

**ECQEMC 2021****The Fourth Annual International Symposium “Education and City: Quality Education for Modern Cities”****ASSESSMENT OF PUBLIC SPACES AROUND SCHOOLS:  
COMFORT INDICATORS AND USER OPINIONS**

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**Abstract**

The scientific problem of interaction between humans and urban environment is considered in the context of urbanites' perceptions of comfort in local public spaces. The subject and scientific novelty of the study is related to consideration of urban public spaces around schools through a prism of their contribution to social life of users and attendance comfort. The study was conducted by interviewing participants of education schools in order to study their opinions about objective parameters of public spaces and also their satisfaction with various characteristics of public spaces. The respondents' opinions on safety, pedestrian accessibility, environmental impact, conditions for maintaining a healthy lifestyle, social infrastructure and "third" locations were analyzed. The study revealed that public spaces around schools can be characterized as areas with diverse infrastructural and functional content. The diversity of infrastructural facilities allows to meet social and business needs of users. Public spaces around schools are locations of attraction in terms of organizing leisure activities and providing comfortable communication. The most common places for users of school territories are parks, squares, and playgrounds, which are among the most common and accessible options for "third" locations. Road conditions created for pedestrians, as well as safety of movement in public spaces around schools can be evaluated as comfortable for most users. Obtained results make practical contribution to development of methods for measuring the perception of local peculiarities of urban spaces by their users, and can be useful in making and implementing management decisions in the field of urban planning policies.

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*Keywords:* Public spaces, pedestrian and transport accessibility, social infrastructure, safety, urban environment



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## 1. Introduction

Relevance of the research on public urban spaces is determined by the high rate of urbanization of Russian cities. For example, the share of urban population in Russia is currently 74.7 percent of the total population of the country, and this figure continues to grow (Federal State Statistics Service, n.d.). In turn, as cities grow and the number of their inhabitants increases, the question of comfort and well-being of public spaces becomes particularly important for their users. Studies show that availability of comfortable public spaces around future residential buildings is the main criterion for their selection (Velevich, 2021).

The importance of comfort and provision of urban amenities to public spaces for the majority of urbanites has also been revealed as a result of numerous all-Russian surveys (The Boston Consulting Group, 2018). Thus, according to the opinions of Russian citizens, improvement of parks and squares should be included in the list of the most important points for development of public spaces (WCIOM, 2020). The interest of the population in development of comfortable spaces is also expressed in the growing attention to the social infrastructure of the city as its most important component. This trend can be observed on the basis of the analysis of queries on the platform "wordstat.yandex.ru". Thus, there was an increase in the number of queries on the topic "social infrastructure" from 13,402 (monthly average) in 2019 to 23,076 (monthly average) in 2020 and 35,189 (monthly average) in 2021, which, in turn, provides an indirect indicator of the growth of interest on the topic under study in Russia.

## 2. Problem Statement

In recent years, development of socially attractive and comfortable urban public spaces has been discussed as one of the main directions for implementation of urban planning policies, and in 2017 the task was elevated to the status of a federal one and was officially included in the priority project "Formation of a comfortable urban environment" (Minstroy Rossii, 2017).

However, as experts note, the definition of essence of a comfortable urban environment used by legislators and urban planners is often radically different from ideas of specific users of public spaces related to comfort and well-being: "The authorities can create all conditions to ensure high quality of living of citizens in the city, but a person can still feel uncomfortable" (Ganchenko & Tarzanova, 2019, p. 83). It should also be emphasized that methods for determining the quality and comfort of urban spaces in Russia are mainly aimed at measuring integral indicators at the citywide level and are applied for comparative analysis of different cities (Sergeeva & Lazareva, 2018). In this regard, users' opinions and local contexts, which play an important role in development of public spaces of individual cities, occupy a minor place in these methods. Public spaces can be safely classified as a thoroughly studied research phenomenon (Kogan, 1982; Marcus & Francis, 2021; Oldenburg, 2018; Park, 2002; Praliya & Garg, 2019; Revzin, 2017). At the same time, there is no unified understanding of this concept among the researchers of urban spaces to date. The research works show the trend towards evolution of the term "public space" from "material" to "social" in a quite clear manner. Early works of scientists are dominated by the morphological approach to consideration of public spaces. The specifics of this approach imply the

study of all peculiarities of infrastructure object locations (parks, residential areas, etc.), urban spaces outside the plane of their interaction with social actors.

Further evolution of the scientific thought is associated with gradual departure from understanding of urban spaces as a simple territorial set of material objects in favor of their greater sociality (Weber, n.d.). There are also works related to interaction of small communities in the urban environment, perception of urban spaces through the prism of cultural values, peculiarities of social actions in urban conditions (Simmel, 2002).

Modern foreign and domestic urban studies make it possible to observe the prevailing tendency to comprehend urban public spaces through the prism of their contribution to the social life of urbanites. Researchers propose to consider public spaces based on their social significance, adaptability to the needs and diversity of activities of urban residents (Brown et al., 2018; Carr et al., 1991; Carmona, 2019; Filonenko et al., 2020; Ivanova et al., 2019; Mehta & Bosson, 2018; Mehta, 2019; Penalosa, 2020; Yarskaya-Smirnova & Yarskaya-Smirnova, 2021).

Despite a large number of works, where public spaces as an object of study are presented in various problem fields, there are relatively few studies dedicated to the search for criteria of comfort in public spaces. Among the available works we have identified several ones, in which the issue under study is considered in more detail.

Among these works we can refer to a large-scale research of the Danish architect and urbanist Jan Gehl (2010), where social attractiveness and success of a certain space among its users is mainly connected by the scientist to the duration of stay in it of the maximum number of people (pp. 6-7). The scholar emphasizes an ability of urban spaces to enhance social stability when any groups of urbanites can meet each other and become a part of the society which leads to a sense of security, confidence, safety, understanding and acceptance of the diversity and unity of the society.

The importance of studying public spaces as locations of urban communities concentration is also represented in the concept of "placemaking" by representatives of the nonprofit organization "Project for Public Spaces (PPS)". This concept conveys the importance of forming urban public spaces, places demanded by users, which are characterized by the following criteria of "success": a) comfort and identity - availability of the convenient and attractive infrastructure, recognized identity of a certain space; b) content - availability of opportunities for a variety of activities, including economic, land use; c) accessibility - external transport and pedestrian accessibility and internal cohesion of space by means of trails and paths, convenient entrances and navigability; d) sociality - friendliness of the environment for different social groups, availability of local communities and social networks (Project for public spaces, 2007).

The works of the architect of urban spaces Mehta (2019), which also examine the problem of comfort spaces in detail, identified the following criteria: universality as providing access for users with different demographic and social characteristics, availability of meaningful activities, safety, ability to bring pleasure, expressed in the architectural and visually complex content (p. 16).

The Roorkee Praliya and Garg (2019) criteria matrix for evaluating the "success" of each space highlights such success criteria as territorial accessibility of the territory, order keeping, attractiveness, comfort, versatility, activities and methods of use, purposefulness, safety (p. 98).

It should be emphasized that all research works reviewed by us were performed by architects, landscape designers, urban volunteers. The criteria highlighted in these works suggest the need for attention to nuances, urban peculiarities and local contexts, thereby revealing a comparatively greater capacity for fine-tuning to the particulars of public spaces.

In this paper the term "public spaces" will be understood as urban areas with a certain functional purpose, designed for various processes of human activity (Votinov, 2014).

The above-mentioned range of research questions, in our opinion, can be successfully considered in the subject field of the microubanism concept. The choice of microubanism as a conceptual framework of the empirical component of a study provides an undeniable methodological advantage. By narrowing the focus of our attention to small urban spaces, we can direct it to the particular while maintaining the possibility of multifaceted analysis. The analytical framework of this concept outlines a "close-up view" on the city, thus providing an opportunity to discern and evaluate a public space in detail from the perspective of all users of such space (Brednikova & Zaporozhets, 2018). In this sense, the microubanism concept is closely connected with the directions followed in modern architecture and urban planning, which declare the idea of convenience and comfort of public spaces for their users.

In this regard, the study of the comfort of public spaces from the perspective of their users on the one hand provides an opportunity to deepen the scientific knowledge in the context of the problems related to "interaction between man and urban environment".

### **3. Research Questions**

The research focus is directed on users of public spaces, the study of peculiarities of human perception in the urban environment, identifying the significant factors and conditions of such spaces, also implementing identification of the reasons for a particular behavior in urban space.

### **4. Purpose of the Study**

Integrated study of the urban environment in the school locus, determination of the significance of criteria for assessing the urban environment for different age categories of urbanites and their understanding of essence of the formulated indicators within the urban space research.

### **5. Research Methods**

The object of our study is an urban public space located within a fifteen-minute walking distance from an educational organization - a comprehensive school in Moscow.

Limiting the studied public space to a walking distance from school, we proceeded from the concept of a "15-minute city". It is based on the idea of creating urban neighborhoods in such a way that all major social facilities, leisure centers and places of basic services provision would be located not more than within a 15-minute walk in a standard slack pace from any point in the neighborhood.

Thus, in a broad sense, the school is defined in our study as a kind of origin of coordinates in the public space. We proceeded from the assumption that schools were and continue to function as one of the main social and infrastructural dominants of urban spaces, around which other elements of social and

infrastructural objects of the city with corresponding types and ways of social and cultural organization were "built up". The school considered within the study is a kind of a "centre/"core" of public space, and spaces around schools are considered a certain "location" or "locus" where elements of an urban system are orderly located and interact with each other (Ivanova & Vinogradova, 2020).

Unlike other social institutions, for example, health care facilities, the school is an object of daily practice, which is visited by people regularly. We identify the participants of educational relations represented by students, parents and school teachers as regular users of public spaces around schools. We identify all participants of educational relations as active users of spaces around schools, who provide their own perceptions and opinions about it, hence are able to evaluate public spaces in more detail in terms of their social attractiveness and comfort.

As a method of research which is the most consistent with the goals and objectives of the study, we created a questionnaire survey in the format of online research, the advantage of which is the ability to obtain reliable data on the quality of urban environment through formation of a representative sample with limited time and personnel resources of the study.

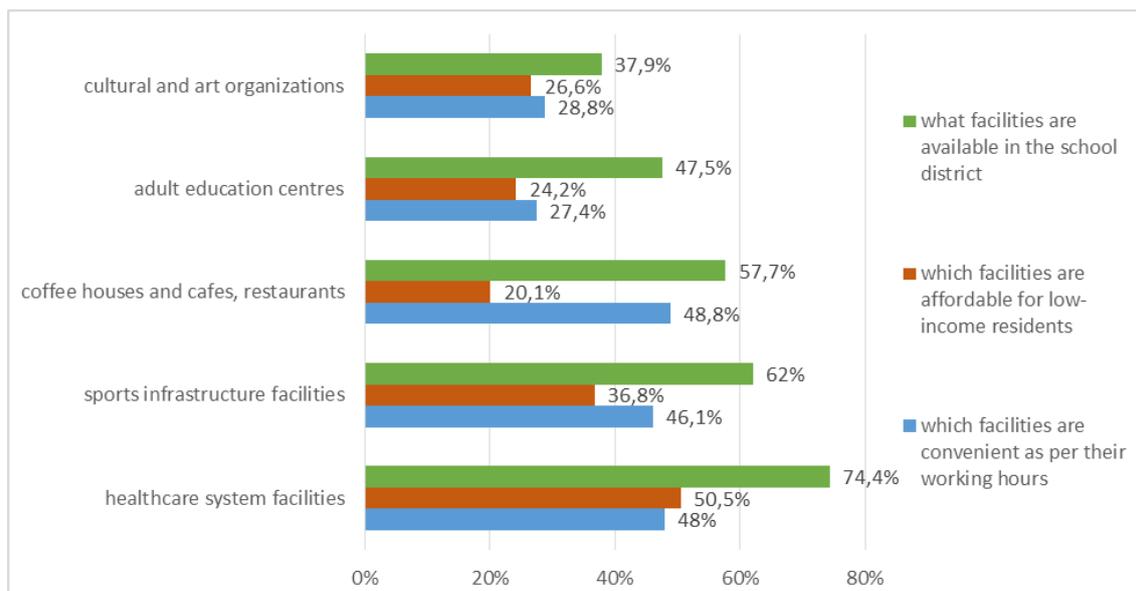
The sample selected schools proportionally to Moscow districts. 996 participants of educational relations were interviewed. The questionnaire surveys are designed according to the chosen criteria for evaluating the comfort of public spaces around schools and involve recording two parameters for each of them: 1) actual presence of these or those objective parameters of a space in the specified location. For example, availability of infrastructure in the studied space (presence of additional education centres, cafes, etc.); 2) assessment of subjective perception based on self-assessment of the level of satisfaction with various parameters. For example, satisfaction with availability of sports grounds, institution work schedule, etc.

The following elements were considered as the criteria for the study of comfort of public spaces: social infrastructure and "third" places, safety, versatility, pedestrian accessibility.

## **6. Findings**

### **6.1. Evaluation of social infrastructure facilities**

As it has been shown by the study, public spaces around schools represent a fairly wide range of soft social and cultural infrastructure facilities: including facilities of the health care system (74.4%), sports facilities (62%), catering organizations (57%), adult education centres (47.5%), culture and arts organizations (38%) (Figure 1).



**Figure 1.** Availability and characteristics of infrastructure facilities in areas around schools, as a percentage to the number of respondents

Different user characteristics of these infrastructure facilities were assessed differently by respondents. The greatest number of respondents classified health care system facilities (50.5%) and sports infrastructure facilities (36.8%) as affordable ones for low-income groups of citizens.

According to respondents' opinion, the most accessible facilities by convenience of the work schedule are catering facilities, facilities of the health care system (48%) and sports infrastructure facilities (46%).

The measure of respondents' satisfaction with considered user characteristics of social infrastructure facilities was also distributed differently. Thus, the respondents have been more satisfied with the work schedule of institutions among all characteristics. The proportion of respondents fully satisfied with this indicator is 45%. The quantity and variety of objects presented in the territory around schools fully satisfy 39.8% of respondents; the cost of goods and services of social facilities fully satisfied 33.6% of respondents of the educational process. The obtained data, in general, match with the results of a social infrastructure research (Vinogradova & Konstantinova, 2021).

According to the respondents' answers, the areas around schools have different locations for comfortable communication outside home and work, or, in other words, "third" places. The largest number of respondents indicated availability of parks and various walking spaces, including routes for cyclists, parks, squares (about 73%), playgrounds with benches for adults (about 72%), squares with gazebos and benches (60%). About 45% of respondents noted availability of shopping centres and outdoor sports grounds. Fewer respondents indicated availability of specialized spaces such as picnic areas (38%) and leisure centres (15.5%).

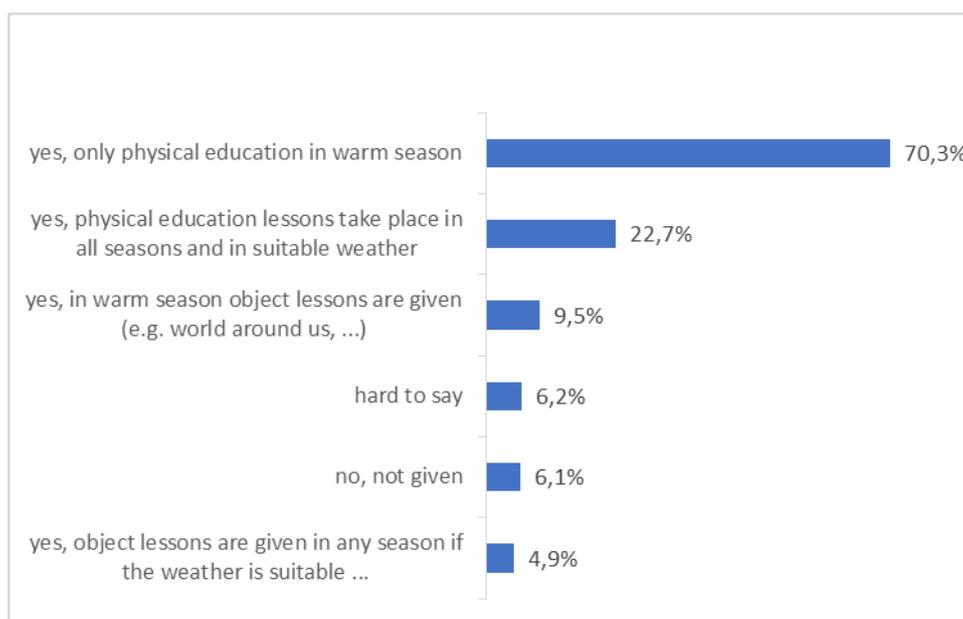
Despite availability of a fairly wide range of communication locations, the level of respondents fully satisfied with recreational opportunities in school areas was quite restrained, at 41.7%. About 27.8% of the respondents were moderately satisfied with recreational opportunities and conditions, the least satisfied were 23% of the respondents.

The research results showed that urban public spaces around schools provide ample opportunities to maintain physical activity for their users. For example, more than 63% of respondents indicated that there is a significant number of special locations for sports activities in areas of residence. The percentage of respondents satisfied with this indicator to a significant degree is also high (60.3%).

According to the respondents' assessments, schools themselves provide facilities for maintaining physical activity of students. Thus, 57% of respondents stated that schools have developed an opportunity to store such gear in specially allocated areas to a large extent.

The vast majority of respondents (57.6%) noted availability of a significant number of outdoor places on their school territory. More than 20% of respondents believe that such places are provided in small numbers, 16% of respondents took an average position in assessing the indicator.

At the same time, the stated areas are mainly used for physical education classes. Thus, 70.3% of respondents indicated that outdoor physical education is only conducted in warm season, and about 23% of respondents estimated that if the weather is suitable, physical education lessons can be conducted outside in any season of the year (Figure 2).



**Figure 2.** Peculiarities of physical education lessons taught outdoors, as a percentage to the number of respondents

To a large extent, 64.4% of questioned persons were satisfied with convenience and possibilities of school area to teach physical education lessons in the open.

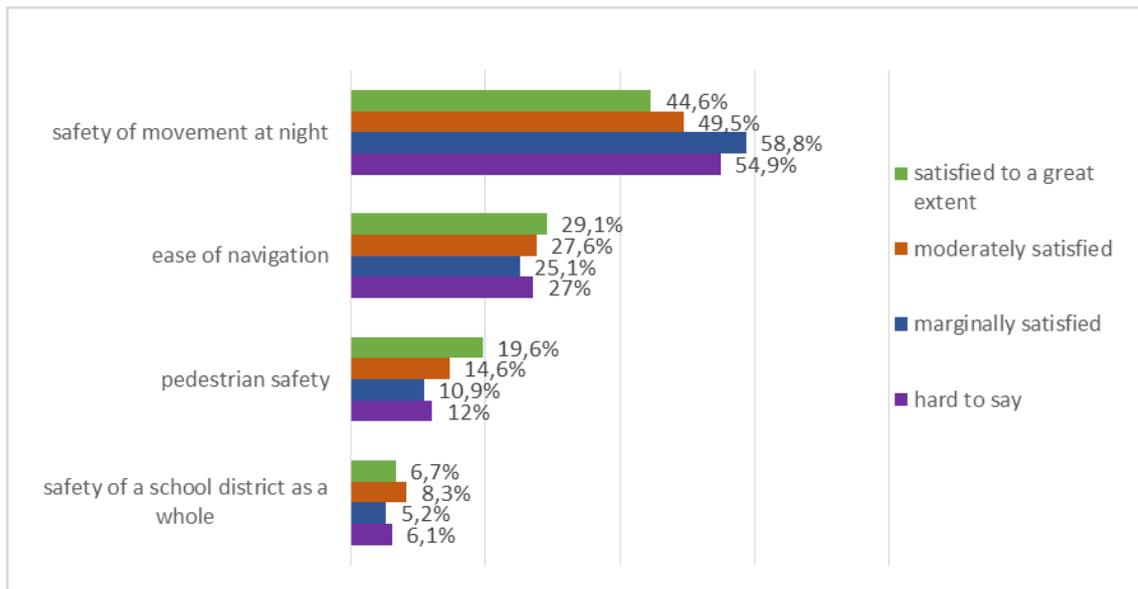
At the same time, teaching object related lessons outdoors (biology, physics, etc.) is practiced in schools pretty seldom. Availability of such practice in schools was indicated by less than 15% of respondents.

It may be assumed that one of the main reasons for low popularity of the practice of object lessons outdoors is related to unsuitability of school territories for stated tasks. It is evidenced by self-assessment of satisfaction with convenience and possibilities of a school territory to conduct object lessons in the

open. Only 35% of respondents are remarkably satisfied with this characteristic. 20.7% of respondents are satisfied to an average degree and about 33% expressed a low degree of satisfaction.

## 6.2. Assessment of public spaces in terms of safety and pedestrian accessibility

The vast majority of respondents was largely satisfied with both safety of their school district as a whole (54.9%) and conditions of safe movement as a pedestrian, including safety at cross roads, walks to school and strolling (58.8%) (Figure 3).



**Figure 3.** Respondents' satisfaction with various safety features, as a percentage to the number of respondents

At the same time, respondents' evaluations of individual safety characteristics in areas around schools are not so unambiguous and demonstrate existence of areas with different levels of danger. In general, this notion is consistent with the research on urban spaces safety and factors that influence perceptions of safety in different groups of respondents (Rahm et al., 2021). For example, the number of people who indicated presence of dangerous road crossings is approximately 34%. According to the respondents, the issue of providing safe underpasses and overpasses in the city is not completely resolved either. Thus, 45.8% of respondents indicated that there are few such crossings under the major highways.

At the same time, a number of indicators of road safety have been assessed positively by the majority of respondents. Thus, 43% of respondents believed that streets are largely characterized by separation of the flows for pedestrians and drivers: highlighted columns, fences mounted between sidewalks and roads, etc. 49.7% of respondents noted that locations of parking zones outside of pedestrian areas and children playgrounds are largely characteristic for areas around schools.

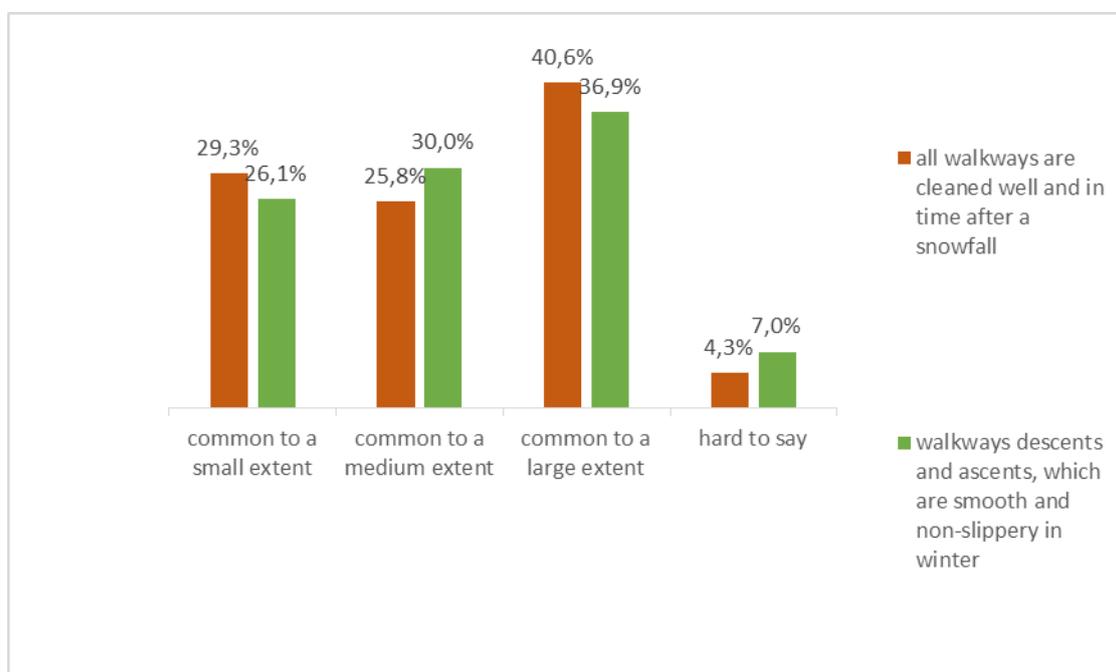
Respondents were asked to evaluate navigation as a tool which helps to competently distribute the flow of people in public spaces, also render assistance to people to better navigate in it. More than 45% of respondents answered that navigation in their area is largely understandable and does not cause any difficulty in finding the way (information boards, diagrams, street name signs). Approximately 50% of

respondents expressed a significant degree of satisfaction with the convenience of navigation, including how easy it is to find the right road and/or place.

One important indicator for safety was related to lighting of a school area. More than 56.5% of respondents reported a high degree of lighting in their neighborhood. However, less than a half of all respondents (44.6%) were fully satisfied with safety and comfort of moving around their neighborhood at night.

The vast majority of respondents was largely satisfied with road conditions created for pedestrians in their school neighborhoods (55.2%) and with the overall comfort and safety of pedestrian routes when walking from home to school (57%). 49.6% of respondents have believed that quality walkways are characteristic of a school district to a significant extent, 46.3% of respondents indicated a significant degree of prevalence of ramps, elevators, convenient exits at staircases of organizations.

The comfort of pedestrian movement in winter time directly depends on timely cleaning of public spaces from the snow cover. 40.6% of respondents believed that this indicator is widespread in school districts to a great extent. Prevalence of descents and ascents on pedestrian paths, which are smooth and non-slippery in wintertime, was also assessed differently by respondents. For example, approximately 37% of respondents indicated significant prevalence of the indicator in question, 30% of respondents felt that safe descents and ascents were moderately prevalent and 26% of respondents showed low prevalence of the indicator in their neighborhood (Figure 4).



**Figure 4.** Evaluation of prevalence of pedestrian amenities important in winter, as a percentage to the number of respondents

Respondents were asked to rate availability of parking spaces for teachers' and parents' vehicles in terms of sufficiency. The results of responses to the question demonstrate that the majority faces the problem of the availability of parking spaces in one way or another. Thus, the cumulative number of

respondents who indicated that parking spaces are "rather and definitely insufficient" has been almost 65%. 18.2% of respondents noted that parking spaces are rather sufficient and only 6% of respondents were sure that there are no problems with availability of parking spaces.

Transport accessibility of social infrastructure objects, including schools, is an important characteristic of a comfortable urban public space. In our study more than 58% of respondents noted presence of public transport stops close to the school. 25.3% of respondents indicated availability of bus stops, but also noted that the way to it is difficult due to the need to cross the road or presence of stairs. 9% of respondents indicated that there was no bus stop located close to a school, and 7.4% of respondents had difficulties answering the question.

## 7. Conclusion

Public spaces around schools can be characterized as areas with the diverse infrastructural and functional content. The diversity of infrastructural facilities allows us to meet various social and business needs of users. The services provided by identified facilities are predominantly accessible to a wide range of users, both in terms of the cost of services and physical accessibility. Limitations on affordability of services for low-income groups of population are often associated with the form of ownership of facilities in question. Services provided by commercial entities that form pricing policies based on economic principles rather than socially oriented ones will obviously be less loyal to low-income categories of users. Expanding the range of targeted bonus programs could increase availability of services and make areas more attractive to the general public.

Public spaces around schools are locations of attraction in terms of organizing leisure activities and providing comfortable communication. The most common locations for users of school territories are parks, squares, and children playgrounds, which are among the most common and accessible options for "third" locations that can be found in public spaces of Moscow. According to cross-country studies, Moscow ranks the second in the world after Hong Kong in the share of parks in urban spaces (Research on development of a comfortable urban environment in Moscow and leading cities of the world, 2018). The number of conceptually new children playgrounds considered as a part of public spaces with the expanded functionality, having not only high playing value, but also being a comfortable "third" place for different age categories with the accompanying infrastructure for adults provided in the form of convenient benches, litterbins, etc. is increasing.

Road conditions created for pedestrians, as well as safety of movement in public spaces around schools can be evaluated as comfortable for most users. At the same time, the results of a survey showed a certain decrease in user satisfaction due to insufficient development of conditions for people with low mobility, lack of parking spaces, presence of dangerous areas when crossing roads.

Here we agree with the conclusions of Gehl on the need to make public spaces more comfortable for pedestrians by increasing pedestrian movement areas ("green mobility"), place benches, etc. Such initiatives can encourage children to walk to school safely, also serving as incentives for social interaction and physical activity and city friendliness for different categories of the population, which in turn increases the intensity of use and expands social and cultural functions of the city.

Public spaces located around schools have developed, publicly accessible sports infrastructure, which is the result of implementation of a focal area for development of the physical culture at a citywide level.

The territories of schools themselves also have well-developed infrastructural possibilities for physical education lessons. At the same time, teaching object lessons outdoors is not a common practice for urban schools, which may be due to low adaptation of school territories for these tasks. More active use of the potential of school territories for organization of object lessons outdoors could be of interest to educational organizations not only in the context of health support, but also as an unconventional approach to increase students' productivity and motivation.

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