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**RETHINKING EVOLUTION OF SPATIAL
STRUCTURE OF RUSSIAN MICRODISTRICT
IN THE POST-SOVIET SPACE**

Abstract: Residential planning units of a large city are indivisible in their overall structure and morphologically identical, as a medieval city. Self-sufficiency and viability of their structure is confirmed by the presence of planning boundaries, a social institution represented by schools and kindergartens, as well as the presence of an open public core – a market or a square, and division into residential groups – formations of lower order (Lawhon, 2009, Patricios, 2002). Colonization of public spaces by the market was the first step in the morphological post-socialist evolution of residential units. This process led to the formation of a pedestrian network connecting the community center, public utilities, recreational and educational institutions. The next step was a change in the land use of the territory, followed by extension of the architectural typology of residential buildings (Kukina, Posdniakova 2011). Morphogenesis of modern residential planning units is a combination of the basic models of their planning. This study is aimed at finding general mechanisms of functional, morphological, as well as social and administrative transformations in the microdistrict structures in the post-Soviet space.

Introduction

The patterns of historical development of settlements lead to reassessment of their content and changes in the morphological structure of the residential environment. Microdistricts were conceived as self-sufficient planning units of a city, inseparable in their general structure and morphologically identical, as a medieval city. In the late 20th century the crisis of urban planning activity in the Russian Federation led to the suspension of the holistic design, construction of new and reconstruction of the existing microdistricts – large and self-sufficient residential planning units. The self-sufficiency and viability of their structure is confirmed by the presence of planning boundaries, a social institution in the form of schools and kindergartens, as well as the presence of an open public core – a market or a square, and the division into the lower-order entities – residential groups (Lawhon, 2009, Patricios, 2002). The concept of the Soviet microdistrict was adopted in the USSR, the CIS countries, as well as in a number of CMEA countries and China.

In the period of global conversion, redistribution of employment in various sectors of the economy, rethinking cities functioning, increase in the mobility and informatization of the population, as well as increase in social stratification, microdistricts structure is transformed: the typology of construction and open public spaces change; multifunctional areas are formed due to the integration of labor activity into the residential environment and introduction of small and medium-sized businesses.

The peculiarities of the cities' development in the post-Soviet space (the former USSR and the countries of Eastern Europe) is the adaptation of the Soviet design experience to the deformations that took place in the conditions of a new socio-economic paradigm emergence.

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Post-socialist changes in the residential environment became the subject of interest for both domestic and foreign researchers. The study of democratization establishment in Russian cities, which includes a set of issues related to the development of new life styles, management mechanisms, and the development of other methods for residential environment objects design is fundamentally important in the context of post-socialist transformations. In this regard, it becomes relevant to summarize the main social and planning changes that have taken place in the residential environment since perestroika. Microdistricts in Russia have undergone significant rethinking of both functional and social nature. According to the studies there is a symbiosis of traditional morphotypes of residential planning units, which leads to the emergence and development of their new forms. Radical concepts require comprehensive analysis and balanced assessment.

This study is aimed at finding general patterns of functional, morphological, as well as social and administrative transformations in the microdistrict structures in the post-Soviet space.

Materials and methods

The study is based on the materials of the results of a comprehensive on-site survey of Krasnoyarsk microdistricts, carried out by the Chair of Urban Development of School of Architecture and Design of SibFU, under supervision of I.V. Kukina and I.G. Fedchenko within the framework of students' course design of "Urban Planning" direction. A systematic survey gave an opportunity to reveal the dynamics and nature of adding new functions in the territory of microdistricts of the 1960-1990s; the analysis showed that over the past decades commercially active areas of employment, maintenance and recreation have been formed within them.

The research methodology includes the analysis of the experimental modeling results of the plans for the reconstruction of Krasnoyarsk microdistricts constructed in 1960-1980. The approaches to the modernization of the industrial construction residential areas of the Soviet period of the 1960-1980s are studied based on the systematization of the methods for planning, architectural and landscape renovation of residential areas of the specified construction period.

Research methods include the analysis and systematization of Russian and foreign theoretical studies in the field of urban planning of residential planning units; the analysis of their construction and reconstruction experience; engineering survey and the study of design and regulatory documentation. Categories of mobility and accessibility in the spatial organization of residential construction are identified in the studies by N.P. Krainyaya. The landscape and ecological principles for modeling and residential areas forecasting were studied by E.M. Mikulina, B.T. Tobilevich, V.I. Gutsalenko and I.V. Kukina. The socio-ecological basis of the landscape vision in the residential environment objects formation is defined in the works by V.A. Nefedova, N.A. Unagaeva, E.E. Krasil'nikova et al. The methods for applied social research of the residential environment are developed in the group of studies by A.E. Gutnov, B.A. Portnov and K.V. Kiyanenکو. The method for residential space modeling, depending on the type of interpersonal relations, taking into account social and psychological environment parameters are proposed in the studies by A.V. Krashennnikov and L.V. Anisimova. The architectural and town planning legacy of the socialist period of construction and adaptation of residential urban development of cities to new social and economic conditions were studied in the works by K. Stanilov, I. Medvedkova, D. Smidt and B. Engel. Methods of organizing the "participation" of the population in making decisions on the design and reconstruction of residential planning units were studied by K.V. Kiyanenکو, G.A. Ptichnikova, E.V. Yeshchina and I.V. Kukina. The mechanisms of residential planning units' self-management are studied in the works by T.V. Filanova. The socio-demographic mechanisms of "self-organization" of the residential environment of a foreign city in the 20th century were studied by J. Symonds, J. Jacobs, R. Grats, B.D. Taylor, G. Sanoff et al on the basis of empirical and social studies. The methods of urban planning regulation of residential construction under conditions of market economy in Russia and other countries are studied in the works by A.G. Vysokovsky, E.K. Trutnev,

Yu.V. Alekseev and A.V. Krasheninnikov. The methods of borrowing and combining various concepts of residential planning units are studied in a number of works (Duanfang Lu (China), Dayane Plate Zuberg (the USA), etc.

“Microdistrict” concept in the USSR

Like American neighborhoods and European urban communities, the theory of microdistricts in Russia draws on urban history of the 20th century. The microdistrict scheme is a residential complex – a basic structural element of residential area construction in Russia and the republics of the former Soviet Union. Microdistricts were built and are still constructed in accordance with this concept. This model provides formation of residential communities with specific recommendations for the spatial arrangement of houses, streets and services. The microdistrict was internally linked by pedestrian walkways that gave access to such services as facilities, nurseries, health services, cultural amenities, etc., with the intent that its residents could easily and conveniently access the majority of their daily needs. The microdistrict was defined as a self-contained residential district with an area of 75–125 acres and the population ranging from 5,000 to 15,000 people. Four to five microdistricts, each with a service radius of 300-400 metres, formed a residential area.

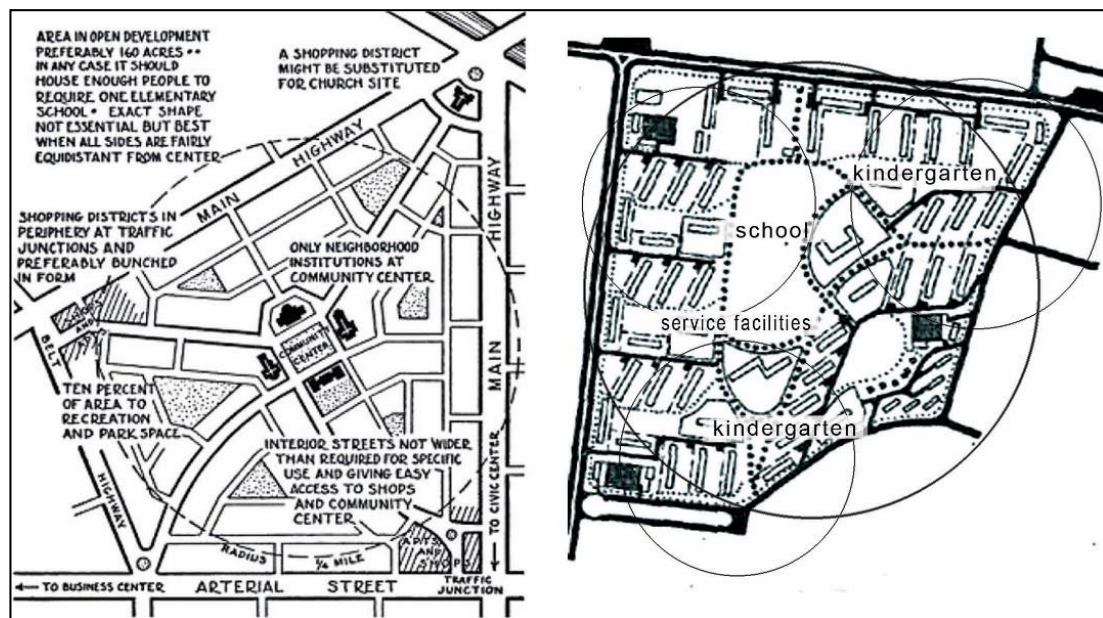


Figure 1. Elementary planning unit concept: a) “Neighborhood Unit Concept”; b) Microdistrict

Unlike Clarence Perry’s “Neighborhood” concept, the microdistrict is a territory with multistorey apartment buildings (most of them) bounded by arterial streets (Fig. 1).

There were few firmly established design principles for the microdistrict:

- housing and facilities should be integrated;
- through traffic should be discouraged;
- green space should be created in a “microdistrict garden” (percentage for each resident);
- the residential grouping should be determined by the ‘service radius’, the optimum distances between houses and services;
- the levels of hierarchy and the optimum number of community facilities should be based on the number of residents they serve.

Planners envisioned that all urban residential districts could be designed and constructed based on the microdistrict scheme.

The vast majority of housing in Russia consists of houses built in accordance with this concept of “Microdistrict” in the late 20th century, the period of the country industrialization.

Evolution of “Microdistrict” concept in the early 21st century

The invasion of capital (in the late 20th – early 21st centuries) into the Soviet cities space became the main driving force in the residential environment transformation. From the late 20th century, market concretion in the open spaces became the first step towards changing the structure of microdistricts. This process led to the formation of commercially active streets along pedestrian paths in the open spaces of the microdistrict. Later, there were changes in the territory use around commercially active zones and the expansion of the architectural typology of residential buildings due to the occupation of the first floors of residential buildings by small and medium-sized business (Kukina, Pozdnyakova, 2011).

According to the analysis of the existing microdistricts, as well as their newest plans, by the late 20th – early 21st centuries their morphological structure became more complex; rethinking of the essence and content of public spaces, as well as the development of social and administrative, as well as microeconomic elements of the city took place.

This period is characterized by the deviation from the functionalist modernism in the urban planning of the mid-20th century, focused on a rigid model of “work-daily routine-rest” due to the fact that such unforeseen processes as the destruction of a staged service system and the formation of unusual for residential environments professional activities, social activity and territories use were generally spreading in residential areas. The study demonstrated that functioning of the minimalist spatial structure of the microdistrict led to the development of previously unforeseen functions: trading enterprises and small and medium-sized businesses services. Microdistrict becomes a multifunctional organism, independent of large-scale production. Mixed multi-valued functioning of the residential environment, where the lower floor of a residential building is treated as a structural segment forming a new quality of social, economic and functional relations was formed. Striving to efficient land use leads to the chaotic development of spaces with high commercial turnover in the residential environment. The problem of connecting the territories of different functional affiliations, the ratio of open public spaces and privacy, the closeness of small residential groups and the permeability of internal residential spaces in the residential planning unit structure became more acute (Fig. 2).

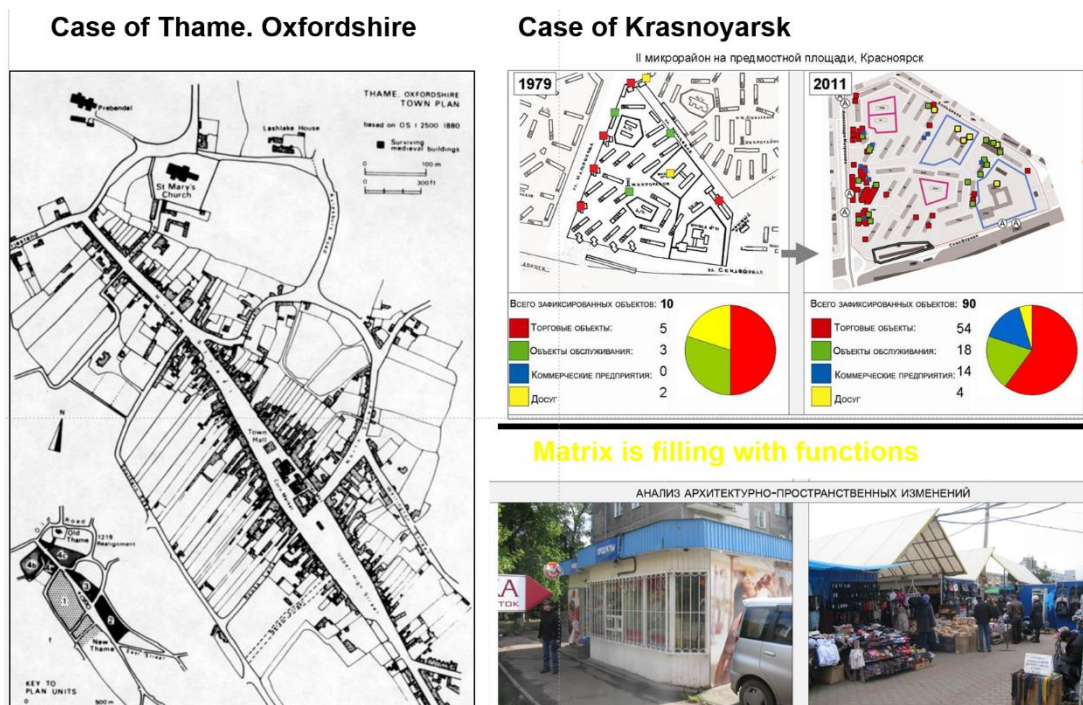


Figure 2. Market concretions – vision within the frame of urban morphology and contemporary situation within the microdistricts of the city of Krasnoyarsk

Changes in private and public relations in residential areas became fundamentally important for the microdistrict transformation in the post-Soviet space due to various types of landowning and land use. Since the introduction of the Town Planning Code of the Russian Federation, urban areas are subjected to compulsory surveying, and after that put up to the city auction. Land diversion, according to the rules of land surveying and easements, as well as sale or distribution of long-term leases by lots, fragmented the holistic perception of the microdistrict both in the plan and in reality. According to the on-site survey of Russian microdistricts, a patchwork demarcation of territories on a property basis into private ownership spaces (groups of residential buildings, less commonly quarters) and public spaces takes place in the residential environment. The policy of land surveying significantly reduces the percentage of public and green spaces. Thus, for instance, in the plan of the Innokentievsky microdistrict in Krasnoyarsk, according to the land survey plan, the territory of the microdistrict is divided into residential areas, a large multifunctional complex, territories of two office centers, the territory of a mosque, the territory of a hospital complex and a number of utility facilities. As a result, with all the multifunctional nature of the microdistrict, the territory is deprived of accessible open spaces that can combine public institutions compositionally and functionally, and please the residents visually. Residential groups are fenced, restricting access to outsiders and forming their own microspace. The multi-storey residential environment has lost the ability to keep social and residential spaces in psychologically comfortable proportions. Extensive, amorphous building-to-building territories belong to all houses and, at the same time, to none of them, let alone a family or an individual. A person is unable to correlate and visually identify any part of this poorly differentiated inert space with his/her own place of residence (Fig. 3).

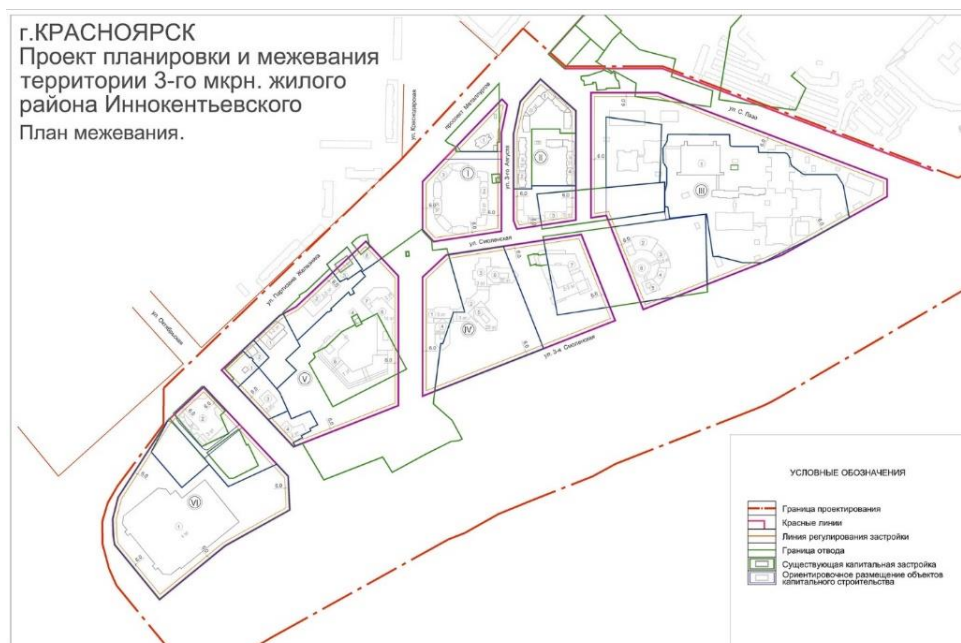


Figure 3. Draft planning and land survey of the 3rd microdistrict of the Innokentievsky residential area

In the early 21st century social communities were formed in the territory of microdistricts with the aim of coordinated management of the adjacent territories' collective property development. Hierarchy of self-government institutions is developing, creating the possibility to coordinate the activities of a lot of subjects and adaptively control the processes occurring at the same time, with the aim to coordinate the diverse interests of the public spaces and functions development in the residential environment. In the planning sphere, there is a trend of open information policy of

microdistricts' planning and development. An important role is played by the timely public coordination of actions related to the development of residential environment objects.

The projects of reconstruction and new microdistricts construction are characterized by the emergence of new morphological types of microdistricts. Since the early 21st century there has been a search for ideas to combine discrete and perimeter forms of the post-Soviet microdistrict in a number of scientific articles and projects:

- combined type of microdistrict-quarter. Fine-meshed pattern of the plan becomes popular in the residential districts' projects of the last decade due to the introduction of quarters into the residential planning unit structure. Due to the increase in the rates of social stratification and social and territorial segregation of modern cities, separate residential complexes are being formed on social and economic basis – divided by the market value of residential property. Isolation is expressed in the formation of physical barriers to residential complexes in microdistricts, that differentiate residential environment into external, “alien” environment and internal, fenced (as a rule, the access to the internal environment is limited) one. Combining the idea of the microdistrict and planning of quarters leads to the territory division by internal roads that form quarters, an increase in the density of the transportation network, loss of the principle of pedestrian traffic continuity and a network of green recreational spaces, as well as physical access violation to social security facilities. The territory of the microdistrict loses the criteria of safety and accessibility of its environment for people with limited mobility and younger generations, as well as aggravates the problem of private cars parking. This is evidenced by a number of projects in Moscow and regions. A number of similar projects, for instance, have recently appeared in Krasnoyarsk: Microdistrict City, Malye Kvartaly, Preobrazhensky, Novoostrovsky, etc. (Fig.4).
- discrete type of combining various morphological types of development within the microdistrict plan. In the planning of the modern microdistrict Evropeisky Bereg in Novosibirsk and microdistrict on Sverdlovskaya street in Krasnoyarsk, the idea of freely located residential groups with a combination of different areas of residential development was proposed: a closed cell, high-density infill, free layout and grouped into residential groups mid-rise buildings (Fig. 5).



Figure 4. Planning design of Novoostrovsky microdistrict in Krasnoyarsk



Figure 5. Planning design of Evropeisky Bereg microdistrict in Novosibirsk



Former territory of the neighborhood built in 1960th

Figure 6. Typical fringes of microdistricts in Siberia

The researchers are especially interested in studying the components that form the microdistricts borders, which makes them self-sufficient planning elements, indivisible in their structure. A field study of the 1970–80s microdistricts spaces demonstrated that binary boundaries are formed along the perimeter: more often these are dense multifunctional public spaces working for various kinds of small enterprises that captured the first floors of residential buildings, or economic use areas, mainly occupied by the individual families’ basements. The

latter phenomenon became possible at the height of the economic crisis in the late 20th century and cannot be controlled either in operation or building quality so far, often posing a threat due to the structures' dilapidation. Similar fringe phenomena were studied by the morphologists based on the historical cities' development, when zones of mixed housing, interspersed with the territories of economic and recreational use were formed, which confirms microdistricts self-sufficiency.

Conclusion

Based on the analysis of the dynamics and types of labour activity, functional use of public spaces and the lower level of residential buildings in the microdistrict, forms and methods of public participation in the development process, as well as the experience of landscape and ecological reconstruction of residential areas, the following trends of microdistricts development have been revealed: deviation from the functionalist modernism of the 20th century; the morphological structure complication; rethinking of the essence and content of public spaces; its development as a social and administrative, as well as microeconomic element of the city.

In the post-Soviet space, the microdistrict changes its original concept, ceases to be a residential area with primary needs near the employment places. With the development of the mixed nature of the local economy, integration of labour activities into the residential environment, spatial localization of the "community-neighborhood", as well as the increase in democratization of the design process, a residential unit becomes an element of the flexible development of a city, able to react to the changing needs of society, while remaining the most optimal and rational model for comfortable living.

The results of the morphological analysis of elementary residential planning units of a modern city can be used to forecast their future development.

References

1. Kukina, I.V. (2005) "Elementary Planning Residential Formations", *Housing Construction* 8, 26-29.
2. Kukina, I.V., Posdniakova, I.G. (2010) "Development of Scientific Conceptions of Elementary Residential Forms at the End of the 20th Century and Beginning of the 21st Century", *Housing Construction* 11, 42-48.
3. Unagaeva, N.A. (2013) "Ekologo-orientirovannoe proektirovanie landshafta", *Vestnik Orenburgskogo gosudarstvennogo universiteta* 5 (166), 143–148.
4. Fedchenko, I.G. (2012) "Mikroraiion na postsovetском prostranstve: sotsialno-planirovochnye izmeneniia i tendentsii razvitiya", *Izvestiya vuzov. Stroitel'stvo* 1, 108 – 115.
5. Landeshauptstadt Dresden, Stadtplanungsamt. Dresden - Gorbitz. Integriertes *Handlungskonzept*, (2009).
6. Landeshauptstadt Dresden, Stadtplanungsamt. Dresden - Prollis. Integriertes *Handlungskonzept* (2009).
7. Lu Duanfang (2005) *Remaking Chinese Urban Form: Modernity, Scarcity and Space, 1949-2005*, (Routledge).
8. Krainyaya, N.P. (2009) "To the Search of Sociality in Urban Building Formation", *Academia* 2, 73-76.
9. Kiyanko, K.V. (2009) "Entering the Industrialization River 2: Search for Alternatives to Mass Houses Building", *Architectural Bulletin* 1 (106), 45-49.
10. Kosenkova, Yu.L. (2008) "Urban Design Thinking of the Soviet Epoch: Search for Stable Structures", *Academia* 2, 12-15.
11. Lawhon, L.L. "The Neighborhood Unit: Physical Design or Physical Determinism?" *Journal of Planning History* 8, 111-132 (2008).
12. Patricios, N.N. (2002) "Urban Design Principles of the Original Neighborhood Concepts", *Urban Morphology* 6 (1), 21-32.
13. Condon, P.M. (2000) *Seven Rules for Sustainable Communities: Design Strategies for the Post – Cardon World* (Washington, DC: Island Press).
14. Brody, J. (2014) *Constructing Professional Knowledge: The Neighborhood Unit Concept in the Community Builders Handbook*: Dissertation for the Degree of Doctor of Philosophy in Regional Planning in the Graduate College of the University of Illinois at Urbana - Champaign' Ph.D. thesis, Urbana, Illinois.
15. Kuvakin, V.A. (2008) "Modern Humanism", *Higher Education in Russia* 4, 41-54.