15. Irkutsk Akademgorodok District—Principles for the Development of Spatial Qualities

Lyudmila Kozlova, Anastasia Malko, and Valery Kozlov

The revitalization of post-Soviet public spaces is a relevant topic for countries of the former Soviet Union. Many courtyards, playgrounds, squares, and parks in cities still retain the attributes and mood of those times. Renovation that takes into account the urban history of the spaces, uses the natural landscape, and integrates modern functions brings new impulses to revitalize the spaces (Kozlova 2017). Scientific workshop on three cities in Germany (Berlin, Dresden, Halle), carried out with the financial support of the Volkswagen Foundation within the project of scientific cooperation among architects and urban planners of Germany, Russia, and Ukraine allowed for study of the positive experiences gained in Germany in the implementation of major programs for the reconstruction of areas of mass panel construction (Engel et al. 2019). Analysis of the German experience made it possible to highlight the main approaches and principles of transformation of public spaces as a socio-spatial framework that forms the planning structure and residential environment of the district.

The project examined six distinctive German neighborhoods built in the period 1960–1980: Fennpfuhl and Marzahn-Hellersdorf (Berlin); Gorbitz and Prohlis (Dresden); Silberhöhe and Neustadt (Halle) (see fig. 1). The identified principles are aimed at improving the relevant spatial qualities: sustainability, identity, and interactivity (see table 1). Sustainability consists of treating the natural areas as the most important value of the open spaces in a residential area. Identity is expressed in preserving the original structure of the residential area and in giving individual expression to individual neighborhoods and the district as a whole by means of art and landscape design. Enhancing the interactive qualities of the neighborhood is achieved by giving a special role to the elements of art (the ability to pass through and read the meanings hidden within); the interaction of private and public spaces via a soft transition from external space to the interior via the intermediate—semi-private and semi-

public conditions; involving residents of the neighborhood to actively participate in its improvement.

Table 1: Main approaches and Tools to Improve Public Spaces in Areas of Panel Construction (German Experience)

Qualities	City Scale	District Scale	Quarter Scale
Sustainability	Green spaces of the dis-trict as part of the green framework of the city	Renaturation	Landscape design
Identity	The uniqueness of public spaces of city-wide significance	Spatial concept for the development of public space in the district	Art and special themes for each living group
interactivity	Inclusion of the district in the system of pedestrian and bicycle routes	Participation	Soft edges and spatial hierarchy

Are these principles applicable to solving the problems of panel housing neighborhoods in Russia? What problems/conflicts can they solve at different scales? We will consider the application of these principles to the example of the Akademgorodok neighborhood in Irkutsk.

Akademgorodok differs from other districts of Irkutsk and it is possible to identify a number of characteristics that collectively form the district's identity (Malko and Kozlova 2019): the location of the science city, the planning structure, the diversity of flora and gradation of green spaces, and the academic community's social environment.

Figure 1: Interaction of residential areas with adjacent and inner green areas, highlighting the main public axis of the district.

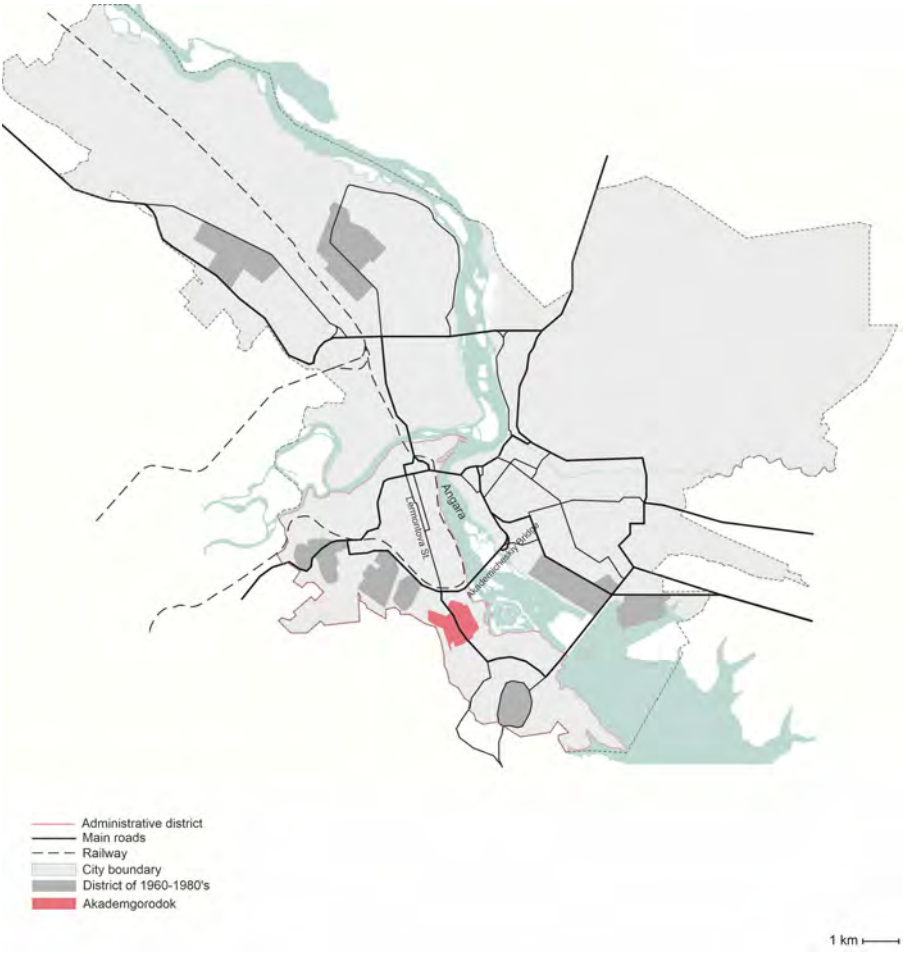
Source: L. Kozlova.

Location and Planning Structure

Akademgorodok is located in the southwestern part of Irkutsk in the Sverdlovsky district, on one of the main arteries of the city, Lermontov Street, surrounded by a large forest area and in close proximity to the Angara river (fig. 2). The area is home to a population of 12,000 people, covers 234.5 hectares, and has a density of 51 people per km^2. Akademgorodok is a compact formation with parallel zoning and is located in an area with a slight slope to the Angara. The microdistrict is divided into three functional zones on different sides of Lermontov Street: *scientific and educational*—a territory of scientific schools and institutes surrounded by greenery; *residential*—between the main road and the river, forming the silhouette of the left bank development; and *recreational*—on the banks of the Angara.

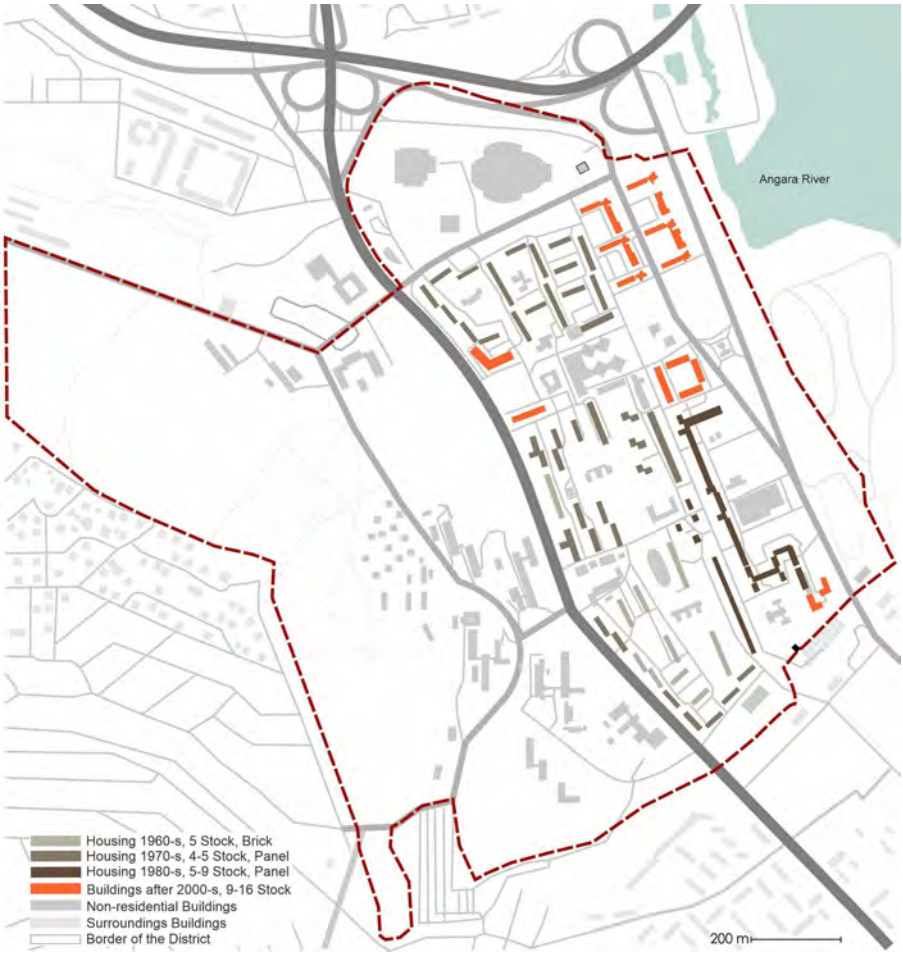
First of all, Akademgorodok is a science city designed inside the city structure, which distinguishes it from other science cities designed outside the city. A distinctive feature of Akademgorodok is its implementation of a typical urban planning concept of the mid-twentieth century: free planning in the placement of scientific and educational institutions in a park area.

Figure 2a: Location of the Akademgorodok district in the structure of the city.



Source: A. Malko.

Figure 2b: Scheme of residential development of the district.



Source: A. Malko.

The area is built in the form of residential groups that were placed along the line of the main street, Lermontov, in the first stage and along the coastal area in the second stage. At the same time, it is possible to note the different configurations of residential groups from each other and from other areas of the city. Each of them has its own distinctive features: the *southern residential group* is distinguished by the openness and flow of residential spaces formed by its closed-line construction, the *middle residential group* is characterized by its "cluster placement" of houses around a socially significant object (school, kindergarten), and the *northern residential group* was built in accordance with the features of the descending topography, which imparts dynamism and forms the silhouette of the coastline. This variety of configurations, combined with the permeable structure of the courtyard spaces, contributes to good legibility within the neighborhood. However, the area is actively undergoing densification with high-rise buildings, which may lead to the loss of the established configurations of residential groups. At this point, the northern and middle residential groups are already affected.

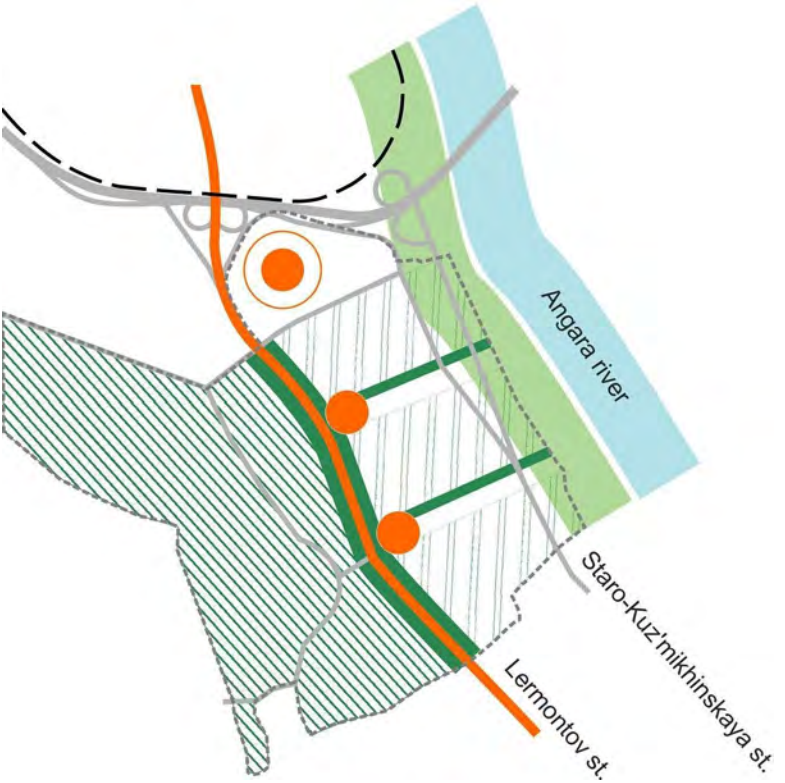
Green Spaces and Sustainability

Green areas are one of the main assets of Akademgorodok. It differs from other districts of Irkutsk in the variety of green spaces. Rare species of plants were brought in. Among them are allées of linden and larch trees, blue spruces brought by special order from America, white lilac, alpine currant, Manchurian walnut, Rugosa rose, Far Eastern species of Maak cherry, Japanese elm, Mongolian oak, Manchurian ash, and others (Starshinina 2005). In addition, it is possible to identify special types of greenery that are characteristic of the area and help form its identity (Landeshauptstadt Dresden 2015, 2017): there are boulevards of trees with large crowns and low shrubs that frame courtyards. It is possible to trace a peculiar gradation of spaces from the forested massif on the upper part of the slope through landscaped boulevards and residential yards to the open space of the Angara river shoreline.

The district reconstruction project of 1970–1980 included two wide internal pedestrian boulevards that formed a connection between the forest and the shoreline, but their formation as a strong perpendicular relationship was never implemented. During the development of the microdistrict, new public functions were built mainly along Lermontov Street, which weakened the planned dominant role of the pedestrian axes. Additionally, access to the coastal space, which is cut off from the area by another roadway (Starakuzmikhinskaya Street), is currently difficult. As a result of this, the coastal zone is almost unused by residents. There is practically no improvement of the space along the bank of the Angara river; there are no walking paths and getting close to the water is very inconvenient. It is also difficult to access the forest area from the opposite side of the district and the adjacent new public center of citywide significance (library, Ice Palace). Existing crosswalks are often inconveniently located, resulting in traffic violations by campus residents and little use of landscaped areas. Because of these problems, the need for a perpendicular connection is obvious.

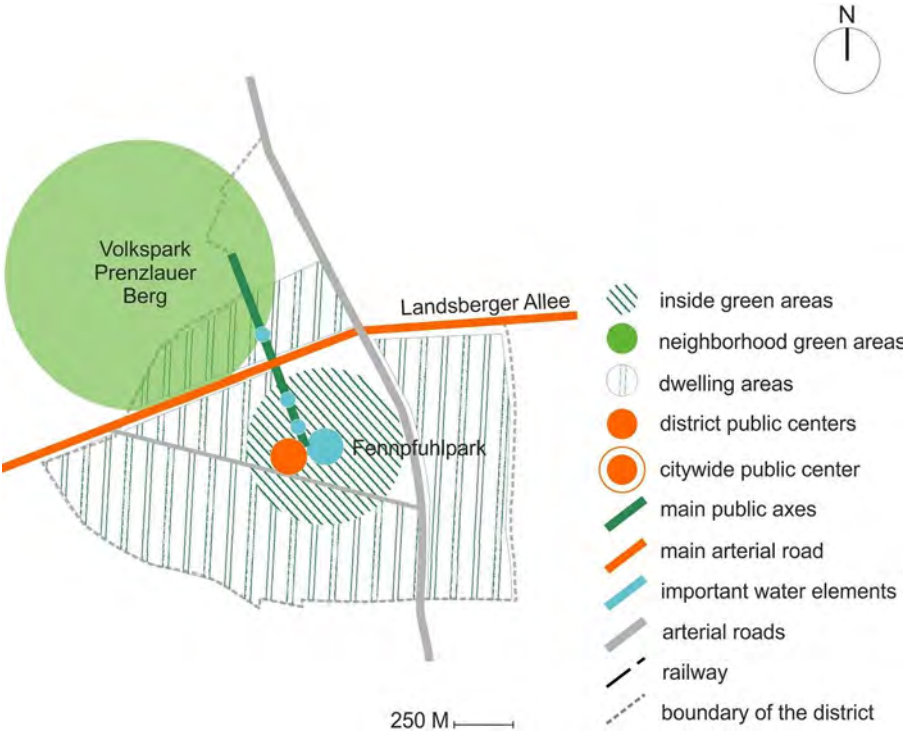
An analysis of German neighborhoods of mass housing showed the presence of a strong pedestrian axis in each of them. The moto for the reorganization of the Fennpfuhl district (Berlin) was "living in nature in the center of the city." The district's planning concept, which has survived since its inception, is a green pedestrian axis that penetrates the district and connects two major parks: Volkspark Prenzlauer Berg outside the district and Fennpfuhl Park within it (fig. 3). There are similarities here to Akademgorodok, where a potential pedestrian axis could link a large, forested area and a coastal space. Public functions in the Fennful neighborhood are concentrated along the axis, contributing to a clear, healthy, and safe public realm. Thanks to the functional diversity with stores, cafes, and playgrounds, plus minimal landscaping for maintaining the green axis concept, the pedestrian street is being actively used again since 2011. It is noteworthy that the axis has retained its functional richness despite the subsequent creation of several shopping centers along the traffic arteries.

Figure 3a: Comparison of the main public axes and centers of the districts Akademgorodok (Irkutsk) and Fennpfuhl (Berlin, see figure 3b).



Source: L. Kozlova.

Figure 3b: Comparison of the main public axes and centers of the districts Akademgorodok (Irkutsk, see figure 3a) and Fennpfuhl (Berlin).



Source: L. Kozlova.

Social Environment and Interactivity

Interactivity refers to the degree of people's involvement in the active life of the neighborhood and the processes taking place in the public space. Consequently, processes need to happen, and participation in them needs to be possible, desirable, and encouraged. Thus, the inclusion of elements of art, sports, or children's play equipment in a transit street space changes the quality of that space, inviting people to stop and linger in it. Involving people in the active life of the neighborhood through the possibility of interaction with the environment and its elements has a positive effect on the vitality of

public space. The reciprocal combination of public and semi-public spaces is a necessary component of pedestrian shopping streets of district significance (pedestrian streets in the districts of Fennpfuhl (Berlin), Halle-Neustadt, etc.). The quality of interactivity also refers to the possibility of transforming areas through discussions and interaction with the inhabitants of the city. This discussion and participation in the creation of space evokes a sense of belonging and responsibility in the future users of the space.

The public functions of Akademgorodok concentrated along the arterial roadways now dominate over the intra-block functions. At the intersection of the arteries, a citywide community center has been built, including a library and two ice arenas. At the intersection of the main planning axis and the two pedestrian boulevards are centers of district significance: the administrative center of Akademgorodok and the social and cultural center. Good infrastructure—comprising kindergartens, schools, an "Experimentarium," where physical experiments are demonstrated for children, and a library—is provided for children of middle- and high-school age. Nevertheless, a few problems can be noted, primarily the lack of functions for people middle and older age and the lack of entertainment functions (restaurants, cafes, movies, etc.). The introduction of these functions on the pedestrian axes could help revitalize them.

In the areas studied in Germany, semi-public spaces are used to revitalize the central public spaces of the neighborhood—the main public axes and centers. Such spaces include cafes, cinemas, a shopping center, and other public functions. They are defined as public spaces with some entry restrictions and a commercial orientation. The saturation of the district center with semi-public spaces and the nature of their interaction with public spaces significantly affect the intensity of the use of both. Jan Gehl (2010), an architect specializing in the study and improvement of public spaces, introduced the concept of "soft edges," emphasizing the importance of activating boundaries to make space more livable. The organization of boundary space with "soft edges" according to the principles of *flow*, *transparency*, *permeability*, and *interaction* can significantly improve the quality of public space (Kozlova 2014). The technique of "overflow," when goods "move" outside a store or business into the public space of the street, is particularly effective on main public street: cafes have street tables, and a building's ground floor coincides with the level of the sidewalk, creating a smooth transition from outdoor space to indoor space.

The identity of panel neighborhoods is shaped not only by its physical form, but also by the social environment. In many neighborhoods, entire generations have grown up there and a strong community has formed, for whom these

neighborhoods primarily have sentimental value. In this regard, participatory development is a particularly important tool in the development of residential areas.

Participation is a phase of urban design work involving the end users in discussions of project ideas. Since 1999, Germany has had a federal program called the "Social City" (Soziale Stadt), which aims to help stabilize and strengthen economically, socially, and structurally weak residential areas. The main goal of this program is to improve the social cohesion and integration of all population groups.

The "Quartiersmanagement" is responsible for the coordination of the various activities (recreational, educational, sports, etc.) and partisan processes in the community; it supports new and existing citizen initiatives (unions, organizations, etc.) and coordinates the activities of the departments within the city administration. This kind of management is often handled by one person, on whose activity the social atmosphere of the entire district depends. In the Halle-Neustadt district, for example, as the result of a project seminar held by the International Building Exhibition (IBA) in 2010 that aimed at the intensive involvement of residents in the use and creation of spaces, projects that have made a significant contribution to the cohesion of residents and the quality of life were realized—a skate park, an open-air gallery, and design of the square on Tulpenbrunnen. The active involvement of neighborhood residents in the design process allowed people to participate directly in the improvement of public spaces, which transforms the awareness of space for all into a space for everyone.

In the Marzahn-Hellersdorf district of Berlin, active work has been undertaken with residents not only on the improvement of open spaces in the district, but also on the renovation of buildings and apartments. The wishes and comments of the residents influence how the process is organized. In this way, the district successfully implemented such an important aspect for the residents as the absence of cars in the yards. The courtyards are green oases for quiet pastimes and children's games. In addition to considering the wishes expressed in this constructive dialogue, restrictions for the residents themselves were also introduced, such as forbidding them from adding glazing to balconies, for both technical and aesthetic reasons.

Participatory design in the Prohlis district (Dresden) that aimed at reorganizing the courtyard space and recreating the natural framework of the areas, supported by the Social City program, made it possible to:

- consider the interests of residents of all age groups
- avoid conflicts in the use of space at the design stage
- provide an additional opportunity for people to meet and get to know their neighbors
- involve the direct users of public space in its improvement, thus contributing to the formation of a personal attitude toward the space in each participant

Due to the high concentration of academic institutions in Akademgorodok, a strong scientific and academic community has been formed that cares about its neighborhood and undertakes initiatives for the development and improvement of the area, which is of particular intangible value. In recent years, there have been several activities of note, making it possible to begin the process of modernizing public spaces. On the initiative of the scientific and academic community and funded by voluntary donations from residents and employees of scientific institutions who are not indifferent to the history of Akademgorodok, a square of science was created with a memorial to commemorate the Irkutsk scientific institutes of SB RAS, designed in the shape of a globe that rests on eleven columns symbolizing the institutions, each with the name of an institution and its date of foundation. The paving of the site is in the form of a labyrinth—as a symbol of the search for scientific knowledge (Velyakina 2018). This monument not only contributes to the formation of a comfortable urban environment, but also strengthens its identity.

Further, as part of the federal program "Comfortable Urban Environment," a number of courtyard spaces were renovated. Each courtyard renovation project became the object of a competition, subject to open voting by the city's residents to evaluate the project proposals. Any citizen of Irkutsk from the age of fourteen could vote, either at specially designated places or online. In the Sverdlovsk district, where Akademgorodok is located, the largest number of Irkutsk residents voted and Akademgorodok took first place in terms of resident participation, which once again emphasizes the active and cohesive urban community (Irkutsk City Administration 2018). Citizen participation in the federal program is one of the first areas of building a real dialogue to solve the problems of urban development and come to a common consensus. However, when comparing the German and Russian approaches to participatory design, there is, in most cases, a more formal approach in Russia that imposes a set of necessary activities without taking into account the merits of the case for example the procedure of Public Hearing organized from municipality

(Potapova 2015). In Germany, however, various types of citizen participation have been developed; these also include an informal approach aimed more at building a dialogue between residents and the city administration (Tab. 2). This (informal) approach involves several stages: the first stage is to inform citizens about the planned processes; the second stage is a joint consultation, that is, residents can already pose their questions about certain aspects; the third stage sees even more active involvement of residents; and the fourth stage comprises designed forms of cooperation, that is, resident participation in the subsequent stages of the planning process (VHW 2012).

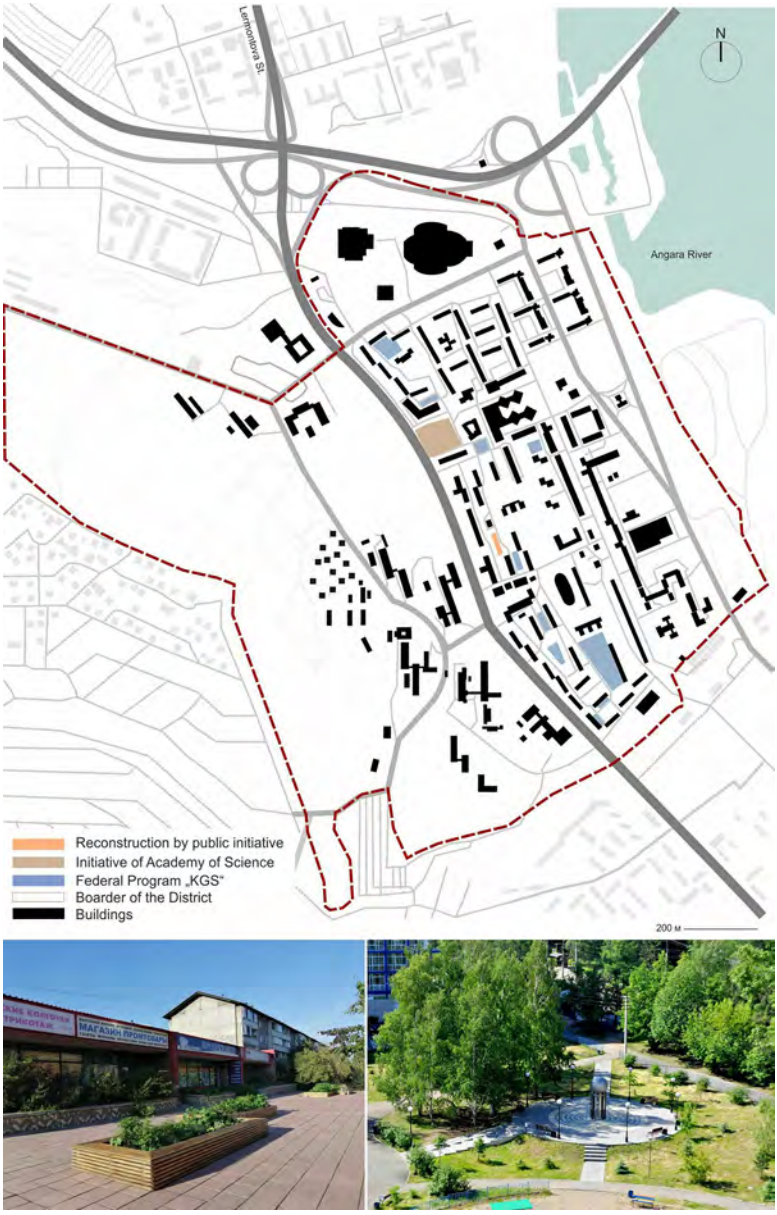
Table 2: Types of citizen participation.

100 % ↑ 0 %	Goals of Citizens Participation		examples
	↓	↓	↓
	Formal	Informal	
	Decide	Cooperation	Working groups, round tables
	Agreement	Co-design	Meditation
	Listen	Consultation	Questioning, comment, public, discussion event
	Inform	Information	information's session, Internet site

Source: A. Malko (based on *Hinweise und Empfehlungen zur Bürgermitwirkung in der Kommunalpolitik*, VHW—Bundesverband für Wohnen und Stadtentwicklung e. V.).

At present, the open spaces in Akademgorodok are almost unused for temporary events that could activate the spaces, be they festivities, such as city or neighborhood festivals, or other events. Germany has developed a system of events throughout the year, which activate the main spaces of the neighborhood and create "impulses" that keep the neighborhood alive all year round (wine festival, Christmas market, family fun fair, Easter celebration, etc.). The public spaces of the district are not very active at the moment; events are mostly held only on anniversaries and on New Year's Eve.

Figure 4: Akademgorodok, areas where renovation was carried out as part of federal programs and the active participation of scientific institutions



Source: A. Malko.

Conclusion

Akademgorodok has retained a number of characteristics, such as its location in the city, its planning structure, and the variety of green spaces. Nevertheless, at the moment, many identity-forming features are poorly legible and require development activities for the sustainable evolution of the area and the preservation and enhancement of its identity. There is no general scenario for the development of public space in the area at the moment. Spot development of individual spaces within the framework of federal programs or other initiatives leads to a fragmented perception and often disrupts the integrity of the urban environment, rather than improving its overall quality. Akademgorodok has a stable green framework that is little used. To improve the situation, it is necessary to establish the interactivity of space, which creates the prerequisites for its use through, for example, participatory design.

Based on our analysis of the German experience, three principles can be noted, and these are also applied in the Akademgorodok area. These are (1) participatory design; (2) design proposals to create a unified framework of green spaces in the city, which accordingly includes an abundance of green spaces; and (3) the formation of unique centers of citywide significance on the periphery of the district. Such principles as renaturalization and creation of a special theme for each neighborhood are not relevant for this particular district due to its unique configuration of residential groups and rich landscape diversity. In order to develop the spaces of the neighborhood, it is important to focus on the application of the following principles:

- Incorporating the neighborhood into a citywide system of connected networks of interactive green routes that invite active lifestyles (walking, sports, play, celebrations, etc.). This principle relates directly to the citywide urban planning policy on the development of public spaces and contributes to the creation of a healthy and attractive urban environment that invites residents to walk and take part in sporting activities.
- The creation of a unified spatial concept for the development of public spaces in the neighborhood. This principle will help to avoid localized solutions to improvement or include them in an overall scenario, making it possible to maintain the legibility and identity of the neighborhood.
- The use of landscape design as the main tool will emphasize and enjoy one of the main assets of the neighborhood—its variety of landscaping.

- The development of a functionally diverse system of nodes of social activity on the pedestrian boulevards with the application of the tool of soft boundaries and spatial hierarchy will activate the connections between the two main natural treasures of the district—the forest and the Angara riverbank.

In achieving the goal of creating an attractive and lively public space in the neighborhood, it is necessary to improve the qualities of identity, sustainability, and interactivity.

References

Engel, B., ed., with Frantseva Yu., Malko, A., and Rogge, N. (2019). *Mass Housing in the Socialist City: Heritage, Values, and Perspectives*. Berlin: DOM Publishers.

Gehl, J., (2010). *Cities for People*. Washington, DC: Island Press.

Kozlova, L. V., and Kozlov, V. V. (2018). "Ten Quality Criteria of the Public Spaces in a Large City." International Scientific Conference "Investment, Construction, Real Estate: New Technologies and Special-Purpose Development Priorities" (ICRE 2018), 212, 04012. Accessed April 8, 2021. https://doi.org/10.1051/matecconf/201821204012.

Kozlova, L. V. (2017). "Transformation of Public Spaces in Residential Areas of the 1960–80s Years: The Experience of Germany" [in Russian]. *AMIT* 2(39):255–267.

Kozlova, L. V. (2014). "Boundary as a *Method for Revitalizing Urban Space*" [in Russian]. *Bulletin of the Irkutsk State Technical University* 6(89):117–122. http://journals.istu.edu/vestnik_irgtu/journals/2014/06/articles/20.

Irkutsk City Administration (2018). V irkutske proveli itogi golosovaniya za obchestvennye prostranstva. [Summary results of voting for public spaces in Irkutsk]. Accessed April 8, 2021. https://fkgs.admirk.ru/public-spaces/obshchestvennye-prostranstva-2018/itogi-golosovaniya.html.

Landeshauptstadt Dresden (2015), *Pressekonferenz zur Aufstellung von Erhaltungssatzungen in Dresden Striesen und Blasewitz*. Dresden: Landeshauptstadt Dresden, Stadtplanungsamt, Abteilung Stadtplanung Stadtgebiet.

Landeshauptstadt Dresden (2017). Erhaltungssatzung H 46 A der Landeshauptstadt Dresden für das Gebiet Dresden-Striesen Nordost, Vom 22. Juni 2017 [Preservation statute H 46 A of the state capital of Dresden for the area Dresden-Striesen Northeast]. Dresden: Landeshauptstadt Dresden, Stadtrat.

Malko, A., and Kozlova, L. (2019). "Revealing the 'Hidden' Values of the Panel Housing in Microdistricts: Their Identity and Future." *Project Baikal* 16(59):56–61. https://doi.org/10.7480/projectbaikal.59.1432.

Potapova, A. (2015). "The Role of Citizen Participation in the Planning Process: German Experience and the Possibility of its Application in Siberian Cities" [in Russian]. *Balandin Readings* 10(2):307–313.

Strashinina (2005). "Mestnyye derev'ya priyekhali iz Ameriki" [Native trees come from America]. *Pyatnitsa*. No. 12, March 25, 2005.

Velyakina, V. (2018). "Irkutskomu Akademgorodku ispolnilos 55 let" [Irkutsk Akademgorodok celebrates its 55th anniversary]. Press release, August 20, 2018.

VHW (2012). *Hinweise und Empfehlungen zur Bürgermitwirkung in der Kommunalpolitik*. Berlin: VHW—Bundesverband für Wohnen und Stadtentwicklung e. V. Accessed February 22, 2023. http://www.staedtetag-bw.de/media/custom/1198_71253_1.PDF?1352128873.