Regeneration of historic residential blocks in small city centers of Western Ukraine

Maksym Yasinskyy

Department of Restoration of Architectural Works and Monumental Art, Faculty of Architecture, National University "Lviv Polytechnic", Ukraine, e-mail: maxim14apr@gmail.com

Abstract: This article analyzes the integrity, condition, the use and structure of city blocks in the central parts of small towns in Western Ukraine using the example of Rohatyn, Komarno and Pidhaitsi. Factors that negatively affect the preserving city blocks and its residential buildings are identified and the detailed principles of regeneration of historically formed structure of residential city blocks and its parcels are provided.

Keywords: historic town center, city block, parcel, residential buildings, regeneration.

1. Introduction

Historically formed architectural planning and three-dimensional environment structure of the residential quarters of the central parts of the small historic towns of Western Ukraine has a high cultural and architectural value. It has been significantly transformed through the years and partially lost. A lot of works are devoted to study of its characteristics and problems of preserving.

Basic scientific research on this subject belongs to Bevz M. (methodological foundations of conservation and regeneration of preserved architectural complexes of historical cities) [1], Prybieha L. (preservation and restoration of architectural and urban heritage of Ukraine) [2], Kravtsov S. (regular urban planning principles of Galicia at XIV-XVII centuries) [3], Rybchynskyi O. (architecture of perimeter buildings of market squares) [4]. Also there are important works of Petryk V. (functional and spatial organization of the capital towns of Kievan Rus) [5], Topylko S. (composition and spatial organization of towns) [6], Boiko Kh. (architectural and spatial organization of Jewish districts in cities and towns of Galicia) [7].

The great theoretical and practical experience in regeneration of small towns central parts building complexes are accumulated in Poland. It is worth noting scientific work in this area of Pawlowski K. [8], Szmygin B. [9], and also summarizing basic work “Urban revitalization of Polish cities” in 12 volumes [10]. We plan to devote a separate study to this Polish experience, therefore in the current article we analyze only the situation that prevailed in small city centers of Western Ukraine and consider only the basic issue of regeneration of the downtown historical town-planning structures.

Inventorying of buildings in some small historic towns of Western Ukraine was conducted on the basis of Scientific Research Laboratory (SRL) - 104 of the National University of Ukraine "Lviv Polytechnic" led by Bevz M., Rybchynskyi O. and Dubyk Y. and on the basis of scientific restoration design institute "Ukrzakhidproektrestavratsiya" led by Mohytych I. and Mohytych R. Historical and architectural reference plan was designed for some small historic towns as well as protected zones were identified, substantiation of status was designed and the boundaries of the State historical architectural preservations were defined for the towns Zhovkva, Berezhany and Buchach. The above mentioned
researchers have proposed general principles of regeneration and preservation of historic cities, but haven’t examined specifically building blocks of small historic towns where residential function is dominating, along with specific principles of developing this building in the current conditions.

Recent reconstruction and new buildings often destroy the historic environment because it does not respond to historically formed architectural and planning structure of the old city blocks. Therefore, it is necessary to detail the regeneration principles of planning structure of city central historical blocks and their districts residential buildings that will provide a consistent program of the city historical part restoration.

The purpose of the article: to identify and analyse factors that negatively affect the historically formed planning and environmental structure of the small towns central blocks, offer detailed regeneration principles for historically formed architectural and planning structure of blocks, parcels and its residential buildings.

2. The material of the study

Every city develops and changes during its existence. The character of buildings and urban planning to some extent depends on the principles of the city self-government, economic development and its administrative importance.

The most negative changes for cities and towns of Western Ukraine and its residential development happened at the beginning and middle of the twentieth century. Large-scale military operations of the First and Second World Wars have led to significant destruction of urban fabric of large and small cities. This statement is truthful for the three small towns in Western Ukraine that are considered in this article – Komarno (Lviv region), Rohatyn (Ivano-Frankivsk region) and Pidhaytsi (Ternopil region).

Lack of funds for professional regeneration projects of the historic city center of these cities (so-called midtown), led to the fact that in the last 60 years the transformation of residential buildings in these cities was presented only by separation of the existing single-family residential houses to apartment buildings, rebuilding of destroyed buildings without taking into account their historical value and construction of new, oversized apartment buildings that mostly did not meet to the parcellation of historical blocks. As predecessors as well as we can confirm that these processes have led to the fact that historical centers of small towns lost their identity of urban structure and architecture, that, in its term, substantially complicates modern regeneration processes.

A number of legislative acts were adopted recently for the preservation and restoration of historical heritage in Ukraine. The "Law on Preservation of Cultural Heritage" is the most thorough [11], according to it every historical city should develop a preserve documentation such as historical and architectural reference plan and project of protected zones. Historical and architectural reference plan (further HARP) it is a summarizing document of scientific research of urban formation or historical settlement, where objects of a cultural heritage are graphically recorded on topography and systematized by types. Protective zones - a set of text and graphic materials, which define the territories within the

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1 residential buildings should be understands as historical buildings, single or linear buildings that were initially built like single-family building with residential function in combination with the trade or crafts functions within the first floor (during its existence, these houses could adapt into apartment buildings), also single and multi-section, semi-detached and detached buildings that were built within the historic part of the small town. Its includes almost all buildings of the historical city core, administrative and sacral buildings are the exception.
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historic settlements, for which there is a limitation of architectural and urban planning activity for the preservation of historical and cultural heritage. This security documentation is generally a good system. It is introduced into the state construction norms of Ukraine where expediency of city architectural planning structure reconstitution is clearly specified on the principles of regeneration (reconstitution of architectural and planning structure of city historic districts in accordance with previous historical patterns of city development). Unfortunately, such preservation documents are not developed and approved for most small historic towns.

Different limitations and identified status of different parts of the city – Historical and architectural Preserve, Historical Area or Protective Area of the City etc. are clearly defined within a project of protected zones basing on research conducted for the project implementation of HARP, According to the draft Law of Ukraine "About preservation of architectural and urban heritage" [12], Historical and architectural Preserve is a planning and spatially separated in the structure of populated places or located outside of it complex (ensemble) of architectural and urban heritage objects, that have outstanding architectural, urban and historical value and is protected by the state for preserve, restore, scientific and cultural education activities, relating to the lands of historical and cultural significance and is removed from all kinds of economic use. Historical Area – area that is built over the same chronological period with inherent, unique, structure of spatial organization and set of objects of architectural and urban heritage. And Protective Area of the City is a historically formed and identified in plan parts of historical settlements that have preserved traditional (historically inherited) character of the architectural and urban heritage environment protected by the state relating to the lands of historical and cultural significance but not removed from economic use.

The research presented in this article was carried out in conditional preserve areas of the cities Rohatyn, Komarno and Pidhaitsi, identified by the author of the article on the basis of previous studies and outlined by border of the historical central part of the city according to the relevant cadastral plans of these cities. The identified Preserve Areas are conditional, because currently its boundaries are not fixed in the existing protecting documents for the studied cities.

Analysis of cartographic and iconographic materials, their comparison with the current maps and results of a detailed site examinations of city blocks and their buildings, made it possible to determine the amount of losses and changes that have occurred in the studied cities. As a result of studies, the author has found that the environmental structure of many of the city blocks in conventional preserve area have been completely changed and historical parcellation have been missed, some of the blocks have transformed environmental structure, and city blocks with fully saved environmental and planning structure and authentic buildings almost never occur.

It was defined two stages of the city development for the analysis: 1) planning structure of the city is displayed in the cadastral map 2) existing town planning structure. This choice could be explained by the fact that the cadastral maps of the XIX century, usually show better the historical core of the city - downtown, which is the basis for determining the Preserve area of the modern small town. Other intermediate stages of the city existence, its destruction and reconstruction, are not investigated in detail, but taken into account during the analysis of available cartographic and iconographic materials.

Graphical part of analysis of the preservation of blocks planning and environmental structure of studied cities, their functional use and character of housing are presented in the form of schemes: a) the cadastral map of the central part of the town (downtown) with the designation of the historical division into blocks, b) scheme of analysis of the planning and
functional structure of the city center on modern topographic plan. Fragments of analysed historic centers city territory are presented in the same scale that gives the opportunity to assess and compare the sizes of downtowns, size of blocks, parcels and so on.

Fig. 1a. The Rohatyn city, Ivano-Frankivsk region, Sketch of cadastral map of city central part (downtown) of Rohatyn [13] with the designation of the historical division into blocks

Fig. 1b. The Rohatyn city, Ivano-Frankivsk region, scheme of analysis of the planning and functional structure of city central part of Rohatyn, according to the author research
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Fig. 1a. The Rohatyn city, Ivano-Frankivsk region, Sketch of cadastral map of city central part (downtown) of Rohatyn [13] with the designation of historical division into blocks

Fig. 1b. The Rohatyn city, Ivano-Frankivsk region, scheme of analysis of the planning and functional structure of city central part of Rohatyn, according to the author research

Fig. 2a. The Pidhaytsi city, Ternopil region, fragment of a cadastral map of Pidhaytsi [14] with our designation of historical division into blocks (black line)

Fig. 2b. The Pidhaytsi city, Ternopil region, scheme of analysis of the planning and functional structure of city central part of Pidhaytsi, according to the author research
Fig. 3a. The Komarno city, Lviv region, fragment of a cadastral map of Komarno [15] with the designation of historical division into blocks

Fig. 3b. The Komarno city, Lviv region, scheme of analysis of the planning and functional structure of city central part of Komarno, according to the author research

System of legend common to all the given plans and schemes of figures 1-3

- Conditional Preserve Areas of the Cities
- Damaged the planning and environmental blocks structure
- Completely changed historical planning and environmental blocks structure
- Blocks parts filled with linear perimeter buildings
- Blocks parts non filled with linear perimeter buildings
- Buildings that destroying planning and environmental blocks structure
- Abandoned territories
- Territories is used for agriculture
- Spontaneous garbage dumps
- Buildings used for agriculture and cattle farming
Analysis reveals the overall picture of the buildings and planning structure condition in the historic center of small towns.

Almost 51% of the total area of all blocks in Rohatyn got some transformations. 72% of which have completely changed historical planning and environmental structure, historical buildings, completely destroyed division of city block to a parcels, and sometimes it destroyed borders of historically-formed blocks; and 28% of transformed city blocks have damaged the planning and environmental structure (lost part of historic buildings, parcel division of blocks often does not take into account, but the limits of the block and the Red Line of dominant building can be well seen). All these areas are concentrated directly around the Rynok Square (central market square of Magdeburg town) or in the central part of the conventional Preserve Area. The remaining 49% of the total blocks area of downtown that has not being radically changed, in most cases are located on the outskirts of conventional preserve area and usually have homestead buildings with areas for agriculture. Of course, its buildings have being changed, but the principle of planning and functional use of these areas is mostly unchanged. Very rare there are blocks, which have almost unchanged planning and environmental structure and division to the parcels, and located near the Rynok Square. The internal blocks space is often an abandoned, sometimes there are spontaneous garbage dumps. Often this area is used for agriculture and cattle farming. In Rohatyn such use has 19% of internal blocks space of study area. This function is more peculiar for the blocks that are more distanced from the center of conventional preserve area. (Fig. 1)

A similar situation is in Pidhaytsi. 48% of the total area of all blocks had got some transformations, 73% of which have completely changed historical planning and environmental structure, and 27% - damaged. 42% of the total area of the downtown blocks that have not being radically changed, are located only on the outskirts of conventional preserve area and have a homestead building with areas for agriculture, closer to the center of study area all blocks have changed structure. It should be noted that agriculture use of internal blocks space is more spread as in peripheral blocks in Pidhaytsi so as in blocks around the Rynok Square. Such use has 38% of the total area of all downtown blocks. An abandoned internal blocks space is 6%, there is also a spontaneous garbage dumps. (Fig. 2)

In Komarno 67% of the total area of all blocks have been changed, 24% have completely changed historical planning and environmental structure, and 76% - damaged. 33% of the total area of the downtown blocks have not changed structure, for the same reasons as in the previous cities, closer to the center all blocks are changed. 42% of all internal blocks space are used for agriculture. An abandoned internal blocks space constitutes 4%. (Fig. 3)

Therefore, the analysis of the historical planning and environmental structure of city blocks and its building, shows that significant part of it have damaged structure and often completely changed. Holistic linear buildings are lost, and therefore blocks with linear perimeter buildings mostly does not exist anymore. Buildings of the second half of the twentieth century, and modern buildings, are often oversized and doesn’t correspond to the historically-formed environment, the existing valuable historic buildings practically is not repaired, and restoration of such objects even does not being discussed. Internal blocks space is frequently used by block inhabitants for agriculture and cattle farming. Also, internal blocks space is often abandoned, which causes the formation of spontaneous garbage dumps.

Consequently, we have in a downtown significant amount of distortion of residential building and new buildings of the twentieth century, which often is not suitable to blocks parcellation and principles of historic urban planning, older buildings are often rebuilt, their
three-dimensional structure is modified, destroyed or lost its decor and devaluated facades tectonic. The negative factor is that this situation with city environment and planning structure of the small historic town causes future destruction processes of the historic city environment and residential buildings.

As it was already mentioned, preserve documentation, which relate to the preservation of small historic towns, is developing very slowly, and documentation that was developed earlier, is already outdated and not relevant. Moreover, this documentation does not identify boundaries of Preserve Area of the City and have no designed the detailed plans for their development. Based on the above analysis, the main factors that affect the structure of city blocks and its residential buildings and territory were identified. Conventionally, they can be divided into two categories: I. Factors which have caused significant damage in the past; II. Factors that continue negatively affect the structure of blocks, parcels and its buildings today. All factors of destruction are closely related to each other. Conventionally its can be identified groups that will cover: 1) town planning structure; 2) structure of blocks and houses adjoining areas - parcel; 3) different types of residential buildings [16]. This article discusses the factors that belong to the first two groups.

Overcoming factors that affect urban structure of the city is the most important task for the preservation of the city and its residential buildings in general. Among these factors are:

- Destruction during the two World Wars that led to significant loss of residential buildings and damage of blocks structure and cities in general (I category)
- The high cost of production for documentation of preservation and lack of funds for professional restoration of residential buildings. (II)
- Failure to comply with the requirements provided by Historical and architectural reference plan or different preservation documentation or it’s lack; (II)

Designing of the City Preserve Area regeneration project is the most effective way to overcome the problems related to these factors a, which will be based on HARP and protection zones project.

All research which is conducted for the development and design of HARP and protected zones project, are establishing boundaries of Historical Range or Preserve Area of the city, except designed graphic materials, reduced in an explanatory note, which collected all the available cartographic and iconographic materials and historical reference of the city. The next step should be the designing of a detailed plan of the city Preserve Area development, based on HARP and protected zones project. This documentation will determine the necessary conditions and requirements for the regeneration of the city structure, the possibility of location of new building spots, its character and number of stories, dismantling or adaptation of disharmonious housing, replacing of city communications, sequence of stages of needed works, etc.

The next step should be the designing of detailed plans for the regeneration of each block separately, which will accommodate the needs of their residents, will provide accurate outlines of a new building and its character. To facilitate and speed up the designing work for the regeneration of the individual buildings of the block, the explanatory note to it should contain separate requirements block with: regeneration and reconstruction of each house; possibility of adaptations, add-ins or extensions and the need for of various internal actions; requirements of their architectural appearance, direction of roofs hip, number of stories of each house; ordering of the block territory, iconographic and cartographic materials. That is that a detailed plan for the regeneration of the block should contain all data for the design work on the reconstruction of the building of each block and the block as complex. It also can be used for interested investors, because it will contain information about new residential areas and reconstruction or regeneration conditions.
At this time similar documents are developed for the cities, historic core of which have a status of Historical and architectural Reservation. In 2003 the Lviv design institute Ukrzakhidproektrestavratsiya developed a master plan of the State historical and architectural preservation in Berezhanu, and in 2007 Scientific Research laboratory – 104 of the Ukrainian National University "Lviv Polytechnic" - for preservation in Zhovkva. Documentation, except specifying protective and restoration action, determines how further buildings and regeneration of blocks in the historic core of the city within the preserve should take place. Several master works on the subject of regeneration historical and architectural environment of Western Ukraine cities such as: Rohatyn (Fig. 4), Zhydachiv, Buchach, Pidhajtsi, Olyka, Klevan’, Dubno and others were defended at the Department of Restoration of Architectural Works and Monumental Art of "Lviv Polytechnic" University in the last years. Materials of these works can be used in the works of blocks regeneration and for the designing of detailed plans for these cities preservation areas development.

Since a detailed plan for the development of protected area requires further designing of a detailed plan for regeneration of the block, we must pay attention to the restoration principles of completion of planning and environmental block structure and houses adjoining areas, that needs to be followed to overcome the factors that negatively affect the historic planning and environmental structure of blocks and parcels:

- Existing post-war buildings within historic districts of the city, which in most cases does not meet the principles of historical housing environment and are destroying planning and environmental blocks structure. (I)
- Unauthorized construction, within the parcels, of residential and commercial buildings, such as garages, sheds, etc.. without complying the principles inherent in the historic housing, which negatively affects the environment of parcels and blocks in general. (II)
Construction of the massive new building within the old town in the post wartime was caused by an urgent need for quick rebuilding of the city housing. Because of the urgency of the works, in most cases, these buildings were not consistent with the principles of historical housing environment and that’s why violate planning and environmental structure of the blocks. In many cases, main red housing line of the blocks have been preserved, but massiveness and similarity of new buildings has led to the loss of rhythm and scale of housing; as a result – parceling of some blocks cannot be read. For any quarter, of the historic city's, most typical element is the division into parcel, and the main division method of city blocks has been division into sections bounded by facades, faced to the main street, and the so-called boundary walls or fences. Therefore, the basic principle for overcoming the negative influence of massive and disharmonious buildings is "the principle of allocation of parcel as the main module of the block"

This principle means allocation of parcels, on the facades of disharmonious buildings, using three-dimensional and decorative arts: division of facades according to the former block parcellation (as it allows to make the window openings), decorating and painting each part differently, separation of the roof between each of these parts and, at the same time, adapting the attic floor to residential mansard (Fig. 5). This will help neutralize the massiveness of Soviet buildings and partly return a historical value to the street facade and better allocate streets parcellation and old buildings.

In most cases there is a need for increasing the living space during adaptation of planning structure of buildings, which can be solved by reconstruction of a building. Adding one floor and attic adaptations to residential function are the best methods. When there is a need for an extension to the massive buildings of the Soviet period all works should take place within one parcel.

There are two component elements of the parcels of buildings: the main building and outbuilding (Fig. 6). Filling of parcels directly dependent of the city population - the more population of the city, the more developed buildings of parcels and its outbuildings. For
example, in the city Berezhanu (with a population of nearly 19 thousand) most parcels, within the Preserve Area of the city, have dense housing and developed outbuildings, often we can find the rear buildings, and in the city Komarno (with a population of nearly 4 thousand.) the vast majority of parcels has only main buildings, and have no outbuildings. Therefore, in Komarno, much of the interior space of the blocks are abandoned. The free space inside blocks is the cause of spontaneous, chaotic construction of farm buildings and landfills, which destroy the structure of the parcels and blocks in general.

Fig. 5. Allocation of parcel in case if there are disharmonious buildings in a block, by author

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So, to return the planning and environmental integrity of the parcels, and thus to the block, we should fill the parcels with developed housing of outbuildings, move in there, if necessary, existing in a block farm functions from disharmony building which should be removed. It also will help to increase city housing using a rear buildings and outbuildings for housing. In the residential blocks of small towns, boundary walls were rarely present, so we can merge inner space of parcels and create areas for recreation for the block citizens. Exactly in filling the parcels with developed housing of outbuildings and with rear buildings – most typical elements to historical filling of a parcel and block in general, are the next "principle of parcels structure filling"

As already mentioned, most of the blocks parcels do not have developed housing of outbuildings and rear buildings. Since the principle of parcels structure filling requires its creation, i.e. new construction within the Preserve Area of the City, we need to establish clear rules for new construction in Preserve Areas of small towns and outline the basic approaches as it was done for the city Frainburh [17].

1) The angle and direction of the roof should comply with historic buildings;
2) Cornices and horizontal thrust should be clear and expressive, typical for of historic buildings;
3) Windows should be able to open, and it should sit in openings of the wall thickness;
4) Visual union of parcels to one building is not acceptable;
5) It is advisable to use the attic space to create mansard, and use mansard windows;
6) May be freer design of rear facades and designing of balconies or terraces on the roof of rear facade;
7) Facades must be produced from traditional materials of formed historic environment.

Compliance with all these requirements allows to form activities of development of historic blocks of the city based on “principle of new construction compliance to historic environment”

These principles will allow to start the process of regeneration of the Preserve Area of the small historic Cities as architectural and urban complexes.

3. General conclusions

This article analyses planning and environmental structure of blocks, its buildings and functional use of the territory within conventional Preserve Area of the City. Identified main factors that negatively affect historically-formed planning and environmental structure of small town historical core and changing of its residential housing. Conventionally, they are divided into two categories by time influence and groups that related: 1) town planning structure; 2) structure of blocks and houses adjoining areas – parcel; 3) different types of residential buildings. The factors that belong to the first two groups were discussed:

- Destruction during the two World Wars that led to significant loss of residential buildings and damaging of blocks structure and cities in general
- The high cost of production for documentation of preservation and lack of funds for professional restoration of residential buildings.
- Failure to comply with the requirements provided by historical and architectural reference plan or different preservation documentation; or it’s lack;
- Existing post-war buildings within historic districts of the city, which in most cases do not meet the principles of historical housing environment and destroying planning and environmental blocks structure.
- Unauthorized construction, within the parcels, of residential and commercial buildings, such as garages, sheds, etc. without complying the principles inherent in the historic housing, which negatively affects the environment of parcels and blocks in general.

Proposed detailed principles of regeneration historically formed planning and environmental structure of blocks and parcels:

- principle of allocation of parcel as the main module of the block – the basic principle for overcoming the negative influence of massive and disharmonious buildings will help neutralize the massiveness of Soviet buildings and partly return a historical value to the street facade and better allocate streets parcellation and old buildings
- principle of parcels structure filling – will help to increase city housing by filling the parcels with developed housing of outbuildings, to create areas for recreation for the block citizens using inner space of parcels, and to return the planning and environmental integrity of the parcels, and thus to the block
- principle of new construction compliance to historic environment – the basic approaches for new construction within the Preserve Area of the City which will help to fill historic environment with new, corresponding buildings.

Implementation of proposed principles will enable to achieve positive results in the recovery of Preserve Areas of small historic towns, regeneration of its urban planning, planning and environmental structure of blocks, improving the living conditions of the inhabitants of these blocks by increasing the number of residential properties and inner space of blocks.
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References

Rewitalizacja zabytkowych budynków mieszkalnych w centrach małych ośrodków miejskich Ukrainy Zachodniej

Maksym Yasinskyy

Wydział Architektury, Uniwersytet Narodowy "Politechnika Lwowska", Ukraina,
e-mail: maxim14apr@gmail.com

Streszczenie: W artykule przeanalizowano stan istniejących bloków i dzielnic mieszkaniowych historycznej zabudowy zlokalizowanej w centralnej części małych miast. Rozpatrzono miasta z regionu zachodniej Ukrainy, przeanalizowano szczegółowo bloki w Rohatynie, Komarno i Podhajcach. W wyniku badań terenowych określono czynniki, które negatywnie wpływają na zachowanie tradycyjnej struktury dzielnic oraz obniżają wartościowe walory historycznej zabudowy. Zarekomendowano zachowanie funkcji mieszkaniowej jako elementu tradycyjnego dla centrum małego miasta, a także określono szczegółowe planistyczne i kompozycyjne zasady przekształcenia istniejących zabudowań i odbudowy niezachowanych budynków oraz odtworzenie historycznej struktury bloków.

Słowa kluczowe: historyczne centrum małego miasta, dzielnica, parcela, zabudowa mieszkalna, regeneracja.