The major cities quality urban environment forming features

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Abstract. The article discusses the currently relevant problem of the quality urban environment, which, as the study has showed, has its own dimensions and characteristics for each person, and the specialists in different fields of knowledge disagree with it and include various indicators and criteria while making a quality assessment. After analyzing the previously developed methods and criteria for assessing the quality of the urban environment, some basic criteria characterizing the degree of suitability of territories, the factors influencing its formation, and the provisions characterizing it, have been formed. The authors proposed several main directions of the large cities’ territory development as well as the recommendations for the urban space design and improvement.

Introduction
The concept of the urban environment is considered by us as the material nature of the city, within which the main processes of the urban life take place, and social, functional, informational links are implemented. The urban environment is a binding disembodied fabric between the objects filling the city. The urban environment is all that creates an image of a settlement and fundamentally affects the lifestyle of its inhabitants. It generates the emotional perception of the city, causes the desire to live in it, work, be engaged in creative activities, raise children, or vice versa, the desire to leave the territory in search of a closer and more comfortable habitat.

The balance of the main components of the urban environment, determines how the locality will be in demand and competitive. Not every city is convenient for living. Many moments are individual for some people, first of all, the presence of greenery and trees, the other is the good roads. But in general, the rules by which the formation of a comfortable urban environment takes place are similar:
- a decent level of consumer services (water supply, heating, electrification, garbage disposal);
- balanced infrastructure (combination of different types of ground and underground transport, adequate traffic, presence of large interchange hubs, satisfying the needs of both motorists and pedestrians, good road conditions, the presence of sidewalks and bicycle paths);
- opportunities for the smooth movement of various categories of citizens, including people with limited mobility;
- competent zoning (such that avoid the daily “pendulum migration” of passengers, providing a thoughtful organization of living space, low level of population density);
- adequate level of noise and information “pollution”;


the ability to meet the social, cultural, educational, recreational requirements of citizens (a sufficient number of parks, recreation areas, objects of architecture and art, educational institutions, trade institutions, etc.).

The post-industrial formation development led to a new stage in the evolution of the Russian cities and determined a different way of people’s life. The paradigm changes in urban planning, the growth of the population needs and the development of human capital lead to changes that affected, among other things, the attitude and increased requirements for living conditions. When choosing a place of residence, not only opportunities for economic growth and business, environmental situation, social and transport infrastructure, but also quality urban environment is of importance. Today, a comfortable environment largely determines the success of cities in the competitive struggle for a declining population, becoming in this regard a kind of town-forming factor and improving the “quality of the urban environment” is becoming a priority in urban planning [1].

To date, a large amount of research has been devoted to the quality environment of urban space. This is reflected in the writings on the formation of the urban environment: Bill Hillier, Rob Krier, David Walters, Linda Luise Brown, Jan Gale, Dhiru A. Thadani, Camilo Zitte, Martin Rein–Kano and Duane Phillips, Gutnova A.E., Glazycheva V.L., Yargina Z.N., Lappo G.M., Krasheninnikova A.V. and many others. The work on the analysis of the consumer’s needs was also analyzed and taken into account (L.V. Gaikova, L.A. Lofland, R.Sennett, S. Zukin); the principles of sustainable design and construction (A.G. Bolshakov, V.A. Nefedov, G.V. Yesaulov); problems of the organization of public spaces and the visual perception of internal movements (A. V. Stepanov, V. I. Malgin); on the interaction of the individual with the urban environment (T.M. Dridze, N.A. Bagrovnikova, E.S. Krasheninnikova, M.G. Chistyakova) [2].

Not only the scientists are involved in the study and identification of methods for assessing the quality of life and the quality of the urban environment, but also many Russian and foreign research and public organizations. So, M. Katz and I. Varlamov, on the basis of the methodology of the urban bureau, Gehl Architects and the works of Jan Gale, identified twelve criteria for the quality of a particular urban place combined into several blocks: safety and protection, comfort and pleasure from the place.

According to the urban prosperity index developed by the McKinsey Global Institute, the urban development environment is characterized by using the population density indicators, the intensity of public transport use and the degree of greening of public space. The assessment of the social infrastructure as a part of the urban development environment is proposed to be carried out on the basis of budget expenditures per capita [3].

According to the integrated multi-level assessment of the urban environment quality proposed by Yu.V. Kataevoy and A.V. Lapina, the “permeability of economic, social, cultural processes occurring in the urban environment, the mutual influence of decisions of the population, business, government, determining its development should be taken into account” [4]. Based on the calculation of the private indicators (housing conditions, urban improvement, state of the environment, cultural and spiritual space, leisure and public spaces, transport infrastructure and state of the road infrastructure, institutional conditions, density of economic use of the territory and space of public services, public safety), an integrated indicator is built, reflecting the “multi-layered urban environment as a space of existence and mutual local community actions”.

A.A. Popov in his works emphasizes that the quality of the urban environment is determined by “minimizing the time spent on the implementation of the widest possible range of residents’ needs” [5]. Based on this definition, the author developed a methodology for assessing the quality of the urban environment, taking into account the impact of several blocks of indicators: the transport factor, the position relative to the objects of trade and social infrastructure, the ecological situation, the position relative to the objects of negative and positive neighborhood.

E.I. Petrovskaya offers a three-level systematization of the quality parameters of urban space, relying on the Maslow’s “hierarchy of social and individual needs” value system. It is proposed to adopt spatial parameters of the environment, qualitative-environmental parameters of the environment and qualitative
modal (color, sound, light, tactile sensations and temperature) as criteria for the quality of public space [6].

According to the studies of T.Yu. Ovsyannikova and M.N. Preobrazhenskaya, the indicator for assessing the quality of the urban environment can be the Urban Quality Index (UQI), which is based on several criteria characterizing the housing, social, utilities and transport infrastructure, investment in fixed capital per capita [7].

In order to enhance the activities of local governments in improving the quality of living conditions in cities, bringing the Russian cities closer to the Western standards, the Ministry of Regional Development of the Russian Federation prepared the Order of September 9, 2013 No. 371 “On approval of the methodology for assessing the quality of the urban living environment”. In accordance with this methodology, the quality of the urban environment of the Russian cities is estimated on the basis of totally 41 indicators, which are combined into blocks according to the directions, forming 13 indices: population dynamics; transport infrastructure; natural and ecological situation; housing affordability; demographic characteristics of the population; innovation activity; engineering infrastructure; human resources; social infrastructure; social parameters of society; well-being of citizens; city economy; housing development.

In 2017, specialists of CB “Strelka” developed the UQI for assessing the Russian cities quality. The total score of each city is formed from the indicators for the six types of spaces: “Housing and adjoining spaces”, “Gardening and water spaces”, “Street infrastructure”, “Social and business infrastructure and adjacent spaces”, “Social and leisure infrastructure and adjacent spaces” and “Citywide space”. Each of them is evaluated by five criteria: safety, comfort, environmental friendliness, identity and diversity, as well as the environment modernity. Points for them were set depending on the indicators based on the specific urban data.

The quality of the urban environment is understood as a set of material benefits, which should be provided to the residents. But the quality of the urban environment is an integral assessment of the development of the system of interactions and relationships among city residents, a kind of harmonious existence of the urban society, which determines the level and possibilities of human potential formed within the urban space of a community of people.

Thus, the assessment of the urban environment quality is an area of the search for opportunities for the development of a settlement system related to the problem of sustainable development, improving the efficiency of using the city resources and developing the long-term strategies. The result of the analysis of Russian and foreign experience shows the diversity of approaches to identifying the parameters of the urban environment, providing a comfortable, attractive, balanced and sustainably developing city environment [8].

The quality of the urban space is the “most town-planning” indicator, since it characterizes the quality of the spatial structure of a city, its planning organization, landscape-visual appearance, improvement and saturation of service facilities. It depends on a number of criteria and characteristics describing the urban planning, spatial, social and visual features of the territory. There are a number of criteria that can characterize the degree of the territorial suitability and also visually display their advantages and disadvantages [9]. The main ones include:

- Urban planning describing the location of a public space in the structure of the city, the location of the territories relative to residential areas. As well as the degree of transport convenience and pedestrian accessibility. These characteristics allow us to evaluate the convenience of accommodation and the availability of the studied urban space territory.
- Spatial criteria have a descriptive nature of the territory in terms of volumetric perception, namely the size of the study area, its configuration and type of formation. They, in turn, allow to assess the territory at the planning level. Spatial features make it possible to estimate the degree of identity and uniqueness of the studied urban space as well as to assess the quality of the urban landscape.
- Social criteria characterize and describe the functionality, degree of social activity, degree of security and equipment, on the basis of which it can be concluded according to the level of the urban space.
quality in terms of the comfort of citizens and tourists in the territory, as well as the ability to satisfy the consumers’ needs.

- Visual criteria evaluate the degree of visual accessibility, environmental features. They are responsible for the level of privacy or publicity [10].

Urban space is formed based on a number of factors inherent in the definition of the compositional environment of the city as a whole. The most important factors in the system for assessing the quality of the living environment are comfort and safety. Also, the factors affecting the formation, organization, development and functioning of the urban environment are the ones satisfying the consumer needs of modern society: economic (budget, labor, income), natural and climatic (climate, terrain), environmental (pollution territory), temporary (moral and physical obsolescence of the territory), level of urbanization (infrastructure) and socio-political structure (size and composition of the population, crime rate) [11].

The quality of the urban environment includes the following key points:

- the architecture of the surrounding buildings - poor architecture is not able to attract the attention of pedestrians, the use of the unique objects will not only transform the street space in the artistic and aesthetic aspects, but also create a place of congestion, thereby increasing the level of security;
- integration in the urban environment — the process of establishing optimal links between various objects of the socio-cultural infrastructure and territories of urban spaces;
- the validity of urban functions - carrying out the mapping process at the initial stage of planning and design will determine the location of the necessary functional load through the study of the functional features of the surrounding development and consumer needs accounting;
- location relative to the center - urban spaces should be placed alternating public and recreational centers or use mixed territories (social and recreational and recreational public centers), distributed within the territorial boundaries of the city;
- accessibility for all transport types - the ability to move to the destination inside the city, which is provided by the presence of the developed systems of the pedestrians’ movement, cars and public transport interconnected with each other;
- social and cultural values - providing conditions for appropriate behavior between different social groups or within the groups of consumers in order to prevent conflict situations.

Based on the evaluation criteria analysis and existing norms and trends in the urban environment creation and arrangement, the authors present the recommendations for the urban space design and formation.

1. The ability to make the changes and transformations.

In the early project’s stages, maintain a simple and adaptable design that will allow to expand the space in the future with the investments and involve the community. The good public spaces meeting the needs, opinions, and current changes of the community need attention. Conveniences are worn out, the needs change; the changes occur in the urban environment as well. Adaptability is provided by its functional and visual transformation, relevant to the modern society according to the constantly changing consumer needs. Quality design should be able to be adapted for changes. While buildings are being built and destroyed, the streets and public places have a longer lifespan.

2. Urban space accessible for everybody.

Optimally equipped public space provides comfort, security, and ability to choose the access to certain places. Accessibility is a quality of the urban environment, providing transport and pedestrian accessibility to the public spaces, as well as creating a barrier-free environment for all the population groups. Helping people to choose a more convenient direction is often overlooked, but this is one of the most important factors in design [12]. Create an unimpeded way to improve the accessibility, orientation, and interoperability of the design and functions. It is necessary to establish a clear hierarchy of streets and tracks, so that pedestrians, cyclists and people with physical disabilities can safely and quickly move around the city. When people walk, they tend to prefer the direct routes. The permissible walking distance for most people in normal conditions is 400-500 meters. For children, the elderly or people with disabilities, the acceptable distance is often shorter. These distances depend on the length
of the street and the quality of the road, given the sense of security as well as the variety of incentives that is offered.

3. Selection of the city’s nature.

Recognizing and evaluating differences between one place and another is the cornerstone of the quality design. Preservation and reconstruction of buildings, streets, small architectural forms, sights and views that are unique will ensure the city’s identity. The appearance of the urban space determines the nature of the area. Identity is the creation of an urban environment with the maximum identification of historical and cultural potential and preservation of the landscape features. The author’s modern design, having its own context, including respect for the heritage is also valuable.

4. Streets for people.

The streets are the boundary between the public and private world. The street should be designed so that it performs all kinds of functions, and not dominated by one, as it is in our modern society with the auto traffic privilege. If to turn the local traffic on the streets with the priority for pedestrians and cyclists, it is possible to get amazing results in terms of quality and safety. Leaving the car on the border of the residence zone, and going 100 or 150 meters to the house, crossing the neighborhood, the citizen will have more space for other creative outdoor events and more human-oriented public space.

5. The use of the relationship of human feelings with the urban space.

Human movement in nature is limited horizontally at a speed of about 5 km / h. Feelings are actually frontally oriented, and vision is undoubtedly developed horizontally. The social field of view is about 100 meters. This is the distance at which one can recognize human figures, while at a distance of about 30 meters it is possible to discern more detailed characteristics of a person. The sense of smell works best at distances of less than 2-3 meters, while the sense of hearing has a wider range of functioning of 35 meters. With this in mind, try to create the opportunities for those who have sensory or physical disabilities to use smell, sound and touch to improve the user experience.

6. Compliance of urban space with the scale of a person.

Compliance of urban space with the scale of a person in a large city should be a universal requirement. When designing, observe the principles of applying human scale in urban planning and the conditions of perception of the urban space, which directly depend on the location of the visitor in it, on its degree of remoteness from the urban infrastructure [13].

7. Priority of park spaces.

Large public parks of the world are the multifunctional areas. How to turn a city park into a quality urban space? Offer a wide range of recreational opportunities, ranging from a place to sit in the shade, to the playgrounds, ring lanes and the sports fields and facilities provide an opportunity to hold events. While ideally the new parks should be no less than 0.5 hectares, this may vary in urban areas, where a minimum of 0.3 hectares is usually considered the smallest viable size for most local informal recreation.

8. The correct materials.

As a rule, the materials used in paving in a public place should be determined by the simplicity of the design, as well as their high quality. There are also some criteria to be taken into account when choosing the appropriate materials for the project. The material must be environmentally friendly and produced in the area of its use in order to avoid the high costs of its delivery and subsequent replacement if necessary. Ensure that they have already been applied and have good implementation rates to avoid additional construction and maintenance costs. The aesthetic qualities of the material should also have an advantage in the selection.

9. Community engagement.

The idea of this principle is to use the collective wisdom of those who know the society best - its citizens. Involving those who have an understanding of how the area functions and an understanding of what is important for the local residents will help to create a sense of ownership and better ensure the success of the projects in the field of public space. To solve the urban conflicts, it is necessary to make architectural, planning and engineering decisions taking into account the interests of local residents, investors, business owners (land tenants) with the help of municipal authorities and the experts’ community.
Summary
The practical significance of the research is the ability to use the developed recommendations, which should be fundamental in the development of the master plans and standards for the large cities various territories qualitative urban environment integrated formation.

The analysis of the existing methods of studying the quality of the urban environment confirms the prevailing ambiguity of its perception, as a result of which many questions arise. Without solving them it is impossible to come to a unified and complete definition, and as a result, to improve the level of urban spaces.

Existing methodologies are based on socio-economic, biological and engineering indicators, on the basis of which the quality indices are calculated and the standards are developed [14]. At the same time, there are conflicts between numerous indicators associated with various approaches to computing.

The elimination of the negative factors and the observance of the optimal conditions in urban spaces design will create the most favorable environment for citizens, increase functional significance and provide a clear distinction between the territories’ designation, which will lead to the subsequent improvements in environmental quality in spatial, aesthetic and social aspects.

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