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CHALLENGES AND OPPORTUNITIES IN THE REDEVELOPMENT OF PUBLIC OPEN SPACE WITHIN MULTI-FAMILY HOUSING ESTATES IN POST-SOCIALIST CZECH REPUBLIC

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Abstract

This research explores the evolution of public open spaces (POS) in large housing estates (LHE) within the post-socialist context, using the Czech Republic as example. The study investigates the challenges and opportunities associated with the redevelopment of POS, considering the impacts of privatization, socio-economic transformations, and urban renewal policies. It also explores the continuity of urban morphology from the socialist era in the post-socialist period, pointing out the complex connections between inherited urban forms and contemporary needs for urban renewal. The methodological approach is based on an exemplar of best practice analysis, with a specific focus on the Na Dolika LHE, which serves as an illustrative example of POS revitalization efforts. The findings highlight key factors that influence successful redevelopment, including community engagement, sustainable design, and policy frameworks. Additionally, it discusses the first state-level urban renewal policies in Czechia, such as the Program PANEL and Green Light for Savings Program, which aimed to improve technical standards and energy efficiency in buildings, along with public area enhancements. The research contributes to the understanding of post-socialist urban transformation and offers insights for the improvement of POS in similar contexts.

Key words: *Public open space (POS), Multi-family housing estates, Housing policy, Czech Republic, Post-socialist period, POS redevelopment, Case of Na Dolika LHE*

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1. INTRODUCTION

The socialist urban planning in Czechoslovakia was greatly influenced by Marxist theories, where space was considered as a product and an instrument of social relations [1]. The transformation of public open spaces (POS) within large housing estates (LHE) is a critical issue in the context of post-socialist urban development. As Eastern European countries, including the Czech Republic, transitioned from centrally planned economies to market-oriented societies, the role and management of POS within these estates underwent significant changes. The importance of POS in fostering community cohesion, enhancing urban quality of life, and contributing to sustainable urban development cannot be overstated.

In the post-socialist period, the privatization of housing and shifts in ownership structures posed numerous challenges for the maintenance and redevelopment of POS. These spaces, once under state control and often neglected during the transition period, now face issues such as deterioration, inadequate investment, and unclear management responsibilities. However, the revitalization of POS presents not only challenges but also opportunities for improving the urban environment and social fabric of LHEs.

Previous researches have explored various aspects of urban transformation in post-socialist cities, yet there remains a gap in understanding the specific processes and outcomes related to the redevelopment of POS in LHEs. This study aims to fill this gap by focusing on the Czech Republic, a country that provides a representative example of post-socialist urban dynamics.

The research will first present the basic morphology as a typical construction in socialism, and later that morphology was reflected on the period of post-socialism with examples that experienced regeneration in public open spaces. That is why it is important to consider the morphology that arose in socialism, because such that morphology continued in post-socialism as a legacy. The research will examine the evolution of POS in LHEs, with particular attention to the challenges and opportunities that have emerged in the context of privatization and urban renewal policies. The post-socialist transition in this country, marked by significant political, economic, and social changes, provides valuable insights into the broader trends affecting POS in LHEs across the region.

Private spaces were confined to the household, while public spaces were areas of communal living and state influence. This dichotomy was critical in shaping everyday life and social interactions within the estates. The Housing Act in Czechoslovakia was adopted in 1964. This act played a significant role in the allocation of housing during the socialist period, with specific characteristics that reflected the social and political priorities of the time. The Housing Act emphasized the allocation of housing based on social criteria. This approach was reflective of the socialist ideology of prioritizing collective needs and social welfare over individual preferences. The act gave a high priority to the creation of family housing units

This characteristic of the Housing Act showcases the state's less favorable attitude towards single adults in comparison to families, which can be interpreted as a reflection of the social norms and values promoted by the socialist government. While it was technically possible to build a home privately, the act

made it difficult to do so. This aspect of the Housing Act aligns with the broader socialist agenda, which tended to favor state control and planning over individual initiatives in sectors like housing. This regulation reflects the central role of the state in managing and directing housing construction and allocation. The goal set by the Central Committee of the Czechoslovak Communist Party (KSČ) to construct 1,200,000 dwellings by 1970 and the shift towards industrialized construction methods is analyzed with reference to Musil, a prominent urbanist and sociologist who assisted in urban planning at the time [2].

The construction of housing estates in Czechoslovakia, as well as other East-Central European countries like Poland and Hungary, was at its peak during the 1970s, continuing until the late 1980s. The construction of these housing estates was made as industrial in character as possible, justifying the standardization in housing form and engineering practice from the mid-1960s till the end of socialism [3]. The housing estates were built on "Greenfield sites" separated from the already existing urban areas, with full public services and sufficient working opportunities for the residents. The physical appearance of these housing estates showed a direct connection to modernist architecture, but the ideas behind their creation were also related to the aspiration of socialist ideologues to make a positive change in the name of socialist modernization.

The dawn of the 90s ushered in a new era for post-socialist societies, a time when the fabric of institutional planning and housing policies underwent significant transformations. This period saw the emergence of new organizational frameworks for multi-family housing complexes, introducing a novel approach to handling Public Open Spaces (POS). Alongside the construction of new buildings, there was a pressing need to breathe new life into the existing Large Housing Estates (LHEs) and their adjacent POS.

This paper is structured as follows:

The first section provides an overview of the housing policy and urban planning context in the post-socialist Czech Republic, followed by an analysis of the morphological types of LHEs and their transformation over time. The third section focuses on the treatment of POS within inherited LHEs, exploring both the challenges and opportunities for the redevelopment. The role of POS in the urban renewal and revitalization of legacy LHEs. A detailed case study of the Na Dolika LHE is presented to illustrate practical examples of POS revitalization. The paper concludes with a discussion of the findings and their implications for urban planning and policy.

This research adopts a case study approach to investigate the reconstruction of public open spaces (POS) within large housing estates (LHE) in the post-socialist Czech Republic. The case of Na Dolika LHE was chosen as a representative example to illustrate the transformation of POS in the post-privatization era.

The research is based on the analysis of available data, information and findings from previous research and reference literature related to urban development, urban and housing policy in the Czech Republic in the post-socialist period. The analysis is framed in the broader context of post-socialist urban transformation, drawing on relevant theoretical frameworks and previous research on the role of POS in community cohesion and sustainability.

2. HOUSING AND URBAN DEVELOPMENT IN POST-SOCIALIST PERIOD: SETTING THE CONTEXT

Fifteen years following the abrupt end of the socialist regime, Eastern European countries, having courageously dismantled their communist governments, declared the successful transition to market-oriented democratic societies. This pivotal achievement was formally recognized with their accession to the European Union in 2003, marking these nations' full membership, with additional former Eastern Block countries joining in 2007 and more listed as candidates. This period highlights two critical observations: firstly, the majority of these erstwhile socialist states have significantly progressed in enacting comprehensive political and economic reforms. Secondly, the pace and outcomes of these reforms have varied across the Eastern block, yielding diverse results. This variance makes the past fifteen years a prime period for examining the intricate interplay among market dynamics, political developments, and historical contexts [4]. As Sýkora observed regarding the reforms after socialism “The political change took only a few weeks and the core institutional transformations of economic system were accomplished within a few years, however, the change of settlement structures will take many years or decades” [5].

2.1. Morphology of large housing estates (LHE)

The morphological analysis of large housing estates (LHE) in the Czech Republic reveals significant variations in their design and layout, which have evolved over time. During the socialist era, LHEs were characterized by standardized, industrialized construction methods, resulting in uniform and often monotonous urban landscapes. However, the post-socialist period has witnessed diverse approaches to the transformation of these spaces, influenced by the privatization and changing urban policies. From the perspective of urban morphology, Czech residential areas can be classified into six basic types:

Rows: The development is characterized by simple, predominantly right-angled geometry and a sequence of repeating rows of houses arranged along guiding lines (Fig.1). The row structure represents the earliest form of breaking up the traditional closed urban block.

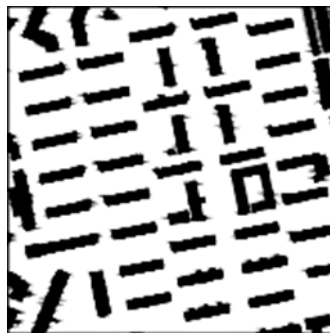


Figure 1. Mining estate Poruba, Ostrava; [6]

Classic examples of row settlements include Solidarity or the first phase of construction in Poruba – the so-called Emergency Miners' Settlement, which followed older pre-war examples (Břevnov, Zelená Liška) or international

settlements like New Frankfurt or the Siemensstadt settlement in Berlin. This type of settlement later found application in a number of settlements of the so-called final phase of settlement construction, such as Pankrác, Krč, or Novodvorská in Prague, reflecting the evolution of urban planning approaches and adaptation to changing social demands over time.

Field: A characteristic feature of this system is the organization of tower buildings (Bohnice, Barrandov in Prague, Nový Pustkovec in Ostrava, or settlements in the central part) or lower point block buildings (Prosek, Ďáblice in Prague, or the Southern Slopes in Zlín) arranged in rows or grids (often in a chessboard layout), but in many cases organically without a clear leading geometry (Fig. 2). This type of construction is often applied as a complement to other structures, and only exceptionally can examples be found where it clearly dominates - for instance, Žabovřesky in Brno, or the settlement at J. Fajmonová Street, or Muglinov in Ostrava. As a complement to other structures, it has been implemented throughout the development of settlement construction since the early 1960s.



Figure 2. Žabovřesky estate, Brno; [6]

Pseudoblocks: Characteristic of pseudo-block development is the organization of building volumes that primarily exhibit formal similarity to the traditional urban block structure, i.e., development along the perimeter surrounded by urban blocks (Fig. 3).



Figure 3. Žabovřesky estate, Brno; [6]

Pseudo-block development appears in the Czech area mainly at the beginning of more systematic construction of settlements, specifically in their socialist-realist phase (Poruba, Ostrov nad Ohří, etc.) and simultaneously at the very end (postmodern phase: parts of Prague's Southwest City: Stodůlky, Velká Ohrada,

Nový Barrandov, or the Ostrava Bělský Les 1 and 2, or the younger phase of Zlín's Southern Slopes), when this type emerged as a reaction to the appearance of settlements from the technocratic phase. The return to traditional urban typology, however, was not – given the construction method and prevailing building regulations – consistent, and this development often exhibits problems in the readability of spatial organization, where formal blocks do not correspond to the communication layout and type of defined spaces. The area inside the blocks often has the character of a public space, not a shared or at least semi-public space. This loses, or at least significantly weakens, the orienting polarity of space ("front-back").

Superblocks: The arrangement of this type of development is based on the composition of clearly visible and spatially separated units. A superblock may take the form of a block, but it is also created in other forms: for example, as a block close to a "spiral" (Lužiny) specifically arranged pair of slab houses (part of the Ďáblice housing estate) (Fig. 4). The basic defining factor is not necessarily the size of the "superblocks," but primarily the treatment of the block as a cohesive unit independent of the classic street network system. Characteristic of this type of housing estate is a clear spatial concept, which is a feature that housing environments often otherwise lack. However, this concept tends to be non-standard and, therefore, more difficult to grasp in terms of the conventional use. Despite its external resemblance to the usual block structure, this development is also significantly larger in scale than traditional blocks. Superblock arrangements are exhibited by some architecturally significant housing estates (Prague's Ďáblice, Lužiny, or parts of the Ostrava estates Nový Pustkovec, Fifejdy II, or Dubina). They are more often found in the peak phase of housing estate development designed in the 1960s.



Figure 4. Lužiny Estate, Prague; [6]

Free compositions: Typically, these are abstract mass compositions, mostly groups of slab (occasionally point) buildings of various proportions and arrangements (Fig. 5). From the perspective of the average pedestrian, they are just as difficult to decipher as the abstractly conceived, continuous public space of variable proportions without a more systematic hierarchy, which surrounds them. The communication framework often features a tree-like arrangement with dead ends, with significant routes usually moving entirely outside the structure. The majority of "free compositions" were created in two phases of housing estate construction. From an architectural-urbanistic perspective, these are innovative and valuable sets built as part of the peak phase of housing estate development,

radically expanding the idea of development freely composed in a park like landscaped terrain (Brno's Lesná, Prague's Skalka, or the first phase of the Ostrava housing estate Fifejdy I.).



Figure 5. Housing estate Starý Lískovec, Brno; [6]

Large compositions: This concerns a grouping of house masses whose spatial organization is rigorously subordinated to the mass composition on the scale of a locality or even a district. The scale and clear geometry distinguish them from free compositions (Fig. 6). Such a district or locality is perceived as a kind of a spatial object. To this arrangement, more or less closely (it is difficult to find a precise boundary between "large" and "free composition"), a number of Czech housing estates primarily in larger cities, belonging to the late peak phase or the technocratic phase, approximate. The specific structure occurs in a variety of variations from the multiplication of simple corner shapes assembled exclusively from residential sections (Řepy) or repeating broken slab houses (Letiště III., Ostrava-Hrabůvka), through cross compositions involving civic amenities (Jižní Město), up to long folded continuous slabs (Nové Butovice).



Figure 6. Jižní mesto housing estate, Prague; [6]

2.2. General characteristics of housing, housing policy and urban planning

After 1989, Czechoslovakia shifted its focus to the privatization of LHEs and the creation of "condominium associations." This process created ownership challenges, as there were individual, public, and commercial claims to the land. To revitalize the socialist landscape, ownership needed to be transparently transferred either to individuals or through partnerships, leading to fragmented cities [7].

In Czechoslovakia, the initial years of the transition period were focused on economic restructuring. Beginning in 1989, the country shifted from a centrally

planned economy to a market-oriented economy based on private ownership, while also working to establish democracy and address previous irregularities. Although housing policy was centrally developed, both federations had authority over rent regulations within their territories. While some estates have benefited from regeneration and have become stable residential areas, others face the risk of social and physical degradation. The variation in the development of these estates is influenced by several factors, including the economic success of regions, the attractiveness of cities, and the quality of local governance [8].

By 2000, approximately 50% of new construction was carried out by private investors, as the state lacked the necessary funds for new projects and maintenance of the existing housing stock. This approach continued in both the Czech Republic and the Slovakia after their separation in 1993, with the privatization of housing taking a secondary role to broader economic reforms. The transition to a global market-oriented economy led to challenges in administrative capacity and management. During this period, housing privatization progressed slowly, with public assets being selectively sold while prioritizing the restitution of properties.

Following the separation in 1993, the Czech Republic introduced new reforms in housing policy, dividing it into three levels: central, regional, and local. Unlike the communist era, where the state was the primary builder of housing, the post-socialist period saw the state mainly setting regulations for new construction, with the responsibility for implementation shifting to lower levels of territorial and administrative governance [9].

After the socialist period, the high cost of housing and limited job opportunities led to increased migration to small towns and suburban areas, particularly around Prague and Brno. This trend continued until 2005 when a renewed wave of migration towards major cities began, driven by a resurgence in housing construction (Prague, for example, saw an increase of about 40%). The area around Prague experienced the most significant economic development, outpacing other regions in the country [10].

2.3. Transformations, changes and development strategies of inherited residential areas (LHEs)

In the post-socialist period in the Czech Republic, the process of privatization was also prominent, particularly with housing buildings that were divided into flats and subsequently became the private property of the families residing in them. The resident structure within these buildings was diverse, but much like in Slovakia, many did not view their living environments (LHEs) as their own space. As a result, the major changes that occurred were primarily on the buildings themselves rather than the broader communal areas. [11].

Following the fall of the socialist regime and the peaceful separation from Slovakia, numerous LHEs were present in all major cities across the Czech Republic. Unlike Slovakia, where new construction within existing LHEs ceased during the 1990s, the Czech Republic saw a different trend. The country embarked on the transformation of these LHEs, incorporating new infill construction within the existing estates. This transformation process was more pronounced in the Czech

Republic, where regeneration programs were introduced to address the functional, social, and spatial challenges of these estates.

During the 1990s, the Czech Republic witnessed significant changes in its urban landscape, particularly in areas surrounding LHEs [12]. New buildings emerged on the outskirts of these estates, often commercial in nature, and were typically located along main roads constructed post-1990s. Additionally, the Czech Republic experienced a wave of religious buildings construction within LHEs on previously unused land, a response to the restrictions on such constructions during the socialist era.

In the post-socialist period, the Czech Republic recognized the disadvantages associated with LHEs, and by the early 1990s, initiatives to improve the quality of these buildings were underway. Facades were renovated with new colors, flat roofs were replaced by attic areas, and safety in common areas was enhanced. Significant efforts were made to reduce energy consumption, with existing buildings being tested and improved through insulating facade panels and better window glazing. When it comes to spatial types of residential settlements, it is noticed that in historical settlements as well as in contemporary examples of compact urban development, the urban space is defined by sets (streets, squares, parks, etc.) [13], that not only guide this space but also organize the connected construction of buildings. Settlements differ from other urban construction systems precisely by the dominance of open space over defined spatial units with clear boundaries. The resulting organization of space and building volumes, as well as the degree of their mutual separation, nevertheless varies, and certain settlements or their parts often significantly differ in this regard.

Despite the higher prices of new housing developments, there was no significant outmigration from the inherited LHEs in the Czech Republic. This resulted in the maintenance of a heterogeneous social structure within these estates, which had a positive impact on the sense of community. Studies conducted in the 2000s revealed mixed perceptions among residents of LHEs in Czech cities. While there were improvements in the availability and diversity of shopping and commercial services, and some progress in basic services, concerns were raised about worsening security, deteriorating interrelations between residents, and declining environmental quality within these estates.

One of the key findings is the impact of privatization on public open spaces (POS) within LHEs. The shift from state to private ownership has led to a range of outcomes, from neglect and deterioration to innovative revitalization projects. For instance, many POS within older LHEs have suffered from the reduced maintenance and investment, leading to issues such as overgrown vegetation, damaged infrastructure, and reduced functionality. In contrast, some communities have successfully mobilized resources to improve and redevelop these spaces, as evidenced in the case of Na Dolika LHE.

3. TREATMENT OF POS IN MULTI STORY HOUSING AREAS IN POST-SOCIALIST PERIOD

This research delves into Public Open Spaces (POS) across two distinct arenas: post-privatized Local Housing Enterprises (LHEs) and the fresh wave of residential developments. By acknowledging the initial privatization effects on

LHEs and contrasting these with the planning approaches in new residential developments, this study aims to provide a comprehensive understanding of POS's role. Through this lens, the spatial cohesion and completeness of new housing developments, especially at the neighborhood or complex level, are scrutinized to offer insights into how public open spaces are integrated and valued in contemporary urban planning.

3.1. POS in inherited LHE

Following World War II, the Czech Republic, like many other Central and Eastern European countries, experienced significant changes under the socialist regime. These changes were particularly evident in the urban landscape, where large-scale housing estate (LHE) projects were constructed to address the acute housing shortage. This analysis explores the nature of these developments, with a particular focus on the construction, design, and functionality of these estates in the Czech Republic.

The design and construction of these estates were heavily influenced by the principles of functionalism, which emphasized efficiency, mass production, and the fulfillment of basic human needs. Buildings were constructed using prefabricated elements, which allowed for rapid assembly and uniformity across the estates [14].

This uniformity extended to the color scheme and architectural design, resulting in large blocks of identical, monotonous buildings. Between the residential blocks, vast areas of public open space (POS) were incorporated. These spaces were state-owned and intended for the use of all residents. The design of these POS areas reflected the socialist ideology, where the collective ownership and communal living were emphasized over individual property rights [15].

In the Czech Republic, these public spaces were designed to meet the needs of the residents, with a strong emphasis on providing functional, rather than aesthetic, amenities. Playgrounds, green areas, and sports facilities were common features, aimed at promoting social interaction and physical activity. However, the maintenance and development of these spaces often lagged behind, leading to their deterioration over time.

One of the key aspects of the LHEs in the Czech Republic was their connectivity to the rest of the city. The socialist government prioritized the integration of these estates into the broader urban infrastructure [16].

Roads and public transportation networks were designed to ensure that residents could easily commute to work, which was particularly important given the industrial nature of many cities in the Czech Republic. Public transportation, especially trams and buses, played a crucial role in connecting these estates with city centers and industrial zones. The design of the LHEs also included adequate parking facilities, although these were based on the standards of the time, which did not anticipate the rapid increase in car ownership that occurred in the post-socialist era.

In addition to vehicular connectivity, pedestrian areas were a significant consideration in the design of Czech LHEs. Wide sidewalks, pedestrian paths, and underpasses were common features, reflecting the socialist regime's concern for the everyday needs of its citizens. These pedestrian areas were designed to ensure that residents could easily access essential services, schools, and recreational areas without relying on motor vehicles. The emphasis on pedestrian-

friendly infrastructure was aligned with the broader socialist objective of creating self-sufficient communities where residents could live, work, and socialize within the same estate. This approach aimed to minimize the need for travel and reduce the reliance on private vehicles, which were less common during the socialist period.

Green areas were a fundamental element of public open spaces in Czech housing estates, much like in other parts of Central and Eastern Europe. These spaces were designed to offer residents opportunities for recreation, relaxation, and social interaction. The emphasis on greenery was part of the broader socialist urban planning approach, which sought to balance the dense residential environment with open, accessible green spaces [17]. In LHE open green spaces became a significant component of residential areas, covering approximately 40-45% of the total area. These spaces were crucial for creating a favorable microclimate, maintaining good sanitary conditions, and providing a well-developed recreational environment tailored to the needs of various community groups. Additionally, they contributed to the creation of an expressive and diverse urban landscape. Green areas contribute significantly to social integration by offering shared experiences for community members. They also enhance physiological health by providing spaces for recreational activities and delivering environmental benefits [18].

Throughout the decades of construction, various types of green areas emerged within these estates. The diversity of these green spaces often depended on their location within the estate and the intended category of users. For example, Central Park in Jižní Město and other larger green spaces were accessible to all residents, while smaller, more intimate green areas were designed for specific blocks of buildings, serving primarily the residents of those adjacent units. This differentiation in green space usage led to the creation of inner block areas with a lower degree of publicity, fostering a more communal and semi-private atmosphere among the residents.

In the Czech Republic, as in other socialist countries, these green areas were predominantly publicly owned. The management of these spaces was typically the responsibility of state or municipal authorities, rather than the residents themselves. This public ownership model was in line with the socialist ideology of collective ownership and public welfare. However, the lack of resident involvement in the management of these spaces sometimes led to challenges in maintenance and the long-term sustainability of the green areas.

The diversity in character and quality in Czechia also reveals a different approach to the creation of public space, particularly in the context of various starting points for creation associated with the period in which the estates were developed. Post-war estates and the first "experimental" collections from the 1960s were created at a favorable distance from the center, in so-called urban gaps (Urban Composition of Southwest City in Prague, Ivo Oberstein). Today, we perceive them as a natural, distinctively different part of the city. There were no significant deformations of the competed designs during their realization. The quality design of the spatial structure, for example, Invalidovna (Fig.7), Malešice, Krč, Dáblice, or Spořilov, ensured a relatively sensible organization of areas and thus suitable conditions for their maintenance and therefore long-term

sustainability [19]. The modest scale of individual units helps with comprehensibility and orientation in public space.



Figure 7. Experimental housing estate Invalidovna [20]

Subsequent decades are linked with the construction of extensive complexes, which, due to their complexity, encountered many problems. A typical example is Jižní Město I, where due to a combination of various factors (lack of funds, limitations of standard and unavailability of atypical materials, insufficient coordination, political pressure from above - increasing capacities, etc.), there was a breakdown of original ideas and fundamental changes in the solution of the urban structure (including the non-completion of centers, etc.), which reflected both in the chaotic organization of public space and in the quality of detail, including the failure to implement most of the proposed landscaping and ground-level adjustments (Fig. 8). In the latter half of the 1980s, a bit more energy was devoted to the outdoor environment of housing estates.



Figure 8. Landscaping of the Central Park in Jižní Město [21]

On the other hand, some of the characteristics of public open spaces in Large Housing Estates for the Czech Republic can be reflected in the following:

- One of the most significant shifts in the post-socialist period has been the privatization of housing and changes in the ownership structures of the large housing estates. This process has had direct and indirect impacts on public open spaces, affecting their maintenance, management, and

development. The shift from state-owned to privately owned spaces has sometimes led to neglect or underinvestment in these areas [22].

- Many public open spaces within large housing estates faced issues of deterioration and neglect in the early years of the post-socialist period. The withdrawal of state support and the unclear responsibilities between new owners, local governments, and residents often left these spaces in a state of disrepair [23].
- Recognizing the value of public open spaces for community well-being and social cohesion, there have been numerous efforts to revitalize and regenerate these areas. Projects have focused on upgrading playgrounds, landscaping, improving accessibility, and encouraging community engagement in the maintenance and design of these spaces [24]. Such examples can be seen in Prague-Jižní Město and Brno.

In some cases, due to a lack of investment, maintenance, and clear ownership structures, POS suffered from neglect, leading to overgrown vegetation, damaged infrastructure, and limited functionality. The ongoing trend of privatization, continuing up to 2010, initiated a significant transformation in the ownership of public open spaces (POS) within large housing estates (LHEs). This shift in ownership led to numerous issues, particularly the neglect of these communal spaces. Originally under state ownership, the public spaces between multi-story buildings were transferred to various city governments and administrative bodies. This transition resulted in a complex ownership structure, and even today, some POS within LHEs lack a clear ownership status. The change in ownership also brought about a shift in how these areas were managed, with a growing emphasis on individualism. As a result, POS began to be used more as transit zones rather than shared community spaces. This change in usage, coupled with challenges in management and maintenance, led to the deterioration and "loss" of these public areas. Despite proposals for the regeneration of certain parts of these estates, issues related to ownership and the absence of proper planning documents have slowed down or even halted the regeneration process entirely [25].

In other instances, parts of the POS in Czech Republic were privatized and converted into parking spaces, commercial buildings, or individual gardens, reducing the overall area and hindering public access. In the post-socialist period the transformation of the street network within LHEs has also impacted POS. In some cases, car traffic has been prioritized, leading to wider roads and more parking spaces, often at the expense of green areas and pedestrian pathways. When discussing the reasons for the transformation of POS within Large Housing Estates (LHE) in the post-socialist context, it is essential to consider the intricate layers of socio-economic, political, and environmental shifts that have occurred during the transition from centralized planning to market-oriented economies. This transition has fundamentally altered the urban landscape, particularly in terms of how public spaces are perceived, valued, and developed. The move towards a market economy has been a cornerstone of the post-socialist transformation, profoundly affecting urban development strategies, including the management and redesign of POS.

3.2 Opportunities and Challenges for LHE POS (re) development

When considering the current planning treatment of POS, it can be viewed through multifunctionality. POS are increasingly seen as multi-functional spaces that can cater to diverse needs, including recreation, social interaction, environmental sustainability, and promotion of physical and mental health. Collaborative planning approaches engage residents in decision-making and design processes, ensuring that POS meet their needs and preferences. Utilizing principles of sustainable design and incorporating green infrastructure can create POS that are both aesthetically pleasing and environmentally friendly,

The current planning approach in Czech offers several chances:

- Enhanced quality of life for residents through improved access to functional and aesthetically pleasing public spaces.
- Fostering a sense of community and promoting social cohesion.
- Contributing to a more sustainable urban environment through green infrastructure and improved pedestrian and cycling connectivity.

The 2000s saw the introduction of the first state-level policies for urban renewal in Czechia, primarily aimed at enhancing buildings' technical standards and energy efficiency, along with the improvement of public areas. In Czechia, initiatives such as the Program PANEL, which offered bank guarantees for loans and expert technical support starting in 2001, the Green Light for Savings Program, providing subsidies for thermal insulation and heating systems powered by renewable energy from 2009, and a program dedicated to the revitalization of panel housing estates, with subsidies for the refurbishment of public spaces and technical facilities beginning in 2001, were launched early in the decade [26].

However, limitations also exist:

- Securing sufficient funding for comprehensive regeneration projects can be challenging.
- Navigating complex ownership structures and bureaucratic obstacles can hinder the pace of improvements.
- Ensuring long-term maintenance and sustainability of revitalized POS requires ongoing commitment from residents, authorities, and stakeholders.

3.3 POS redevelopment in practice - Case of Na Dolka LHE

While the demographic composition of residents in post-socialist housing estates remains diverse, past humanization efforts largely concentrated on rectifying technical defects and enhancing urban-architectural aspects, as discussed by (Lux, 2005). These initiatives can be categorized into three primary focus areas: 1. The redesign of individual flats; 2. The refurbishment of apartment buildings; 3. The rejuvenation of communal spaces. These targeted areas represent a concerted attempt to address the multifaceted challenges facing housing estates, striving for a balanced improvement in both the living conditions and the aesthetic appeal of these communities.

Points one and two can be discerned through an examination of the diverse beneficial practices that have been implemented in the Czech Republic. The Czech government has taken steps to address the regeneration needs of panel housing by implementing a series of initiatives, including the provision of direct

subsidies. These financial aids are primarily aimed at improving the structural and technical aspects of the buildings. However, a portion of these subsidies is also allocated for the enhancement of communal spaces within the estates. This approach indicates a comprehensive effort to not only upgrade the physical condition of the housing units but also to enrich the quality of life for residents by revitalizing shared public areas.

Subsidy programs for improving housing conditions in the Czech Republic vary in focus, including direct and indirect subsidies. Direct subsidies involve government funding for specific projects, while indirect subsidies create favorable conditions, for example, by reducing interest rates for loans. Other sources of funding include the European Union's Structural Funds. The most common program is the Regeneration of Panel Housing Estates, aimed at transforming monofunctional estates into multifunctional complexes, targeting municipalities with estates of at least 150 flats. Other notable programs focus on urgent repairs, modernization, energy demand reduction, and revitalization of public areas and apartment houses in problematic estates, some of them are: the Programme of Financial Support for the Repairs of Defects in Panel Buildings (1998-2005), The Czech initiatives from 2002 to 2020, encompassing the Panel Programme, Green Savings Programme, and European Structural Funds Programs, were strategically designed for the refurbishment and energy optimization of housing, along with the revitalization of community spaces in dated estates. This approach reflects a concerted effort to boost the sustainability and quality of life within these residential areas. A key transformation within housing estates has been the enrichment of civic amenities, notably shops and services. This development has transitioned the previously singularly residential blocks into multifunctional complexes, significantly uplifting the residents' quality of life, as identified by Herfert [27].

Point three will be illustrated by the case study. Over recent years, Na Dolíká estate has seen numerous enhancements. The makeover of the children's playground (Fig.9), the ball game area for teenagers, and the bin enclosures, along with adjustments to the traffic flow and an increase in parking space capacity, have sequentially revitalized the area.

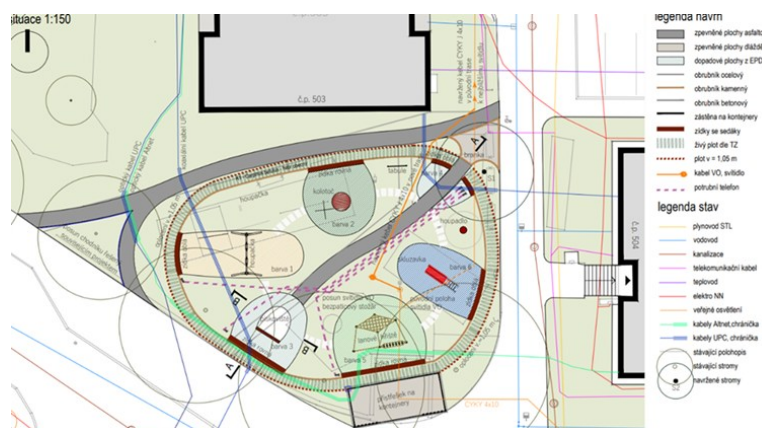


Figure 9. Revitalization of children's court [28]

The introduction of the "Piazzetta" marks a pivotal end to these upgrades, serving as a vibrant hub for the community. Initially aimed at reinstating the area's central role in social and residential life, these efforts have emphasized creating an

inviting space for residents from various backgrounds. This project aimed to uplift the social, urban, economic, architectural, and technical aspects of this public space and has been successful in doing so. The inclusion of a relaxation zone with water features, a stone trough with sluice gates leading to a fountain, and enhancements to the garden including new plantings and a lawn, have all contributed to the revitalization of this estate, breathing new life into the community space (Fig.10).



Figure 10. Revitalization of the new public open space [29]

The Na Dolika LHE serves as a notable example of successful POS revitalization. The project involved the redesign of public areas to better meet the needs of residents, including the creation of multifunctional spaces that support social interaction, recreation, and environmental sustainability. Key factors contributing to the success of this project included strong community involvement, effective collaboration between local authorities and residents.

The challenges identified in the maintenance and redevelopment of POS reflect broader issues faced by post-socialist cities. These include the legacy of centralized planning, the fragmentation of ownership, and the socio-economic disparities that have emerged during the transition to a market economy. However, the opportunities for innovation and improvement are equally significant, particularly in the context of evolving urban planning paradigms that emphasize sustainability and inclusivity.

4. CONCLUSION

The morphological analysis of large housing estates (LHE) in the Czech Republic has provided important insights into the transformation of these spaces during the post-socialist period. The research has shown that different morphological types, including rows, pseudo-blocks, super-blocks, free-standing, and large compositions, present specific challenges and opportunities for the revitalization of public open spaces (POS). Therefore, it is crucial to consider the morphology that originated during the socialist era, as this form has persisted into the post-socialist period as a significant legacy. Understanding this continuity is essential for effectively addressing the challenges and opportunities involved in the transformation and revitalization of these spaces today.

The findings of this study contribute to a deeper understanding of the post-socialist transformation of public open spaces (POS) within large housing estates (LHE). The morphological changes observed in the Czech Republic's LHEs highlight the complex interplay between privatization, urban policy, and community engagement in shaping the urban environment. The success of POS revitalization projects, such as the one in Na Dolika, underscores the importance of a holistic approach that integrates newly designed, community participation, and supportive policy frameworks. This study has explored dynamics of public open space (POS) redevelopment within large housing estates (LHE) in the post-socialist Czech Republic. Through a detailed case study of the Na Dolika LHE, the research has highlighted both the challenges and opportunities inherent in the transformation of POS during the post-socialist transition. Key findings include the significant impact of privatization on the maintenance and quality of POS, as well as the critical role of community engagement and new design in successful revitalization efforts.

The regeneration efforts within post-socialist housing estates in the Czech Republic have been marked by a multifaceted approach aimed at addressing both the physical and social challenges inherent in these environments. While the demographic composition of residents remains diverse, past humanization initiatives have primarily focused on three key areas: the redesign of individual flats, the refurbishment of apartment buildings, and the rejuvenation of communal spaces. These targeted interventions reflect a broader strategy to not only rectify technical defects but also to enhance the urban and architectural quality of these estates, thereby improving the overall living conditions.

The Czech government's proactive measures, including the provision of direct and indirect subsidies, have played a pivotal role in this transformation. Programs such as the Regeneration of Panel Housing Estates and the Green Savings Programme have been instrumental in converting monofunctional housing blocks into multifunctional complexes, equipped with improved civic amenities and services, that was discussed at the beginning of Section 3. These initiatives, supported by European Union Structural Funds, underscore a comprehensive effort to upgrade the structural integrity of housing units while simultaneously enriching communal areas, which are vital for fostering community well-being.

A fundamental general deficiency of housing estates is primarily the sectoral approach to planning, which, as was desirable, separated all aspects of the design from each other and addressed them piecemeal. As a result, instead of an integrated whole with a characteristic image, there is a conglomerate of necessary operational infrastructures: access and approach to the apartment units had to be ensured, they had to be connected to networks of technical infrastructure, and the provision of services and shops within walking distance had to be supplemented. The atypical nature of the urban complexes of housing estates led to atypical solutions for ensuring their operational capability. Public spaces, often significantly undervalued, were usually the victim of these problematic circumstances. Andráško [30] underscore the necessity of viewing the dynamics of housing estates and their residents' quality of life from a holistic perspective, acknowledging the intricate web of social and physical dimensions that define these spaces. The administration of these estates thus becomes paramount, with local government bearing significant responsibility. Equally important is ensuring that residents have a voice in the decisions that shape their living spaces, as their engagement is

crucial for the success of any revitalization effort. The depth of resident involvement often mirrors their satisfaction with the transformations, tying closely to their sense of community identity. This correlation between participation and positive outcomes in housing estate humanization has been confirmed through various studies in post-socialist settings, illustrating the positive impact of active resident involvement on their connection to and satisfaction with their living environment.

The implications of this research extend beyond the Czech Republic, offering valuable insights for urban planners and policymakers in other post-socialist countries. The lessons learned from successful POS revitalization projects can inform strategies for improving the quality of life in large housing estates, enhancing social cohesion, and promoting environmental sustainability. Future research should continue to explore the dynamics of POS in post-socialist contexts, with a focus on identifying best practices and scalable solutions.

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