

# Peculiarities of Interaction of Traditions and Innovations in the Architecture of Low-rise Settlements

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## ABSTRACT

The article is devoted to the peculiarities of the evolution of traditions and innovations of different types of low-rise settlements, mostly rural and suburban, and in some cities as well. Traditions and innovations are interconnected with each other. These interrelations are multivariant and create the originality of settlements. The low-rise development is especially valuable in the period of the pandemic and after it. The article focuses on the changes in the settlement structure related to the structuring of the area of the rayon into districts and volosts with their own self-governing bodies; it discusses the transition from neighborhood development to more complex planning formations; different types of residential buildings are described; the significance of digitalization in remote service is clarified.

**Keywords:** Tradition, Innovation, Low-rise development, District, Typology and architecture of residential and public buildings.

## 1. INTRODUCTION

Low-rise residential buildings are being built in different places, first of all in rural and suburban areas, in small, medium, and sometimes large cities, in conditions of difficult terrain, in areas with a hot climate and high seismicity, for private developers.

This type of development has a number of features:

- a direct connection with nature, with the surrounding landscape, with the decisive influence of the natural and climatic conditions of the place of construction;
- low height and weight of the house, which facilitates the construction process and allows for the use of light machinery and more compact construction elements;

- the design of the dwelling as a combination of the house, the garden, and outbuildings;
- the deconcentration of residents in the period of force majeure (pandemics, etc.);
- the possibility of using timber as a construction material, especially in areas that are rich in forests;
- the use of houses of the "growing" type – allowing for the expansion of the house vertically by adding an attic or horizontally by building extensions;
- Individualization of the house is helped by integrating personal needs and traditions in the design of the house, including the way of life and the perspective of the development of the demographic structure of the family.

The negative aspects of low-rise housing include the complexity of its engineering equipment, requiring the use of autonomous or mixed systems.

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\*Fund: This study is based on the research, supported by the Program of Fundamental Research of the Russian Academy of Architecture and Construction Sciences and of the Ministry of Construction, Housing and Utilities of the Russian Federation - 2021.

According to Y.P. Bocharov and Z.K. Petrova [1], low-rise (one- to four-story) housing should be divided into two groups in accordance with the volumetric - spatial structure and the presence of the plot:

- homestead and cottage houses with land plots, semi-detached houses, townhouses (blocked houses) with small land plots;
- apartment buildings of sectional type.

Within these two groups, some division is also possible: low-rise mansion houses, semi-detached houses, and cottages with land plots gravitate towards rural and suburban areas; townhouses with small plots – towards small and medium-sized cities and suburban areas; sectional houses can be used in low-rise development for social housing.

## 2. STRUCTURING OF THE RAYON'S DISTRICT

An innovation for low-rise development was the introduction of smaller municipal formations such as districts, volosts, uluses, and rural settlements

(with small territorial sizes) with their own elected self-governing body within the boundaries of a district [2]. The self-governing bodies are responsible for the maintenance of all settlements on their territory.

These municipalities are more commonly referred to as districts. They are quite varied in size, population, nature of production, and level of urban development. The analysis of these characteristics of about 40 districts in Belgorod, Kaluga, and Moscow regions allowed for the division of them into small ones with a population of 700-1000 people (30% of the total number), medium ones with a population of 1500-2000 people (60% of the total number), large ones with a population of 3500-4000 people like Shopino in Kaluga region, Kushchevskiy in Belgorod region (10%). Usually, there is one central settlement, 2-5 agricultural production complexes, several farms, and about 10-20 villages on the territory of the district.

An example is the Kuzyaevsky district of the Dmitrovsky rayon of the Moscow region ("Figure 1").

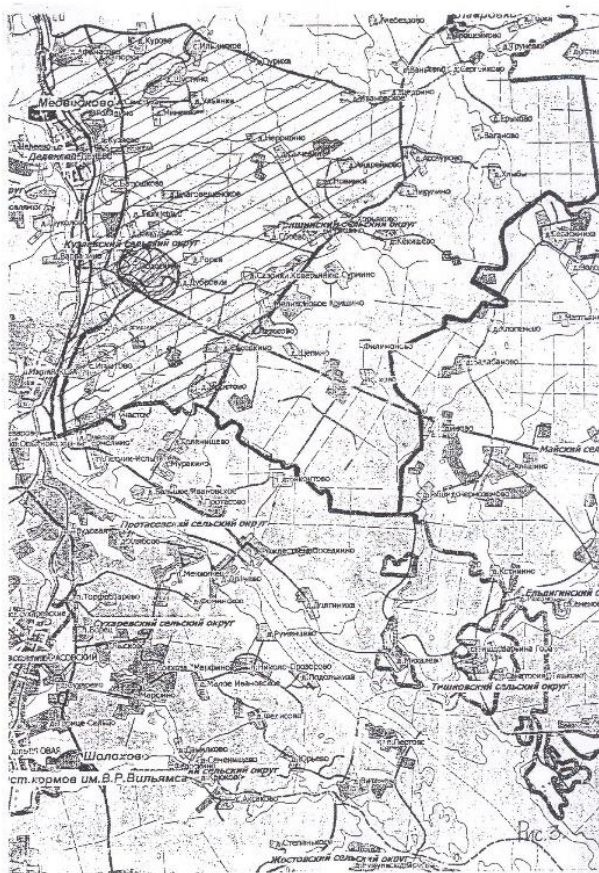


Figure 1 Kuzyaevsky rural district of Dmitrovsky rayon. (The broad hatching indicates the territory of the district, the narrow hatching indicates the central settlement of Podosinki.)

We have surveyed this district three times over nine years in order to identify consistency in construction priorities. There are two large enterprises in the district: Joint Stock Company "Borets" (on the basis of the state farm "Borets", existing since the mid-20th century) and the building and finishing materials production in the village of Ignatovo. In addition to these two settlements, there are 10 villages.

Nature has richly gifted this district: at the entrance to the Podosinki village, there is river rich in fish people are allowed to fish, but only with a fishing rod. There are picturesque places for recreation. Residential and public buildings are comfortable, as will be discussed later. Therefore, the residents live here for generations.

Summing up this innovation, we note that the allocation of municipalities within the area and the natural increase in population in these self-sufficient formations allowed us to rationally design the social and engineering infrastructure and give the territory an owner.

### 3. DEVELOPMENT OF PLANNING TECHNIQUES

In the field of planning structure, traditions and innovations are adjacent to each other. Over the years, a number of traditional techniques have

developed: the division of the territory of the settlement into residential and industrial zones; the allocation of a landmark, distinguished by its height or unusual forms, the accentuation of the entrance; the creation of open spaces for public use - the main street, community center, a field for games and entertainment; sports fields or a stadium. It is this kind of planning structure along with pedestrian or bicycle circulation that is relevant now - during and after the pandemic. To this, we must add the dispersed placement of residential homes with lots. It is no accident, even before the pandemic, striving to be closer to nature, many residents of large cities, having insulated their summer cottages, live in the suburbs throughout the year.

Traditionally, the block development system dominated in the planning of settlements: it was convenient for the division into homesteads but led to the monotony of development, as can be seen in all the neighborhoods of the village Verkhneyarkeevo of the Republic of Bashkortostan, in the new neighborhood of the village Shygyrdan in the Republic of Chuvashia and many others as well.

A pleasant innovation in the planning structure is distinguished by the suburban village Edem in the Krasnogorsk rayon of the Moscow region ("Figure 2").



Figure 2 The masterplan of the settlement of Edem, Krasnogorsk rayon of the Moscow region. Designed by V. Rzhnevsky.

a 1 - school, 2 - sports complex, 3 - administrative center, 4 - supermarket, 5 - open parking for 100 cars, 6 - club center in the public garden - for the residents of the settlement, 7 - guarded entrance, 8 - a group of townhouses, 9 - blocks of detached houses with plots.

A construction firm has built this settlement according to the project of the architect V. Rzhnevsky and sells residential houses to all who can afford them.

The layout of the village has many innovative features [3]: it has a mixed structure - most of it is composed of curvilinear streets with dense townhouse development, which creates interesting perspectives; blocks of three-story buildings, with a garage and a workshop on the ground floor. Almost all of the service facilities are concentrated for the sake of profitability at the entrance to the village and have two entries, so they could be used, both by their residents and the surrounding population as well. There is a clubhouse for the residents of the village in the public garden at the end of the main street. In addition to the townhouses, there are detached single-family houses with plots [4].

The already mentioned Podosinki settlement has the same unusual planning structure: the public center is designed as an orchard going to the House of Culture and ending with a small square for public events. On one side of the garden, the main

street runs, and on the other - there is a ravine, from which tongues of vegetation stretch to the main public buildings - a kindergarten, a school, an administrative complex.

#### **4. TYPES OF RESIDENTIAL BUILDINGS**

The low-rise residential buildings are very diverse. Traditionally, single-family homestead houses are the most common, since they are connected with the plot and allow for changing their size and structure depending on the needs of the owners. For example, a two-story house in the village of Varnitsa, in addition to living rooms, has a built-in garage, a porch on the first floor for a greenhouse, and an attached kitchen unit.

The single-family houses in the village of Shygyrdan in the Republic of Chuvashia ("Figure 3") are beautiful and comfortable; low fences here do not completely enclose the plot but are part of the architectural design.



Figure 3 Single-family house with a plot in the village of Shygyrdan in the Republic of Chuvashia.

Gradually, the number of apartments in low-rise houses began to grow, and from two-family houses in the village of Podosinki increased to eight in a row in the village of Novye Luzhki in the Kaluga region. Townhouses can be of a linear, cross, and mixed structure. Houses comprised of four blocks are the most convenient as such construction is well-communicated with the site.

The Lapino village ("Figure 4") is an example of townhouse development in the suburbs. It consists of three- and five-family houses and is

very beautiful. The houses differ by their architectural means of expression: arcades, height differences, the dynamics of openings, and color contrasts.





Figure 4 Two-story three- and five-apartment houses in the elite suburban settlement of Lapino, Odintsovo District, Moscow Region. (The author - Ph.D. in architecture D.F. Radygin.)

The "houses with a place of application of labor" justified by candidate of architecture N.M. Sogomonyan can be considered as an innovation, which grew out of tradition. Having studied the structure of existing houses of a mechanic, spoon maker, shopkeeper, she proposed a whole series of such objects. For some of them the projects have been developed (the "Craftsman's House" and the "Teacher's House" [5].

Rental houses are an innovation for low-rise development. They can be of different structure: four-story, as in the village of Romanovo in Kaluga region with hotel rooms, provided with a niche kitchen, toilet, and shower, with a dining room, a hall of public events and amateur laundry; or in the form of several two- and three-room houses, united by a common yard with a service center, as in the agricultural company "Belaya Dacha" in Moscow region. Rental houses have production and recreational potential in a low-rise development.

## 5. SERVICE ORGANIZATION AND PUBLIC BUILDINGS

The most pronounced innovations may be found in the organization of social infrastructure and the typology of public buildings. But here, too, innovations are based on traditions: for centuries, the tradition of "peddling" when a wagon with goods and services came to a certain place, and the peddlers went to the settlements has existed. Now there is a mobile service with a dispatch service.

Digitalization and the use of cell phones are of great importance for dispersed low-rise settlements. The establishment of remote connections in both work and education, especially during the pandemic, has made it possible to exist normally under difficult conditions.

The multifunctional objects, such as the cultural and educational centers, which combine a kindergarten, school, clubhouse, gym, and swimming pool in the village of Kultuban in Bashkiria, are increasingly manifesting themselves in the typology of public buildings. Likewise, the social center in the village of Voevodskaya, in addition to the four service institutions, includes the Museum of Military Glory ("Figure 5").



Figure 5 Multifunctional Social Center that includes a museum of War Glory, a cinema hall, a library, a post office, a first-aid station in the village Voyevodskoye, Kochkurovo District, Republic of Mordovia.

The most expressive are still the objects of cultural and educational purpose ("Figure 6") - they stand out in the surrounding development with the

forms of their front entrances, glazed planes, colonnades, and the originality of openings.



Figure 6 Cultural institutions of the Belgorod region.

a Top - Rakityansky Palace of Culture "Youth", bottom - Youth House in the village of Bessonovka.

In conclusion, it would be good to talk about the role of low-rise development in the city, with a particular example. With great effort, a group of talented architects, not indifferent to beauty, was able to defend and regenerate a block of two-story houses, which greatly impeded the high-rise development of Irkutsk. This quarter after the construction, landscaping, and engineering works, has been transformed into a recreational center and became a favorite place for the residents [6]. The work was well prepared: the author of the idea is D.F. Mezentsev, the authors of the planning project are architects: E.I. Grigorieva, A.Y. Makarov, N.N. Krasnaya, S.V. Mullayarov; with the participation of A.I. Kozak, L.A. Krylova, E.N. Kholodnaya, and the chief engineer of the project L.B. Ezhova. Scientific and methodological support was provided by M.G. Meerovich, K.L. Lidin. The consultant on the objects of historical and cultural heritage was E.R. Ladeyshchikova.

## 6. CONCLUSION

Concluding the article, let us note that life in a low-rise development is natural for the population: it brings people closer to nature and allows to reflect more clearly the needs of a particular family living in a house.

A variety of housing types in accordance with the demographic structure and lifestyle of the family; a combination of stationary and mobile services; multifunctional complexes based on the interaction of tradition and innovation – are the heritage of Russia and are a platform for the further development of the architecture of low-rise settlements.

## AUTHORS' CONTRIBUTIONS

The author's personal contribution includes the improvement of low-rise buildings in various directions [7]:

- Identification, on the basis of natural surveys, of new types of rental houses for rural conditions with different spatial structures - hotel type with a corridor system and as a group of 2-3-room houses united by a common garden with its own service center.
- Combination of basic and everyday service centers with transport mobile and remote service, with the development of monitoring service and methodical assistance; use of digitalization in different types of services, especially in education.

- Creation of multifunctional centers of different compositions using co-operative and transformative means.

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