



THE IMPORTANCE OF GREEN PUBLIC SPACES IN RESIDENTIAL AREAS FOR QUALITY OF LIFE: THE EXAMPLE OF SOCIALIST AND POST-SOCIALIST HOUSING IN NOVI SAD, SERBIA

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Abstract. Residential architecture and urban planning have the task of fulfilling the complex and manifold needs of inhabitants spending the majority of their everyday lives in these areas. Residential areas represent crucial spatial infrastructure that shapes the possibilities and life circumstances of its users, and thus should go beyond satisfying only the basic need for shelter. The importance and lack of green public spaces has been highlighted in recent years, especially during and after the Covid-19 pandemic lockdowns. It is becoming evident that the ongoing, investor-led, intense building activities in larger cities in Serbia are moving forward without much consideration of their footprint, generally disregarding the opportunity to develop green, public spaces. Having access to these kinds of areas not only benefits the living conditions in terms of microclimate, but it also benefits the overall health and mental health, as well as the social satisfaction of residents and users. Collective, green areas serve as a place for gathering, socialising and rest, giving users the possibility of satisfying their social and personal needs on different levels. The aim of this paper is to research the importance of green public spaces in residential areas for quality of life, analysing built residential areas in Novi Sad, Serbia. Analysing examples of residential areas built during the socialist period, under specific economic, political and social circumstances shaping urban planning, and examples of a more recent date, highlights the different percentage of green public spaces envisioned in these types of residential complexes. By comparing these two forms of spatial concepts, we are able to understand what each of them offers their residents regarding social, health and personal needs, showcasing the kind of quality of life that exists in these areas. This research can help us contemplate solutions for the future, based on past and present experiences.

Keywords: green public spaces, quality of life, residential areas, socialist, post-socialist.

Introduction

Living in cities that are becoming more and more populated is increasing the overall built environment, however public green spaces are also needed in order to fulfil the manifold needs of residents. Apart from satisfying basic existential human needs, the residential areas of cities also have the ability to enrich social, health, as well as mental health aspects of a person's well-being through developing collective green open spaces. These urban green spaces in cities are rich in vegetation and, apart from their positive impact on the environment, can be directly used by citizens for recreation and other health and social needs, improving the quality of life in urban

areas (Prashanti, 2021). The European Environment agency highlights the value of urban green spaces because of the health benefits they provide. For example, children's mental and physical development is supported through living, playing and learning in these areas. Apart from children, older adults also have a lot to gain from access to green and blue spaces, which promote both physical health and social well-being. In light of this, the World Health Organization advises that everyone should live within 300 meters of a green public space, although national and local guidelines differ across Europe (EEA, 2022). Therefore, apart from being favourable for the overall climate, green spaces and vegetation in cities serve multiple purposes for increasing the quality of everyday life of residents. When it comes to Europe as a whole, cities in the north and west contain more green areas than is the case in the southern and eastern regions. However, publicly accessible green areas account for only a small proportion of this total space, while their accessibility varies depending on the city. The distribution of vegetation is uneven within urban areas, with neighbourhoods of lower socio-economic status often having less public green spaces and of poorer quality (EEA, 2022).

When looking at the benefits and importance of public green spaces on a broader scale, green infrastructure, the presence of green areas, and their spatial connectivity are being increasingly recognized as valuable assets for regional and urban development. The multifunctionality and attractiveness of these spaces represent significant growth factors, influencing both individuals and businesses in decisions such as relocation (GRETA, 2025). Green infrastructure represents a multifunctional network which aids the adaptation to climate change and its mitigation, fosters human health and well-being, and increases biodiversity. Creating coherent green infrastructure requires the strategic planning of land and water resources (GRETA, 2019). In short, accessible green areas offer a wide array of economic, business, climate and cultural benefits: enhancing well-being and stress relief through outdoor recreation, boosting regional attractiveness and property values, supporting sustainable agriculture, forestry and tourism, mitigating environmental risks like flooding and heatwaves while improving air quality and biodiversity, and fostering a sense of cultural affinity.

On a smaller, albeit arguably more important scale from the point of view of city residents, having accessible and well-managed green spaces in close vicinity to their residential dwellings impacts more than the day-to-day lives of the occupants. Understanding the complexity of human existence means understanding the manifold needs of each individual encompassing everything from basic needs related to the primary functions of our organisms, to the intricate emotional, social and psychological needs. The places in which we reside in, i.e., the multifamily residential complexes that represent the dominant way of city life, are, in fact, focal spatial points in our everyday life, so it becomes easy to understand the importance of that physical, but also, social frame. In this sense, it is important not to view neighbourhoods as just territorially and spatially bounded entities but as a series of overlapping social networks. Forrest and Kearns (2001, p. 2130) highlight the importance of these networks by saying that 'it is these residentially based networks that perform an important function in the routines of everyday life and these routines are arguably the basic building blocks of social cohesion – through them we learn tolerance, co-operation and acquire a sense of social order and belonging'. Communities created in residential neighbourhoods greatly enrich the lives of its members, adding the crucially important social aspect to everyday life. Living in a place with a strong community can positively impact mental health, social satisfaction and overall well-being. The acknowledgement of the direct and complex system of co-existence formed through the relationship of inhabitants and their residential environment, opens up an interesting field of research, which encompasses the types of communities that can be formed in different spatial settings (Stefanović, 2021).

Therefore, the role of accessible green public spaces in residential areas goes well beyond improving the microclimate of the space – they also positively impact the mental and overall well-being of residents, giving them a space in which they can interact and form bonds. Shared green areas also serve as a place for socialising, recreation and rest, allowing users to satisfy their social and individual needs on various levels. If the shared public spaces within the residential area are formed in such a way that invites people to spend their free time there, meaning that they are equipped to support different activities through encompassing green areas combined with urban furniture and specifically formed spaces for various usage scenarios, the residents are more likely to occupy those spaces which, in turn, increases the frequency of their interaction leading to the formation of interpersonal relations and communities.

Based on the theoretical framework outlined above regarding the numerous benefits of green public spaces, the objectives of this paper are to examine, compare and analyse two representative examples of city blocks in Novi Sad, Serbia, that were built during two different time periods – socialist and post-socialist, with the aim of identifying and evaluating their similarities and differences in terms of spatial design, as well as assessing the direct impact these differences have on the potential benefits for residents. Through the comparison of these two spatial concepts, while focusing on publicly available green areas and additional elements that serve as spatial infrastructure for different activities, we will be able to understand what each of these urban design approaches offers their residents regarding their everyday needs, socialisation and well-being. This insight can help us contemplate solutions for the future, based on past and present experiences, giving us an outline for future actions in the realm of urban design.

Green public spaces in cities and their manifold benefits

Urban well-being is a multidimensional concept that encompasses various aspects of an individual's life in an urban setting. It involves the physical, psychological, social and environmental dimensions of well-being, all of which are interrelated and influenced by the urban context (Trisnawati Setiawan & Ningtyas, 2023). This urban context, specifically in terms of residential city areas has a crucial role in establishing the life quality of residents regarding their overall well-being. The establishing of public green spaces within this urban frame enriches the possibilities for the enhancement of life-quality through its numerous benefits.

The effects of regular access to natural environments have been researched at an interdisciplinary level by numerous experts in the fields of medicine, psychology, sociology and other relevant disciplines. The comprehensive scientific literature explains various ways in which the natural environment can have a positive impact on human health and overall well-being: Along with 'passive' benefits green areas and vegetation provide for humans in the sense of positively impacting the microclimate and their role in air purification, these areas also create opportunities for recreation, socialisation and stress reduction which impacts the social, physical and mental well-being of individuals. Another key value of public green areas can be seen in the environmental benefits they provide. They lower energy costs for cooling buildings by countering the urban heat island effect. Urban greenery reduces air, water, and noise pollution in cities, while the absorption of CO₂ it provides can mitigate greenhouse gas emissions. It also helps minimise floods through the attenuation of storm water. Other ecological benefits include biodiversity preservation and nature conservation. Considering the number of environmental services and benefits they provide, urban green spaces can be considered as a public good of high value (Chee Keng Lee et al., 2015).

In terms of human health, a myriad of epidemiological studies has shown numerous positive health effects in relation to sustaining public green areas, which include the improvement of mental health and the reduction of depression, enhanced pregnancy outcomes, as well as lowered rates of cardiovascular morbidity and mortality, obesity and diabetes (Röbbel, 2016). Research suggests that exposure to natural environments in various forms (i.e., viewing nature through a window or spending time in these areas) can have a positive impact on mental health. At the population level, there is a clear relation between the proximity and accessibility of green spaces and the health of individuals. Therefore, public green spaces are essential for mental health since regular engagement is tied to longevity and a declined risk of mental ill-health. However, with over half of the world's population lives in cities, daily engagement with natural areas is becoming rarer, highlighting the increasing importance of accessible local green spaces for both quality of life and the sustainability of cities (Barton & Pretty, 2010).

Assorted research about the correlation of green spaces and health benefits also highlights the fact that natural areas in cities are not only beneficial for human health, but for social well-being as well. Public green spaces in cities create opportunities for social interaction, which can aid in the reduction of social isolation, thus leading to a higher sense of personal resilience and improved well-being (Chee Keng Lee et al., 2015).

All of these aspects of green public areas, along with the fact that multifamily housing provides opportunities for the creation of communities through its implied large number of residents, indicates that green spaces in these complexes can have a manifold role: benefiting not only individual health and mental health, but also enabling social interaction in shared public spaces leading to the strengthening of communities. If we define communities as groups of people who share common activities and/or beliefs and who are bound together principally by relations of affect, loyalty, common values, and/or personal concern (i.e., they express interest in the life events of one another) (Brint, 2001) and a neighbourhood community relies on spatially defined social relations facilitated by urban interventions in space (Pajvančić-Cizelj & Knežević, 2017), the interconnection between the communal residential area and the resulting community becomes undeniable. Also, the physical qualities of a neighbourhood, such as its urban design and residential density, street interconnectivity, land use mix, and the availability and accessibility of public spaces, can generate more or less opportunities for social interaction among neighbours (Deirdre & Cloutier, 2016).

As for some spatial factors regarding green public spaces, their juxtaposition and proximity to residential buildings have an impact on their effectiveness in various ways. A fundamental requirement for the use of a public green space is its availability. Research suggests that the scale of the area is also important, seeing as greater benefits are related to larger green spaces. The size of the area can also determine the type of activities that take place there: for example, if a green area is larger, it is more likely to be used for sports and recreation, while a smaller area would be more appropriate for socialisation and rest. Research often states that accessibility of the public green space also represents a vital determinant for the frequency of its use. This is based on the proximity of the urban green space from residential dwellings, since it has been shown that there is a direct correlation between shorter distances and higher use frequency. The optimal distance from residential buildings is said to be less than 0.5 km, which translates to a 5-minute walk. Apart from the distance of the public green area from homes, the ease of access (e.g., avoiding busy roads) is also highly significant (Chee Keng Lee et al., 2015).

Methodology

Relying on all of the theories and research results outlined in the previous paragraphs, we can conclude that in order to have a maximal positive impact both on an individual and communal level, green public spaces established in residential city complexes should be: rich in various vegetation, safe to use, close to residential buildings, easy to access and large enough to enable social activities and encounters, which can also be enhanced with the addition of urban furniture and other elements intended for particular activities.

In order to research and evaluate the two urban blocks selected for this paper in terms of the fulfilment of these aspects by their respective collective block areas, a mixed method research approach will be implemented including both qualitative and quantitative methods. Both blocks will be visually represented through their morphologies and existing-state photographs. The qualitative methods include the evaluation of the composition of the urban blocks – both in terms of their spatial configuration and the ‘content’ i.e., the existing urban areas and elements in the block, such as the presence and type of vegetation, urban furniture, specifically formed urban micro-areas with different programmes, as well as safety parameters in terms of the separation of moving traffic from pedestrian areas. The quantitative method is reflected in the numerical overview of the blocks represented in the urban parameters calculated for each block. The comparison of the urban parameters, such as the relation between the built and unbuilt surface areas accurately portray the proportions and size of the open collective block areas, which also indicate the quality of the communal space which can be established in terms of its spatial restraints.

The data collection for both the qualitative and quantitative analysis has been carried out by the author of this research paper. The data collection methods are therefore tied to the specific area of the author’s professional expertise as an architect. After numerous site visits, photographing and documenting, as well as research of precise geodetic city maps, the author was able to produce accurate technical drawings of the blocks and their morphology. These technical drawings served as the basis for calculating the urban parameters of each block (see Tables 1 and 2), thus supporting the quantitative aspect of the research. At the same time, they represent a crucial tool for the clear and precise observation and interpretation of the urban design concepts, elements, and contents of each block, thereby informing the qualitative evaluation of both blocks.

The combination of both methods will provide a more comprehensive understanding of the quality of the open public spaces, as well as an accurate indication of the possible quality of life that the residents are provided with, concerning all the highlighted benefits of green public spaces for residents – individual health and mental health, as well as the possibilities for the establishing of communities that impact the social well-being of residents. After the thorough evaluation of each block individually, a comparative analysis of the two urban residential complexes will be performed. This will expose the differences and similarities between the two urban blocks that represent prime examples of architecture and urban design in their respective time periods. This comparative analysis will further highlight the type of lifestyle and quality of life than can be had by the residents of these distinctive spatial solutions, indicating which aspects of urban design and configuration of public green areas should be implemented in contemplating future spatial concepts of collective residential areas in cities.

Public green spaces: analysis of examples from Novi Sad, Serbia

Novi Sad is a city in the Republic of Serbia, formerly the Socialist Federal Republic of Yugoslavia, and is the capital of the Autonomous Province of Vojvodina. It is located alongside the Danube River, one of the city's most important natural elements. The city's public green spaces are well connected to green areas outside of the city such as forests and rural green areas (Fig.1). The green spaces located within the city are mostly concentrated in the form of city parks and green corridors which represent streets with an array of trees in a spatial sequence. According to landscape architect dr Luka Bajić (Kahrimanović, 2024, para. 18):

Based on some calculations and documents, it is considered that Novi Sad has around 15 m² of green space per resident, however the city is growing – demographically through the increase of population and also spatially, therefore the number referring to green spaces is becoming more and more relative. Novi Sad has a specific situation since the wider borders of the city include some parts of Fruška gora [mountain], as well as forests which are not typical for cities in Vojvodina, so some of those green areas are included in the calculation of available green space per resident. This is why it is also important to look at the accessibility of those green spaces.

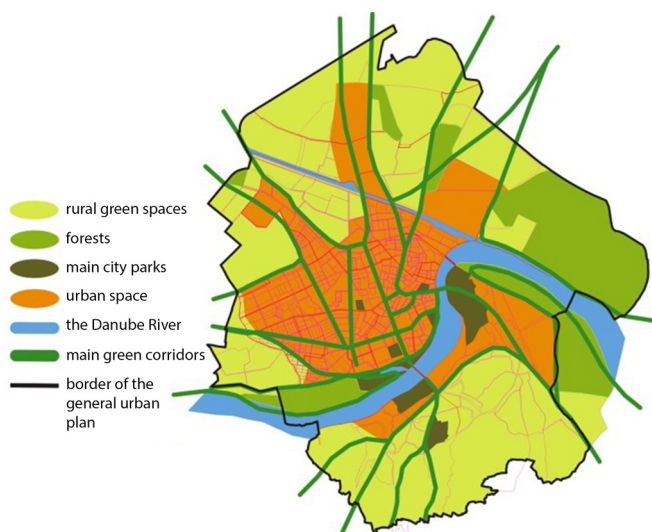


Figure 1. The connection of Novi Sad's city green spaces to green areas outside of the city
Source: Faculty of Agriculture, University of Novi Sad (2010, p. 24).

Throughout its existence and rich history, the city of Novi Sad underwent a myriad of changes. However, the process and execution of its modernization is what still stands out as a significant spatial and urban characteristic, even today. The city's modernization began during the time period between World War I and World War II, soon after Vojvodina became a part of the Kingdom of Serbs, Croats and Slovenes, which also resulted in Novi Sad becoming the capital of the Danube Banate. Still, the most notable changes to the city's urban fabric were executed after World War II, with the significantly high building activity present in socialist Yugoslavia, which was a newly formed state. The city underwent distinct radical changes which were envisioned and implement-

ed through official urban planning documents. These bold urban interventions shaped and redefined the city, resulting in the urban morphology and identity it has today. When it comes to housing, the notable increase of the population generated a need for the creation of new residential areas. Consequently, the Danube River marshes were drained, allowing the city's expansion. This formerly uninhabited land, now prepared for construction, enabled the precise realization of planned urban residential neighbourhoods, whose design was influenced by the architectural discourse of modernism present at the time, as well as the principles of the Athens Charter (Stefanović, 2024). The residential blocks formed in socialist Yugoslavia are large-scale complexes, equipped with green areas and urban furniture, which creates distinct neighbourhoods. However, after the disintegration of the Federation and the change in political, economic and social circumstances, the form of housing changed as well. Led by private investors, the housing created in post-socialism is of a smaller scale and often lacks elements such as green space and specific places for socialisation that would add positive value to the daily life of its residents. This kind of urban and architectural design is still dominant today. The comparative analysis between these two distinct forms of multifamily housing can highlight the main differences in their spatial frames, as well as showcase the living conditions and social opportunities for residents that are generated through the urban design and equipment of each urban block type. The comparison will be conducted with focusing on the core insights from the social, spatial, health and psychological theories and research of the benefits and requirements of public green areas that were outlined in the previous paragraph.

The residential city blocks selected for this analysis represent prime examples for the architectural and urban design approaches dominant during the time periods they were created in. The block in the Liman III area was created in the socialist period, while the block in the Grbavica area was built during post-socialism, representing the type of spatial solution still predominant in Novi Sad at the time of writing this paper (Fig. 2).

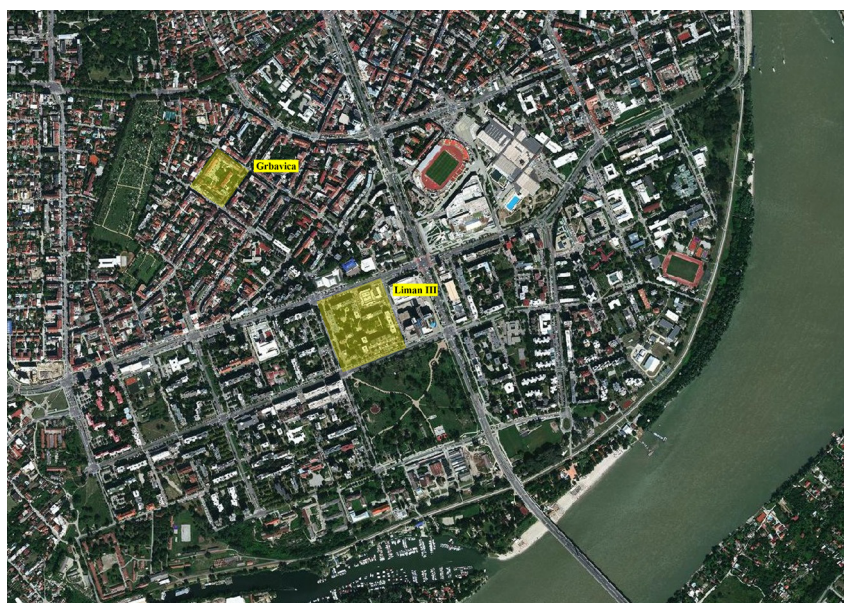


Figure 2. Novi Sad: the juxtaposition of the two blocks selected for analysis
Source: GeoSrbija (2025).

When it comes to the proximity of the two blocks selected for analysis to city parks, from it is clear from Figure 3 that the block in the Liman III area is adjacent to one of the largest city parks in Novi Sad – Limanski park (approximately 330 m straight-line distance from the block's center to the park's center), while the nearest city park to the block in the Grbavica area is Fu-toški park (approximately 575 m straight-line from the block's center to the park's center). Even though the straight-line distances don't differ from each other in a huge amount, the fact that they were measured from the centre of the block area to the centre of the park area should be taken into account – the fact that the Liman area is literally across the street from the block in the Liman III area means that this green space is highly accessible to the resident of that block, while the residents of the Grbavica block have to put in more effort to reach their nearest city park – Fu-toški park, meaning that the accesbilty is lower which also indicates a high probability of a lower frequency of visitation by residents. The difference in levels of accesbilty of city green spaces which varies among residential areas also highlights the importance for the development of public green areas within residential city blocks, which offers immediate access to these valuable outdoor spaces to residents.



Figure 3. The proximity of city parks to residential areas, with the two blocks selected for analysis marked in yellow

Source: Faculty of Agriculture, University of Novi Sad (2010, p. 29)

A block in the Liman III neighbourhood (socialist housing)

When it comes to socialist residential architecture in Novi Sad, Serbia, it is important to note that the very first examples of co-habitation in the form of collective housing complexes in this city originated in socialist Yugoslavia. The conclusion of World War II and the formation of socialist Yugoslavia marked the beginning of the state's rapid industrialization, which went hand in hand with the zest of the post-war period. This resulted in the migration of citizens from rural to urban areas, causing a housing crisis. This pressing need for housing, along with the conditions formed in the newly established socialist state, enabled and encouraged architects of the period to deliberate and envision residential space, leading to the development of varied urban and architectural

design concepts. Guided by two ideologies – socialist and modernist, architects were given the opportunity to create new forms of housing. The socialist ideology, which encompasses paradigms of social equality and a need to showcase the future prosperity of the newly formed state, along with the importance of unifying the republics, created an environment in which housing was considered not only an architectural, but a political question. The modernist architectural ideology which was extremely relevant in the architectural discourse at the time, was focused on progress in all forms and highly assisted by technological developments, representing the aspiration towards creating a new chapter in the making of cities, and by extension, city life (Stefanović, 2023a). Novi Sad's urban fabric underwent a series of changes through official planning documents, while the change in the way of city living was made with the conception of collective housing complexes of a large scale.

The Liman area in Novi Sad represents a spatial endeavour that was realised during the socialist period. It is comprised of four segments: I, II, III and IV, with the numbers corresponding to the order in which they were built. The block that will be analysed in this paper is located in the Liman III neighbourhood.

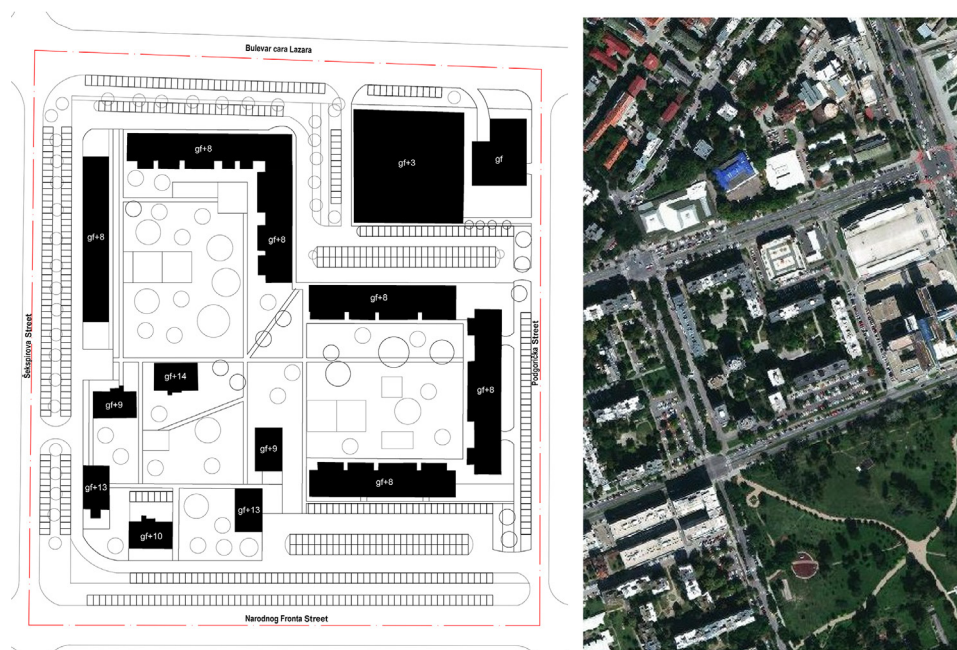


Figure 4. A block in the Liman III neighbourhood: morphology (left), satellite image (right)
Source: author (left); GeoSrbija (2025) (right).

As it can be observed from the block's morphology (Fig. 4), the main ideas of its spatial concept lie in the creation of some closed and some opened borders of the inner courtyard, which is accomplished by the envisioned positioning of the buildings. It is also important to note that the buildings in the upper right corner of the image (on the corner of the Tsar Lazar Boulevard and Podgorička Street) are not residential ones, but are in fact a gas station and parking garage. They are even divided from the residential area via narrow lanes intended for low traffic and parking purposes.

The fact that the outer edges of the residential block are designated for parking and low traffic, along with the position of the buildings which is related to these edges, enables the creation of a semi-secluded inner courtyard which is in the form of a public green area. The firm spatial separation of the parking area creates a communal space inside the block which is safe and easy to access by all residents, including young children. The public green area is filled by various forms of high and low vegetation, creating a beneficial microclimate and adequate shade, while the juxtaposition of the buildings allows good ventilation and sunlight. It is also important to note that, since the entire courtyard is public space, the green areas of the urban block are continuously maintained by the Public Utility Company 'City Greenery' of Novi Sad in a very satisfactory manner.

The characteristics of the block's open space also make the frequency of interaction quite high, especially since numerous people (residents and non-residents alike) frequently pass through the inner space of the block. The high level of frequency is deduced from the morphology and design of the block and its passages, as well as the wider city area in which the block is located – the proximity of the Liman market and Limanski park, all of which indicate that a large number of pedestrians pass through the block to get to the surrounding areas. This is also due to the fact that residents often pass through this space when they park their cars on one of the block's edges, as well as the fact that the ground floors of the buildings are occupied by different shops and other services. It is also worth noting that the longitudinal buildings are designed with voids on the ground floor which enable people to pass directly into the inner space. The presence of various programmes and functions on the ground floors, aside from the residential spaces makes the possibility for spontaneous and planned encounters even higher, adding to the crucially important high frequency of interaction.



Figure 5. A block in the Liman III neighbourhood: urban furniture (left), basketball court (right), June 2019
Source: author.

Apart from vegetation, the inner courtyard features two sport courts (intended for basketball and futsal), a playground, as well as spaces for children's play that are created using concrete structures designed along with the housing complex. The fact that the courtyard is spacious, has vegetation, urban furniture, designated places for games and sport, along with numerous pathways means that the residents of this block have various possibilities for spending their free time

in a space extremely close to their place of residence. Therefore, this space enables both planned and spontaneous activities for people of various age groups (Fig. 5).

Table 1. Urban parameters of the block in the Liman III neighbourhood

Urban parameters	
Total block surface area (m ²)	68482
Built block surface area (m ²)	12134
Unbuilt block surface area (m ²)	56348
Total floor built area (m ²)	94200
Block surface area coverage (%)	17.72
Floor area ratio	1.38

Source: author.

The urban parameters displayed in Table 1 showcase the ratio between built and unbuilt surface areas, with 82.28% of the block being an open public area, leaving the block surface area coverage to just 17.72%. Therefore, the public green area occupies the majority of the entire block space. This space in the Liman III block fulfils a lot of the determinants outlined by various studies and research concerning the beneficial impact public green spaces have on human lives: it is large enough to accommodate communal activities and encounters, safe to use and easy to access, while being filled with vegetation that positively impacts the block's microclimate and health of the residents. The added planned spaces for sports and other activities further diversifies the types of encounters and activities members of the neighbourhood community can share, creating opportunities for the creation and growth of the community.

A block in the Grbavica neighbourhood (post-socialist housing)

Armed conflicts that took place in the beginning of the 1990s, were a culmination of a period of political and economic instability of the state, that eventually resulted in the official disintegration of the Socialist Federal Republic of Yugoslavia. As a result of thorough changes in socio-political circumstances, the role of the state was reduced in all spheres, including housing. This reduction also created preconditions for privatisation, which enabled private investors to have a great impact on the urban fabric of cities. As a result of the Federation's disintegration, a considerable amount of war refugees fled to Serbia and specifically to Novi Sad. This created a need for more housing units, in the economic and political situation which was already unstable. In the newly opened market amidst the high demand for housing, private investors frequently disregarded regulations concerning regulations on flat sizes, materials, outdoor spaces and other elements of architectural practice. During the early post-socialist period, multi-family buildings were constructed on small lots previously intended for single-family houses, which resulted in the almost total coverage of the entire building lot, leading to overcrowding and a lack of outdoor public spaces. A spatial sequence of this type of lots (i.e., a street) with such large buildings leaves virtually no room between them, thus eliminating the possibility for creating outdoor areas that could have been designed as public green spaces. A similar building approach is still dominant in residential projects being carried out in Novi Sad even today, posing the question whether the post-socialist transition ever truly ended (Stefanović, 2021).

The block selected for analysis as a prime example of this type of spatial concept is located in the Grbavica neighbourhood in Novi Sad.

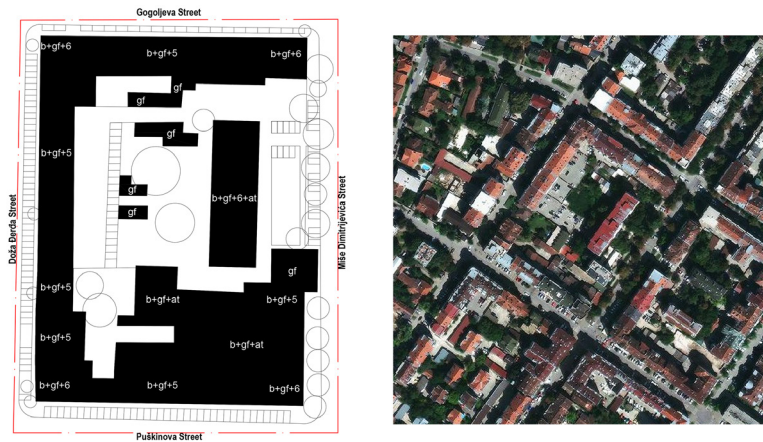


Figure 6. A block in the Grbavica neighbourhood: morphology (left), satellite image (right).
Source: author (left); GeoSrbija (2025) (right).

Based on the block's morphology (Fig. 6), we can see that the block is almost completely closed, apart from the relatively small passage on Miše Dimitrijevića Street which is a result of one of the longitudinal buildings not being adjacent to the others. Otherwise, all of the other buildings form a continuous line along the bordering streets, without any passages. This lack of access makes it impossible to enter the inner courtyard from the surrounding streets, which means it is basically only accessible to residents of the buildings. The fact that almost all of the buildings are adjacent to one another does not favourably influence the ventilation or microclimate. The collective block area is mostly bare, apart from a couple of trees, with no defined public green area. Due to the fact that the block is so closed up, the inner block area is strictly physically defined by the buildings. However, since the parking spaces are not grouped on the outside of the block, the inner courtyard is not safe for pedestrians seeing as vehicles can freely enter this space. Furthermore, the collective area is mostly used for unstructured and unplanned parking, seeing as the parking spaces are not spatially defined or marked. Apart from the bare area that is occupied by parked vehicles, most of the space has been taken up by private and usually improvised garage structures and/or sheds (Fig. 7). There is an evident lack of any kind of urban furniture, pedestrian pathways or areas designated for outdoor activities. The entire open block area has been reduced to the role of an impromptu parking space.



Figure 7. A block in the Grbavica area: outer view (left), inner block area (right), June 2019
Source: author.

Since the inner block space is neither safe nor accessible, and there are no areas intended for the prolonged use by residents or passers-by, the possibilities for social encounters are slim. The residents could potentially meet one another while entering or leaving their buildings or vehicles, however the duration and quality of these encounters are questionable since there are no urban elements or infrastructure that would encourage socialisation and shared activities. The overall lack of vegetation can only have negative effects on the microclimate of this space and the residents have no easy access to green spaces, therefore no access to health benefits.

Table 2. Urban parameters of the block in the Grbavica neighbourhood

Urban parameters	
Total block surface area (m ²)	17797
Built block surface area (m ²)	10679
Unbuilt block surface area (m ²)	7118
Total floor built area (m ²)	63223
Block surface area coverage (%)	60
Floor area ratio	3.55

Source: author.

The lack of public space is underlined with the data shown in Table 2, with the block surface area coverage equalling 60% of the overall block area. This means that only 40% of the area is open public space. However, this is still large enough to enable the design of a public green area with urban furniture, elements and spaces that could enable residents to spend quality time outside and create a more favourable microclimate.

Discussion

The residential city blocks analysed in this paper represent examples of two different spatial concepts, with each of them corresponding to the political, economic, social and cultural circumstances of time periods during which they were created. It is therefore important to note that the block in the Liman III neighbourhood was built in the socialist era, meaning that it was developed on state (publicly) owned land of a big scale, while the block in the Grbavica neighbourhood was created in the time of post-socialism and was privately owned, built and sold. However, even though the scales of the blocks are different, as well as the social-political circumstances under which they were created, it remains a fact that a green public space enriched with urban elements to facilitate socialisation can be successfully developed in both. Although both residential blocks have similar main structural ideas, such as the positioning of buildings alongside the bordering streets, their communication with the surrounding neighbourhood and the characteristics of the formed inner spaces are extremely different.

The block in the Liman III neighbourhood was built during the socialist period and it encompasses a vast shared area in the inner block courtyard comprised of a large public green space divided by numerous pathways and different spaces designated for various activities. The combination of urban furniture and areas for sports and children's play indicates that users of all age groups can occupy and use the space in different ways at the same time. This improves the possibilities for encounters and prolonged socialisation among residents. The fact that the shared area

is safe from moving traffic and that the block is open in certain areas to the surrounding streets, enables residents and passers-by to enter and use it freely. With rich vegetation and green space, the microclimate of this area is favourable due to the natural elements and the adequate spacing of the buildings. The amount of vegetation has a positive impact on the health and mental well-being of the residents as well. On the other hand, the block in the Grbavica neighbourhood has an inner space which is physically and spatially completely and strictly defined. This space is unsafe to use due to the fact that most of it is used for parking purposes and vehicles can easily enter. This shared space was not intended for use as a public space in which residents and other users can spend their free time. There is a notable deficiency of public green areas and vegetation, while the closed morphology of the block does not enhance ventilation, equalling to poorer microclimate conditions when compared to the block in the Liman III neighbourhood.

The block surface areas of the analysed blocks (cf. Tables 1 and 2) indicate that the block in the Liman III neighbourhood, with a block surface area coverage of only 17.72%, has a much greater open public space than the block in the Grbavica neighbourhood with a block surface area coverage of 60%. The spatial concept of the post-socialist neglects the social dimension of collective housing, as well as the significance of green spaces and vegetation, since it does not plan for public spaces that can be used by the residents. This minimises the chances for social encounters, limiting the social relations that can be created among members of that community. On the other hand, the inner courtyard of the block in the Liman III neighbourhood was planned as a public shared space that can be used by all, while the vast green area and rich vegetation positively impact the health and general well-being of residents.

As for the impact these two spatial concepts have on climate, research conducted with the aim of creating guidelines for sustainable urban communities states that:

Grbavica represents the epicentre of post-socialist urbanization in Novi Sad, characterized by a high usage of concrete and asphalt, densely packed buildings, and minimal greenery. Data (...) indicates that the most intense urban heat island in the city is located in Grbavica. This means that during warm summer nights, this city district is up to 8°C warmer compared to the city's natural surroundings. In contrast, Liman is characterized by a block-style urban layout with less concrete and asphalt, a greater share of green spaces, and buildings that are not closely packed together. This type of urban planning and design has helped to reduce the intensity of the urban heat island by 2–4°C and to create more pleasant microclimatic conditions in Liman (Milošević, 2024, p. 6).

Conclusion

The importance of green public spaces in city residential areas should not be overlooked, due to their manifold benefits for residents. Green public areas established in residential city complexes should be safe to use and easy to access while also being large enough to facilitate various social activities and encounters of residents belonging to all age groups. If these shared spaces are accessible by all, it enhances the possibilities for members of a community to interact with one another, developing social relationships that lead to the creation, development and nurturing of strong and meaningful communities. Also, if the shared open space of a residential block is envisioned and formed as a green area with various vegetation forms and types, there are numerous health benefits for the users - including their general and mental health, not to mention the improvement of the microclimate and overall air quality. Since a human being has complex needs, ranging

from basic and physical to mental and psychological, it is of the utmost importance to develop, create and design residential city areas in a way that aims to fulfil a large amount of the spectre of these needs. The everyday lives of people are deeply influenced by their inner-most spatial frame – their place of residence. In a time in which individualisation is becoming more and more established and the internet is creating more opportunities for non-physical connection, reducing the time we spend together and in nature, our residential complexes can have a vital impact on overall life quality.

This research paper indicates that the two spatial concepts of socialist and post-socialist residential blocks in Novi Sad have different implications for climate factors, and they provide different spatial infrastructure for their residents. Since the majority of residential areas in Novi Sad are still being built similarly to the analysed block in the Grbavica neighbourhood, with developers not investing in shared, open and green areas, it is crucial that we learn from the example of the analysed block in the Liman III neighbourhood and start producing city residential blocks that offer their residents much more than just apartments and parking spaces. Apart from the health and ecological benefits of vegetation, green public spaces can be equipped with urban furniture and spaces designed for various activities which enhance the possibilities for social encounters and the development of social bonds leading to the creation and strengthening of communities. These are all highly important aspects of collective living which greatly impact the overall life quality of residents.

In order to create more sustainable and quality residential areas with multipurpose green spaces in today's social, economic and political climate, municipal policies which create and establish obligatory and set percentages of the residential block area that must be developed as a public green space should be considered and developed by policy-makers and city stakeholders. In this sense, an area for further research into the topic of this paper can be seen in the aim of conducting research for the optimisation of such policies – investigating the optimal ratio of built/unbuilt block surface area depending on the number of residents, the type of vegetation that is most suited for green spaces within residential complexes, etc. Investing in such research and the restructuring of housing policies that would lead to creating more sustainable residential areas that offer urban communities a chance to thrive in a quality green and multifunctional space would improve the overall life quality of city residents. Therefore, this research can be used to inform and reshape housing policies so that new developments support sustainable, high-quality residential neighbourhoods, providing multifunctional green space that enhances overall urban life.

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