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## Construction of large commercial real estate objects at life cycle stages under risk conditions

The paper deals with the identification of the main features of the construction of commercial real estate objects and the activities of construction enterprises. The main tendencies and approaches to be used in the construction of multifunctional large real estate objects (shopping centres) in the housing market are revealed. The following basic scientific methods were used in the research: “dialectical”, “systemic”, “dynamic”, “variant”, “balance”, “modelling”. The information base for the analysis of the given problem became literary sources on the activity of construction organizations, scientific papers, monographs. Scientific methods such as description and classification served as the methodological basis for the paper. For the effective work of enterprises in the construction of such objects in the housing market it is necessary to create a set of legislative, legal and economic regulations, carrying out various measures on the production, which are aimed at the construction of such complex and large homogeneous objects in the form of regional groups in the regions, which most fully take into account the interests of each participant in the process and allow to influence all production processes in the conditions of flow forms of organization and management of material production at all stages.

**Keywords:** peculiarities of construction, commercial real estate objects, types of production process, risks, life cycle, participants of construction of commercial non-residential real estate objects

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### PROBLEM STATEMENT AND RESEARCH

The implementation of national projects “Affordable Housing” in each region of Russia is solved differently, based on their territorial and sectoral specifics of its development. One of the most important reasons for the regionalization of Russia is different prospects for the economic and social development of each of the regions. They are forced to rely on their own basic production resources and their capabilities, which leads to the differentiation of many regions in terms of the level and pace of their development and determines their specialization<sup>1</sup> [1, 2].

At the same time, there is a common problem — in what conditions this development should be carried out and how to ensure the comfort of living of the population in this region. One of the directions of such development is the creation of various commercial real estate facilities, the main of which are: office; retail; warehouse; industrial; gas stations; garages and parking lots, underground and multi-storey parking lots; multifunctional commercial real estate. The existing peculiarities of the construction of such facilities are characterized by the spatial fixation of their construction products, the presence of a variety of production links, the dispersion of objects and their remoteness from material and technical bases, the duration of life cycles when creating final products. In addition, the system of commercial real estate objects should provide for their placement in places of concentration of consumers of these products in a specific territory of the region, with preference given to large commercial real estate objects, for example, large shopping malls (Fig. 1).

At the same time, the influence of the external and internal environment on their construction process leads to the formation of various types of risks that

significantly affect all stages of their life cycles, as well as the stability of the functioning and development of all production processes in space and time.

These features require their own consideration and create all the necessary conditions and prerequisites for their construction on the basis of the formation of regional groups of commercial real estate for various purposes, as well as the transfer of their construction to production-line forms of organization of material production. In this regard, it can be concluded that in modern conditions of development of construction production, there are objectively a number of features associated with the construction of regional groups of commercial importance. They, as a rule, determine the external conditions of the activity of construction enterprises, the type of organizational and technological situations, as well as

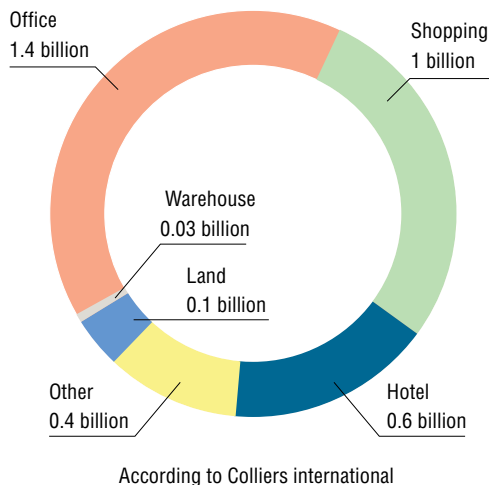


Fig. 1. Distribution of investments by commercial real estate segments, USD

- the specifics of their functioning at all stages of the life cycle. That is why the importance of accounting for them is the basis for the use of modern technologies, forms of organization and management at all stages of the life cycle in order to reduce them in space and time, especially in risk conditions [3–5].

## RESULTS

The analysis of modern construction production in the housing market in Moscow and other regions of Russia showed the presence of positive dynamics in the commissioning of commercial real estate, the main type of which are multifunctional trade centres. At the moment, as residential facilities are being commissioned, the number and production capacity of commercial real estate facilities themselves is growing, primarily multifunctional shopping centres. This ensures the development of industrial and social spheres and their infrastructures, which contributes to the formation of not only individual residential neighborhoods in cities, but also satellite cities themselves. For example, a large developer of the CH "Thermodom" (Penza) built separate commercial facilities for the needs of residents of the satellite city of Penza, designed for 125 thousand residents, such as shopping multifunctional centres: "Raduzhny", "Auchan" (Fig. 2, 3).

The construction of such complex commercial real estate objects in modern conditions depends on the coordinated work of all sections of investment and construction activities of their construction and enterprises, which determine the presence and specifics of the stages of the life cycle of the real estate object and the nature of the functioning and development of all types of production processes on them.

The main participants include:

1. Investors who act as creditors, customers, buyers, etc.
2. Designers, manufacturers and suppliers of basic production resources (material, technical, technological, etc.).
3. Developers who determine the location and territory of the construction of regional groups of residential and commercial real estate.
4. Construction and installation organizations that convert production resources into commercial real estate. They also combine the activities of investors, customers, designers, suppliers of material and technical resources in a rational combination of their interests among themselves.
5. Innovative organizations that develop scientific and technical innovations and innovations for the purpose of their subsequent use in production processes for the creation of fixed capital.



Fig. 2. "Raduzhny" multifunctional shopping centre in the satellite city of Penza



Fig. 3. "Auchan" multifunctional shopping centre in the satellite city of Penza

6. Logistics firms that ensure the process of moving and concentrating all types of resources in production processes and bringing goods and services to consumers in the housing and commercial real estate markets.

7. Transport organizations. In addition, any enterprise in the construction industry has a certain organizational and technological potential, which it uses in the process of its activities in order to satisfy its interests. At the same time, each enterprise strives to minimize its costs and maximize its final result (volume of products, profit) with the shortest possible time for their receipt and manufacture, which directly affects the entire course of development of the stages of the life cycle of commercial real estate objects. The life cycle of such objects is the time from the moment when the need for their creation in a specific territory of the region is justified until the moment when it is impractical for their further operation in space on this territory.

The construction system, as a rule, is open and subject to the influence of the external environment, which is negative at the moment. This does not allow this system and all its participants to fully realize their accumulated potentials and achieve the desired results [6–8].

At the same time, the process of formation of uncertainty and risk factors under the influence of the external and internal environment is observed in the construction system, which leads to the fact that the production processes of the construction of commercial real estate (multi-functional shopping centres) significantly deviate in time and space from the normal course of their sustainable development. The sustainability of the development of production processes is determined by the presence and rational combination of basic, auxiliary and service processes, the characteristics of which are given in Table.

In addition, it is necessary to consider the main sources of the formation of various uncertainty factors and ways to take them into account when evaluating the effectiveness of construction projects for the construction of large commercial real estate. There are three main ways to assess the accounting of uncertainties [9, 10]:

1. Checking the sustainability of the construction project.
2. Adjustment of project parameters and production, economic norms at all stages of the life cycle of the facility construction.
3. Formalized description of uncertainty.

"Uncertainty" should be understood as incompleteness or inaccuracy of information about the conditions for the implementation of the entire investment project at all stages of the life cycle. At the same time, the uncertainty associated with the possibility of the formation of complex, unstable organizational and technological situations and consequences is characterized by the concept of risk. Construction projects for the construction of large commercial real estate objects

*Characteristics of production processes in the construction of commercial real estate*

Name of the production process	Characteristics of the production process	Types of main works
Main	A part of the finished final product is created, the objects of labour are transformed into finished products characteristic of construction	Underground works, above-ground works, finishing works, construction and installation works, special works
Supportive	The final product is created, which is not typical for the main process, but contributes to the production of the main product on it	Repair of construction machinery, quality control of the object of labour, manufacture of tools for their own needs, repair of fixed assets, etc.
Attendant	Conditions are being created for the sustainable development and functioning of the main and auxiliary processes	Warehousing and transportation of raw materials, materials and products, implementation of technical control. Creation of production infrastructure (transport communications, engineering networks)

during their implementation are characterized by the following types of uncertainty and risks:

1. Risk associated with the instability of economic legislation and the current situation, investment conditions and the use of profits.
2. Foreign economic risk (the possibility of imposing restrictions on trade and supplies, closing borders, etc.).
3. Uncertainty of the political situation, the risk of adverse socio-economic changes in the country or region.
4. Incompleteness or inaccuracy of information on the dynamics of technical and economic indicators, parameters of new equipment and technology.
5. Fluctuations in market conditions, prices, exchange rates, etc.
6. Uncertainty of natural and climatic conditions, the possibility of natural disasters.
7. Production and technological risk (accidents and equipment failures, manufacturing defects, etc.).
8. Uncertainty of the goals, interests and behavior of the participants.
9. Incompleteness or inaccuracy of information about the financial position and business reputation of participating enterprises (the possibility of non-payments, bankruptcies, failures of contractual obligations).

Therefore, the system must respond to all these changes accordingly in full. It is advisable to reduce the negative impact of these factors of uncertainty and risk of the external environment on the basis of the transition of the construction of such large complex shopping centres of the same type in the form of regional groups; the formation of flexible organizational structures; risk management at the enterprise; the use of modern technologies and forms of organization in all production processes, taking into account the specifics of each stage of the life cycle of the facility real estate.

## CONCLUSION

According to the results of the conducted analysis of foreign and domestic experience on this problem the following main conclusions are revealed:

1. It has been established that the development of commercial real estate objects is characterized by the presence of a number of objective features that should be taken into account in their construction in the form of regional groups in specific territories of the housing market. Consideration of these features allows to establish the degree of compliance of the internal environment of commercial real estate with the external conditions of their activity and to link the interests of all participants in the housing market in a rational combination of them among themselves [11–13].
2. It is established that the most effective form of production activity of construction enterprises is the implementation of options for integrated management of commercial real estate objects in the implementation of construction projects at all stages of the life cycle on the basis of providing them with the required organizational and technological reliability.
3. Depending on the influence of external and internal environment factors, the presence of existing features of functioning and development of commercial real estate objects and construction organizations to implement the process of formation of various organizational and technological mechanisms in the main directions (sectoral, territorial, investment and innovation) of commercial real estate development [14].
4. It is established that the construction process of multifunctional commercial property is influenced by a large number of factors of external and internal environment, which should be identified and taken into account in further research.

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### Особенности возведения крупных объектов коммерческой недвижимости на этапах жизненного цикла в условиях риска

В статье рассматриваются вопросы выявления основных особенностей возведения объектов коммерческой недвижимости и деятельности строительных предприятий. Выявлены основные тенденции и подходы, которые необходимо использовать при возведении многофункциональных крупных объектов недвижимости (торговых центров) на рынке жилья. При проведении исследования были использованы следующие основные научные методы: «диалектический», «системный», «динамический», «вариантный», «балансовый», «моделирование». Информационной базой для анализа данной проблемы являются литературные источники по вопросам деятельности строительных организаций, научные статьи, монографии. Методологической основой при написании статьи послужили такие научные методы, как описание, классификация. Для эффективной работы предприятий при строительстве таких объектов на рынке жилья необходимо создание комплекса законодательных, правовых и экономических нормативов, проведение различных мероприятий на производственных процессах, которые направлены на возведение сложных и крупных однородных объектов в виде региональных групп в регионах, что наиболее полно учитывают интересы каждого участника процесса и позволяют влиять на все производственные процессы в условиях поточных форм организации и управления материальным производством на всех этапах жизненного цикла объекта недвижимости с целью его сокращения.

**Ключевые слова:** особенности строительства, объекты коммерческой недвижимости, виды производственного процесса, риски, жизненный цикл, участники возведения объектов коммерческой недвижимости

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