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APPROACH TO RISK ASSESSMENT OF PUBLIC-PRIVATE PARTNERSHIP IN CONSTRUCTION

It is noted that depending on the scope and type of services of the private sector services, there may be many basic models of PPP. The following classification of the main forms of PPP is provided: government contracts with private sector investment obligations (co-financing of the project, its construction and operation); rent (operation, technical re-equipment or modernization of the object); participation in capital (co-financing of share capital, construction and operation of the facility); concession (co-financing, design, construction, including expansion, reconstruction, technical re-equipment, modernization, and operation); production sharing agreement (construction and operation of the facility); contracts that combine different types of works and property relations (co-financing, or co-financing and construction, or co-financing, construction and operation). It should be understood that the above classifications give only a general idea of the models of public-private partnership, which is a very flexible system that depends not only on the legislation of each country, but also the scope, complexity and significance of the project. Most often in practice there are mixed forms that combine elements of different forms of contracts listed above. In order to be able to share risks between the state and a private company in PPP contracts, these risks must be clearly identified. This distribution of risks is significantly different from traditional contracts, where there are many so-called "hidden" risks assumed by the state. In PPP models, private contractors can assume the risks that are within their management. This is especially true for risks that are not controlled by the state. Under the traditional model of the state order for performance of works, the state pays work to the contractor, in

process of performance of works or rendering of services. In the PPP, private businesses can recoup their costs based on different economic models of interaction through tariffs, fees for the use of the facility from physical users, periodic government payments based on productivity, or a combination of these sources. Traditional contracts are usually fully funded by the state from budgets at various levels. Depending on the type of contract, the share of private funding in the PPP varies. Projects with private pre-investment works, maintenance of the object under the contract, can be coordinated as projects of mixed financing taking into account public and private means. Paid concession contracts, where individuals reimburse their costs by collecting fees from natural users of the facility during the term of the agreement, are an example of projects that are fully funded from private sources.

Keywords: state regulation, public-private partnership, construction, regional road network, transport network, socio-economic efficiency

Formulation of the problem. In today's economic environment, world powers, including Ukraine, are increasing investment in road infrastructure. The need for investment growth seems justified, as roads and infrastructure in general are central to economic and social development and are a major factor in economic activity.

Today, all over the world, the role of public authorities in the process of planning, designing, financing and ensuring the functioning of transport is of paramount importance. However, one of the main problems in the transport infrastructure today is the lack of public funds for the construction, modernization and maintenance of the road network. Therefore, in world practice there is a tendency of interest of the government of many countries in public-private partnership (PPP) as a way to attract private funding.

Thus, the main task for the state is to attract investment for the implementation of projects in the road sector.

Analysis of recent research and publications. The work of many scientists, including Bibik N.V., Shcherbinina S.A., Sokha I.Y., Protsak K.V., Sorokina L.V., Kambur O.L., Biba V.V., Karlova O.A., Gritskov E.V., Kononova O.E., Lisun J.V. and many others, is devoted to the study of the development of approaches to assessing the

risks of public-private partnership in construction, the impact on other industries and the economy, identifying its problems and finding ways to solve.

The aim of the study. The purpose of the study conducted in this article is to identify approaches to assessing the risks of public-private partnerships in construction.

Presenting main material. Depending on the scope and type of private sector services, there may be many basic PPP models. The following classification of the main forms of PPP [1, p.87] is given as follows:

- 1) Government contracts with private sector investment obligations (co-financing of the project, its construction and operation);
- 2) Lease (operation, technical re-equipment or modernization of the facility);
- 3) Participation in the capital (co-financing of share capital, construction and operation of the facility);
- 4) Concession (co-financing, design, construction, including expansion, reconstruction, technical re-equipment, modernization, and operation);
- 5) Production sharing agreement (construction and operation of the facility);
- 6) Contracts that combine different types of work and property relations (co-financing, or co-financing and construction, or co-financing, construction and operation).

According to V. Iarochkyn, the following most common PPP mechanisms in the world can be identified depending on the property rights transferred to the private sector [2, p.113]:

- 1) WHO (Build, Own, Operate, Transfer - construction - ownership -operation / management - transfer).
- 2) WTO (Build, Transfer, Operate - construction - transfer - operation / management).
- 3) VGO (Build, Own, Operate - construction - ownership -operation / management).
- 4) WOMT (Build, Operate, Maintain, Transfer - construction -operation / management - maintenance - transfer).

5) DBOOT (Design, Build, Own, Operate, Transfer - design - construction - ownership - operation / management - transfer).

6) DB (Design-Build - design - construction).

7) DBOM (Design, Build, Operate, Maintain - design - construction - management - service).

Ownership of the infrastructure object may be retained by the concessionaire or transferred to the concentrator, depending on the form of the contract, upon termination of the PPP agreement. In the above classification, this is indicated by the abbreviation "T" - transfer ("Transfer").

It should be understood that the above classifications give only a general idea of the models of public-private partnership, which is a very flexible system that depends not only on the legislation of each country, but also the scope, complexity and significance of the project [3, p.54]. Most often in practice there are mixed forms that combine elements of different forms of contracts listed above.

According to the forecasts of the Federal Highway Administration of the United States [4, p.115] the main types of PPP for the implementation of road projects will be:

1) DB - construction of new roads of medium or high capacity, or reconstruction of existing roads;

2) DBOM - construction of new roads on a paid or free basis for physical users;

3) DBFO - creation of toll roads;

4) Concession agreements - commissioning of existing private sector and construction of new toll roads;

5) Agreement on joint development - creation of new roads and increase of transit capacities.

According to representatives of the International Road Federation, the main characteristics of the contractual forms of PPP-projects are [5, p.67]:

1. Combination of several tasks in one contract.

In PPP contracts, the contractor is usually responsible for the design, construction, maintenance and operation of roads. In the traditional approach to these tasks are separate contracts.

2. Relative autonomy for the contractor.

In PPP-contracts, in contrast to traditional schemes, only the functional and qualitative characteristics of the object are indicated as the results of the project implementation, and not specific design decisions. This leaves considerable freedom to the contractor in planning and organizing its activities.

3. Specific risk allocation mechanisms.

In order to be able to share risks between the state and a private company in PPP contracts, these risks must be clearly identified. This distribution of risks is significantly different from traditional contracts, where there are many so-called "hidden" risks assumed by the state. In PPP models, private contractors can assume the risks that are within their management. This is especially true for risks that are not controlled by the state.

4. Procedure for reimbursement of expenses.

Under the traditional model of the state order for performance of works, the state pays work to the contractor, in process of performance of works or rendering of services. In the PPP, private businesses can recoup their costs based on different economic models of interaction through tariffs, fees for the use of the facility from physical users, periodic government payments based on productivity, or a combination of these sources.

5. Joint or private funding.

Traditional contracts are usually fully funded by the state from budgets at various levels. Depending on the type of contract, the share of private funding in the PPP varies. Projects with private pre-investment works, maintenance of the object under the contract, can be agreed as projects of mixed financing taking into account public and private funds [6, p.228]. Paid concession contracts, where individuals reimburse their costs by collecting fees from natural users of the facility during the term of the agreement, are an example of projects that are fully funded from private sources.

The above characteristics cover all types of contracts, from the implementation of contracts based on the maintenance and management of road infrastructure, to schemes for the implementation of paid concessions. The term of the contract has not been included in the list of key characteristics, but the duration of PPP contracts can be set

from 5 to 80 years, depending on the required investment, assets to be built, operation and many other factors.

One of the key features of PPP contracts is the identification of project risks. Since the main incentive of the contractor is payback and profit, according to economic laws for clear control of costs it is necessary to identify and manage risks. To decide to assume certain risks in PPP projects for the creation of road infrastructure, knowledge of the risks and their consequences is essential for the contractor and even more so for private investors in the project.

Thus, before the risks are shared among all participants, they must be identified. This process makes PPP projects most effective, as it helps to identify hidden risks and, consequently, the associated losses. Identifying all risks makes it possible to control them and take precautionary measures to neutralize or mitigate them. Risk identification is traditionally based on statistical analysis and probability assessment. This process identifies both acceptable risks and risks that must be neutralized or transferred by one of the parties to the contract.

Despite the fact that the risks for construction works are described in great detail, for the maintenance of road facilities in the process of their operation is insufficient systematization of risks [7]. In traditional contracts, insufficient consistency in risk control can lead to:

- Operation of a temporary lag between road works and works on drawing a road marking that leads to increase of risks of traffic;
- There are cases of laying asphalt concrete without taking into account possible loads in the future, exceeding the laid bearing capacity;
- Inconsistency of road works with the organization of traffic, and other risks.

Thus, PPP contracts through risk analysis give the contractor an incentive to increase productivity and reduce costs, which leads to improved quality of maintenance and operation, as well as the realization of hidden reserves. At the same time, the main difficulty in PPP contracts is to determine the optimal balance of risks for all parties, and to establish the necessary incentives for the contractor to achieve the desired result by the grantor.

For example, in PPP projects related to projects such as the operation of bridges and overpasses, it is impractical for the contractor to take full responsibility for these facilities, as in fact he does not have the ability to fully control the infrastructure created decades ago. Therefore, the principle of "covering" the liability of the contractor in this area, according to the type of franchise mechanism in insurance contracts, can be adopted. This approach does not release the contractor from liability, but gives him an incentive to inspect bridges and repair work to avoid or delay serious damage.

The risks transferred to the private sector are primarily related to the design and construction stage, maintenance, as well as operational and revenue recovery risks. All risks, with the exception of the return on investment risk, which remains entirely with the management company, are transferred to the contractor and the operator.

Another feature that characterizes PPP projects is the emergence of favorable conditions for innovation, whether technical or organizational. Thus, the University of Technology of Queensland shows the PPP model as a factor of innovative development [8, p.269].

Innovations in the construction of road facilities can be successfully used with:

- 1) Building long-term relationships for the life cycle of the object;
- 2) Applying an integrated approach to road construction instead of using traditional "one-off" contracts with contractors;
- 3) Redistribution of the total amount of risks between project participants;
- 4) Creating opportunities for contractors to apply non-standard modern methods of solving problems.

In the long run, the laws of a market economy force the contractor to strive to reduce costs and increase efficiency. Thus, the management of projects that were previously funded by the state, often for political reasons, move into a conscious area of economic relations. This plays an important innovative role. For example, in the fight against rising energy prices. Contractors, based on economic considerations, come to innovations such as energy-saving technologies.

It should be remembered that any innovation requires a significant period of time: from the first research in this area, in the current process of development and

discovery, to the commercial operation of a new product or process. Due to their duration, PPP projects allow the contractor to recoup its investment in research and development. As a rule, the term of the contract allows to complete innovative developments during the whole life cycle of the project.

In PPP projects for operation and maintenance of road infrastructure, planning and integration of efforts throughout the life cycle of the facility also leads to increased efficiency in terms of increasing productivity and return on investment through the implementation of innovative technical solutions.

Another advantage of the PPP model in the road sector in terms of innovation is the direct interaction between the concessionaire and road users. Through a system of user surveys and other tools, according to which customers can submit complaints and suggestions, the contractor has a valuable additional resource to improve service efficiency.

Conclusions. Extremely interesting international experience in public control over long-term contracts of PPP projects. When drawing up a model of government interaction with the private sector, the government must identify and secure the interests of its taxpayers, requiring accountability from the management company, while not driving its activities in a strict framework, limiting motivation to apply innovative approaches to the project. Concession agreements typically consist of several hundred pages and may include additional documents (such as detailed performance standards).

Assessing the general world experience in the field of regulation of relations between the public and private sector, we can identify the following necessary provisions and requirements for the contract with the concessionaire:

- 1) The party responsible for financing the construction or reconstruction of the road;
- 2) The procedure for making a decision on the scope of the project and the timing of its implementation;
- 3) Necessary indicators from the toll road and its operating company (for example, safety, maintenance, snow removal and other requirements);
- 4) Possibilities of change of provisions in the contract without oppression of interests of its parties are provided in advance;
- 5) Liability of the parties for breach of contract;

- 6) Regulations on early termination of the contract;
- 7) State guarantees provided to the private sector during the project implementation;
- 8) Fixed fare restrictions for physical users and possible restrictions on the rate of return for the management company.

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