

PRAXIS OF URBAN  
MORFOLOGY





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***PRAXIS OF URBAN MORPHOLOGY***

ORGANIZED BY

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MorphoLab Research Unit,  
and



**SNUM**

Serbian Network of Urban Morphology (SNUM)

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## INTRO

### ISUF2023 PRAXIS OF URBAN MORPHOLOGY

Coming from 20 architects, geographers, planners and historians, to more than 600 individual and institutional members across the globe, ISUF presents the important international organization of urban form both for researchers and practitioners. Due to its orientation to both of these fields, ISUF 2023 presents a great opportunity to rethink the praxis, perceived as process by which theory/idea is enacted, embodied and realized.

The theme for ISUF 2023 is drawn from the previous experience and ideas, directed toward systematization and synthesis of intellectual knowledge.

Following this line of reasoning, the Conference tracks are envisioned to confront the topics that are represented as being opposed in order to open up a debate how to transfer ideas to operational knowledge.

#### **A. Good in Planning, Landscapes and Townscapes**

A1. Urban planning vs. Urban design

A2. *Fringe growth* vs. *Urban belt*

A3. Prescription vs. Description

#### **B. Culture Space, Common Space and Personalities**

B.1. East vs. West

B.2. South vs. North

B.3. Networks vs. Individuals

#### **C. History of Ideas and Challenges**

C.1. History vs. Future

C.2. Preservation vs. Transformation

C.3. Pre vs. Post

#### **D. Programming and Rethinking Concepts**

D.1. Strategies vs. Measures

D.2. Education vs. Practice

D.3. Quantitative vs. Qualitative research

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## REFLECTION ON THE CONFERENCE

In its jubilee year of 215 years, the University of Belgrade and the Faculty of Architecture as its constituent member had an opportunity to host the 30th International Seminar on Urban Form Conference (ISUF2023).

This year's conference titled Praxis of Urban Morphology presented a great opportunity to discuss the process by which this discipline is enacted, embodied, and realized. The ISUF 2023 organization committee's endeavor was to build on the previous experience and ideas, and to direct activities toward systematization and synthesis at an international level, aiming to embody these ideas into operational knowledge. The conference was developed in a manner to provide a framework for reflecting on ISUF community intellectual knowledge coming both from the practical and scientific arenas. As a part of side activities, a special issue of the Serbian Architectural Journal - SAJ titled Regional Perspectives of urban morphology was prepared with the goal to demystify advancements of intellectual thought from all continents. Accordingly, the presentation will cover the main issues raised by scholars and practitioners both in SAJ contributions and during conference with the overall goal to contribute to the advancement of knowledge in this field, moreover to reconsider and critically examine advancements and perspectives on urban morphology.

Decision to focus the ISUF2023 conference on the Praxis of urban morphology and SAJ special issue on Regional perspectives on Urban morphology, hopefully, yet unintentionally achieving a harmonious integration of these two. Consequently, the resulting journal double issue serve as valuable testimony of longlisting engagement within the study of urban form in various contexts reflecting a specific moment in time and various perspectives on urban morphology, while conference reveals state of current topics and research fields within the urban morphology. Thus, the first one looks at the history, while the second reflects on the future

The very conference included total of 227 presentations with 580 authors (220 present on site), with representation of participants from 43 countries. The conference was developed in 4 tracks: A. Good in Planning, Landscapes and Townscapes, B. Culture Space, Common Space and Personalities, C. History of Ideas and Challenges and D. Programming and Rethinking Concepts.

Conference proceedings were developed in two parts - One available in print and online format that has texts recommended by session or conference chairs and the second with other submitted full papers.

*Editors*



## PREFACE

The International Seminar on Urban Form (ISUF) gathered for its 30th conference in the Balkans. There was a long way between Lausanne 1994 and Belgrade 2023 – between an exploratory meeting of about 20 urban morphologists, coming from five countries, in Europe and North America, and a robust conference in Serbia gathering more than 200 morphologists coming from five continents. Throughout this way, together, we have increased our knowledge about the basic elements of urban form, how these are combined generating different patterns, and how these are shaped by different processes and agents over time. We also have a better understanding of how these patterns influence the environmental, social, and economic dimensions of human settlements, and how urban morphology can contribute for addressing some of the main challenges of our times, from climate action to the construction of sustainable cities and communities. In a year of celebration, and in addition to the Belgrade conference, some of us have been reflecting on the past, present and future of ISUF (Oliveira, 2024), while others have been debating the role and contribution of our regional networks (Djokić and Samuels, 2023).

The ‘Praxis of Urban Morphology’ was the last step of a one-decade path starting with the systematic participation of Serbian researchers in ISUF conferences and journal, leading to the creation of the Serbian Network of Urban Morphology, and including the development of research projects with other networks (Kantarek et al., 2022). The ‘Praxis of Urban Morphology’ organized by Vladan Djokić, Aleksandra Djordjević, Vladimir Lojanica, Ana Nikezić, Milica Milojević, Aleksandra Milovanović and Mladen Pešić was a remarkable event. Each and every part of it was carefully planned, making evident the commitment of its organizers. The event also represented the return to full face-to-face conferences, after two online conferences, in 2020 and 2021, and the hybrid event held in Lodz and Krakow in 2022. The conference was organized in four main themes: i. the good in planning, landscapes and townscapes; ii. culture space, common space and personalities; iii. the history of ideas and challenges; and iv. programming and rethinking concepts. Each of these themes was then arranged in three pairs of poles to foster morphological debate. The conference had about 230 presentations, authored by almost 600 researchers (more than 1/3 was present in Belgrade) representing more than 40 countries.

Part of the morphological knowledge produced in the Belgrade conference is now gathered in the proceedings edited by Djokić, Djordjević, Pešić, Milojević and Milovanović. The proceedings are a precious record of one week of morphological debate in a notable city, with a rich urban history and built heritage, and a vibrant urban life. They develop new perspectives about our field of knowledge, how urban morphology can support action on the physical form of human settlements (through

planning, urban design, and architecture), and how morphological insights can consolidate knowledge on the main dimensions of urban life, from social equality and good health to decent work, and to responsive consumption of urban energy, to name just a few policy applications. For all this, the International Seminar on Urban Form is grateful to our Serbian colleagues, preparing both conference and proceedings, and to all participants.

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## A Taxonomy of Liminality: Exploring Open Infrastructure Spaces in Post-Socialist Belgrade

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### ABSTRACT

Urban morphological approaches to open space are often overlooked in interdisciplinary studies, particularly due to the complexity of spaces left-over or spontaneously generated. This paper focuses on these under-represented spaces, integrating the pedestrian perspective into the analysis. Belgrade, Serbia, serves as a case study, revealing remnants of open public spaces within the post-socialist context, shaped by historical urban planning principles and recent socio-economic shifts. In this paper, all of these spaces are considered as liminal spaces from a pedestrian perspective, accommodating individual and collective users with various cultural meanings. The aim is to create a potential classification of pedestrian liminal spaces in post-socialist Belgrade. The study employs a theoretical and observational approach, combining quantitative assessments of urban morphological indicators with qualitative analyses using the urban structural unit (USU) approach. By observing the use of space and detecting social dynamics, the study proposes three types of liminal spaces from both morphological and cultural aspects. In comparative analysis between these spaces, morphology and organization imply a possible measure of spatial quality. This work can contribute to a new way of reading and analysing contemporary open public spaces and help in their transformation, especially in a post-socialist context.

**Keywords:** taxonomy, urban morphology, urban space quality, culture space, individual vs. collective

### INTRODUCTION

Urban morphological approaches to open space are still under-represented and, more particularly, quite rarely referred to in studies of open spaces in other fields. This is partly attributed to the fact that a considerable number of open spaces are either 'left-over' or spontaneous in nature (Han, Xu and Wang, 2014). The focus of this paper is on these spaces, trying to consider pedestrian movement as a part of it. The examination of factors influencing pedestrian movement in the urban environment is a significant concern in urban planning. The entire landscape can contribute to encouraging walking (Foltête and Piombini, 2007). Therefore, the main hypothesis of the paper is that landscape and urban geographic approach in typomorphology can help in trying to resolve characteristics of pedestrian space.

The study explores the example of these left-over spaces, particularly evident in a post-socialist context. During the socialist period, modernist urban principles with rigid functional zoning (Carmona, 2003) focused on block structure and essential transport infrastructure, resulting in fragmented urban

areas characterized by car dominance and radical disjunctions in the urban fabric. This led to the creation of green belts and large open areas between buildings.

In the present day, after regime changes and significant shifts in urban patterns and impacts, there is a diversification of mono-functional areas, an increase in individual standards and choices, and improved shopping opportunities and personal mobility (Stanilov, 2007). This also signifies a social shift from collective to individuality. Consequently, remnants of open public space in urban areas have emerged, remaining undefined with issues of ownership or maintenance. These spaces vary in interpretation among individuals based on perception.

The study area is Belgrade, Serbia, where all the aforementioned elements are visible — a radical cut in urban tissue created by an urban highway, and aggressive occupation of open public spaces in the large mass housing neighborhood of New Belgrade (Blagojevic, 2005). Many undefined spaces remain within the block structure, under or above transport infrastructure, or in park areas. These remnant spaces are considered as liminal spaces from a pedestrian perspective.

In this study, the primary focus is on defining liminality from both morphological and cultural aspects. The morphological aspect primarily concentrates on the form and position of urban space, while the cultural aspect considers the usage of individuals and collectives in open urban space, as well as the quality of urban space. There is an effort to define *spatial quality*. This paper aims to provide a potential classification of pedestrian liminal spaces in post-socialist Belgrade based on a theoretical and observational approach.

Following a theoretical framework of open infrastructure within urban morphology literature and typomorphology, as well as the quality and critiques of contemporary public space, and urban-geographic categorization of urban open space, this paper attempts to reconsider potential quantitative or qualitative research of liminal spaces from a pedestrian perspective through three study areas of post-socialist Belgrade. Methodologically, the work is based on a theoretical and observational approach. Quantitatively, an attempt is made to determine which urban morphological indicators correspond to these spaces, while qualitatively, using the urban structural unit (USU) approach, the current state of these spaces is descriptively presented. Observationally, the use of space is observed to detect social aspects of space, such as groups and relationships between users. A potential measure of spatial quality is defined by the morphology and organization of these spaces in comparative considerations. In the end, a new way of reading and analyzing contemporary open public spaces, mapping and characterizing pedestrian spaces, is offered to aid in their transformation, especially in a post-socialist context.

### **Urban open spaces – complexity of typomorphological exploration**

The main reason for under-represented urban morphological approaches to open space lies in the inherent complexity of urban open spaces, which vary significantly in ecological, social, and symbolic roles, as well as in their shaping mechanisms. The vague, loose, and diversified nature of these spaces, encompassing juxtapositions such as soft and hard, private and public, spontaneous and planned, presents challenges for categorization and delineation crucial for urban morphological research. Additionally, the historical neglect and minimal socio-economic investment in open spaces, often considered as 'left-over' or incidental spaces, contribute to a lack of archaeological and physical evidence, further hindering comprehensive urban morphological analysis (Han, Xu and Wang, 2014). Open spaces are usually defined according to land use functions such as squares or streets. Within this context, such spaces do not suggest any wide range of opportunity to conduct morphological analysis on open space. If investigation of the streets and their pertinent strips is conducted, urban tissues and townscape do not present any opportunity to discuss the organization of open space.

In the literature on urban morphology, the most commonly employed categorization of open space includes street networks, urban squares, and open infrastructure spaces. When delving into the examination of open infrastructure spaces in detail, various types emerge, including pocket parks, amenity parks, linear parks, and other spaces (Pattacini, 2021). These uncategorized (other) spaces represent new opportunities for typomorphology research.

Hence, through typomorphological analysis, this study identifies similarities and distinctions, linking urban forms and types to broader contexts and processes. Specifically, this research focuses on the material aspects of types, using key urban landscape elements to propose a potential classification of open spaces and establish a functional and structural taxonomy. This effort aims to create a comprehensive database for public entities engaged in the maintenance, enhancement, and modification of the built landscape (Kropf, 2017; Oliveira, 2016).

Research on urban spaces from a pedestrian perspective is divided into two approaches: one that quantitatively measures the urban environment or the relationships between space indicators and space quality. Today, with modernist principles as a heritage in cities, spatial quality has been crucial in revitalizing urban environments (Gehl and Svarre, 2013; Carmona, 2003).

In the literature of public space there are actual question and critiques on which way we polemicize and consider contemporary public space (Carmona, 2015). The initial efforts to develop typologies for open spaces in contemporary urban studies focused on morphology, notably detailed by Carmona (2010a, 2010b). Expanding beyond design literature, Carmona explores typological approaches from sociology and political science, considering the relationships between urban spaces and social dynamics, cultural norms, class formation, and political-economic power. To unify these diverse perspectives, Carmona proposes a public space typology, categorizing twenty space types into *positive, negative, ambiguous, and private*, addressing continuums from public to private and from form/function to sociocultural values. However, due to its complexity, Carmona's typology presents challenges in application across diverse cultural contexts, leading us to adopt a simpler nominal typology, emphasizing category interpenetration and their variation across sociospatial scales (Stanley et al., 2012). Therefore, *urban-geographic approach* proposes typology in which types represent a mix of form and function, including both functionally specific and multi-purpose categories. Seven major types of open space are delineated: (1) food production areas; (2) parks and gardens; (3) recreational space; (4) plazas; (5) streets; (6) transport facilities; and (7) incidental space. Open spaces within each are further categorized by a spatial scale continuum: city-wide, intermediate, and residence (Figure 1) (Stanley et al., 2012).

As a focus of this study, *incidental spaces* are selected because these spaces align the best with aforementioned remnant spaces in the urban fabric. Incidental space is characterized as any green or grey area situated on the edges of other spaces or buildings. These spaces are often overlooked or not designated for a specific purpose, serving primarily for safety, visual amenity, or physical separation. Incidental spaces pose challenges for formal or functional classification due to their lack of clear attributes or defined purposes (Stanley et al., 2012).

Observing at three different levels, *at the city level*, semi-wild and "natural" open spaces, whether planned or unplanned, now often encompass fields, gardens, groves, and parks as large-scale green areas. *At the intermediate level*, smaller-scale incidental spaces emerged in the 20th century due to the transportation revolution and urban expansion. Underused paved spaces resulting from modernist planning and zoning ordinances, often along transportation corridors, arise from safety concerns or aesthetic reasons. *At the residence level*, distinguishing between purposive and incidental space in empty urban lots, whether overgrown or bare, is challenging (Stanley et al., 2012).

		Scale		
		City	Intermediate	Residence
Form	Transport Facilities	Harbors, Airport and Train Station Parking	Transit Stations, City Gate Areas	Driveways, Parking Areas
	Streets	Central Boulevards	Street Space	Pedestrian Alleys, Paths
	Plazas	Large Formal Plazas	Smaller Neighborhood Plazas	Interior Courtyards
	Recreational Space	Stadiums, Greenbelts, Beaches	Sports Facilities, Playgrounds	Houseyard Playspace
	Incidental Space	Natural Features and Semi-Wild Areas	Empty Lots, Transit Borders	Marginalized Space Between Buildings
	Parks and Gardens	Major Formal Park and Garden Space	Institutional Gardens, Small Parks, Cemeteries	Household Gardens
	Food Production	Orchards, Agricultural Fields	Grazing Commons, Community Gardens	Kitchen Gardens, Small Horticulture

	Grey space
	Green space
	Grey/Green space

Figure 1. A transdisciplinary typology of urban open spaces - Incidental Spaces selected, photo credit: Stanley et al., 2012

In this study, all of these spaces are considered as *liminal spaces* from a pedestrian perspective due to their unclear positions and boundaries between different areas.

### METHODOLOGY

Methodology is based on on a theoretical and observational approach. There is new systematisation and rethinking of existing approaches in order to analyse liminal (remnant) space from pedestrian perspective.

Firstly, from the group of urban indicators for generating the design of urban morphology, those related to open space are selected. The application of parametric modeling and evolutionary optimization methods aims to address complexities in urban design, with the goal of simplifying the generative process of urban morphology by offering a classification of indicators (Elzeni, Elmokadem and Badawy, 2021). This classification includes horizontal-based UMIs, vertical-based UMIs, and volumetric UMIs, contributing to the assessment of morphological connections between urban

elements (Figure 2). Quantitatively, an attempt is made to determine which urban morphological indicators correspond to the subject (liminal) spaces for further research.

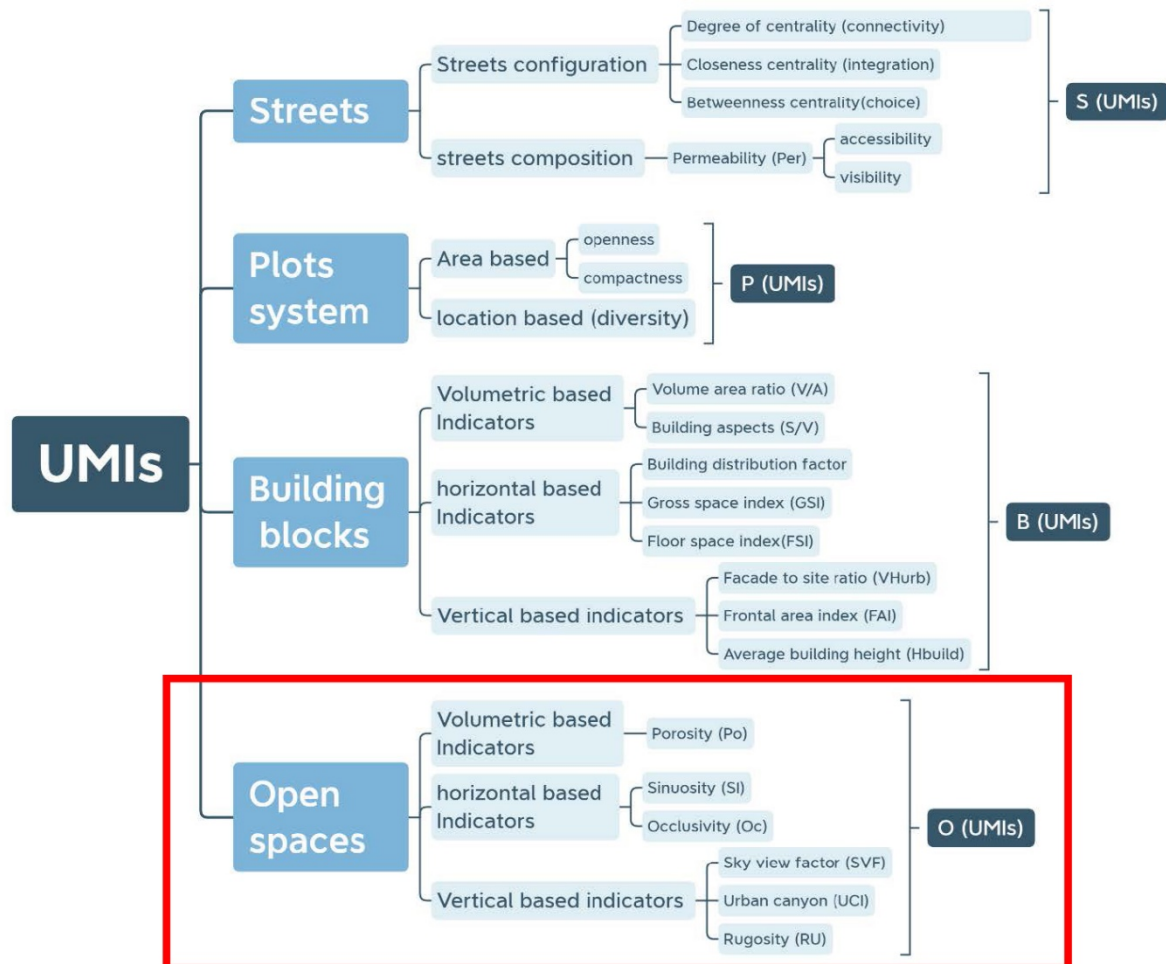


Figure 2. Urban Morphology Indicator (UMIs) Classification – Selected indicators for Open spaces, photo credit: Elzeni, Elmokadem and Badawy, 2021

Secondly, the Urban Structural Unit (USU) method is introduced (Osmond, 2009) as a technique identified as the basis for decomposing an urban space into a set of relatively morphologically homogeneous entities. This method establishes a common vocabulary for urban form, facilitating communication across disciplines and scales. It is not the sole way to describe a city, but it offers a valuable perspective. The USU is presented as a physical matrix for the urban functional unit (Figure 3), encompassing land use, ecology, and human dimensions. This approach helps explain phenomena beyond structural criteria. Qualitatively, using the Urban Structural Unit (USU) approach, the current state of the study (liminal) spaces is descriptively presented in order to consider spatial quality.

Additionally, there are also implemented behavioral observations in order to detect movements and usages in urban space. This approach entails a methodical observation of people's actions, involving the recording, analysis, and interpretation of their behavior. The investigator becomes an

active member of the group under study, gaining insights into their situation by directly experiencing it (Gray, 2004).

Study areas, liminal (remnant) spaces, constitute focal points within systems of incidental spaces in post-socialist Belgrade according to the previously described urban-geographic approach typology (Stanley et al., 2012), with a focus on the pedestrian perspective. In the following section, the study areas will be presented.

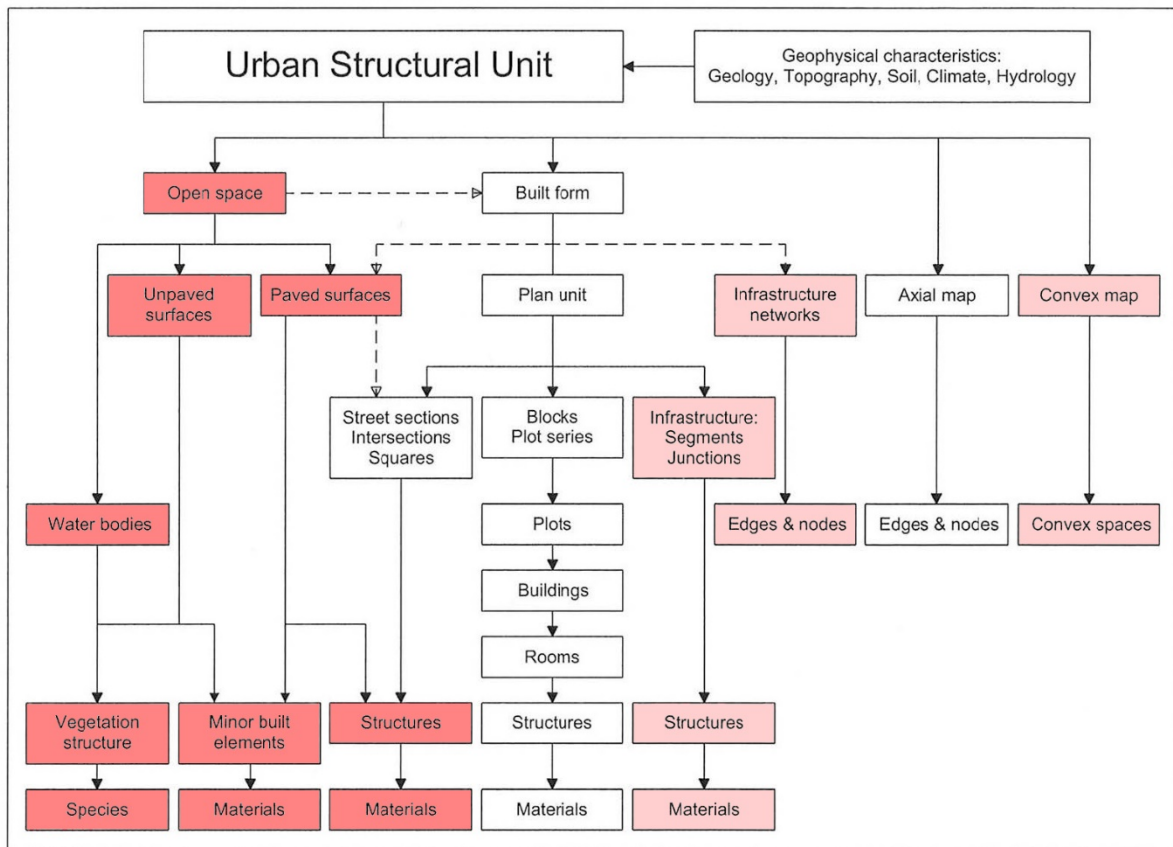


Figure 3. Decomposition of the urban structural unit – Study relevant elements, photo credit: Osmond, 2009

### Study areas – block, interchange and park

Systems of spaces in post-socialist Belgrade (Figure 4) have been selected based on incidental spaces from the urban-geographic approach typology (Stanley et al., 2012) (Figure 1). Within these systems, there is the potential for *incidental (liminal)* spaces to occur. At the *city level*, the selected "natural" open space is *Park "Ušće" (The Park of Friendship)* (yellow color). At the *intermediate level*, as a transit border or underused paved space, areas above or under the *urban highway* are chosen (red color). At the *residence level*, *Blocks of New Belgrade* (orange color) are selected, particularly the spaces between buildings.

*Block 30* (Figure 5) is situated in the Central zone of New Belgrade, as one of the nine blocks of that zone. Its rectangular shape measures approximately 600x400m with a varied urban structure including five towers, two horizontal slats, and a meandering structure in the central part with shared



spaces in between. Large open public spaces in the middle of the block were intended for a kindergarten and school but were never realized. These shared spaces between buildings are considered as *liminal space 1* (Figure 6, 7).

*The Mostar Interchange* (Figure 5), an interchange of the urban highway, is one of the most crucial traffic points in the old part of Belgrade. The walking underpass is an essential connection between two parts of the urban tissue that the highway cuts and contributes to the daily lives of the urban population. In this area, there are bus and tram stations. The interchange is designed across four construction levels at a total height of 18 meters. These walking underpasses are considered as *liminal space 2* (Figure 6, 7).

*Park "Ušće"* (or *The Park of Friendship*) is a riverfront park, an integral part of the urban planning project of New Belgrade. Initiated to symbolize the struggle for peace and equality among nations during the Cold War, the park was made based on modernist principles. Today, there is a lack of some connections in the pedestrian network. Several walking paths in the park are considered as *liminal space 3* (Figure 6, 7).



Figure 4. Map of Belgrade - systems of incidental spaces, photo credit: N. Mitrović (July 2023 using SwarzPlan plan - schwarzplan.eu)

## RESULTS AND DISCUSSIONS

There are three liminal spaces in the taxonomy, representing different kinds of areas. Despite this distinction, similar problems of usage occur.

*Liminal space 1* occurs at the *residence level*, between the buildings of Block 30 in New Belgrade. It is an access paved area to the buildings, elevated from the ground by several stairs and protected with railings. In the middle, there are concrete flower pots and seating furniture. This area is influenced by local citizens with changes in pavements, leading to conflicts between existing and new pavements, as well as maintenance issues with urban furniture. The ownership level between public and private is questionable, where residents consider some parts of the area as their space, often using garden pots, creating a specific sense of feeling. Pedestrians move through this area or enter buildings without much retention. This area can be considered as a surface and analyzed by *visibility studies*. In a three-dimensional way, the distance between buildings and implemented *horizontal or vertical UMIs*, such as *occlusivity (Oc)* or *urban canyon (UCI)*, could be considered.



**Figure 5.** Map of Belgrade with three study areas: 1. open communal space in block 30, 2. walking underpasses of Mostar Interchange, 3. walking paths of riverfront park „Ušće“, photo credit: N.Mitrović (July 2023 using SwarzPlan plan - schwarzplan.eu)



**Figure 6.** Morphological comparison of three liminal walking spaces in post-socialist Belgrade: liminal space 1 (left), liminal space 2 (middle), liminal space 3 (right), photo credit: N. Mitrović (July 2023 using Google maps plan - googlemaps.com)



**Figure 7.** Liminal walking spaces in post-socialist Belgrade: open communal space in block 30 (left-up), walking paths of riverfront park „Ušće“ (left-down), walking underpasses of Mostar Interchange (right), photo credit: N. Mitrović (April 2021 / June 2023)

*Liminal space 2* occurs at the *intermediate level*, as the area under the urban highway in the form of walking underpasses. These walking paths on different levels are crucial connections for pedestrians between two parts of the city, serving as a transport hub for buses and trams. The width of paths is not large, but in some parts, it expands as a connection with the park. The fences on both sides with a small distance between levels create the feeling of a box. Pedestrians move through these paths or stop at the stations, facing problems with orientation without much retention. Comparing concrete materialization, only orange-accented handrails could be helpful in movement and orientation. This space can be considered as axial lines, so the analysis needs to be based on the *configurational approach*. In a three-dimensional way, the distance between levels and covered areas with implemented *horizontal or vertical UMIs*, such as *occlusivity (Oc)* or *sky view factor (SVF)*, could be considered.

*Liminal space 3* occurs at the *city level*, as part of the pedestrian network in the "natural" open space or riverfront park (*The Park of Friendship*). There is a dominance of longitudinal movement alongside paths parallel to the river, without enough transverse connections between paths themselves. There are more users compared to the other two liminal spaces, such as recreationists, but without much retention either. The same pavement with excessive greenery contributes to a monotonous experience. Regarding axial lines' dominance, the analysis could be based on the *configurational approach*, as in *liminal space 2*. In a three-dimensional way, the height of greenery, distances between trees, and covered areas with implemented *horizontal, vertical, or volumetric UMIs*, such as *occlusivity (Oc)*, *sky view factor (SVF)*, or *porosity (Po)*, could be considered.

Comparing the size of these liminal spaces, it could be concluded that *liminal space 1* is a larger area with more possibilities to introduce new content regarding pedestrian movement. If we focus on cultural/social diversity, it could be said that in *liminal space 1*, there is a dominance of local citizens with a sense of being between private and public spaces, in *liminal space 2*, momentary communities are formed as groups of people who currently use the space, while in *liminal space 3*, there is a mix of both group of users. Comparing the spatial quality of these spaces, as a result of the analysis, it could be said that *liminal space 3* is the most useful regarding the conditions of usage with the biggest potential for transformation. This cannot be said for *liminal space 1*, which has a problem of denivelation, and especially for *liminal space 2*, where its usefulness is achieved with low potential for transformation of any other aspect in its geometry of narrow walking paths.

In order to more precisely define the spatial quality of space, a combination of approaches is lacking, where the modification of indicators is desirable or more guidance of the descriptive approach to quantitative analysis.

## CONCLUSIONS

The paper begins by addressing the under-representation of urban morphological approaches to open spaces, attributing it to shaping mechanisms. The vague, loose, and diversified nature of these spaces, marked by various juxtapositions such as soft and hard, private and public, spontaneous and planned, presents challenges in categorization and delineation. The research focuses on a single category of liminal (incidental) spaces within street networks, urban squares, and open infrastructure spaces, examining them from morphological to cultural perspectives to define spatial quality for pedestrians. This study has the potential to contribute to the development of future methodologies bridging urban morphology with disciplines like urban geography, landscape research, or anthropology based on a social approach. It aims to expand the field of action and enhance our understanding of the system of these liminal spaces. For future research, there is a need to work on methodologies that bridge quantitative and qualitative approaches in the mentioned disciplines to establish measurements of spatial quality. The findings offer a new perspective on reading and analyzing contemporary open public spaces, helping in their transformation, especially in a post-socialist context.

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