Project Proposals for Models Scenarios of Life in Residential Buildings of the City

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Abstract. The article explores the issues of a large-scale residential development, its evolution and modern forms. In the result of the conducted research it was found out that every person daily follows definite scenarios depending on his needs and individual preferences. Every scenario implies certain preferences in the four spheres. Based on the different scenario combinations different spatial solutions can be applied, individual looks of every residential complex can be formed. Varying degree of functional diversity presupposes the application of different spatial parameters of site development. Based on the diversity of scenario models of everyday life we can distinguish options changing city-dwellers life and making it more comfortable.

1. Introduction
Urban residential development is the basic element of urban growth. The need for effective use and urban area development is caused by city growth and high rates of construction activities in our country.

Solving this problem through erection of comfortable dwellings and urban environment is in demand today as the modern politics of Russia is being more focused on the use of new approaches in construction [21].

The objectives necessary to attain the set goals are listed below:
- examination and outlining the existing site development in residential urban areas, revealing their features, advantages, disadvantages;
- analyzing the world experience of reconstruction and renewal as well as approaching to new municipal housing, determination of basic factors and tendencies of urban area development;
analyzing scenarios of life in residential urban areas to reveal the citizens’ needs for their comfortable life.

Scientific novelty of the researches concerns revealing of basic models of urban environment as well as developing design proposals aiming at creation of space-saving and comfortable urban area.

Thus, it is possible to conclude that the chosen topic is a relevant issue of domestic town planning and concerns analysis and methods for residential areas renovation.

2. Methods

We used some general scientific methods - a systematic method that requires holistic consideration of the object of research; structural analysis; compositional analysis of town planning objects, methods of historiographical research, methods of spatial analysis in town planning; typological analysis of town planning facilities.

Application of these methods contributed to complex investigation of historical development and evolution of urban residential area, it revealed the needs and preferences that can be reflected in everyday life scenarios.

Based on the use of spatial analysis methods in town planning, we developed scenarios of everyday life. Also we singled out models of solutions on comfortable dwelling selection.

3. Discussion

Cities are places where people meet to share ideas, to do business or simply to relax and enjoy their life [15]. Comfort of cities gives you a feeling of high comfort of life and, vice versa, if a person is not comfortable in the place of residence, this environment will be a burden [16].

The city should not necessarily be organized in such a way that it as a whole had a proper layout: a correct layout of its separate areas and blocks is much more important both for the city’s safety and aesthetic appeal [3].

Mass urban refinement at the end of XIX century, industrial development and growth population of cities resulted in high compactness of urban blocks. Only by the middle of 1920-th in Europe architects-antagonists of the existing urban development - Walter Gropius, Le Corbusier and André Lurçat - appear, coming up with opposing urban doctrines. Their doctrines were based on the numerous illnesses of city-dwellers caused by poor lighting and bad ventilation in buildings [5, 7]. It was found out that mass industrial development, minimization of dwelling size occurred in the result of enormous loss of housing facilities in the Second World War in European countries and Russia of the post-war period.

Having analyzed scientific publications and technical literature, one can conclude that there is little experience in implementation of renovation projects and town planning reconstruction in the modern town planning. Reconstruction generally results in demolition of outdated housing areas and construction of new districts, following the old-fashioned standards [11, 12].

Nearly all preserved urban development, called historical or pre-revolution, that we can observe in our cities and in the cities of Europe is dated back to the XIX and beginning of the XX centuries [12, 15]. Today the content and structure of the existing urban environment needs reassessment [21].

Every person daily follows special scenarios depending on personal preferences and needs.

Dwelling in the central parts of urban areas is generally smaller in size than the one in the suburbs and on the outskirts, but it also offers a wide variety of options, types and sizes. Besides, this variety contributes to the choice of type of housing acquisition: renting is more popular in downtown than on the outskirts [16].

As a rule suburbs and outskirts are individual residential areas with a plot of land.

Downtown residents more often use public transport or walk, while residents of the outskirts prefer to drive. The choice of transport depends on the concentration and variety of functions - presence of shops, services, workplaces, located nearby the area where a person lives [16].

Residents of the downtown go shopping to the nearest stores. Residents of the suburbs spend free time at home or in nature.
To add more variety and comfort to life it is necessary to take into consideration people’s needs and preferences that can be reflected in everyday scenarios.

4. Results
Taking into consideration dependency analysis, three scenarios can be determined: suburban, urban and central.

Every scenario implies certain preferences in four spheres: choice of dwelling, ways of moving around the city, consumption of goods and services and leisure-time activities. Each of these four scenarios has advantages and specific features considered by residents.

Scenarios are generalizations that reflect contrasting ways of living in the city. In reality the specified characteristics can be combined in different ways. On the basis of these combinations different spatial solutions can be applied and particular images of the territory can be formed.

First of all urban environment should meet the requirements of variety of the objects of commercial and social infrastructure within reach on foot and by transport. Different functional variety means different spatial parameters of site development (Figure 1).

![Figure 1. Modern residential area of Voronezh.](image)

Based on the variety of scenarios of everyday life it is possible to determine town planning models. Model is a combination of functional and spatial parameters of urban environment, determining quantitative and qualitative characteristics of site development in accordance with one of the basic scenarios of everyday life.

Every single model is oriented to enhance the development compactness that provides a quality standard of living. Target models are to emphasize and develop the advantages and correct deficiencies noted by the users of the developed urban areas.

4.1. Model of the block 1. Proposal for the use of detached and terraced low-rise housing development
More than a half of Russian people consider detached house to be an ideal option. Nowadays the demand for the purchase of apartments in bedroom suburbs decreases [13]. Buying or renting apartments in the downtown is more attractive for the young people. Older people prefer a more relaxed way of life. In the absence of the desirable dwelling on the market a person prefers to buy a plot of land and to build a house. Thereby, the detached housing does not always follow the principles of comfort and diversity (Figure 2).
Figure 2. Low-rise detached housing.

Plan structure of low-rise model is based on the relatively large blocks with the area of 1.8–5 (ha). The model implies the combination of detached, terraced and apartment buildings up to 4 floors high in the same location. Terraced and apartment houses offer the possibility for housing shops and services on the ground floors.

To create a road network just two types of streets are required: the main street of the district and adjacent local streets. Main streets of the district will be designed to hold main routes of public transport. Local streets will be used for pedestrians, cycling and automobile transport.

Life in the city center is concentrated as a rule around the public transport stop connecting the territory with other areas of the city.

The main area of greenery in the low-rise model will be located in the adjacent territories [16].

Schools with all levels of general education (primary, basic and secondary) may be located on separate selected sites.

With a low development density, the most preferred option is the organization of kindergartens with a capacity of up to 50 places in areas equal to the size of sections of detached residential houses (0.1 ha).

The use of various types of residential development contributes to the creation of a recognizable image of the territory of a low-rise model. That may increase the recognition of groups of blocks and facilitate orientation on the area (Figure 3).

Figure 3. Terraced low-rise development.

4.2. Model of the block 2. Proposal for the use of medium-rise sectional development

From 60 up to 90% of new housing development in large cities of Russia is multi-story construction [11]. The medium-rise model is aimed at improving the quality of mass housing, as well as creating a sustainable urban environment in the areas of apartment development [1].
Planning and spatial solutions of the model provide opportunities to increase the share of commercial infrastructure, building density and the road network.

To create a unique image for each territory of a new residential area, the medium-rise residential model involves diverse variants of development.

The development of blocks in the medium-rise model is formed by buildings from 5 to 8 floors. If the width of the street profile and the size of the land plots are limited, such development ensures the formation of streets and courtyards proportions that are human in scale [14]. Plots of 0.1–0.3 hectares located in the blocks when placing apartment buildings allow you to create a party development that provides a high extension of the façades along the red lines [14].

Some residents of the apartments on the ground floors have a terrace or a front garden with a separate entrance from the street. These benefits are available not only for residents of terraced houses, but also for apartments on the ground floors of apartment buildings.

Garbage collection sites are located along local streets to provide access for special vehicles, avoiding areas within the blocks.

A significant part of all surface parking for residents of the medium-rise model is located along the streets. This allows you to limit the number of parking lots in the courtyards of residential buildings.

Schools in the medium-rise model are stand-alone buildings or building complexes.

In the medium-rise model, it is recommended to place kindergartens with a capacity of not more than 150 places. These gardens can be built in or attached to residential buildings.

The individual image of the territories of the medium-rise model is formed with sections of different quantity of floors. Recognizable solutions of stop and trading pavilions, group tree planting, flower beds, paving elements contribute to improved navigation for pedestrians and cyclists on the territory of the medium-rise model.

4.3. Model of the block 3. Proposal for the use of medium-rise sectional residential development in the city-center

Development areas that meet modern quality standards and sustainability of the urban environment are located, as a rule, in the historical centers of Russian cities [17, 18]. These areas respond to a request from a significant part of Russians who would like to live in the pedestrian availability from work. The central model is aimed at the development of centers - functionally diverse urban areas, where housing is adjacent to workplaces, recreation and leisure facilities.

The territory of the central model is divided into blocks with an area of 0.4 to 0.9 ha, designed to accommodate residential and multifunctional buildings. The exception is the blocks in which the schools are located.

Apartment residential development of 7 up to 9 floors dominates in the central model.

The territory developed according to the central model is connected with other areas of the city by public transport routes.

In the conditions of dense development with a high concentration of facilities of trade and services, streets become the most important open public spaces. The central model is characterized by the most diverse functional options and the most dense development among all the models discussed. Its distinctive feature is the presence of not only daily, periodic and episodic demand trading enterprises as part of blocks of residential development, but also availability of business infrastructure facilities: offices and small industries.

The high density of development in the central model suggests a compact distribution of green areas. The maximum size of local parks is 3 hectares; the size of public squares is up to 0.2 hectares. The local park as part of the central model can be oriented not only to residents of the territory, but also to the employees of the enterprises located within the area, as well as to periodic, episodic and transit visitors.

The central model supposes that no more than 30% of households can park a car in its territory. The main share of parking lots (up to 70%) is located along the streets.
To increase the compactness of buildings, sports and playgrounds from school grounds can be moved to parks or placed on the roofs of school buildings. In both cases, the area of the school site can be reduced to 1.2 hectares. Primary schools can be included in the blocks of residential and multifunctional development with an area of 0.9 hectares.

Kindergartens are mostly located in the blocks of residential development. Parents working in the central model have the opportunity to take their children to kindergarten near work.

The central model is characterized by a greater visual and spatial diversity.

5. Conclusion
We revealed person’s dependence on his needs and individual preferences, according to which he daily follows certain scenarios. As well we determined the main components that are closely related to life in the city.

We observed the basic scenarios of life based on values that can serve as a reason for choosing one or another place to live.

We have developed the basic models that combine the functional and spatial parameters of the urban environment, which determine the quantitative and qualitative characteristics of development in accordance with one of the basic scenarios of everyday life.

6. References
[1] Zubov V P 1963 Aristotle: Man. Science. Fate of the heritage Scientific and Biographical Series ed V P Zubov (M.: Publishing House of Academy of Sciences) p 368
[2] Gehl J 2012 Cities for People ed J Gehl (M.: Concern "Krost") p 276
[3] Gehl J 2012 Life Between Buildings ed J Gehl (M.: Concern "Krost", transl. from English, M.: Alpina Publisher) p 200
[4] Gropius W 1935 The New Architecture and the Bauhaus ed W. Gropius (London, Faber and Faber) p 112
[5] Glebushkina L V 2015 Modern approaches to the formation of the city block development ed L V Glebushkina and D A Zheleznitskaya and K Yu Sharashov (Materials of the conference “Young Thought: Science, Technology, Innovation”) pp 26-30
[6] Gnidko V I 2016 Typical development of Russian cities ed V I Gnidko (Student Scientific Community, Proceedings of the X International Student Scientific and Practical Conference) pp 19-20
[7] Gutnov A E 1990 The world of architecture The face of the city ed A E Gutnov and V L Glazychev (M.: Young guard) p 352
[8] Gutnov A E 1984 The Evolution of Urban Planning ed A E Gutnov (M.: Stroyizdat) p 256
[9] Dileman F 2004 Compact City and Urban Sprawl Built Environment Vol 30 ed F Dileman and M Wegener pp 308–323
[10] Design Bureau ‘Strelka’ 2017 Principles of integrated development of areas Vol 1 Design Bureau ‘Strelka’ M p 198
[11] Komarova A V 2007 The Estimation of the Human Capital's Impact into the Economic Growth of the Regions of the Russian Federation (Using Mankiw - Romer – Weil Model) ed A V Komarova and O V Pavshok World of Economics and Management Vol 7 3 pp 191–201
[12] Le Corbusier 1976 The Athens Charter ("La charte d'Athènes", Le Corbusier, Paris, 1943) ed Le Corbusier (M.: Stroyizdat)
[13] Mikhaylova T V 2018 Architectural and town-planning reconstruction problems of the historical center of Voronezh ed T V Mikhaylova and D S Parshin Housing and communal infrastructure 1(4) pp 62-71
[14] Mikhaylova T 2018 Architectural and town-planning reconstruction problems of the city of Voronezh ed T Mikhaylova and D Parshin and V Shoshinov and A Trebukhin and D Safarik and Y Tabunschikov and V Murgul (E3S Web of Conferences) pp 10-33
[15] Mikhaylova T V 2015 Architectural and town-planning problems of reconstruction of landscape
and historic environment areas with existing buildings on the example of Voronezh ed T V Mikhaylova and E V Zolotukhina and I S Moskovkina *Engineering systems and facilities* 3(20) pp 89-96

[16] Mikhaylova T V 2016 The concept of development of pedestrian zone located in Sacco and Vanzetti street (urban district of Voronezh-city) ed T V Mikhaylova and E G Mizilina *Town-planning. Infrastructure. Services* 4(5) pp 17-21

[17] Mikhaylova T V 2018 The formation of a comfortable urban environment in the residential areas on the example of Voronezh city ed T V Mikhaylova and V D Fernyuk *Housing and communal infrastructure* 4(7) pp 50-56

[18] Mikhaylova T V 2019 Problems of formation of a modern residential environment and the concept of its redevelopment ed T V Mikhaylova and E V Sazonov (Materials of the 6th International Scientific and Practical Conference dedicated to the 40th anniversary of the Institute of Architecture, Construction and Transport FSBEI of HE "TSTU") pp 225-229

[19] Baburov V V 1969 City planning and development, Academy of Architecture ed V V Baburov, P I Goldenberg, L S Zalesskaya, V A Lavrov, G E Mishchenko, N Kh Polyakov, N S Smirnov, D M Sobolev and M O Hauke State Publishing House of Literature on Construction and Architecture (Moscow) p 346

[20] Decree of the Government of the Russian Federation of 04.15.2014 No 323 “Creating conditions for providing affordable and comfortable housing for the citizens of Russia” 2014 p 79

[21] Order of the Department of Architecture and Urban Planning of the Voronezh Region dated 09.10.2017 No 45-01-04 / 115 "On approval of regional standards for urban planning of the Voronezh region (as amended on July 20, 2018)" 2017 p 78