EXPLORING THE SPATIAL CHARACTERISTICS OF URBAN GREEN SPACES IN RESIDENTIAL DEVELOPMENTS

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Abstract
Despite the increasing recognition of the importance of urban green in fostering sustainable and livable cities, landscape architecture and the study of urban green spaces in Slovakia remain significantly underdeveloped compared to advancements in urban planning and architectural design. This knowledge gap highlights the urgent need for a more integrated and systematic approach to the planning, design, and management of green spaces within residential areas. Urban green spaces are fundamental components of residential environments, providing a multitude of ecosystem services that contribute to climate resilience, environmental sustainability, and public health. This paper critically examines the complex and reciprocal relationship between green spaces and housing estates, emphasizing the necessity of integrating greenery into the design and planning of residential developments. By assessing the spatial distribution, accessibility, and functional diversity of urban green spaces, the study highlights their role in shaping not only the physical landscape but also the social and economic dynamics of urban living.

Key words: housing, sustainability, urban resilience, green infrastructure, recreation

Introduction

Residential neighborhoods play a crucial role within urban environments, serving as spaces that support the diverse routines and lifestyles of their inhabitants. These areas are defined by distinct housing types and urban structures, both of which have evolved and adapted throughout history (Remali, Abudib, 2019). In contemporary urban planning, residential neighborhoods are increasingly recognized for their influence on social interaction, mobility, and well-being. According to Carmona (2019), the design and layout of residential areas directly affect levels of walkability, public space quality, and perceptions of safety. The integration of green spaces within residential complexes not only provides aesthetic value but also promotes ecosystem services and community engagement. Incorporating features like community gardens and green roofs can enhance residents' vitality and contribute to sustainable urban development (Vinczeová, Tóth, 2025). Several studies have focused on the recreational value of large green areas such as parks and forests. However, the everyday green space found in close proximity to where people live—especially within residential neighborhoods—remains relatively underexplored (Bäcklin, Thorsson, Wing, 2024). In order to fulfill diverse needs and expectations of an urban community, it is necessary to have a wide range of different spaces that can satisfy various needs of various users—from children to adults and elderly people (Rózová, Turanovičová, Tóth, 2020). In the context of Slovakia, there is also growing public awareness around sustainable living and the shared responsibility for the quality of the environment (Slobodníková, Tóth, 2024). This shift is increasingly mirrored in calls for the revitalization of collective housing neighborhoods, where underperforming green spaces are being re-evaluated through lenses of ecological performance, climate resilience, and social vitality (Boros et al., 2022). As a result, spatial planning and design strategies are beginning to prioritize the adaptive reuse and redesign of these areas to support everyday recreation, strengthen community ties, and enhance the livability of dense residential zones (Dushkova, Hausladen, Haase, 2021). Moreover, the integration of green infrastructure and nature-based solutions—recognized as important planning approaches, as well as design documents and implementation tools in urban areas and landscapes (Tóth, 2022)—further anchors these interventions within a broader sustainability agenda. In doing so, the revitalization of green spaces in collective housing areas becomes a catalyst for urban regeneration, social inclusion, and resilience building at the neighborhood scale. In the context of ongoing urbanization, however, inconsistencies in planning and development often result in spatial gaps—underused or leftover parcels of land within residential districts that lack a defined function. These lost spaces or urban gaps are currently underexplored and create an opportunity to increase the share of urban greenery or introduce ephemeral installations, turning passive voids into active contributors to urban life (Bodó, Žolobaničová, Vinczeová, 2024). These so-called vacant lots, if left unmanaged, may initially be perceived as disorderly or out of sync with planned urban structures (Žolobaničová, Čibik,

Štěpánková, 2023). Although typically disconnected from formal recreational planning, these ambiguous spaces offer considerable potential for transformation—particularly in the context of collective housing.

Material and methods

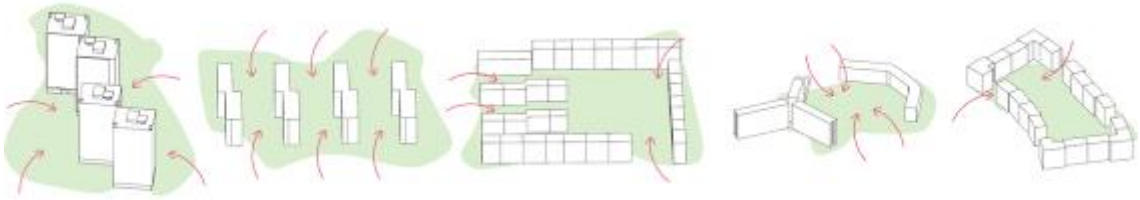
The methodology of this research primarily focused on an extensive review and analysis of existing literature, aiming to gain a comprehensive understanding of the spatial development of housing estates in Slovakia. By synthesizing insights from various sources, the research sought to build a solid theoretical foundation and contextual framework for interpreting the specific characteristics and developmental patterns of Slovak housing estates. Housing estates in Slovakia exhibit unique spatial patterns that have been influenced by a range of historical, socio-political, and environmental circumstances. Most of these developments emerged during the socialist period, when rapid urbanization and the demand for accessible housing were addressed through centralized, state-driven planning strategies. The study focused mainly on residential areas in Šaľa and Nitra town, particularly the Chrenová housing estate, where a field survey was conducted. Chrenová features a mix of high-rise and low-rise buildings, green spaces, and an evolving transit system. Its open structure and high population density are key characteristics. We based our main methodology on the CIDEP (City Development Patterns) catalog, which focuses on different housing forms and their relevance for urban development. The project was launched and overseen by the cities of Vienna and Bratislava, with urban planning and architecture specialists from both municipalities contributing to its development (Magistrát hlavného mesta SR Bratislava, 2011). Using this framework, we identified several predominant types of housing forms (Fig. 1) within our study areas. Based on this typology, we aimed to develop a new classification of urban green spaces that are spatially and functionally connected to these residential developments, with the goal of better understanding and enhancing the relationship between built form and green infrastructure. Each typology integrates green space access differently, based on whether the spaces are private, semi-public, or public. We mainly identified point, row, ridge developments and open courtyards and open structures in Šaľa and Nitra towns.

a) b) c) d) e)

Fig. 1: Types of housing forms selected from the catalog that were based on existing forms identified in the study areas. From left to right, a) represents point development, b) row development, c) ridge development, d) open structures, and e) open courtyards. (Author, Magistrát hlavného mesta SR Bratislava, 2011)

Results

This study aimed to identify the prevailing urban development types, including point, row, and ridge developments and open, courtyard structures. We then examined the layout of green spaces in relation to these development types, focusing on common urban green spaces like parks, community gardens, and residential front gardens. A key aspect of the research was assessing the accessibility (Fig. 2) and spatial organization of green spaces, taking into account the influence of surrounding buildings, including their type and height. While this approach can be applied to Slovak neighborhoods, its success depends on factors like accessibility, scale, and residents' needs.



model a) model b) model c) model d) model e)

Fig. 2: Within the study areas, we selected the most suitable dominant types for our research, in which green spaces were categorized based on their accessibility. Model a) and model d) represent public access to green space. Model c) and model e) represents semi-public access, and lastly model b) represent either semi-public or semi-private access due to existing front gardens. (Author, Z. Vinczeová, 2025).

Discussion

The accessibility of green spaces plays a crucial role in determining the quality of life in urban environments. Numerous studies have shown that, from a social standpoint, the quality and accessibility of these spaces are significantly more important than their sheer quantity (Reháčková, Pauditšová, 2006). The findings indicate that urban greenery should not be classified solely by density or accessibility; its significance goes beyond these factors and must not be overlooked (Vinczeová, Tóth, 2025). The limited public awareness of the potential benefits of green buildings remains a significant barrier to the industry's growth. Addressing this issue requires not only raising awareness but also strong ideological, legislative, and financial backing from the government (Gladkih et al., 2019). In addition to the physical characteristics of green spaces, the integration of public art can play a pivotal role in enhancing the quality and identity of communal areas within residential neighborhoods. Sometimes only a small, short-term intervention based on a deeper developed idea called “bring back function” will suffice to revitalize forgotten or unused areas and reconnect them with the community (Prochnow, Čibik, 2022).

Conclusion

This study emphasizes the need to reassess the relationship between housing developments and urban residential green spaces through a thorough review and the presentation of new insights and recommendations. Advocating for improved integration of green infrastructure in residential planning is essential to balancing building density with high-quality living, recreational value, and accessibility in sustainable urban environments. This is a key challenge for urban planning. It is vital to recognize that high-quality residential greenery offers numerous benefits, and therefore, green spaces should not be overlooked or inadequately studied, as they are a critical ecological component and provide valuable recreational opportunities in urban areas.

References

Back Prochnow, S., Čibik, M. (2022). Unconventional Interventions on Redeveloping Unused UrbanLandscapes Based on Social Interactions. In Acta Horticulturae et Regiotectuare, 25(1): 92-98.

Bäcklin, O., Thorsson, S., Wing, C. (2024). Urban Greenery Variation Between Residential Typologies: Implications for Recreation. Trees for People, 16.

Bodó, E., Žolobaničová, T., Vinczeová, Z. (2024). Umělec Jako Spojující Médium Umění a Zapomenutých Prostorů = The Artist as a Bridging Medium for Art and Forgotten Spaces. In Mezi krajinami / Nová Estetika. Praha: České vysoké učení technické, pp. 54–55.

Boros, L., Fabula, S., Papp, E. (2022). Urban Green Space Transformation and Participation in Post-Socialist Cities: Reclaiming Public Spaces. Cities, 131.

Carmona, M. (2019). Place Value: Place Quality and its Impact on Health, Social, Economic, and Environmental Outcomes. Journal of Urban Design, 24(1): 1–48.

Dushkova, D., Hausladen, F., & Haase, D. (2021). Urban Green Space in Transition: The Social-Ecological Transformation of Post-Soviet Residential Districts. Urban Forestry & Urban Greening, 64.

Gladkih, A.M., Konyuhov, V.Y., Galyautdinov, I.I., Shchadova, E.I. (2019). Green Building as a Tool of Energy Saving. In IOP Conference Series: Earth and Environmental Science, 350: 1–6.

Magistrát hlavného mesta SR Bratislava. Forms of Settlement Structures, 1st ed.; Stadtenwicklung: Vienna, Austria, 2011; pp. 1–167.

Reháčková, T., Pauditšová, E. (2006). Vegetácia v Urbánnom Prostredí; Cicero s. r. o.: Bratislava, Slovakia; p. 132.

Remali, A.M., Abudib, H. (2019). Interrogating the Characteristics of Residential Neighbourhoods in the City of Tripoli/Libya. Open House International, 44(1), 81–89.
Rózova, Z., Turanovičova, M., Tóth, A. (2020). Quality of Green Spaces in the City of Nitra in Terms of Recreational Cultural Ecosystem Service Provision. In SGEM Proceedings, 20(6.1).
Slobodníková, K., Tóth, A. (2024). Contribution of an NGO to Environmental Education at a Primary School Through the Project Garden Laboratory. In Jitka Fialová (Ed.), Proceedings of the 15th Conference Public recreation and landscape protection – with environment hand in hand! (pp. 23-26). Mendel University in Brno.
Tóth, A. (2022). Planning and Designing Green Infrastructure Across Landscapes and Scales. Acta Horticulturae et Regiotecturae, 25: 1–7.
Vinczeová, Z., Tóth, A. (2025). Urban Green Spaces and Collective Housing: Spatial Patterns and Ecosystem Services for Sustainable Residential Development. In Sustainability, 17(2538): 1-18.
Žolobaničová, T., Čibik, M., Štěpánková, R. (2023). Exploring the Recreational Potential of Urban Gaps. In Public recreation and landscape protection – with environment hand in hand? Proceedings of the 14th Conference (Eds. Fialová, J.), pp. 57-62. Mendel University in Brno. ISBN 978-80-7509-904-4.

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