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## **THE TECHNIQUES OF EFFECTIVE USE OF RECREATIONAL AREAS OF THE UNIVERSITY COMPLEXES**

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### **ABSTRACT**

An investigation of scientific works to concern the town-planning structure of higher education establishments and their connection with an urban structure was provided. It was reviewed architectural and planning methods of improving the economic indicators of Universities. The analysis of practical experiences of the current higher educational establishments at Ukraine was made. The main principles of effective use of recreational areas of the Universities were produced. The methods and techniques were implemented in the projects of the amenities and landscaping of plots of the O. M. Beketov National University of Urban Economy in Kharkiv and the Volodymyr Dahl East National University.

Key words: higher educational establishments, recreational areas, effective usage, urban structure.

## 1. INTRODUCTION

Within a transition to market economy model the issue of effective applying of Ukrainian cities territorial resources has obtained a critical importance in the current days. The solution of the question calls to matching with urban significance for a temper of functional employment of the each parcel. The plots located in the central city's part possess a vast city-planning opportunity and, subsequently, a treasure. It is meant not only for a build-up area, but also open undeveloped places that often perform a recreational function. Some of these spaces belong to the "public use" category. These are urban gardens, parks, embankment boulevards. Another part of open landscaped spaces refers to the category of "restricted use" and located in the areas of public complexes, including the higher education establishments' complexes (HEEC).

Analysis of the HEECs (Tab. 1) in the central administrative districts of Ukrainian cities revealed the presence of two types of universities:

- complexes with dense building system and small open recreational areas;
- complexes with sparse building system and large open areas.

Tab. 1. Urban planning characteristics of university complexes in central districts

Name of the higher education establishment	Total Square of the territory, ha	Square of unbuilt territory, ha	Number of students	Number of teachers
Alfred Nobel University	1,1	0,2	3400	264
Dnipropetrovsk Humanities University	0,15	0,05	1174	108
Dnipropetrovsk State University of Internal Affairs	11,5	5,7	3283	451
Kharkiv National Automobile and Highway University	1,2	0,3	4708	1326
Kharkiv National Medical University	2,7	0,6	10000	718
Kharkiv National University of Civil Engineering and Architecture	1,3	0,2	8000	520
Kharkiv National University of Radio Electronics	4,7	0,4	11177	683
Kharkiv State Academy of Design and Arts	1	0,2	1209	265
Kyiv National University of Construction Architecture	15	3,5	10000	1881
Kyiv National Economic University named after Vadym Hetman	6,5	2	38000	643
National Technical University „Kharkiv Polytechnic Institute”	21,6	11,5	22000	2700
National Pedagogical Dragomanov University (the main building)	1,7	0,2	16000	3470
National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”	46	9,5	26442	4264
Odessa national economic university	1,1	0,2	8162	525
Odessa I.I.Mechnikov National University	6,6	1,6	10490	1683
Odessa National Medical University	2,6	0,5	8360	1804
Odessa National Maritime University	4,1	0,8	5964	563
Oles Honchar Dnipro National University	22	4,5	20000	1882
O. M. Beketov National University of Urban Economy in Kharkiv	3,9	1	11000	600
South Ukrainian National Pedagogical University named after K.D.Ushynsky	4,2	0,85	5780	828
Taras Shevchenko National University of Kyiv	5,0	0,7	26000	4400
University KROK	0,8	0,1	4000	296
Ukrainian State University of Railway Transport	3,3	0,7	13200	551
V. N. Karazin Kharkiv National University	5,8	0,3	15000	3337
Yaroslav Mudryi National Law University (the main building)	2,5	0,2	14000	1305

The study of the functional and planning organization of the HEEC territories in Kharkiv, Kiev, Lviv, Dnepropetrovsk has shown that today their open spaces (often large in area) are not used effectively enough. Most often, such areas are located in the peripheral part of university complexes (Fig. 1). Low level of engineering accomplishment and landscape design, lack of convenient planning connections with other functional blocks of the complex are not allowed to develop the recreational functions in there.

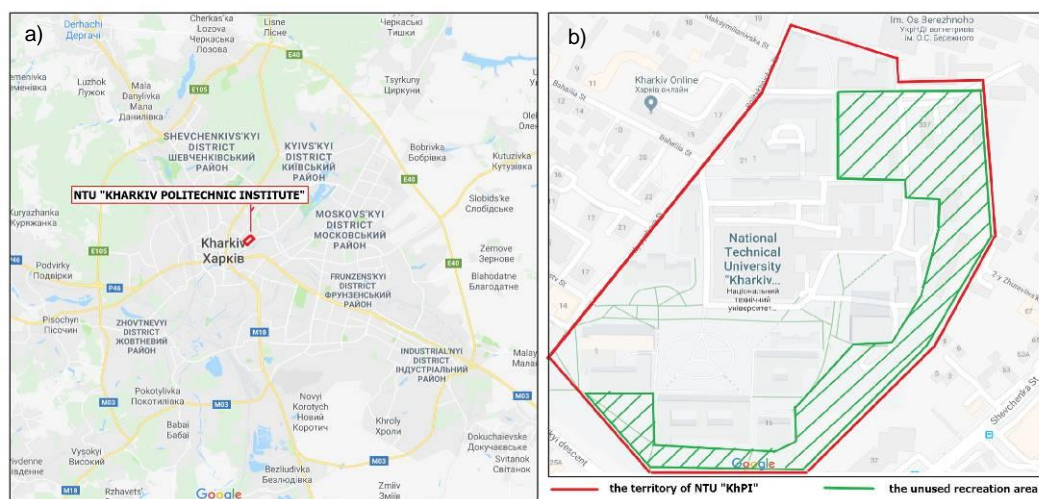


Fig. 1. National Technical University „Kharkiv Politechnic Institute”: a) map of Kharkiv city; b) map of NTU „KhPI”. Source: scheme made by the author

On the other hand, in recent years there have been significant changes in the economic situation of state universities. Financing of universities has been greatly reduced in recent decades. Reducing of public funding has led to an independent search for solving economic problems of each higher education institution. The increasing number of students studying under the contract, as well as foreign citizens - is an important factor in solving this problem. Observations and surveys of students show that increasing the attractiveness of the architectural environment of HEECs, creating new functional elements, improves the image of the educational institution and contributes the influx of students.

Thus, the issue of effective urban development using open landscaped spaces in the structure of the HEEC becomes more and more relevant.

The study of modern practical experience has confirmed that an important method of attracting enrollee to a higher educational establishment has been the improvement of its architectural and landscape environment. For example, monuments are fixed to a well-known scientist, new public spaces are formed, unique elements of landscaping and equipment of the territory are created, public service facilities are opened on the territory of HEECs, etc.

A special place is occupied by the organization of cars and bicycles parkings. This is a relatively new issue for the functional and planning organization of the HEEC area.

However, the processes of open spaces transformation of HEECs most often occur spontaneously. Decisions taken without professional scientific justification can not ensure the effective use of valuable territories. This confirms the necessity and importance of studying the problem of their architecture and landscape organization on the examples of foreign university complexes.

## 2. LITERATURE REVIEW

The study of scientific experience has shown the following strategy models for the universities development are offered: Demin, N. "The management of the development of urban planning systems" [4], Rodionov, A. " Development of strategic management of the universities " [14], Satsik, V. "In Search of an Effective Strategy of the Development of Higher Education in Ukraine" [15], etc. In the sphere of architectural and town-planning theoretical scientific base, problems of recreation zone organization in the structure of university complexes have been studied. As well as the spatial organization of agricultural educational and scientific complexes, have been researched by Skakova A., Bolkhovitinov M., Putintseva O. The questions of the compositional structure of higher education institutions, their formation in the urban environment and interaction with it, have been reflected in several scientific works made by Kovalska G.[7], Kondel-Perminova N.[6], Solobay P.[16], Olkhovskaya E., Kolozali R., Mahadin T. [9] However, problems of architectural and landscape formation of unused or rationally used recreational areas in the structure of HEEC are not covered in normative documents and have been studied insufficiently.

## 3. STUDY MATERIALS

The first stage of the research included the following methods: cartographic analysis, empirical analysis (observation, comparison, measurement) and survey. When analyzing prototypes methods of analysis and systematization were used. The stage of offer development of transformation of the territory of HEEC included methods of graphic modeling and experimental projecting.

**The purpose of the study** is the determination of techniques of the effective usage of HEEC's recreational areas.

The higher educational institution is an important structural and functional element of the current city. The improvement of its architectural and town-planning organization undoubtedly contributes to raising the attractiveness of the complex. Analysis of modern HEEC in Ukraine highlights that it is possible to identify a number of methods for transforming their architectural environment in order to increase the rating aspects:

- improving quality of the recreation areas;
- location of public services on the Universities` territory;
- improving aesthetic characteristics of academic buildings;
- creation of up-to-date parking places
- implementing principles of universal design into inner room and territory improvement
- reinforcement of planning relations between the urban territory and the university.

The abovementioned principles of inner open territory improvement are realized due to active usage of modern landscape design approaches on the territory of higher educational establishments that adjoin public territory. Resting areas for public usage for non-official social communication are often created here. These areas help promote a higher educational establishment and thus increase its social attraction. Examples are the V. N. Karazin Kharkiv National University, National University of Physical Culture and Sports of Ukraine, Bukovinian State Medical University, Kharkov National University of Radio Electronics, Lviv Polytechnic National University, and others.

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (NTUU "KPI") is an example of using several methods of improving the architectural environment (Fig. 2). The number of changes of compositional and planning structures of the University has been conducted in the course of several decades. For example, the method of placement of public services (food, trade) on its territory and creation of transit pedes-

trian links and the improvement of open recreational areas for common access is actively used.

During the period of time from 2005 to 2008 the park due the NTUU “KPI” was reconstructed with the help of public financing. Activities included the following tasks: replacement of lighting fixtures, installation of benches and litter bins, setting up a watering system throughout the territory of park and laying tiles on the alleys and venues. The territory belongs to the city structures, however it is a visiting card of the university. The park is focused to the public usage of both students & employees of the university, and all citizens.

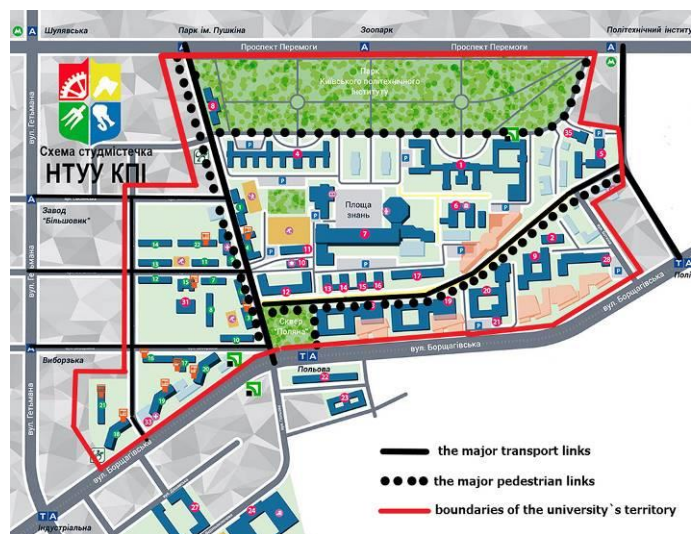


Fig. 2. The scheme of National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”. Source: [12]

Thus, the NTUU “KPI” is a vivid example of architectural improvement of recreational areas, creation of comfortable conditions for students and teachers and incorporation of approaches that enhance planning connections between the city and territory of the university. However, certain territory improvement and disposition of service objects are not systemised – they are realised pointwise for every separate area without taking into account the whole territory composition.

Effective approaches and principles of organization of higher educational establishment’s open areas were revealed with the study of foreign experience.

For instance, the campus territory of Brooklyn College (Fig. 3) has strict compositional structure and divided into zones. The campus is situated on the 35 acre territory in Midwood, in the suburbs of Brooklyn. The structure of the complex includes educational, communicative, sports and residential functions. The open recreational area is also divided and involves zoning: the territory of parking, sports areas, and improved areas of quiet rest. Parking places are located near the main entrances to the campus. Improved recreational areas near the buildings are places of quiet rest with communicative and informative functions. Separately, on the other side of the campus, there is a stadium and tennis courts that form the campus's sports zone.

Thus, in the planning structure of the college, compositional integrity and a clear division of the territory's parts according to their functional purpose are traced.

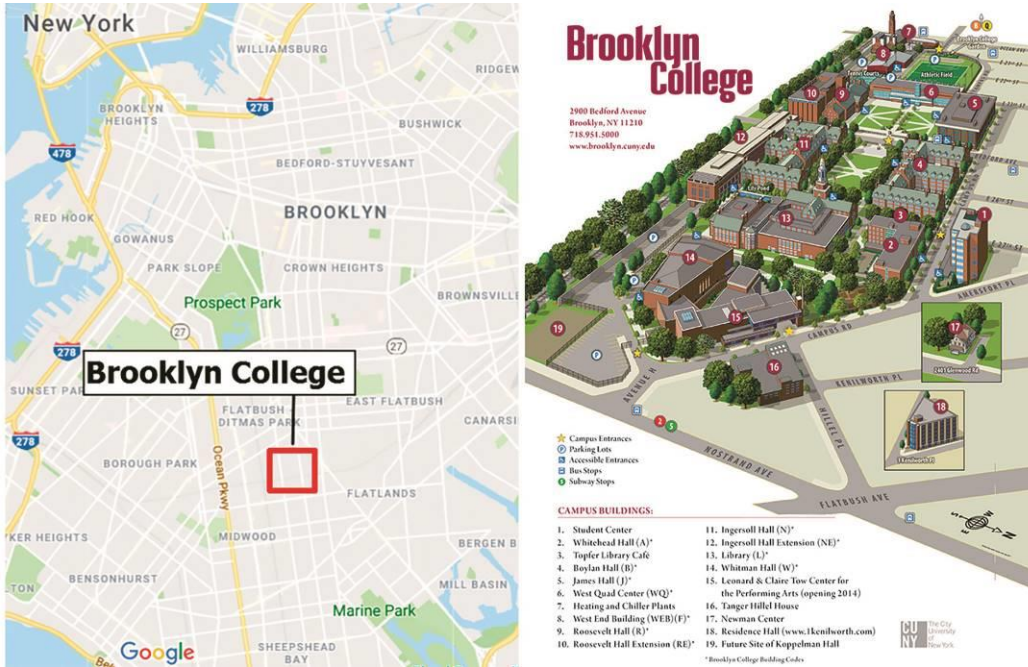


Fig. 3. Brooklyn College: a) map of Brooklyn city; b) map of Brooklyn College. Source: [2]

Another example is Middle East Technical University in Ankara (Fig. 4). The university campus is located 7 km from the center of Ankara and includes large recreational areas in the city. The territory occupies 4,500 hectares, including 3,043 recreation hectares. Moreover, the territory includes educational buildings, residential buildings, libraries and scientific laboratories, sports grounds, public service buildings (banks, shops, cafes, etc.). In the structure of the campus, the prevalence of clear compositional links between the zones and their rational interposition relative to each other can be traced. For instance, the training and administrative zones are closer to the entrance area. Public service areas (cafes, shops, personal services), cultural and entertainment and sports areas adjoin the residential area.

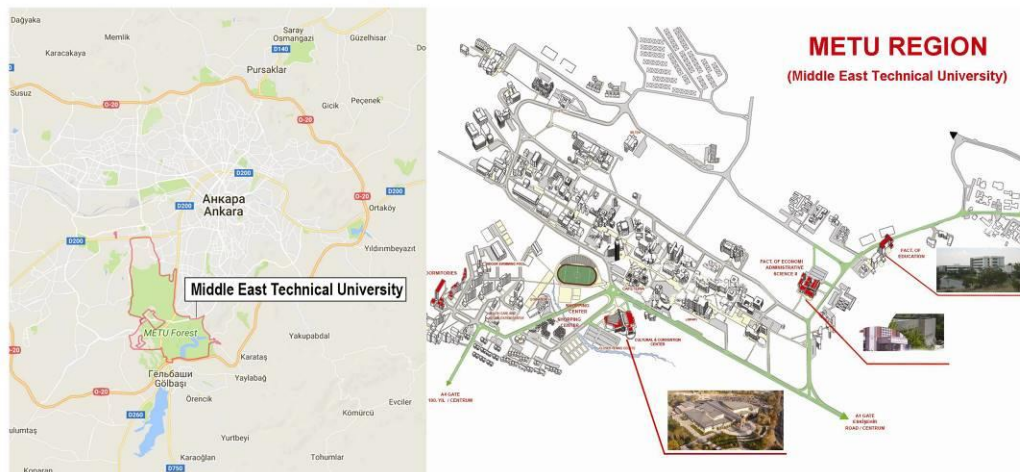


Fig. 4. Middle East Technical University: a) map of Ankara; b) map of METU. Source: [10]

However, it is worth mentioning that compositional integrity with a clear zoning is formed and maintained in campuses and university complexes in the periphery of major cities, rather than in its central regions. For example, Columbia University in Manhattan, New York (Fig. 5). The block between Broadway Street, Amsterdam Avenue, 114th Street and 120th Street is a coherent structure, all the elements of the functional and planning organization, the central core and the main composition axes are visually revealed. Entrance spaces in front of the main buildings have quiet rest areas. Also courtyard areas are improved inside, each of which is most effectively used and implements the functions of rest, information or communication. However, some areas adjacent to the block and related to the university do not have a clear compositional connection with the core of the HEEC and the compositional organization.

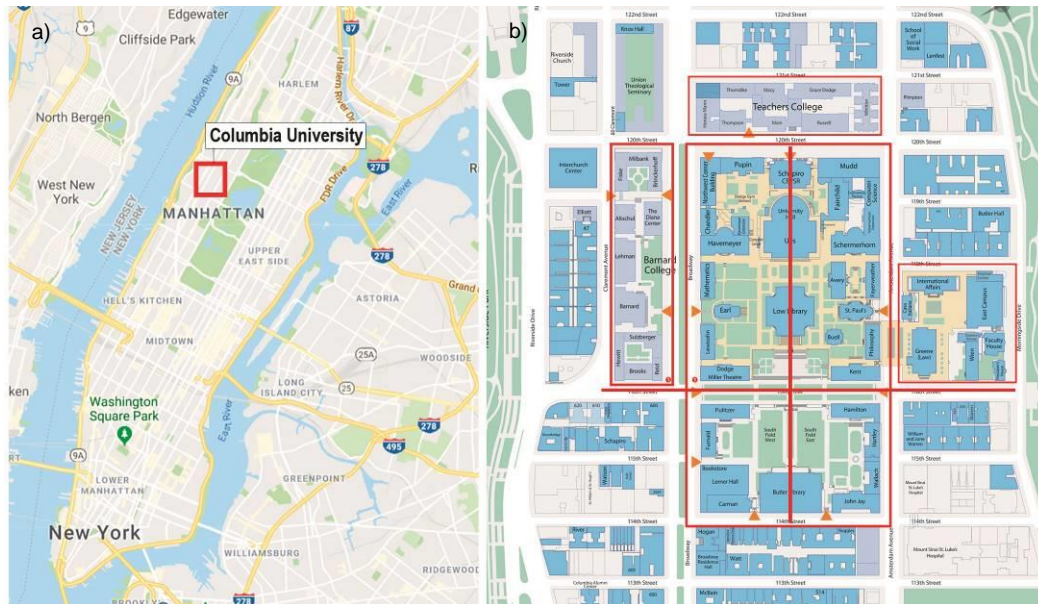


Fig. 5. Columbia University in New-York : a) map of New-York city; b) map of Columbia University at Manhattan. Source: [3]

Analysis of modern examples of improvement of HEEC's open areas has proved that there is a tendency for supplying territories with informative-communicative areas, multi-functional usage of one area or strict division of an area according to its functional purpose. For example, quiet rest areas are organized as places of communication, information, recreation or training (Fig. 6, 7). Also, in order to emphasize the individuality of an educational institution, different forms are used in the landscape design of their territories using small architectural forms with a unique design solution (Fig. 8, 9).

Thus, when transforming the territories of HEECs in Ukraine, which occupy large areas (for example, National Technical University „Kharkiv Politechnic Institute” or NTUU “KPI”), foreign experience in the functional organization of territories should be used. As the study showed, the organization of the complex's territory should include such functional modules:

- the territory of the entrance space – the area of dispersal and information
- an area with a cultural and entertainment function;
- a zone of quiet rest;
- sports' territories;

- territory for educational purposes - areas for lectures and practical classes "in the open air";
- territory of public service facilities;
- parking area – if a complex does not provide underground parking.



Fig. 6. Monash University Caulfield Campus Green. Source: [11]



Fig. 7. Reinterpreting Nature in Design: Teikyo Heisei University Nakano Campus. Source: [13]



Fig. 8. Biological institute of Dresden University of technology. Source: [1]



Fig. 9. Thomas Jefferson University - Lubert Plaza. Source: [17]

On the territories of higher educational establishments, which are located in the structure of dense urban development and occupy small areas (for example, V. N. Karazin Kharkiv National University, National Pedagogical Dragomanov University, Kharkiv National University of Civil Engineering and Architecture), such functional modules as parking, territory of entrance space and territory of quiet recreation should be provided. The last two modules can be combined and located on one territory.

The abovementioned recommendations were realized in the projects for the improvement of territories " Volodymyr Dahl East National University" and "O. M. Beketov National University of Urban Economy in Kharkiv", executed by the author.



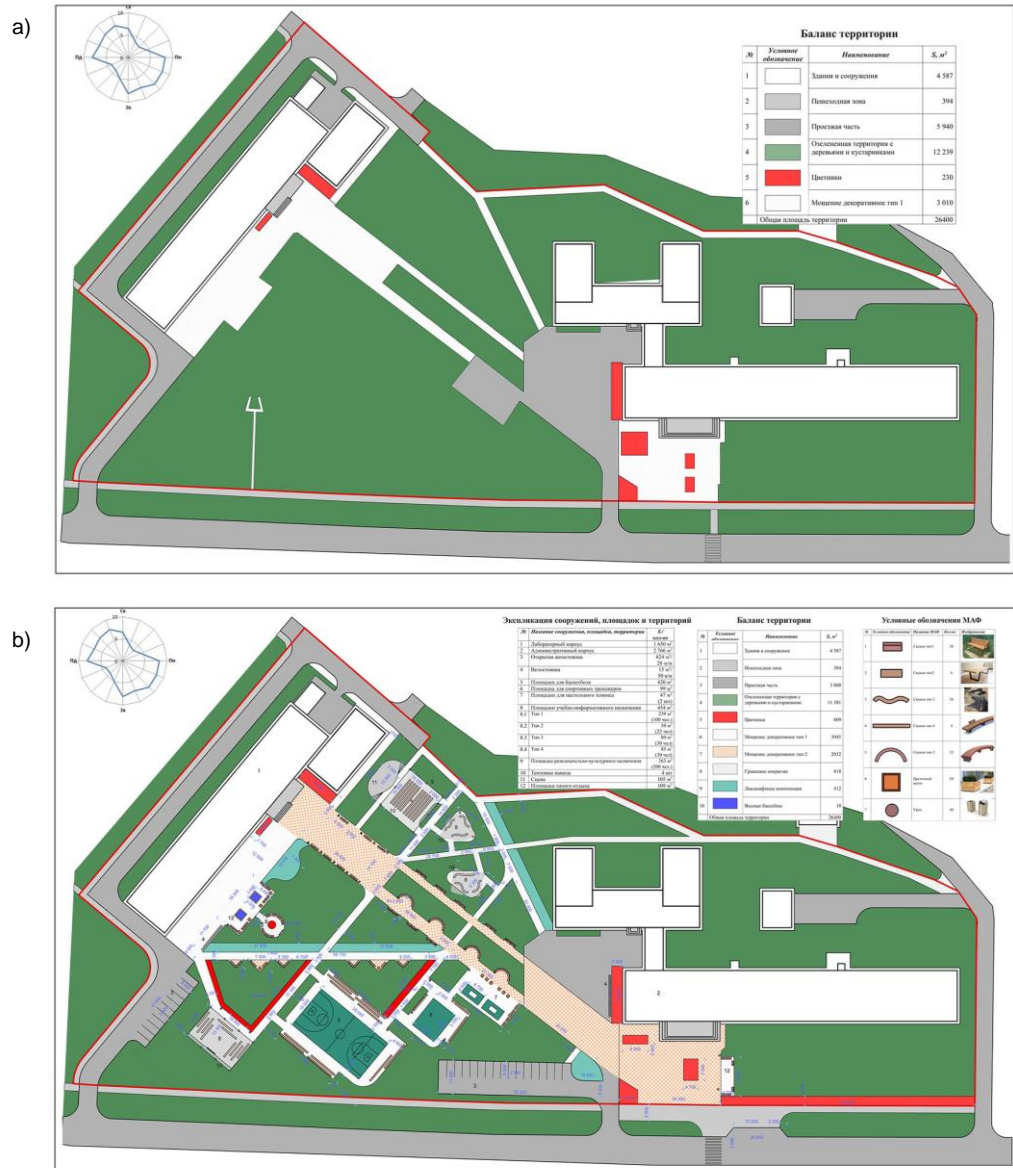


Fig. 10. Volodymyr Dahl East National University: a) the current state of the territory; b) the project for the improvement of the public garden in the territory. Source: scheme made by the author

In the project for the improvement of the public garden in the territory of the Volodymyr Dahl East National University (Fig. 10) the problems of effective planning organization of recreational areas are solved, offers for the formation of new functional modules in previously unoccupied areas of the territory are developed. This is a platform for communicative-informative, sports and cultural-entertaining activities. In the entrance area, an additional information area and parking zone for 28 cars are planned. The project is under development.

Events devoted to improvement of the functional and planning organization of the territory of the O. M. Beketov National University of Urban Economy provide for the phased implementation of project offers. Territory before the project proposals is shown at the scheme of the organization of existing roads, paths and venues (Fig. 11).

At the first stage (Fig. 12), part of the territory of the planning module at the entrance was transferred to communal ownership. Therefore, the financing of the improvement of this territory and the erection of a monument to the famous Kharkov architect Alexei Nikolaevich Beketov was carried out from budget funds and funds from the patrons of art. Previously located on this territory parking zone was moved to a neighboring territory, which was not used.



Fig. 11. O. M. Beketov National University of Urban Economy in Kharkiv. Source: scheme made by the author



Fig. 12. O. M. Beketov National University of Urban Economy in Kharkiv. The first stage. Source: scheme made by the author

At the second stage (Fig. 13), a project to improve the entrance module of the university was developed. The main objective of the project was to improve the aesthetic characteristics of the territory. Moreover, during the the project offer development, the following tasks were accomplished: changing of the functional zoning of the territory, improving compositional characteristics and pedestrian links, increasing the area of recreation areas for students. The project proposed: creation of an array of playgrounds for quiet rest, informal communication and mass events, launching of pedestrian links between the entrance space of the university and the space of an open parking lot.



Fig. 13. O. M. Beketov National University of Urban Economy in Kharkiv. The second stage. Source: scheme made by the author

**4. CONCLUSIONS**

In the conditions of Ukraine's transition to market forms of economic relations, the issue of effective use of free sites (open spaces) in the structure of the HEEC becomes more and more relevant.

At present, the architectural and town-planning transformation of free sites (open spaces) in the structure of the HEEC occurs spontaneously, without using any scientific recommendations.

Based on the study of scientific works and generalization of practical experience, such methods of transforming open spaces of Ukrainian universities complexes in modern conditions have been developed and used in the course of experimental design:

- allocation of functional-planning modules in the structure of open spaces for efficient and comfortable organization of new functional processes;
- combination of several functional processes in one planning module in conditions of small territorial resources;
- placing special parking sites for individual vehicles and bicycles in the entrance planning module for improving the safety level and traffic comfort;
- using of modern design techniques for organization of entrance planning modules so that increase the level of informativeness, comfort and representativeness.

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