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# Analysis of the Development Management System of Public Spaces of Penza as a Mechanism of Forming a Comfortable Urban Environment

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**Abstract.** The development of a modern city is unthinkable without the reconstruction of dilapidated or construction of new buildings, the modernization of existing and the creation of modern territories and public spaces in order to increase the attractiveness of Russian settlements. It has been revealed that modern trends in the development of the urban environment are aimed at overcoming archaic associations, shaping the environment, taking into account the needs of residents. However, despite the implementation of various federal programs and regional subprograms developed on their basis to improve the quality of life of the Russian population, in each individual city in one degree or another there will be a lag behind the ideal model of comfort in the urban environment.

The article presents the results of a survey of the Penza city territory. Monitoring the general state of quality of the urban environment and indicators of housing construction made it possible to identify the main problems of non-compliance with modern safety requirements, environmental friendliness, accessibility and aesthetics. Microdistricts of the city with a high, medium and low assessment of the quality of the urban environment were identified. In the course of the study, comparison of the obtained results with a more ideal model of the balance of the territory of the microdistrict has identified specific problems that reduce the overall assessment of the quality of the urban environment of Penza.

The identified weaknesses in the management of the development of the city territory require the development of a system of measures aimed at improving the quality and increasing the comfort of the urban environment.

## 1. Introduction

Please note that the first paragraph of a section or subsection is not indented. The first paragraphs that follows a table, figure, equation etc. does not have an indent, either.

The goal of the territory managing of any city in the country is continuous improvement of the quality of the population's life. This means: providing citizens with high-quality housing and jobs, creating an uninterrupted system of engineering structures (facilities) and communications, ensuring human security in the city as in the social structure of increased risk, and in general creating a comfortable living environment for people [19, 20].

Due to the increasing degree of urbanization of the population of Russia and the rapid development of cities, the question of the quality of life of the population in them is becoming ever more acute, the lack of which is expressed in an increasing density and randomness of development, deterioration of



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infrastructure facilities, environmental pollution of urban and suburban areas, the deterioration of the transport network and others.

## 2. Literature review

Public space is currently understood as «a certain urban area formed due to historical, cultural, social and other characteristics created for public use» [2]. It is equally accessible to all residents of the city. It is important to observe the principles of strategic planning for the development of a city during the developing projects for planning settlements and their districts. It should be an integral and harmonious system of interconnected elements and zones of the city (social and cultural centers, residential, landscape and recreational areas, industrial zones), which would ensure the maintenance of the necessary territorial proportions, the formation of favorable conditions for economic activities and social development in the city, the most rational using of its resource potential, which in general will allow creating a comfortable urban environment [13-17].

Among the main directions of the study of urban areas for decision-making to reduce the imbalance of planning of public space fundamental one is the analysis of existing problems and situations in terms of identifying the weaknesses of the development of the city.

In developed countries, the modern direction of urban development in the organization of the urban environment is to maintain a balance of interconnected elements: acceptability – the creation of urban development projects through social integration; construction of eco-friendly and energy efficient buildings; accounting for long-term housing affordability.

Distinctive features of a city with dense buildings in addition to ensuring easy accessibility to social facilities and public service areas are the creation of a high-level transport network of the city, ensuring the optimization of population movement, increasing energy efficiency and safety of city residents. It should be noted that the main direction in the modern transformation of cities is the development (or creation) of multifunctional public spaces that form the high quality of life of the population in the city, ensuring the performance of the necessary functions (work and rest, production and movement, trade and social actions).

## 3. Formulation of the problem

Accounting for disproportions and imbalances in the organization of urban space is one of the main tasks in the practice of strategic planning of socio-economic development and ensuring the security of the territories of Russia. The development of urban land and its character determine not only the current impact on nature, but also lay the impact of human activity on the environment and its individual components for a long period. Therefore, the following directions of the construction industry greening are so important. This may be central of solving the problem of resource conservation [6]:

- conducting voluntary environmental certification of newly constructed capital construction projects;
- ensuring compliance with «green building» standards;
- creation of buildings with high technical and economic indicators to ensure comfortable and safe living conditions for citizens.

## 4. Theoretical part

Among the factors that determine the nature of the modern Russian city, dominates the perception of urban space. Large cities are associated with dense, multi-storey buildings, underreporting to create aesthetic qualities of the environment, ignoring the psychological preferences of citizens in relation to urban areas, routes, objects of social and historical significance. Modern trends in the development of the urban environment are aimed at overcoming archaic associations, shaping the environment, taking into account the needs of residents.

In the course of systematization of the conceptual apparatus of the term «urban environment» in the context of the urban environment management process, it was revealed that there are many approaches to the definition of this concept: geographical, urban planning, land management, marketing, sociolog-

ical, ecological, economical. Combining all these approaches, we can say that the urban environment is the environment within the city's territory, i.e. a set of man-made objects that occupy the main part of the city (buildings, streets, squares, underground passages, stadiums, television towers and other facilities); components of the environment (air, surface and groundwater, soil, sunlight); natural and man-made objects (urban forests, parks, gardens, green areas, protective zones, water bodies) and natural objects (natural monuments). The quality of the urban environment is determined by a combination of factors that directly characterize the state of the city, which it is advisable to divide into external (environment, convenience of geographical location, area occupied, intensity of economic flows) and internal (landscape-compositional, environmental, transport, social, economical, historical, cultural and architectural factors).

The role of the urban environment in the municipal system as the material basis of the city is seen in providing the potential for sustainable development of the city including a large number of objects that are in municipal ownership [1]. At the same time, the main importance of urban spaces is laid by combining organizational and social design and creating the necessary infrastructure [4].

It is known that the main role in the regulation and development of the city, i.e. in its strategic planning, is played by the municipal authorities. The strategic planning plan of a city or region is aimed at improving the competitiveness of the city as a whole as a place to live, work, rest and other areas of social and economic activities of people. It should be noted that here it is primarily meant the creation of such «agglomerations» of construction, transport, natural recreational and other objects of the urban environment, which will create conditions for comfortable living of the population and will be the impetus for the further development of the territories of the municipality.

However, it often happens that the builder's and developer's functions are divided into the development and implementation of development projects and improvement of the city's territories, which negatively affects the integrity of the projects planned for implementation and the division of the city's public spaces into separately functioning facilities. Accordingly, the human factor in the design of the urban environment becomes unrecorded. As for the financing of such projects, there is a different participation of budgets of all levels in their implementation, depending on the scale of activities [5, 12, 17].

## 5. Practical part

As part of this study, monitoring of the general state of the quality of the urban environment and indicators of housing construction as the main component of the urban environment of Penza was carried out.

The quality of the urban environment and the balance of housing development were assessed by the method of expert panels [3]. The assessment was carried out according to the results of field observations and comparisons with regulatory requirements. The territory of the of Penza city was divided into 173 microdistricts - public spaces, and anthropogenic and natural-anthropogenic objects of microdistricts and components of the natural urban environment were evaluated on a scale from 1 to 10.

The criteria for evaluating man-made objects include:

- building typology;
- condition of buildings, constructions, structures;
- compliance with fire and sanitary standards;
- condition of the local / public territory;
- the presence of various public institutions (kindergarten, school, shops, health facilities, etc.);
- the presence and condition of roads, pedestrian sidewalks, bridges.

The criteria for evaluating the components of the natural urban environment include:

- microclimate condition;
- state of relief;
- manifestation of natural phenomena: flooding during spring floods, etc.

The criteria for evaluating natural-anthropogenic objects in microdistricts include:

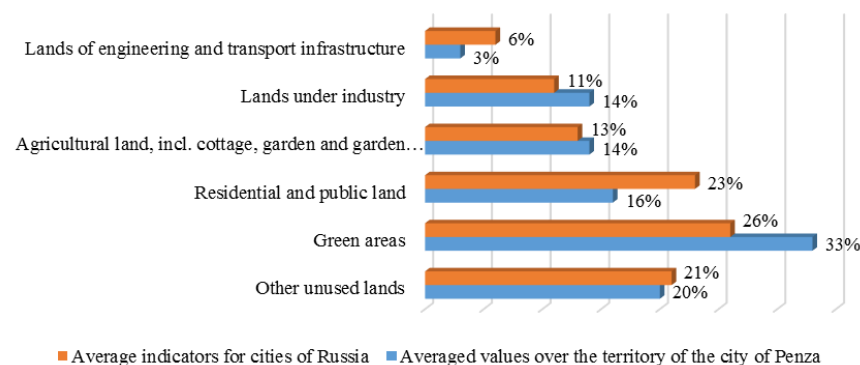
- the presence and condition of the park, garden, urban forest;

- the presence and condition of the water body;
- the presence and condition of undeveloped territory.
- In the course of the study, microdistricts with high, medium and low quality assessment of the urban environment were identified. It is determined that:
  - 8-10 points were not received by any microdistrict. Some discrepancy to the modern requirements of the quality of the urban environment was revealed;
  - 7-7.99 points were received by 11 neighborhoods. Elements of complexity were revealed among the positive aspects, negative ones include insufficient number of parking spaces, insufficient insolation of closely located buildings, insufficient accessibility for non-mobile citizens;
  - from 5 to 6.99 points were received by the most of the neighborhoods (114). Not livability and complexity of arrangement of house territories, remoteness from the most frequently visited organizations, etc. are revealed.
  - less than 5 points were received by the remaining 48 microdistricts. significant deviations from the requirements for the quality of the urban environment were revealed. Basically it is villa quarter, garden arrays and the private sector.

In general, the results of the study can be presented as follows:

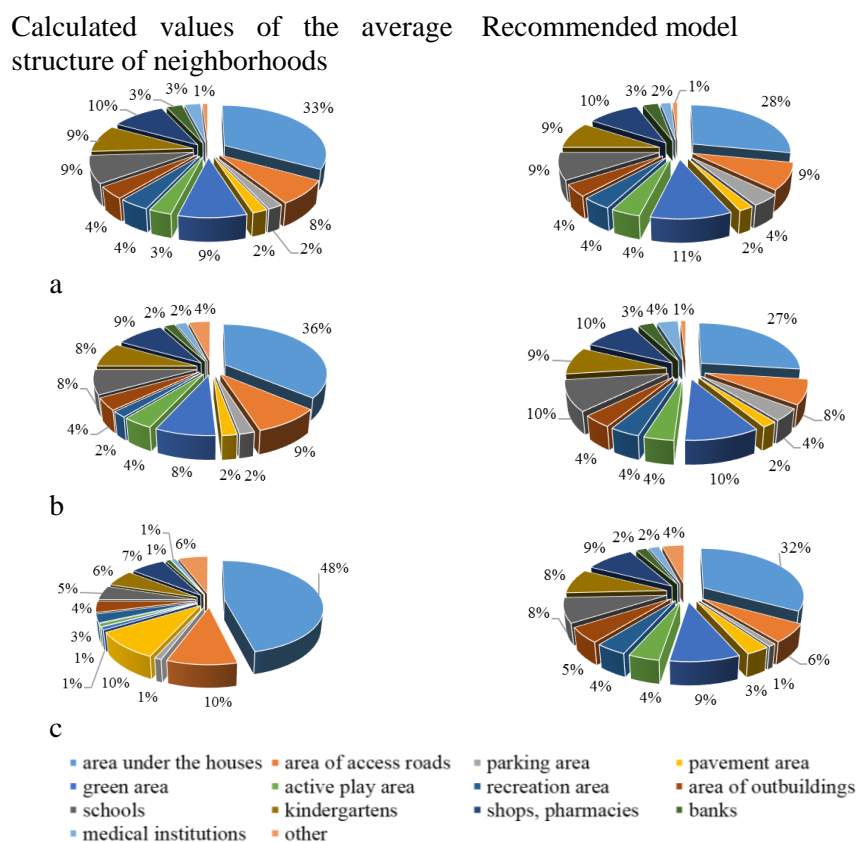
- neighborhoods with high and higher than average – 9%;
- neighborhoods with an average rating – 24%;
- low-grade neighborhoods – 29%;
- other uninhabited territories – 38%.

To compare the obtained calculated data for the city of Penza with the average Russian indicators of the use of the territory of cities, a chart of actual land use has been drawn up, which allows to make a conclusion about the correspondence of the structure of Penza to the average Russian levels (see Figure 1).



**Figure 1.** Comparative analysis of actual land use.

Development balances in the context of the averaged indicators of the neighborhoods under consideration are the compiled below and it makes it possible to see the main problems of the inconsistency of their quality with modern safety, environmental, accessibility and aesthetic requirements. Circular diagrams (see Fig. 2) present the example the calculated percentage ratios of the elements of a microdistrict with high, medium and low quality of the urban environment of the Penza city. It also presents diagrams that are compiled for a more ideal model of the balance of the territory of a microdistrict, which takes into account the conditions of accessibility, security, availability of parking lots and pedestrian accessibility objects.



**Figure 2.** The estimated percentage of the elements of the microdistrict with high (a), medium (b) and low (c) quality of the urban environment.

This distribution made it possible to clarify specific problems that reduce the overall assessment of the quality of the urban environment: the unsatisfactory condition of asphalt concrete pavement in the adjoining and public areas; insufficient provision of the living environment with elements of improvement (urns, benches, children's and sports grounds, parking lots, platforms for collecting municipal solid waste, lighting, etc.); unsatisfactory condition of green spaces, lack of landscape design; lack of conditions or facilities accessible to people with disabilities. This comparison will provide a general idea of the use of urban land in the Penza city.

## 6. Findings

According to the results of the study, it can be concluded that the public spaces of the city and the quality of the urban environment of Penza as a whole do not meet modern standards and require the development of measures to improve the situation. Thus, it is advisable to make management decisions and develop a system of measures aimed at improving the quality and comfort of the urban environment, improving the city and bringing it to the stylistic unity. We believe that when developing a strategic plan for the development of a city, it is necessary first of all to take into account the priority of the interests of urban development and strict adherence to the norms when making planning decisions. In addition, when upgrading the urban space, it is necessary to use the practice of similar pilot projects, to create an independent public organization to audit the quality of the urban environment and to develop administrative measures to violate the rules of beautification of Penza.

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