Modern approaches to assessing the efficiency of urban development projects in the context of the formation of a comfortable urban environment

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Abstract. Nowadays, authorities at various levels, urban planners, architects, residents are rethinking and forming new approaches to urban planning in the context of sustainable development and the pursuit of a high-quality urban environment. The paper discusses the main methodological approaches to assessing the efficiency of urban development projects at the present stage. Attention is paid to the documents of strategic and territorial planning, methodological documents in the field of urban development assessment in the context of creating a comfortable urban environment, the main technical and economic indicators for substantiating urban development projects are given. The efficiency of urban development projects in the context of the formation of a comfortable urban environment is proposed to be considered in three areas: commercial, budgetary and socio-economic. The paper systematizes the characteristics of the types of efficiency and their criteria, provides formulas for calculating the indicators of commercial efficiency (income and expenses), the composition of costs and revenues of budgetary efficiency, describes the social effects in the implementation of urban development projects.

1. Introduction

In the world of high technology, educational and professional opportunities, a person seeks to make his life better and more comfortable. And since most of the country's population lives in cities - 70% [1], the city must meet emerging needs and satisfy existing and future needs of residents. Hence the attempt of authorities at various levels, urban planners, architects and just residents to formulate new approaches to urban development in the context of sustainable development and the pursuit of a high-quality urban environment.

In this regard, methods of assessing the efficiency of urban planning measures at the present stage deserve special attention, both for government at all levels and for the participants in the investment process themselves: urban planners, developers, architects, and city residents. The objective complexity of such an assessment is associated with the uneven development of regions and cities at the moment, the lack of feedback from the population of regions and cities, and the need to work not only with the creation of new settlements, but also with the restructuring of existing urban spaces with all their functioning features. Modern urban development projects are complex, sometimes ambiguous, requiring knowledge of various fields, including professional skills in urban planning and architectural design, an understanding of social orientation, economic significance and investment attractiveness of
projects. The potential feasibility, as well as the quality of life of cities, regions and the country as a whole, will depend on the reliability of the project assessment.

2. Materials and methods
Urban planning activities are aimed at meeting the needs, achieving a balance of interests of various entities, ensuring the investment attractiveness of the territories and improving the welfare of the population [2]. So, the goal of the spatial development strategy of the Russian Federation for the period up to 2025 is to ensure sustainable and balanced spatial development of the Russian Federation, aimed at reducing interregional differences in the level and quality of life of the population, accelerating the rate of economic growth and technological development, as well as ensuring the national security of the country [3].

Proceeding from this, in order to assess the potential of the territories economically, it is necessary to identify their comparative advantages by conducting a multivariate assessment of the land in question and climatic conditions, transport scales, population size taking into account its growth dynamics, types of population employment, economic diversification, technological breakthroughs, specialization, attraction qualified personnel, resource capabilities and taxation systems, etc. The goals and indicators of urban planning projects should be compared with target indicators of the development of the country and its entities.

Urban development entities with their economic interests in relation to specific territories and real estate are involved in the process of creating and implementing the project. In this regard, urban development should be considered as a system that provides a balance of economic interests of the parties [2]. Planning for the development of specific territories of the Russian Federation is reflected in the territorial planning documents that take into account environmental, economic, social and other factors in the implementation of urban development activities [4]. Documents of territorial planning and urban planning zoning of the Russian Federation are given on the official website of the Federal State Information System of Territorial Planning [5], the structure and filling of documents of which are shown in figure 1.

Figure 1. The composition of the documents of the Federal State Information System of Territorial Planning.
Modern urban development projects are focused on creating comfortable living conditions for people. The main indicators of a modern comfortable urban environment and methods for their calculation are traced in the methodology for calculating the urban environment quality index [6], which takes into account key modern principles of urban development. The methodology has 36 indicators, divided into six spaces (housing and surrounding areas, road network, green spaces, public and business infrastructure and surrounding areas, social and leisure infrastructure and surrounding areas, city-wide space) and six criteria (safety, comfort, environmental friendliness and health, identity and diversity, modernity and relevance of the environment, management effectiveness). The index allows analyzing the priorities of urban areas and identifying their problematic aspects that can be resolved in urban projects. The index is based on: priority of pedestrian accessibility, the possibility of varied leisure activities and minimizing the time spent on travel to work, a variety of types of public spaces in the city, and a variety of accessible infrastructure.

When assessing urban planning measures, it is necessary to take into account the modern view on the assessment of the urban environment, which is reflected in the standards for the development of territories, including foreign experience in urban planning [7]. Along with safety standards and standards of density characteristics (density of residential buildings and population density), projects should take into account the connection of residential buildings with public spaces, potential life scenarios of citizens: jobs, coworking, educational environment, etc.

Nowadays, at the legislative level of the Russian Federation (the Ministry of Construction of the Russian Federation), a standardized base for the integrated development of territories is actively being developed (and is planned to be completed by 2021), the main areas of which are: the development of free territories for housing construction, the development of territories of residential and multifunctional buildings, landscaping open public spaces. The principles of the new Standard include: functional diversity, compact and dense development, safety and health, comfort of movement, comfortable housing.

The conditions for effective urban development of the territories are: investment attractiveness of the territories, budget self-sufficiency of the territory, a high level of quality of life, industrial and technological safety [8,9,10]. The economic assessment of urban development projects is based on an analysis of its main technical and economic indicators: area, building area, building density, population density, housing density, weighted average number of floors, the length of external engineering networks, pavements. Also, in modern market conditions, one should take into account the types and classes of real estate being built, the availability of infrastructure, transport accessibility, environment, etc [11,12].

3. Results

For successful implementation, the urban development project must have an investment attractiveness for investors, which is identified by assessing the commercial efficiency of the project. However, commercial efficiency is not the main and sufficient condition for the implementation of the project. In addition, budgetary and social efficiency should be considered. Moreover, the latter is usually called the “socio-economic” in the conditions of a market economy. That is, it can not only have a positive effect for society as a whole, but also fully or partially pays off during the operational phase of the project (figure 2).

The possible cost structure of the investor for the implementation and operation of the project can be represented as follows:

\[ I = E_{terr} + C_{con} + E_{inf} + E_{eng.inf} + E_{transp.inf} + E_{land} \] (1)

\( I \) – investments;
\( E_{terr} \) - expenses for the preparation of the territory (registration of rights to the land plot, rental payments, etc.);
\( C_{con} \) - the cost of construction of facilities for various functional purposes (residential, administrative, shopping and entertainment, industrial, etc.);
Es.inf - expenses for creating/developing social infrastructure (schools, kindergartens, healthcare and sports facilities, culture, etc.);
Eeng.inf - expenses for creating an engineering infrastructure (construction of engineering structures, payment for connection and construction of engineering networks);
Etransp.inf - expenses for construction and reconstruction of the transport infrastructure.
Eland - expenses for landscaping.

\[ O = T + U + F + R + M \]  

O - operating costs;
T - taxes and insurance payments;
U - utility bills for the maintenance of the object;
F - facility maintenance fee;
R - rental payments for land;
M - the cost of maintenance and overhaul.

**Figure 2.** The efficiency of urban projects in the context of creating a comfortable urban environment.
Based on formulas 1 and 2, it is possible to calculate the unit cost of construction and operation per capita.

Investor income from the sale and operation of real estate is calculated by the formula:

\[
\text{In} = \text{Ins} + \text{Inr} + \text{Inprod} + \text{Inserv}
\] (3)

\[
\text{In} - \text{income;}
\text{Ins} - \text{income from the sale of real estate;}
\text{Inr} - \text{income from the rental of real estate;}
\text{Inprod} - \text{income from production activities;}
\text{Inserv} - \text{income from the provision of services.}
\]

The costs of the project implementation can be carried out both from private investments and in whole or in part from the budgetary funds of the budget system of the Russian Federation. At present, public-private partnerships have become particularly relevant as an effective way to solve socially significant problems on mutually beneficial conditions for private and public investors.

In addition to the costs of the project implementation, the budget of the Russian Federation incurs costs during the operational phase of the project: the development of the urban environment and the maintenance of urban infrastructure, the development of health care, education, culture and sports, safety and social protection of the population.

Budget revenues are observed due to regular tax flows (payment of value added tax, income tax, property tax, personal income tax, land tax) and one-time budget revenues.

Social effects in the implementation of urban development projects depend on measures to change the quality of the urban environment, including provision of potential jobs, development of a network of social infrastructure, environmental conditions, etc., and can be assessed by assessing indicators of the quality of the urban environment. When assessing socio-economic efficiency, first of all, the number of people who are provided with material benefits, social security (in health care, education, culture, sports, etc.), jobs and an appropriate standard of living is calculated. To calculate social effects, the level of deviations from socio-economic indicators during the implementation of the project is estimated (deviation in the level of housing, health care, educational services, etc.). According to the calculation results, social effects are not always positive for the population (for example, harm from a large enterprise is noticeable for the environmental situation). In this case, the conditions for the implementation of the project should be adjusted.

Achieving planned high indicators of the three types of project efficiency leads to a consensus in the economic interests of participants in urban development, which creates a multiplier effect on their joint activities, expressed in the capitalization of territories (the investment climate is improving, the cost of real estate and rental rates of both residential and commercial real estate are increasing), increased budget revenues and positive social effects.

4. Conclusion

A modern assessment of an urban planning project involves its multifactorial assessment, taking into account current regulatory and methodological documents, and standards in the field of urban planning. The implementation of the urban development project and its assessment may be complicated by the lack of project targets, the fragmentation and incompleteness of the project data, contradictions in the calculated and theoretical parts, lack of consensus of interests of the main project participants and synchronization of their activities in time and space. The calculated efficiency should include social indicators. Therefore, the synchronization of the efforts of participants and orientation towards achieving not only high indicators of economic efficiency, but also public (socio-economic) and budget ones are especially important. The multiplicative effect of simultaneous increase in three areas of efficiency will be expressed in increasing the investment attractiveness of the territory, improving the business activity of the quality of life of the population.
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