Chapter 11
PPP Mechanisms in the Transport Infrastructure of Russia

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Abstract Current state and major problems of transport infrastructure—one of the largest segments of the Russian economy—are examined. New trends in government approaches to public administration of the sector are explored. Conclusion on the objective need for the use of PPP mechanisms to reach ambitious goals of government transport policies is made. Application of PPP mechanisms in transport infrastructure is explored. It is noted that the transport industry in Russia is the most advanced in terms of the application of public-private partnership mechanisms. Noteworthy that both the sectoral range of PPP projects and the variability of payment mechanisms and forms of PPP are expanding. The most representative cases of implementation of PPP projects in the sector are presented. On the basis of the study, it is concluded that PPP mechanisms are in demand in various sectors of transport infrastructure. The most promising areas of application of PPP mechanisms and key drivers in the sector are evaluated. Specific recommendations on the use of PPP mechanisms in transport infrastructure are made.

Keywords Public-private partnership in russia · Public administration · Concessions · PPP policy · Transport infrastructure

JEL-Codes H43 · H43 · K12 · K15

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Introduction

Transport infrastructure is one of the most important components of social and industrial infrastructure in the Russian Federation. The special geographical position of Russia determines the enormous role of transport in the development of competitive advantages of the country. The high level of development of transport infrastructure directly affects both the satisfaction of social and production needs in the country and the implementation of economic relations in the territory of the Russian Federation and abroad.

However, despite the strategic importance of the transport component, Russia is not able to provide its financing in full. The budget for the implementation of all projects is not enough. According to the World Economic Forum, the quality of Russian infrastructure in many important components leaves much to be desired—114th place in the quality of road infrastructure, 66th in the quality of seaports, 59th in the quality of airport infrastructure. (World Economic Forum 2018, pp. 248–249).

The country's leadership is aware of the scale of the problem and is trying to solve it systematically. In the beginning, the government developed a strategic document for the development of infrastructure. Since 2018, the transport system in Russia has been developing within the framework of a Comprehensive plan for modernization and expansion of the core infrastructure for the period up to 2024 and National projects.

Since the state is not able to cover the infrastructure deficit in the transport system, PPP mechanisms are actively used in the country. Most of the concessions in transport are on roads. In fact, this sector is one of the most advanced in terms of PPP application.

Results

Transport Infrastructure in Russia

The Russian market of transport infrastructure is quite large: according to the data of the consulting company EMBS Group, the construction and repair of roads, bridges and railways, airports, ports, and coastal infrastructure in 2017 accounted for 12% of the costs of the construction industry in Russia, amounting to almost 7.6 trillion rubles. Currently, the transport complex employs more than 1.8 million people.

Historically, the transport infrastructure of the Russian Federation is experiencing a lack of investment (Maksimov 2010; Ivanov 2019). The infrastructure deficit causes a low level of accessibility and quality of transport infrastructure in the country and, according to the estimates of the Research Institute of Territorial Development and transport infrastructure, costs the domestic economy more than 1.3 trillion rubles or 3% of GDP annually.

In many respects, the transport infrastructure occupies an important place in the agenda of the government. In 2009, the implementation of the Federal target program (FTP) "Modernization of the transport system in Russia in 2002–2009" was successfully completed. The projects and initiatives launched within its framework were continued in the new sectoral FTP for 2010–2020, implemented within the framework of the Transport strategy of the Russian Federation, which was adopted by the Government in 2008. In 2014, the Government of the Russian Federation approved the State program "Development of transport system for the period 2013–2020", which included financing of two target programs—"Development of transport system of Russia" and "Modernization of Uniform system of the organization of air traffic of the Russian Federation".

Since 2018, the fundamental document for the development of transport infrastructure in Russia is a Comprehensive plan for the modernization and expansion of the core infrastructure for the period up to 2024. Its budget is 6.3 trillion rubles, of which only 3 trillion rubles will be allocated from the Federal budget. It is planned to attract 3.3 trillion rubles from extra-budgetary (private) sources. The comprehensive plan includes nine projects aimed at modernization and expansion of transport infrastructure. These Federal projects envisage the development of the West-East and North-South transport corridors for transportation of goods and improvement of economic connectivity of the territory of Russia through expansion and modernization of railway, aviation, road, sea, and river infrastructure. In particular, the plan includes such projects as: "Europe—Western China", "Sea ports of Russia", "Northern Sea route", "Railway transport and transit", "Transport and logistics centers", "Communications between the centers of economic growth", "Development of regional airports and routes", "High-Speed railways", "Inland waterways".

The priority of the transport part of the Comprehensive plan is the innovative transformation of the infrastructure construction industry. To this end, it is planned to introduce and widely apply advanced technologies and best practices, digitalization of the transport industry and logistics processes (Inshakova et al. 2019).

According to the Russian government, the implementation of the transport part of the Comprehensive plan will significantly improve the transport system by 2024.

Since 2018, road construction has been separately identified in the national project "Safe and high-quality roads". The budget of the national project is 4.8 trillion rubles (Chart 11.1).

Traditionally, the Russian market of transport infrastructure is dominated by road facilities—in 2017 their share was 59%. The remaining costs and investments are borne by railways, airports, and ports (Fig. 11.1).

Despite the increased attention from the government and the slow but still existing growth of the Russian market of transport infrastructure, its quality is still estimated to be low. Thus, in the special annual report of the World Economic Forum, The Global Competitiveness Report[1], Russia has not been in the best positions among almost 140 countries for many years.

[1]The rating is compiled by processing the results of a survey of local businesses for satisfaction with the state and level of development of national infrastructure. This KPI, which reflects the degree of

Chart 11.1 Dynamics of the volume of the Russian transport infrastructure market (2009–2016, billion rubles). *Источник: ПАО "Мостотрест" по данным PMR, EMBS Group, Росстат*

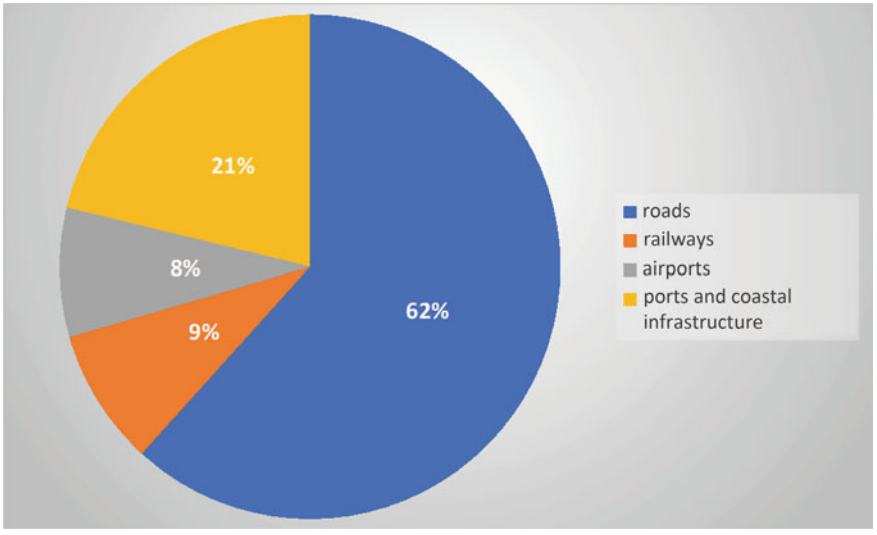

Fig. 11.1 Structure of the Russian transport infrastructure market (2017, % and billion rubles). *Источник: ПАО "Мостотрест" по данным PMR, EMBS Group, Росстат*

Although, as can be seen in Table 11.1, since 2011 Russia has managed to significantly improve its position in the ranking in terms of the overall quality of transport infrastructure, rising from 100 to 35-the place, quality of roads—that is 62% of the total market—is still at a critical level

optimism/pessimism of infrastructure users, is recognized by the most informative experts of the WORLD ECONOMIC FORUM.

Table 11.1 Russian Federation in the WEF ranking of quality of infrastructure

Index components	Global competitiveness index	
	2011/2012 142 countries	2017/2018 138 countries
Quality of overall infrastructure	100	35
Quality of roads	130	114
Quality of railroad infrastructure	29	23
Quality of port infrastructure	97	66
Quality of air transport infrastructure	105	59

Source World Economic Forum. The Global Competitiveness Report 2011–2012, 2017–2018

Moreover, according to a World Bank study, Russia ranks 85th in the world in the Logistics Performance Index (Logistics Performance Index), with low scores on all indicators taken into account in the calculation of the index (including the assessment of the customs system, the state of infrastructure, the availability of international transport, etc.).

Thus, despite attempts to rectify the situation, Russia still has the historical problems of the transport sector: lack of investment and low operational efficiency. The use of PPP mechanisms is intended to solve these problems, and it is quite natural that public-private partnership in the transport sector is becoming increasingly common practice.

PPP in Transport Infrastructure

In Russia, there are 148 PPP projects in the field of transport infrastructure at different stages of implementation as of May 2019. Most of them were initiated in the road sector (Fig. 11.2).

As of May 2019, 124 projects have reached commercial closure, the total volume of investment obligations of the public and private parties amounts to 2,051 billion rubles, including the obligations of private investors—1,293 billion rubles.. It is noteworthy that the accumulated volume of private investment attracted to PPP transport projects is greater than the volume of investment in all other areas of public infrastructure combined.

The sectoral structure of projects that have reached commercial closure is shown in Chart 11.1. The share of road projects is 53%, while the share of private investment in these projects in total amounts to 49%. However, if we take into account the

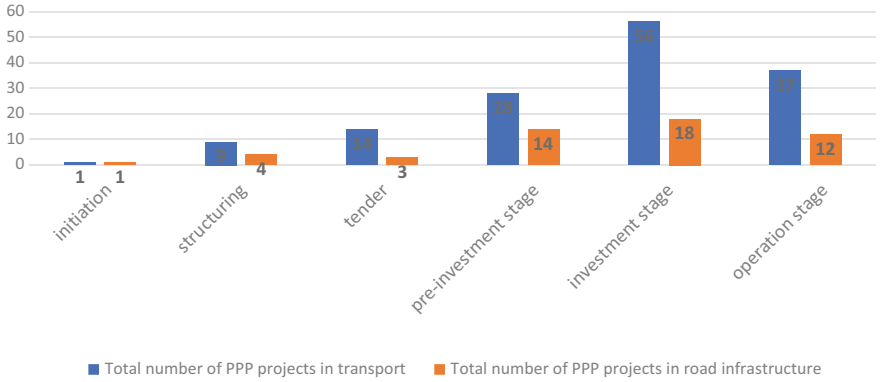

Fig. 11.2 PPP projects in transport by stages of implementation. *Source* National PPP center

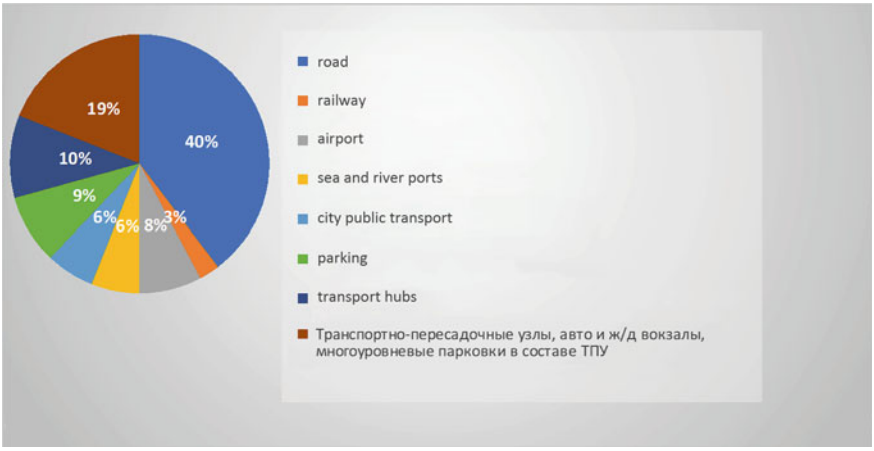

Fig. 11.3 PPP projects in the transport sector that have passed the stage of commercial closure

accumulated budget investments made through PPP, the investment share of road projects will be significantly higher—71% (see chart below) (Fig. 11.3).

Specifics of Concessions in the Road Sector

In toll road construction and operation projects, revenue from toll collection is the main and in most cases the only source of return on investment. That is why one of the key risks of such projects is the risk of demand/traffic. In order to minimize this risk, at the pre-project stage, it is especially important to assess the potential intensity of traffic at the object. The main factors that should be taken into account

in its calculation are current traffic intensity in the location of the object, forecasts of socioeconomic development, and data on the development of the road network.

At the same time, the actual traffic intensity is often lower than expected, which should be taken into account in the financial structuring of the project. In this regard, for example, the Ministry of Economic Development of Russia recommends to build financial models of road projects in such a way that the cost of the project at the stage of operation in the amount of 20–30% less than the projected revenue.

Legal structuring of the project should adequately reflect the peculiarities of implementation of projects in the field of construction and operation of toll roads in all material aspects, including distribution of liabilities and risks between the parties, payment mechanism under the agreement, mechanism of enforcement (the procedure for recovery of losses, penalties, conditions and procedure for payment of additional remuneration to the private partner/concessionaire, the procedure for providing Bank guarantees and other security methods) (Estache et al. 2007; Rall et al. 2010).

Thus, in terms of risk allocation, the project should ensure the transfer of specific risks associated with the construction and operation of the road to one of the parties (taking into account which party is most likely to manage such risk). For the construction stage primarily risks of errors in design, detection of additional objects, risks associated with the provision of land as well as environmental risks and risks of commissioning should be paid attention in the legal structuring of the project. For the stage of operation, it is important to take into account the already mentioned demand risk, risk of road changes at the request of the Concedent, etc. Distribution of risks can be made through various legal mechanisms, in particular, mechanism of circumstances (ensuring the economic balance of the agreement), assurances about the circumstances (Art. 431.2 of the Civil Code) and others.

In the case of toll roads, the main factor determining their payback is the efficiency of toll collection. Fee collection, in turn, largely depends on the demand and accordingly, the quality of the final infrastructure services. In this regard, it seems appropriate to link payments in favor of the private partner to the achievement of the established levels of transport and operational indicators (for example, convenience and safety of travel and other operational qualities of the road).

To date, the Russian practice of implementing road PPP projects has been formed within the framework of the concession law (Ivanov 2016). The main types of concession agreements are the direct fee concession and the availability payment concession. The subject of the concession with direct fee collection is the performance by the private partner of a complex of works on construction or reconstruction and operation of the road (or its section) in whole or in part at the expense of own and borrowed funds. This agreement allows participation of the Concedent in the costs of creating the facility of the concession.

The right of ownership of the created object of concession after completion of construction (reconstruction) remains with the Concedent, thus for the period of validity of the agreement the object is transferred to the private partner for temporary use. The main source of return on investment and financing of the concessionaire's operating costs is the direct collection by the private partner of fees from the users

of the object of the concession agreement. Such agreements are usually concluded for 25–30 years.

The subject of the concession with the payment of the Concedent is the concessionaire's performance of a complex of works on construction and operation of the concession facility (road, road section) in whole or in part at the expense of its own and borrowed funds. The concessionaire collects fees from the users of the concession facility in favor of the Concedent. In this case, the concessionaire's return on investment is provided in stages within the period specified in the agreement with the agreed rate of return, the actual amount of which depends on the achievement of the private partner's transport and operational targets. Financing of operating costs is provided by operating fees paid by the Concedent. Agreements on this model are concluded, as a rule, also for a period of 25–30 years.

Case. Construction of the Moscow—St. Petersburg Highway (M-11)

This is a high-speed toll road connecting the largest megacities of the country. The total length of the motorway is 669 km, which is comparable to the distance from Paris to Zurich. The road passes through Moscow, Tver, Novgorod, and Leningrad regions bypassing all settlements. The construction period 2010–2019. The highway was put into operation in November 2019.

The M-11 highway is built in parallel to the existing free M-10 highway. According to Russian law, toll roads can be used only if there is a free-of-charge alternative.

Construction of the highway Moscow—St. Petersburg was carried out in several sections, each of which was an independent investment project. All plots were built under concession. The state company "Avtodor" acts as the Concedent, which on behalf of the state concluded agreements. For a long time, Avtodor was the only company in Russia that could act as a Concedent. Since 2018, such an opportunity has appeared at the state Corporation Rosatom, which is engaged in the construction and maintenance of nuclear power plants in Russia, and also owns the world's only nuclear icebreaker fleet.

Concessionaires at M-11 in different sections were: a consortium of investors "North-West concession company" (including the French group Vinci), companies "Magistral of two capitals", "Mostotrest", "Transstroymechanizatsiya".

The total cost of construction of the M-11 resulted in 520 billion rubles, of which about one third (148 billion) are the funds of private investors.

Sources of return on investment for M-11:

- Direct collection of fees from consumers for the use of the object (services)/other commercial activities;
- Availability fee (fixed payments) from the public partner (budget).

According to "Avtodor", the fare throughout the site will be 1800-2000 rubles. (≈25–27 €).

Technical parameters of the Expressway:

- road category—IA (highway);
- design speed—150 km/h;
- number of lanes—4 to 10.
- traffic intersections at different levels—36;
- artificial structures (bridges, overpasses, overpasses, and cattle runs)—325;

Case. Modernization of Pulkovo Airport (St. Petersburg)

Pulkovo airport in St.Petersburg is the first airport in Russia built on the terms of public-private partnership. In 2010, following the results of the tender, the government of St. Petersburg and Pulkovo Airport (owned by St. Petersburg) signed an agreement on PPP with the consortium "Air Gates of the Northern Capital" (VVSS), which includes VTB Capital (subsidiary of VTB state Bank), the German company Fraport managing Frankfurt airport, as well as the Qatar Investment Authority (QIA). The airport was built entirely at the expense of the consortium. The total investment amounted to 50 billion rubles.

Source of return on investment is direct collection of fees from consumers for the use of the object (services).

Under the terms of the agreement, the private consortium received a long-term lease for 30 years of the airport property complex for the large-scale reconstruction of existing and construction of new airport infrastructure. Throughout this period, the consortium will operate Pulkovo airport, provide airport services, and invest in the development of the airport in accordance with the PPP agreement. The consortium has been granted the exclusive right to provide airport services at the Pulkovo airport. In 2011–2015, a new international passenger terminal with an area of 145 thousand square meters, passenger and cargo aprons, a hotel and a business center on the forecourt, a complex of Parking lots and other infrastructure of the airport were built and put into operation, as well as the terminal building of "Pulkovo-1" was reconstructed.

The agreement on PPP "Pulkovo" is considered one of the most successful. The project was awarded international awards. In 2014, the International Financial Corporation, as well as the Infrastructure Journal, selected the best projects out of 40 PPP projects worldwide on the basis of their high innovative level and social significance. The Pulkovo airport reconstruction and development project won a silver award in the categories Europe, Central Asia, Middle East, and North Africa.

Case. Construction of Western High-Speed Diameter (St. Petersburg)

Western high-speed diameter is the first intracity high-speed toll highway in Russia. The road length of 47 km passes through the territory of St. Petersburg. At the same time, more than half of the motorway are artificial structures: bridges, overpasses, etc.

The plans of the government of St. Petersburg to build a high-speed road passing through the city, appeared in 1966. However, the work on the project began only in the 90 s, at the same time it got its name "Western high-speed diameter", because the road runs along the Western part of St. Petersburg along the coast. The project was decided to be implemented on PPP terms and even a tender was held to choose a concessionaire. However, the project encountered many difficulties. Due to the crisis of 2008, the agreement on construction and operation with the winner of the tender consortium "Nevsky Meridian" headed by "Basel" billionaire Oleg Deripaska was never signed. As a result, the city authorities built the southern and northern sections of the road by 2011 independently, without the involvement of a private investor.

However, the most difficult from a technical point of view was the Central section, which runs along the coastline. In 2011, the government again announced a tender, which resulted in signing a PPP agreement with the Northern capital highway consortium for 30 years. The consortium includes VTB Capital, Gazprombank and Astaldi (Italy), Ictas Insaat (Turkey) as construction contractors (Inshakova et al. 2018).

The volume of investments in the Central section amounted to 120 billion rubles, of which the private investor invested 70 billion rubles.

Source of return on investment—direct collection of fees from consumers for the use of the object (services).

According to the PPP agreement, the consortium will maintain all sections of the road and charge tolls until 2042. Under the agreement, if the private partner's annual income is less than 9.6 billion, the city budget pays the investor a subsidy to cover the costs incurred.

Technical parameters of the Expressway:

- road category—IA (highway);
- total length of the highway—46.6 km;
- number of lanes—4 to 8;
- maximum speed—110 km/h;
- average intensity →100 thousand cars per day;

PPP in Other Transport Sectors

At the first stage, PPP in the transport industry was only in roads. However, afterward the mechanisms of public-private partnership began to be increasingly applied in other sectors too. At the same time, the volume of investment in projects, for example,

in the railway industry was not inferior to roads. In 2018, Russia signed two major concessions for construction of railway lines: Kyzyl–Kuragino (Eastern Siberia) and Northern Latitudinal Passage (Western Siberia).

Kyzyl–Kuragino is a section of the road more than 412 km, which is to be built for the export of coal from the Elegest Deposit. Its capacity is up to 15 million tons/year. The construction of the road will be fully financed by a private investor who will invest 127 billion rubles. Construction will be carried out in a mountainous area, which will require the construction of 8 tunnels with a total length of 11 km, the construction of 127 bridges with a length of about 16 km. Source of return on investment—direct collection of fees from consumers for the use of the object (services).

The Northern Latitudinal Passage will be built for the export of oil cargo and gas condensate. The length of the section of the Ob–Salekhard–Nadym is 353 km, total investments—113 billion rubles, the Government will provide a capital grant in the amount of 13 billion rubles, the remaining funds will be invested by private investors. It is also expected to attract debt financing. The main work on both projects will be carried out by the state company—"Russian Railways" (in the case of the Northern Latitudinal Passage, Russian Railways is a co-owner of the project company), which in Russia is a monopoly on the transport of goods by rail. The source of return on investment under the project is the availability fee (fixed payments) from the public partner (budget).

Both projects—Northern Latitudinal Passage and Kyzyl–Kuragino —were under discussion for more than 10 years, because the state could not afford to fully finance them. Construction started in fact only with the use of PPP mechanisms.

In addition to the railway industry, PPP mechanisms have started to be used in the port and airport infrastructure. In 2018, a concession agreement for the construction of the Lavna coal terminal in Murmansk (1500 km North of Moscow) was signed. The capacity of the terminal will be 18 million tons/year. The construction will be carried out entirely at the expense of the private investor, who will invest 16.7 billion rubles, the Source of return on investment will be the availability fee (fixed payments) from the public partner (budget).

The next port concession project is expected to be a dry cargo terminal in Taman (Krasnodar region, South).

The first since the Soviet Union times completely new airport was also built using the PPP mechanism. Renova Group, a private investor, built Platov International Airport in Rostov-on-Don, the largest city in the South-West of Russia. The capacity of the airport is 5 million people/year. "Renova" has fully funded the construction of nearly $20 billion. Source of investment return is a direct collection of payments from consumers for the use of the object (service)/other commercial activities.

In addition to classical concessions and PPP agreements, other forms of public-private partnership are actively used in the transport sector in Russia. For example, Moscow buys subway cars under life cycle contracts (LCC) from a private group of companies Transmashholding. These are large contracts for more than 100 billion rubles. Transmashholding supplies subway cars for Budapest (Hungary) under a similar scheme.

Moscow is also actively using this form of PPP as a corporate model of public-private partnership in the implementation of transport projects. According to the approach of the World Bank (the leading analytical center and aggregator of PPP projects in the world), the corporate model of public-private partnership corresponds to the type of contract called "Partial privatization"/"Joint venture", which means the partial sale of equity in a state-owned asset company to a private investor while maintaining state control over the asset of the company ("Project company"/"Special purpose company"). Moscow is building transport hubs through the corporate model as part of the development of the capital's passenger transport system. As of May 2019, 15 contracts worth 110 billion rubles were signed under the scheme. Funds are invested by a private investor. The contracts provide for different sources of return on investment:

- other commercial activities (sublease, advertising, trade, etc.);
- availability fee (fixed payments) from the public partner (budget);
- direct collection of fees from consumers for the use of the object (services).

Conclusion

- Russian transport industry is the most advanced sector in terms of the use of public-private partnership mechanisms. The most capital-intensive PPP projects are also implemented in the transport infrastructure. Initially, PPP mechanisms were used only in road construction, gradually the spectrum of PPP application significantly expanded to include railways, airports, ports, transport hubs, city public transport, etc.
- Since 2018, Russia has been implementing two large-scale National projects—the "Main infrastructure development plan" and "Safe roads". For these two projects alone, 11.1 trillion rubles will be invested in transport projects over six years, of which 3.5 trillion rubles will be extra-budgetary funds. No doubt, these are significant funds for the country, but these plans will not have a strong impact on the PPP market. According to the estimates of the National PPP Center, most of the projects are planned to be implemented through public procurement, i.e., without the use of PPP mechanisms.
- However, since the implementation of transport projects using PPP forms has already proven itself, especially in the road sector, these tools will continue to be used. Russian governors recognize that Federal budget money provided to implement National projects to improve transport infrastructure is not enough. Therefore, regional authorities will have to look for private investors and use PPP mechanisms. As recognized by the Ministry of Eonomic Development of Russia at the St. Petersburg International Economic Forum in June 2019, "more than 90% of the total network of roads in the country are roads of regional importance. The subjects of the Russian Federation are faced with the urgent task of ensuring both the construction of these roads and bringing them to the normative state.

Here, of course, it is necessary to pay attention, first of all, to projects within the framework of public-private partnership".

– We also believe that PPP mechanisms will be developed in different sectors of transport infrastructure. Budget deficits in the regions will encourage the search for new mechanisms to achieve the goals. This will be the main driver for not rich regions. On the other hand, rich regions, such as Moscow, have already gained good experience in implementing multibillion projects through PPP mechanisms, and will continue to move along this path. So, there is enough ground to believe that public-private partnership will develop in the regions regardless of the level of gross-regional product.
– A significant driver for the PPP market will be the new status of Rosatom State Corporation as a Concedent, granted by a special Decree of the Government in 2019. The company is assigned as the curator of the Federal project "Northern Sea route" with total investments of 735 billion rubles, and with dozens of large enterprises in which more than 400 thousand people work, under its control. Therefore, from our point of view, Rosatom will become no less active player in the PPP transport market than Avtodor state company.

We also believe that if Russia takes the decision to begin construction of such large-scale projects as Europe–Western China and Meridian highways, Moscow–Kazan or Moscow–St. Petersburg high-speed railways, they will be implemented through PPP mechanisms.

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