Spatial Planning Techniques for Forming the Urban Environment in the Friendly City Concept

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Abstract. The article focuses on formation of comfortable urban spaces and citizen friendly cities in Russia. The experience of Europe and the USA in the area of concept “Friendly cities” was examined. As a key focus of urban transforming in Russian cities and towns is proposed to create the system “Safe route to school”. The technique of execution of the project is suggested. The project “Safe School Route” has been tested on the example of Kazan city. It has conducted sociological study and developed proposal for the reorganization of urban areas adjacent to school grounds.

1. Introduction
A city is an living organism with own habits, character, and rhythm, can such an organism, fast, busy and immersed in the affairs of adults, strong people, be more friendly to those who are younger, weaker? The overall humanization of the urban environment and safety are the leading trends in urban development worldwide. In terms of urban planning term “friendly city” is a city, which is friendly for children, physically challenged people, cyclists, pedestrians. In West European countries and in the USA it is an obligatory part of the urban development strategy. The need to create a friendly environment in modern cities was openly voiced at the second United Nations conference in 1996. This idea is based on the principles of the United Nations Convention on the Rights of the Child and is monitored by UNICEF, the United Nations Children’s Fund. A child-friendly city (CFC) is a settlement where management, environmental and social practices are aimed at improving the lives of children and realizing their rights as enshrined in the UN Convention on the Rights of the Child. Thus, the document and the concept initially had a clear focus on children. The concept has now become more broadly understood – i.e. cities, in shaping spatial development strategies, include solutions to realize an accessible environment for children (Child-friendly city), women (Women-friendly city), older persons (Age-friendly city), people with disabilities (Accessible Environment), cyclists (Bicycle-friendly city). In the concept of “friendly city” there are basic criteria by which the urban environment, urban transformations and improvement projects could be evaluated. The key characteristics of a city-friendly environment are safety, accessibility to facilities, services, infrastructure, recreation and sport, cleanliness and environmental friendliness. The most important characteristic of activity in this sphere is active work with the community not just at the stage of agreement of project solutions, but already
at the stages of research and adoption of the main project solutions. In the end, the realization of the “friendly city” concept in the city benefits all residents.

For Russian cities, the twentieth century has passed under the trends of urbanization and industrialization. The cities that have been built have received the impetus for development, as well as the emergence of new cities based on large industries. A large proportion of cities were industrial. Soviet cities were managed within the framework of a rigid administration and a planned economy, and the spatial development of settlements was conditioned by the convenience of industrial enterprises. The decoration and design of cities was aimed at demonstrating the greatness of the existing political order. Today, some large cities and small settlements with unique heritage sites have moved into the post-industrial stage, where the socio-economic life of urban dwellers is determined by the service economy. A large proportion of cities with a million inhabitants are in transition. In the last decade, there has been a clear demand from city dwellers to change and reconstruct the urban environment. The urban transformation began with the initiatives of individual cities and regions. For example, in 2011 the program “100 Squares” was launched in Kazan, which continued the republican program “Parks and Squares”. Today in Russia a large-scale national project “Housing and Urban Environment” is being implemented (implementation period is 2018-2024), within the framework of which a methodology on the definition of the urban environment quality index has been developed. In general, everything goes in a planned and consistent manner, but it is possible to note the fragmented approach, the lack of attention to everyday, micro-spaces and objects, which are as if “not large” a program of state scale, but the city can’t be built itself because of the rigid centralization of funding. Also behind the strategic objectives are the improvement of the index of the quality of the urban environment, the increase of the housing stock, but a living consumer, a citizen is blurring. And despite the introduction of participative practices, in many cases it comes down to laying linear meters of curb, square meters of tiles, increasing the parking space in the courtyards.

The aim of the research is to identify the key directions and techniques of spatial and planning changes within the framework of the concept of a friendly city, and to develop recommendations for the reconstruction of the urban environment for Russian cities.

2. Materials and methods

The study is based on an integrated approach. An analysis has been made of literary sources and project practices and foreign experience of urban development in the concept of a friendly cities.

The beginning of research and project activities to create an urban environment friendly to children is considered the project “Growing Up in Cities”, initiated by Kevin Lynch in the 70s of the twentieth century [1]. Then its activities were supported by UNICEF. In 1995, the project was resumed by UNICEF with the support of a range of public organizations. Work in this area is described in the works of D. Chawla [2, 3] and V. Driskell [4].

Today, research and project activities in the field of creating child-friendly cities continue. This is the work of international organizations – UNICEF [5], NACTO, 8 80 Cities, Gehl Institute, Urban95. The systematic practice of cities in the United States, Canada, and Europe in child-friendly cities has been studied - New York, Michigan, Vermont, Vancouver, Toronto, London, Edinburgh and many others.

Author's research and projects are also considered. It is necessary to note their diversity and expansion of views and activities within the general theme of a child-friendly city. Study of the comprehensive works of Tim Gill [6], Bartlett S. [7], Bishop K., Corkery L [8], Ferguson, A. [9], Monaghan Jonna [10] and Special issue: child-friendly cities, Cities & Health [11]. Modern participatory practices with the active participation of children have been studied [12]. The work of Krishnamurthy S. on the role of urban design in the relationship between public space and families with children has been studied [13]. The paper “Designing for the next generation. Children urban design as a strategic method to improve the future in the cities” (by Laura Giraldi, Elisabetta Benelli, Roberta Vita, etc.) talks about the need to create an urban environment specifically for children [14].
There are no complex interdisciplinary studies in Russian research. Sociological works are considered [15, 16], works of psychologists on the perception of the urban environment by children and adolescents [17, 18], works that consider the quality of the urban environment and its “friendliness” from the perspective of urban administration [19, 20]. The methodology of sociological research is also considered “Urban environment of megapolis, friendly to children: comparative characteristics of inner-city districts of Yekaterinburg” (by Simonova E. A., Bannikova L. N.) [21]. Despite the existence of research papers, in the practice of Russian cities there is no systematic and purposeful activity to create an urban environment friendly to children. As single projects of urban public spaces implemented together with children and for children it is possible to note the boulevard “White flowers” in Kazan, the square “Rainbow world” in Voksa, Russia.

A comprehensive field study was conducted of the environment and features of the spatial planning organization of the Republic of Tatarstan cities (Kazan, Zelenodolsk and Naberezhnye Chelny). Sociological research among children on “How I spend (would like to spend) time in the city” and “What are the most important components of the city environment – the children’s look” has been carried out. The study was carried out in the format of interviews with pupils of 5-7 classes and as a cartoon, based on the method of mental maps laid out in the book K. Lynch “Image of the City” for Zelenodolsk and Kazan respectively. The study was conducted in the format of conversations with students in grades 5-9 and as a survey-drawing, based on the method of mental maps, described in the book by K. Lynch “Image of the city” for the cities of Zelenodolsk and Kazan, Russia.

3. Results and discussion
The analysis of the world practice of the concept “friendly city” made it possible to highlight the following principles of the concept - safety, accessibility, ecology, diversity, participation of the public, local community, children in urban environment, transparency in management and planning decisions for the city development.

An analysis of the practices and research in friendly cities highlighted spatial planning, architectural and design, organizational and management techniques, as well as a variety of ways to work with residents. The following spatial planning techniques have been identified:

1) Layout and improvement of everyday spaces and daily routes of people (pedestrians and bicycles).
2) Introduction of measures to limit and calm traffic.
3) Priority planning of the city’s green infrastructure.
4) Creating diverse and accessible public spaces near schools and other social facilities, aimed at using different social groups and ages.
5) Focus on the environment upgrading at the micro-scale level.
6) Understanding and identifying the local identity of the place.

For testing in research and project activities on the formation of a friendly urban environment was chosen the direction of forming a Safe route to school system. In European urban planning practice and municipal management, the concept of Safe route to school (SRTS) appeared in the 1970s [22, 23]. Various cities and states have accumulated experience in this area [24-26]. There is no such experience in the practice of Russian cities. The project was implemented for two districts of Kazan city, Russia. In Russian practice, there is a concept of “school route”. It usually refers to the transportation of children to schools on school buses in the peripheral territories of the city or from rural localities where there are no schools. Also at the beginning of the school year in urban schools teachers, traffic police officers, and school administrators conduct classes where safe school routes are drawn – they are laid according to the existing road infrastructure, along sidewalks, and parallel to the road network.

In the project proposal, the proposed route is distinguished by graphic, planning, and semantic techniques that ensure physical and psychological safety. This is achieved through separation from cars, creation of quiet traffic zones, installation of video surveillance cameras, security buttons, lighting and landscaping for low-mobility groups of the people. To create a sense of psychological security, it is necessary to ensure “social control” by placing public facilities on the route that attract
the flow of visitors, creating street public areas and window glazing. Landscaping elements, game elements, eco-friendly materials, and tactile surfaces that are proportional to the child's growth are used to create comfortable conditions for staying in the designed space.

A sociological study conducted in schools (when children drew their home-school-home route) shows that their paths differ from the recommended ones. Children noted in the drawings frightening and positive moments on their route (figure 1).

![Figure 1](image1.png)

Figure 1. Examples of works by Kazan schoolchildren on the topic “My route to school”.

For example, an underground pedestrian crosswalk near the school, which should ensure the safe passage of children across the roadway is perceived by them as frightening. In general, it can be noted that cars, parking lots, urban highways, underground or above-ground crossings are perceived by children as a dangerous and disturbing factor. Also in many drawings of young citizens as negative characteristics of their “school route” marked sections of the path that have mud and puddles. If the route passed through courtyards, then the area with garbage containers is an unpleasant place. Warning icons mark places where alcoholic beverage stores are located.

The coverage of the territory of the field study was determined by children's drawings and the distance of pedestrian accessibility of schools defined by Russian standards of 500 meters. During the field analysis, activity points, dead zones, wastelands and characteristic features of territories adjacent to these schools were identified (figure 2).

Mandatory (basic) techniques aimed at forming a Safe route to school in Russian cities are the reorganization of the road network and traffic and engineering improvement along the school routes. In particular it is the introduction of traffic calming measures in certain areas of the network, the reorganization of underground pedestrian crossings, the exception of the unregulated pedestrian crossings, landscaping spontaneously appeared pedestrian connections, the organization of the green strips or islands, storm sewer reconstruction, video surveillance, mandatory outdoor lighting along the entire length of the routes as the lighted windows, lights, the use of navigation objects. Depending on the local characteristics of the territory and the requests of the local community, recommended techniques can be identified that will help to reveal and strengthen the identity and individual characteristics of the territory. These special techniques include innovative color solutions, the use of thematic street art, the creation of places for short-term recreation at social and commercial
infrastructure, the organization of sports grounds, the allocation of buffer areas where parking, landscaping or parklets can be organized, the use of children's navigation (small architectural forms, installations, pavilions, signs, thematic inscriptions and drawings on building facades and sidewalks, etc.).

Figure 2. Photographs of the urban environment along the school route, made up according to the scheme-drawing of a school student in the village of Derbyshki, Kazan city, Russia (photos by I.I. Bilalova).

The research conducted on the basis of two schools in Kazan city revealed the characteristic routes of children to school, problematic and favorable sections of the path, and the features of these spaces. Then the directions of urban planning changes for these territories were proposed. One of the schools under consideration is located in the Sovetsky district of Kazan, in the village of Derbyshki. The main building consists of housing of the 1940 – 1950s, good greening. Despite the fact that the territory is not characterized by active traffic, children note spontaneous and blocked parking areas as uncomfortable and unpleasant. In the description of the desired route many drawings show unique objects, which indicates the scarcity of infrastructure services for the territory and the “impersonal” urban environment. Based on this, the design solution for this fragment pays considerable attention to the architectural and artistic organization of the urban environment. The concept for navigation infrastructure, small architectural forms, sports grounds and recreation areas are based on abstract paintings of the first half of the XX century: the works of Soviet artist and architect El Lissitzky, Dutch artist Peter Mondrian, and abstract art of Vasily Kandinsky (figure 3). For the second city fragment, the crucial decisions were the reorganization of the road network and the use of street art. In general, research and project work has a «network character». In other words, the methodology and developed project proposals can be adapted and partially distributed to other cities.

Figure 3. Sports and playground on the site of a vacant lot in the village of Derbyshki, Kazan, Russia (project proposal of the authors).
4. Conclusions
The safe route to school program can be an impulse for reconstruction and formation of everyday environment of Russian cities in the concept of friendly city. For Russian cities it is a new approach from the point of view of its interdisciplinary, intensive orientation to the children’s audience, the scheme of project activity from children “from the bottom up” (from the project to the implementation). After discussion with the local community, the project could be implemented. The implementation process can occur in two ways. Such projects can be accomplished in the framework of other programs, such as “My Court”, “My District”. Since they are currently being implemented in a number of Russian cities and state funding is allocated for them. But the stated goal of such programs – improvement of urban environment is often reduced to replacing outdated equipment, or creating additional parking spaces. The second option is an independent direction of urban transformation: all other programs should be integrated into the concept of urban development aimed at creating a friendly spatial and social environment, actively involving young citizens, public organizations, city administrations and city services in the research, project process and implementation. The second option is a higher priority, because here the key figure is the citizen, and the safety of the environment is declared as a priority. It is the design of a friendly environment, design for children, that can become the central and starting point, that animates a large program for the modern development of Russian cities.

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