

Article

Planning and Architecture as Determining Influences on the Housing Market: Budapest–Csepel’s Post–War Housing Estates

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Abstract

In Hungary, post-war housing estates can be categorised according to the time of their construction. Thanks to the development of construction technologies and urban planning, these so-called generations of housing estates demonstrate different features with regard to their physical layout and socio-economic characteristics. Socio-economic transformation that took place after the change of regime (1989) was widely affected by the physical parameters of these neighbourhoods and their dwelling stock. Our results show that different generations of housing estates have followed distinct trajectories in the housing market; thus, in addition to their geographical location within the city, planning, architecture, design, and the dwelling stock play a significant role in the market positions of these generations of housing estates. House prices have risen rapidly in Budapest since 2014 up until the pandemic in 2020, and housing estates became popular segments of the housing market. The main aim of this article is to investigate the role of urban planning, architecture and the built environment in this real estate process. The research is based on empirical real estate investigations, statistical house price analyses, and fieldwork undertaken on housing estates. The case study area is Csepel, a former industrial town which became the administrative district 21 of Budapest in 1950. All types of post-war generations of housing estates co-exist, and the majority of the population lives in such neighbourhoods. This special geographical context makes it possible to explore the influential role of the built environment in the housing market. Empirical results from these low- and mid-rise housing estates can make a major contribution to the more effective and successful development of high-rise neighbourhoods.

Keywords

architecture; Budapest; built environment; Csepel; housing estates; housing market; socio-economic characteristics; urban planning

Issue

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1. Introduction

Due to intensive urbanisation and the concept of modern urbanism, housing estates (HEs) have been built almost everywhere around the world over the last hundred years, regardless of political-economic systems and levels of development.

Europe is one of the continents with a significant number of post-war HEs and occupants: more than

170 million people for approximately 56 million dwellings (van Kempen et al., 2005). After the Second World War, the efficient construction of HEs was inevitable given the shortage of housing that existed, and different types of mass housing based on standardisation and state involvement became a global product (Glendinning, 2021; Urban, 2011). Although the original urban and architectural ideas were similar, the final results reflect the political, economic, and technological differences

between Western and Eastern Europe, as well as reflecting differences between countries. In the Eastern bloc during the state-socialist period until the political change, the housing market did not really exist, but after the privatisation process in the 1990s, the post-war, mainly panel-style housing stock entered the market.

In Hungary, central planning, architecture, and construction have played a key role in shaping the built and social environment of HEs. Architecture, in a narrow sense, refers to the spatial, formal, technical, technological, and engineering solutions used in construction, but, in a broader sense, it also encompasses the culture, artistic solutions, and process of shaping the space (Navickas et al., 2020). In recent decades, the importance of careful design, liveability, accessibility, and environmental friendliness of the living environment has gradually increased in the construction and development of HEs. Within architecture, there has been a growing emphasis on creating a human-friendly environment in which form and function are in harmony. This can only be achieved and managed if architecture is closely intertwined with planning and design. In the long term, the success of harmonising these three processes will be reflected in the market position of HEs as well as in their prices.

The urban planning, architectural solutions, and technologies used in the decades after the Second World War, including the paradigms and ideologies that determined design and construction, have continuously evolved and changed, leaving their mark on the appearance of HEs. Considering the period of their construction, size, physical layout, and the technology related to building materials used, we can define different generations of post-war HEs.

The Hungarian HE generations are basically a combination of mid-rise buildings of eight to 10 storeys and low-rise buildings of three to five storeys without a lift. High-rise buildings over 30 m are rare, they appear only in the larger HEs in the form of 15-storey residential towers of 55 m in height. Research on the planning, design, socio-economic, and housing market characteristics of mid- and low-rise residential areas provides research results that can be successfully integrated into the planning and construction of high-rise residential areas. Research on HEs is particularly important in Europe because the spread of high-rise buildings in European cities is still far behind that of Asian metropolises, so the experience of building HEs in previous decades can be just as easily applied when developing high-rise residential areas today.

The objective of our study focusing on one area of Budapest is to show how the planning, architectural, and design solutions that characterise the built environment of the different generations of HEs can have an impact on their position in the housing market. In this context, we seek answers to the following research questions:

- How important is the role of planning, architecture, and design in the housing market position of HEs?

- What housing market trends can be identified in the development of HEs? How could the housing market processes of the different generations of HEs in Csepel be defined and characterised over the last two decades?
- What are the links between local social composition and architecture, planning, and design?
- What perspectives and breakthrough points are possible for the further development of HEs and the strengthening of their position in the housing market?

The case study area is Csepel, a former industrial town which became the administrative district 21 of Budapest in 1950. All types of post-war generations of HEs co-exist here, and the majority of the population still lives in such neighbourhoods. This special geographical context makes it possible to explore the influential role of the built environment on the housing market. The classification of case study areas is based on their architectural characteristics and social data from the Census 2011. There are no newer census data on HEs yet; therefore, we used house prices at the level of HEs calculated by the Hungarian Central Statistical Office (based on house prices provided by the National Tax Office). In order to obtain information on the condition of the building stock and renovation of buildings, empirical surveys were carried out in the HEs for three different years (2012, 2017, and 2022).

2. How to Define Housing Estates?

The term “housing estate” can be interpreted in many different ways. In the broadest sense, from ancient times to the present day, they tend to be built as a series of identical or similar dwellings forming a spatial, planning, and architectural unit. They are distinctive within the urban fabric because of the way they are built as well as their architecture (Ferkai, 2005). Modernism in the first half of the 20th century drove the search for appropriate terminology for these rapidly multiplying residential areas. These distinctive districts or neighbourhood units were called *rayon* and *mikrorayon* in the USSR (Engel, 2019), housing estates in the UK, housing developments or public housing in the US (Glendinning, 2011), *Wohnsiedlung* in the German-speaking world (Balla, 2021), and *grands ensembles* in France (Rotival, 1935). In post-socialist European countries, the word “housing estate” (in its narrowest usage) is stigmatised and refers to the neighbourhoods produced by prefabricated housing factories in the 1960s, 1970s, and 1980s based on uniform standards, design principles, and construction techniques (Hess et al., 2018). In Hungary, the definition of HE has changed several times over the past decades. At the beginning of the 1980s, a HE was defined as a part of a municipality, usually bounded by roads, with a group of dwellings forming a coherent unit. It had to contain at least one electoral district and have a separate name.

In the second half of the decade, a different definition was used: A HE was defined as a form of housing development based on a single plan, built in an organised way, usually based on a standard plan, containing multi-storey dwellings on common plots. Since the 1990s, the concept of HEs has become much simpler: They have been defined as a group of medium and high-rise blocks of flats, mostly built using prefabricated technology (Census HCSO, 2011). Our research was focused specifically on Csepel's post-war HEs, which were built between 1945 and 1990. The time span of more than 30 years since the regime change is important for several reasons. Firstly, after the regime change in 1990, dwellings were privatised, and private ownership became dominant in the housing market (Hegedüs, 2007). The HEs built later were already better adapted to market needs and may still be considered a "novelty" which increases the prices unrealistically. On the other hand, HEs built earlier already require intensive renovation.

The development of HEs has been closely linked to urban development and the evolution of the housing market in cities. In the socialist period, land and housing stock were state-owned, and supply and demand as well as land use and urban planning were under strong state control. The size, population, and consumption of housing in cities were limited by administrative measures (Tosics, 2005). State housing was mainly built in the form of high-density HEs (mostly in the outer zones of cities). Their construction was not only a means of alleviating the severe housing shortage but also an important ideological development. The party-state sought to underpin the power and performance of the socialist economy by building housing rapidly. HEs, by their very nature, provided at the same time a good opportunity to realise the socialist ideal of man (everyone being equal) and the two-child family model. This explains why about 40% of the population of cities in post-socialist countries lives on large HEs and why they are far more important in the urban housing markets of post-socialist cities than in Western Europe (van Kempen et al., 2005).

The urban planning of the state socialist period changed the earlier urban structure characterized by low-rise outskirts and concentration of the highest residential buildings in the city centre. The mass housing construction resulted in the emergence of high- and middle-rise prefabricated buildings in the periphery.

After the change of regime, with the establishment of a capitalist market economy, decentralisation became the dominant factor in the political and urban policy field, resulting in privatisation and liberalisation of planning in the economic and housing market development processes (Enyedi, 1998). New HEs were rarely constructed, and those that existed started to gain a different market value depending on when they were built. In older generations (especially in the HEs of the 1950s), the influx of younger, better-educated strata could be detected bringing a relative upgrading of the housing market, while in younger generations (both in the HEs of the 1970s and

1980) an ageing process and a gradual socio-economic downgrading has taken place (Kovács et al., 2018).

3. The Influence of Planning, Architecture, and Design Values on the Housing Market

It was in the late 1970s that researchers began to point out that architecture, planning, and design could add significant value to the real estate market (Ching, 1979). The concept of real estate market value can be approached from two main perspectives: (a) the value the built environment generates and (b) the determinants of market value as a measure of impact on real estate economics. Macmillan (2006) distinguishes six types of value that the built environment can represent in the real estate market: The most important from a housing market perspective is exchange value, the actual price that the property can be sold for on the market. Besides this, the built environment also represents use, image, social, environmental, and cultural values as well. According to Dubin (1988), the location (geographical location or relative position), structural attributes (size, rooms, age, etc.), and neighbourhood characteristics (socio-economic and physical features) are among the main determinants of market value.

The perception of architectural quality varies over time. Commemorative value relates to the past, while current value relates to the present. In the case of a HE, the present value, in particular its location and use value, is priced by the housing market. Two types of value can be assessed in HEs—the novelty value and the relative artistic value (Riegel, 1903). The novelty value is always about timeliness, i.e., whether in the era of planning and building you can offer something new, different, and forward-looking. Professional awards for urbanism and architecture (apart from the political background) usually qualify this. In the case of HEs, the award has often been given for the development plan itself, its value as a public building, or, less often, a residential building. Half of the six sample sites in Csepel have at some time been award-winning HEs. It is up to the present day to identify the relative artistic value. In Western Europe, an increasing number of modern and post-modern buildings and complexes are becoming listed, but Hungary's HEs are still waiting. Of the six sample sites in Csepel, the oldest modernist HE built in the late 1940s is the one with the greatest relative artistic value. The mini-HEs, the prefabricated buildings, do not have the same value because of their sheer size and their architectural character.

Navickas et al. (2020) identify five areas where architecture has an impact on the real estate market. It is essential to highlight the *spatial dependence*, *spillover effects*, and *externalities* of architecture. There is a relatively long history of studies on the dynamics and spillover effects of house prices at the neighbourhood level (Can, 1990; Wilhelmsson, 2002). In recent years, research on the effects of location and residential environment on the real estate market has gained

momentum (Cellmer & Trojanek, 2020), which provides evidence of the spatial dependence of real estate market processes. Among the studies analysing the significance of *urban and architectural design quality*, the first seminal studies that investigated the effects of the built environment were published in the 1980s. Hough and Kratz (1983) used a hedonic regression model with office market prices in the Chicago central business district, demonstrating that commercial buildings that won architectural awards had a 22% higher value premium. Vandell and Lane (1989) used office buildings in Cambridge and Boston to show that the quality of architecture and design correlates with the rent premium, i.e., the higher the quality of design, the higher the price premium. A similar conclusion was reached by Smith and Moorhouse (1993), who studied the effects of architecture on prices in Boston's residential sector. Using a model that included dwelling size, dwelling characteristics, building materials, architectural style, and features, they concluded that architecture and planning have a positive impact on property values. Lindenthal (2017) recognized the relationship between higher property prices for homogeneously designed residential houses in Rotterdam compared to heterogeneously designed ones. In terms of *heritage aspects*, it has been highlighted that heritage-protected buildings tend to have a positive effect on the residential value of neighbouring buildings (Rudokas et al., 2019). Architectural design and good quality architecture can attract buyers and customers for whom *sustainability* is a priority (Fadaei et al., 2015). From the perspective of *architecture as a non-market or public good*, Scerri et al. (2019) pointed out that architecture as a public good can capture the local characteristics of a place, which can be attractive to local residents and tourists. From the above, we can conclude that planning, architecture, and design can add value to the built environment in both quantitative and qualitative terms. The main problem with creating planning, architecture, and design values is that the developer's goals are predominately short-term and quantifiable, whereas both the user's and community's goals are often long-term and intangible (Millhouse, 2005).

4. Characteristics of Housing Estates in Hungary and Budapest

4.1. On Housing Estates in Hungary and Budapest in Brief

In 2022, of the 4.4 million dwellings in Hungary, 927,000 are in HEs, which makes up 20% of the housing stock. About 600,000 dwellings were built using prefabricated technology, while another 100,000 dwellings in HEs were built before the introduction of prefab technology, using medium or large blocks or cast concrete. There are also more than 200 thousand brick-built HEs. In Budapest, the number of officially recognised HEs is 121, and there are 240,000 dwellings located within these estates.

Seven out of the nine giant HEs in Hungary with more than 10,000 apartments are located in Budapest (Egedy, 2000). In sharp contrast with high-rise cities like Hong Kong (Forrest et al., 2020), high-rise housing is only a small part of the housing stock in Budapest and not even the highest residential buildings are skyscrapers. Based on their planning, architecture, and design, we can distinguish different generations of HEs. A generation of HEs is a group of estates built in roughly the same decade using the same construction technology and grouped together mainly on the basis of similarities in their built environment (see Table 1).

The share of the population living in HEs is around 20% in Hungary and about 30% in Budapest. HEs in Hungary and Budapest generally provide homes for lower-middle class strata. Single people, young couples, and single parents are more likely than average to live in HEs. In older generations of HEs (especially in the HEs of the 1950s), the influx of younger, better-educated strata could be detected since 1990. Since that time, an ageing process and relative social-economic decline have taken place both in the HEs of the 1970s and 1980. HEs, in particular panel estates, fulfil an important housing market function, as they provide an affordable solution for young people entering the housing market and buying their first home or an alternative for elderly people who want to reduce their housing consumption (replacing an expensive family house with a cheaper HE dwelling for single pensioners). This is basically due to the fact that house prices in prefabricated HEs are, on average, 15 to 30% lower than in brick buildings and houses. Although the share of residents with tertiary education is growing in all generations of HEs, the dynamics lag behind the Budapest average. In relative terms, our results testified to a gradual downgrading process in the social status of HEs.

Processes of social exclusion and influx of immigrants, as in some Western European HEs, are not typical in Hungary or Budapest. Thus, problems regarding ethnicity, poverty, marginalisation, or discrimination appear only in a very limited form compared to other European countries and cities (Kovács et al., 2018). With regard to segregation processes inside the buildings, it can be said that the vertical segregation in the prefab buildings is weaker than in the inner city, and it follows a different pattern (Kovács et al., 2022). The social status is in parallel with the height in the inner city of Budapest, just like in historical European metropolises (e.g., Paris) and in some cities with newer building stock (e.g., Athens; Maloutas & Spyrellis, 2016). The segregation shows a different pattern in post-socialist cities like Bucharest: Dwellings on the middle floors have the highest prestige (Marcińczak & Hess, 2019). The same holds true for the mid- and high-rise estates on the outskirts of Budapest.

The effects of the 2008–2009 economic crisis on the housing market in Hungary had largely subsided by 2014 after the trough in house prices in 2013. Since then, the real estate market has seen a dramatic price increase,

Table 1. Generalised characteristics of generations of HEs in Hungary.

	1950s	1960s	1970s	1980s
Planning issues	socialist realism, later modern architecture	Long-term housing plans, use of normatives and standards, and demolition/replacement, prefabrication	Excessive central planning, housing factories, technology defines urban landscape, demolition/replacement, and greenfield development	Increasing private housing, higher quality, and humanisation
Location	Transition zone (between the urban core and periphery)	Transition zone	Peripheral	Peripheral, outlying subcentres
Building technology	Brick	Brick, block technology, and panel technology after 1965	Panel, large panel	Panel and brick
Building stock	Three to four storeys	Four to five, later nine to 10 storeys	10-storey slabs and 15-storey towers	Nine to 10 or four to five storeys
Average housing stock	500–1,000	1–2,000	3–5,000 (+giant estates)	2,000

which has also affected the HEs and has led to a boom in house prices. In the prosperous municipalities, housing stock has appreciated, house prices have risen above their surrounding areas, and the quality of housing has also improved considerably (e.g., in Budapest and in the western part of Hungary).

4.2. Urban and Architectural Characteristics of Housing Estates in Budapest Csepel

Csepel, the former industrial town, the land Manfred Weiss Steel and Metal Works annexed to Budapest in 1950, nowadays promotes itself as a garden city. Industrial production began in the area in the mid-1880s, and by the time of the First World War, the company employed 30,000 workers. After the Second World War, the company was nationalised, and, during the socialist decades, it grew into one of the largest heavy industry complexes in Hungary. During the state-socialism between 1949 and 1989 (Benkő & Kissfazekas, 2019), it was a district recognized by the Csepel Works and the HEs built for the working classes. After the change of political and economic regime, everything was privatised. The factory was divided among more than 200 owners, and the flats in the inherited housing stock became private, inhabited mainly by their owners.

Recently, approximately two-thirds of the actual population of Csepel lives in one of the 14 HEs (Csepel Budapest, 2017). The land use map shows clearly that the HEs are compact and located along the main axis of the districts (see Figure 1). In addition, their green open spaces remained public after the privatisation pro-

cess, a huge, detached house area developed next to the Little Danube, and now the state has started to realise Budapest's 36 ha new public park in the north eastern zone of the district.

In this article, the selected six HEs are presented from an urban design and architectural perspective (see Table 2). These areas represent each generation of HEs, and, with different locations (central and peripheral), these characteristics have a major impact on the prestige of HEs (Benkő, 2015). Following a chronological order, the next section presents the main components of the initial physical environment of these HEs. It highlights some points that could affect their actual market position based on contemporary lifestyle, human needs, and housing values.

4.2.1. Béke Square Housing Estate

The Béke Square HE was the first to be planned and realised after the beginning of the communist regime in 1948 to create a new home for the family of the top employees of the Csepel Works. It is very well located, around a Catholic church, between the terminus of the new suburban railway opened in 1950 and Csepel's football field. This is the district's smallest HE with 352 flats in two different types of four-storey high residential buildings: a slab and a cube. The urban and architectural solutions reflect the early modernism of the interwar period: stand-alone buildings in a green public park; well-orientated one to two bedrooms apartments with big windows or flat roof brick houses (see Figure 2); and human-scaled, green, and car-friendly

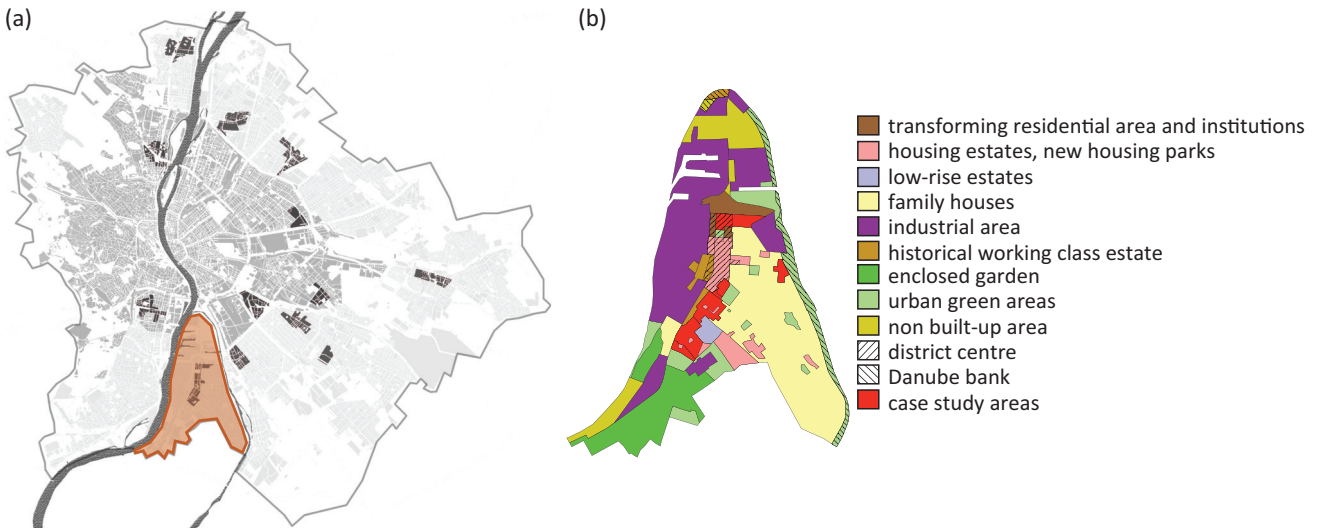


Figure 1. Csepel: (a) Location of District 21 and (b) land use in Csepel. Source: Authors’ work based on Csepel Budapest (2017).

areas with buildings built using traditional technology, without an elevator, but with sophisticated architectural details. This neighbourhood can be classified as one of the first modern experiments in Hungary to realise HES using standardised residential buildings.

4.2.2. Csillagtelep Housing Estate

Csillagtelep was planned just after the socialist-realist period in 1954–1955 and realised between 1955 and 1966. Altogether, 1,893 flats were built in the 1950s and

Table 2. Characteristics of the case study areas.

	Construction period	Number of dwellings	Building type	Share of prefab flats (%)	Location within the district
Béke Square	1949–1966	352	Brick, three and four storeys	8.3	Central
Csillagtelep	1954–1967	2,159	Brick, three to five storeys	14.4	Peripheral
Ady Street	1959–1979	3,714	Panel, 10, 11, and 15 storeys	86.0	Central
Királymajor	1977–1979	1,216	Panel, five and 11 storeys	100.0	Peripheral
Simon Bolivar	1982–1989	3,371	Panel, five and 11 storeys	100.0	Central
Rakéta Street	1986–1988	756	Panel, four and five storeys	100.0	Peripheral

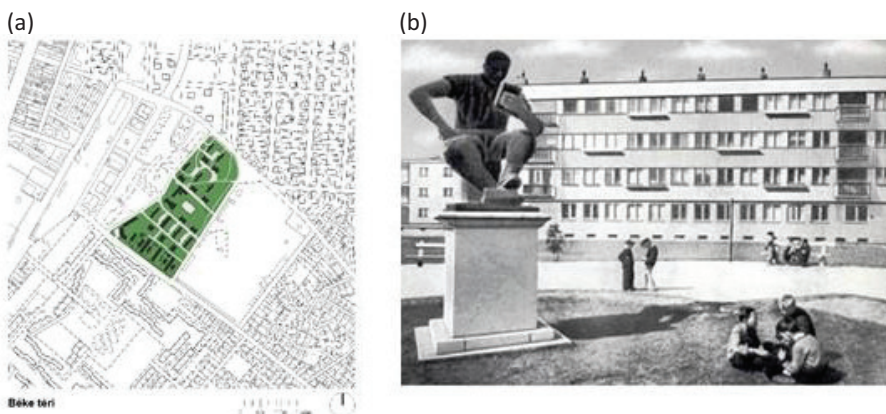


Figure 2. Béke Square HE: (a) Layout and (b) experimental type of a modern residential building with the Reading Worker statue (1951) in the foreground. Source: Sziklai (1953).

other 266 at the beginning of the 1960s. The neighbourhood is composed of residential urban blocks around an inner block of a primary and a secondary school complex. In the residential areas, three-to-four-storey-high slabs and cubes built using different traditional technologies form smaller urban units organised around their open public, car-free, green courtyard. Small basic services (nursery, bakery, traffic, post office, etc.) established in kiosk-like buildings served the inhabitants (see Figure 3). The neighbourhood has a clear urban structure based on a new street network, and the residential buildings are well orientated, but the flats are small: approximately 60% are just studios, 30% are one-bedroom flats, and most of them have no balcony. Being isolated and at the edge of the district, Csillagtelep became like a small city within Csepel with an introverted but strong community.

4.2.3. Ady Housing Estate

The regeneration of Csepel's centre according to the modern concept of demolition and replacement started in the 1950s. Ady HE, officially the third phase of the regeneration project, became one of the first Hungarian HEs fully constructed using prefabricated concrete panels produced by factories. Here, at the beginning of the "panel period," two different technologies were used: the Soviet and the Danish Larsen-Nielsen. Along the main road toward Budapest's historic city centre, five

10-storey-high Soviet panel slabs border the north side of the HE, creating a drastic rupture in the urban fabric giving the impression of a landmark wall. On the contrary, the four 11-storey-high Danish perpendicular slabs are only oriented towards the east or the west (see Figure 4). However, in these residential buildings, the flats have no balconies. The Ady HE is composed of approximately 3,700 flats, and all the basic public facilities (e.g., nursery, primary school, playground, senior residential home, and other services) are located in standard buildings along the main inner axis of the urban composition. The central zone is a green, car-friendly, calm environment, and the parking places (one for every 10 flats) are located at the edge of the superblock.

4.2.4. Királymajor Housing Estate

Built in 1978–1979, the Királymajor HE consists of a single building, an 11-storey-high tower. In some places, this building stands alone, whereas, in others, three or four units are connected in a zigzag pattern. There are six apartments on each floor, four of which are in a corner position and have balconies, and two smaller ones are unidirectional. A total of 1,216 apartments have been built here on the edge of the industrial area and detached housing zone, away from the centre of Csepel and the other HEs. Királymajor's special value is the proximity to a branch of the Little Danube as well as the green



Figure 3. Csillagtelep: (a) Layout and (b) open inner courtyard built in the 1950s. Source: VÁTI (1968).



Figure 4. Ady HE: (a) Layout and (b) slabs built by the Danish Larsen-Nielsen (left) and Soviet-type (right) panel technology.

infrastructure (Balla, 2019). The natural landscape is visible from almost every apartment and can be experienced by everyone as they leave the building (see Figure 5). Along with the residential buildings, the primary level facilities and the public green park of the neighbourhood have been developed in a sophisticated way.

4.2.5. Simon Bolívar Housing Estate

The architecturally award-winning superblock is composed of three different urban areas: along the main street 11-storey-high zigzag slabs provide a clear borderland (see Figure 6), meanwhile on the three other sides, human-scale, four-storey high panel buildings frame the development (Barna et al., 1995). In addition, public facilities are grouped in the middle of the central green park of the neighbourhood, forming an ÁMK (general cultural-educational centre). Another unique feature introduced here is the Dutch Wohnerf system, a shared space organisation of the traffic between the residential buildings and the public centre. In 1976, a new catalogue for panel buildings appeared with some small opportunities

for innovation: corner sections to allow more complex urban compositions, as well as apartments for different households, to accommodate multi-generational families, large families, or single people. Technology followed new demands slowly, and the famous family “E” panel with a 5.40 m panel structure was realised only in 1982 (Körner & Nagy, 2006). As a consequence, the interior organisation of the panel flats changed, and larger living spaces with small bedrooms became typical.

4.2.6. Rakéta Street Housing Estate

One of the last HEs to be built in Csepel and communist Hungary is Rakéta Street HE, built between 1986 and 1988. It is a small neighbourhood with only 756 flats, on the southern border of the district, between the Csillagtelep from the 1950s and the cemetery. Five-storey apartment blocks are arranged along a quiet green lane with no cars, and the entrances and parking spaces are located on the other sides of the buildings (see Figure 7). It was constructed as a residential development because of the ageing of the neighbouring HE,

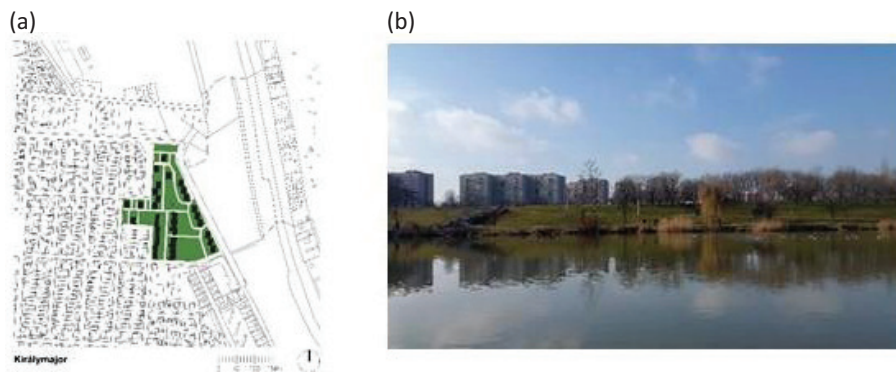


Figure 5. Királymajor HE: (a) Layout and (b) location on the riverbank of the Danube.



Figure 6. Simon Bolivar HE: (a) Layout and (b) detail of the superblock.

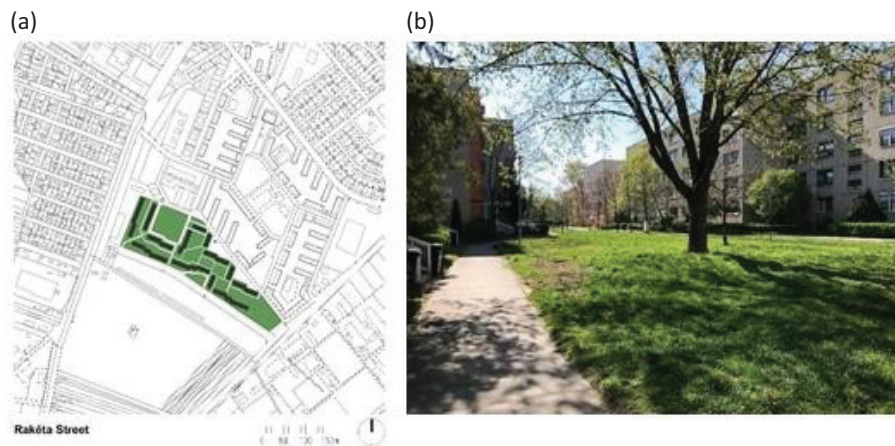


Figure 7. Rakéta Street HE: (a) Layout and (b) car-free street with inner green space between the low-rise slabs.

Csillagtelep. It was thought that newcomers could use the existing public infrastructure of the area.

5. Socio-Economic Characteristics, Housing Stock, and Housing Market Positions of Csepel Estates

5.1. Local Social and Demographic Conditions

Csepel is traditionally a working-class district, where the earlier social profile still has an effect on the recent social composition. The demographic profile of the HEs shows a younger population compared to the low-rise residential areas of Csepel. The share of young people (aged 20 to 40) is 32% in HEs, while it is only 26% in low-rise residential areas. The difference between the HEs is predominantly based on the construction period. The share of the elderly population (60+) is somewhat higher in the older generations of HEs (e.g., 30% in Csillagtelep, built in the 1950s), while it is lower in the newer estates (only 15% in the Simon Bolivar HE built in the late 1970s and early 1980s). HEs typically provide homes for families with children (Kovács et al., 2018), and the ratio of children in HEs is between 14 and 19%.

HEs are essentially for middle-class groups, meaning those who have secondary level education and those who work in middle-income professional groups (ISCO3–5). This perfectly fits the HEs of Csepel, because 68% of the population has completed secondary education, almost 20% have a lower level of education, and only 15% have a university degree. In general, 29 to 31% of the active population of HEs are in the middle employment categories (ISCO3–5). Thus, the social status of the HEs in Csepel is basically lower compared to other parts of the district.

There are apparent differences in the social status of HEs. The status is the highest in the Rakéta HE (17% higher educated and 22% professionals), which is the newest HE with larger flats. In the second half of the 1980s, modernised HEs were constructed, wealthier families moved there, and the social structure of Rakéta is inherited from this period. The Csillagtelep and Ady HEs

have a clear working-class profile. More than one-third of the active population are manual workers, and more than one-fifth of the population is uneducated, showing the traditional working-class profile of old Csepel.

5.2. Housing Stock and Rehabilitation

The composition of the housing stock in the district is two-fold: Sixty per cent of the housing stock is located in HEs, and the remainder is in low-rise detached houses. The composition of the housing stock by dwelling size depends mainly on the period of construction of the neighbourhoods. In the HEs, there are hardly any large dwellings (over 80 m²), the vast majority of dwellings being medium-sized (50 m² on average), in line with the housing ideology of the socialist period. The proportion of small dwellings (less than 40 m²) is between 25 and 35% in the older generations of HEs, much lower in the younger generations, and hardly ever found in the most recently built estates (see Table 3).

The urban rehabilitation program of the district government has also had an impact on the dwelling stock of HEs since it focused on large HEs (Szabó & Burneika, 2020). In Csepel, the district government launched an urban rehabilitation project (so-called Ady Project) in 2011, which included support for housing renovation in the central part of Csepel. The rehabilitation of the Ady HE as part of the central zone started in the early phase of the project; accordingly, the ratio of dwellings in completely renewed buildings in the early phase is 15.3% (see Table 4). The main period of the rehabilitation was in the middle of the 2010s when another 20% of Ady HE buildings were insulated. Rehabilitation of the Simon Bolivar and Csillagtelep HEs started in this period as well (Table 3).

Since the national and local rehabilitation programmes support only buildings built by prefabricated technology, old brick-built HEs can hardly afford to finance complete insulation. As a result of this, other low-cost and small-scale renovation activities appeared in the HEs that affect the house prices and values (e.g., painting

Table 3. Characteristics of HEs in Csepel.

	(a) Share of flats by size (%)			(b) Share of dwellings in renovated buildings (%)					
	Below 40 m ²	40–80 m ²	Above 80 m ²	Complete renovation			Partial renovation		
				2012	2017	2022	2012	2017	2022
Béke	26.7	72.8	0.5	0.0	0.0	8.2	68.4	71.4	77.6
Csillagtelep	35.2	64.3	0.5	0.0	7.1	8.1	23.5	29.3	39.1
Ady	17.1	82.6	0.3	15.3	35.7	35.7	0.0	0.0	10.9
Királymajor	27.2	72.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Simon Bolivar	13.8	84.3	1.9	0.0	9.7	12.1	11.5	18.2	24.9
Rakéta	3.9	89.9	6.2	11.1	11.1	11.1	11.1	29.6	33.3

Sources: (a) Census HCSO (2011); (b) Authors' own surveys in 2012, 2017, and 2022.

of buildings in Béke HE, partial insulation in Rakéta and Simon Bolivar HEs). Most of these renovations occurred in the first half of the 2010s. After 2017, the rehabilitation process slowed down in the district, only the buildings of Csillagtelep saw significant benefits from rehabilitation (10%).

5.3. Housing Estates Within the Local Housing Market of Csepel

With regard to house prices, there is a significant difference of more than 10% in transaction prices in HEs. Taking into account the average house prices per square metre, the highest rates could be observed in Csillagtelep and Királymajor (see Table 4). The former is a HE built with non-prefab technology and planning structure. The prestige of non-prefab, old HEs increased significantly in the housing market in the 2000s due to their green local environment, mid-rise buildings with brick walls, and the high share of small flats (preferred by young couples). The most important advantages include the traditional architectural structure (four- to five-storey high buildings), brick walls, and lots of green areas. The Királymajor HE is located in a good environment next to the Danube River, which is actually the only benefit of the HE.

The lowest house prices per square metre are in the Rakéta HE, which has a peripheral location. The com-

position of dwelling stock could be one of the reasons. An average flat is the most expensive in the Rakéta HE because a typical flat is 60 m², which is 10 m² larger than the other estates.

Due to the fact that renovation has a long-term impact on the housing market (minimum of five years), the most renovated HE, Ady, is still not among the most expensive HEs. However, a quite dynamic increase in house prices was noted (more than 340%) in those HEs which were renovated in recent years (e.g., Ady, Béke, and Simon Bolivar HEs)

The location and residential environment exert a powerful influence on the housing market, and their role in the prestige of urban neighbourhoods increased after the change of the regime (Nzimande & Fabula, 2020). In the case of Ady HE, the central location is rather a drawback because the estate lies in a busy junction of the main roads of Csepel with high pollution and noise. In the case of Királymajor, location has a positive effect on the housing market position of the estate (actually the only one) because the riverside provides favourable environmental conditions for its residents. Surprisingly, thanks to its location, it is the most prestigious HE in Csepel. The planning structure plays only a limited effect on the prestige, as the case of the Simon Bolivar HE shows: From an architectural point of view, it has better characteristics than Királymajor, but the prices are lower thanks to the less favourable location inside the district.

Table 4. House prices of HEs (in EUR).

	House price, in EUR/sqm (between 2013 and 2021)	Average house price 2021	House price change 2013–2021 (%, 2013 = 100%)
Béke	746.1	64,122	+351.1
Csillagtelep	809.8	54,692	+310.4
Ady	764.9	58,002	+354.2
Királymajor	809.5	66,659	+323.4
Simon Bolivar	742.7	64,710	+347.8
Rakéta	689.0	70,709	+325.8
Csepel HEs	768.1	62,915	+335.9
Csepel	789.2	69,804	+324.4

Source: Census HCSO (2011).

6. Discussion and Conclusions

According to Navickas et al. (2020), planning and architecture play an important role in shaping the built environment, and the built environment has a great influence on the real estate positions of HEs. In general, due to the technological disadvantages of prefabricated buildings, the older brick-built HEs and mid-rise buildings occupy a better market position. This is despite the fact that these buildings were originally built for the working classes, so the dwellings are small, and the buildings have no elevator.

The role of architecture and design is also reflected in the composition of the housing stock so that their effects on the housing market, although indirect, are evident in the long term. In terms of dwelling size, the housing situation in HEs has become more favourable over time. The younger the generation of a HE, the more favourable and heterogeneous the composition of the housing stock. This means a lower proportion of small dwellings (traditionally a major reason for people to move) and a higher proportion of larger dwellings (see the case of Béke Square vs. Rakéta Street).

The role of renovation and therefore of design in driving up house prices is particularly strong in HEs that have undergone significant renovation. This is well illustrated by the housing market situation in the Ady HE. The HE is in a medium position among the estates surveyed but has seen the most dynamic increase in the price per square metre. In those HEs where a complete renovation of residential buildings has not been achieved (e.g., architectural structure or financial means of the local society do not allow participation in support programmes), partial renewals were initiated and/or financed by the local community (see the cases of Béke Square and Csillagtelep). These interventions are more pronounced in older generations.

In today's housing market processes, the role of architecture has increasingly been taken over by urban design and urbanism. In other words, although house prices are influenced by the architectural image, it is the characteristics of the living environment and the urban design solutions used (e.g., the rehabilitation of public spaces and public buildings, the quality of the environment) that are more important. Environmental aspects became significant after the change of the regime, and they have a major impact on the market position within a district (Fabula et al., 2021).

Today, HEs are a significant asset in terms of liveability. A green environment, a low building percentage, child-friendly, car-free super-blocks, public services, and facilities within 15 minutes are all in line with contemporary urban design principles. Architecturally and technically, there is a big difference in the materials and technology used in residential buildings. Traditionally built brick houses are much more sought-after and offer a higher level of security than large-panel prefabricated blocks. Brick buildings are also richer in terms of architectural

details (e.g., entrance, windows, etc.) and easier to adapt, which is a definite value-adding factor.

In Csepel, the green environment and the vicinity of the riverside give a positive market value to the Királymajor HE, which has neither good planning design nor renovated buildings and good transport connections. The case of Királymajor highlights well the changing role of location: While location (where to build up a HE) was not a planning issue in the state-socialist system when the whole urban area was owned by public planning authorities, it has now become the most important housing market factor. The planning and design of HEs lost their original value, although they were modern at the time of construction, they have no positive effect on the market value today (see the case of Simon Bolivar HE).

In Hungary and in the HEs, the majority of people live in low-rise and mid-rise buildings, with high-rise being a negligible housing market factor. The real estate prices in Budapest show that low-rise represents a more valuable housing market segment than mid-rise due to their human scale, proximity to land, and access to green spaces. The value of the mid-rise today is driven partly by the accessibility of the dwellings because of elevators, an increasingly important consideration for the ageing HE population. On the other hand, the panoramic views from the upper floors of buildings in peripheral locations are an important asset. In the case of Budapest–Csepel, for example, this value is represented by the view of the Danube and its public park (Királymajor HE), the Buda Hills (slabs of the Simon Bolivar HE) or the city centre (the northern lanes of the Ady HE). The planning and design of high-rise buildings and neighbourhoods should therefore aim to create spaces and surroundings that allow residents to enjoy these benefits.

Looking back at Macmillan's (2006) theory of values, the importance of exchange, environmental, and image values clearly outweighs the role of use, social, and cultural values. Current real estate market prices show that the location, the quality of the immediate surroundings, and the size of the HE can easily override the value represented by construction, building, or structural attributes (Balla et al., 2017). The use value of a given dwelling and its renovation does not really add much to the exchange value, as everyone shapes their home according to their own needs.

From a historical point of view, an obvious repositioning of the main determinants of market value suggested by Dubin (1988) took place. According to our empirical results, the typical priorities of market value determinants characterising the early (socialist) phase of the development of HEs (i.e., structural attributes, neighbourhood characteristics, and location) were actually reversed and nowadays, in a market economy, the role of location is decisive, neighbourhood characteristics are important, and structural attributes play a subordinate role.

There is a strong correlation between the housing market situation, house prices, and the composition of

the population in HEs. The historical development of the neighbourhood (the importance of path dependency) has played a decisive role in shaping the composition of local society, which was later modified by the housing market situation through house prices. Differences in the built environment have led to different paths for HEs on the housing market, which also entails a slow transformation of the social environment. In the case of HEs, the curious situation is that before the regime change, it was architecture, planning, and design that had an impact on the composition of the local population moving in. After the regime change, in the new social and economic environment, they contributed rather to the significant change and differentiation in the composition of the population. All of this shows that the spillover effects of architecture, planning, and design in the housing market must be understood as a constantly changing and dynamic system over time.

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Conflict of Interests

The authors declare no conflict of interests.

References

- Balla, R. (2019). Élhetőség a szomszédban [Liveability in the neighbourhood]. *Metszet*, 10(3), 10–17. <https://doi.org/10.33268/Met.2019.3.1>
- Balla, R. (2021). *Az 1945 után épült modern nagy lakótelepek Budapesten* [Modern large housing estates built after 1945 in Budapest] [Doctoral dissertation, Budapest University of Technology and Economics]. DSpace. <https://repozitorium.omikk.bme.hu/bitstream/handle/10890/16843/ertekezes.pdf?sequence=2&isAllowed=y>
- Balla, R., Benkő, M., & Durosaiye, I. (2017). Mass housing estate location in relation to its livability: Budapest case study. In E. Tracada & G. Cairns (Eds.), *Cities, communities and homes: Is the urban future livable?* (pp. 192–203). AMPS.
- Benkő, M. (2015). Budapest's large prefab housing estates: Urban values of yesterday, today and tomorrow. *Hungarian Studies*, 29(1/2), 21–36. <https://doi.org/10.1556/044.2015.29.1-2.2>
- Benkő, M., & Kissfazekas, K. (Eds.). (2019). *Understanding post-socialist European cities*. L'Harmattan.
- Can, A. (1990). The measurement of neighborhood dynamics in urban house prices. *Economic Geography*, 66(3), 254–272. <https://doi.org/10.2307/143400>
- Cellmer, R., & Trojanek, R. (2020). Towards increasing residential market transparency: Mapping local housing prices and dynamics. *International Journal of Geo-Information*, 9(2), Article 2. <https://doi.org/10.3390/ijgi9010002>
- Census HCSO. (2011). *2011. évi Népszámlálás—A lakások és lakóik* [Census 2011—The apartments and their occupants]. Hungarian Central Statistical Office.
- Ching, F. D. (1979). *Architecture: Form, space, and order*. Wiley.
- Csepel Budapest. (2017). *XXI Kerület Településképi Arculati Kézikönyve* [Urban design manual of Csepel]. https://www.csepel.hu/anyagok/kepek/cikkek/2017_12/Csepel_Arculati_Kezikonyve_2017.pdf
- Dubin, R. A. (1988). Estimation of regression coefficients in the presence of spatially autocorrelated error terms. *The Review of Economics and Statistics*, 70(3), 466–474. <https://doi.org/10.2307/1926785>
- Egedy, T. (2000). The situation of high-rise housing estates in Hungary. In Z. Kovács (Ed.), *Hungary towards the 21st century: The human geography of transition* (pp. 169–185). Geographical Research Institute; Hungarian Academy of Sciences.
- Engel, B. (Ed.). (2019). *Mass housing in the socialist city: Heritage, values, and perspectives*. DOM.
- Enyedi, G. (1998). Transformation in Central European postsocialist cities. In G. Enyedi (Ed.), *Social change and urban restructuring in Central Europe* (pp. 9–34). Akadémiai Kiadó.
- Fabula, S., Skovgaard Nielsen, R., Barberis, E., Boros, L., Hedegaard Winther, A., & Kovács, Z. (2021). Diversity and local business structure in European urban contexts. *Hungarian Geographical Bulletin*, 70(1), 65–80. <https://doi.org/10.15201/hungeobull.70.1.5>
- Fadaei, S., Lulo, L. D., & Yoshida, J. (2015). Architecture: A missing piece in real-estate studies of sustainable houses. *Procedia Engineering*, 118, 813–818. <https://doi.org/10.1016/j.proeng.2015.08.518>
- Ferkai, A. (2005). *Lakótelepek* [Housing estates]. Városháza.
- Forrest, R., Tong, K. S., & Wang, W. (2020). Residential stratification and segmentation in the hyper-vertical city. In S. Musterd (Ed.), *Handbook of urban segregation* (pp. 346–365). Edward Elgar.
- Glendinning, M. (Ed.). (2011). *Post-war mass housing: East + West*. Docomomo International. <http://openarchive.icomos.org/id/eprint/1494>
- Glendinning, M. (2021). *Mass housing: Modern architecture and state power—A global history*. Bloomsbury Visual Arts.
- Hegedüs, J. (2007). Social housing in transition countries. In C. Whitehead & K. Scanlon (Eds.), *Social housing in Europe* (pp. 165–177). Routledge.
- Hess, D. B., Tammaru, T., & van Ham, M. (2018). Lessons learned from a pan-European study of large housing estates: Origin, trajectories of change and future prospects. In D. B. Hess, T. Tammaru, & M. van Ham (Eds.), *Housing estates in Europe: Poverty, ethnic segregation and policy challenges* (pp. 4–31). Springer.
- Hough, D. E., & Kratz, C. E. (1983). Can “good” archi-

- ecture meet the market test? *Journal of Urban Economics*, 14, 40–45.
- Körner, Z., & Nagy, M. (2006). *Az európai és a magyar telepszerű lakásépítés története 1945-től napjainkig* [The history of European and Hungarian estate-like housing construction from 1945 until now]. Terc Kiadó.
- Kovács, Z., Egedy, T., & Szabó, B. (2018). Persistence or change: Divergent trajectories of large housing estates in Budapest, Hungary. In D. B. Hess, T. Tamaru, & M. van Ham (Eds.), *Housing estates in Europe: Poverty, ethnic segregation and policy challenges* (pp. 191–214). Springer.
- Kovács, Z., Székely, J., & Szabó, B. (2022). Vertical micro-segregation in apartment buildings in Budapest. In T. Maloutas & N. Karadimitriou (Eds.), *Vertical cities—Micro-segregation, social mix and urban housing markets* (pp. 189–203). Edward Elgar.
- Lindenthal, T. (2017). Beauty in the eye of the homeowner: Aesthetic zoning and residential property values. *Real Estate Economy*, 48, 530–555.
- Macmillan, S. (2006). Added value of good design. *Building Research & Information*, 34(3), 257–271. <https://doi.org/10.1080/09613210600590074>
- Maloutas, T., & Spyrellis, S. (2016). Mapping the vertical social stratification of residents in Athenian apartment buildings. *Méditerranée*, 127, 27–36.
- Marcińczak, S., & Hess, D. B. (2019). Vertical segregation of apartment building dwellers during late state socialism in Bucharest, Romania. *Urban Geography*, 41(6) 823–848.
- Millhouse, J. A. (2005). *Assessing the effect of architectural design on real estate values: A qualitative approach* [Master's thesis, Massachusetts Institute of Technology]. DSpace@MIT. <http://hdl.handle.net/1721.1/33195>
- Navickas, V., Skripkiūnas, T., Tanas, J., & Trojanek, M. (2020). The influence of architecture on the real estate market value: A methodological framework. *Journal of International Studies*, 13(4), 38–53. <https://doi.org/10.14254/2071-8330.2020/13-4/3>
- Nzimande, N. P., & Fabula, S. (2020). Socially sustainable urban renewal in emerging economies: A comparison of Magdolna Quarter, Budapest, Hungary and Albert Park, Durban, South Africa. *Hungarian Geographical Bulletin*, 69(4), 383–400. <https://doi.org/10.15201/hungeobull.69.4.4>
- Riegel, A. (1903). *Der moderne Denkmalkultus, sein Wesen, seine Entstehung* [The modern monument cult, its essence, its origin]. Braumüller.
- Rotival, M. (1935). Les grands ensembles [The large complexes]. *L'Architecture d'Aujourd'hui*, 6(6), 57–63.
- Rudokas, K., Landauskas, M., Viliūnienė, O., & Gražulevičiūtė-Vilenišké, I. (2019). Hedonic analysis of housing prices and development in Kaunas: Heritage aspect. *Environmental Research, Engineering and Management*, 75(2), 15–27. <https://doi.org/10.5755/j01.erem.75.2.22823>
- Scerri, M., Edwards, D., & Foley, C. (2019). Design, architecture and the value to tourism. *Tourism Economics*, 25(5), 695–710. <https://doi.org/10.1177/1354816618802107>
- Smith, M. S., & Moorhouse, J. C. (1993). Architecture and the housing market: Nineteenth century row housing in Boston's South End. *Journal of the Society and Architectural Historians*, 52(2), 159–178.
- Szabó, B., & Burneika, D. (2020). The impact of social structure and physical characteristics on housing estate renovation in post-socialist cities: Cases of Vilnius and Budapest. *Geographia Polonica*, 93(2), 229–244.
- Sziklai, D. (1953, March 25). *Városkép—Csepeli pillanatképek* [Cityscape—Csepel snapshots]. [Photograph]. (MTI-FOTO-M_SZI____557759). MTVA Sajtó- és Fotóarchívum, Budapest, Hungary.
- Tosics, I. (2005). City development in Central and Eastern Europe since 1990: The impact of internal forces. In F. E. I. Hamilton, K. Dimitrowska-Andrews, & N. Pichler-Milanović (Eds.), *Transformation of cities in Central and Eastern Europe: Towards globalization* (pp. 44–78). The United Nations University Press.
- Urban, F. (2011). *Tower and slab: Histories of global mass housing*. Routledge.
- Vandell, K. D., & Lane, J. S. (1989). The economics of architecture and urban design: Some preliminary findings. *AREUEA Journal*, 17(2), 235–260.
- van Kempen, R., Dekker, K., Hall, S., & Tosics, I. (Eds.). (2005). *Restructuring large housing estates in Europe: Restructuring and resistance inside the welfare industry*. Policy Press.
- VÁTI. (1968). *Csepel, Csillagtelep, Orion utca* [Csepel, Csillagtelep, Orion street]. [Data set]. <https://fortepan.hu/hu/photos/?q=csillagtelep>
- Wilhelmsson, M. (2002). Spatial models in real estate economics. *Housing, Theory and Society*, 19(2), 92–101. <https://doi.org/10.1080/140360902760385646>

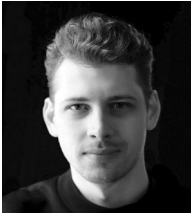
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