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The development of Urban Areas and Spaces with the Mixed Functional Use

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Abstract

The article examines the principle of a mixed-use urban areas. It analyzes the historical development of multifunctional areas and considers the historical development of multifunctional areas. The article gives the definition of mixed use areas and reviews the main studies relating to mixed use areas, and creation of a comfortable urban environment. It discusses the principle of the compact urban environment. The enumerated effects occur when the compactness of the urban environment is reached. It raises the issue of the principle of a mixed-use urban development in the modern Russian practice and the possibility of applying this principle for the development of a new master plan of Kazan. It also consider new areas of a mixed land use designed for the city of Kazan.

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1. Introduction

Throughout human history, the majority of the settlements is a multifunctional environment. People lived in close proximity to work. Foot traffic was the main method of transportation. Most people live in buildings that have been a place of work and home at the same time. Production of goods and their sale took place in an apartment building.

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People lived in close proximity to each other, and sometimes at very high densities, since the space needed for everyday life and movement between different activities has been identified pedestrian accessibility. The increase in population has led to the growth of cities. Therefore, some modifications have been made between the personal and professional lives.[1]

For a long time, with the advent of functionalist ideas, registered in the Athens Charter CIAM, city planning organization was formed for reasons of a clear delineation of the city in time and space of functional processes. [2] All this is reflected in the method of functional zoning of the city territory. But practice has shown that the processes taking place in the city is much more complex and do not fit into the rigid framework of functional zoning. Gutnov in book "The Evolution of Urban Planning" wrote: ... there are places of application of labor, associated with the development of the leisure industry and new types of public services. In these circumstances, it becomes increasingly difficult to locate system application labor seats in a particular area of the city, and it covers the industrial area of the city center..., and residential areas of the city, and even recreational areas "[3]. Isolation of habitation of visited sites and actively functioning causes reproaches from the urban population.

In the middle of the last century, when the city began to choke on the car, and some cities have become de-industrialized, it is understood that the zoning of the territory, in the usual form, has outlived its usefulness. Jane Jacobs wrote about this in her book "The Death and Life of Great American Cities" in 1961 [4].

The basis for the planning structure of the city must be put to a more flexible concept than rigid functional zoning as delineation of elements of planning structure can not be implemented based only on the grounds that one of the activities is predominant in the area.

Implementation of the new urbanism concept based on 10 principles and we want to stop at one of them - mixed-use areas. [5]

2. Literature review

The following series of publications of authors reveals some aspects of the problem being studied. Problems of development of complex urban environment are considered in these sociologists, theorists and architects: Rem Koolhaas, Charles Landry, Glazichev V.L., Egorov M.M. [6, 7, 8] Mixed-Use Development Handbook by Dean Schwanke have examples of the mixed use projects development.[9] The theoretical justification for the development of new interaction formats between office and residential spaces in the context of our time is given in the study of Avi Friedman. [10]

Because pedestrian accessibility is one of the main principles of a mixed-use spaces and territories. Jeff Speck in his book talks about walkability in the city as a key point of comfort of life in it.[11] Jan Gehl in his books describes the methods of creating a comfortable urban environment and public open spaces.[12, 13] Kevin Lynch in his book helps us understand how to make the urban environment more lively and memorable for passers-by and how to use the human perception of the physical form of the city to create an urban design.[14] Peter Newman and Isabella Jennings disclose environmental issues of sustainable urban development, describes the urban ecosystem.[15]

3. Mixed use areas

Mixed use areas in the broad sense - is a combination of residential, commercial, cultural, institutional and production functions, where these functions are physically integrated into different scales, in different intensities and in different combinations. This variety of functions allows people to live, work, relax, go shopping in one place, which then becomes a vital activity destination for people from other areas, therefore, can increase the economic viability and security of space by increasing the number of people on the street and in public places.[16] At the basis of the multi-function areas and spaces concept there is a principle of efficient urban areas and infrastructure use by providing people with everything you need as close as possible to the places of residence. The presence of different functions within the boundaries of quarters and districts will promote economic development and maintenance.

This approach saves considerable space and meet the increased demand for housing in the city center and accommodation located near the workplaces. All of this entails a reduction in traffic congestion due to increased pedestrian accessibility of workplaces and reduce the number of car trips for personal use.

Mixed use of functional areas helps to achieve uniform distribution of population and residential development on the territory of the city, the lack of pronounced imbalances in the territorial conditions of the city, as the urban environment, in the availability of public goods. The implementation of the principle of compactness means achieve the following effects:

- low degree of differentiation in residential development, the density of population dispersal, concentration of business between local areas of the city;
- alignment of the transport accessibility of the index areas of the city,
- increasing the efficiency of transport services;
- the achievement of low-density variation index economic use of the territory;
- uniform coverage of the city engineering and public utility and social infrastructure. [17]

4. Mixed use areas

Modern understanding of zoning in Russia recorded by the Urban Planning Code of 2004, which defines zoning as "... the zoning of municipalities in order to identify the territorial areas and the establishment of town-planning regulations".[18] The urban zoning document are land use and development rules, which are approved by the regulatory legal act of the local authorities and which are installed above the territorial areas with urban planning regulations. The land use and development rules set boundaries and town planning regulations for territorial zones.

Urban planning regulations define:

1) type of permitted use of land and other real estate; 2) limit the size and parameters of land and allowed the construction and reconstruction; 3) restrictions on the use of land plots and capital construction projects. The land use and development rules is implemented urban zoning of the municipality, is a division of the territory into zones, each of which establishes the legal regime of urban use. Development of land use and development rules has the following objectives:

- sustainable urban development, protection and conservation of the environment and cultural heritage.
- respect for the rights and interests of individuals and legal entities, as well as owners of land and capital construction projects.
- provision of planning the territory of municipalities.
- creating an environment for attracting funds. The ability to create alternative types of permitted use of land plots and capital construction projects for maximum efficiency in their operation. [19]

At the moment there is a work on preparing a new master plan of Kazan, on justification of zoning and town planning regulations, developed a new classifier territorial zones.

5. The concept of zones with mixed use areas

Were developed four areas of mixed use. These zones are based on the type hierarchy locations, each of which may be implemented using one or more zones. The table below shows the relationship between the areas and types of places in the city.

Table 1. The relationship between the zones and the type of space in the city.

Type of space in the city.	Zones
Urban center	MU1, MU2, MUC
Median zone	MU2, MUC
Urban periphery	MU1, MU2, MU3, MUC
Dispersed	MU1, MU2, MU3, MUC

The basis for the formation of the zones are as follows:

- permitted activities in this area;
- the scale of permitted use;
- various options for mixing activities;

The result of the mixing and separation of uses submitted in Table 2, which shows the band with the allowed uses.

Table 2. Uses permitted in mixed use zones.

		Small scale zone	Medium scale zone		Large scale zone
		MU1	MU2	MUC	MU3
Commercial	Office	restricted	permissible	permissible	permissible
	Retail Sales and Service	restricted	permissible	permissible	permissible
Residential	City quarters	permissible	permissible	permissible	no permissible
	Mega quarters	no permissible	permissible	permissible	permissible
	Medium height tower	no permissible	no permissible	permissible	permissible
	Tower	no permissible	no permissible	no permissible	permissible
Industrial	Light industry	restricted	restricted	restricted	restricted

6. Conclusion

Planning of the urban area is an important factor in the successful development of the city. Competent territorial organization of urban space provides a comfortable accommodation of local communities, creates conditions for the reproduction of the population, business development and improving the competitiveness of the city as a "service" consumed him residents. The correct type of construction determines the efficiency of the city's transportation and engineering and utility networks, increases the attractiveness of living in general.

The principle of functional zoning of allocating residential, business and industrial areas should be rejected. This emphasis on a mixed-use area, allocation of its own center, the organization places of application of labor, creating objects of social infrastructure within walking distance availability. The person should receive all good in their area, and the center of the handle only citywide values (theaters, museums, etc.). Such polycentric model of development of the urban environment contributes to the comfort level of living for the local communities in terms of convenience transportation, access to public goods, opportunities cooperation with municipal authorities and non-governmental organizations on the development of local communities. This style of life gives public amenities such as parks, green spaces and public transport. Most significant is that well thought-out and designed mixed-use area contribute to a more vibrant life in the urban environment and nothing has a greater impact on improving life in the city. [20]

Regarding this we can say that the development of zones with mixed use areas have a great importance for sustainable urban development. The development of these areas should be given adequate attention.

References

- [1] Restore, Commercial and mixed-use development trends in the rocky mountain west, Report, Sonoran Institute.
- [2] Information on http://www.getty.edu/conservation/publications_resources/research_resources/charters/charter04.html.

- [3] A.E. Gutnov, The evolution of urban planning, Stroyizdat, Moscow, 1984.
- [4] D. Jacobs, The Death and Life of Great American Cities, A new publishing house, Moscow, 2011.
- [5] The Lexicon of new urbanism, Duany Plater- Zyberk & Co.
- [6] R. Koolhaas, A Retroactive Manifesto for Manhattan, Delirious, New York, 1978.
- [7] C. Landry, The Creative City: A Toolkit for Urban Innovators, second ed., Taylor & Francis Ltd, London, 2000.
- [8] V.L. Glazichev, M.M. Egorov, Urban environment development technology, Handbook, Ladia, Moscow, 1995.
- [9] D. Schwanke, Development Handbook, Ser.: Mixed-Use Development: Handbook, Hardcover, 2003.
- [10] A. Friedman, Sustainable Residential Development – Planning and Design for Green Neighborhoods, McGraw Hill Professional, 2007.
- [11] J. Speck, Walkable City – How Downtown Can Save America, One Step at a Time, Macmillan, 2012.
- [12] J. Gehl, Birgitte Svarre, How to Study Public Life, Island Press, 2013.
- [13] J. Gehl, Cities for People, Island Press, 2013.
- [14] K. Lynch, The Image of the City, Mit Press, 1960.
- [15] P. Newman, I. Jennings, Cities as Sustainable Ecosystems – Principles and Practices, Island Press, 2012.
- [16] A. Barr, Mixed use, density and the power of the myth.
- [17] Y.U. Kataeva, I.L. Lobanova, Territorial organization of large cities as a factor of cities development (On an example of Perm), Problems of Modern Economics Journal. 13 (2013).
- [18] Information on https://www.consultant.ru/document/cons_doc_LAW_51040.
- [19] Information on https://www.consultant.ru/document/cons_doc_LAW_51040.
- [20] C. Sackey, Mixed-use development an urban design approach to cities in developing countries, Kwame Nkrumah University of Science and Technology, 2009.