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LOCAL URBAN-PLANNING FORMATIONS AS A FOUNDATION FOR REORGANIZING REGIONAL SYSTEMS OF SETTLEMENT: PREREQUISITES FOR DEVELOPING THE METHODOLOGY

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Statement of the problem. New trends in urban planning of the 21st century reflect the influence of scientific and technological progress and development of social relations. In the territorial systems of settlement, there is a pronounced dynamics of urban planning processes, their regional identity, heterogeneity and locality of location in space. Without proper methodology in place, maintaining the existing structural and functional order is becoming challenging. Establishing the features and patterns of development of territorial systems as the basis for their reorganization requires the systematization of the latest urban planning experience.

Results. A special group of objects - local town-planning formations - is revealed, their characteristic features are substantiated which predetermine the construction of a typology. Based on the differentiation of the ways of their interaction with territorial systems, the main provisions of the methodology of urban planning are formulated.

Conclusions. The signs, properties and characteristics of local town-planning formations determine the dynamics of territorial systems. Considering them when justifying urban planning decisions allows one to simultaneously implement the requirements of sustainability and innovation, which contributes to the formation of new elements and connections in territorial systems, determines the process of urban planning evolution and contributes to an increase in the comfort of the living environment.

Keywords: local town-planning formations, territorial settlement systems, dynamics, evolution, technology.

Introduction. The problem of ensuring the stability of territorial settlement systems in all nations is of an interdisciplinary nature and has been relevant for more than a decade [2, 8, 15, 21, 32]. Urban planning in the 21st century is inevitably undergoing changes that might

potentially disrupt the stability of systems [4, 25, 26, 27]. These are significant complications of the object of urban planning activities, multiplicity of scenarios for its development due to the appearance of a large number of subjects with conflicting interests, unpredictability of functioning processes of object and commonly presence of large amounts of information resources characterizing their complexity [8, 10, 16, 19]. These also transform the traditional process of developing urban planning solutions complicating the requirements for their content and, at the same time, increasing dependence on the factors of an unstable external environment. Scientific endeavors in recent years have been aimed at improving the efficiency of the system of urban planning decisions, depending on the promising directions of development of systems of settlements based analyzing the progressive experience of territorial planning [12, 14, 24], system principles of their justification [2, 29, 30], orientation to new values [6, 18, 33], compliance with social needs of the population [1, 3, 31] considering the specifics of the existing organization of the territory [8, 15, 29], changes in the technical parameters of urban planning facilities [1, 26, 28]. However, despite the diversity of scientific approaches, professional assessments of new urban planning phenomena are still far from being comprehensive. On top of that, the problem of increasing the urban planning sustainability of territorial systems is associated identifying potentially possible priorities for their development [7]. On the one hand, their formation involves concepts and strategies for the development of macroregions and constituent entities of the Russian Federation and a set of factors that are critical to the individual characteristics of a particular area on the other [3, 7, 10]. The result of their joint influence is the characteristic dynamics of territorial systems. All of this is indicative of the expediency of developing methods to investigate the processes of changes in territorial systems, to establish their amplitude and to identify their patterns. This would allow one to obtain substantiating materials employed in the development of strategies for the formation of objects of urban planning activity in contact with territorial settlement systems.

1. Local urban formations as “points of growth” of territorial settlement systems. The development of new concepts of urban planning in the second half of the 1950s is associated with the fact that following the Second World War and in subsequent years, socio-economic conditions changed considerably with the demand for the classical principles of territory development is dropping significantly. The theoretical model “work — life — rest”, based on the postulates of the “Athenian Charter” since the 1930s, remains a renowned standard for the formation of space in different countries of the world, a universal tool of addressing urban

planning situations, is repeatedly replicated and implemented in practice. As time goes on, it starts losing its significance in determining the methods of development and use of the territory in urban planning solutions.

The contradictions are intensified due to the shift of emphasis to the processes of commodity production as opposed to industrial production [11]. A fundamentally new social order is in place which is pushing forward the ideas of a post-industrial society [4, 9, 13, 17, 21]. Its content compiles the actual requirements of our time emerging from the nature of market relations: accelerated turnover of goods and services, involvement of an increasing number of consumers, idea of elements of a material-spatial environment (environmental objects) as ways of obtaining a guaranteed profit. It is due to the current changes that a concept of “polarized development” emerged which grew to be popular and penetrated various aspects of life. It is known that the concept was first set forth in the early 1950s by F. Perroux [20]. Subsequently, it was developed by his compatriot J. Budville. According to his theory, specialization and uneven distribution of areas of space, “growth points” determined by the intensity of economic activity are substantiated [12, 14, 24]. The ideas underlying the concept of “polarized development” were adopted by urban planning. The concept has become central in the substantiation of promising forms of territorial systems at various levels and has been relevant for several decades.

Market laws neutralize the possibilities of urban planning activities to harmonize the requirements for the organization of the living environment and ensure its maximum comfort for the population. It is becoming less and less environment-forming and more and more oriented towards ensuring the market demand of consumers of its products. The development of the territories of settlements of various ranks is defined as the continuity of the functioning of the market mechanism which produces various market offers that formalize fashion trends to a larger extent than those that form the standards of life support.

This accounts for the intensification of the process of designing urban planning objects that can dramatically change the overall imperfect human environment and thus become an investment product [6]. The appearance of such objects is seen as an opportunity to achieve, if not total, but a quite rapid urban development of individual territories in almost all nations. Contrary to the systematic approach, their planning was preceded by design. With this objective in mind, it was unnecessary to talk about a comprehensive result of their implementation. During these years, their terminological descriptions were not yet obtained, the technological schemes of their functioning were not known, the overall planning process was not structured. However, the development of scientific ideas on the methods for assessing the quality of life of the population using spatial planning tools gave rise to their popularization.

Reinforcing the position of the so-called “new economy” in Europe and America involved, e.g., the active formation of new sectors of the economy and their interconnections followed by the spread of their influence over the area [15, 27, 34]. These processes have caused the manifestation of urban trends. They were found in the structure and content of the nature of the distribution of productive forces, migration processes, quantitative growth of the urban population, forms of its employment, etc. [15, 27]. Generally, this caused the transformation of territorial systems including by means of the pronounced unevenness of the processes of spatial development (centers of urbanized development and metropolis) [4]. However, there were also recorded individual centers of concentration of activity that did not have prototypes of formation, such as centers of advanced social and economic development [6, 16, 19]. They reinforced the emerging asymmetry of territorial systems. In order to prevent crisis situations, targeted actions in the planning and regulation system were required to ensure the preservation of permissible balances with an active expansion of the range of urban planning tools [31]. Later on, this line of research in the theory of modern urban planning received a special terminological description, i.e., the construction of “new cities” [17, 25].

The specificity of the spatial differentiation of America (division into separate states), presence of large undeveloped territorial areas and, at the same time, absence of restrictions in the form of the existing order of functional zones, hypothetically, contributed to the use of various urban planning solutions for organizing various types of economic activities [9, 17, 27]. When developing options for the location of “new cities”, factors of particular importance were economic feasibility, reducing the time spent on labor movements, stimulating the inflow and free movement of labor resources, proportional ratio of “daytime migrants” (temporary population) and permanent population. All this resulted in the limited functional diversity in the planning organization of the territory of “new cities” and despite special programs for their future formation, it was only partly provided by strategic solutions.

While adapting the concept of “new cities” to the conditions of Europe, some peculiarities are identified. The “new economy” is dependent on the intensification of technology, science and industry, which are actually the source of innovation. This causes an intensification of the economic activity of market entities in the sphere of “tertiary industry” which is characterized by the constantly emerging new types of life promoting the social activity of the population. Accordingly, the “points of growth” of territories should stick with this logic of constant renewal of the material and spatial environment due to new multiple differentiated typological forms. A priori, the contrast of new manifestations with the existing urban planning organiza-

tion of the territory is inevitable. However, even with such restrictions in place, a new conceptual direction received its development manifested through the gravitation of “growth points” [4, 8, 9, 10, 17] to large agglomerations such as Paris, Lyon (France), London, Edinburgh (Great Britain), Berlin, Hamburg, Munich (Germany), Rome, Milan, Turin (Italy); to small university campuses, e.g., Cambridge (UK), Heidelberg (Germany), Leiden (Netherlands); to the old industrial areas (the Ruhr region in Germany)

A significant expansion of the typological range of urban planning objects is set to happen caused by the development of the “new economy”. As the importance of the science and technology sectors is on the rise, there is a further expansion of the processes of technologization and automation, production management resulting in territories singled out as a separate segment. The diffusion of innovations in the production of goods and services modifies the stable concept of “technological chains” including space organization [4, 7, 31]. They are associated with the common transition from monofunctional objects to multifunctional complexes that combine heterogeneous elements with a different “life cycle” of functioning. This is a prerequisite for a fundamentally new class of urban planning solutions where a direct dependence of the planning organization of the territory on the processes of its functional use is no longer a rigid requirement.

Hence in the countries of Europe and America, a significant amount of experience has been gained in the design and implementation of urban planning objects that develop the conceptual provisions of “polarized development”. It has propagated in similar but not identical forms. The way the transformation of territorial systems occurred did not fit into the known development scenarios. This was individuality which also manifested itself in the personification of the restructuring of the formed order of placement in space of objects and zones. Accordingly, the methods and techniques used in urban planning began to acquire an international character enabling the development of solutions not “ground zero” but according to the prototypes. This provided a real urban planning and construction breakthrough in some Asian countries leading to a large number of innovation-technological and neo-industrial zones [4, 6, 18].

Technological and industrial innovations have contributed to the rethinking of the characteristics of the living environment in the professional community of architects, urban planners, and urbanists. It has become important to ensure the safety of life, subject to changes in the physical parameters of the material-spatial environment and its subject content. An increase in scientific interest in the systemic study of the category of “quality of life” [7] makes the prob-

lems of studying a complex of conditions for its provision, assessing the impact of types and forms of consumption of the population, and developing living standards relevant. Considering these factors in urban planning resulted in a tendency towards the formation of objects, the functional content and spatial forms which are determined by the dynamics of socio-economic processes. This is confirmed by the growing design practice of the 1960—1970s in different countries of the world leading to a considerable expansion of urban typology due to such objects as satellite cities, multifunctional settlements, new districts, villages of individual dwelling of superior comfort, entertainment complexes [3, 7].

The developments dating back more than half a century as design and later as a line of research confirm the consistency of methods combining the analysis and assessment of objectively existing socio-economic and urban planning trends making it possible to determine the directions of their improvement for better results. A condition for this is purposefully organized activities for forecasting, planning and designing changes in the state of the territory. This refers to the expediency of a step-by-step substantiation of the entire technological cycle of the prospective development of an urban-planning object synchronized with the territorial system. This is suggested as the foundation in the development of urban planning technologies.

2. Design solutions of a new generation: features of contemporary practice of designing local urban formations in the Russian Federation. Russia's latest practice of developing projects of local town-planning formations combines international trends and uniqueness of domestic experience including the end of the 20th century. It was at this time that Russia searched for further ways of developing urban planning activities at the junction of new strategic priorities and problems of the collapsing socio-economic system. It was also then that some attempts were made to preserve the planned development of information technology resources and development of promising industries, such as space, nuclear energy, and electronic instrumentation. These were the sources and conditions contributing to the difference between Russia and other nations.

Political, economic and social realities in Russia at the turn of the 20th and 21st centuries made it difficult for most of these initiatives to be implemented. That was the prerequisite for the formation of conceptual directions in urban planning which were almost mutually exclusive. The first one is the integration direction, compliance with the global development trends. It is associated with a constant response to the latest trends in all areas showcasing intellectual achievements of various nations. A prerequisite for this was the adaptation of examples of development and implementation of objects unknown to domestic practice that might cause

changes in the functioning of the territorial system. Their content reveals the meaning of the transition processes to market models of management and its urban planning expression. The second one is the disintegration trend which dates back to the traditions of the planned organization and management of the national economy whose principles have evolved over decades over the entire period of building the country's socialism. It is obvious that the previously developed and tested town-planning schemes determining the methods of development and use of the territory were becoming less and less viable. Nevertheless their basic characteristics and individual elements were retained as options for further refinement.

The contradictions in these situations generated conflict. Possible ways to eliminate or reduce it were believed to be in urban planning which made it a state priority. It was expected that professional solutions initiated by practice can be more effective due to the "built-in" algorithm of guaranteed implementation. This would enable them to compete with the strategic initiatives of the national and regional levels that were relevant back then. As domestic experience indicates, urban planning activities partly performed a similar scenario combining features of both directions, which caused the duality of urban planning solutions.

A new stage in searching for directions to develop urban planning methods involves Russia's transition to an innovative development model recognized by the entire global community. Changes are occurring in the country's administrative-territorial structure, macro-regions are being formed, individual territories are growing increasingly independent enabling them to conduct and implement their own strategies of spatial development. At the same time, the degree of interdependence of urban planning and socio-economic decisions is rising. This accounts for the reason for the perception by urban planning of terms and definitions that are not specific to it: "strategic imperatives", "capitalization of the territory", "competitive advantages", "investment attractiveness", "profitability", "life cycle" [1, 3, 6, 31]. These concepts characterize the process of imparting the importance of a market economy factor to urban planning predetermining the development of its methodology for years to come. Among the tendencies in the reorganization of territorial systems, signs of the formation of "growth points" are clearly manifested but already at a new stage in the evolution of urban planning.

Almost all the experience of urban planning in this country from the very first years of the 21st century indicates that the formation of local town-planning formations is one of the priorities of the strategies for the development of territorial settlement systems. In subsequent years, as the tasks of innovative development are becoming more specific, practical developments in the field of urban planning are focusing on the design of this class of objects. Origi-

nally in practice, widely known samples from the world urban planning are employed as design prototypes. So, when substantiating the concept of Skolkovo (Moscow region), the Silicon Valley project in the USA and similar projects were employed as a textbook example. It was imperative as in our country only the experience of the formation of science cities as the closest in their characteristics to the planned object was wide-spread. It was clearly not enough, though. As a result of the analysis of the design characteristics of the implemented objects, based on the experiences of the Silicon Valley as well as an assessment of the features of their functioning, the town-planning concept of the Skolkovo innovation and technological zone was developed. This is a territorial multifunctional scientific and industrial complex that combines universities, enterprises and business incubators forming a system for obtaining, transferring and commercializing innovative technology. It was an actively developing innovative technological chain of blocks and objects that implemented renewable economic processes as well as the links between them capable of responding to external impulses with no disruption to the overall stability of the urban planning structure.

The development of the Skolkovo center project stimulated the further expansion of the practice of developing local town-planning formations in various forms and statuses: memoranda on the development of the territory, conceptual projects, integrated design developments. To date, an insignificant part of them has been implemented.

A characteristic feature of all these developments was the experimental approach employed in the absence of theoretical and methodological justifications for their development. In spite of this, the practice has acquired a national character. Today, such typological types of local town-planning formations are already known, such as, e.g., innovation and technological zones and centers, multifunctional production and technological centers, special economic zones, technological sites, technical parks, technopolises, innopolises, and innovation cities. There are multiple varieties of such objects and with such a diversity of species, it is an extremely difficult analytical task to classify an object as belonging to a certain typological type. So, with the dissimilarity of the main characteristics of objects, the overwhelming number of their particular characteristics can be identical. Or, on the contrary, it is not always possible to single out and formalize the main characteristics of each individual object, but at the same time, it is available to define their particular characteristics. Other various options are not excluded. Generally, we are talking about the consolidation of groups of requirements for the design of local town-planning formations, their generalization according to belonging to the basic or variable characteristics of objects. Standard assessment techniques do not provide such opportunities. The above arguments are accepted as the foundation for the development of the author's methodology.

3. Development of a methodology for assessing the properties and characteristics of local urban formations. In urban planning activities model states of the future object, its virtual properties and verbal descriptions commonly appear. This identifies the specifics and fundamental differences of the methods and techniques employed for the development of design solutions as well as their analysis. Therefore, the applicability of traditional methodological tools inherent in technical sciences is extremely limited. Thus, for the purposes of urban planning, it is advisable to develop and employ special methods and methods of assessment, personified to the specific tasks of the research being conducted. In this case, the aim of the research is to design a typology of the formation of local town-planning formations (Table 1).

Table 1

Results of employing the methodology for assessing properties and characteristics of local town-planning formations: substantiation of differentiation of types

Types of local town-planning formations in territorial systems		
Innovative modules	Investment active modules	Multi-functional modules
selectivity and indicativeness of processes	variability of processes	mutual consistency of processes
a high degree of dependence on intelligent types of resources with the sustainability of infrastructure support	predominantly monofunctional forms of using the reproduction of resources, the infrastructure is dependent on factors: location, actual estate market conditions, consumer preferences	infrastructure connectivity and dependence on the level of economic development of the region, the need for a constant increase in resource potential
resolving the contradiction between centrifugal and centripetal tendencies	dominance of centrifugal tendencies	combination of centrifugal and centripetal tendencies
fragmentation of forms of improving the quality of life, their orientation of types; ensuring the functioning of the territorial system	the use of selective forms of improving the quality of life of the population (new formats of public services)	a distinct desire to use technologies that improve the quality of life of the population, consistent with the differentiation of types of employment
uneven and peripheral placement of local formations	the possibility of modifying local formations without violating the requirements of the complexity of their functioning	dependence of expanding the range of local entities on the possibilities of strengthening resource potential
a distinct desire for spatial autonomy from the core of the territorial system	incentives for spatial autonomy from the core of the territorial system	the possibility of combining spatial autonomy and subordination to the core of the territorial system

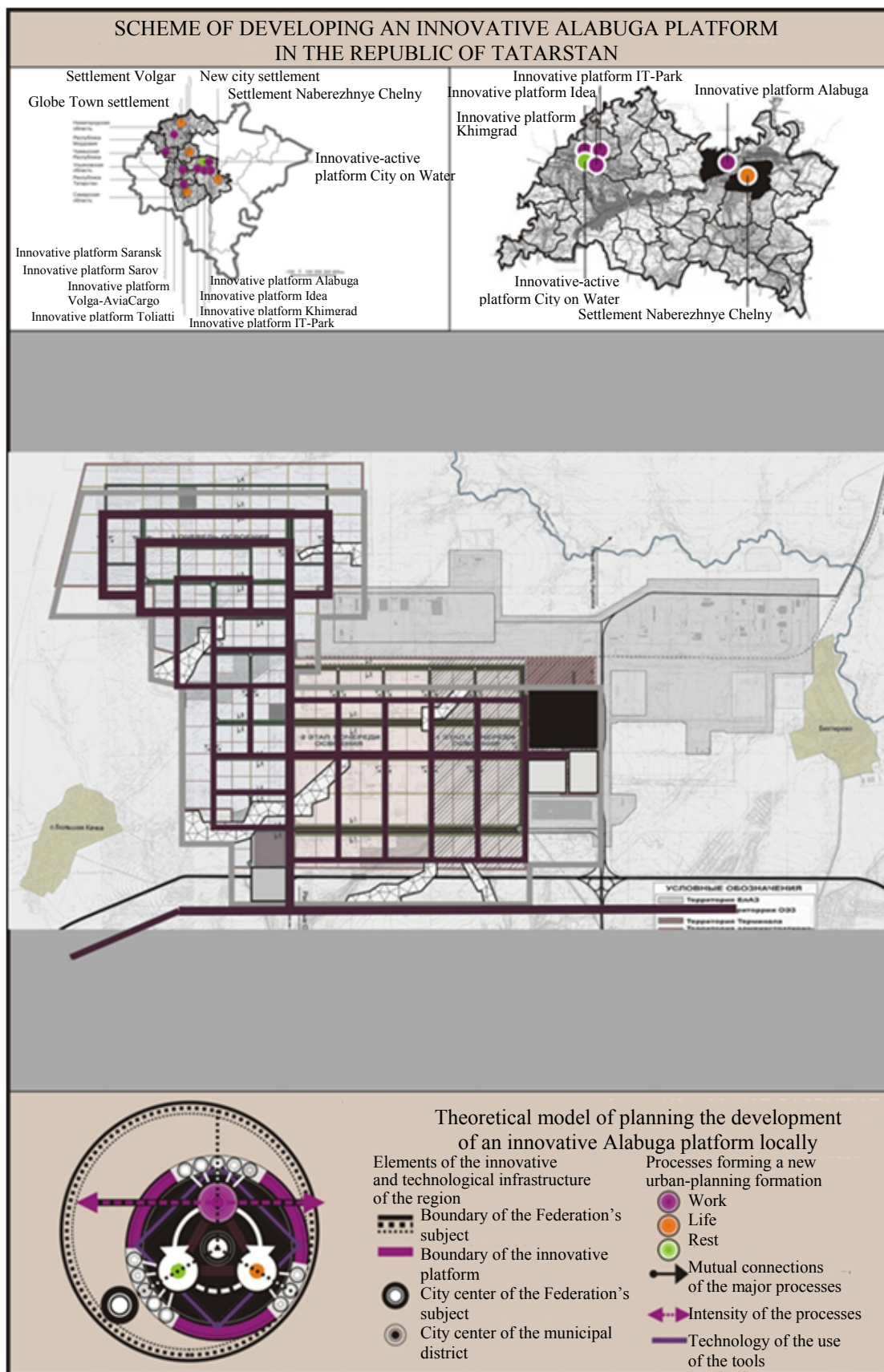


Fig. Structure of the technological map: formalization of the provisions of the methodology for identifying the properties of local town-planning formations in conjunction with the dynamics of the territorial system

In order to address this, the author's methodology is set forth which has an information technology base. An important resulting element of the methodology is a technological map of an urban planning object which is a template for its description in the form of a structured data array — information layers (Fig.). The structure of the information content (information data) of the technological map is performed throughout the entire process of analytical work. The card reflects both the initial and the newly obtained information characterizing the current state of the object or its changes (according to the principle of drawing up the standard “Patient's Health Chart” used throughout the country).

For research purposes, it is suggested that the following stages in the study of the properties of local town-planning formations are distinguished:

- 1) establishing their initial characteristics;
- 2) identification of urban planning characteristics of objects depending on the identified features;
- 3) development of an analog scheme for the functioning of the object;
- 4) development of a fundamental model of interaction of the object (objects) with the territorial system.

Table 2

Principal methodological scheme for planning the development of territorial systems based on the formation of local town-planning formations

Types of local town-planning formations in territorial systems		
Innovative modules	Investment and active modules	Multi-functional modules
Determinants of local town-planning formations in territorial systems		
Basic technology of providing life activities		
Work	Rest	Life
Types of life activities implemented in local town-planning formations		
Innovative activities	Reactive activities	Traditional activities
Schemes of a life cycle provided by the types of local town-planning formations		
Rationalization of functioning processes	Impulse responses to environmental disturbances	Ensuring the continuity of the functioning processes
Functions performed by local town-planning formations in the territorial system of population		
Implementation of the technological mission by renovating viable and creating new places of employment within the territorial system	Intensification of the interaction of elements of the territorial system by identifying its attractiveness	Ranking of proposals for “cells of vital activity” within the territorial system to meet the variable needs of the population
Dynamics of urban-planning changes		
Spiral dynamics	Wave dynamics	Stable dynamics

Table 2 summarizes the fundamental provisions of the methodology for planning the development of territorial systems, taking into account the previously presented (Table 1) differentiation of the types of local town-planning formations.

The determinants of the development of model schemes of territorial systems are identified: basic technology for ensuring life processes; types of life activities of the population carried out in the local town-planning formations; diagrams of the life cycle provided by the types of local town-planning formations; functions performed by the local town-planning formations in the territorial settlement system; dynamics of urban planning changes.

The formulation of the determinants contains the fundamental meaning of the actions performed in stages using the means and tools of urban planning, mainly within the framework of territorial planning.

These provisions reflect the results of systematization and analysis of modern experience in the formation of local town-planning formations as active participants in the process of reorganizing territorial systems at the regional level. It was found that almost all existing types of such formations are carriers of “cross” signs of subspecies, which results in their mixing and does not allow harmonious methods of their design to be built. The suggested methodological provisions substantiate the advisability of a fairly strict gradation of signs, properties and characteristics of local town-planning formations. In the case of their simultaneous use in a specific region, this provides a certain predictability of the implementation of the stated scenarios of their urban development. This thesis seems to be extremely important as regional systems are commonly limited in development resources restraining the form and degree of urban planning intervention. This means that there is in theory still a danger of disrupting the stability of territorial settlement systems. The work opens up avenues for research and development of urban planning technologies to ensure the sustainability of territorial systems.

Conclusions. In the course of investigating the design urban planning solutions of the new generation, a special group of them - local urban planning formations – was identified which are carriers of the signs of the concept of “polarized development” adapted to the conditions of the Russian Federation.

The study showed that local town-planning formations have some features and properties, i.e., they have a distinct effect on territorial systems on their existing state and in the long term; the ability to act to secure the harmonization of existing and newly-formed elements of territorial systems; during controlled formation they develop consistently with respect to the territorial systems of settlement while maintaining the orderly organization of its structural parts, town-planning units and zones and functional processes.

Due to the above identified properties, they freely enter into interactions with territorial systems, as a result of which the processes of urban planning changes with varying degrees of dynamics are defined.

The urban planning tendency associated with the subsequent widespread transition from monofunctional object elements of territorial systems to multifunctional territorial cluster structures combining heterogeneous complexes of elements with a different “life cycle” of functioning is identified.

At the current stage of the transition, local town-planning formations in territorial systems are differentiated. In order to identify their types, an assessment methodology has been developed. The following typological types have been identified based on it: innovative modules, investment-active modules, multifunctional modules. It is important to assign a certain dynamics of urban planning changes to each of the types of modules. If the modules are employed in combination, even greater results can be achieved, i.e., the planned dynamics of changes in the territorial system. The condition for the stability of the system is the observance of certain balances of their combination and control of threshold states. Due to such combinations, there will obviously be a need for new classes of urban planning solutions abandoning rigid restrictions in favor of optimal requirements in the process of their development.

The study proposes the direction of development of the methodology of the urban planning system affecting the development of strategies for territorial settlement systems using the properties of local town-planning formations. In the context of a broad interpolation of natural, historical, ethnic, cultural and other factors in Russia, the development of typical scenarios for the reorganization of territorial systems might undermine the regional identity. Thus there must be a reasonable combination of general and specific principles of reorganizing territorial systems.

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