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## UFA PLANNING STRUCTURE TRANSFORMATION

**Abstract:** This article is devoted to the study of the cycles of city development in the context of the world and all-Russian processes. This approach allows us to determine the place of the city in a general trend, to see possible ways of its development and to choose adequate town-planning measures that promote sustainable development. Involvement of interdisciplinary knowledge in the research area makes it possible to determine the factors that led to morphological changes in the city structure, and to assume possible functional-structural transformations.

**Keywords:** city, morphology, structure, transformation, period, cycle.

### Introduction

Currently, urban science is experiencing a process of rethinking and expanding the boundaries in the study of the city. Town-planning theory, which was formed by the middle of the last century, described the city as a system of clearly differentiated in space territories that corresponded to the paradigm of the industrial period. However, as the physical dimensions increase and the internal structure of the city becomes more complex, the fundamental inadequacy of the classical approach becomes more and more obvious.

Complex morphological changes in the city structure, the presence of many different uncontrolled processes, obliges urban planning to enter an interdisciplinary level. More often in the theory of urban planning there are non-traditional directions: synergetic approaches, cycle theories, parametrism, etc.

A huge amount of diverse empirical knowledge of the city has been accumulated and continues to grow. And although it allows to get general information about the city, there are still no answers to simple questions about what the structure of the city is and how it develops in space and time. Currently, the rapidly developing process of urban structure transformation has not been sufficiently studied due to the lack of theory of scientific knowledge of the city. Accordingly, this process is heavily regulated by modern normative documents.

Meanwhile, the city entered the orbit of the research interests of other scientific disciplines, despite the undoubtedly successes, the city's study is still conducted in isolation and practically beyond any connection with urban planning. The absence of a universal scientific language and a unified theoretical and methodological basis prevents mutual enrichment of different approaches and a constructive exchange of ideas and results.

Despite this, modern research, carried out at the intersection of different sciences form a new, uncharacteristic for urban planning view of the city as a complex, continuously developing facility. This research orientation allowed to connect the physical space of the city with its processes.

For effective solutions, we need a forecast, a vision of the contours of the desired and possible future for several decades ahead. This clearly shows the sharply increased interest in strategic planning of cities in Russia and around the world. The city of Ufa is not an exception. For several years the work to develop a strategy for the city's development is underway, however, there is still no clear vision of what the city should be and where to strive. For a more

complete understanding of the current situation in urban planning, it is necessary to identify how the current trends have developed. It is important to understand the mechanisms and processes taking place in the city in the context of the entire world development (Wall, 2013).

### **Methodology**

The theoretical basis of the work was formed by a number of studies in various fields devoted to cyclical processes, civilization waves and waves of innovation. It was important to consider how the theoretical data in such areas as sociology and economics is correlated with the issues of urban morphology.

In the development of any city, periods with characteristic features of the structural and functional organization of the system are traced. Each period includes a series of cycles associated with growth and structural reorganization. The duration of each epoch and its inherent structural and functional organization is determined by the possibilities of mastering space by the means characteristic of the level of development of a given society. The beginning of a new era arises in the bowels of the current, the transition to a new stage of development is due to the limited resources and finiteness of spatial reserves. Such a logical model fully agrees with the empirical data and theories of urban growth (Baymuratova, Nizamova, 2014).

### **Measurement and analysis**

Cyclic interrelations in the development of economic systems are described back in the 20s of the last century by Nikolai Kondratiev and later developed by different researchers. His wave graphs clearly show the life cycle of the system from its inception to decay and subsequent rebirth. These cycles are linked with the waves of innovation.

Cyclic processes in town planning are based on the stages of social development. In a number of concepts of Western sociologists and political scientists – D. Bella, O. Toffler, J. Furaste, A. Turena, etc., there is an idea of the stages of the progressive development of society (Toffler, 2010).

Criteria for establishing the stages of social development in the works of these theorists are the level of development of technology, the degree of development of social ties.

An analysis of the historical development of urban planning allows us to correlate the stadal development of society with the periods of development of the city. The morphology of the city changes with the changing needs and opportunities of society.

Analysis of the factors affecting the spatial organization of the city, allowed them to be merged into main groups: administrative-political, economic and socio-cultural. With the passage of time, the content and the significance of these groups varies, but they are not changed.

Administrative and political factors include factors related to the management of the city, the form of government in the country, the political status of the city, etc.

Economic factors are among the leading for the development of the city. The economy of the city was originally based on trade relations occurring in the city, manufacturing, business, etc. At the same time, the nature of production and the ratio of the various economic components of the city are changing not only with the development of technology, but also for each city separately. The economy of a single city is sharply responding to global economic processes.

Sociocultural factors are more pronounced at the present time. The needs of modern people in a better environment present the city with demands related to the organization of the city space. They reflect the quality of life, the image of the city, the attractiveness of the city for residents, as well as its socio-cultural potential. In addition, such factors include the level of social relations in the city. The most important indicator of the quality of the city is the comfort of the urban environment.

In order to determine the main factors affecting the morphological changes of the city, more than fifty cities of different size, status and time of occurrence were analyzed. The study included global, metropolitan and innovative cities, as well as industrial cities with positive and negative

dynamics of development. Stages of development of each city were synchronized in accordance with the generally accepted stages of social development, economic cycles and waves of innovation. This made it possible to define groups of cities as developing in accordance with the cycles described above and lagging, and to understand their position in the global system, as well as to understand the place of the city of Ufa in the system of global processes (Naisbitt, 1982) (Fig.1).

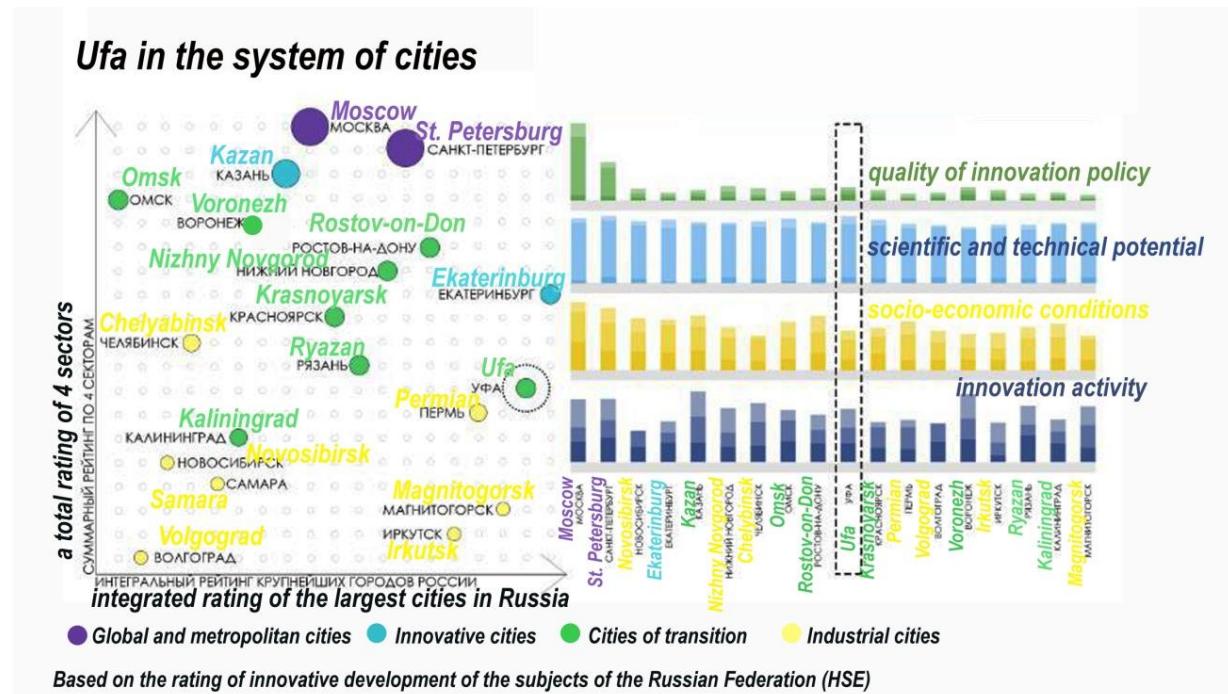


Figure 1. Ufa in the system of cities

Global cities usually have great significance for large regions of the Earth and have a serious political, economic or cultural impact on them. The spatial organization of global cities is characterized by a pronounced influence of socio-cultural factors in the presence of all three groups, this creates the necessary balance for the further sustainable development of the city. Global cities are developing gradually, and due to a diversified economy world economic crises are less painful for them than for the cities with a smaller range of diversification (Sassen, 1991).

An important component of the innovative city is the scientific base. Innovative cities, more than all others, satisfy the needs of a post-industrial society, what attracts a huge number of residents. Unlike global cities, innovative cities, as a rule, have an abrupt nature of development, and are not always stable. An important element is a clearly expressed “growth factor”, which determines a sharp economic growth and, as a consequence, a change in the sociocultural background. Such a factor can be administrative and political transformation, such as in Singapore, which brought about the phenomenon of the “Asian miracle.”

In the capital cities, the factor of the political center determines all their development. They were less dependent on the development of the industry than other cities. Their economy is initially diversified. In addition, such cities have a rich historical experience, which, undoubtedly, is reflected on their spatial structure. This provides a milder continuity of their development.

Industrial cities are currently developing according to two scenarios: prosperous industrial cities and cities in decline. Analysis of successfully developing industrial cities shows that they diversify the industrial sector only partially, paying more attention to improving the quality of the urban environment and the socio-cultural background. Most industrial cities of a new type have a

sufficient historical basis and try to preserve and use it fully for the development of tourism and services. Another part of the cities could not overcome the industrial crisis and move to a new path of post-industrial development.

Analysis of Russian cities shows that most of them belong to a group of industrial cities. The process of transition to a new stage occurs with some lag behind the world progress. In addition, there is a discrepancy between social development and urban spatial structure. In some cities the attempts to diversify the industrial sector are being made by administrative and economic methods. Monotowns and small cities, whose economies were initially based on industry, today are experiencing great difficulties.

An analysis of the set of factors that influenced the development of the city of Ufa in each of the periods made it possible to reveal the dependence between its functional organization, status and spatial organization. The change of the main factors led to a change in status and reflected on the functional and planning structure of the city. The city is consistently experiencing a change of status from a fortified city with defensive functions, degenerating into an administrative center becoming a provincial city, then becomes an industrial city during the development of industry, maintaining this status and, to date, a delay from the main global processes of 30-50 years. This delay is typical for many Russian cities, which is due to inertial processes in the domestic urban planning (Gutnov, 1985).

The whole development of the city of Ufa can be divided into several periods due to the overcoming of a certain threshold by the city structure: functional, structural, physical and technological. Each period is marked by structural changes. The radical nature of these changes and a sharp spasmodic transformation of the structure are most closely connected with global external causes of the state or global scale. Internal factors of growth determine sequential, smoother and less noticeable changes. In addition, in support of the above-described theories, the whole development of the city is cyclical. The cycle includes three phases: extensive development, equilibrium and intensive development. The impulse to the transition to an extensive development path is the global external factor. This is the period of morphogenesis, the appearance of new structural elements beyond the existing boundaries of urban planning and the transition to new territories. In the phase of equilibrium, stabilization and delineation of the borders begins. In the period of intensive development, under the influence of internal factors, active development of the territory within the new borders, accumulation of “energy”, and then “fading” before a new surge take place (Baymuratova, 2005) (Fig.2).

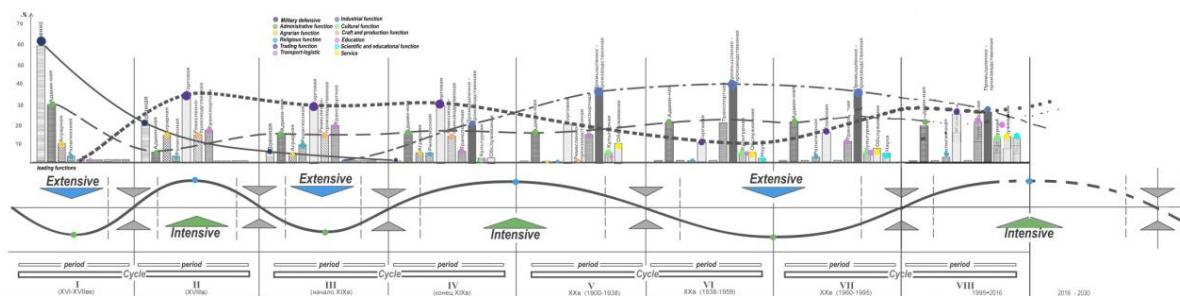


Figure 2. Leading function

The analysis of the territorial development of the city of Ufa shows the nature of the change in cycles and periods.

The first cycle. The appearance of city in 1754 is partly due to the political situation of that time. In connection with the expansion of the borders of the Russian state to the east, as well as to protect the territory and the population from the claims of the Siberian Khanate, an outpost was needed on these lands. In addition to strategic reasons, the development of the city was facilitated

by the favorable position at the intersection of four roads: Kazan, Siberian, Nogai and Osinsk. Subsequently, these roads became streets and formed the basis of the radial-semicircular structure of the city plan. Ufa is becoming an important link between Kazan and Siberia. From the time of the city-fortress and until the beginning of the 19<sup>th</sup> century the city developed according to the morphotype of the ancient Russian city. In the construction of fortifications, there are clear patterns in the use of the relief. At the initial stage of development Ufa, like the vast majority of cities in this period, in a compact relief situation had a compact plan with the location of the initial core of the city at a high level. Structural changes more reflect the nature of the city's internal life and the consistent growth caused by a change in factors. The cycle includes two periods of correspondingly extensive and intensive development. The boundary of the periods is the change in the status of the city: administrative functions and trade have replaced the lost defense functions. The city turned into a large market with strong economic ties, both with the central regions of the country, and with its southeastern outskirts. He attracted to himself both the internal resources of the region, as well as the external nonresident capital. Ufa was a transshipment point for products supplied from various parts of Bashkiria, as well as for salt, brought from the south and under Ufa overloaded to large river vessels.

The second cycle. Further development of the city is associated with profound administrative, political and sociocultural changes in Russia. The disintegration of the feudal-serf system of the economy and the growth of non-state land ownership, changes the economic situation of cities. With the division of the lands of the Russian Empire into 50 provinces along 1015 uyezds in each province, the Ufa viceroyalty is renamed Orenburg Province. In 1802 Ufa became an administrative center. This event served as an impetus for the beginning of design and planning works. Established in the 18<sup>th</sup> century, the ideas of classicism are embodied in the Ufa planning in the form of a new city plan. The area of the city increases exponentially, completely changing the nature of the layout from the conditioned relief to the regular. The extensive nature of development leads to a shift of the city center to a new territory, revealing a new composition axis. Since the middle of the 19<sup>th</sup> century there is a process of stabilization, structural changes have the nature of compaction and crushing. The approval of the capitalist mode of production in the country accelerated the development of the economy. The opening of the steamship and, most importantly, the railway movement, turned Ufa into a major transport hub in the Southern Urals, contributed to the rapid development of the Ufa industry, as well as to the growth of trade between Ufa and the regions of the Urals, Siberia, the Volga region, Central Asia, Central Russia and the capitals. All this caused migration of people to Ufa which, in turn, affected the population growth in this period, however, the development of the city was of a succession nature, therefore, the planning structure of the city remained compact. The city mainly mastered the territory within the borders.

The third cycle. After the October Revolution, up to the 30s, the city structure continued to be formed by inertia. Taking the country's course towards industrialization and moving to the planned economy launched a new development cycle with subsequent changes in the structure of the city. In 1933, under the guidance of the well-known architect M. Ya. Ginzburg, the scheme of the district planning of the "Big Ufa" and the outline design of the Chernikov industrial area were implemented. The city was divided into four main parts: Old Ufa, North, South-West and Southern regions. In fact, this scheme was the first town-planning document covering large areas and, most importantly, taking into account the location of the city in the settlement system. Work on the district planning was reduced to the development of the "Scheme of Regionalization of Ufa." The transition from the scheme to a specific draft settlement project was carried out only for the northern part of the Chernikov industrial district and the Old Ufa. 80 villages entered the sphere of Big Ufa influence. The direct connection between Ufa and the Chernikovsky industrial area was proposed to be implemented through suburban railway communication with intermediate stations, as well as the introduction of a new mode of transport – a tram with access to Shaksha. In the industrial zone of Chernikov area it was decided to build a highway connecting

all production facilities and having exits to the main road. These highways have determined the planning framework of the Chernikov industrial area. The planning network of the Chernikov industrial region as a whole had a characteristic “secondary-linear” form.

Separate ideas on the planning and development of the Chernikov industrial region of 1933 were subsequently realized. However, the residential nucleus of this district in the 40s-50s was built up on the basis of the principles of compactness, ensemble and development of the classical heritage. During the five-year plans, the Chernikov industrial-residential district complex with a population of 50,000 people included fifteen settlements of the Ufa rural district in the “Big Ufa”. The construction of the central electric systems near the village Chernikovka predetermined the area and direction of the location of the major enterprises of the city for the next decades. The city went to the extensive development path, breaking once again the structural threshold.

The large territorial reserves that arose as a result of structural reorganization from a compact city to an extended linear one, began to be built up at the time of the war, it could not be envisaged and accounted for by the plans and projects developed earlier. With the outbreak of the Great Patriotic War, more than 40 industrial enterprises were evacuated to Ufa. 104 thousand evacuees arrived from the western regions of the country. The new general layouts of 1958 and then 1971 took into account the existing areas, proceeded from the new town planning principles and the practice of planning large centers. Rational use of urban areas was solved by increasing the number of storeys in buildings. The main vector of development of the city was determined from the north to the south along the center of the peninsula.

The fourth cycle. The city's transition to a new development cycle predetermined the city's exit to the left-bank territories, a similar scenario was envisaged by the general plan adopted in 1995, which is indicated by the trend of development of the territories adjacent to the city. Currently, the city is undergoing a new restructuring, with a new level of suburbanization. This process completely fits into the system of global processes of post-industrial space (Fig. 3).

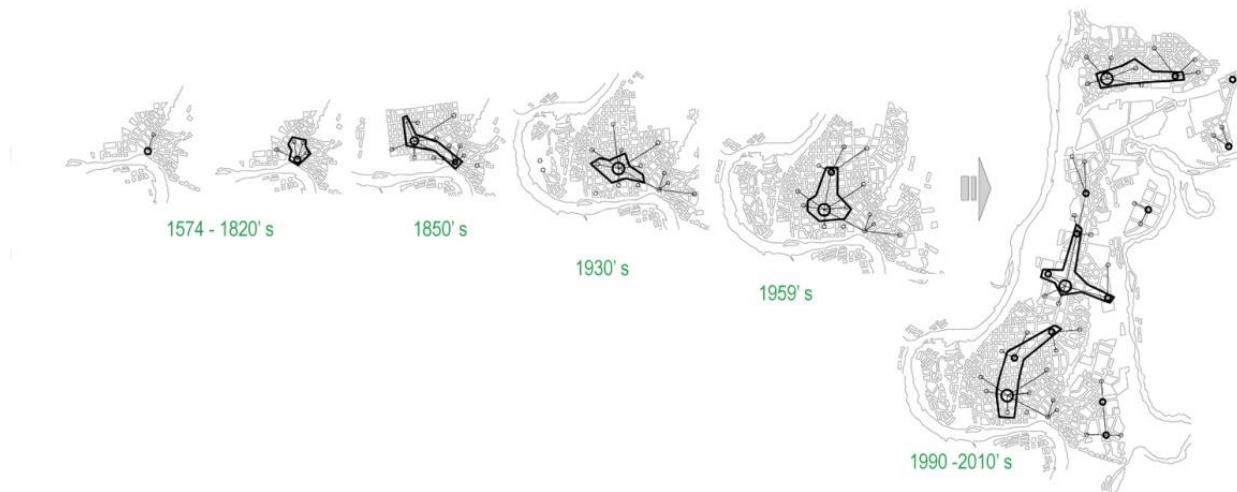


Figure 3. Stages of development and transformation of the planning structure

## Conclusion

Analysis of Russian and foreign cities allowed to determine the cycles of their development in the context of global processes, as well as to determine the place of Ufa in this system. Factors that led to morphological changes in urban structures in different periods were identified. The historical analysis of the dynamics of the territorial development of Ufa has shown that the development of the planning structure, as well as in other cities, is cyclical. Each two periods regularly replace each other, encompassing, including periods of extensive and intensive

development. The completion of the previous and the beginning of the next period is characterized by a state of equilibrium. The period of extensive development of the city is characterized by the effects of morphogenesis, that is, there is a radical structural transformation and exponential growth of the city's area. During this period, the city acquires territorial reserves, the development of which takes place at the next intensive stage of development. The end of the period is characterized by the termination of the next level of the territory, the state of equilibrium occurs, at which a new level and transition to a new stage take place. In the period of intensive development, the city begins to build up the remaining undeveloped territories within the borders, the density of development in the center increases and the city's altitude rises. Again, the state of equilibrium or "fading" occurs when the potential of the urban area is exhausted, and the city is not able to develop more intensively. There is a glut of functions, problems of transport, comfort of living. And under the current situation, the trend begins to move the city to a new, extensive period of development, driven by external global factors.

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