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METHODOLOGICAL APPROACHES TO THE CREATION OF CONCEPTS OF MODERNIZATION OF THE URBAN TERRITORY OF LVIV

ZASADY METODYCZNE TWORZENIA KONCEPCJI MODERNIZACJI TERENOW ZURBANIZOWANYCH LWOWA

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ABSTRACT

The article describes the sequence of research of urban characteristics of the selected areas of the territory of Lviv and the formation of the concept of modernization of urban territories, illustrated with the results of work of Masters of Architecture according to the specialization "Urban development" in the Institute of Architecture of Lviv Polytechnic National University.

Key words: concept of modernization of urban territories, Lviv, urban characteristics, urban development.

STRESZCZENIE

W artykule opisano sekwencję badań cech miejskich wybranych obszarach terytorium Lwowa i tworzenia koncepcji modernizacji obszarów zurbanizowanych, przedstawione wynikami prac studentów drugiego stopnia specjalizacji "Urbanistyka" w Instytucie Architektury Uniwersytetu Państwowego „Politechnika Lwowska”.

Słowa kluczowe: charakterystyki urbanistyczne, koncepcja modernizacji terenów zurbanizowanych, Lwów, rozwój urbanistyczny.

1. INTRODUCTION

The aim of this article is to show the experience in processing current urban challenges by students of Lviv Polytechnic National University. Experiences of research on real objects and 20 –years of the practice of holding summer workshops in the Department of Urban planning together with the Technical University in Vienna allows students to practice in real designing and secure theoretical knowledge and skills during learning [9, 18]. The majority of existing urban planning processes of Ukraine can be defined by the term of “urbanization”. Urbanization is not just about demographic changes and increasing of building density. The criteria of urbanization is to optimize correlation of functional use of cities' areas [16].

The development of cities, their densification, the replacement of one of the buildings for the other are the permanent processes of adaptation of cities to changes in social and economic conditions [12]. As the Polish urbanist Jan Chmielewski formulates, "the evolutionary development of urban space is the process of turning it into a more arranged perfect state" [2].

The projected rate of increase in the share of urban population¹ causes the need for rational use of urban land. The rational is to upgrade the sections of the city, which have low intensity of use of space.

2. THE EXPERIMENTAL PART

2.1. The theoretical framework of the study

The studies of urban structure optimization, modernization of development as well as functional use of the territory of the city are relevant to the most cities of Ukraine.

Separate vision of this process is needed for each city.

According to the statistical data, the Lviv city has one of the highest population density of Ukraine. (table1). The item of urban density is reflected in finding of both: the further densification of the city and preserving of unbuilt areas. This would follow the recommendations of sustainable development course of the city. The practice of construction, for example, of housing which is in very short supply in the real estate market in the last decade, shows almost exclusively the development example of intensification of the use of territories [11].

The subject of many studies is the search of the optimal parameters between the intensity of development, which takes into consideration the indicators of population density, and ratio of built areas to free (especially green) territories [4], [13].

Practice of modern construction is based on the redevelopment of the territory, accordingly, the cities have worked out the strategy of urban development for a significant period (20, 30 or 50 years), which defines the space of urban transformation [1]. As practice of implemented strategies shows, the increase in density allows you to raise the rank of the proposed on-site functions and to preserve in the urban structure vacant green areas and public spaces with high intensity of their use [10].

¹ According to United Nations Department of Economic and Social Affairs, the percentage of the population residing in cities will be increased. In Ukraine, in 2010 the proportion of urban population was 68.79% and the proportion that is expected to increase to 81.78% by 2050. It is expected the percentage of urban population in Germany - 80.68%, Italy - 81.19%, in France - 94.13%, the Netherlands - 91.82% by 2050 [17].

Table 1. Comparative characteristics of the population density of largest cities' of Ukraine

City	Population in 2016 [15]	City area (in sqKm)	Density (people per sqKm)
Kyiv	2 897 272 [15,p. 6]	847.66	3417,9
Kharkiv	1 449 732 [15,p. 70]	350	4142,1
Odesa	1 010 848 [15,p. 57]	162.42	6223,7
Dnipro	983 836 [15,p. 20]	405	2429,2
Donetsk	944 915 [15, p. 24]	358	2639,4
Zaporizhzhia	756 927 [15, p. 36]	331	2286,8
Lviv	758 398 [15, p. 52]	182,01	4166,8

The concept of urban densification has not only direct value – density of housing, but it also includes the concept of density and diversity of functions. As proven by Jane Jacobs, the American writer and theorist of urban social planning, places that are characterized by the diversity of functions and the "liveliness" of public space, as in the number of people and in the level of improvement, are the most popular in the city [6].

In the choice of means of modernization it is important to adhere to the principles of balanced development. Paradigm of the concept of a balanced urban development is interpreted by the Polish scientist N. Stangel as the creation of a dense multifunctional city areas, in which you can move on foot or by public transport and have access to local services, jobs and green areas as well [13]. This is largely a return to the idea of a dense historical urban structure, interpreted to the needs of the modern problems of the city.



Ryc.1. Schemat podziału miasta na tereny badawcze (1, 2, 3...) z identyfikacją obszarów (A, B, C), podlegających priorytetowej modernizacji. Źródło: il. N. Sosnova, 2016.

Fig.1. The scheme of the city division into territories under research (1, 2, 3...) with the identified areas (A, B, C) which are the subjects of priority in upgrading. Source: il. N. Sosnova, 2016.

2.2. The didactic purpose of the project

1. The mastering of methods of analysis of significant territorial objects and the detection based on this analysis of the problems and conflicts of the functional, spatial and composite character.
2. Familiarization of students with the specifics of the influence of various factors (historical, cultural, social-economic, engineering-technical etc.) on the design and the modernization of the city.

There are several important steps required in the choice of methods of modernization and densification of the selected areas of the city:

- a – the base step is an inventory of urban areas subject to low functional or planning density of areas;
- b – the definition of the role of the area in the overall structure of the city;
- c – the definition of what is the role of the area in the perspective of the General plan of the city;
- d – the orientation on the future role of the city in the settlement system (Lviv as the capital of metropolis).

In the course of the fulfilment of the project the students are assigned the following tasks:

- provision of the heritable development;
- improvement of architecture and planning organization of the city;
- the solution of problems of transport services and pedestrian traffic;
- resolving the detected conflict situations: functional, compositional, architectural and spatial;
- implementation of the proposals of architectural and planning decisions of development and modernization of the specified areas of the city.

2.3. Organizational and methodological background of the study.

The first stage – theoretical (done as a group task):

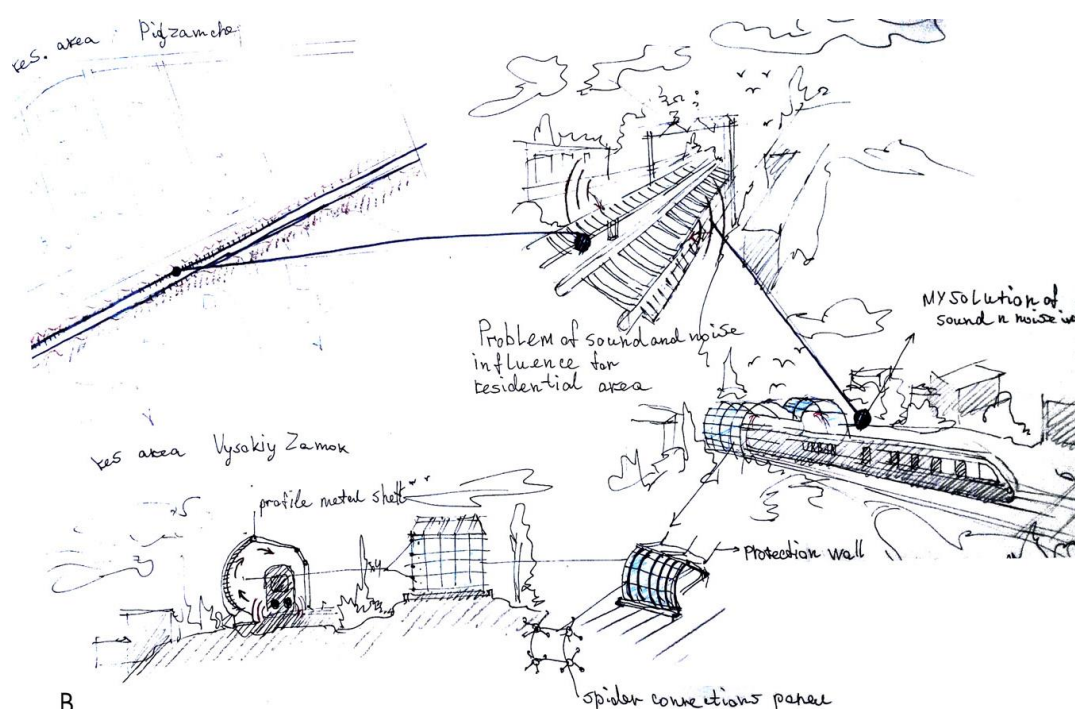
- a theoretical course on the modernization of cities on the example of the realized projects in significant cities;
- search of graphic concept of the project objective. Each of the students completed the logo of the topic "Modernization of the city" and by vote of the group selected logo - the winner which was adopted as common logo for all works;
- analysis of the experience of modernization of urban areas, identification of means and methods of the modernization (a comparative analysis of two, implemented in the world practice, urban complexes are performed).

The second stage – draft studies

To accomplish the second stage the students of the academic group were divided into working groups in 3 - 5 persons depending on the size of the area of study (Fig.1). Each group was treated as a separate "architectural firm", the first task of which was to come up with a name, logo and create an account on facebook with information about themselves and their job. Information was supplemented by executed stages of work.² During the semester students receive responses from the public and participated in discussions about their ideas for the modernization of the area:

²So, for example, was created by the following groups: "Cities Project", "ROB Group", "Urban Live", "SKY", "Archi Pulse".

- field examinations with setting out to the territory and fixation in the form of text notes and graphical sketches of "first impression" from city environment (Fig. 2). That identifies the limitations, conflicts and problems of the functioning of the area, as well as its positive features and its potential. Further, the cartographic processing of the area will provide the detailed implementation of urban studies, but the first survey of the area gives emotional indicators of quality of the space.



Ryc. 2. Szkice urbanistyczne, powstałe w trakcie analizy terenu ujawniające problemy połączeń pieszych w okolicy stacji kolejowej Podzamcze. Źródło: il. S. Holotovskyy, 2016.

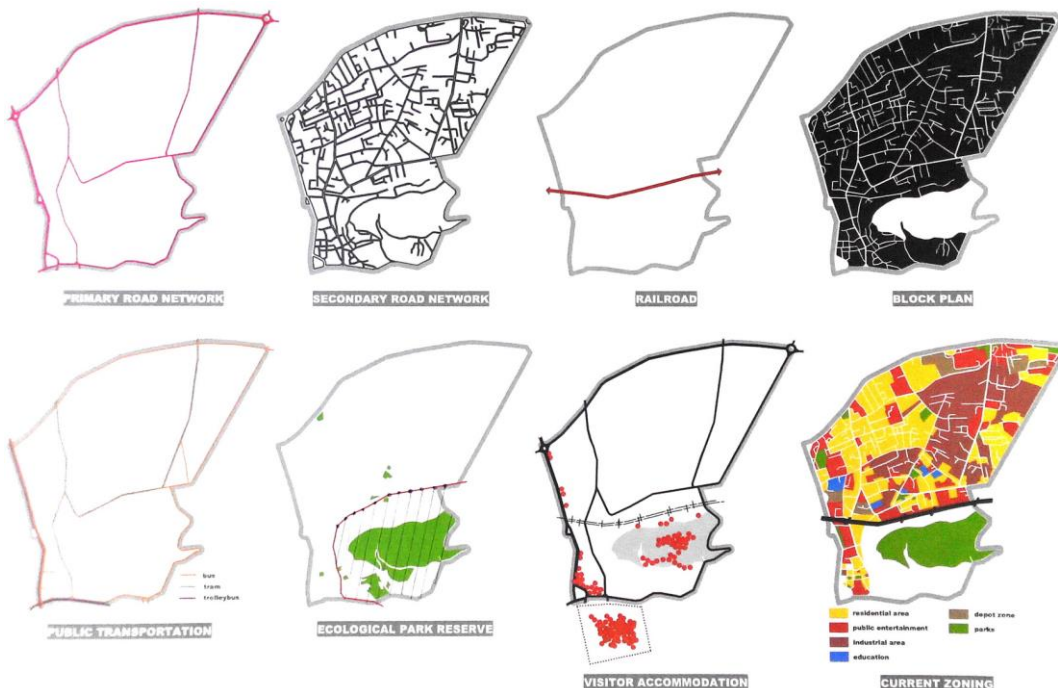
Fig. 2. Drawings emerged during field surveys of the problems and conflicts of the area of the railway station Podzamche.. Source: il. by S. Holotovskyy, 2016.

- composing of cognitive map of the territory after its visit allows to perform structuring of the space, the consistency of the planning structure of area and to identify "gaps" and missing spatial references;
- map analysis: analysis of the natural environment, urban planning constraints, social features and economic and territorial potentials of the area that are done on Google - maps, topographic backgrounds, etc. The result of such work on the ground is drawing of the "Map characteristics of the territory" that contains information about the flaws, positive qualities and potential of the territory;
- finding of the best concept for the solution of the modernization of the city fragment, which would correspond to the concept of balanced development. Condition of balanced development is a combination of several components, namely the preservation of the natural elements in the urban structure, existing historical forms of urban planning, compliance with construction standards, securement of social protection of the population and the economic feasibility of the project proposal.

The third stage – the concept formulation and rationale of problems for solutions

The proposal of the concept of modernization of the territory each student performed independently. The students had to put into the basis of project design the main essence

of the area, its role in the structure of the city, its peculiarities of functional use and to identify dominant object in it or its function (Fig. 3).



Ryc. 3. Analiza głównych elementów strukturalnych działki №2. Źródło: il. S. Holotovskyy, M. Dychkivska, H. Kravetz', 2016.

Fig. 3. Analysis of the main structural elements of the area No 2. Source: il. by S. Holotovskyy, M. Dychkivska, H. Kravetz', 2016.

For example, let us take Option A (area No 7). The leading feature of this area within the boundaries of Lychakivska and Kost Levyskyy streets was its educational and medical function because the main part of this area occupies the Medical University, the regional diagnostic center and auxiliary facilities of these objects.

Option B (area No 2). It is the territory where the train station is situated. The significant part of the adjacent blocks are oriented to this object of external transport and its related services.

It was necessary for the students in the course project to develop a proposal about functional, planning and compositional organization of the territory, which was taken into consideration. Functional structure in comparison with the existing is complemented by proposals, the implementation of which is needed for a given area and its functions:

- due attention, when designing, should be given to compositional and spatial organization of the city, the foundations of which were laid in the Master plan. One needs to see the architectural and spatial structure of the developed territory as a single unit of the whole city, to identify the main and the secondary composition axis and nodes;
- areas of new housing construction of justified superficiality are identified as well as possible complementing functions; the boundaries and prescribed criteria for the operation of preserved and reconstructed blocks are specified and areas provided for densification or rehabilitation;
- service infrastructure: design decisions are made on the basis of the carried out calculations of the necessary service infrastructure: service of institutions and enterprises is carried out in accordance with the regulatory data according to DBN 360 – 92**

(section 6, table. 6.1) [5]. These are new public facilities, commercial establishments, schools and child care facilities, sports facilities, healthcare institutions, objects of transport storage, objects of infrastructure of transport network, and the like;

- also, it is vital to develop a proposal on conservation, reconstruction and planning of landscape and recreational facilities: parks, boulevards, squares, urban gardens, etc.

The fourth stage – processing of the Master plan of the territory for the solution of selected problem

It is implemented as an individual task.

Developing of Master plan for the territory is accompanied by improvement of the planning structure, and it is often a complication, which manifests itself in tracing of new streets to the centers of attraction of people and transport or for streamlining of planned units - neighborhoods and districts.

An important factor in the modernization of urban areas is the indicator of the value of urban land. And it takes into account not only the nominal cost of land, but its importance in the intangible criteria like architectural value or memory location.

The final stage of work

It is the implementation of a detailed plan of the individual node of the territory, which has been identified as the most problematic. So, we formulated the following tasks:

- "The organization of pedestrian and cycling linkages of Wuletski hills",
- "Architectural and urban reconstruction of postindustrial territory within the boundaries of Industrial and Bohdan Khmelnytsky streets",
- "Development of transport and pedestrian infrastructure, including objects of city importance between V. Navrotsky and Chervona Kalyna streets",
- "Modernization of the territory along Kost' Levytsky street",
- "Modernization of the parking system in the area of the Citadel",
- "Formation of a network of pedestrian connections between the social objects within the limits of Taras Shevchenko prospect and Vasyl Stefanyk – Mikolaj Kopernik – Dnisterska streets",
- "Network of pedestrian linkages in the limits of the Horodotska – Mikolaj Kopernik – Stepan Bandera streets",
- "The formation of pedestrian connections between the historical area of Lviv and the Governor's bulwarks",
- "Modernization of the transport movement and parking system in the district of Kleparivska – Viacheslav Chornovil streets".

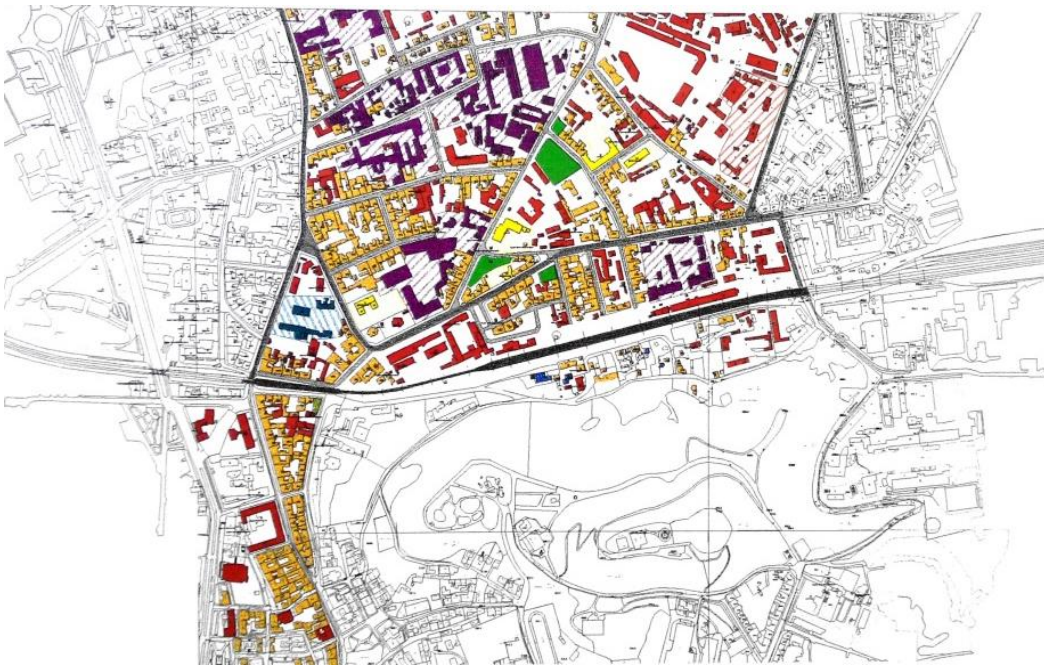
Each stage of the research and forming the concept of modernization of the territory passes public presentation to students and teachers.

3. THE RESULTS AND DISCUSSION

Prospects of modernization of the North-Eastern part of the city of Lviv

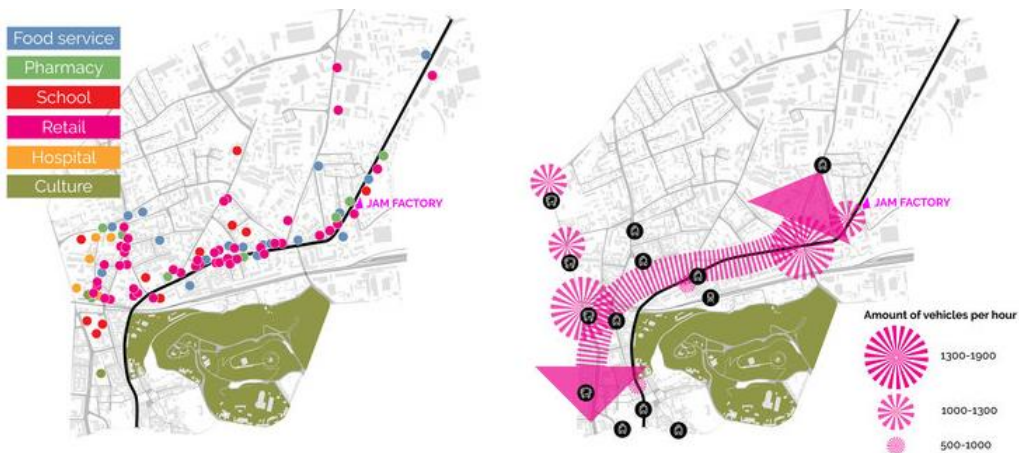
One of the most degraded, however, with a lot of potential plots of Lviv is the territory within the boundaries of Viacheslav Chornovil prospect, Viacheslav Lypynskyy and Bohdan Khmelnytsky streets. This district begins in the city centre – behind the Opera house and stretches in the North – East direction to historically established in the 19th century industrial part of the city (territory No. 2 according to the task).

The territory is characterized by mixed housing and industrial buildings with isolated objects of services for the residents (Fig. 4). As an architectural and spatial type of development is concerned, the territory is divided into multi-storey buildings of the Soviet period (the 2nd half of the 20 century); residential estate development (early 20th century), mixed industrial and residential development of mid-rise (the end of the 18 - the beginning of the 20th century).



Ryc. 4. Wykorzystanie funkcjonalne badanego obszaru № 2. Źródło: il. S. Holotovskyy, M. Dychkivska, H. Kravetz', 2016.

Fig. 4. Analysis of the main structural elements of the area No 2. Source: il. by S. Holotovskyy, M. Dychkivska, H. Kravetz', 2016.



Ryc. 5. Natężenie funkcjonalne obszaru № 2. wzdłuż ulicy Bogdana Chmielnickiego, 2012. Źródło: [14].

Fig. 5. The Functional Density of territory №2 along B.Khmelnytskyy str., 2012. Source [14].

Railroad is a barrier for Pidzamche but Bohdan Khmelnytskyy street is its connection with the rest of the city. It is the most active street in area both in transport meaning and city

life. Along the street are located a lot of public buildings and services. It is connected with railway station, multiple shops, little squares, church etc. (Fig. 5) [14].

Modernization of the area began with the process of de-industrialization in 90 - ies of the 20th century. The process of de-industrialization leads to relocation of the objects of industry in the city structure according to the new production needs and capabilities. Accordingly, these processes are associated with transformation of the urban structure. Industrial territories are parceled in favor of other functions or remain non managed. It is positive that a large share, despite the separation between the new owners, continues to perform industrial, manufacturing and warehouse functions.

This can be considered positive because the modern economy is dominated by non-productive sphere of activity, namely the service sector and commerce. The number of people employed in the non-productive sphere, especially in trade and financial sector, banking and administrative activity in the countries of the Big Seven is up to 70% [3]. In such consumer society most of the capital is invested into consumer services – trade, food, entertainments. These areas of the economy have specific visualization in architecture, which aims to attract consumer attention. Tasks of planning and urban composition are sidelined before the economic feasibility in the realization of architectural projects.

Without architectural and spatial organization of the city as a whole and the character of the local environment in particular, diverse architectural objects are erected and as a result of that separate fragments of the city are becoming a jumble of architectural volumes which do not shape the urban environment. Construction of shopping and entertainment complexes and high-rise housing as a priority investments, fully distance themselves from social needs of the city. In recent decades construction of kindergarten in Lviv becomes an isolated case and new schools are not built at all.

The study area is also characterized by a low density of service functions for residents. Infrastructure of this district was built for the industrial development of the city and it did not take into account the needs of residents of the working blocks. The service infrastructure continues to be unchanged from the 2nd half of the 20 century and that is why it predicts future planning and spatial transformation of the district.



Ryc. 6. Torowiska na działce 2 – stacja kolejowa Podzamcze. Źródło: [20]

Fig. 6. Railway tracks on the area No 2. – Railway Station Pidzamche. Source:[20]

Planning problems of development of the territory under research are also in its unstructuring. The randomness of the allocation of the functions and the promiscuity of the nature of development lead to spatial chaos. Such effect of "patchwork" in functional and

spatial organization of the area is apparent when the densification of the residential territory and the restructuring of industrial areas takes place. As the result the perception of the district and the whole of the city become deformed. The corresponding formulation is derived in K. Lynch - if the "directions of movement are not enough recognized then the whole image of the city remains unclear" [8].



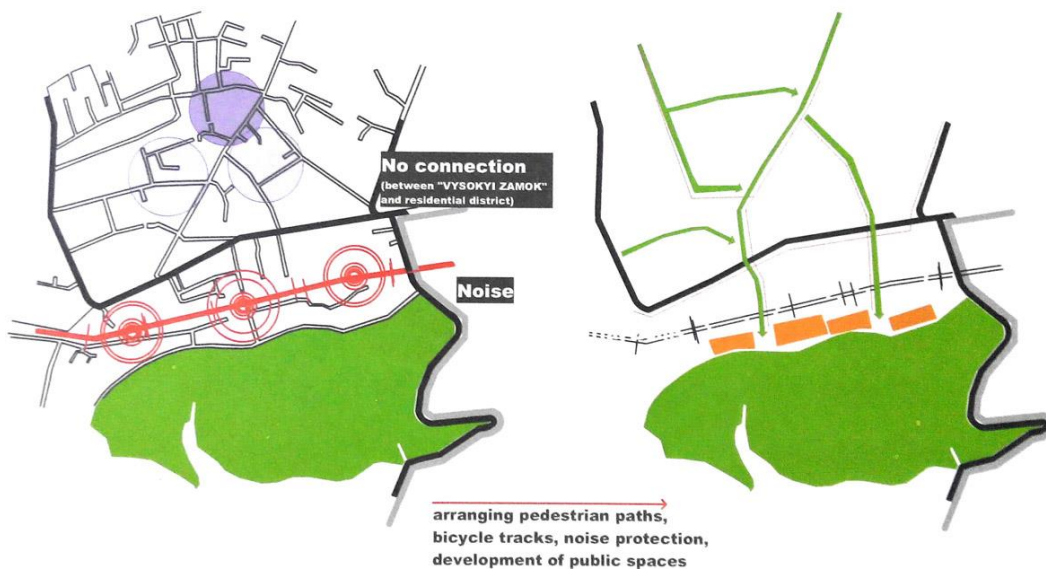
Ryc. 7. Zabudowa mieszkaniowa 19 w. na Podzamczu ul. Ostryanyci. Źródło: [19]

Fig. 7. Residential buildings of 19 c. in Pidzamche district Ostryanytsi St. Source: [19].

Dominant planning constraint of the area No2, that is outlined in this article, is passing of the railroad tracks. The railway separates the area from the city centre and nearby recreation (Fig 6; 7). The lack of a connection of the area with the adjacent extensive landscape objects - "High Castle" park and regional landscape "Znesinnia" park can be considered as a loss of a chance for this territory site.

Taking into consideration the potential of the area and possible threats to the development of the territory based on regulatory documentation concerning urban planning and the protection of monuments of architecture [5] and incorporated in the Master plan concept of development of city of Lviv [7] students are proposed the following planning decisions.

First, it is proposed to develop the above-ground overpass over the railroad tracks in the area of the Pidzamche railway station that will link together residential neighborhoods and the adjoining two parks (Fig. 8). The overpass is designed as a complex structure that in addition to pedestrian transit will contain objects of service infrastructure, which will contribute to the functioning of the passenger railway station. The complex will include shops, objects of consumer services, objects of tourist services (Fig. 9; 10). Connection of Pidzamche and the High Castle Park will provide new entrances to the park and the involvement of residents into the green zones of the city, which today are scantily involved in city life. Residents and tourists are "isolated" from these green zones because of complexity of access and lack of public transport.



Ryc. 8. Koncepcja podolania problemu połączenia terenów mieszkalnych i parku (obszar C). Źródło: il. S. Holotovsky, 2016.

Fig. 8. Model of design solution: connection of residential neighborhoods and the park by over-ground overpass (section C). Source: il. by S. Holotovsky, 2016.



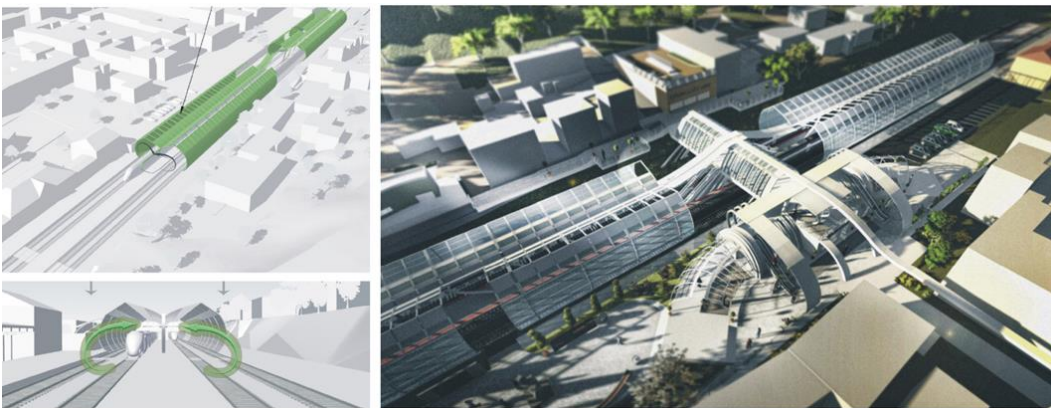
Ryc. 9. Rzut i przekrój projektowanego przejścia nad torowiskiem. Źródło: il. S. Holotovsky, 2016.

Fig. 9. The project proposal of architectural and spatial solutions of over-ground overpass and noise screens. . . Source: il. by S. Holotovsky, 2016.

4. CONCLUSIONS

The study of various urban areas revealed numerous internal reserves, unexposed potentially attractive locations, which indicate the identity of Lviv, of areas under research

and buildings - markers. Negative issues in general were of the same type as: inconvenient transport and pedestrian structure, fragmentation of green areas, weak provision of social and serving institutions. Impressive are also the composite irrelevances in development of some sections of the city. Developed concept proposals for urban improvement of the areas of the city contain several of the leading ideas. The modernization of the urban areas consist in the formation of new qualities of the urban environment, which are derivative of new ways and motives of activity of the principal groups of city population. The preservation of natural and cultural characteristics of the urban environment and their adaptation to societal changes will provide the concept of the identification of the city.



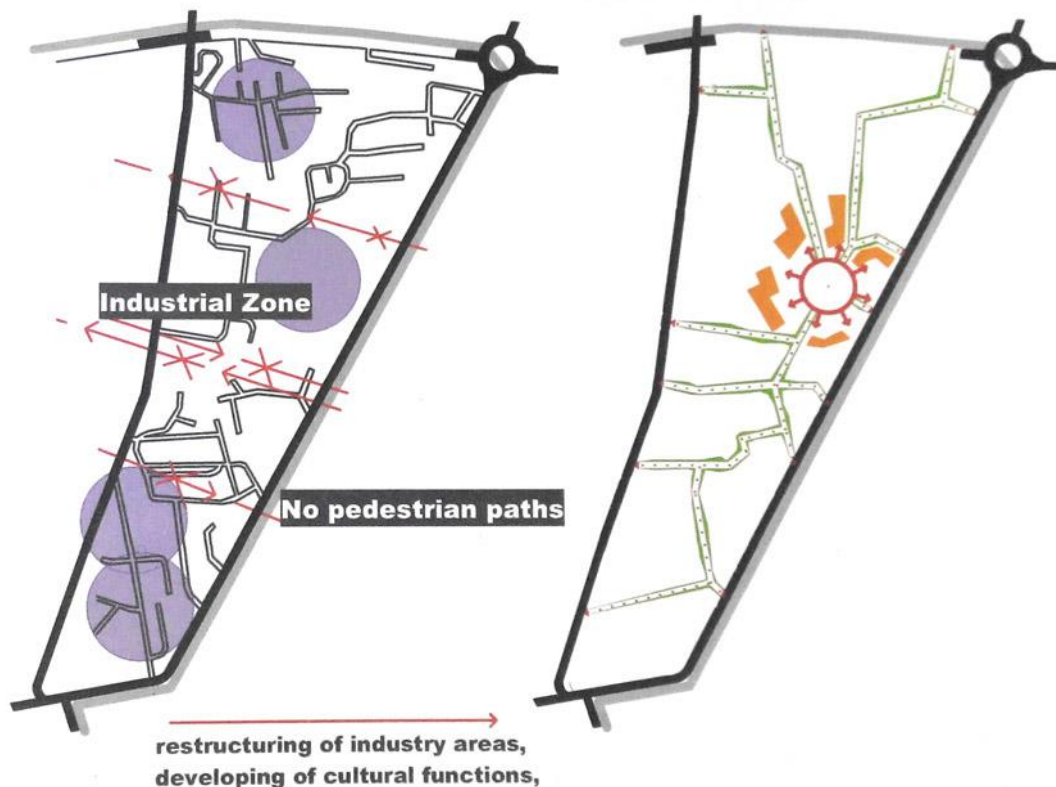
Ryc. 10. Propozycja projektowa rozwiązania przestrzennego przejścia nad torowiskiem i ekranów przeciwhałasowych. Źródło: il. S. Holotovskyy, 2016.

Fig. 10. The project proposal of spatial solutions of over-ground overpass and noise screens. Source: il. by S. Holotovskyy, 2016.



Ryc. 11-12. Uregulowanie problemu transportowego w obszarze A, w strefie centrum. Źródło: il. I. Kasinevych, 2016.

Fig. 11-12. The solving of transport problem at the A territory near the central part of the city. Source: fig. I. Kasinevych, 2016.



Ryc. 13. Pomysł na zmianę funkcji poprzemysłowej i kształtowanie nowego centrum dzielnicy (obszar C). Źródło: il. H. Kravetz', 2016.

Fig. 13. The idea of post-industrial area functional transformation and modeling of new local center. Source:fig. H. Kravetz', 2016

BIBLIOGRAPHY

- [1] Berlinstrategie. Source: <http://www.stadtentwicklung.berlin.de/planen/stadtentwicklungs-konzept/de/berlinstrategie/index.shtml> , dostęp/access 2016-12-05.
- [2] Chmieliński J. M. Teoria urbanistyki w projektowaniu i planowaniu miast. – Warszawa: PW, 2004. - 410 s.
- [3] Cyrek M. Kapitał ludzki w procesie serwicyzacji rozwoju społeczno-gospodarczego. UR. Ekonomia. Z. 6/26 – Rzeszów, 2005. http://ur.edu.pl/pliki/Zeszyt6/26_Cyrek_Magdalena.pdf, dostęp/access 2016-12-05. S.321-337.
- [4] Dąbrowska-Milewska G. Standardy urbanistyczne dla terenów mieszkaniowych - wybrane zagadnienia. Architecturae et Artibus, Z. 1/2010. S. 17-31. Source: <http://wa.pb.edu.pl/uploads/downloads/3--Standardy-urbanistyczne-dla-terenow-mieszkaniowych-----wybrane-zagadnienia.pdf>, dostęp/access 2016-12-05.
- [5] DBN 2.2-2-2008. Planuvannia ta zabudova mist I funkcjonalnyh terytorij. - Kyiv 2008.
- [6] Jacobs J, The Death and Life of Great American Cities, New York Random House, 1961.
- [7] Koreguvannia generalnoho planu m. Lvova. Koncepcija rozvytku m. Lvova. Source: http://city-adm.lviv.ua/lmr/images/stories/arhitect/123/ug/01_genplan.pdf ,dostęp/access 2016-12-05.
- [8] Lynch K. The Image of the City. The M.I.T. Press. Massachusetts Institute of Technology Cambridge, Massachusetts and London. – 1960.

- [9] New Urban Density. Vienna 2015. Source: <http://www.vienna-lviv.info/new-urban-density-2015.html>, dostęp/access 2016-12-05.
- [10] Petryshyn H. Formation of waterfronts in the context of Copenhagen's metropolity S&F (PiF). - 2016.25-1 – Szczecin: ZUT, 2016. - P. 223-240.
- [11] Petryshyn H., Hanec' S. Reorganizacja postpromyslowykh terytorij u konteksti Generalnoho planu Lvov do 2025 r. // Dosvid ta perspektyvy rozvytku mist Ukrainy. T. 26. / red. Yu. Paleha. Kyiv, Dipromisto, 2014. – s. 141-149.
- [12] Schröteler-von Brandt H. Stadtbau- und Stadtplanungsgeschichte. Berlin, Verlag Kohlhammer, 2008.
- [13] Stangel M.. Kształtowanie współczesnych obszarów miejskich w kontekście zrównoważonego rozwoju. Wydawnictwo Politechniki Śląskiej, Gliwice 2013. - 264 s. Source: <http://repolis.bg.polsl.pl/Content/20828/13Stangel.pdf>, dostęp/access 2016-12-05.
- [14] Shulyar, Andrew; Yakovchuk, Iryna; Ponomaryova, Anastasiya. Revitalization of the Lviv Jam factory. Source: <http://mistosite.org.ua/en/articles/revitalizaciya-fabryky-povydla-u-lvovi>, [29 December 2015]. dostęp/access 2016-12-05.
- [15] Statystyczny zbirnyk "Chyselnist najawnogo naselennia Ukrainy". 01.01. 2016. Redaktor Timonina M.B. -K.: 2016 (http://database.ukrcensus.gov.ua/PXWEB2007/ukr/publ_new1/2016/zb_nas_15.pdf)
- [16] Szymańska D.. Urbanizacja na świecie. W-wo naukowe PWN. – Warszawa, 2008. – 390 S. – s.169.
- [17] United Nations, Department of Economic and Social Affairs, Population Division (2010). World Urbanization Prospects: The 2009 Revision.
- [18] Urban Density Lab Vienna 2016. Source: <http://www.vienna-lviv.info/urban-design-lab-vienna-2016.html>, dostęp/access 2016-12-05.
- [19] Vulytsia Ostrianyci/ Source: [https://commons.wikimedia.org/wiki/File:%D0%9E%D1%81%D1%82%D1%80%D1%8F%D0%BD%D0%B8%D1%86%D1%96_%D0%B2%D1%83%D0%BB._\(%D0%9B%D1%8C%D0%B2%D1%96%D0%B2\)-2.JPG](https://commons.wikimedia.org/wiki/File:%D0%9E%D1%81%D1%82%D1%80%D1%8F%D0%BD%D0%B8%D1%86%D1%96_%D0%B2%D1%83%D0%BB._(%D0%9B%D1%8C%D0%B2%D1%96%D0%B2)-2.JPG), dostęp/access 2016-12-05.
- [20] wikimapia. wikimapia.org dostęp/access 2016-12-05

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