Modern principles of integrated land development of the territory and transport infrastructure in Russia

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Abstract: The article analyzes the problems associated with the implementation of large-scale and complex development projects and transport networks. The main principles of integrated development of territories are substantiated and transport infrastructure.

1. Introduction
Since the 1990s Russian real estate market has been under the dominance of construction companies, and only nowadays the direction of the industry development has begun to change. There had been a huge competition regarding profitable parcels of land and the amount of space occupied by newly constructed buildings, while the quality of those structures had not been taken into account [1]. The lack of balance between infill construction products and social and transport infrastructures had become the cause for inconvenience and impracticality.

The legitimization of private ownership of land in Russia became a starting point for analyzing different practical approaches for construction [2]. Market relations development compelled clients, investors and contractors to consider not only the quantity of buildings, but their quality as well.

Some of theoretical and methodological development approaches for built-up areas and undeveloped territories are going to be reviewed in order to find the most possible ones for applying to the Russian industry.

2. Methodology
Some integrated territorial development strategies created worldwide may be used successfully in Russia. Those include American-Canadian, European and Asian approaches. In particular, the 1960s in the USA, as well as in the USSR, was the time of major reconstruction and new territory development. [3] Old buildings losing their functionality and the necessity in the development of industrial territories had come to be the basis for integrated reconstruction and erection of new structures. Furthermore, the design of new territories was characterized by rationality and thoughtful territorial zoning.

The city of Irvine, California, is an example of a planned city which had been developed by the Irvine Company since the 1960s. The 170 km² city has a population of more than 200,000. Its space is divided in several parts, each one involving various urban zones and having its own architectural style: residential zone, commercial zone, business zone, recreational and religious zones. The airport is located in the south of the city. Aside from the Irvine Company, a number of corporations and universities had found their places in the city.

Another example is The Woodlands, Texas, which is a master-planned community established in 1974 by the oil industry investor George P. Mitchell. This is a 114 sq.km. census-designated place...
separated into several “villages” where approximately 115,000 people live. [4] The Woodlands Development Company is permanently working on this area to make it better. Offices and shopping centers are being built in the center of The Woodlands, and housing construction is being held on the outskirts of the area.

It should be noted that the dominant feature of residential construction in Canada and the US is the production of low-rise apartment buildings where each apartment is provided with its own exit to the street. In Canada, for instance, there is a legally approved construction principle: the less unclaimed territory is in the building, the more comfortable and secure life is.

The Asian approach also represents rationality and distinct territorial zoning: they distinguish the administrative, the commercial and the residential parts of the city. Medium-rise residential dwellings (5-12 floors) are in favor.

The European urban experience is the most interesting for Russia. Europe is characterized by a large amount of cities and towns with a polycentric structure, which means the presence of several life centers instead of a single one, and a comparably small population. There are no cities with a population of millions, which we are used to. House design solutions and urban planning directed at keeping as much greenery as possible form a comfortable habitat. Territorial isolation gives the residents a feeling of security. A public space, where the residents and social infrastructure employees build a trusting relationship, is created. Unfortunately, such harmonic relationships are missing in modern Russian cities, where people living in multi dwelling units mostly are not even acquainted to their next-door neighbors. [5]

According to the Western studies, the development of new territories requires at least 45-50 years. Commonly, an integrated construction site takes about 800-1400 ha of land. A population for such territory is planned to be 100-150 thousand. [6] In case a product has a successful concept and its population rapidly increases, there is a possibility of creating a new project for developing an area adjacent to the sophisticated territory if it has not been developed yet.

Integrated territorial development resulted in the 111 km² industrial city of Gütersloh, Germany, where the headquarters of Miele & Cie. KG and Bertelsmann SE & Co. KGaA are located. The need in professionals able to provide local companies’ development led to Bertelsmann founding its own university along with providing all necessary infrastructure in the undeveloped suburban area.

It is notable that for integrated development municipal authorities quite often select “unpopular” parcels of land, located far away from any settlements or transport connection. In spite of this, these urban projects are successfully implemented, forming a unified architectural ensemble and a comfortable living space provided with full infrastructure. [7] This method of integrated territory development was used in the 1960s’ construction of Saint-Quentin, a commune with the population of 145,000 on the outskirts of Paris, France. Today it is a part of Grand Paris and its second economic center where the headquarters of international companies and research centers are located.

In the 2000s the Russian construction terminology had been replenished with a new definition of development. In the classical sense, development means the company taking all responsibility for implementing the construction project: the concept, the choice of the location, the design of future buildings, management of the construction process and selling the product.

For Russians development means entrepreneurship in developing vacant land, creating new structures and reconstructing the old ones, which results in the increase of its value. [8] Consequently, everyone involved in the construction process had been called “a developer”: clients, investors, contractors and companies who managed to obtain large land parcels in order to implement their projects and get the maximum profit.

The Russian developers’ desire for money along with the lack of knowledge in construction design and the disregard of the building location resulted in the lack of market demand - for instance, they built residences without the access to social infrastructure, or shopping malls without transport accessibility.

Today the concept of development evolves, shifting from infill development to integrated development. The usage of the methods of integrated land development is a more productive way to produce real estate and infrastructure. Development services become more and more in-demand. As a
result of using this complex approach, we can see the evolution not only of the most populated cities in the Central Russia, but of other regional cities and towns as well. [9,10]

One of the main principles of integrated land development lays in combining residential buildings of different comfort classes with business districts and optimizing them for more comfortable living, working and recreational experience. Working out the construction project, it is essential to consider the possibilities for satisfying people’s need for a home, a job, an access to consumer goods and services, and recreational facilities. [11,12]

One of the main advantages of the development company’s activity is the presence of the full documentation for the entire construction process in one place. It includes working drawings, transportation system schemes, information on near cultural objects, etc. Minimization of expenses is also an important factor, as construction capacity is focused on an exact area for the exact period of time. [13]

However, bringing such a project to life requires a large initial investment which can be afforded only by large development companies. That is why integrated land development projects are usually worked out with the usage of the city financing and preferential terms of lending or taxation. [14]

Integrated land development projects are already being implemented in several cities across Russian Federation. Thus, land parcels in Perm Region are chosen for further development not only in its central part, but across the whole region. In 2015 in Ekaterinburg the first stage of construction of the new neighborhood “Academichesky” was completed. This is the northern part of the neighborhood with the housing provision no less than 25 square meters per person. The second stage of this project, implying housing provision no less than 30 square meters per person, is scheduled to be complete by 2030. The development of this territory is performed due to the master plan for the development of the municipality “The City of Ekaterinburg”.

The city of Samara is expecting to obtain several residential complexes: for instance, RK «Samarskoyezarech'ye» with the total living area square footage of 6,3 million square meters, constructed on the territory of 1718 ha; or RK «Volgar’» with the total living area square footage of 778.9 thousand square meters, constructed on the territory of 118.75 ha. Integrated land development projects are also being implemented in Bryansk and Cheboksary. [15,16]

It is quite interesting to distinguish the main characteristics and distinctions of infill and integrated development projects.

The main features of infill development are:
- projects are independent, including one or two types of real estate;
- the project is being implemented in the midst of the existing overloaded and outdated infrastructure, or when developers create local infrastructure which does not fit into urban development plans;
- projects are mainly located in the urban area, which means traffic issues and the impossibility to implement the project completely due to the existing limits;
- an increased probability of delays or the termination of the project due to the absence of the compromise between the developer and the municipal and regional authorities.

The main features of integrated development are:
- the complexity of land development, which combines the presence of residential buildings, the transport system, social infrastructure and workplaces, increasing the effectiveness of the project for everyone involved in its implementation and further usage.
- financial support and risk reduction due to the involvement of the governmental, regional and municipal authorities into the project (a public-private partnership);
- the construction of modern infrastructure increases the area’s investment attractiveness and makes it one of the best parts of the city.

The main goal of integrated development projects is to create a new attractive urban space based on a balanced urban planning solution (concerning housing, infrastructure, jobs and entertainment) and its implementation on the particular territory confirmed by local authorities. [17] These projects should be
oriented on different types of social classes in order to obtain the most effective experience in using the territory and to develop the region in general.

3. Results

The analysis of the usage of integrated land development methods in Western countries allowed me to conclude that the basis for successful implementation of such projects in Russia combines several principles.

Principle 1. Structure optimization of real estate objects during implementation of integrated development projects.

Integrated development brings the best results if a parcel of land is divided in such a way so that residential, business and public structures are approximately in the following ratio: the residential zone should account for about 60% of the total area, and the business and public areas, respectively, 15% and 25% of the territory. With this ratio, the residents of the area can be sufficiently provided with social infrastructure, workplaces and conditions for rest and leisure.

It is also important to take into account the tendency of stratification of the inhabitants, and, accordingly, to provide living, working and leisure conditions in the given territory for various categories of the population. In this regard, the responsibility of developers is increasing. They are obliged to take into consideration the social composition of the residents with different levels of income.

Thus, integrated land development projects should include facilities for different social classes in a rational way in order to prevent possible social tension and antisocial activities.

Principle 2. An access to the transport system.

During the creation of the integrated development project for a vacant area on the outskirts of the city, it is essential to provide the new district with a decent transport infrastructure. Nowadays a comfortable life is impossible without an access to a modern transport system, in the development of which regional and municipal authorities should be interested. Their organizational and financial participation along with development companies forms a public-private partnership.

Principle 3. Ecological aspect of integrated land development projects.

One of the main factors of integrated land development is the focus on environmental preservation. Today this factor has become the main one for choosing the territory for development – especially if industrial facilities are going to be constructed. The governmental, regional and municipal authorities must conduct thorough survey during the search for the potential development area in order to not disturb the balance between the economic development of the territory and environmental preservation. Thereby, projects’ ecological orientation becomes a qualitative element of the competitive advantage of this territory.

The harmonization of the integrated territory development projects with the environment is achieved through responsible attitude to nature at the stage of urban planning and engineering preparation of the site, as well as by using modern environmentally friendly materials and technologies during the construction process.

However, given the current economic situation, the regional and municipal authorities are not always able to invest into the complex urban development all by themselves. The major obstacle is the necessity in conducting overhauls of significant number of residential buildings. Despite the emergence of regional funds for raising money from the population, financing is clearly insufficient even for overhauls of apartment buildings, not to mention the complex territory reconstruction.

In this regard, the most effective option for implementing integrated territory development projects can be public-private partnership. Regional and municipal authorities are trying to attract trusted investors and developers to implement major construction projects. Also a wide range of specialists in marketing, budget planning, architectural design, construction, engineering and real estate is necessary. In the development companies participating in the public-private partnership, internal tenders are held. The main architect and the general contractor are chosen. It is quite important because not less than 50% of the success of the future project is dependent on them.
In classical mixed finance schemes with public-private partnerships, a large development company can invest in the project within 50% of the project cost, including at least 10% of its own funds, 25 to 30% of borrowed funds (bank loan) and 10% of the contractor's investments. The government invests at least 25% to 30% of the project cost or another equivalent tangible asset. The remaining 20% of the funds can come from the future owners and tenants of the real estate object. Under such a scheme, a development company can count on 50% of the constructed real estate.

Large development companies that have established themselves as reliable and sustainable partners involved in public-private partnerships can also serve as a strategic investor and contractor and finance more than 50% of the project cost on their own.

4. Conclusion
From all of the above, we can draw the following conclusions.

For the successful implementation of large-scale integrated land development projects, it is necessary to abide by the following rules:

- The development of integrated development projects should provide for a balance between housing, social, public, industrial and recreational types of real estate;
- Simultaneous or previous design of the transport system;
- Integrated land development should be harmonized with the surrounding environmental situation;
- The implementation of integrated territory development projects is ensured by the development of public-private partnership as the most effective type of interrelation between the government and private investment and development companies.

Under such conditions, an effective implementation of integrated development of territories or reconstruction of existing buildings is possible.

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