

# Ukrainian Post-socialist Cities and Integrated Development



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**Abstract** Modern Ukrainian cities in the post-socialist time of their development found themselves in a situation of the lack of an appropriate urbanistic methodology. Socialist urban development doctrines of urban development no longer work in the new socio-political and economic realities and new methodologies are required. One of these methodologies is fractal urbanism. One of the postulates of this methodology for the post-socialist city is the UN Sustainable Development Initiative (SCI) and the Integrated Development Concept (ISEK).

**Keywords** Information society · Fractal urbanism · Integrated development architectural composition

## 1 Introduction

Modern Ukrainian cities in the post-socialist period of their development found themselves in a situation where there was no corresponding urban theory and methodology. The demographic situation in most Ukrainian cities remains tense [1].

The international project GIZ “Integrated Urban Development in Ukraine” (ISEK), which is supported in Germany by BMZ, and in Switzerland SECO is implemented in a number of Ukrainian cities, including Poltava [4]. The decrease in the population in Ukraine (41,588,000 people by 2020) is taking place against the background of an increase in the percentage of the urban population. In 1959, the percentage of urban population was 45.7% of the total population of Ukraine, in 1970 it was already 54, 5%, and in 2020 the percentage of urban population was 69.2%. The total number of urban settlements was—1345.

The high dynamics of urbanization in Ukraine did not in itself solve the problem of development of post-socialist Ukrainian cities, but on the contrary exacerbated the existing problems of spatial development of territories and cities, especially given the processes of decentralization and territorial administration in the country.

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More cities in Ukraine have signs of a monofunctional industrial structure, because the enterprises are mostly one or two profiling sectors of the socialist economy, formulating the revenue side of the city budget, thus ensuring the functioning of social infrastructure. Such times are over. Today, against the background of rapid population decline, the issues of creating new jobs and forming the appropriate social infrastructure of cities have become more acute.

The process of urbanization in Ukraine continues, despite the economic, demographic and social challenges facing post-socialist cities, so cities should be given more attention. Today, cities are becoming points of growth and future development.

The implementation of new approaches in the development of Ukrainian post-socialist cities on the basis of the Concept of Integrated Urban Development (ISEK) requires the application of new methodological foundations of urban planning [2].

**The aim of the work** is to formulate relevant approaches, based on fractal urbanism and sustainable development methodology, for the development of the Concept of the integrated development of the Ukrainian post-socialist city.

**Presentation of the main material.** The theory and practice of urban planning in Ukraine during the period of socialist development was closely connected with the socio-economic planning of a directive nature, the central government agencies. The conditions of the centralized planned process (five and seven-year development plans of the state, individual economic districts, regions and cities) contributed to the complexity of urban development. Urban planning theory and practice of Ukraine has a glorious history of its development since the middle of the twentieth century, which was due to the large-scale construction of new industrial facilities and new settlements, reconstruction and development of existing cities.

At the same time, during the construction of Ukrainian cities of the socialist era, certain problems arose in spatial development. The priority was the organization of the location of productive forces, production facilities, and the social sphere was perceived as a supplement to the “city-forming” factors. Large industrial zones in the planning structure of Ukrainian cities after the decline of the economy, which was focused on energy-intensive, resource-intensive production, became “industrial deserts”.

During the years of Ukraine’s independence, fundamentally new economic, environmental and social challenges arose for the implementation of world and European experience of urban development for Ukrainian cities. Today, the processes of urbanization in Ukraine have their own characteristics. The processes of urbanization occur under the influence of external and internal factors of different territorial levels - from national, regional and local, which are interrelated. Among the external factors of the spatial organization of urbanization in Ukraine are urban agglomerations.

It is the analysis of the spatial characteristics of urban location in Ukraine that indicates the presence of urban agglomerations. Urban agglomerations of Ukraine have different levels of development, population and are morphologically specific to monocentric and polycentric (bicentric). About 19 million people or 36% of the country’s population live in the 19 largest urban agglomerations of Ukraine.

Agglomeration forms of settlement must be taken into account in the formation of new territorial units in the process of decentralization.

The ecological component and the preservation of the natural environment remain relevant for the development of Ukrainian cities. The natural landscape component is an important element of spatial planning of territories at different territorial levels from national, regional to local, at the level of individual cities. In addition, for Ukrainian post-socialist cities, it becomes important to take into account the global characteristics of urbanization. At the beginning of the XXI century in the information society, there was a phenomenon of “global city”, with the effect of implosion—explosive compression of space and time, removal of urban functions in the information space, social networks—they are objects of fractal urbanism. Such changes in global processes of urbanization are due to the formation of transnational corporations in the fields of industrial production and finance, the development of IT technologies and blockchain in the formation of a digital society with the provision of the latest digital services.

In addition to taking into account external factors on the spatial development of cities and surrounding areas in the process of developing the Concept of Integrated Urban Development, the state of use of internal resources is carefully considered. Such resources include rational land use, optimization of functional zoning and engineering and transport infrastructure. For example, abandoned Ukrainian territories are a significant problem for Ukrainian post-socialist cities. Built on the calculations of economic growth and full employment of the working age population, such industrial zones in cities occupy a large area (from 12–18 to 23–27%). At one time, working enterprises were the main lever for economic growth in cities.

To solve these topical issues of spatial development of Ukrainian post-socialist cities, modern geoinformation technologies (GIS) are needed, on the basis of which a model of permanent project process is implemented.

In Ukraine, since 2005, various attempts have been made to create a national infrastructure of geospatial data—NIGD. steps to build a similar system NSDI, INSPIRE in our country. In 2020, the Law of Ukraine “On the National Infrastructure of Geospatial Data” was adopted, which should summarize the existing scientific and practical experience in the formation of geographic information systems. Urban geographic information systems of urban management are a new tool in the implementation of the Concept of Integrated Urban Development.

Urban geoinformation systems, based on which the cadastral information resources are combined (land cadastre, town-planning cadastre, register of addresses, register of objects of town-planning activity, etc.) become the basis for the formation of a “smart city”. The processes of urbanization have the features of fractality—in different areas, in different climatic and socio-economic conditions there is a spatial compaction with different morphology, which should be monitored using GIS technologies.

Therefore, spatial planning in information systems acquires the features of a permanent spatial (urban planning) design process, the essence of which is that the existing hierarchical system of urban planning [3], implemented at three interconnected territorial levels (national, regional and local), in information systems is transformed into a rotational development system. urban planning documentation. At the same time, the subjects of the permanent design process, objects, processes

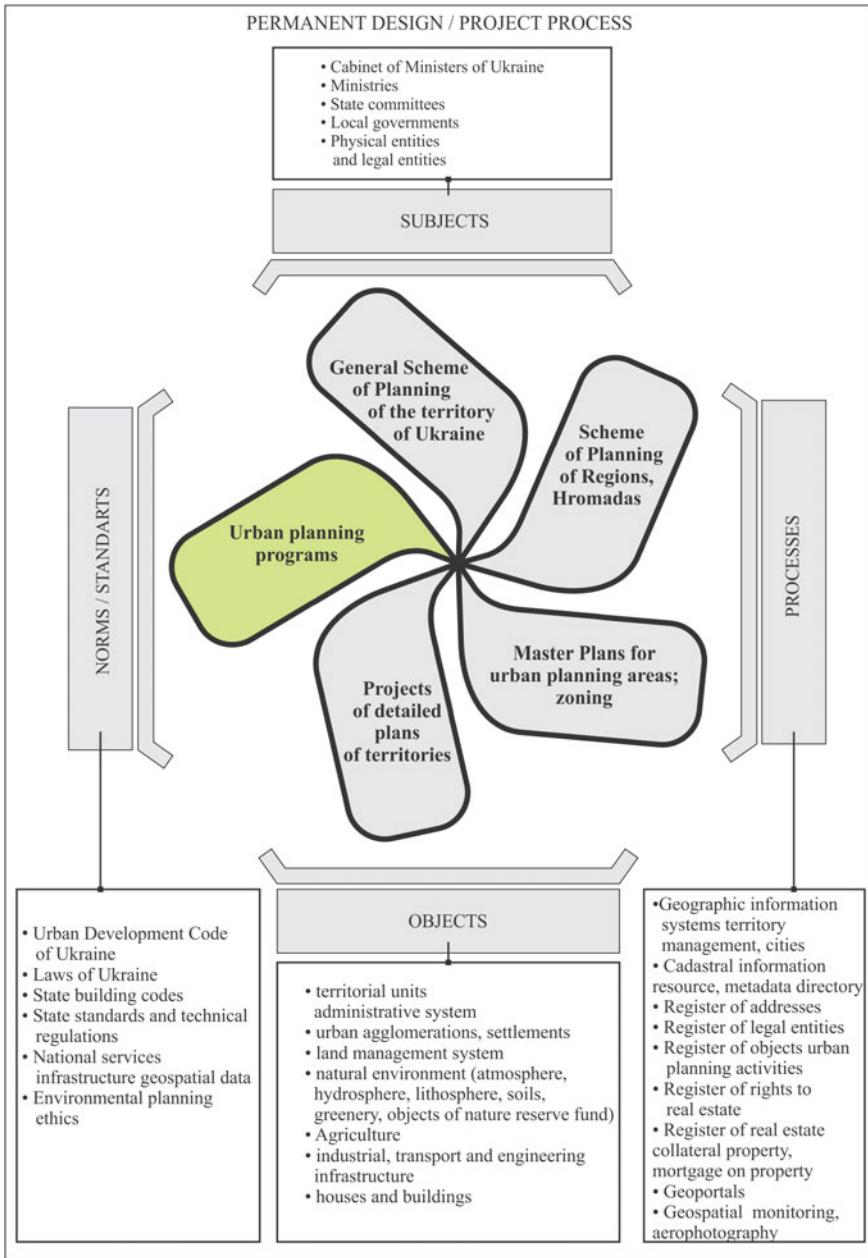
and norms are determined (Fig. 1). The basis of this process are urban development programs of dynamic spatial objects [5].

Urban planning programs are a new type of spatial documentation where urban planning strategy and its constructive development are concentrated. Urban planning programs are not rigidly fixed in their indicators planning documentation, when the conditions change, the recommendations on possible implementation options will change. Spatial objects of different urban territorial levels (national, regional, local) are complex systems. An integral part of the management of complex systems is the methodology of nonlinear equations, on which the theory of dynamical systems is based and which form the methodological foundation for the study of complex systems. Complex systems are first of all dynamic, from the point of view of the available potential of self-development, systems. Urban development programs establish, on the basis of nonlinear characteristics for spatial objects, the anticipated course of events and rules that ensure the implementation of the planned.

Urban development programs are problem-oriented, ie the formulated problem field at a particular point in time is key. This can be ensuring economic stability, environmental security, protection of historical and cultural heritage, elimination of the consequences of man-made disasters, and others. There are options for combining and correlating problems depending on the territorial level for which the program is being developed. In this case, there is a need for subject-oriented and object-oriented programs that can (depending on the problem) be integrated into integrated urban planning programs. Urban development programs include analytical and constructive parts [5].

The analytical part contains: 1) study of the current state of objects and their constituent subsystems—social, economic, environmental (establishment of patterns, trends, formulation of major problems, followed by the allocation of priorities); 2) study of the conditions and characteristics of the factors that determine the functioning and development of objects; 3) development of a hypothesis of development of situations, processes or structural states according to those areas of programming which are recognized as key, formulation of target area and development of variants of its achievement; 4) analysis of resource opportunities, management tools, legal framework, regulatory framework, time constraints, social requirements, political institutions, research and design support and other factors and conditions that potentially must have a society and territory to achieve the results contained in the target area of the hypothesis; 5) development of the concept and relevant urban models, which means the formulation of specific goals (objectives) in the form of a set of desired and potentially achievable results in a generally parameterized form (program-target model) aimed at achieving goals, taking into account resource capabilities. The concept means an algorithm for solving a specific problem (problems), which is a set of the most important elements of the theory (theories) regarding the problem (problems) under consideration, given in a constructive and acceptable for practice form.

The constructive part forms, analyzes and evaluates the range of possible solutions, one way or another focused on achieving the goal and selects those that are most able to change the course of processes, problem solving or change the structural state of



**Fig. 1** Permanent design process in conditions information systems for integrated development management

the object in the desired direction. These decisions must be twofold. This means that normative-target models must be resource-based, ie the measures outlined in them, the amount of investment must be invested in real opportunities, take into account real trends in the formation of natural, labor, energy, water, territorial and other resources, investment growth, change their structure, resources of the construction industry, building materials industry and other and the whole system of external and internal constraints.

Moreover, the adopted normative-target models for the near future should be resource-provided, ie all measures should be based on actually proven material, financial, labor and other resources. In addition, in the constructive part it is necessary to: - first, take into account the range of main consequences of decisions affecting the interests of various actors in regional activities; - secondly, based on the target interests of this program, take into account the necessary and sufficient set of territorially related factors that can influence the decision taken and reflect them in it; thirdly, to create the necessary, sufficiently complete, but not excessive information base, able to ensure the implementation of the above two conditions. Implementation of urban development programs should involve the creation of significant information arrays and conduct certain operations with them. There is a need for a database with information about the area, which allows you to track the status of design objects, make the necessary adjustments [5]. The international project GIZ “Integrated Urban Development in Ukraine II” (ISEK) continues for the next three years the implementation of modern models of project processes in Ukrainian post-socialist cities, among which will be urban programs of dynamic spatial objects.

## 2 Conclusions

The theory and practice of urban development of Ukrainian cities of the post-socialist period, as a result of the implementation (2015–2020) of the international project GIZ “Integrated Urban Development in Ukraine” (ISEK) gained useful experience and legal basis by adopting the Law of Ukraine № 711-IX (17.06.2020). Comprehensive spatial development plans of territorial communities and cities, based on modern methodological approaches, include Concepts of integrated development, thus ensuring the sustainable development of territories and settlements in the future.

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