are the gross domestic product (GDP) growth rates; fixed capital investment growth rates; consumer inflation rates; exchange rates; volume and structure of foreign trade turnover; industrial production indices; real household income; world energy price indices; labour market conditions and wages; and domestic consumer demand.

The forecast also takes into account the targets and parameters for the transport sector development set by Decree of the President of the Russian Feder-

¹ The Unified Interdepartmental Information and Statistics System.

² Transport of Russia. Information and Statistics Bulletin (2015–2024).

³ Forecast of the Social and Economic Development of the Russian Federation for 2026 and the Planning Period of 2027 and 2028. URL: https://economy.gov.ru/material/directions/makroec/prognozy_socialno_ekonomicheskogo_razvitiya/prognoz_socialno_ekonomicheskogo_razvitiya_rf_na_2026_god_i_na_planovyy_period_2027_i_2028_godov.html.

ation No. 309, dated May 7, 2024 “On the National Development Goals of the Russian Federation for the Period up to 2030 and for the Future up to 2036”, the plan of activities of the Ministry of Transport of Russia, the instructions based on the results of the strategic session on “Advanced Development of Transport Infrastructure” strategic session of June 17, 2025, and the strategic session on “Development of High-Speed Transport” of September 16, 2025, the parameters and indicators of the Development of the Transport System State Programme, national and departmental projects, and other documents of strategic and target programme planning of the Russian Federation^{4, 5, 6, 7, 8, 9, 10}.

The approach to forecasting used in this paper is based on research into the development and practical application of a number of econometric, scenario-based macroeconomic, and transport forecasting models [1–8]. A trend-based forecast of the transport sector performance based on standard linear multi-factor models is combined with the analysis of the impact of various external factors on growth rates of certain indicators using Pearson coefficients.

Given the evaluative nature of the statistically identified dependencies, the forecasting involves expert adjustments of the coefficients of the impact of certain factors on the indicators concerned, where the identified dependence does not fully reflect the future effects of a factor on an indicator.

For example, for the “industrial production index” factor, it should be taken into account that it will have a stronger impact on the domestic freight traffic in the future than it had in the past, since the share of goods for domestic consumption in the total industrial output will grow within the import substitution policy.

Along with formal factors, the forecasting takes into account a number of informal social, economic, and political factors that have no reliable statistical quantitative assessments to enable a correlation analysis with the indicators considered, as well as a number of factors that were not observed in the past and had no impact on the indicator analysed.

Some of these factors include modernization and expansion of certain sections of the transport

infrastructure, establishing new foreign trade relations with partners abroad, development of international transport corridors, changing the structure and volumes of transport flows, restrictions on transportation, changes in tariffs, innovation in transport technologies, digitalization, introduction of artificial intelligence, and others.

Informalized factors are taken into account on the basis of the expert assessment of their impact on the trend of the indicators analysed. This involves normalizing impact assessments for both informalized and formalized factors so that their sum should be equal to one to balance the forecast through account for the relationships of impacts from these factors.

The forecast is made for a baseline scenario and a conservative scenario. The baseline scenario of development is based on an objective assessment of the geopolitical conditions of operation of the national economy, takes into account a set of public policy measures for macroeconomic stability, provides for government support and stimulation of domestic demand for transportation services, and assumes that the transport system adapts to the changing foreign business environment, including the redistribution and reorientation of freight flows, while maintaining moderate yet sustainable rates of the country’s economic growth.

The conservative forecast implies that external conditions will have a more profound constraining impact on the transport sector in the medium run.

The forecast is made in the following sequence to reflect the internal logical relations between the indicators under consideration. First, a forecast of freight and passenger traffic volumes, freight turnover, and passenger turnover is built. At the second stage, these estimates are used as input data for subsequent calculations of other transport sector indicators, such as employment numbers, wages, workforce productivity, financial performance of transport organizations, and investment activity parameters. At the third stage, the calculated indicators are used to forecast parameters of small and medium-sized business development, as well as research and development activities in the transport sector.

⁴ Decree of the President of the Russian Federation No. 597, dated May 07, 2012 “On Measures for the Implementation of the State Social Policy”.

⁵ Decree of the President of the Russian Federation No. 145, dated February 28, 2024 “On the Strategy for Scientific and Technological Development of the Russian Federation”.

⁶ Federal Law No. 419-FZ dated November 30, 2024 “On the Federal Budget for 2025 and for the Planning Period of 2026 and 2027”.

⁷ Order of the Government of the Russian Federation No. 3363-r, dated November 27, 2021 “On the Transport Strategy of the Russian Federation until 2030 with a Forecast until 2035”.

⁸ Order of the Government of the Russian Federation No. 3097-r, dated November 03, 2023 “On Approval of the Strategic Area in Digital Transformation of the Transport Sector of the Russian Federation until 2030”.

⁹ Decree of the Government of the Russian Federation No. 1630-r, dated June 21, 2023 “On Approval of the Strategy of Unmanned Aviation Development in the Russian Federation for the Period until 2030 with a Forecast until 2035”.

¹⁰ The Unmanned Aircraft Systems National Project.

FREIGHT TRANSPORTATION AND FREIGHT TURNOVER

The trends of, and constraints to, growth in freight traffic volumes and turnover in 2023–2025 were driven by both internal and foreign economic factors. Overall, freight traffic volumes in the transport industry increased by 2.8% in 2024 and are estimated to remain at the 2024 level in 2025, although growth patterns will vary across transport modes. At the same time, the turnover decreased by 2.6% in 2024 and is expected to go down further by 2.4% by the end of 2025.

Railway transport demonstrated a decline in loadings and turnover, although for some types of cargo, such as chemical and mineral fertilizers, and imported goods, the dynamics were positive. The decline in traffic volumes is, in particular, accounted for by high freight rates for open wagons and reduced loadings of coal in 2023 and 2024 by a total of 23 million tonnes compared to 2022. In 2025, the freight traffic volumes continued to decline and are expected to show a decrease of 5.0% by the year end compared to the previous year, with an estimated decrease in turnover of 3.1%.

At the same time, increasing freight rates contribute to higher final prices of goods and this does not promote the growth of trade and freight transportation. The essential factors that affected rail traffic volumes were the ongoing capacity constraints in the Eastern operating domain, excessive wagon fleets, and the need to return empty wagons to owners, which slows down services on congested lines, as well as competitive advantages of road transport in domestic shipments of up to 500 km, including predictable delivery times.

In 2023–2024, road transport showed significant growth on average by 282.6 million tonnes due to the rapid development of the domestic industrial sector, transformation of logistics schemes, and an increase in e-commerce shipments. Given the redistribution of freight flows from railway to road transport primarily due to promptness of shipments, road transport remains the key element in domestic transportation of freight. A further 1.2% increase in freight traffic volumes and a 4.8% increase in freight turnover are expected by the end of 2025.

In 2023, sea cargo transportation demonstrated a considerable growth. In 2024, while the amount of goods transported somewhat decreased, the dynamics of freight turnover remain positive, mostly in the international services sector, amounting to over 65%. In 2025, the cargo traffic volumes will slightly decline by 1.4% compared to the previous year, with a significant (20.4%) decrease in cargo turnover.

Despite several adverse factors, such as the sanctions and persisting infrastructural constraints, the seaport system of Russia demonstrated positive

dynamics in 2023. Subsequently, a downward trend was noted for overall cargo handling volumes, which decreased by 2.3% in 2024 and by 3.8% in 2025, primarily in the liquid bulk cargo segment, which is due to the impact of external economic conditions of their export.

In inland waterway transport, a decrease in freight traffic volumes in 2023–2024 was driven by external factors, the poor condition of the infrastructure, the increasing cost of fuels, personnel shortages, and price competition with railway transport during the navigation season. The major share of freight flows on river transport is accounted for by dry bulk carriers. While it is steadily growing, already reaching 90%, bulk liquids handled in 2023–2024 decreased on average by 2.4 million tonnes, as these have shifted to railway transport. River freight traffic is expected to continue declining and will reach 10.7% by the end of 2025.

In 2023–2024, river ports demonstrated a gradual decrease in cargo transshipment volumes by 8.8%. The major share of freight flows handled (more than 95%) accounted for by dry goods was progressively increasing, while the amount of bulk liquid cargo handled declined from 4% to 3%.

In air transport, there was a growth in freight traffic to the Middle East and the Asia-Pacific Region. Despite a decrease in air traffic in 2023, the subsequent expansion of its international component by 15.8% and an increase in the average flight distance contributed to the recovery of positive dynamics in air traffic volumes as early as 2024. According to estimates, by the end of 2025, air traffic volumes will grow by 8.3%, and freight turnover will increase by 21.8%.

The forecast of transportation volumes and freight turnover for the period until 2028 is structured by the transport mode in the baseline and conservative scenarios, taking into account the identified trends, constraints, and drivers of freight transportation development, as well as the following exogenous macroeconomic parameters of the forecast of the social and economic development of the Russian Federation for the period until 2028: GDP growth rates; fixed capital investment growth rates; goods exports; goods imports; industrial production index; US dollar exchange rate; freight transport tariff index; and the number of the employed in the economy³.

The analysis shows that the key factors that have the greatest effect on freight traffic volumes in the forecasting are the industrial production index, goods exports and imports, GDP growth rates, and the number of the employed in the economy. Moreover, the values of these parameters in the baseline and conservative scenarios of the macroeconomic forecast are quite significant, which defined the relevant freight traffic forecast corridor. The dynamics of freight traffic volumes and freight turnover in 2023–2028 are shown in Fig. 1.

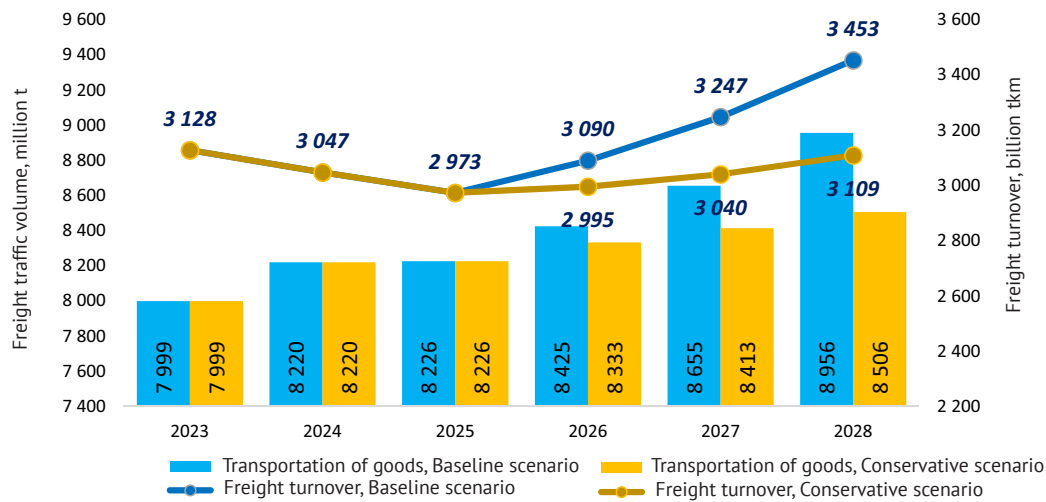
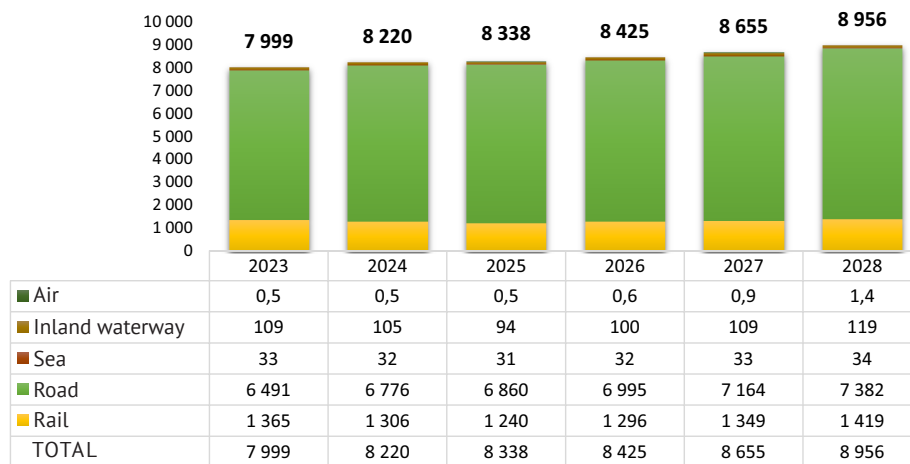


Fig. 1. Actual and forecast total freight traffic volumes and freight turnover in the transport industry in the period until 2028

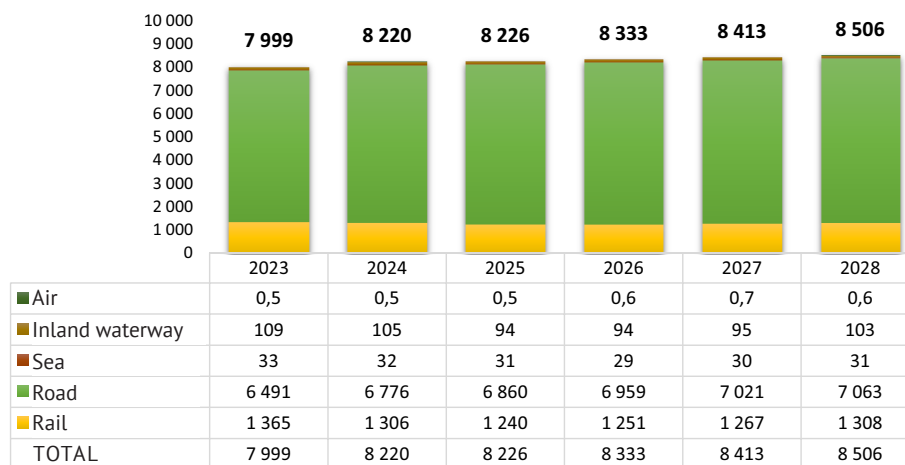
The freight traffic growth in 2028 compared to 2024 is forecasted to be +9.0% in the baseline scenario and +3.5% in the conservative scenario, and the freight

turnover growth will be +13.3% and +2.0%, respectively.

The forecast of freight flows by the transport mode is shown in Fig. 2.



a



b

Fig. 2. Actual and forecast freight traffic volumes by transport mode until 2028, million t: a – Baseline scenario; b – Conservative scenario

In the baseline scenario, railway transport is expected to grow by 8.6% in freight traffic volume and by 13.2% in freight turnover in 2028 compared to 2024. Moreover, railway transport will retain its dominant share (of about 82% in 2025) of the total freight turnover.

Dynamics by the mode of transport will vary significantly. A notable growth of 22% in freight traffic volumes is forecasted in international traffic, while after a significant decline in 2025, domestic traffic is only expected to recover to the 2024 level by 2028.

In the baseline scenario, road transport will achieve 9.0% growth in freight traffic volume and 12.8% growth in freight turnover by 2028 compared to 2024. Unlike railway transport, dynamics by the transport mode will be mainly driven by domestic traffic. Road transport accounts for the predominant

share (of about 83% in 2025) of total freight traffic, and this will not change significantly.

In maritime transport, in the baseline scenario, freight traffic by Russian carriers is expected to grow by 5.3% in freight traffic volume with a slight decrease by 3.7% in freight turnover by 2028 compared to 2024. The expected increase in traffic volumes along the Northern Sea Route shows that the impact on these dynamics is not strong, as approximately 84% of freight exports and imports are currently carried by foreign vessels.

In the baseline scenario, inland waterway transport is expected to grow by 13.2% in terms of freight traffic volume and even more, by 36.2%, in freight turnover in 2028 compared to 2024.

The dynamics of freight transshipments at sea and river ports until 2028 are shown in Fig. 3.

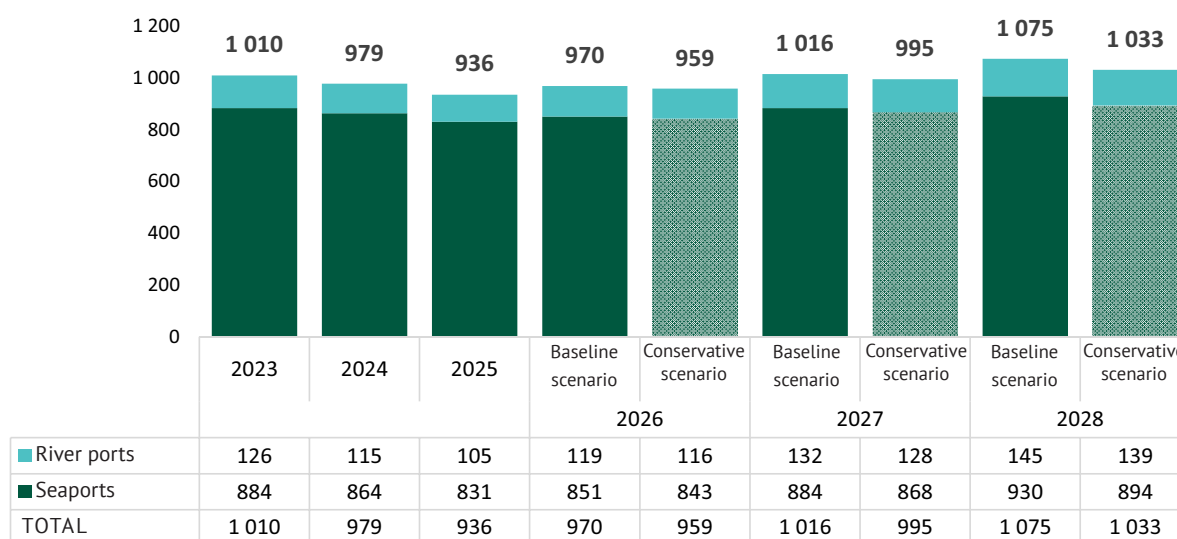


Fig. 3. Actual and forecast freight transshipments at sea and river ports until 2028, million t

In the baseline scenario, cargo transshipment at seaports in the conditions of relative transshipment overcapacity and limited capacity of approach transport routes will increase by 7.7% in 2028 compared to 2024. In river ports, transshipments are expected to grow much more, by 26.5%. This growth will be facilitated by projects of modernization of equipment of the Vostochny Port and reconstruction of the Vanino Port, as well as development of the river infrastructure of the Volga-Caspian Sea Canal.

Freight transportation by air accounts for a small share of the total freight traffic. At the same time, in the baseline scenario, the air freight traffic volumes are expected to increase by 185% and the freight turnover will grow by 236% in 2028 compared to 2024.

PASSENGER TRANSPORTATION AND PASSENGER TURNOVER

In 2023–2024, the passenger transportation market demonstrated sustained growth, continuous service

quality improvement, and active implementation of advanced IT solutions aimed at enhancing customer services.

This period witnessed steady growth in rail passenger traffic, with suburban services accounting for the largest share (of up to 90%). The number of passengers transported by long-distance trains increased by almost six million people.

Air transport demonstrated steady annual growth, both in terms of numbers of passengers transported and passenger-kilometres, with international traffic accounting for the highest (25%) growth rate. The recovery of the pre-crisis traffic levels was driven by the prompt removal of a great number of foreign-made aircraft from foreign aircraft registries, thus enabling Russian airline companies to optimize fleet management, improve fleet utilization, and expand the range of services offered, including international flights.

In inland waterway transport in 2023–2024, passenger traffic on domestic routes prevailed, while

international traffic was insignificant, accounting for less than 0.2%.

In sea transport, a drop in the passenger traffic was due to the fact that navigation in certain waters was banned by unfriendly countries and foreign companies refused to call at Russian ports.

Passenger bus traffic accounted for the highest (59%) share among all public transport modes, providing for the major share of domestic passenger transportation. The development was driven by the upgrade of obsolete vehicles, as well as by the expansion and streamlining of routes. Urban electric transport has rapidly developed, consistently increasing the number of passengers transported. The metro system had the largest passenger traffic, having carried 6.2 billion people in 2023–2024.

Creating an efficient transport system capable of catering for public demand for passenger transportation in an adequate and high-quality manner is one of the major development goals in the Russian Federation.

In the coming years, the dynamics of the passenger transport market and satisfaction of the public demand for transport will be driven by many factors,

such as the economic and geopolitical landscape, the national transport policy, modernization and development of the infrastructure (including the Integrated Backbone Transport Network), emergence of new transport routes (including international ones), new transport technologies, better quality of transport services, digitalization of transport, transformation of consumer preferences and demand for various modes of transport, environmental initiatives, and requirements for emission reduction.

In addition to the factors listed above, the forecasting of passenger traffic indicators by transport mode both for domestic and international services in the baseline and conservative scenarios for the period until 2028 also used exogenous macroeconomic forecast parameters, such as the GDP growth rates, consumer price index, households' real disposable income, US dollar exchange rate, and Russia's population forecast available on the website of the Russian Statistics Committee (Rosstat)¹. The forecast of passenger turnover (passenger-kilometres) and passenger traffic volumes in the transport industry until 2028 is shown in Fig. 4.

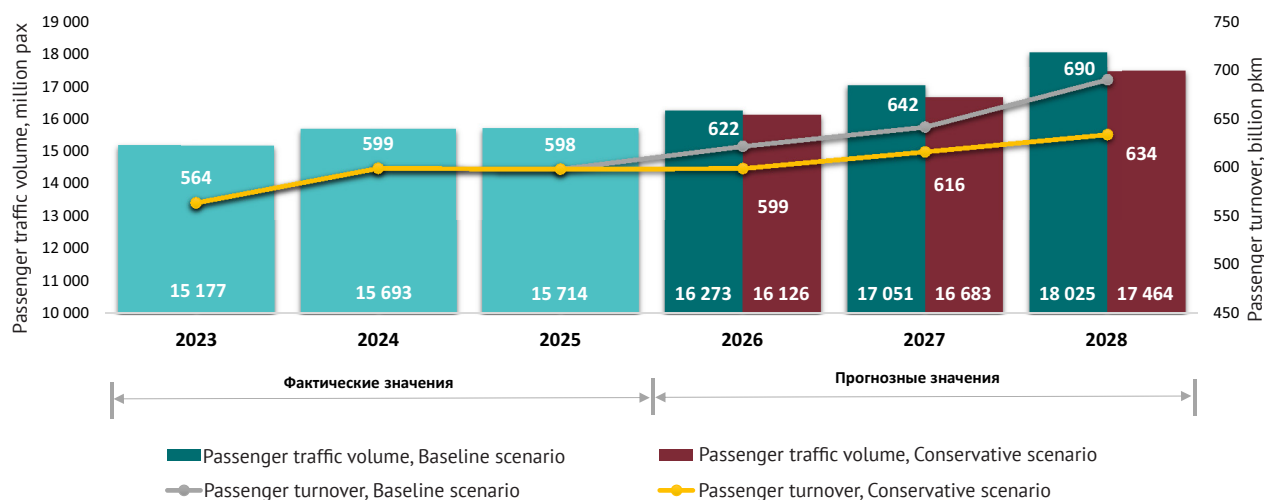


Fig. 4. Forecast of passenger turnover and passenger traffic in the transport industry until 2028

According to the baseline scenario, passenger traffic is expected to grow significantly up to 18.02 billion people, which is 2.4 billion people or 14.9% above the 2024 level. The passenger turnover will grow by 91 billion passenger-kilometres to reach 690.3 billion passenger-kilometres, which is 15.2% increase compared to 2024.

In the conservative scenario, the basic performance indicators in the passenger transport sector are also expected to grow, however at a more moderate rate. By 2028, the forecast expects the passenger traffic to reach 17.46 billion passengers, which is 11.3% or 1.7 billion people more than in 2024. The passenger

turnover will be 633.9 billion passenger-kilometres, which is 5.8% (34.6 billion pax) increase compared to the 2024 level.

Fig. 5 shows a forecast of the passenger traffic by transport mode in the baseline and conservative scenarios in the period until 2028. A significant share of the total passenger traffic is accounted for by urban electric transport (UET), public buses, and railways, which is due to the fact that these transport modes are highly available, the infrastructure is well-developed, services are regular and frequent, the carrying capacity is high, and interoperability is growing, making them more convenient and popular for daily travels.

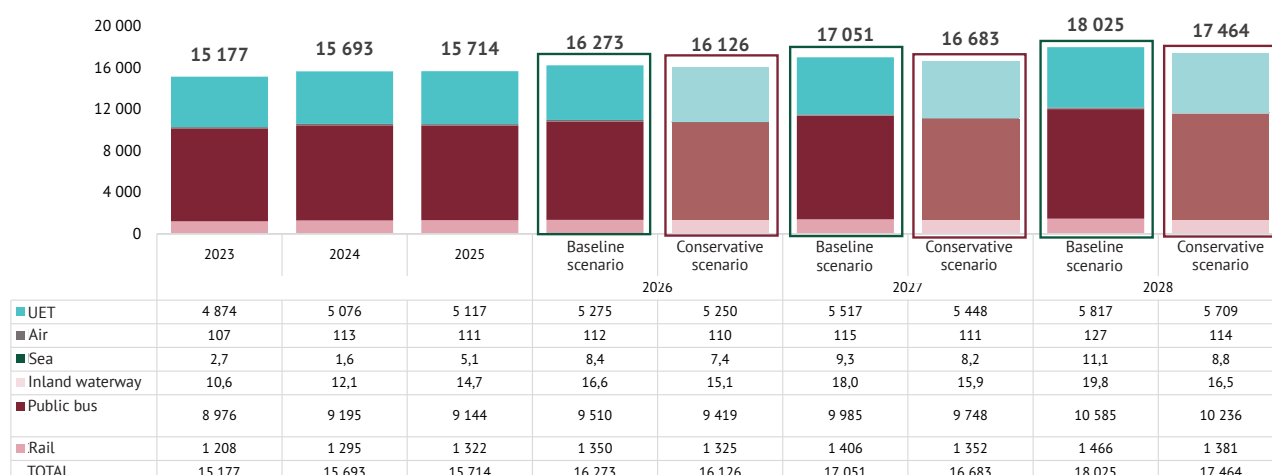


Fig. 5. Forecast passenger traffic volumes by transport mode until 2028, million people

In the coming years, bus services will remain the most popular and available public transport mode. In the baseline scenario, 10,584.6 million passengers will be carried by 2028, which is 15.1% more than in 2024. In the conservative scenario, bus passenger traffic will reach 10,235.6 million passengers in 2028, 11.3% increase compared to 2024.

Passenger transportation by sea accounts for the smallest percentage of total transport services. However, the development of infrastructure, fleet, and cruise tourism, mainly in the Azov-Black Sea basin, will

have positive effects on increasing the number of sea passengers in the medium run. By 2028, the number of passengers on sea transport is projected to reach 11.07 million people (+609% compared to 2024) in the baseline scenario, and 8.8 million people (+462% compared to 2024) in the conservative scenario.

Fig. 6 shows a forecast of the passenger traffic by transport modes until 2028. International traffic accounts for less than 1% of the total number of passengers carried, and more than 90% of international traffic is by air.

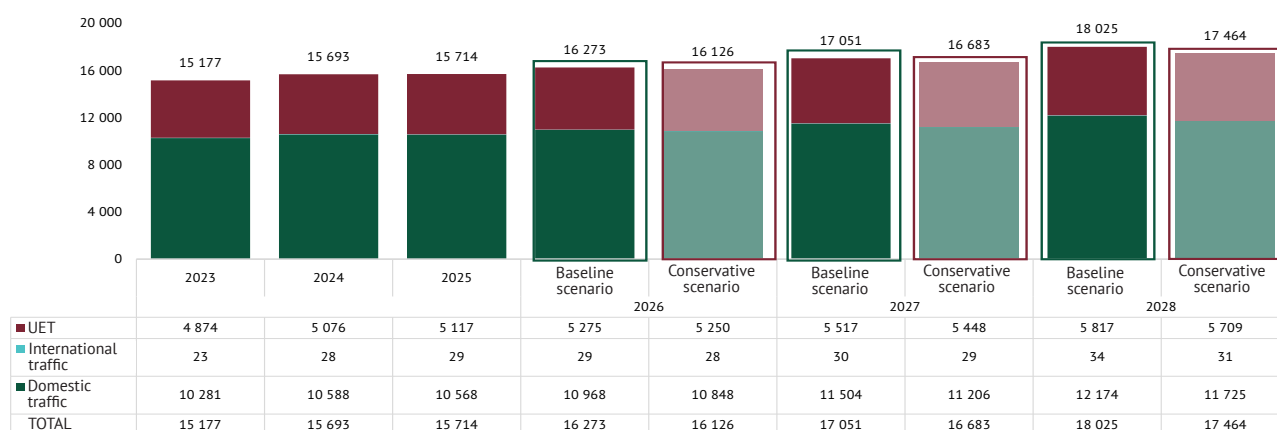


Fig. 6. Forecast passenger traffic volumes for domestic and international traffic until 2028, million people

FINANCIAL PERFORMANCE OF TRANSPORT ORGANIZATIONS

In 2024, revenues of transport organizations grew by 14.7% compared to 2023, and increased by 8.4% during the first six months of 2025. At the same time, the analysis reveals a systemic problem: In 2024, the growth rates of the cost of the services sold (16.0%) and the sales and administrative costs (21.6%) were considerably higher than the revenue growth. This led to a moderate increase in profits in 2024 – by 2.9% com-

pared to 2023, indicating a decrease in profitability and higher inflationary pressures on costs.

During the first six months of 2025, an 11.0% higher growth rate of cost compared to revenues resulted in a 6% drop in profits compared to the same period of the previous year. However, the situation is related to the investment cycle phase and is temporary. Given the past trends, profits of transport organizations are expected to grow by the end of 2025. The dynamics of financial performance by activity are given in Fig. 7.

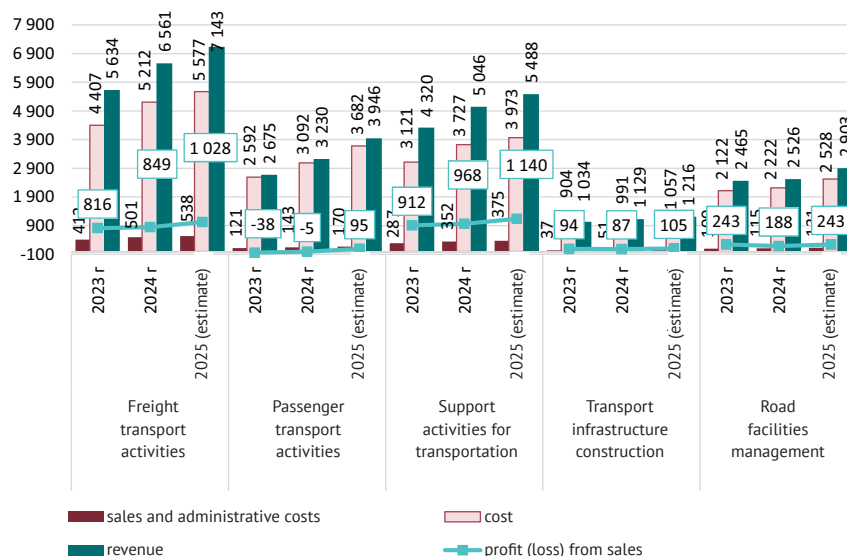


Fig. 7. Financial performance of transport organizations by activity, RUB billion

The freight transportation sector remains the foundation for earning revenues in the transportation industry. In 2024, it demonstrated 16.5% growth in profits compared to 2023, with the highest rates recorded for railway and road transport organizations. The trend continued during the first six months of 2025. As a result, by the year end, the financial performance of the freight transportation sector is expected to be positive.

The passenger transportation sector remains unprofitable, although in 2024 losses decreased by 85.7% compared to 2023. At the same time, for the majority of modes of passenger transport, 2025 saw higher losses than during the first six months of 2024, except for rail transport, which remains consistently profitable.

Air transport demonstrated profitability in 2024, but suffered a loss for the first six months of 2025. At the same time, based on the past statistics, the situation is temporary. It is expected that positive trends of the late 2024 will persist in 2025 and by the end of the year, passenger transport companies will in aggregate demonstrate profits, mainly on account of rail and air transport.

In 2024, road operations demonstrated lower service profits due to growing costs and expenses, while revenues grew at a modest rate (+2.5% compared to 2023).

During the first six months of 2025, the performance declined: sales profits dropped by 33.6% compared to the same period of 2024, and revenues decreased by 3.6%. An increase in sales and administrative costs has led to higher costs. However, given the past trends, organizations are expected to profit at the end of 2025.

In 2023–2025, financial performance of transport organizations tend to maintain the revenue growth in many areas; however costs outpace revenues, requiring improvement in cost management, streamlining sales and administrative costs, and improving the effectiveness of both infrastructure projects and transport and logistics processes. Nevertheless, despite the current challenges, the industry shows the sustainable growth potential.

The forecast of financial performance of transport organizations takes into account projected traffic volumes, freight turnover, passenger turnover, and changes in macroeconomic parameters that operate as exogenous impact factors in the forecasting model, namely the GDP and fixed-capital investment growth rates, consumer price index, and freight transport tariff indices³.

The forecast of the financial performance of transport industry organizations is made in current prices of each year and shown in Fig. 8.

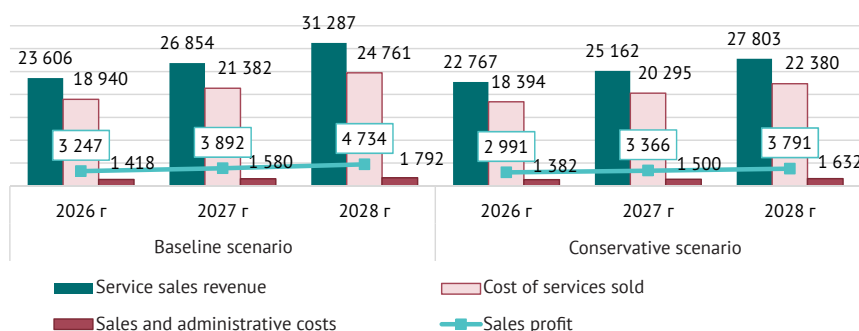


Fig. 8. Forecast of financial performance of transport organizations, RUB billion

The baseline scenario, where the macroeconomic development environment is favourable, provides for steady growth in freight and passenger traffic, steady changes in rates, an improved cost and revenue structure, and growth of investment. Correspondingly, in 2028, profit from sales of transport services will reach RUB 4,723.6 billion, which is 126.8% increase from the 2024 level.

The conservative forecast scenario takes into account negative factors, such as increasing rates and consumer prices for goods and services, a decline in passenger and freight traffic due to economic changes and consumer preferences, a worse cost and revenue structure, and a decline in investment. Correspondingly, according to the conservative scenario, in 2028, profit from sales of transportation services will be RUB 3,790.5 billion, which is 81.7 % increase from 2024.

In freight transportation, by 2028, profit from sales of transportation services will increase by 117.2% compared to 2024 to reach RUB 1,843.1 in the baseline scenario, and by 76.5% compared to 2024 to reach RUB 1,498.1 billion in the conservative scenario. The key driver of the sector will still be the rail transport demonstrating the highest revenue and profit figures in both scenarios. Air transport demonstrates high volatility, with significant growth in the baseline scenario and the greatest vulnerability in the conservative scenario. Road and water transport show sustainable growth in both scenarios.

Passenger transportation is expected to shift to a rapid development phase, with revenues outpacing costs. After the loss (–RUB 5.3 billion) suffered in 2024, by 2028, the sector is expected to earn RUB 547.0 billion in profits in the baseline scenario and RUB 336.1 billion according to the conservative scenario. Air and rail transport will be the major contributors to profits, while road (bus), inland waterway, maritime, and urban electric transport will remain unprofitable throughout the forecasting horizon.

FIXED CAPITAL INVESTMENT IN THE TRANSPORTATION INDUSTRY

In 2024, the favourable domestic economic environment and high business activity of companies combined with government support drove an increase in investment in fixed capital of transport organizations¹¹ by 14.0% compared to 2023, amounting to RUB 4,797,995 million or 14.9% of the total investment in the country as a whole.

However, the investment growth rates declined by 10.8% during the first six months of 2025 compared to the previous year, which was, in particular, due to the completion of a number of measures in the transport section of the Comprehensive Plan for the Modernization and Expansion of the Trunk Infrastructure for the Period until 2024 and the Safe and High-quality Roads national project, as well as due to the transition

to new phases of infrastructure construction and modernization of the transport system.

Railway transport and the public road system lead the transport industry in terms of investment amount (over 27%), which underlines their strategic importance for the provision of stable competitiveness of the transport system. In 2024, tram (+194.4%), inland waterway (+36.6%), and air transport (+31.1%) were the leaders in terms of investment growth rates.

In 2025, investment in the fixed capital of transport industry organizations is estimated to achieve the level close to that of 2024, amounting to RUB 4,734,023 million. The highest increases are expected to be recorded by organizations in the metro system (+66.3%), inland waterway transport (22.9%), and the public road system (+22.3%).

Investment in the fixed capital of transport organizations by segment in 2023–2024 and estimates as of the end of 2025 are shown in Fig. 9.

The analysis of sources of investment in the fixed capital shows that the share of equity of transport organizations has been constantly increasing, accounting for more than one half of the total investment from 2024 onwards. This indicates that the financial position of organizations becomes more stable, making them less dependent on external financing, and their investment processes ramp up. The trend is typical of most business segments, excluding urban electric transport (metro, trolleybus, and trams) which relies more on borrowed funds.

The structure of investment is dominated by budget financing, including the federal budget, budgets of constituent entities of the federation, and local budgets, which is particularly important for the implementation of large transport infrastructure projects. However, the share of budgetary funds in the amount of investment attracted has been decreasing since 2023, giving way to bank loans and borrowings from other organizations.

As of the end of 2025, the amount of budgetary investments is expected to increase compared to the 2024 level, to achieve RUB 1,952,927 million (+19.9 %) and the amount of extra-budgetary investments is expected to decrease to RUB 2,781,096 million (–12.2% from the level of 2024).

The forecast of fixed capital investments in the transport industry until 2028 is based on a comprehensive analysis of the global trends, including key macroeconomic forecast parameters, such as GDP growth rates; fixed capital investment growth rates; and fixed capital investment deflator index³, as well as parameters of the federal budget for the planning period until 2027⁶. The forecast also takes into account the measures provided for in the national and federal projects included in the Development of the Transport System of the Russian Federation until 2030 state programme, aimed at meeting the strategic goals defined in Decree of the President of the Russian Federation No. 309, dated May 7, 2024, and the instructions following the “Advanced Development of Transport Infrastructure” strategic session.

¹¹ Excluding small businesses.

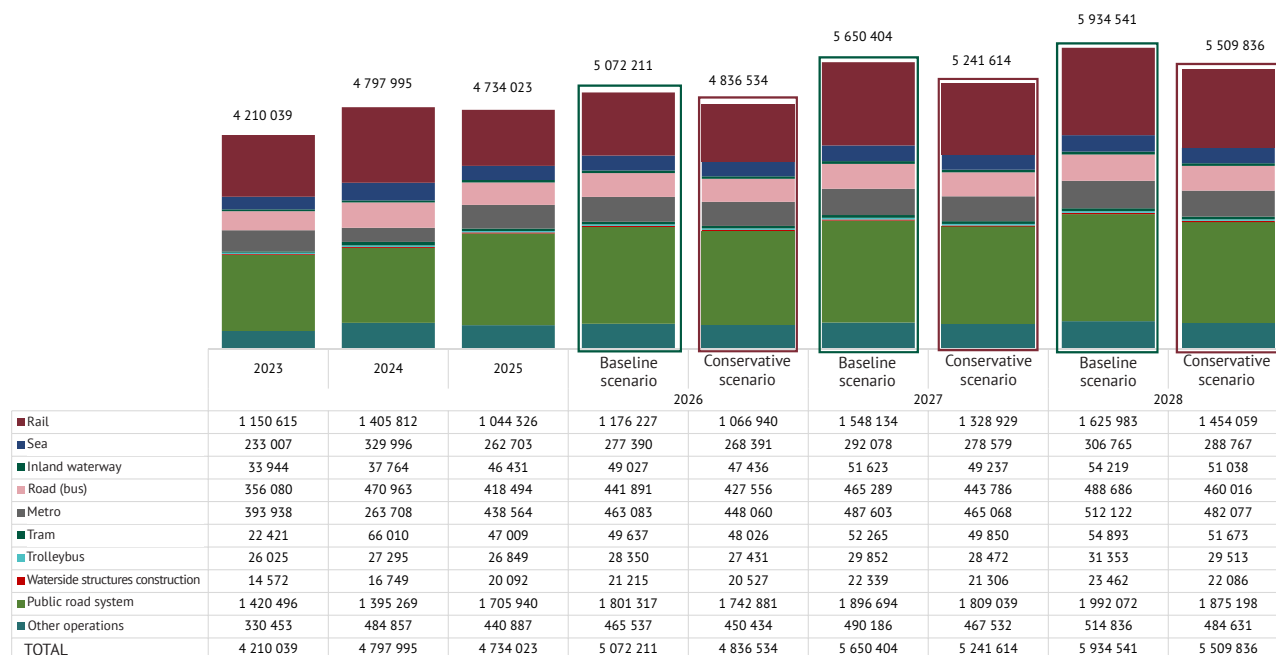


Fig. 9. Investment in fixed capital of transport organizations by segment in 2023–2028, RUB million (baseline and conservative scenarios)

Forecasting the amount of investments by source of financing is based on a retrospective analysis of the dynamics of distribution of budgetary and extra-budgetary funds, as well as the assessment of planned investment parameters in the context of the transport industry development projects being implemented.

In the forecast period, one of the priority areas of the investment policy will be comprehensive modernization and expansion of the transport infrastructure. Significant funds will be allocated to develop the road network, railways, inland waterways, aviation and maritime infrastructures.

Investment in high-tech solutions for transport automation and digitalization will also demonstrate steady growth. Some of the key areas of focus will be intelligent control systems, unmanned vehicles, and using big data for supply chain optimization. A special focus will be placed on the development of environmentally sustainable transport. Growth in investment

is expected in projects for public transport electrification, building infrastructure for electric vehicles, and introduction of alternative fuels.

By 2028, fixed capital investments in the transport industry are expected to grow up to RUB 5,934,541 million (+23.7% from 2024) in the baseline scenario and to RUB 5,509,836 million (+14.7%) in the conservative scenario. In the baseline scenario, by 2028, organizations in the metro system (+94.2%), inland waterway transport (+43.6%), and the public road system (+42.8%) are expected to show the greatest increases in investment. The conservative scenario expects the same organizations to lead, however with slower rates of investment growth, at +82.8%, +35.1%, and +34.4%, respectively.

Investment in the fixed capital of transport organizations by business segment in 2023–2028 is shown in Fig. 9. Changes in investment by source of finance are presented in Fig. 10.

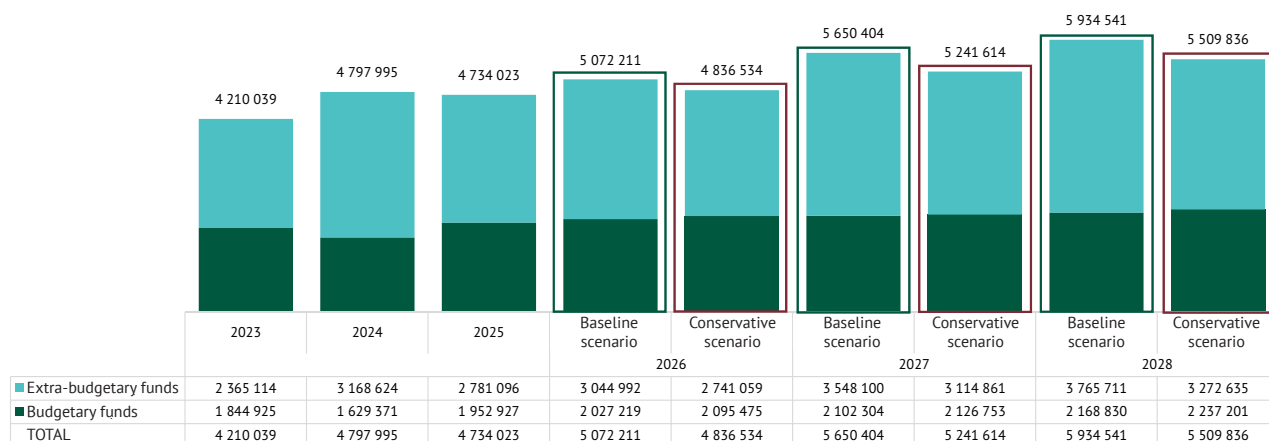


Fig. 10. Investment in fixed capital of transport organizations by source of finance in 2023–2028, RUB million (baseline and conservative scenarios)

In the context of the modern macroeconomic and systemic challenges, as well as increased uncertainty, it is particularly important to optimize the investment portfolio structure. Ramping up the share of extra-budgetary sources to ensure the successful and timely implementation of the projects planned is a key strategic area.

Based on this, the baseline scenario provides for a gradual increase in the share of extra-budgetary sources of funding. According to the calculations, during the three-year planning time-frame of 2026–2028, this figure is going to increase by 3.5%. The conservative scenario provides for a growing share of extra-budgetary investments at a more moderate rate of 2.7%.

The considerable limitation of the forecast estimates is also due to a sharp decline in extra-budgetary investments in 2025. Regardless of the seemingly positive dynamics of the subsequent years, the recovery growth will not be enough to compensate for the previous decline and achieve the 2024 level. By 2028, extra-budgetary investments are projected to fall behind the 2024 level by 2.6% in the baseline scenario and by 6.6% in the conservative scenario, necessitating the development of further measures for promoting increased extra-budgetary financing of investment activities in the forecast period.

SOCIAL ASPECTS OF THE TRANSPORT INDUSTRY

In 2024, the average number of employees in transport organizations other than small businesses was 1,978.29 thousand people or 100% compared to 2023, or 2,292.83 thousand people (100.6% compared to 2023) including those employed in construction of transport infrastructure.

Taking into account the baseline forecast scenario of the total number of workforce and those employed in the economy in the context of the changing demand for transportation services of certain transport modes, in 2025, the average number of employees of transport organizations is estimated to be 2,300.5 thousand people or 100.5% of the 2024 level.

In 2026–2028, the average number of employees in transport organizations is expected to grow slightly, which is in line with the situation in the country as a whole – a little increase in the number of workforce and the number of those employed in the economy until 2028 in accordance with the forecast of the Ministry of Economic Development of Russia dated September 26, 2025. According to the baseline scenario, in 2028, the average number of employees of large and medium-sized businesses in the transport industry will be 2,309.24 thousand people which is 16.4 thousand people or 0.7% more than in 2024. In the forecast

period, the shortage of workforce will be compensated for by optimal workforce use, careful retention of talent, retraining in the course of transformation of production processes, and provision of personnel mobility.

In 2019–2024, the nominal average wages in transport organizations were growing rapidly, reaching RUB 104.72 thousand in 2024 or 113.8% compared to 2023. Note that this is above the average monthly wages at large and medium-sized economic businesses in Russia by 19.1% (2024: RUB 87.95 thousand).

In 2024, the growth of real wages in the transportation industry was 4.9% compared to 2023. In particular, the growth was 7.95% in railway transport organizations, 5.9% in road transport, 13.6% in inland waterway transport, 9.15% in air transport, 9.45% in the metro system, 4.1% in land urban electric transport, and 7% in organizations engaged in support activities for transportation. At the same time, in maritime transport, the real wages declined, although they are still expected to grow 3.4% by the end of 2025.

In 2025, according to the current data of Rosstat for January–August 2025 and the expected implementation of the baseline scenario of Russia's economy performance, the nominal average monthly wages in transport organizations will be RUB 119.74 thousand, which is 16.6% higher than for the economy as a whole in current prices (RUB 102.73 thousand).

In 2025, the expected growth of real wages in transport organizations will be 4.8% compared to 2024, including 5.4% in railway organizations, 5.1% in road organizations, 4.4% in inland waterway transport, 3.4% in maritime transport, 5.4% in air transport organizations, 7.4% in metro system organizations, 9.3% in tram transport organizations, 8.9% in trolleybus organizations, 4.2% in support activities for transportation, and 3.6% in transport construction.

In 2028, given the trends identified and macroeconomic parameters included in the forecasts of the Ministry of Economic Development dated September 26, 2025 (including growth of real wages, real disposable income of the population, workforce productivity, and consumer price index), the nominal average monthly wages per employee in the transport industry will increase for all transport modes and reach 149.38 thousand in current prices (142.7% of the 2024 level) in the baseline scenario, which is significantly higher than the average wage level in Russian economy as a whole.

At the same time, in the period from 2024 to 2028, the growth rates of real wages in transport organizations reaching as high as 15.1% in the baseline scenario are 2.45 times higher than the growth rates of workforce productivity (6.2%).

In 2024, the workforce productivity as a whole across the transport industry was 2,870.3 reduced tonne-kilometres per employee or 98.3% of the 2023

level. The decrease in the workforce productivity was against the backdrop of a 0.1% increase in the number of those employed by large and medium-sized companies and a 4.3% decrease in freight turnover on railway transport due to changes in amount and directions of freight flows. In 2024, workforce productivity in railway transport, which accounts for the major share of transportation operations in the transport industry, decreased by 3% compared to the previous year.

Alongside higher utilization of the railway infrastructure and changes in supply logistics, there is advanced growth in demand for freight transportation by road. In 2024, the workforce productivity in reduced tkm in the road transport segment increased by 5.2% year-on-year. The growth of road traffic volumes was driven by enhanced competitive positions of road transport on the market of high-margin and perishable goods, the development of e-commerce in regions, and temporary closure of airports in central and southern regions near the international borders of Russia.

Along with the analysis and workforce productivity forecast in physical terms, a cost method can be used, which allows for the assessment of workforce productivity in monetary terms and takes into account the performance of workers of different skill levels and specialties. In 2024, under the conditions of increasing sanctions pressure on the economy, the workforce productivity per transport industry worker in monetary terms was 102.2% of the 2023 level.

Regardless of the impact of sanctions on Russian exports, the restrictions on access to foreign technology, spare parts and equipment, and other adverse factors, in 2025, the workforce productivity in the

transportation industry was maintained at the level of the previous year thanks to switching to other commercial partners and reorganization of supply chains.

The key factors taken into account in forecasting workforce productivity growth in the transport industry in 2026–2028 include the following: the expected outcomes of national projects and federal projects in the transport sector, the Development of the Transport System state programme, and projects for the development and modernization of trunk infrastructure of railway, air, road, sea, and river transport; implementation of measures to increase the speed and reduce the cost of freight and passenger transportation; optimization of logistics processes, development of multimodal transportation, integration of various modes of transport, and use of IT solutions for transportation planning, monitoring, and management.

The forecast calculation used the following exogenous macroeconomic parameters defined in the Forecast of the Ministry of Economic Development for the Period until 2028: industrial production index, economy-wide workforce productivity, fixed capital investment growth rates, number of jobholders and those employed in the economy, exports and imports of goods³.

The forecast growth of the workforce productivity in monetary terms is in many respects driven by growth rates of the transport industry output, which by 2028, will be 7% of the 2024 level in the baseline scenario and 6.5% in the conservative scenario.

Fig. 11 shows changes in the workforce productivity in the transport industry in monetary terms in 2028 compared to 2024 under the baseline forecast.

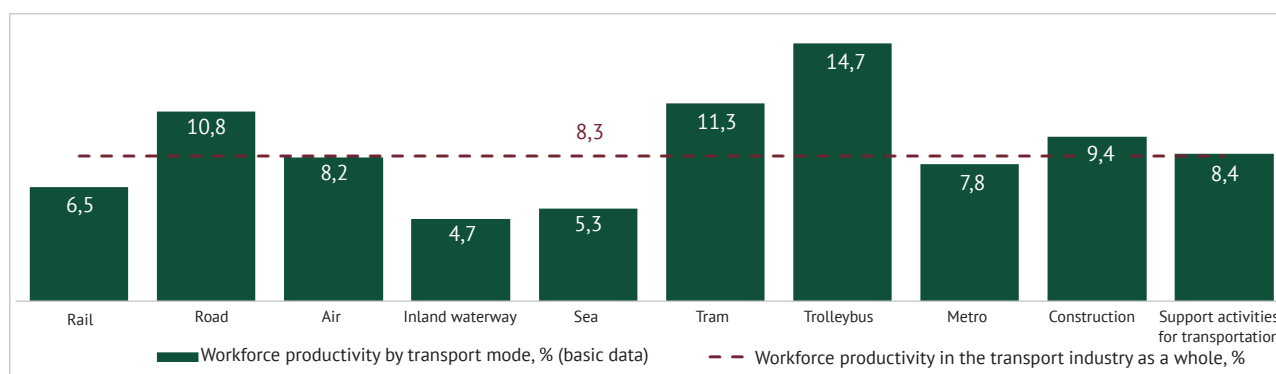


Fig. 11. Changes in workforce productivity in the transport industry in monetary terms in 2028 compared to 2024 under the baseline forecast, %

In 2028, under the baseline scenario, the workforce productivity in the transport industry in monetary terms will increase by 8.3% from the level of 2024 to reach RUB 6,330.7 thousand in constant 2024 prices per worker. In the conservative scenario, in the forecast period, the workforce productivity will grow by 3.7% (to RUB 6,064.2 thousand).

SMALL AND MEDIUM-SIZED ENTERPRISES

The national action plan for restoration of employment, raising of household incomes, and implementation of long-term structural changes, places a special focus on supporting and promoting the development of small and medium-sized enterprises (SMEs).

The COVID-19 pandemic significantly affected the transport industry and the SME sector proved to be the most vulnerable due to the lack of sufficient backup resources. Anti-crisis measures mitigated the impact, but the recovery has been slow and troublesome. Full restoration of the previous traffic levels was hampered by geopolitical instability, reduction in international transportation, disruption of international supply chains, rising fuel prices, and higher rolling stock maintenance costs, which was a critical challenge for the industry. Companies have to budget for circumventing sanctions and adapting their business processes.

The current status of the SME sector in the transport industry, taking into account support measures of the government, is characterized as follows: The number of companies in the transport industry is constantly growing and in 2024, it increased by 8.6% compared to 2023. In 2024, the average workforce increase was just under 1% compared to 2023.

In 2023–2025, transport companies recorded turnover growth of between RUB 220 billion and RUB 500 billion per year, which corresponds to the annual growth rate of 8% to 20%. In 2025, the expected turnover in the SME sector will be RUB 3,122 billion, with freight companies accounting for RUB 1,532 billion or 49% of the total turnover of transport companies, and organizations engaged in support activities for transportation account for RUB 1,301 billion of 42% of the total turnover in the transport industry. Organizations in the passenger transportation sector account for just 9% of the total turnover of transport companies.

The development of SMEs will be significantly influenced by government support measures, including the implementation of the Small and Medium-sized Entrepreneurship and Support for Individual Entrepreneurial Initiatives federal project, and the Efficient and Competitive Economy national project being implemented in accordance with Decree of the President No. 309, dated May 07, 2024.

The exogenous macroeconomic parameters used for forecasting SME development indicators until 2028 in both baseline and conservative scenarios included growth rates of industrial output, GDP, consumer price index, and freight transport tariff index³.

In the baseline development scenario, in 2028, the total number of SMEs with the core business being freight transportation services is likely to exceed 8 thousand companies (118.3% compared to 2024). In 2028, the average workforce at SMEs engaged in freight transportation will be 229 thousand people (116% of the 2024 level). By 2028, the turnover of SMEs providing freight transportation services will increase by 34% from the 2024 level to reach RUB 1,948 billion (2024: RUB 1,451.3 billion) (under the baseline scenario).

In the baseline scenario, in 2028, the total number of SMEs with the core business being passenger trans-

portation services will be 1.29 thousand organizations (117% of the 2024 level). In 2028, the average headcount at SMEs engaged in passenger transportation will be 89.1 thousand people (129.3% compared to 2024). By 2028, turnover of SMEs offering passenger transportation services will increase, according to the baseline scenario, by 63% from the 2024 level to reach RUB 398 billion (2024: RUB 244 billion).

In the conservative scenario, in 2028, the total number of SMEs with the core business being freight transportation services is expected to be about 7.6 thousand companies (111% compared to 2024). In 2028, the average workforce of SMEs engaged in freight transportation will be 214 thousand people (108% of the 2024 level). By 2028, the turnover of SMEs providing freight transportation services will increase, under the conservative scenario, by 24% from the 2024 level to reach RUB 1,800 billion (2024: RUB 1,451 billion).

According to the conservative scenario, by 2028, about 1,214 SMEs will be operating in the sector of passenger transportation services (110.3% of the 2024 level). In 2028, the average workforce will be 65.5 thousand people (95 % of the 2024 level). By 2028, the turnover will increase by 52% compared to the 2024 level amounting to RUB 374 billion (2024: RUB 244 billion).

By 2028, in the baseline scenario, the number of SMEs engaged in support activities for transportation will grow up to 5.2 thousand companies (127% of the 2024 level) and their average workforce will be 138 thousand people (112% compared to 2024). In the conservative scenario, in 2028, the number of such SMEs will reach 4.7 thousand companies (115% of the 2024 level) and their average workforce will be 131 thousand people (107% compared to 2024). By 2028, turnover of these SMEs will grow by 42% compared to 2024 to reach RUB 1,709 billion (2024: RUB 1,203 billion) in the baseline scenario, and to RUB 1,544 billion in the conservative scenario.

SCIENTIFIC AND TECHNICAL POTENTIAL OF THE TRANSPORTATION INDUSTRY

The scientific and technical potential of the transportation system of the Russian Federation is a major driver in achieving the technological sovereignty, improved competitiveness, and effective development of the industry.

In 2024, research and development expenditures in the transportation industry amounted to RUB 5.9 billion, with 2.3 thousand people employed in science. In 2025, expenditures are estimated to be RUB 5.8 billion.

In the medium term, priorities in scientific work will still include predictive modelling, economic and transport planning, and decision-making support on the basis of big data and multi-objective optimization, active utilization of artificial intelligence for better

transportation safety and streamlined traffic flow management, introduction of highly automated vehicles and information and communication media for their functioning, integrated satellite navigation and geo-information systems^{5, 7}.

The Concept of Scientific and Technological Development of the Transportation Sector until 2035 also involves the creation of new research management models, development of industry-specific training

centres and consortia, which will allow for integrating research findings, including fundamental research, and improve the level of top-qualification personnel training. The introduction of new solutions and technology is expected to expand, leading to the improved quality of transportation services and supporting the sustainable development of the transport industry.

The forecast of research and development expenditures until 2028 is given in Fig. 12.

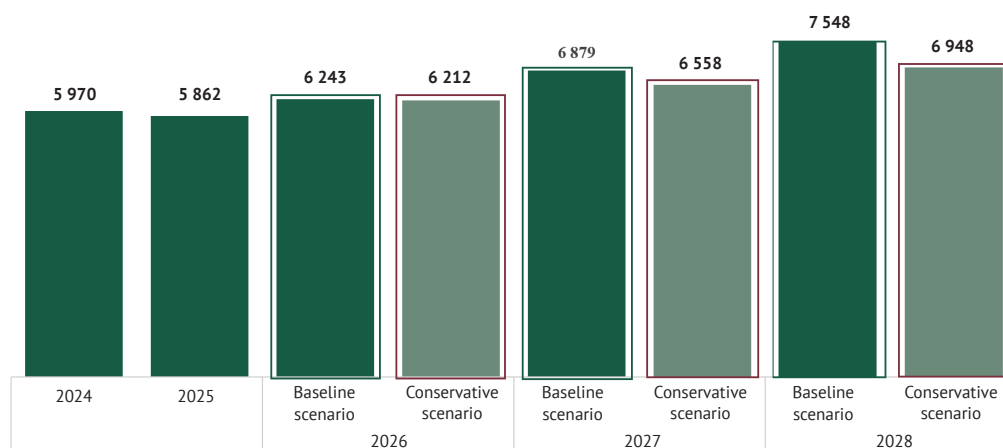


Fig. 12. Forecast of R&D expenditures in the transport industry until 2028, RUB million

By 2028, research and development expenditures for the transport sector are expected to reach RUB 7.5 billion (126.4% of the 2024 level) in the baseline scenario and RUB 6.9 billion (116.4% of the 2024 level) in the conservative scenario.

The development of the scientific and technical potential of the transportation industry will aim at the purpose-oriented integration of efforts by all stakeholders in the fields of innovation, key scientific research, investment in the development of scientific schools, and training highly skilled personnel.

In order to efficiently manage industry-related scientific research, a list of priority areas and a comprehensive programme of research and development will be developed. Regular updates of the programme will allow for adapting research to the changing environment, improving the performance and ensuring the sustainable development of the transport system, increasing its competitiveness, and achieving its technological sovereignty.

CONCLUSION

The analysis and forecast of the development of the transport industry in the future until 2028 shows the general trends and consolidated dependencies of the basic transport system parameters on both internal and external factors that determine the development of the transportation market and the positions of

transport organizations. The authors also used the same approach to forecasting the parameters of the transport sector development in the long run until 2042. The findings have shown a significant increase in the expert component that allows for taking into account informal factors in a long-term forecast, as well as a higher dependence of financial and economic performance on projected traffic volumes. Therefore, in long-term forecasting, it is expedient to use a more detailed traffic forecast as a basis both for Russia as a whole and with a breakdown by region.

It is proposed to make such a forecast as part of the Transport and Economic Balance of the Russian Federation [9, 10] developed by the Ministry of Transport of Russia, in particular, with contributions from the authors of this paper. For the purposes of forecasting, the "Guidelines on medium- and long-term forecasting of freight and passenger traffic by transport mode with a breakdown by constituent entity of the Russian Federation and for the country as a whole in accordance with the Scenarios for Social and Economic Development of the Russian Federation" were developed and approved by Order of the Ministry of Transport No. VS-7-r, dated January 18, 2023.

The Transport and Economic Balance will present a forecast of traffic volumes and correspondences between regions and certain major transport districts of Russia, thus enabling further analysis and forecasting of the parameters for the development of the transport industry considered in this paper.

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