

# Evolution of the Planning Paradigm and Urban Design of Housing Complexes in the Context of Changing Challenges in Ukraine: Case of Lviv

Oleksandr Fenchuk\*, Mykola Habrel

Lviv Polytechnic National University, Institute of Architecture and Design,  
Department of Architectural Design, Stepan Banderu str. 12, 79013, Lviv, Ukraine

\*Corresponding author: [oleksandr.t.fenchuk@lpnu.ua](mailto:oleksandr.t.fenchuk@lpnu.ua)

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The study provides a retrospective of the housing development in Lviv and the factors that affected it. Using the general process of housing evolution, the study focuses on the impact of the war as a catalyst that influenced the demand and volume of housing construction over the last decade. Moreover, it reflects the unprecedented demographic shift driven by the number of IDPs in Ukraine since the beginning of 2022. The study demonstrates that, due to the increased demand for housing, the approaches to the design of housing have changed in recent years, defining a new type of urban unit called a housing complex. The study aims to identify and examine the genesis and characteristics of the modern planning paradigm and urban design of residential architecture in Lviv in the context of shifting conditions. Spatial and urban characteristics, social indicators, resident focus, and urban influence evaluate the studied objects. The study results demonstrate key differences in planning philosophies and approaches to designing and constructing new housing, identifying qualitative differences between housing of the previous and current paradigms. A detailed examination and comparison of the studied complexes in Lviv reveals changes in the approach to their planning, reflecting the evolution from the inherited modernist approach to housing to the creation of sustainable planning. It also aims to determine the quality of Lviv's modern housing environment and the vector of its development.

**Keywords:** housing architecture; housing complex; sustainable urban planning; mass housing construction; migration.

The modern history of the European continent, especially in the 21st century, has always been accompanied by a steady increase in migration processes. The largest of them were usually caused by significant climatic, economic, political or humanitarian problems. (Van Mol, de Valk, 2016). According to Eurostat, as of 2021, almost 30 million people immigrated to the European Union between 2014 and 2021. (Eurostat, 2023) UN research shows that migration is growing faster than the world's population (20 million new migrants annually), and their total number now stands at 272 million. However, the situation changed significantly in early 2022. With the start of the full-scale military invasion of Ukraine by the Russian Federation, a large part of its population was forced to flee their homes. The Russian invasion of Ukraine on 24 February 2022 led to an unprecedented population

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## Abstract

## Introduction



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movement – the most massive flow in Europe since the Second World War. (Pozniak, 2023; Gluszak & Trojaneck, 2023). According to the UNHCR, from 24 February 2022 to 10 January 2023, national authorities in six neighbouring countries registered more than 17 million border crossings from Ukraine. In addition, during the same period, 7.9 million refugees from Ukraine were registered across Europe as a whole. (UNHCR, 2023; IOM, 2023) According to the United Nations High Commissioner for Refugees (UNHCR) operational data portal, 5,232,014 people have fled Ukraine as a result of the hostilities. According to the International Organization for Migration (IOM), as of 2022, more than 7.7 million people were internally displaced within Ukraine, or almost 18% of the country's population. (IOM, 2022) As a result, this dramatic demographic change has exacerbated the problem of housing and a wide range of related social and political issues.

The most horrific result of this war was the significant destruction of residential and civilian infrastructure, which mostly occurred in the eastern and central regions of Ukraine. This factor significantly exacerbated the housing problem in the country. The war has caused the largest housing crisis in Ukraine's history. Over the past year, thousands of homes have been destroyed by Russian attacks. According to various estimates, the loss of housing stock in 2022 ranged from 135,000 to 817,000 destroyed or damaged buildings. These estimates remain approximate, as the ability to physically inspect buildings in the context of hostilities is limited. (Bobrova, 2023) Since the beginning of the war, temporary shelters have been set up in Ukrainian cities by converting municipal facilities for living. Later, temporary settlements were set up in modular housing containers (Moskaliuk, 2022), and eventually the process of designing and building permanent housing in Ukrainian cities began. (NEFCO, 2023) Analyzing the impact of the military aspect on the housing issue, one must delve into the retrospective of the last decade. It's crucial to note that military actions on Ukrainian territory commenced in 2014, commencing with the occupation of the Crimean Peninsula and the invasion of the eastern regions. The above-described internal migration phenomena, which have now exacerbated the housing problem at the European level, have been taking place in Ukraine for almost 10 years. Thus, according to the Ministry of Social Policy of Ukraine, as of the beginning of March 2021, there were 1.4 million IDPs in the country. (Ministry of Social Policy of Ukraine, 2021) However, their actual number was not known for certain, as not all IDPs officially register their status with social security authorities, so it is likely that their share was much higher. Thus, over the last decade preceding the current crisis, Ukraine has already hosted a large number of internally displaced persons from Crimea, Luhansk and Donbas. This has already made Ukraine a leader among the countries hosting the largest number of refugees. (Teke & Sirkeci, 2022)

The aim of the research is to reveal and study the genesis and characteristic features of the modern planning paradigm and urban design of residential architecture in Lviv under changing conditions and challenges. Tasks of the research: 1) Identify and analyze the peculiarities of housing development in the context of migration challenges in Ukraine. 2) Study the urban planning parameters of residential complexes in Lviv and identify changes in approaches to their urban design. 3) Reveal the evolution of the housing planning paradigm, explore and compare the main provisions of the previous one and the features of the new paradigm. 4) To contribute to the discussion on the principles of restoration and planning of new housing for the future reconstruction of Ukraine.

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## Methods

Lviv, specifically the city's housing complexes, was chosen as the object of study based on a combination of circumstances: 1) due to the significant resettlement of IDPs to the western part of the country and directly to Lviv; 2) due to the large volume of housing construction on a national scale, (as in recent years the city has been ranked second in terms of housing construction, second only to Kyiv and its region); 3) due to the availability of a sufficient number and variety of housing complexes that can show a change in the approach to housing planning. The sample of objects under study was formed according to the following criteria: 1) period of construction – the study considers only complexes that were built during 2014-2023; 2) area of territory – the study

considers only complexes that occupy a large territory – usually more than 1 ha and no more than 15 ha; 3) territorial and planning location – the study mainly considers complexes built on separate territories within new residential construction quarters in the city; 4) the presence of evolutionary planning features. One of the main criteria for selecting the objects under study is the presence of changes in the urban planning and architectural solutions of the complexes. The studied cases demonstrate a change in the parameters of urban planning and architectural design of residential construction in Lviv. Direct field research of the complexes was carried out during 2021-2022 and included observations, photographs, and mapping. The authors inspected and observed most of the new residential areas in Lviv and selected the objects described below for the study based on the above criteria. The next stage of sampling the objects under study involved the collection of empirical data from all complexes. For a detailed study, 5 residential quarters were selected, each of which contains 2 housing complexes. In the local context, it is quite typical to provide the naming of complexes, so for convenience, they were also mentioned in the description.

The study employs theoretical analysis of literature, analysis of statistical data, and cartographic and field research of chosen housing complexes. These complexes are assessed for both quantitative and qualitative indicators, encompassing spatial and urban planning characteristics, population orientation, and their impact on the city's overall development. In addition, the study examined and analyzed data from the State Statistics Service of Ukraine on demographic indicators and construction volume data, data from online real estate sources, as well as project materials provided by the municipal architecture department (drawings, maps, and text materials). The study of quantitative indicators includes graphical processing of objects, derivation, and calculation of their urban planning index characteristics. The indices used in this article are proposed by Berghauser Pont, M., & Haupt, P. (2009), which examine urban density indicators and explore the relationship between space, density and the urban environment: 1) Floor space index (FSI) or building intensity – an index calculated as the ratio of constructed floor space on all floors to the gross area of the land plot; 2) Gross space index (GSI) or coverage – an index that demonstrates the relationship between built and undeveloped space. (Berghauser Pont & Haupt, 2009). The rest of the quantitative data on the studied housing complexes includes construction period, land plot area, total apartment area, average height of buildings and number of apartments. The collected quantitative data on the studied housing complexes are displayed on maps and tables grouped by category. The maps and data are used to compare the characteristics of complexes and to highlight their physical and planning features based on the approach they were designed and built. The analyzed data is included in the conclusions to contribute to the overall spatial assessment of the study area.

In the study of Lviv's residential architecture, it is important to understand the relationship between the sociopolitical stages and the history of the city's development. Before revealing the evolution of the planning paradigm and urban design, it is worth outlining the general features of the history of Lviv's urban planning, the formation and changes in its spatial structure. The realities that shaped the city's space: natural ("historical part" located in a hollow, dividing the city into southern and northern parts by the mountain system "Vysokyi Zamok - Kortumova Hora," absence of a river, landscape and expressive surroundings of the city) and urban planning (ultra-compact structure, radial-ring planning organisation with insufficient development of the rings, inefficient relations between the city and its surroundings, etc. ) influence modern decisions, including those on the location, scale and spatial forms of new residential areas. As for the political conditions of the city's formation, it is worth starting with the fact that for almost 50 years Ukraine and Lviv were part of the Soviet Union, where the issue of construction was fully controlled by the state. State housing was planned centrally in large urban areas, regardless of whether apartments were allocated by central authorities, state or municipal enterprises, or entrepreneurial cooperatives-usually the only "alternative" for urban populations was overcrowding. Given Khrushchev's and Brezhnev's

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## Results

commitment to state provision, the pace of urbanization increased significantly in the USSR, as well as in the GDR, which was the Eastern Bloc country that most closely followed the Soviet model. (Soaita & Dewilde, 2019) Evaluated by volume, it can be argued that Lviv's housing infrastructure is deeply imprinted by the Soviet era. In Lviv, most housing was built in the 1970s and 1980s. (Cherkes, Petryshyn, & Konyk, 2019) This development was implemented in the form of a new type of urban planning, which in the modernist planning paradigm was called "microrayons" or micro-districts. The Soviet microrayon model was developed as a result of an architectural competition in 1960, which was crucial for changes in residential urban planning, abandoning the system of building housing along the perimeter of the city block in favour of a freer arrangement of apartment buildings (Drémaitè, 2019). It was during this period that enough new neighborhoods were built in the city to form the basis of the city's housing stock today, and they still play a significant role in meeting the housing needs of most Lviv residents. As was typical at the time, these projects usually consisted of freestanding linear buildings with large unstructured and undeveloped open spaces between small social and entertainment facilities. Massive housing construction created a typical urban landscape formed by large residential areas with a population of several tens of thousands of inhabitants, mostly 9-story buildings, with architectural solutions based on typical building series. (Cherkes et al., 2019).

When assessing the nature of residential architecture, it is worth identifying the key aspects that influenced its emergence in a new form. To do this, it is necessary to outline the main economic and social framework in the shaping of Ukraine and the process of housing construction at the national stage. Since the end of the Soviet totalitarian era, most spheres of socio-political life have been transformed. (Skvorets, & Kudinov, 2021) The field of architecture was no exception. After gaining independence, the overall volume of construction and housing construction was significantly reduced compared to the Soviet era. One of the reasons was the formation of a new property institution, or the transition from collective to private ownership. The new real estate market conditions and the difficult economic situation of the population did not contribute to the rapid and high-quality start of a new era of construction in Ukraine. However, over the years, economic development has gradually improved, and the population has begun to generate demand for new housing. The first decade after the end of the Soviet Union was marked by spontaneous urban movements, when master plans of cities built according to the Soviet methodology proved to be unsuitable, including because they were based on public investment and the high natural growth of the urban population. (Petryshyn, 2019) Thus, new residential buildings gradually began to appear on the market, which no longer resembled the modernist buildings of the 1980s. The key difference that gave these units a new characteristic look and subsequently influenced most of their planning characteristics was the land (territory). The land policy of the Soviet era, characterised by the centralisation of state regulation of land relations at all levels, and that of independent Ukraine differed (Plutalova, 2020). After the collapse of the Soviet Union, there was a need to introduce legal schemes that would ensure private property, a fundamental concept necessary for the functioning of a capitalist economy (Babie, 2016), and after Ukraine gained independence, private property (including housing) was proclaimed as the basis for building a market economy (Fedoriv, & Lomonosova, 2019). After the emergence of private property, it became possible to develop territories and build private facilities. This change gave rise to a development market that was usually guided by economic indicators when creating new facilities. It was economic indicators that became the basis for the formation of the new planning paradigm that is currently in place. Unlike housing construction before '91, where all construction was carried out by the state, which also owned the land and could build entire neighborhoods with free and loose planning, the period of market economy dictated new rules for the creation of residential architecture. As a result, housing construction turned from a tool for implementing social policy into a type of entrepreneurial activity that realizes the economic interests of private construction and development

companies. (Petryshyn, 2019) This has resulted in a dramatic increase in the size of built-up areas in Ukraine, which started at the beginning of independence and has been sustained for decades. This is reflected in the fact that Ukraine ranked 4th in the world in terms of the growth rate of new built-up areas between 2000 and 2014, adding 76,202 square kilometres to its built-up area. Importantly, this growth occurred against a backdrop of negative population growth. (IBRD, 2015) The reason for this impressive growth in construction can be seen as a reaction to the lifting of long-standing restrictions on construction, as well as a significant concentration of investment in the real estate sector.

These shifts formed a new planning paradigm that still exists to some extent today. In some studies, it is commonly referred to as “market modernism,” while in others the term “square meter architecture” is used. These and other terms do not have a clear definition, but in residential construction, their synopsis can be characterized as follows: when choosing an urban or architectural solution for a new object, the economic benefit from its sale is always in the first place, while other indicators are ignored or formed on a residual basis. The emergence of this concept has created a new urban planning unit, which is locally known as a “housing complex.” This concept also does not have a normative or any fixed definition, but exists as a physical phenomenon and is actively exploited at the professional, academic, household, and even regulatory level.

Analysing the theoretical basis for the change of the old paradigm and the emergence of a new one, it should be noted what a paradigm means in the housing issue. Kunh (1970) describes that in its most common use, a paradigm is an accepted model or pattern for solving a particular problem (Kunh, 1970). Whitelegg (2018) describes that a paradigm is a deeply held set of often unspoken beliefs and assumptions about how the world works, what is normal and what can be justified within existing financial and regulatory frameworks. (Whitelegg, 2018) Hall (1993) points out that paradigms are by definition never fully comparable in scientific or technical terms, as each paradigm contains its own description of how the world works. (Hall, 1993) It can be said that a paradigm is the most general element of a theory, but within paradigms there may be both theories that have general applicability and theories that can only be used in specific contexts, such as housing. (Clapham, 2018) Also, a paradigm may periodically undergo fundamental transformations that can lead to profound changes in its field of existence. In addition, the very definition of a paradigm can be understood more narrowly, i.e., as a way of thinking that provides guidance to teams of researchers on how to analyse and solve problems, or in other words, indicates a model for solving a problem in a particular scientific field.” (Ogryzek, 2022) In terms of defining a paradigm in housing, Clapham (2018) notes that the use of theory in housing research is problematic because the unique nature of housing means that the application of general theories drawn from other fields is not always useful. Nevertheless, it is possible to develop a theory of housing that can draw in part on existing concepts relevant to the housing context, as well as on concepts derived from the specific nature of housing itself. While the creation of a dedicated, transdisciplinary theory of housing is not practical at the current level of knowledge, the main priority should be to develop and test the specific concepts needed to build a theory. (Clapham, 2018) In this case, in the absence of an agreed grand theory of housing, housing paradigms are mid-range theories. They are consistent with many theoretical frameworks, especially social constructionism, discourse analysis and narrative theory. However, the definition and elaboration of housing paradigms implicitly challenges the claim that any one housing paradigm is true or accurately encompasses the entire field of housing. (Iglesias, 2009) However, Iglesias (2009) also defines housing paradigms as historically determined, value-based organisational principles that shape the entire spectrum of housing issues, namely the financing, production, distribution and use of housing. More specifically, a housing paradigm is an organising principle that influences housing law and policy by drawing attention to certain kinds of facts and issues that are relevant and important for policy and decision-making. Each housing paradigm problematises housing in its own way and enables

a certain discourse with its own concepts and vocabulary. (Iglesias, 2009) In turn, it is quite natural to undergo a paradigm shift, which usually occurs as a result of some political, scientific or social breakthrough. It can also be said that paradigm shifts are a logical response to past experiences, growing anomalies, and efforts to correct mistakes; they are also constructivist, as the very parameters of what constitutes a mistake and a good policy are determined by the institutional context, the prevailing discourse, and the struggle for authority. (Friedman, & Rosen, 2020) In this case, the proponents of the new paradigm that replaced the old one argues that it can solve the problems that led to the crisis of the old paradigm. In the case of this study, it can be assumed that the paradigm shift described here was influenced by the transformation of social housing as an instrument of housing policy in general, which took place in parallel with the postmodern cultural and aesthetic critique of modernist typologies of social housing.

Analyzing the current state of this research at the theoretical level, it should be noted that, in terms of studying housing complexes as a separate object, a sufficient research base has not yet been formed, except for a few individual studies. Petryshyn (2019) in her study of modern residential development in Lviv identifies the main trend as the emergence of a new type of residential unit (in her definition – a quarter), which is formed by a group of segmental blocks of the same or variable number of stories. She forms a certain classification of these blocks, according to their morphological scheme, giving examples of blocks built around closed courtyards, blocks with built-up adjacent territory, and blocks with a more dispersed organization of the territory. Another observation she cites is the tendency to increase the percentage of built-up area (hereinafter defined as GSI), which for new neighborhoods is about 20-40% (GSI 0.2-0.4) and increase the density of residents. (Petryshyn, 2019) Cherkes et al. (2019) consider the approach of increasing density and percentage of buildings to be a search for a new form of compact city development, which is done by modernizing and consolidating sprawling cities built during the socialist era. (Cherkes et al., 2019) Among the key differences between the Ukrainian and European approaches to housing design, as noted by Hnes (2013), European housing is built on the basis of recommendations to limit the height of residential buildings to 7 floors. The widespread introduction of medium- and low-rise housing is accompanied by the use of an arsenal of architectural features that provide high structural capacity without compromising the quality of the building's inhabitants. (Hnes, 2013) Ladigina et al. (2020) in their study of new housing construction attempt to describe housing complexes, giving the definition of "housing complex" – one or several apartment buildings united by a common territory and a single architectural style, forming a single spatial and territorial unit. She notes that they range from low-rise to high-rise, from those occupying an area of various hectares to those consisting of many buildings. They also note that most housing complexes are relatively isolated projects implemented by non-state construction companies and are often built haphazardly. Despite the architectural, typological, and engineering differences of housing complexes, they are characterized by several common features: a chaotic situation in the city structure, social isolation, and territorial isolation. (Ladigina, Dubina, & Bizhko, 2020). At the same time, this form of housing is widespread around the world, making housing complexes one of the most popular types of housing in modern cities. (Kim et al., 2014)

For a broader understanding, the description proposed in the study applies an approximate definition of what a "housing complex" is. In most cases, it is a set of apartment buildings located on a common (one or more) land plot, united by a single planning structure and architectural solution. As a rule, the complexes have a common residential area or courtyard and additional services necessary for living: parking lots, sports and playgrounds, educational facilities or separate educational buildings, administrative, commercial and retail premises, etc. This new typology of urban residential development initially had no visible advantage in terms of architecture or urban planning. But instead of the open modernist layout of large areas, housing complexes were planned and built much more densely, forming separate territories of residential buildings.

In the early stages, housing complexes did not differ qualitatively from the modernist buildings of the Soviet era. The architecture of that period, which is called the post-Soviet period, tended to overuse artistic elements in facade decoration, prioritizing aesthetic features over comfort. According to Mysak (2016), formally, they (ed. – complexes) were a kind of replica of mass housing development with improved comfort (with the main disadvantages of Soviet apartments eliminated, and the area increased), often simply “wrapped” in new shells. In fact, the building envelope (facades and roof as a “fifth” facade) became the main means of protest and a manifestation of a “qualitatively” new architecture, “separated” from the anonymity, mass, industrialism, and political connotations associated with the Soviet period. (Mysak, 2016) The main distinctive option for new residential buildings was the private residential area, which was regularly fenced off, making the new environment detached from the context of the city. Of course, not every new building had this feature, as insertion buildings also appeared in the historic environment. However, the saturation of the market with such architecture began to create a contest between developers, and today’s housing complexes have a visible increase in the proposed living environment.

In the context of the specifics of the country’s housing sector, it is worth noting that, compared to most European and global housing models, Ukraine has almost no state, national, or local housing estate or other generally recognized types of social housing, as only 1 per cent of the population lived in state-owned housing. (Bobrova 2022; Merheim-Eyre, 2022) At the same time, almost 95% of the country’s housing is privately owned. Given the general failure of the housing model to create the necessary level of housing for the population, due to the lack of government mechanisms for renting, purchasing, or building housing for socially vulnerable groups, the problem of providing housing for IDPs has not received effective government mechanisms to address it. As a result, this has become one of the drivers for the further development of the private construction sector. The resulting rapid demand for residential real estate since the beginning of 2014 has affected the real estate market, which has responded by increasing the volume and pace of residential construction. According to Petryshyn (2019), new, larger housing complexes have dominated residential construction in Lviv since 2015, which is also associated with the movement of investment capital to the centre and west. (Petryshyn, 2019). For example, according to state statistics, almost 190,000 sq.m. of new housing was built in Lviv in 2013, and 320,000 sq.m. in 2014. This figure grew steadily until 2022 and fluctuated between 420,000 and 560,000 sq.m. per year. As a result, from 2014 to 2020, more than 4 million sq.m. of new multifamily housing was built in Lviv. For comparison, the same amount of housing was built between 1990 and 2013.

Such a large amount of housing, by the standards of a city with a population of up to a million people, was physically manifested mainly in the form of “housing complexes”. They were located all over the city, without a defined strategy or a single development plan, since, as already mentioned, housing construction in the local context is an exclusively private prerogative. The study is based on the analysis of 5 residential areas located in different parts of the city: 2 quarters in the areas of new housing construction (formerly known as green fields), 2 quarters in the established urban environment, and 1 quarter in the historic part of the city (Fig. 1). This location of the research objects allows us to examine most of the scenarios for the development of new housing construction in the city. It is also worth noting that 2 of the studied neighbourhoods are located in green fields, which in fact launched the development of new territories. The list of the studied areas: 1) Quartier Shevchenko – O. Stepanivnyi streets: housing complexes “Velyka Britannia” and “Knyazhyi”; 2) Quartier Maloholoskivska street: housing complexes “Maloholoskivski Pohorbi” and “Maloholoskivska, 8”; 3) Quartier Kulparkivska - Riashivska streets: housing complexes 1) “Misto trav” and 2) “Familiya”; 4) Quartier Stryiska - Vernadskoho streets: housing complexes “Leopol Townn” and “Stryiskiy”; 5) Quartier Kniahynyi Olhy street: housing complexes “Greenville” and “Dobra oselya”.

Fig. 1

Location of the studied quarters in Lviv. Drawing: O. Fenchuk, 2023



### 1. Quartier Shevchenka - O. Stepanivnyi streets

The quarter of Shevchenko and O. Stepanivna Street (Fig. 2) is located in proximity to the city centre, providing the complex with access to the existing city infrastructure. Shevchenko Street is one of the main transport corridors of the city, with a tram running along it, which provides good transport links. In addition, the new quarter should enhance the range of services, as it is planned to build a sports complex, a school in the centre of the quarter and retail space. The construction on this site is a brownfield development, as the area was previously occupied by warehouses and industrial buildings. The perimeter of the quarter is partially surrounded by historical buildings, and its middle is filled with new housing complexes Velyka Britannia (1) and Knyazhyi (2). The total area of the new development is 8.27 ha. The quarter was built up gradually, first with small buildings in 2013, and then with the largest part of the complex, which occupies a plot of about 7 hectares. As the quarter borders on the historic district, the number of storeys was designed in such a way that the buildings facing the streets have a reduced height of 6 floors, while those in the rear part of the quarter have 9–12 floors. At the same time, the average number of storeys in the quarter varies within 9 floors. The urban planning structure of the quarter is planned in a mixed way, where the buildings along the washout form the contour of the urban space and emphasize the structure of the external streets. At the same time, the internal layout of both complexes is designed in a modernist manner, with buildings arranged in a free order without a clear delineation of internal spaces. The entire territory of the quarter is lined with automobile driveways and is mostly filled with parking spaces. Currently, these driveways are used exclusively for residents and are limited, which does not make this area fully intertwined with the urban fabric. The obvious drawback of this solution is that it prioritizes car traffic while ignoring the need to create spaces for recreation and community interaction. According to the urban development impact assessment, the total residential area built in this quarter exceeds 115,000 sq.m. Comparing the two complexes, it is worth noting that despite their differences in planning and architecture, they are quite close in terms of quantitative indicators, keeping the FSI score between 2 and 2.4. Despite



Fig. 2

Quartier Shevchenka - O. Stepanivnyi streets: housing complexes "Velyka Britannia" (1) and "Knyazhyi" (2); Photos and drawings: O. Fenchuk, 2023

their overlap in the time dimension of implementation, the architecture of the two complexes is different. "Knyazhyi" was designed as a typical 10-storey U-shaped block, creating narrow and high courtyards. At the same time, "Velyka Britannia" offers buildings of different number of storeys with a free arrangement of blocks and is more humane in terms of scale and geometry of spaces in relation.

## 2. Quartier Maloholoskivska street

The next objects under study are the housing complexes "Maloholoskivski Pohorbi" and "Maloholoskivska, 8" (Fig. 3). Both complexes are located in the zone of mass construction, in a new district of Lviv called Pid Holoskom. This is a new residential area located in the northern part of the city with a total area of 168 hectares, most of which is undeveloped and covered with greenery. In 2013, active construction began there, mostly with residential buildings. The first development plan for the area was designed for 12,000 residents. However, in recent years, construction volumes have significantly exceeded the previous values and have grown to at least 20,000 residents or more than 400,000 sq. m. of housing. As of the end of 2022, approximately 235,000 sq.m. had already been built in the area and approximately 180,000 sq.m. are in the process of being realized. In total, about 545,000 sq.m. of housing may be built in Pod Holosko in the near future. (Cherkes & Fenchuk, 2021). In total, more than 30 housing complexes have been built or are under construc-



Fig. 3

Quartier Maloholoskivska street: housing complexes "Maloholoskivski Pohorbi" (1) and "Maloholoskivska, 8" (2); Photos and drawings: O. Fenchuk, 2023

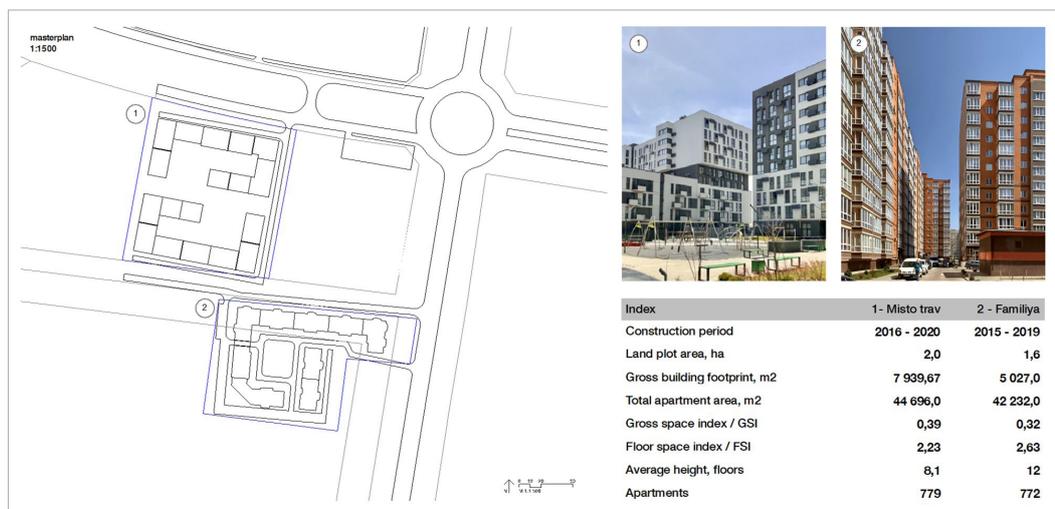
tion in the area. Rapid and uncontrolled development in the area has created a significant number of urban problems, such as inaccessibility to public transport and poor transport links to the city. At the same time, there is a lack of social infrastructure, such as schools and kindergartens, in the area. In particular, urban planning documentation for the area provides for 7 preschools and 3 secondary schools. However, as of today, only one kindergarten for 200 children has been built. "Malogoloski pagorbi" (1) is a housing complex that can be divided into 3 separate parts, which together have 13 buildings. The complex has more than 1,200 flats located in an area of almost 3.5 ha. Its construction began in 2018 and was completed in 2023. Due to its location on a hilly plot, the complex has an architecture that creates unique planning and space solutions. One part of the complex is built on a hillside and is designed as 4 separate buildings connected by a stylobate, which houses a semi-enclosed car park. The other part of the complex is designed as a perimeter semi-open quarter building with pedestrian courtyards and a mixed number of storeys from 6 to 10. Most of the buildings in the complex have individual underground parking, which frees up internal spaces for residents. Most of the ground floors in the complex are intended for retail, which provides the necessary range of services for residents directly under the building without causing significant displacements. The disadvantage that could not be overcome, which was caused by the construction on a steep-sided terrain, was the problem with drainage during heavy rains. "Maloholoskivska, 8" (2) can be considered the predecessor of the first complex, as they were built by the same developer. Nevertheless, the complexes are the total opposite in terms of their planning approach. This second complex is designed as a U-shaped block that occupies the entire plot and is open on one side. Due to its height of 10 floors and the configuration in the plan, an inner courtyard is created, which has a vertically closed square. The complex has a set of all the typical planning approaches of the time: the entrances to the building are located from the courtyard, the entire territory of which is given over to carriageways and parking lots. At the same time, there is no underground parking in the complex, which turns the entire territory within and outside the complex into an open car park. This effect is further reinforced by the fact that most of the neighbouring housing complexes also have no parking. Despite being obviously smaller than the first complex, "Maloholoskivska, 8" is very densely built, achieving an FSI of 2.81 compared to 2.61 for "Malogoloski pagorbi".

### 3. Quartier Kulparkivska - Riashivska streets

The development of the territory within Kulparkivska and Ryashivska streets began in 2015 and was completed at the end of 2020. During this period, 2 housing complexes were built: 1) "Misto trav" (1) and "Familiya" (2) (Fig. 4). The urban context of the territory is quite rich, but not fully de-

**Fig. 4**

Quartier Kulparkivska  
- Riashivska streets:  
housing complexes "Misto  
trav" (1) and "Familiya" (2);  
Photos and drawings: O.  
Fenchuk, 2023



veloped. The territory of the complexes borders residential blocks of the 70s, offices and former manufacturing facilities. A large shopping centre and social infrastructure facilities are located within walking distance. The disadvantages of the location include the lack of parks and squares, public spaces or public places of social interaction. The proximity to the runway of Lviv airport can be considered a “Misto trav” (1) is a complex consisting of 2 buildings located on a 2 ha plot and a total of 779 flats. The planning of the complex is made in the form of a block development of the perimeter of the site, and partially entering the middle of the perimeter, delimiting the spaces of a large courtyard. The buildings of the complex have a mixed number of storeys, with separate height accents at the corners of the blocks. The typology of the complex consists of 6-10-storey buildings located along the perimeter of the quarter and 4-5-storey buildings within the quarter. On the upper floors of these blocks, there are penthouses with access to an exploited green roof, which is a step towards sustainability. This structure of buildings forming enclosed courtyards is one of the key features of the complex. The landscaping of the courtyards, a wide range of landscaping elements and interior gardening play the role of a humanizer in the environment of a multi-storey courtyard. At the time of implementation, such courtyards were a novelty for Lviv and were considered a rather revolutionary solution, demonstrating to other market players a focus on the comfort of residents. However, after the construction was completed, they became closed and accessible only to their owners. Thus, they did not give a social impetus to the residents of neighbouring buildings, creating a gated community. Under the entire complex is an underground car park with a total capacity of over 350 parking slots. The ground floors of the buildings have a significant amount of retail space. Instead, the “Familiya” (2) is a vivid representative of the architecture of the previous planning paradigm. The territory of the complex is 1.6 ha, and the total number of flats in the complex is 772 units. However, the approach and principles by which “Familiya” was built are significantly different from its neighbour. The complex has a number of features that worsen its operation, such as entrances to buildings located inside rather than outside the block, and almost the entire space of the complex is cut through by car driveways. The courtyard, most of which is used as a car park, lacks landscaping, trees and common spaces for residents. The typology of “Familiya” is rather questionable, since all residential blocks are 12-storey towers formed by replicating the same typical floors vertically. The volumetric and spatial structure of the interior space of the complex creates a rather inhumane environment due to its height and layout, including the parameters of the ratio of building height to courtyard width.

#### 4. Quartier Stryiska - Vernadskoho streets

On the list of new housing areas, the Stryiska-Vernadskoho street block (Fig. 5) is one of the new major construction sites. It began in 2014 with the first housing complexes, one of which was “Stryiskiy”, and continues to expand the development boundary northward to the city limits. The neighbourhood is located on the southern outskirts of the city, near the city bus station. Its context is quite developed, as it borders the existing Soviet-era neighbourhoods, and is not located completely isolated from the city, like the Pid Holoskom neighbourhood, which was mentioned earlier. Also, Stryiska Street is a city thoroughfare that has a well-developed public transportation network and leads almost to the city centre. However, like most new residential neighbourhoods, it suffers from a lack of social infrastructure, schools, kindergartens, and public spaces.

“Leopol Townn” (1) is a complex of 857 flats designed as an ensemble consisting of 7 buildings located on a 3-ha territory. The planning of the complex defines a structure comprising a semi-enclosed quarter composed of 3 linear blocks positioned along the southern and western perimeters of the site, shaping the street facade and the outer contour of the development. Additionally, the design includes 4 towers strategically placed within the middle of the complex, creating an open courtyard that faces the adjacent park, which borders it from the west. This design creates a courtyard that smoothly transitions into a green park, giving the complex a unique natural feel. This feeling is enhanced by the presence of large trees in the courtyard that were not cut down during

Fig. 5

Quartier Stryiska - Vernadskoho streets: housing complexes "Leopol Townn" (1) and "Stryiskiy" (2); Photos and drawings: O. Fenchuk, 2023



construction. Almost all the blocks of the complex are 10 floors high, except for the southern line, which was built last and drops to 7 floors. The architecture of the residential blocks is simple and flat, but has a recognizable silhouette due to the pitched roofs that give the complex a more humane scale. The courtyard of the complex is almost entirely pedestrianized, except for two driveways that enter the neighbourhood. Despite the good planning solutions implemented in this complex, there are several drawbacks. There are no additional functional premises, such as offices or educational institutions, except for a few shops on the ground floors. Almost the entire perimeter of the neighbourhood is designed for driving and equipped with a large open car park, which isolates it from the surroundings. In addition, the entire area of the complex is fenced and inaccessible to visitors from the outside. "Stryiskiy" (2), which is a large complex with more than 1,600 flats covering an area of 5,8 ha, like the previous pair of complexes, is the opposite of its neighbour. Its construction began in 2015 and lasted almost 6 years. The complex consists of 7 buildings with almost identical planing in the form of perimeter blocks open on one side. The planning structure of the complex is made in the form of orthogonally placed buildings, 9–10 floors high, which in some places have a distance of 20 meters between the facades. This arrangement, together with the volumetric solutions, creates the effect of narrow vertical courtyards, closed by the walls of the facades, which are located parallel to each other. At the same time, the entire territory of the complex is permeated with carriageways that lead directly to each internal block. This is due to the attempt to provide automobile access to the entrance to the buildings, which are typically located in the middle of the courtyard. On top of that, most of the ground floor areas where the flats are located are raised above street level to visually separate the living spaces and avoid contact between people. As a result, most of the facades with which people interact are completely blank and inactive. Most of the territory, including the courtyards, is completely parked and difficult to access for pedestrians. In addition, there is virtually no landscaping or public spaces for residents.

##### 5. Quartier Kniahyni Olhy street

The construction of the quarter along Knyahynya Olhy Street (Fig. 6) began in 2014 with the construction of the "Dobra oselya" housing complex (2) and later in 2016 with "Greenvile" (1) and was fully completed in 2019. The neighborhood is located along one of the city's main streets connecting the southern and central parts. The urban context of this quarter is historically formed in the form of low-rise buildings located as an abstract buffer between local sub-centres of the city. It can be said that new construction has radically affected the appearance of this part of the city, as the scale of the predominantly two-story single-family houses is discordant with the new multi-story housing complexes. At the same time, a railway line runs adjacent to part of the neighbourhood

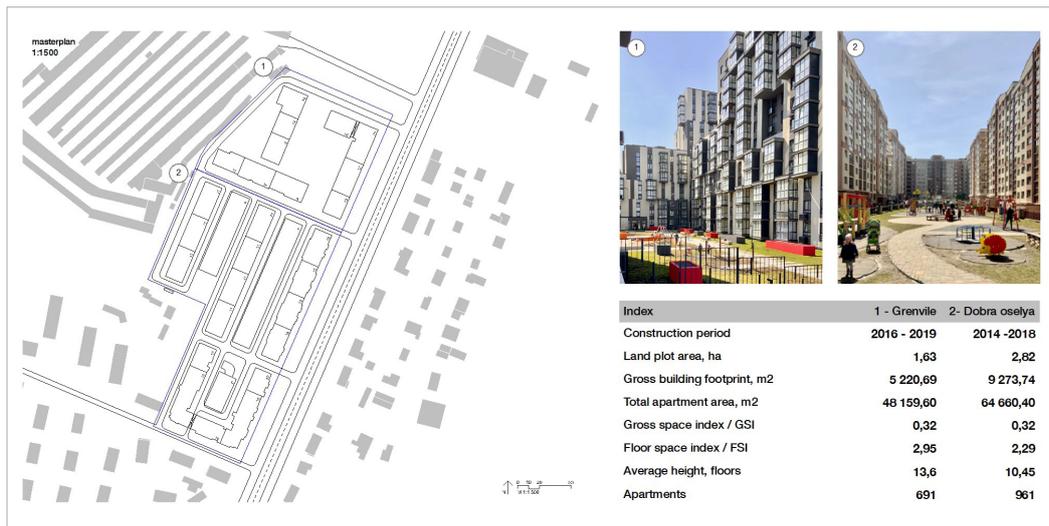


Fig. 6

Quartier Knyahyni Olhy street: housing complexes "Greenvilev" (1) and "Dobra oselya" (2); Photos and drawings: O. Fenchuk, 2023

boundary, which creates a significant noise load for residents. It is worth noting the good transport links, as a tram line leading to the city centre runs right along the street.

"Greenvile" (1) is a housing complex with almost 700 flats, consisting of 3 buildings located on a plot of 1,63 ha. It has the layout of a semi-enclosed block with a courtyard that is not accessible to cars and is exclusively pedestrian. Parking is provided by an underground car park with 180 spaces. The complex consists of separate buildings with a variable number of storeys from 8 to 10 floors, with high accent blocks of 16 floors. Its architectural solution is shaped by the plasticity of protruding glass balconies grouped in vertical lines that shift along the facade, emphasizing its height and slenderness. This solution is also reinforced by the graphic highlighting of the windows in vertical lines, painted in dark grey, in contrast to the overall white volume. "Dobra oselya" (2) directly borders "Greenvile" and is connected to it by a common street. Construction began only 2 years earlier, but the approach to urban and architectural design is clearly different. The structure of the complex is made in the form of linear residential blocks, the longest of which reaches 130 meters in length, located parallel to each other. At the end of the linear development, perpendicular blocks are formed, completing the block and forming the perimeter of the interior space. The vast majority of this space is occupied by the buildings of the above-ground car park, despite the fact that parking is one of the biggest problems in this quarter. The rest of the area is allocated for carriageways, which are mostly filled with cars. The entrances to the blocks are traditionally located in the middle of the courtyard, so they face the traffic directly. The volumetric solution of this complex is designed as a "canyon", as all the buildings have the same height of 10–11 floors, and the long line of facades creates the effect of a tunnel between the buildings. On the ground floor of the blocks facing Knyahynya Olhy Street, there are numerous commercial premises. The complex also has virtually no high-quality landscaping, as the entire territory of the complex is built up. There are spaces for residents in the form of children's and sports grounds located on the roof of the aboveground parking lots. This solution, despite its non-inclusivity (as the access to the roof is via stairs from street level), creates a significant noise impact on the apartments with windows facing the courtyards. It is also worth noting that the architecture of the complex can be called a typical representative of postmodernism. It is formed by the vertical replication of typical floors, with some special finishes on the roof. In total, the complex has more than 900 flats, creating an extremely dense area with an FSI of 2,29. Despite the conceptually improved planning approach, (1) the complex is built even denser than its neighbour, achieving an FSI of 2,95. In addition, like its neighbour, it has parking problems, as 180 parking spaces are disproportionate to the 700 flats. This ratio also makes the surrounding areas completely parked.

## Conclusions

The study of the development of residential architecture in the example of the city of Lviv illustrates the emergence of a qualitative change in approaches to the formation of modern housing, indicating the formation of a new planning paradigm. The previous or post-Soviet planning paradigm, which developed as a result of socio-political processes associated with the becoming of independence, is characterized by deeply rooted modernist principles and approaches to the formation of residential buildings. In contrast, as a result of economic and social development in recent decades, under the influence of new requirements for architecture, a process of evolution in housing planning has begun, which can be distinguished into a separate planning concept that has significantly better living conditions. However, this change is most evident in urban planning or architectural rather than economical solutions. All the cases under comparison have a similar set of shortcomings that undermine their comfort compared to newer facilities. Despite their similar technical characteristics, due to their typology and planing, the complexes have a significant difference in the quality of their living environment. One of the key differences in all cases is the height of the buildings. In post-Soviet complexes, the average number of storeys starts at 10 floors, while in some, such as "Familiya" in the Kulparkivska - Riashivska street quarter, all buildings have the same height of 12 floors. At the same time, its neighbour "Misto Trav" has either a variable number of storeys with an average height of 8 floors or "Maloholoskivski Pohorbi" in the Maloholoskivska street quarter has 8,6 floors compared to the solid 10 in "Maloholoskivska, 8". The number of storeys, together with the planning solution, creates the basis for the perception of the living environment, both in terms of the human scale and the urban landscape. Another significant difference in all the complexes is the attitude to the interior space. Examples of the old planning concept have a typical set of problems – the courtyard is surrounded by car driveways, parking lots, and entrances to entrances located on the inside. Instead, the interior space of complexes created in a new paradigm is in most cases fully pedestrianized and green, with space for residents. As for technical indicators, it can be concluded that new complexes are built on par with their predecessors or even exceed their level. In the case of each neighbourhood studied, their economic performance is quite comparable. For example, in Quartier Stryiska-Vernadskoho streets, the GSI indicators are 0,24 in both complexes, and the FSI is 1,55 in the first and 1,49 in the second complex. The situation is similar in the Quartier Maloholoskivska street – FSI indicators are 2,62 in the first complex and 2,81 in the second. At the same time, they have radically different qualities of spatial and volumetric organization. And in the case of Quartier Kniahyni Olhy street, where both complexes have the same 0,32 GSI, the FSI density in the first complex is 2,95 compared to 2,29 in the second.

Based on the following, the main trends in the urban planning design of housing complexes, which form the provisions of the new paradigm and can be taken into account in the substantiation of future design solutions, are: 1) open spaces of housing developments are not only their structural component, but also a part of the social or public facilities of the complexes; 2) the change in the trend is accompanied by the rehabilitation of the role of the "courtyard" as the main public recreational space within the complex, which are presented as an element of impact on the economical and intangible value of the complex; 3) an equivalent of the role of street space or facade space is being sought, with public functions and activation being brought to them; 4) rehabilitation of traditional or quarter planning techniques in urban planning design with the gradual displacement of "free" modernist planning; 5) reconsideration of the role and place of the car and the infrastructure required for it, as opposed to improving pedestrian use of the spaces of the complexes; 6) the spread of the practice of integrating additional functional premises into residential complexes necessary for comfortable living of residents, as well as the "isolation" of objects with low social characteristics in space. Overall, alterations in the interaction between residential buildings - public spaces - infrastructure are integral urban planning factors and connections that determine the transition from one paradigm to another - building forms, differentiation of functions, creation of independent spheres and new elements of different structural levels, etc.

This study also aims to add to the discussion on the principles of planning new housing in Ukraine, which has become relevant in the context of the need for large-scale post-war reconstruction of the country. Taking into account the statement of Weclawowicz-Bilska, E. (2013), the challenges, visions, and development paths for tomorrow's cities in terms of their housing function should be characterized, firstly, by socially balanced housing and decent, healthy, suitable and affordable social housing adapted to new family and demographic patterns, with high architectural quality, diversity and identity, it is worth noting that these aspects should be more widely represented in the decision-making process regarding future housing. From this point of view, the issue of social adaptation of living conditions is critical for new housing projects and should be a priority to strengthen the social and spatial cohesion of new residential neighbourhoods in the city. The impetus of thousands of IDPs should become a new driver for the formation of conditions or models for creating socially oriented living conditions, including through space and architectural solutions. To combat the degradation of the housing sector in Ukrainian cities and the social exclusion of the population in certain areas, further research is needed to delve into the complex status of the country's housing model.

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## **OLEKSANDR FENCHUK**

### **PhD student**

Lviv Polytechnic National University, Institute of Architecture and Design, Department of Architectural Design

### **Main research area**

Urban planning, housing architecture

### **Address**

Stepan Banderu str. 12, 79013, Lviv, Ukraine  
Tel. +380968623028  
E-mail: oleksandr.t.fenchuk@lpnu.ua

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## **MYKOLA HABREL**

### **Professor, Head**

Lviv Polytechnic National University, Institute of Architecture and Design, Head of the Department of Architectural Design

### **Main research area**

Research in urban planning and regional design is system-wide

### **Address**

Stepan Banderu str. 12, 79013, Lviv, Ukraine  
E-mail: mykola.m.habrel@edu.lpnu.ua

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## About the Authors

