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Trends and approaches to reorganization of urban environment

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The article describes the standards of urban environment reorganization, which are oriented to the effective use of land resources and the load distribution for urban transport infrastructure, a high degree of functional diversity. The authors have analyzed the approaches and trends of the urban environment transformation, based on the concept of the compact cities formation. The authors determined specific features of the urban industrial environment transformation different types depending on the degree and direction of the objects modification. In the conditions of land plots shortage, redevelopment projects provide an opportunity to renew the urban environment, to solve transport problems, and to find the potential for building new objects.

Keywords: reorganization, redevelopment, reconstruction, revitalization, renovation

Тенденції та підходи до реорганізації міського середовища

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Розглянуто стандарти реорганізації міського середовища, орієнтовані на ефективне використання земельних ресурсів і розподіл навантаження на міську транспортну інфраструктуру, високий ступінь функціонального розмаїття. Проаналізовано підходи і тенденції перетворення міського середовища, виходячи з концепції формування компактних міст та стандартів комплексного розвитку територій. Промислові підприємства у великих містах припиняють свою діяльність через економічні причини або виводяться за межі міста через порушення екологічних норм. Частина таких підприємств приходить в занепад, при цьому здійснюючи негативний вплив на зовнішній вигляд міста. Через потребу в суттєвих капітальних вкладеннях власники або місцева влада не мають змоги здійснювати перетворення таких промислових об'єктів. Визначено специфічні особливості різних видів перетворення міських промислових зон, залежно від ступеня та напрямку видозміни об'єктів, а саме: реконструкції, реновації, джентрифікації, браунфілду, ревіталізації, редевелопменту. Редевелопмент дозволяє використати ті очевидні переваги, які в сучасному місті надає концентрація і збільшення щільності міського середовища. В сучасних щільно забудованих містах редевелопмент може стати майже єдиною можливою формою перетворення. Редевелопмент передбачає більш масштабні зміни об'єкту (зміна функції промислової території, історичних будівель і транспортної інфраструктури) та суттєві інвестиції. В результаті не запитовані і нерационально використовувані території перетворюються на нові інвестиційно привабливі проекти. В умовах дефіциту земельних ділянок проекти редевелопменту дають можливість оновити міське середовище, вирішити транспортні проблеми, знайти потенціал для будівництва нових об'єктів.

Ключові слова: реорганізація, редевелопмент, реконструкція, ревіталізація, реновація



Introduction

One of the problems of the modern cities development is the deficit of free territorial resources. This leads to the need to increase territorial reserves by using territories previously used for other purposes. For example, the territory of industrial and warehouse enterprises can be used as such reserves [1, 2, 12, 13].

Since the middle of the 20th century, in connection with the development of automation and high technologies, sharp decline in production in large industrial centers around the world can be observed. This process reached its peak in the 70-80s of the last century.

In recent years, Ukraine, experiencing a period of deindustrialization of large cities, has faced a major challenge in the redevelopment of industrial zones and facilities. Industrial enterprises in large cities cease their activities for economic reasons or remove their activities from the city because of environmental standards violation. Some of these enterprises are slowly falling apart and this negatively affects the external appearance of the city. Because of the large amount of required capital investments, owners or municipal authorities cannot begin transformation of industrial facilities into active urban areas.

Review of research sources and publications

According to [3, 7, 14 – 17, 19], the consistency of the urban environment with the characteristics of a compact city is carried out by using the system of standards for integrated development of territories.

The standards are oriented to the effective use of land resources and the load distribution for urban transport and engineering infrastructure, a high degree of functional and social diversity, a wide choice of residential development types considering the needs of different groups of users:

- security: security in open spaces at any time of the day, preventing offenses and emergencies;
- environmental friendliness: air quality, quality of gardening, energy efficiency, waste utilization;
- comfort: mobility, balance of publicity and privacy, visual comfort, acoustic comfort, climatic comfort;
- identity and diversity: recognizability of the image, preservation of historical elements of the urban environment, consideration of established practices for the use of buildings and territories, the diversity of types of spaces, the diversity of functions in residential areas, cultural diversity.

Definition of unsolved aspects of the problem

The reorganization of industrial areas is one of the most urgent urban problems in the post-industrial society. For example, in Kiev they occupy about 7 thousand hectares [2]. Historically, industrial enterprises which were created on the wave of industrialization in the first half of the 20th century on the Kiev outskirts often found itself in the middle city in the postwar period, in the era of mass housing construction, when the capital housing stock increased almost 10 times com-

pared to the pre-war period. Today, at the new stage of the economic development of the society, after extensive structural changes in the production complex and its stagnation, the buildings, structures and territories of industrial enterprises are partially empty or leased; they are used in many cases extensively and extremely irrationally. At the same time, the value of the land they occupy is extremely high. It is extremely irrational to leave these areas without proper attention while there is acute shortage of sites for the construction of residential and public buildings.

After all, with the system approach, using industrial enterprises' territories, it is possible to solve the problem of the residential and public buildings construction, and development of a green plantations system for the nearest decades. It is necessary to consider the opportunities for the large Ukrainian cities development, firstly, at the expense of internal territorial resources, rather than of expanding the boundaries of urban development. It significantly increases the cities compactness; make them more economical and comfortable for living.

Problem statement

That is why the **goal** of this article is to analyze the approaches and the urban environment transformation trends, based on the concept of the formation of compact cities.

Basic material and results

The process of transformation (reorganization) of the urban environment and its elements at the present time can be classified depending on the degree and direction of the objects modification.

With regard to the process of industrial zones transformation, the following types can be distinguished: reconstruction, renovation, gentrification, brownfield, revitalization, redevelopment. Despite the different approaches to environmental conservation, all these types of activities are related to reconstructive processes.

Reconstruction includes the reorganization of the construction object put into operation in accordance with the established procedure, namely: changing its geometric dimensions and / or functional purpose, that leads to a changing the basic technical and economic indicators (quantity of output, capacity, etc.), improving production, raising its technical and economic level and quality of manufactured products, improving operating conditions and quality of services [6, 10 – 11].

Reconstruction provides complete or partial elements preservation of bearing and enclosing structures and a whole stoppage of facility operation or of its parts (provided their autonomy) for work execution period. Reconstruction of buildings is a complicated and time-consuming process, especially if it is an architectural monument or historical buildings. In this case, the age of the structure can be several centuries and the task posed to the designer is complicated tenfold, since it is necessary not only to improve the operational characteristics of the building, to create con-

ditions for its effective use, but also to restore its former shape, to preserve the spirit of the era.

In the reconstruction of industrial facilities, more productive high-mechanized and automated technological processes are introduced, more rational use of production areas is achieved, and the efficiency of using capital investments is increased.

The reconstruction of existing enterprises includes the reorganization of existing workshops and facilities of the main, ancillary and maintenance purposes, as a rule, without the expansion of primary purpose existing buildings. While reconstructing existing enterprises, it is possible to expand separate buildings and structures in those cases when a new high-performance and more advanced equipment can't be located in existing buildings; to build new ones and expand existing workshops and other facilities of the complex in order to eliminate imbalances; to build new buildings and structures of the same purpose instead of ones that are being liquidated on the enterprises territory, which further exploitation, according to technical and economic conditions, was not considered to be necessary.

The reconstruction significantly differs from the new construction and has its own peculiarities in the design, the development of the construction technological process, the specifics of the construction and installation works, which is connected with the variety of structural and space planning decisions, tightness of the construction site, the need for step-by-step execution of work in various areas, a combination of the enterprise production activities with the performance of civil and erection works, disassembling dilapidated structures or their parts in some cases, etc.

There are such major factors that affect the nature of building reconstruction as the characteristics of the city itself, the place of development in the city planning structure, the quality of the microdistrict, quarter, buildings.

The considerable amount of work during the reconstruction relates to the disassembly and destruction of the buildings structures. They are very labor intensive and largely determine the terms of reconstruction [11].

Renovation is a process of restoring the structure and type of damaged historical town-planning structures, facades and interiors of morally and materially obsolete buildings [8].

Gentrification is the reconstruction and renovation of buildings in previously unpublished urban neighborhoods, either under a planned urban rehabilitation program or as a result of decisions taken by professionals and managers. As a result of gentrification, the average level of incomes of the district population increases due to the replacement of low-income residents by the more affluent [18].

Another type of reorganization of urban industrial zones is brownfield, which is the creation of industrial parks on pre-existing production sites (former factories, workshops or port docks). As a rule, in such places there have already been buildings that are being reconstructed, some are being completed, usually

there is a suitable infrastructure, communications and ready storage facilities [4].

Revitalization is a term used in scientific and practical activities to describe the processes of reproduction, revitalization and restoration of urban space; it means literally a «revitalization» of a territory or an object that no longer functions [5].

In urbanistics, the term «revitalization» means the restoration of the urban environment, which makes it becomes more habitable.

The principle of revitalization consists in revealing and showing new possibilities of old forms, considering their functions.

In addition, in revitalization, an integrated approach is most often used to preserve the identity, authenticity and historical resources of the urban environment.

The revitalization of existing industrial complexes that are located within the city limits is very popular in the modern world, which is connected with the contradictions between the needs of society and the existing structure of the urban environment.

In such cases, revitalization is seen as a reconstruction of the industrial architecture with a change of its functions. For example, re-equipment of industrial buildings for living space is known as loft. Today, revitalization includes such a semantic tinge as an attentive and careful attitude to the object, preserving the spirit of place and material memory of the past. The degree of change in the urban environment in the process of revitalization depends on the degree of value of historical and cultural objects.

The task of revitalization is the socialization of space, the development of infrastructure elements that regulate tourism and scientific activity, the development of industry, care for the environment and, as a result, the attraction of investments.

Revitalization is a special case of redevelopment.

Redevelopment is one of the most effective ways of re-profiling of unclaimed real estate objects or irrationally used territories [9, 12].

It is especially acute in large cities, where inefficiently used territories and individual objects are clearly seen.

Zones of cities, formed under the influence of economic and political conditions of other times, provide ample opportunities for redevelopment of: buildings used with underload and suitable for reconstruction, as well as land for the implementation of point redevelopment. Intensive construction of recent years has led to the almost complete filling of free land in the territory of large cities in Ukraine.

The logical extension of the urban real estate transformation is residual development of several land patches and parallel implementation of reconstruction projects of existing buildings or redevelopment of the existing territories of large industrial complexes:

- redevelopment of enterprises' buildings that do not use high technologies, in order to redirect them to use for administrative purposes and research work related to high technology;

- reconstruction of old large enterprises for further use as warehouse and modernized office and technological buildings;

- demolition of heavy industry facilities and subsequent use of land for the construction of residential community or commercial real estate;

- re-profiling of inefficiently used territories with garage-construction cooperatives, small industrial enterprises, snow blowers.

For the redevelopment of degraded industrial areas, it is necessary to do:

- system analysis of the real estate market: general trends in the real estate market, the state of the real estate market segments, the forecast for the development of the real estate market;

- full and comprehensive assessment of the property in next areas: functional property of the real estate object (industrial, communal, warehouse, degraded territories, carpoles, etc.), the attractiveness of the territory (economic, urban, landscape, ecological, etc.), degree of negative impact on the environment, analysis of cultural, historical, architectural value of the territory and buildings (monuments, private buildings, unique modern architecture), form of ownership, profitability, degree of reliability and durability of buildings and structures;

- formation of the strategy, concept and project team (the concept includes: new functional use, architectural requirements, consumer requirements, engineering and investment aspects, legal parameters; the formation of a professional team of executors implies: tendering among various specialists, designers, consultants, contractors; tender documents development);

- investment analysis (main assumptions and standards for financial and economic calculations, organizational plan, project cost estimates in accordance with the main components, income calculation, investment development schedule, sources, financing volumes and terms, cash flow statement, forecast balance sheet, profit and loss account, development of various project budget scenarios, including assessment and forecast, a business plan development).

Sometimes redevelopment is identified with reconstruction, but this is not entirely correct, because the first one doesn't always include the modification of the object's constructions. We can talk about three main types of redevelopment: complete, partial and superficial.

The complete redevelopment assumes absolutely new development of objects and territory: starting from the change of the special purpose of the site and the coordination of the new project and ending with the laying of modern engineering networks and the organization of new transport interchanges. In this case, industrial enterprises transform into trading or shopping and entertainment centers, specialized or grocery supermarkets or business centers, and logistics complexes. It is necessary to conduct marketing research, develop a concept, look for a suitable architectural idea, do financial analysis. We use only the land plot in this variant. A complete redevelopment of

industrial facilities is the leader in terms of costs, as the amount of required investment is equivalent to the amount of costs for the implementation of a new project plus the costs of changing the specific purpose of the site and cleaning up the territory from existing buildings and structures.

Partial redevelopment means a new life of industrial areas and partly of facilities with the modernization or fragmentary renovation of the existing engineering and transport infrastructure. In this case, it is not always necessary to change the status of the site, often the future project is implemented within the existing target purpose or with small adjustments. Typically, this is how office-warehouse or logistics complexes with administrative buildings are formed. Partial redevelopment takes a second place in terms of costs.

As for superficial redevelopment, it usually does not involve serious modernization and constructive changes of existing facilities, so the objects usually are either enterprise's administrative buildings or separate workshops. This type is often used for building grocery or construction supermarkets, as well as small office complexes of class C. In this case, the transport infrastructure does not change radically. Surface redevelopment is most beneficial in terms of time and financial investments.

A short list of the main steps for investor who has decided to redevelop industrial areas include next:

- to develop a project for transferring production capacities outside the city limits and prepare for the corresponding costs associated with the organization of this process;

- to prepare a project of existing buildings demolition and demolish them in fact;

- to carry out works on cleaning the territory;

- to update communications, more than half of which probably are in a deplorable state;

- to change the purpose of the site;

- to get the right of ownership of the land plot;

- to develop a new plan for the development of the territory;

- to develop real estate projects;

- to conduct directly construction work (to carry out capital costs for construction or equity participation in it);

- to implement the finished object (to lease or sell).

But, despite the complexity of the process, redevelopment remains a very attractive area of activity. Today redevelopment of industrial areas, in particular, industrial buildings is a good way for the investor to minimize costs. As a rule, spacious, multi-span production buildings, especially one-store ones, enables to make a flexible plan, to solve with minimal means the problem of obtaining a large number of today' commercial real estate (retail, entertainment and logistics objects). Many enterprises, that are currently undergoing restructuring, are located near the highways and metro stations, which often becomes almost the determining factor in the successful implementation of the future project. In addition, most of these facilities are provided with engineering infrastructure, in par-

ticular power supply, which is advantageously different from undeveloped territories. Today, in large cities, the problem of electric power distribution has become much more acute, and each enterprise, as a rule, has its own powerful switchgear.

It is worth noting that the «starting position» of an industrial facility is not always attractive enough, and this greatly complicates the work with it. For example, very serious problems can arise in the re-profiling of industrial buildings and territories located in the sanitary protection zones of adjacent industrial facilities where the level of environmental pollution is unacceptable for public buildings. The situation with the plant territories is also ambiguous. In some cases, they are quite sufficient for the organization of guest parking lots, corresponding to new needs, and this provides a high attractiveness of the facility for visitors. In others, exact opposite, the territory is extremely small, and then, if decisive measures to organize a multi-level parking are not taken, the facility comes to the «culprit» of automobile pandemonium on the roadside. At the same time, during the construction of new building, when objects in industrial territory are not of value and are subject to demolition, it is important to maintain a balance between the load on it and the areas necessary for servicing transport. It is of great importance to link the transport load to the adjacent city highways, which arises with the construction of a new facility, with the intensity of traffic along them.

Despite all the bureaucratic and economic difficulties of redevelopment, there are enough examples of successful transformation of industrial facilities into commercial buildings in Ukraine. Many cities can boast of good examples, but Kiev and Kharkiv still have leadership in this respect. In the capital such shopping and entertainment centers as «Caravan», «Bolshevik», «Promenade», office facilities «Forum Business City», «Forum Park Plaza» and others were built on the site of industrial facilities. In Kharkiv, the process of redevelopment began with the acquisition of industrial property (production and storage buildings, administrative buildings of large enterprises with an area of more than 1000 m²) by new owners and their reconstruction with redevelopment for supermarkets («Rost», «Target»), shopping centers («Sun City»), cultural and entertainment centers («Colosseum») and business centers («Telesens»). Today the largest project in Kharkiv from the point of view of industrial redevelopment is the plant «Serp i Molot», the territory of which occupies more than 50 hectares of land in the city center [2, 9].

Both redevelopment and revitalization of spaces are effective methods of functional and stylistic changes in the concept of objects and property management. The difference between concepts lays in the scale of the object and the amount of capital investment. Redevelopment involves more large-scale changes in the facility (changing the function of industrial territory, historic buildings and transport infrastructure) and significant investments. Revitalization of the territory is realized by the redevelopment of the industrial territory in the shopping and entertainment area, the revitalization of buildings – by the restoration of architectural monuments, and the revitalization of urban space – by the reconstruction of transport infrastructure.

Redevelopment can be confused with renovation, revitalization, reconstruction and gentrification. The common thing in all these processes is that they are based on the change, improvement and activation of space. But the ways and programs are different for each one. So, revitalization is not always connected with demolition and re-building.

Redevelopment is a secondary land conversion – the creation of a new, more demanded product of real estate. The economy and society are not still, technologies and social models become obsolete. The objects and territories targeted to them become ineffective or unclaimed. It is a natural process. Therefore, as a rule, redevelopment means re-profiling which is a partial or complete replacement of the function, also by active construction intervention. Redevelopment enables to use those obvious advantages that are given by the concentration and increase in the density of the urban environment in the modern city. Actually, redevelopment can be generally the only possible way to do something in the developed, densely built-up cities.

Redevelopment is a reloading of real estate. The new investment-attractive projects from unclaimed and irrationally used territories are created.

Conclusions

In the conditions of land plots shortage, redevelopment projects provide an opportunity to renew the urban environment, to change not only the architectural appearance, but also the social level. If the urban space is re-organized, transport problems can be solved, the potential for building new roads, bridges, parks and embankments can be founded. Territories that were previously closed, on the contrary, become new places of attraction for citizens.

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