THE SPACE OF DISCOURSE

УДК 332.1+711.4

DEVELOPMENT OF THE INTELLIGENT URBAN ENVIRONMENT: TRENDS AND PROSPECTS

Maria Polozhikhina

PhD (Geogr. Sci.), Senior Researcher at the Economics Department, Institute of Scientific Information for Social Sciences, Russian Academy of Sciences (Moscow, Russia); polozhihina2@mail.ru

Abstract. *In the history of human civilization, cities have played and continue to play the role of centers of innovation and drivers of socio-economic progress. However, growth of cities sometimes takes diverse trajectories, from heyday to complete oblivion. The opening up of the potential of cities and the possibilities of conducting innovative activities in them are largely determined by the state of the urban environment, primarily intellectual. In turn, city environment is strongly influenced by side effects of efforts that are being made to solve problems that are not directly related to its development. The review examines how the intellectual environment of cities is affected by such modern trends as the creation of technoparks and university campuses, the formation of creative spaces and the introduction of smart city technologies. The author believes that their effectiveness in terms of using the innovative potential of cities could be higher if government policy focused not on individual components, but on interconnections, and considered the communication component of the urban intellectual environment.*

Keywords: *urban environment; technopark; creative space; university campus; smart city technologies.*

For citation: Polozhikhina M.A. Development of the intelligent urban environment: Trends and prospects // Social Novelties and Social Sciences: A view from Moscow. – 2025. – N 2. – P. 8–24.

URL: snsen-journal.ru/archives DOI: 10.31249/snsneng/2025.02.01

Introduction

Prototypes of modern cities appeared at the dawn of human civilization – 10–12 thousand years BC – and for a very long time remained «islands of another life» among the prevailing rural settlements. The sharp acceleration of urbanization in the 20th century made city dwellers the majority. But as in the distant past, so now, the state of cities and the processes taking place in them determine the speed and direction of social progress. Emphasizing the «paradoxical and contradictory nature of a city, its defeat ... by all sorts of social ills, uncontrollable growth, and unruly behavior», the Russian geographer-urbanist G.M. Lappo noted that it is in cities that new ideas and practices arise, which ensure the progressive development of society [Lappo, 1997, pp. 3, 11, 14, 17].

By attracting resources and stimulating socio-economic and technological development [Semyachkov, 2021, p. 475], cities ensure a high territorial concentration and heterogeneity of innovative activity: «what is bought and used all over the world is created in a very limited number of locations. ... Less than 3% of the world's population lives in the top ten [leading innovative] cities, and 40% of all patent applications in the world are filed there[1]...; almost 40% of the 2,500 companies with the highest R&D costs are located in these ten cities; the same pattern is characteristic of 60% of all unicorn companies and 35% of highly cited scientists. In the creative industries, the unevenness is even higher: the top ten cities house more than 55% of the world's recognized fashion brands, 65% of the companies producing high-rated films, and 70% of the artists leading auction sales» [Kutsenko, 2022]. A side effect is the aggravation of various environmental, urban planning, managerial, economic and social contradictions.

The complex aspects of the functioning of cities and their social significance determine the high public and scientific interest in these issues. Another incentive is the practical need to regulate and manage the life of cities in order to ensure their sustainable socio-economic development. Moreover, not all cities demonstrate a successful trajectory and the ability to level out negative phenomena.

G.M. Lappo reflected on the dependence between the effectiveness of cities as engines of development and scientifically based municipal policy [Lappo, 2019, p. 3]. However, it is very difficult to formulate such an inter-dependence due to the diversity of cities, the combination of typical and unique features in each. On the one hand, this expands the range of managerial decisions when choosing the path of urban development, on the other hand, it limits the possibility of copying specific successful practices. In addition, the recognition of the latter is usually delayed. Therefore, the developed strategies (programs, pro-

[1] Patent applications filed under the PCT procedure (Patent Cooperation Treaty, signed in Washington on June 19, 1970. The latest amendments were made to it in 2001) are taken into account.

jects and plans) for the development of cities are often socio-economic experiments, not always fully understood, and the results often turn out to be other than expected.

All this creates the appearance of spontaneity in the development of cities. Although the real reason is the lack of knowledge about the combined impact of various mechanisms, factors and conditions on the state of cities and their dynamics. In addition, new circumstances arise on a regular basis, which should be assessed and taken into account. Therefore, despite the huge accumulated volume of information about cities, it is necessary to continue to study the possibilities and directions of their development.

This is especially important for Russia in the current complex geopolitical conditions. The solution to main national problems – the intensification of innovation, overcoming interregional imbalances and depression in individual territories – is associated with the development of cities. In practical terms, it is transformed into the task of effective use of their innovative potential.

In turn, the utilization of the innovative potential of cities and the possibility of conducting innovative activities in them are largely determined by the state of the urban environment, primarily the intellectual one. The purpose of this work is to systematize approaches to its development. The discussion of constructive basic principles that meet modern challenges, as well as the peculiarities of their application in specific conditions, is very relevant and has scientific and practical significance.

Theoretical foundations of systematization

The interdisciplinarity of urban studies and the boom of urban studies [Turgel', 2014, p. 74] in the 20th century formed a huge flow of scientific literature and a variety of approaches from different scientific and practical disciplines. The sociology and economics of the city, urban planning and architecture are often based on diametrically opposed theoretical foundations, accompanied by inaccuracy and multiplicity of definitions.

The confusion is compounded by the discrepancy between the domestic and foreign terminology used, the temporary «layering» of concepts and the «fashion» for some of them. In this regard, it seems necessary to outline the general conceptual positions that are most productive, from the author's point of view, for subsequent scientific and practical discussion.

For example, it is proposed to divide the entire variety of approaches into an optimistic paradigm dating back to Charles Louis de Montesquieu and a pessimistic anti-urbanism dating back to Jean-Jacques Rousseau [Agashirinova, 2019, p. 178]. Within the positive paradigm, the authoritative position of D. Jacobs (1969) on a city as a source of economic growth is supported by empirically identified positive correlations between the rate of economic growth and the share of the urban population, labor productivity and city size [Minaeva, 2010, p. 5]. It is noted that «with a doubling of a city size, the increase in labor productivity in developed countries is from 3 to 8%». In countries with a lower level of economic development, the return on urbanization in the form of increased productivity of production factors can be even greater [Kolomak, 2015, p. 60].

As a reaction to the growing socio-environmental problems accompanying urbanization (including the alienation of man in the city, the impersonality of low-cost mass housing, environmental degradation, etc.), the so-called «environmental approach» was formed in the community of architects and urban planners in the 1960s – 1980s. Within its framework, a city is viewed as a large and complex organism. By analogy with the concept of «natural environment», the idea of the «urban environment» arose [Creating a comfortable urban environment, 2022, p. 6–7]. Later, the term became widespread in scientific discourse, despite its vagueness and its different understanding by representatives of different disciplines and directions.

Currently, the urban environment is interpreted as a set of material, socio-cultural and economic conditions of life of the urban population. The innovation of a city, according to A.S. Akhiezer[1], is predetermined by the diversity of cultural contacts taking place in it, which makes cities capable of accumulating creative potential and introducing the individual to it (cited from: [Lappo, 1997, p. 127]).

Formed by the efforts of many subjects (city residents, architects and urban planners, representatives of government and administration bodies, etc.), the urban environment itself directly affects them. «Numerous studies of human behavior in public spaces of cities confirm Jan Gehl[2] hypothesis on direct dependence of activity types, intensity, or duration on the quality of the physical urban environment. In turn, there is also a subsequent positive return effect: the activity of urban life «provoked» by spatial and architectural solutions ... has a direct impact on the subsequent perception of the environment as friendly, hospitable, comfortable to stay in» [Notman, 2021, p. 106].

It is natural that the functioning and transformation of such an artificial formation as a city has always been regulated, trying to direct its growth in the desired (from the point of view of the governing entity) direction and to neutralize the negative effects. At the same time, the development trajectories of different cities vary greatly: in addition to successful ones, there are many depressed, dying and simply abandoned cities. The desire to ensure sustainable positive dynamics of cities and ideas about the influence of the urban environment on the behavior and well-being of residents have forced us to pay more attention to the issues of its development.

Another approach is based on a theory of innovations (their emergence and dissemination) and innovation potential[3] as "the opportunity and ability to generate new ideas, create technologies, innovative products, and solutions" that emerged in the late 19th century and has received universal recognition since the 1970s [Semyachkov, 2021, p. 475]. Innovations are currently considered the main driving force

[1] Russian social philosopher and cultural scientist, Doctor of Philosophy (1929–2007, Moscow). In the last years of his life, he was a leading research fellow at the Institute of Economic Forecasting of the Russian Academy of Sciences (since 1991, he worked at the Center for Demography and Human Ecology).

[2] Danish architect, urbanist and urban design specialist (born 1936, Copenhagen).

[3] «The concept of innovation potential was first used by Christopher Freeman, an English economist and one of the most famous researchers of economic cycles. In his work "The Economic Theory of Industrial Innovation" (1974), Freeman defined innovation potential as all possible resources of an enterprise that can be used for innovation processes» [Belyaeva, Serebryakova, Adrakhovskaia, 2021, p. 277].

of economic and social progress. Accordingly, the formation, use and expansion of the innovative potential of cities is considered as a priority direction of their development, which is ensured in two ways. The first is the concentration of resources, including human capital. The second is the creation of favorable conditions for life and creative self-realization of people. The sources of its formation are determined as «modernization of the operating environment of economic objects; financing of innovative projects and programs; development of special mechanisms for the implementation of innovative projects and programs that are based on partnership between the state, business and society» [Sokolova, Varakina, 2016, p. 2].

Thus, objectively, the intelligent urban environment is focused on intellectual and innovative activities. This postulate, widespread among urbanists, is little taken into account by representatives of other scientific and practical areas. Although the state of the urban environment is greatly influenced by side effects from the efforts that are made to solve problems not directly related to its development. Thus, an increase in the level of intelligence of the urban environment (intellectualization) is largely determined by measures to stimulate innovative activities, improve the education system, etc. However, misunderstanding or underestimation of existing relationships largely reduces the effectiveness of management decisions and their effectiveness. This is evidenced by examples of modern impact (mainly indirect) on the intelligent environment of cities, an attempt to systematize which is presented below.

Trends in the development of intelligent urban environment

First of all, it should be noted that the administrative hierarchy of Russian cities significantly affects the financial capabilities of municipal, regional or federal government institutions. In addition, there is a problem of coordinating decisions made by sectoral and territorial governing bodies. Nevertheless, there are several broad and fairly universal initiatives available to cities of any size and administrative subordination. These include the following.

Establishment and support of technology parks. Experts note the lack of a single definition and classification of technology parks due to inter-country differences in terminology [Ulianychev, 2018, p. 116]. The variety of names – innovation center, scientific / university-research / research and development / research and technology park, business incubator, high-tech cluster, high-tech valley, etc. – in addition to different translations of foreign terms, is due to the applied marketing strategies and journalistic metaphors to draw attention to individual projects.

One of the recognized definitions (2002) characterizes the goals of the technology park as achieving «the well-being of the local community through the promotion of an innovative culture, as well as the competitiveness of innovative business and scientific organizations» [Ulianychev, 2018, p. 116]. A.A. Androsova identifies three models of technology parks [Androsova, 2019]:

1. The American model (USA, UK) is characterized by reliance on universities and powerful state support.

2. The Japanese model (Japan, Taiwan, Hong Kong, South Korea) is implemented in technopolis cities specially built for the commercial implementation of research results and financed at the regional level.

3. Mixed (France, Belgium, other European countries) is formed by the efforts of universities, banks, private firms focused on solving regional problems.

Silicon Valley in the United States is considered to be the reference technology park[1]. The «key point» in its development was the idea in 1950s to «lease land [owned by Stanford University] for long-term use as an office park». On the one hand, this «allowed Stanford graduates to find work in close proximity to their alma mater». On the other hand, «companies received highly qualified specialists» [Leonova, 2011, p. 39]. The main incentive was the stable funding of research by the state (primarily, military and space departments), and then the growing influx of private venture capital. As a result, Silicon Valley has become the largest high-tech center. Nowadays, it is home to numerous IT companies, from leading global corporations to small startups. The Silicon Valley ecosystem includes a number of well-known universities and thousands of specialists, and its name has become a household word (for more details, see [Abdulbarova, 2022]).

Other countries have tried to replicate the success of Silicon Valley. A successful example of creative borrowing of foreign experience is the high-tech district of «science and technology» Zhongguancūn in China (Beijing) and the Bangalore[2] metropolitan area in India (see more [Leonova, 2011, pp. 41–42]).

In Russia, the idea of a technology park has been repeatedly addressed. The first attempt was the creation of the science city of Zelenograd (Moscow region) in 1965 as a reaction to the success of the American Silicon Valley. However, it «did not work» for a number of reasons (for more details, see [Revzin, 2020, p. 37, 38]).

The second stage began when «in 1990, the Government of the Russian Federation adopted the "Technoparks of Russia" program developed by the Ministry of Economy, planned for five years. Its goal was to dramatically increase the return on those developments of scientific and technical universities that had accumulated during the Soviet period. The government allocated targeted funding to universities for the creation of technology parks, but it was so insignificant that it did not produce results» [Sumskaia,

[1] Geographically, this is the Santa Clara Valley in the state of California, southeast of San Francisco (a section 1,6 km long along the coast of the bay of the same name). It owes its fame «to the production of semiconductors and electronic equipment. The valley, which was once an agricultural region (until the 1950s it was famous for its plum orchards), is now built up with cities that stretch in a chain from the San Francisco Bay to the city of San Jose. The core of growth was Stanford University in Palo Alto, where research in the field of electronics had been conducted since the 1940s. The first large computer plant was opened in 1956 by IBM in San Jose» [Leonova, 2011, p. 38]. The name «Silicon Valley» was suggested by journalist D. Hefler in 1971.

[2] The capital of Karnataka. The third most populous and second most literate city in the country, with many higher education and research institutes, it is called the «Silicon Valley of India».

2007, p. 22], with the exception of isolated cases (in Tomsk, Zelenograd, Moscow). In 1993, against the backdrop of the rapid collapse of «science towns», the concept of their transformation into technopolises was adopted, but it was not implemented in practice due to financial and managerial problems [Sumskaia, 2007, p. 22].

The third stage, started with Vladimir Putin's visit to India and Bangalore in December 2004, and elevated the scattered attempts to create Russian technoparks to the level of national policy. In 2007, the program «Creation of Technoparks in the Russian Federation in the Field of High Technologies» stimulated the development of a number of territories as a result of creating favorable conditions to house domestic and international industries.

During 2007–2011, the infrastructure of technology parks received almost 20 billion rubles of financial injections from various sources [Technoparks of Russia, 2025]. From 2010 to 2014, the number of technology parks in the Russian Federation reached 16 [Technoparks of Russia, 2025]. Later, the process accelerated. Mostly, domestic technology parks are built according to a mixed model, but there are also attempts to borrow Japanese experience. As, for instance, the Skolkovo technopolis in the Moscow region (since 2010) and the Innopolis in the Republic of Tatarstan (since 2015)[1]. The maximum number of technology parks in the country over the past period was in 2020 (183), by 2024 it decreased to 129 (in 46 regions). A third of them are concentrated in Moscow and the Moscow region – 31 (24%) and 14 (about 11%), respectively [Technoparks of Russia – 2024, 2024, p. 10–12].

An important stage was the adoption in 2015 of the GOST[2], which approved the official understanding of technoparks: «a complex of municipal, transport and technological infrastructure facilities managed by a management company, providing a full cycle of services for the placement and development of innovative companies that are residents of the technopark» [Ulianychev, 2018, p. 116]. Industrial technology parks dominate in Russia, and high-tech technology parks account for less than 20% (only 24 out of 129 in 2023) [Technoparks of Russia – 2024, 2024, p. 10–12]. However, industrial parks can also include educational complexes and units that perform applied R&D (in addition to exhibition centers and representative offices of innovative companies).

Residents of technology parks receive certain advantages due to the preferences provided (both local and federal) and the synergistic effect of the concentration of companies in one place. For example, in 2010, the main share of the revenue of all technology parks was provided by two Kazan and one Novosibirsk parks [Technoparks of Russia, 2025]. In 2014, the total revenue of residents of all technology parks exceeded 138 billion rubles, and in 2023 it reached almost 550 billion rubles [Technoparks of Russia –

[1] The question of how justified their creation was, as well as the results obtained, remain the subject of heated debate, especially against the backdrop of the ambiguous situation in the existing science cities - Soviet-era projects with a city-forming scientific and industrial complex (for more details, see [Revzin, 2020]. After the special conditions for their functioning disappeared during the reforms of the 1990s, the problem of adapting science cities to new circumstances and effectively using their intellectual potential arose. And it has not yet been resolved.

[2] GOST – Russian state standard. The 2015 GOST standard was later amended. The latest revision dates back to 2021.

2024, 2024, p. 14]. At the same time, as of 2018–2019, it was noted that the sources of almost all income were «rent and basic services, and the level of provision of professional and special services is extremely low» [Technoparks of Russia, 2025].

The state offers various support measures for the creation and operation of technology parks: tax incentives, targeted financial subsidies, budgetary and extra-budgetary investments in construction [Technoparks of Russia, 2025]. The increase in the number of technology parks and provided preferences is primarily an instrument of support for small and medium-sized businesses, i.e. entrepreneurial activity, in Russia. Parks attract labor, create new jobs (especially highly skilled) and, thus, activate the use of innovative practices. The creation and functioning of technology parks contribute to increasing the level of innovation and intellectuality of the urban environment.

The formation of creative spaces began with moving industry to the outskirts of New York during the Great Depression and renting out empty industrial buildings that proved attractive to the bohemia. First, as lofts. Then the areas between them began to be filled with museums, exhibitions and cultural centers, reaching the peak of their popularity in the 1950s. They remain in demand among show business stars, as well as representatives of creative professions, and today, producing the most sought-after product – «new meanings» focused on an non-standard consumers [Steklova, Raguzhina, 2013].

In Russia in the 1990s, the question of using the abandoned territories of liquidated enterprises was quite acute. At the beginning of the new millennium, the country began to implement this concept of creative spaces, primarily in Moscow, St. Petersburg, Yekaterinburg, Rostov-on-Don, and Samara. «Today, there is an understanding that the legacy of industry is an integral part of the national heritage and an environmental resource for social evolution. ... However, comparable and no less encouraging reserves of the province are blocked by trade» [Steklova, Raguzhina, 2013], i.e. the dominance of trading capital in domestic private business.

Currently, in many countries (including Russia), a broader approach to the development of creative spaces has become widespread. It implies a variety of support for creative activities not only in the former industrial zones. In this regard, it is more accurate to talk about the expansion of the segment of the urban socio-economic complex associated with creative industries. «In September 2021, declared by the UN as the International Year of the Creative Economy for Sustainable Development, Russia approved the “Concept for the development of creative industries and mechanisms for their state support in large and largest urban agglomerations until 2030”. Despite the title of the document, the support mechanisms described in it are proposed to apply equally to megacities, other cities, and even non-urban areas» [Creative Specialization of Russian Cities, 2022].

The high assessment of creative industries in post-industrial society and the life of a modern city (including its contribution to the economy) is well deserved. At the same time, there is a fragmentation of creative activity (division into many small segments) and the emergence of cross-industries that combine

creative and production components. However, the absence of clear guidelines does not yet make it possible to distinguish between creative, production and intellectual urban environments.

The «creative» model is especially promising for developing cities as tourist centers. Successful examples include Venice in Italy, Cannes in France, Sochi and Myshkin in Russia. Obviously, in this case, «urban policy should combine into a single cultural, industrial and environmental» agenda [Yukhina, 2021, p. 240].

At the same time, innovations increase the level of creativity and intelligence of any city. Canadian researcher N. Bradford systematized their types, highlighting «innovations in management, civic innovations, economic, social, artistic and cultural innovations» [Yukhina, 2021, p. 240]. The theory about the creative potential of a place as a stimulate to human intellectual abilities has become generally accepted today.

Development of university campuses. University campuses have an American-Western European origin, and their special position and role are associated with the localization of some higher education institutions in large cities of Europe and the USA.

As experts believe, the rise of universities that emerged on the basis of cathedral schools (i.e., at cathedrals or bishop's chairs) in large European cities was facilitated by the «transition of control over their activities from church to secular power» [Turgel, Bugrov, Oikher, 2023, p. 95–96]. As city-based universities grew, «districts with a special structure were formed: faculties, dormitories, libraries, scientific laboratories, institutes, etc.» [Shatilo, 2021, p. 24], which later received the name campuses[1]. It is believed that «the campus ... was first used to describe the territory of Princeton University» (USA) in 1774. «This was accompanied by complete economic, legal and territorial independence of universities, which formed the campus as a spatial planning phenomenon. ... As an example of a practically ideal model for the embodiment of architectural and spatial organization, one can cite the campus of the University of Texas in Austin[2] and the campus of the Vienna University of Economics» [Kuleshova, 2021, p. 74, 75].

For a long time, university campuses were created and operated on the principle of «city within a city». At the same time, they became widespread in different countries and regions of the world. However, in Russia the situation developed differently due to the specifics of the national system of higher education and abrupt changes in its organization.

Firstly, in the Russian Empire, higher education institutions were created and located not in small and medium-sized cities (as was often the case in Europe and the USA), but exclusively in large cities[3]. Secondly, they had significantly less autonomy compared to European and American universities.

[1] From the Latin «campus», i.e. «field», «camp».

[2] Capital of the state of Texas (USA), about 1,0 million residents.

[3] Therefore, no separate university cities emerged in the country. For more details, see [Turgel, Bugrov, Oikher, 2023; Shatilo, 2021].

Thirdly, instead of campuses, boarding houses emerged. For example, a bursa[1] is a dormitory at a theological educational institution, first created at the Kiev Brotherhood School (later the Kyiv Theological Academy) in the 18th century. In the 19th century, as experts write, the housing issue for students was solved by renting or living in dormitories of academic buildings. Dormitories as separate university buildings appeared at the turn of the 19th and 20th centuries [Popov, 2025].

After the Great October Revolution, the higher education system in Russia was reformed and made much more egalitarian, which was facilitated by new admissions rules, the creation of workers' faculties, the abolition of tuition fees, scholarship support, the mass construction of student dormitories and the emergence of their standard designs (starting in the 1930s) [Gorlov, 2015]. On the one hand, «the entire dormitory building was a communal apartment. On the other hand, a student in a dormitory, willy-nilly, turned into an independent person» [Gorlov, 2015, p. 182].

Student dormitories in the USSR primarily solved the housing issue for out-of-town university students. At the same time, cultural and everyday services for students were provided. A striking example of a comprehensive approach to organizing the educational process is the high-rise building of Lomonosov Moscow State University on Vorobyovy Gory in Moscow (1953), from which students could never leave. In addition to educational and residential premises (dormitories for students and teachers), there is the possibility of providing a wide range of cultural and everyday services (from laundry and canteens to a movie theater, swimming pool, post office, museum, etc.).

However, such multifunctional complexes were isolated, since the construction of individual dormitories provided more room for maneuver [Gorlov, 2015, p. 180]. Although student towns were also created, «representing a concentration of dormitories in integral block developments», which had «many positive aspects: improved administrative and economic services; compact layout of residential buildings; the possibility of sequential construction; organization of cultural and household services. The problem was that ... it was not always possible to allocate significant [land] plots in the conditions of the existing urban development» [Gorlov, 2015, p. 180]. Nevertheless, such student towns were created (for example, in Moscow – for students of the modern Peoples' Friendship University of Russia named after P. Lumumba or in Dolgoprudny, Moscow Region – for students of the Moscow Institute of Physics and Technology, etc.).

In the late 20th – early 21st centuries, the university mission was reformulated and Western countries began transition from an «urban university» to a «university in urban society» [Korovnikova, 2023, p. 70]. Accordingly, the role of university campuses has changed and their importance has increased. «The traditional closed university courtyard, which served as a place for communication and leisure, is

[1] They originated in France (Latin bursa – «pocket, purse») and were a kind of boarding house, in which students were provided with a shared apartment with full maintenance (paid for mostly by patrons, and later for a fee). Moreover, the students living there were under strict supervision: they did not dare to leave without permission, had to dress according to regulations, etc.

gradually losing its role. In its place, open parks and gardens are emerging, accessible to the entire university community. Over time, such a public and communication space extends to the entire campus territory» [Popov, 2025]. Today, campuses are modeled based not only on residential, educational and scientific functions, but also on the «third mission of the university», as well as the business component [University Campuses and the City ..., 2021, p. 28].

As the idea of the third (social) mission of universities spread, the attitude towards former student towns and institute dormitories in Russia has changed (and they also began to be called campuses). The desire to increase competitiveness of domestic education in the global market and the effectiveness of using the innovative potential of universities contributed to a higher assessment of their potential: «in 2021, V. Putin instructed the government to create a network of modern world-class campuses in various regions of the country as part of the national project[1]. By 2036 ... it is planned to build a network of 40 such campuses, which will become not only educational, but also technological and cultural centers of the regions» [Popov, 2025]. «The project to create student campuses today is one of the most important for the scientific and technological development of Russia, for attracting talented young people to the regions, as well as for ensuring the technological sovereignty of the country. …Campuses should be open not only to students and university professors, but also to residents of the communities in which they are built» [Shutov, 2024]. Such campuses include, for example, Kantiana at the Baltic Federal University in Kaliningrad, campuses at the Novosibirsk State University, the Ural Federal University (Yekaterinburg), and the Oryol State University, world-class campuses in Chelyabinsk and Samara, the interuniversity student campus of the Eurasian Scientific and Educational Center in Ufa, the new campus of the Bauman Moscow State Technical University, etc.

The current initiative to create a network of world-class campuses in Russia cannot be considered completely new or original. As already noted, student towns are not uncommon in the country. A positive aspect is the declaration of «integration of different types of campuses into the urban space, as well as requirements for cities that plan to position themselves not only in the Russian, but also in the global educational services market» [University Campuses and the City ..., 2021, p. 44]. However, this idea contains a contradiction: what should be the focus in creating campuses – urban (i.e. local) issues or the global educational services market?

The desire to improve the cultural and living conditions of students can only be assessed positively. Of course, students need it. But the overall plan for 40 new campuses and 800 renovated dormitories throughout the country by 2036 according to the national project seems less than ambitious. As of 2024, there were 3,022 dormitories in Russia, and «two-thirds of this fund were built more than 50 years ago and have become noticeably dilapidated by today, and universities do not have the funds to repair them»

[1] Currently – «Youth and Children» Project.

[Guzairova, 2024]. If only about 30% of the existing fund of dormitories is planned to be repaired in ten years, then what will happen to the rest?

Other questions arise, too. As follows from open information, «world-class campuses» are being created based on unique projects. To what extent is this justified in modern conditions – and wouldn't it be better to develop a line of standard projects? Finally, wouldn't their creation lead to an increase in the level of concentration and, thus, to a reduction in the educational space in the country and an increase in regional disparities?

Even in theoretical terms, the national project under consideration seems quite controversial. But much depends on its implementation. Russia has also had negative experiences with creating student campuses. An example is the St. Petersburg State University dormitory complex in Peterhof (Leningrad Region), built in the 1970s and currently a depressed area. The current plan is to abandon it to build a new university campus in Pushkino [Kazakov, 2019]. Moreover, there have been attempts to «transform» the direction of the project, in particular, a proposal to create «scientific campuses based on leading scientific organizations and their technological partners»[1].

Given the current status of university campuses as socio-economic entities, it seems that the expectations from the national project «Creating a Network of World-Class Campuses» may be too high in terms of stimulating scientific, educational, and innovative activities. There are fears that, in principle, a sound idea to improve the conditions for obtaining higher education in Russia will turn into another short-term campaign. At the same time, the expansion of the participation of students and faculty members of universities in solving the problems of the cities in which they are located, certainly contributes to the improvement of the urban environment and an increase in the level of its intelligence.

Spread of «smart city» technologies. This set of digital technologies serves as an example of how the metaphor (translation into Russian of the English "smart city") has become a common concept, the definition of which has been repeatedly refined and changed since the early 2000s. «The concept of a smart city initially described ways to use IT infrastructure to create a virtual space of a real city ... At the next stage, a smart city was mainly associated with the strengthening of the role of digital technologies in improving the efficiency of urban economy. Finally, today it is increasingly common to talk about a smart sustainable city (SSC) ... , in which information and communication technologies and other tools, on the one hand, are used to improve the quality of life, the efficiency of the city and the provision of urban services, as well as to strengthen competitiveness, and on the other hand, meet the needs of present and future generations, without having a negative impact on the economic, social and environmental components of the city» [Priority areas …, 2018, p. 7].

[1] This proposal was made at a strategic session in Chernogolovka (Moscow Region) in July 2025. On the one hand, it indicates another attempt to «fit» existing science cities into the state scientific and technical policy. On the other hand, there is no place for them in it yet.

As the specialized market of «advanced technologies to improve the efficiency of the urban ecosystem» has grown and acquired global investment attractiveness since the 2010s[1], «active institutionalization of the smart cities concept (the emergence of specialized standards, the emergence of national and international associations and ratings, the increasing spread of the term in socio-political discourse, etc.)» has begun [Priority areas..., 2018, p. 8, 23]. The need to assess the market of relevant digital technologies on a global scale has led to the rating of the world's «smart cities». One such list has been compiled since 2019 by the Swiss International Institute for Management Development (IMD Business School) in collaboration with the Singapore University of Technology and Design. The ranking published in September 2020 included 109 cities. The top ten included Singapore, Helsinki, Zurich, Auckland, Oslo, Copenhagen, Geneva, Taipei, Amsterdam, and New York. Moscow took the 56th position, St. Petersburg – 73 [Smart City…, 2024]. In 2025, this rating already included 146 cities (Russian cities were not taken into account). The leaders were Zurich, Oslo, Geneva, Dubai, Abu Dhabi, London, Copenhagen, Canberra, Singapore, and Lausanne [IMD Smart City ... , 2025].

Ratings allow not only to assess the introduction of digital technologies in a particular city, but also to identify trends and help to predict the demand for various technical solutions. According to the conclusions of a similar South Korean study in 2024, «European and Asian cities continue to lead the ratings. They stand out by prioritizing technologies that meet local needs, whether it's urban mobility, digital accessibility, or environmental friendliness» [Smart City ... , 2024]. North American cities, on the other hand, have fallen in ratings «due to infrastructure and public safety issues» [Smart City ..., 2024]. It is emphasized that «cities that are performing well are supporting initiatives aimed at improving the overall quality of life of the population. They focus on increasing green space, expanding opportunities for cultural events and social connections. In most cities, these efforts are combined with innovative strategies to attract and retain talent, selectively stimulate investment, and address issues related to geographical inequality and inclusiveness» [Smart City ... , 2024]. Recently, the housing issue, i.e. the availability and quality of housing in cities, has attracted increased attention [IMD Smart City…, 2025].

Russia, following the global trend, actively supports the implementation of the smart city concept through state measures. Since 2018, the country has been implementing the «Smart City» project, which was part of the national project «Housing and Urban Environment» of the national program «Digital Economy» (2018–2024). Commenting on the results of its implementation, the Russian Ministry of Construction noted the growth of digital maturity of Russian cities [The Ministry of Construction summed up ..., 2025]. The ministry included the following among the achievements:

- development of standards and methods for assessing the digital maturity of cities;
- establishment of the Smart City Competence Center for methodological support of municipalities;
- creation of a bank of successful digital solutions for housing and communal services, etc.

[1] The UN report «Digital Dividends» published in 2016 gave recognition on a global scale and accelerated the process.

In 2019–2022, the Russian Ministry of Construction, together with Lomonosov Moscow State University, developed and approved a methodology for calculating the Urban Digitalization Index or «City IQ»[1] – «an integrated assessment of the effectiveness of the digital transformation of the urban economy in the Russian Federation» [Order of the Russian Ministry of Construction ... , 2023]. In 2023, the study covered 283 cities in Russia. The leaders in the digital transformation of the urban economy among the largest cities were Moscow, St. Petersburg and Kazan; among the large ones – Tiumen', Vladivostok and Sevastopol'; large ones – Yuzhno-Sakhalinsk, Nizhnekamsk and Reutov; administrative centers – Chernushinskii Urban District (Perm Krai), Kol'tsovo and Dubna [The results of calculating …, 2024]. «During the project's implementation, the IQ of cities increased by 1,5 times, reaching an average score of 61 out of 120 in 2023 (which is 55% more than in the base year of 2018) [The Ministry of Construction summed up ..., 2025].

Since 2025, smart city programs are included in the national project «Infrastructure for Life» and are dispersed across several areas, including «Formation of a comfortable urban environment», «Modernization of public infrastructure», «Development of infrastructure in populated areas», «New rhythm of construction», etc.

The accelerated introduction of digital technologies into various sectors of the urban economy forces residents to acquire and use new competencies. As a result, both human capital and the level of intelligence of the urban environment increase. Due to the fact that these measures affect not individual components of the urban environment or population groups, but all city residents, they seem to be the most comprehensive and universal in comparison with other actions discussed above.

Conclusion

The complexity and diversity of cities «in terms of the functions they perform, the composition of the population, and the type of their planning» [Lappo, 2019, p. 4], rightly noted by G.M. Lappo, continue to increase as cities become intellectualized. At the same time, any city is an artificial formation and the result of human activity. However, due to the multidirectional collaborative impact of various actors, its development becomes (or appears to be) spontaneous and chaotic.

The complexity of processes unfolding in cities requires thoughtful and careful adherence to some theoretical concepts and management approaches. After all, the state of the urban environment is influenced not only by direct management. Measures taken to resolve issues not directly related to the urban

[1] The accepted methodology for calculating the City IQ Index involves dividing cities into five groups by population size, similar to calculating the Urban Environment Quality Index: largest cities (from 1 million people), large cities (from 250 thousand to million people), large cities (100-250 thousand people), medium (50-100 thousand people) and small (less than 50 thousand people). In 2023, the IQ of cities was calculated in 15 areas (state and municipal administration, development of the urban environment and housing and communal services, energy, construction, security, geoinformation technologies, healthcare, youth policy, culture, science and higher education, education, transport, sports, entrepreneurship, ecology) and contained 37 indicators [Order of the Ministry of Construction of the Russian Federation ..., 2023].

area, in one way or another, have side effects. Moreover, due to the limited financial resources of most city administrations, side effects often turn out to be much stronger than the proposed solutions.

The example of an intelligent urban environment clearly demonstrates this. Its development is influenced by existing views on human capital and the education system, the innovation process and the place of science in society, the role of creative industries and the historical heritage of territories. The choice between concentration or deconcentration of innovation activities, the elitism of higher education (reproduction of elites) or its egalitarianism and accessibility to masses (increase in the general level of education of the population) and other similar decisions determine the dynamics of individual components of the urban environment and, thus, the its intellectual level.

The mixture of different theoretical concepts and approaches and, most importantly, the rapid change of priorities in state policy in Russia (fashion is fickle) significantly complicate an adequate response to modern urban problems, while the development of cities and the urban environment is an inertial process. The results of actions taken in the present to reconstruct or transform the urban environment will fully manifest themselves in the future and will be significant for a long period of time. «Tossing» from the implementation of one project to another leaves no time for proper returns, prevents specialists to evaluate positive and negative aspects of the undertaken projects. Finally, it is necessary not only to create new components of the urban environment (including the intellectual one), but also to ensure their stable functioning and interconnections. This should not be a short-term campaign, therefore it requires a certain stability of the strategic state policy and the coordination of its various directions.

So far, various national-scale initiatives fail to take into account the effect they produce in different cities and the urban environment. A review of the areas influencing the intelligent urban environment shows that the emphasis is on its individual components (objects in the field of education, innovative production, culture), and not on their interrelations. But what fits the sectoral principle of management is not always good for the project management. In addition, the communication component within the intelligent urban environment, whose importance has increased dramatically in the era of digital technologies, is clearly underestimated.

One should also not forget about the need for creative freedom to develop the intellectual environment of cities. In this regard, the conclusion made about the success of the Novosibirsk science city (Akademgorodok) during the Soviet period is very indicative: «soviet scientists, in order to be protected from the fighters against the prostitutes of imperialism, were ready to flee to the taiga, to the barracks, to study genetics and cybernetics there» [Revzin, 2020, p. 36, 37].

Thus, the solution to modern issues of developing an intelligent urban environment needs contribution from a wide range of specialists, continued study of situations and practices in different cities (cases), as well as wide discussion among representatives of various scientific and practical areas.

References

1. *Abdulbarova Yu.* Silicon Valley: the history of the creation and success // linDEAL. – 2022. – URL: https://lindeal.com/business/silicon-valley-istoriya-sozdaniya-i-uspekha (accessed 18.06.2025). (in Russian).
2. *Agashirinova V.Yu.* Urbanization as a complex phenomenon // Innovatsionnaia ekonomika: perspektivy razvitiia i sovershenstvovaniia. – 2019. – N 8 (42). – C. 178–191. (in Russian).
3. *Androsova A.A.* A study of current trends in the development of technoparks and technopolises in the world // Vektor ekonomiki. – 2019. – N 3. – URL: https://vectoreconomy.ru/images/publications/2019/3/innovationmanagement/Androsova.pdf (accessed 18.06.2025). (in Russian).
4. *Belyaeva G.V., Serebryakova N.A., Adrakhovskaia L.L.* The genesis of theoretical concepts of innovation potential research // Vestnik VGUIT. – 2021. – Vol. 83, N 3. – P. 276–280. (in Russian).
5. *Creating a comfortable urban environment : an educational and methodological guide* / O.I. Adamov, M.I. Afonina, A.E. Korobeinikova, S.V. Privezentseva; Ministerstvo nauki i vysshego obrazovaniia RF, Natsional'nyi issledovatel'skii Moskovskii gosudarstvennyi stroitel'nyi universitet, kafedra gradostroitel'stva. – Moscow : Izdatel'stvo MISI – MGSU, 2022. – 32 p. (in Russian).
6. *Creative specialization of Russian cities.* Scientific digest. Special issue / Higher School of Economics. Center for Interdisciplinary Human Potential Research. – Moscow, 2022. – 42 p. (in Russian).
7. *Gorlov V.N.* Soviet student dormitories – focus on teamwork // Vestnik MGOU. Seriia Istoriia i politicheskie nauki. – 2015. – N 5. – P. 176–182. (in Russian).
8. *Guzairova A.* "I cried every day." Students no longer want to live in dormitories and rent apartments en masse. What difficulties do they face? // Lenta.ru. Ekonomika. – 2024. – 19.08. – URL: https://lenta.ru/articles/2024/08/19/arenda-students (accessed 25.07.2025). (in Russian).
9. *IMD Smart City Index 2025. The housing affordability challenge: A growing concern* // IMD. – 2025. – URL: https://imd.widen.net/s/psdrsvpbk7/imd_smart_city_2025_report (accessed 21.06.2025).
10. *Kazakov I.* To demolish dorms in Petrodvorets, to give apartments to rowdies // Fontanka.ru. Gorod. Obshchestvo. – 2019. – 11.10. – URL: https://www.fontanka.ru/2019/10/11/106/?ysclid=mdvj68yd8r744114013 (accessed 25.07.2025). (in Russian).
11. *Kolomak E.A.* The resource of urbanization in Russia // Prostranstvennaia ekonomika. – 2015. – N 4. – P. 59–74. (in Russian).
12. *Korovnikova N.A.* The educational potential of a modern city // Ekonomicheskie i sotsial'nye problemy Rossii. – 2023. – N 3. – P. 60–78. (in Russian).
13. *Kuleshova G.I.* University and city. An essay on the evolution of the university institution's relationship with the urban environment. Part 1. World experience // Academia. Arkhitektura i stroitel'stvo. – 2021. – N 4. – P. 70–79. (in Russian).
14. *Kutsenko E.* Focus on talent: how innovative cities are changing their development strategy // RBK. Trendy. – 2022. – 07.10. – URL: https://trends.rbc.ru/trends/social/633e9a1c9a79475df09f423c (accessed 10.06.2025). (in Russian).
15. *Lappo G.M.* Geography of cities. – Moscow : Gumanit. Izd. Tsentr "Vlados", 1997. – 480 p. (in Russian).
16. *Lappo G.M.* Urban diversity as a factor of successful spatial development in Russia // Izvestiia RAN. Seriia geograficheskaia. – 2019. – N 4. – P. 3–23. (in Russian).
17. *Leonova T.* The global experience of creating innovative cities: success stories and conclusions for Russia // Vestnik IE RAN. – 2011. – N 3. – P. 37–49. (in Russian).
18. *Minaeva I.V.* The city in the territorial space: a review of foreign studies // Voprosy territorial'nogo razvitiia. – Vyp. 3 (33). – P. 1–12. (in Russian).
19. *The Ministry of Construction summed up the results of the Smart City program: what results have been achieved?* // Smetana. – 2025. – 24.02. – URL: https://smeta-na.ru/novosti/minstroj-podvel-itogi-programmy-umnyj-gorod-kakie-rezultaty-dostignuty/ (accessed 21.06.2025). (in Russian).
20. *Notman O.V.* Urban environment as an interdisciplinary concept // Obshchestvo: sotsiologiia, psikhologiia, pedagogika. – 2021. – N 12. – P. 104–107. (in Russian).
21. *Order of the Ministry of Construction of the Russian Federation dated 09/28/2023 No. 6967/pr "On the organization of the execution of the departmental project of the Ministry of Construction and Housing and Communal Services of the Russian Federation on the digitalization of the urban economy "Smart City" and the invalidation of certain acts of the Ministry of Construction and Housing and Communal Services of the Russian Federation"* // Minstroi RF. – 2023. – URL: https://www.minstroyrf.gov.ru/upload/iblock/6b8/m0gouhaen1lgnatm6m4lruvwvejvb4zy/prikaz-696pr.pdf (accessed 21.06.2025). (in Russian).
22. *Popov A.* The prototype of a modern university is a monastery compound // Kommersant. Nauka. – 2025. – 30.04. – URL: https://www.kommersant.ru/doc/7690795 (accessed 20.06.2025). (in Russian).
23. *Priority areas for the implementation of smart city technologies in Russian cities.* Expert and analytical report / Center for Strategic Research. – Moscow, 2018. – 174 p. (in Russian).
24. *Revzin G.I.* Science cities in Russia: questions of genesis // Labyrinth. Teorii i praktitki kul'tury. – 2020. – N 4. – P. 23–42. (in Russian).
25. *The results of calculating the IQ Index of cities for 2023* // Minstroi RF. – 2024. – 02.09. – URL: https://www.minstroyrf.gov.ru/docs/373609/ (accessed 30.05.2025). (in Russian).
26. *Semyachkov K.A.* The innovative potential of a smart city // Zhurnal ekonomicheskoi teorii. – 2021. – Vol. 18, N 3. – P. 474–484. (in Russian).

27. *Shatilo D.P.* University cities in Europe: concept, specifics of development, planning structures // Kontury global'nykh transformatsii: politika, ekonomika, pravo. – 2021. – Vol. 14, N 4. – P. 23–39. (in Russian).
28. *Shutov A.* A point of attraction for students. How world-class educational campuses are being created in Russia // Lenta.ru. Ekonomika. – 2024. – 02.07. – URL: https://lenta.ru/articles/2024/07/02/tochka/ (accessed 20.06.2025). (in Russian).
29. *Smart City: development in Russia* // TAdviser. – 2024. – 13.12. – URL: https://www.tadviser.ru/index.php/Статья:Умный_город:_развитие_в_России (accessed 30.05.2025). (in Russian).
30. *Smart City Index 2024: How cities are shaping the future of urban life* // TPBO. – 2024. – 18.09. – URL: https://placebrandobserver.com/smart-city-index-2024-summary/ (accessed 21.06.2025).
31. *Sokolova S.A., Varakina S.A.* Formation and realization of the innovation potential of a large city in a crisis // Internet-zhurnal "Naukovedenie". – 2016. – Vol. 8, N 2. – URL: http://naukovedenie.ru/PDF/54EVN216.pdf (accessed 02.07.2025). (in Russian).
32. *Steklova I.A., Raguzhina O.I.* Creative spaces as the hope for the province // Teoriia i praktika obshchestvennogo razvitiia. – 2013. – N 12. – URL: https://cyberleninka.ru/article/n/kreativnye-prostranstva-kak-nadezhda-provintsii (accessed 07.07.2025). (in Russian).
33. *Sumskaia T.V.* The functioning of technopolises and technoparks abroad and lessons for Russia // Vestnik NGU. Seriia Sotsial'no-ekonomicheskie nauki. – 2007. – Vol. 7, vyp. 1. – P. 14–24. (in Russian).
34. *Technoparks of Russia* // TAdviser. – 2025. – 10.07. – URL: https://www.tadviser.ru/index.php/Статья:Технопарки_России (accessed 16.07.2025). (in Russian).
35. *Technoparks of Russia – 2024* : Annual Business Navigator / Association of Clusters, Technoparks and SEZs of Russia. – Moscow : AKIT RF, 2024. – 100 p. (in Russian).
36. *Turgel' I.D.* [rec.] // Munitsipalitet: ekonomika i upravlenie. – 2014. – N 2 (7). – P. 74–75. – Rec. ad. op.: Retsenziia na knigu V.Ya. Liubovnogo "Goroda Rossii: al'ternativy razvitiia i upravleniia". – Moscow : EKON-INFORM, 2013. – 614 p. (in Russian).
37. *Turgel' I.D., Bugrov K.D., Oikher A.D.* Russian University Cities: expectations vs reality // Vysshee obrazovaniie v Rossii. – 2023. – Vol. 32, N 5. – P. 89–111. (in Russian).
38. *Ulianychev M.A.* The concept and socio-economic essence of technoparks // Vestnik nauki i obrazovaniia. – 2018. – N 15 (51), pt. 1. – P. 115–118. (in Russian).
39. *University campuses and the city: cooperation for the sake of competitiveness* / VEB RF, the Center for Strategic Research Foundation. – Moscow, 2021. – 67 p. (in Russian).
40. *Yukhina A.A.* Concepts and approaches to understanding the "creative city" // Nauchnye issledovaniia i razrabotki. – 2021. – N 10. – P. 235–241. (in Russian).