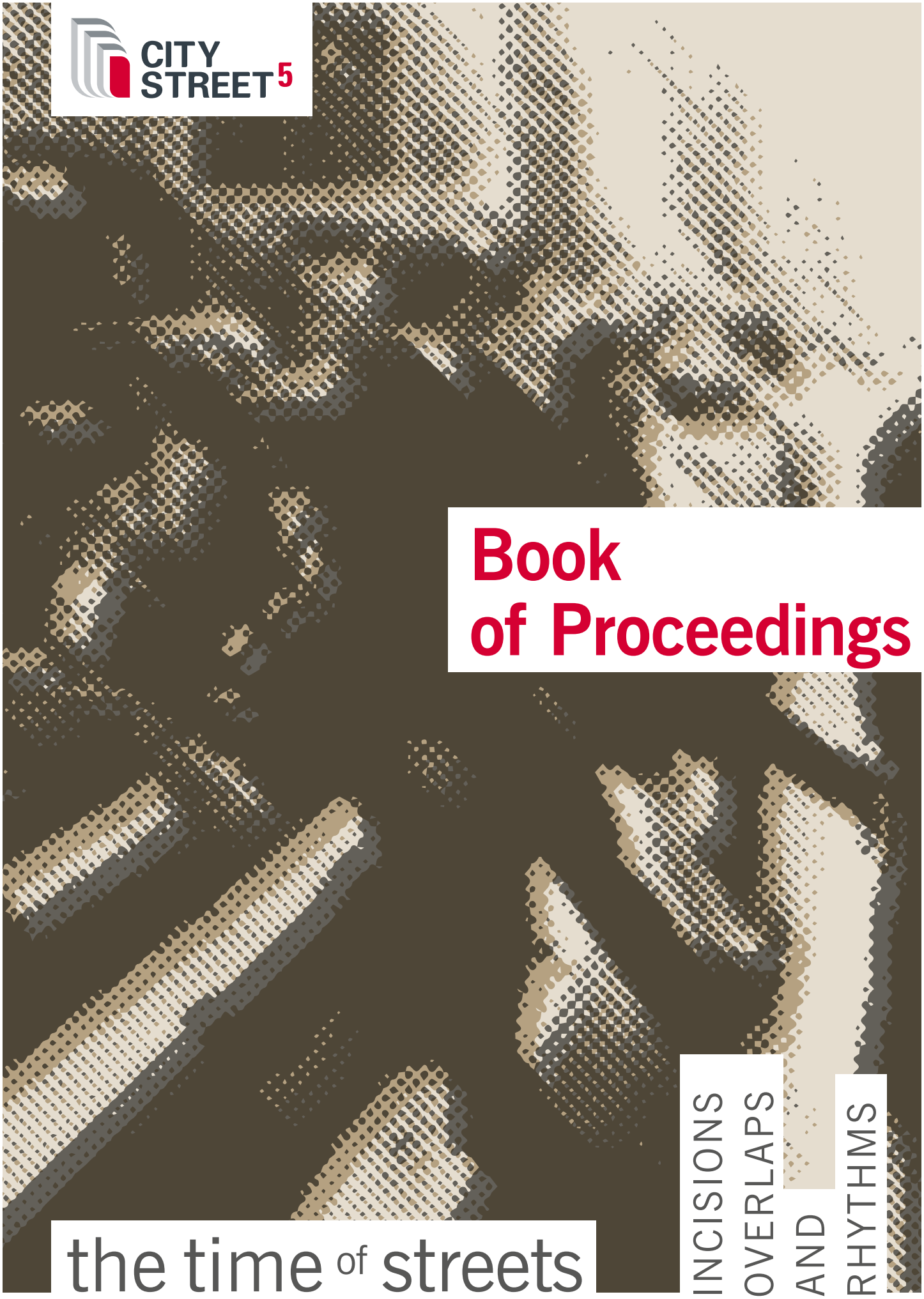
CITY STREET 5

Book of Proceedings



the time of streets

INCISIONS OVERLAPS AND RHYTHMS

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the time of streets

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INTRODUCTION

The Time of Streets: Incisions, overlaps and rhythms

The fifth edition of the City Street International Conference follows in the footsteps of the previous editions organized in Beirut by the Ramez G. Chagoury Faculty of Architecture, Arts and Design at Notre Dame University-Louaize, and in Ljubljana, virtually, by the Faculty of Architecture at the University of Ljubljana along with the Urban Planning Institute of the Republic of Slovenia.

This time in Lisbon, City Street 5 was organized by the Lisbon School of Architecture, Universidade de Lisboa, with the support of the CIAUD (Research Centre for Architecture, Urbanism and Design) and the AEAULP (Academy of Architecture and Urbanism Schools of Portuguese Language); and was hosted at the Calouste Gulbenkian Foundation. Hosting the venue in one of the most significative examples of Portuguese modern post-war architecture, at the intersection and overlap of streets from different times, was a conscient choice to frame the debate on the time of streets in the most adequate setting.

Two keynotes framed the works of the conference: the opening of the first day counted with "Lisboa" by João Luís Carrilho da Graça, introducing the hosting city from a personal perspective of one of the most significant architects with a recognized body of works in the Portuguese capital; and the last day closed with "Streets: agents of the Transition" by Paola Viganò, sharing a knowledgeable insight on the role of streets in the evolution and transformation of the urban organism, formed by the vast academical and professional experience in urban, landscape projects and public spaces in Europe.

The conference works counted with a roundtable with the moderation of Nuno Mateus which gathered a diversified panel of speakers: architect-artist-illustrator Ana Aragão, landscape architect João Nunes, economist-urbanist-geographer João Seixas and architect Lucinda Correia, who discussed about the "rhythms" of streets.

The second day of the conference counted with the Lisbon walking workshops that certainly will be kept in the memory of all participants ["WALK 1 - walking along tram 28 tracks", accompanied by Jorge Mealha; "WALK 2 - walking and drawing", accompanied by Pedro Janeiro; and "WALK 3, walking the hills and valleys", accompanied by Carlos Dias Coelho] with the previous introductory talk on the "Names and Form of Lisbon streets" by Sérgio Barreiros Proença.

The street, as a public space, defines both common and exceptional elements of the city's urban layout. The various declinations of forms, names and meanings of streets reflect different geographies and cultures that nevertheless share common characteristics.

Street, in Portuguese, is translated with the word *rua*. According to the first dictionary of the Portuguese language (Bluteau, 1712-1728), *rua* derives from the Greek *ruo* with the same meaning as the Latin *flŭo*: a stream of water "because through the streets runs the rainwater, that falls from the roofs (...) also the people run the streets, and each one of them is a stream of people (...)." Bluteau finally refers that some etymologists state that the word *rua* has the same Latin root as the word *ruga*, which means wrinkle: "a line, or a groove, caused by the time". *Rua* therefore congregates the notions of motion and line, in a single word.

Recognising the street as a line produced by the effects of time on the

skin of the city, as a wrinkle testify the passage of years, frames City Street 5– The Time of Streets: Incisions, overlaps and rhythms. Streets are the physical repository of the polis memory, an urban object in transformation over time, resulting from social and political evolutions that shape the form of the city, the urbs. Reading the incisions and the overlaps of time in the urban fabric, allows us to decode the polis eventum, which have contributed to form the present stratum urbanum. Understanding the cycles and rhythms that sculpt the wrinkles of the city, remains essential to imagine and design the future of streets.
Under this common theme, City Street 5 welcomed proposals from different contexts, methodological approaches, and disciplinary fields, that relate to the timeless importance of streets on the construction of the city as a framework for human life. From more than one hundred and twenty submissions, a selection of 60 papers, from authors of 23 different countries participated in the conference, distributed by the six tracks that also structure this book of proceedings: Track 1, STREET REPRESENTATION: theories and practices; Track 2 STREET MOBILITY: current and future trends; Track 3 ON STREETS: research tools and methodologies; Track 4 THE LIFE OF STREET: collective memories and multiple rhythms; Track 5 STREET ADAPTATION: urban transformations and (a)temporal needs; Track 6 THE FORM OF STREETS: interpreting and designing.

We hope you share our common interest and passion for cities and streets as you read these pages.

The organising committee.

3
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ON STREETS:
RESEARCH TOOLS AND METHODOLOGIES

Legibility vs. readability – Between transport planning and pedestrian behaviour

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Abstract

Pedestrian behaviour is defined by a significant number of factors, but the readability of space is one of the key prerequisites for observation and all other pedestrian activities. The focus of the paper is on the relation between legibility and readability.

By analogy space with the written text, legibility is focused on small parts and signs, while readability is based on the whole and on associations, that are emerging in our minds with possible common space usage scenarios. This paper tries to divide which urban elements affect legibility, and which one on readability for pedestrians to help transform networks in neighbourhoods between transport planning and pedestrian behaviour.

Interesting areas for analysis are overlaps of pedestrian and road traffic. So, the study area is mega blocks in New Belgrade - block 23 and block 30, especially the parts of the pedestrian network. This approach starts by identifying key elements of legibility and readability and analysing how the road traffic affects the pedestrian network and supported activities in mega blocks.

The methodology consists of forming evaluation criteria based on literature review and examining it in the study area through behavioural observations. After the assessment and analysis are done, the results as the elements in two groups of perception data can contribute to guidelines for redesigning the space in the function of pedestrian movement.

Keywords

pedestrians, legibility, readability, evaluation (criteria), (urban) elements

Introduction

Walkability is important for the sustainable development of cities. However, increase of share of trips by foot provides environmental, economic and health benefits. Walkability requires well-connected street networks that provide direct, efficient routes linking origins and destinations.[1] 'Walkability' measures the quality of walking conditions in a street, neighbourhood, or city, from the physical efficiency of a place to the perception of an individual who is walking. So, the factors that define a space as walkable are not limited to the physical dimensions of a place but also include perception. [2] In the literature on walkability, only one dimension is included: physical or perceptual but, rarely both. In this paper, there will be considered both, physical and perceptual walkability, i.e. relationship between activity, intensity or movement on one side and environmental cognitive processes while walking on the other side.

Previous pedestrian space construction has mainly focused on the settings of street sections, neglecting the facilitation of network connections or nature and characteristics of the users themselves. Also, the spatial orientation is crucial, because the current complex city-street systems often make it difficult for people to find their way to destinations.[3]

Combining the different factors is important because, from a psychological view, two components which play a part in the process of reading an environment or obtaining spatial information are the characteristics of the space and the characteristics of the observer.[4]

The research questions are regarding elements that contribute to a pedestrian-friendly environment and the terms of legibility and readability. This research tries to define which elements of the environment affect legibility, and which one on readability for pedestrians to transform networks in neighbourhoods between transport planning and pedestrian behaviour.

The assumptions are made by analogy with the written text. Legibility would only show the perception of the spatial structure, and the readability includes the recognition of potential usage scenarios, thus ensuring the "text" attractiveness or interest to the reader; or it can be said that based on associations, that are emerging in our minds with

possible common space usage scenarios.[5]

This paper aims to define and examine the affection for legibility and readability and form guidelines for redesigning the space for the function of pedestrian movement. It starts with the literature review section identifying concepts from walkability to legibility and readability to form evaluation criteria, then outlines the methodology. After that, a discussion of the results and analyses are presented through behavioural observations followed by a comparative analysis and conclusions with guidelines.

Literature review

The walkability concept was studied in three main topics in the literature. The first topic focuses on the physical conditions of walkable places or basic components of a walkable environment, the second one focuses on the perceptions and thoughts of pedestrians about their environment, and the third one on the relationship between physical and psychological health and walking as physical activity.[6] The focus of this paper is on the second topic, especially on the relationship between activity and spatial cognition to define elements of legibility and readability of space.

There are several approaches to reconsidering the legibility and readability of space and in the text those from environmental psychology of Kevin Lynch's and Gordon Cullen's theories will be presented.

Environmental psychology focuses on a psychologically acceptable environment – an environment in which a human chooses to live and has a freedom of choice. Four characteristics of the psychologically acceptable environment are coherence, complexity, mysteriousness, and legibility, where legibility means that the spatial environmental configuration is easily perceived. Also, it can be seen as the basis for the expression of the other three attributes.[7]

"The Image of the City" by Kevin Lynch is a model that is closely related to urban landscape readability. It identifies elements of a conceptually perceived city's physical body (paths, nodes, landmarks, edges, and districts) that can, in principle, be interpreted as archetypal elements of the city's "text" perception.[8]

Gordon Cullen's concept of perception is based on how the human conscience structures the city landscape from the "inside", i.e. by

"moving" or walking through it. Based on this theory, the relationship between the "here" and "there" is the essential link that describes the urban landscape structure. Furthermore, the connection between these two terms leads to legibility or even readability of the environment. "Here" is an area in which an observer is at a certain time (known and visible), "there" – an area in which he or she can move (it can be both visible and invisible). The most important perceived spaces form the "lifeline"- functionally and compositionally distinguish the backbone of the city or its part in the environment, which can be named as the most legible part of the city. That part is associated with Lynch's concept of a mental mapping and city image, especially with elements of paths, landmarks, and nodes.[9] In this paper, those elements of "lifelines" will be searched in pedestrian networks of mega blocks.

Regarding the psychological aspect, the internal strategies for making decisions have a bigger influence than external factors or stimuli. This quote describes it more:

Despite the conscious nature of perception, the process of perceiving space is both influenced by the background of the subject and by unconscious subjective factors. The output (verbal expressions or behaviours) is highly subjective. The nature of perception relies on a mental "spontaneity" (resembling proprioception) combined with unconsciousness, instinct, needs, and attention.[10]

Also, the previous research on legibility and readability of the environment is based on relations between visibility and positions of semi-private spaces on walking routes, and also the interaction between pedestrians and open spaces on streets. The results show that:

open spaces should be created alongside main streets with high visibility, and the presence of each roadside space should be emphasized using urban design methods, as this will encourage visitors to perform various street activities

- car-parking spaces have a negative effect on legibility
- semi-private spaces with separating elements such as boundaries, steps, fences, or space under the eaves have a lower effect, but semi-private spaces that are more open to pedestrians influence attractiveness

- route type with fewer turnings is legible
- semi-private spaces should be concentrated around intersec tions rather than widely distributed along the route[11]

Method and material

According to the literature review, elements of the environment which can affect the legibility or readability of the walking route are grouped in details or wholes. Table 01 showed which elements would be evaluation criteria and which presence would be searched in space of mega blocks near the paths.

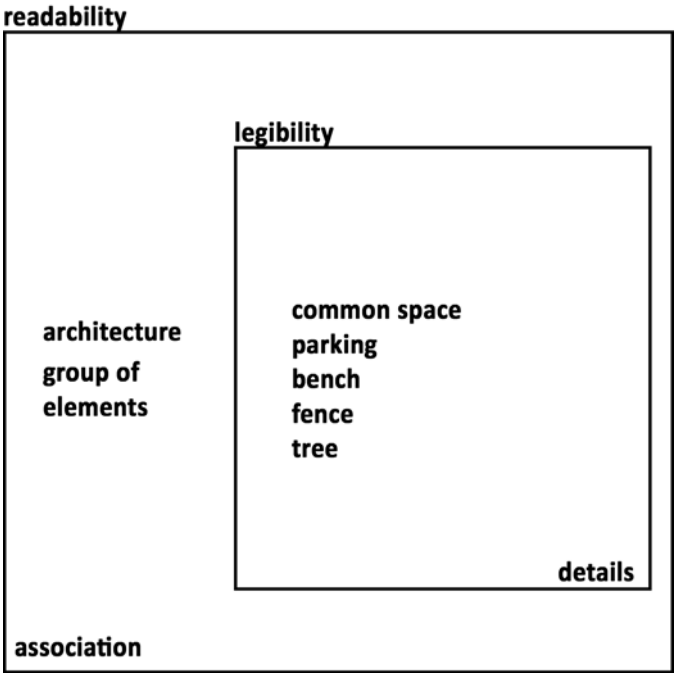


Table.01 - Legibility vs. readability - Evaluation Criteria - Source: Author 2022

The methodological framework of the research is based on two methodologies – behavioural observations activity of usage and walking interviews of respondents to map elements of the environment which can affect the legibility or readability of walking routes in New Belgrade mega blocks.

Behavioural observations

Observation is not simply a question of looking at something and then noting down 'the facts'. Observation is a complex combination of

sensation (sight, sound, touch, smell, and even taste) and perception. Observation involves the systematic viewing of people's actions and the recording, analysis, and interpretation of their behaviour. The researcher can collect the data covertly by hiding their identity or collecting the data overtly.[1]

In this research, these observations will be made as undercover participants where with participant observation, the researcher becomes a member of the group being researched and so begins to understand their situation by experiencing it. Also, the researcher does not disturb the behaviour of other individuals.

Observations can be seen as mapping some behaviour to define patterns. There are, as one a lot of, observations as social and cognitive mapping. Social mapping, for example, is a method concerned with the nature of relationships between people and their social networks. As with most mapping methods, social maps have been used to document and analyse social networks and interactions as well as by those whom they study to gain an understanding of participant perspectives. Social mapping techniques have been used to document social behaviour, movement patterns, and spatial relationships. While cognitive mapping is based on the mutually constitutive nature of place and social relationships. It is important because of understanding how people make sense of the built and historic layers of the natural landscape and the lives that are made possible by such a landscape.[2]

In this paper, the focus will be on behavioural observation activity on paths of a pedestrian network of New Belgrade mega blocks. There will be shown intensity of usage of each path. Bearing in mind evaluation criteria, the aim is to search for elements of the environment that can affect the legibility or readability of the walking route. There is a hypothesis that spaces with bigger activity are legible and readable.

Walking interview

The focus of the interview is on the relationship between what people say and where they say it - qualitative and quantitative. Interviewees are prompted by meanings and connections to the surrounding environment and it provides richer data than a sedentary interview. Quantitative data concerning the routes taken, as well as qualitative

data derived from the conversational exchange.[3]

In this paper, this method will be used just as control data for observations. In that sense, the number of respondents and the importance of this data is small but important in forming and controlling the previous methodology of this paper.

The interview was face-to-face as a part of a survey field and it is based on responses from several respondents (about 100) who are passers-by (pedestrians). The survey was simplified to examine legibility, i.e. readability, by asking the users what helped them the most on their way to the destination, i.e. which of the spatial elements most helped to define their current position and orientation in the mega block. The survey and its results try to make an analogy so that good legibility helps in moving towards the destination, i.e. wayfinding, and on the other side readability in the current position and orientation in space.

Study area – mega blocks

The study area included two typical mega blocks of the central zone of New Belgrade. Mega blocks 30 and 23 are similar in size and density, but in different positions. Mega block 30 is located quite close to the quay (Zemun Quay) and large park areas along the river, contrary, mega block 23 is located next to the highway, and near two big constructions – an office building and a Belgrade bus station.

The main reason for the selection of this study area is based on the presence of semi-private or semi-public spaces and the intersection of pedestrian and road traffic, and tendencies of transforming the pedestrian network into wider zones in New Belgrade. [4]

Results and discussion

Implementing the structure of research discussed above, results of evaluation on the study area of New Belgrade mega blocks will be presented.

Evaluation Results of Mega Block 30

The movement has been realized on two levels. At some points of the path, there are stairs and changes in the level of usage.

There is a bigger pedestrian activity in outer zones of mega-block, especially on walk sides of boulevards where there are about 700 pedes-

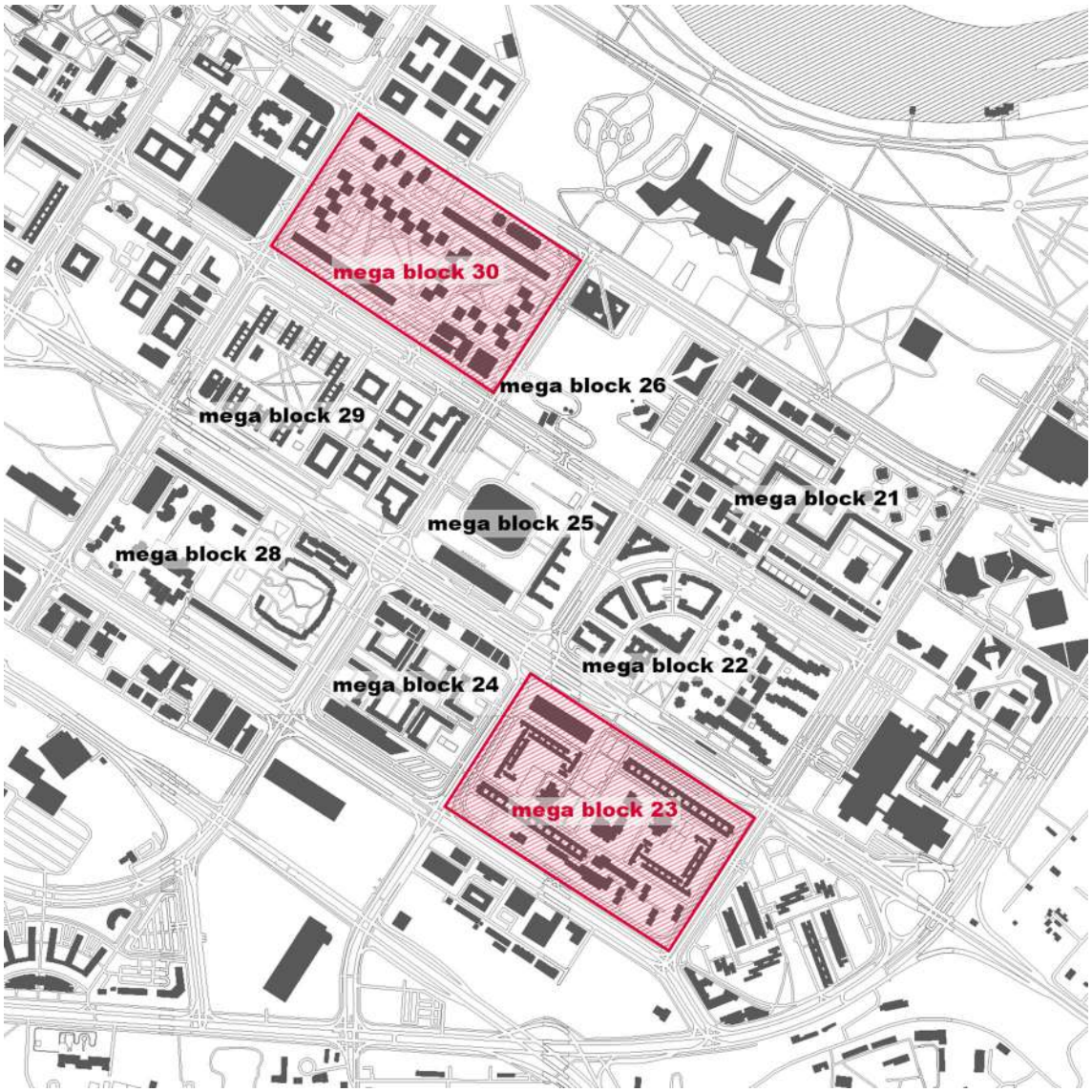


Fig.1 -Map of New Belgrade – Study area include mega block 30 and mega block 23 - Source: Author 2022

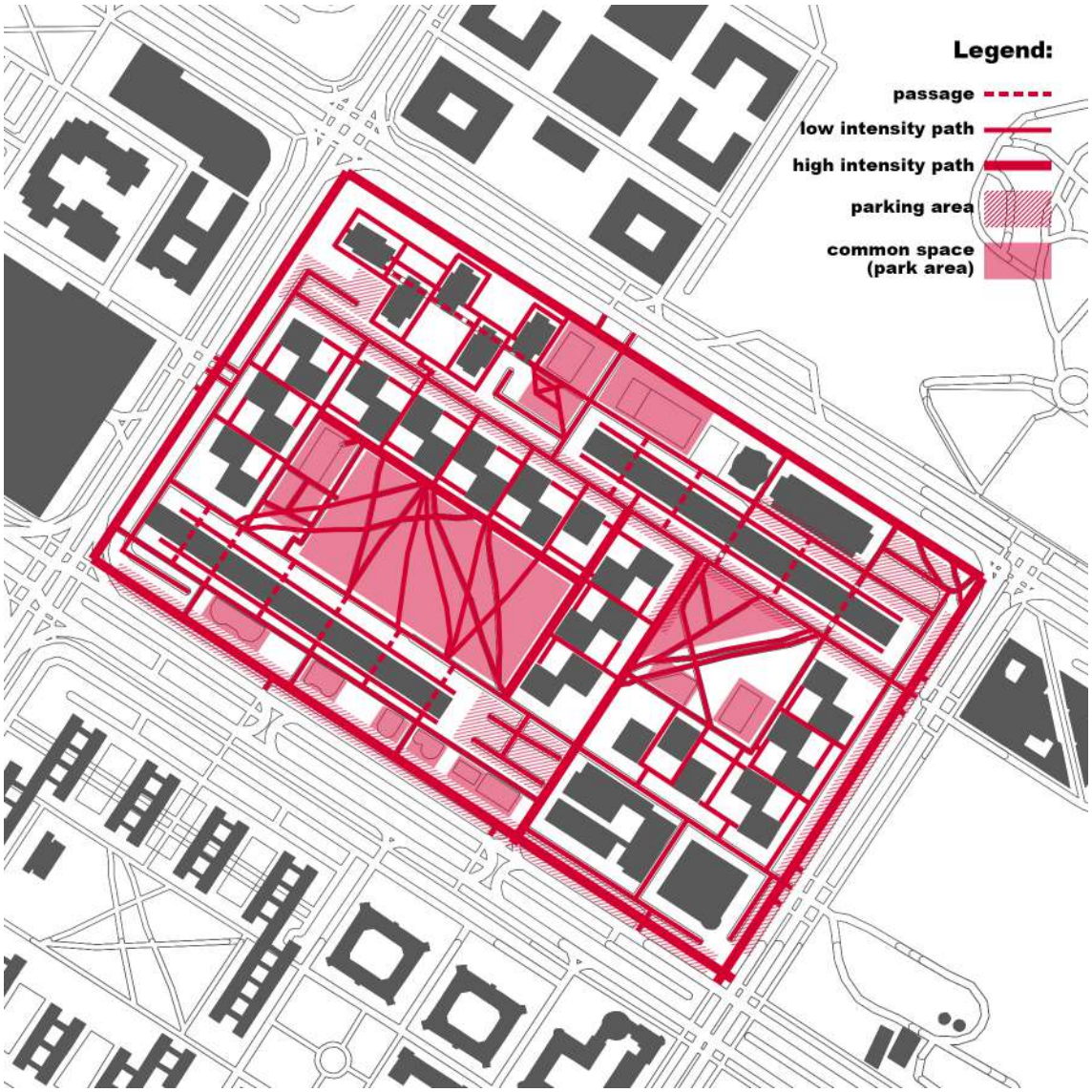


Fig.2 -Pedestrian network of mega block 30 - Source: Author 2022

trian users per day, while in the most used path in the middle of mega block it is about 500 pedestrian users per day. It is because the pedestrian activity is based on facilities outside of mega-block and on big walking distances which users pass by. Bearing it in mind, the connection between a pedestrian network of mega-block and other zones of New Belgrade is so important. So, in which way are those connections made?

According to the result of the walking interview, elements of the environment that affect legibility the most are the small park areas near the paths (36% of respondents) and elements of signage systems, especially number signs (30%) more than text signs (14%). Also, there are marketing signs (about 6%) and other pavements, colours and materials (about 5%). Elements of the environment that affect readability the most are the interesting big marketing sign Coca Cola (50% of respondents) and the large open space in the middle of the mega block (30%). [Charts 1]

Evaluation Results of Mega Block 23

The movement has been realized on the same level, so it is easier to use the space than in mega block 30.

There is bigger pedestrian activity on one part of the outer zone of mega-block, walk sides of boulevards according to new business and shopping district where it is an intensity about 900 pedestrian users per day. Also, big activity is present in some parts of the mega block, such as parks, where there are about 600 pedestrian users per day.

According to the results of the walking interview, elements of the environment that affect users' movement to the destination through the mega block are the marketing signs (about 30% of respondents) and colour (25%) and materials (20%). Also, there are the small park areas near the paths (about 8%), text signs (about 7%) and others. Elements of environment that affect readability the most are the architecture of the mega block (40% of respondents) and the construction site in the mega block (33%). [Charts 1]

Comparative analysis

The comparison of mega blocks has been based on the elements that affect legibility and/or readability of the route while pedestrian user

Fig.3 - Mega block 30: Environmental elements that affect legibility/readability - Source: Author 2022

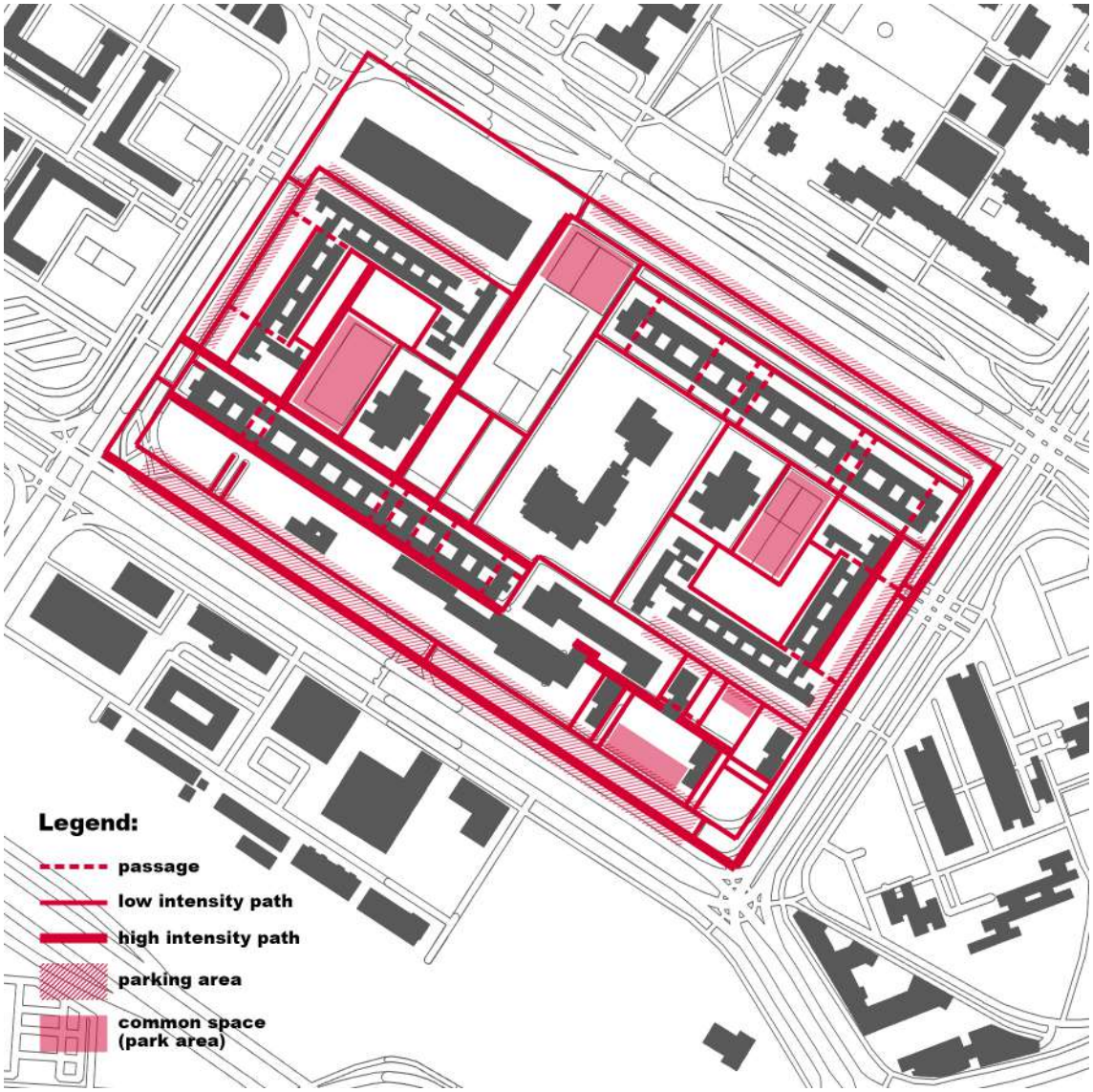


Fig.4 - Pedestrian network of mega block 23 - Source: Author 2022

Fig.5 - Mega block 23: Environmental elements that affect legibility/readability - Source: Author 2022

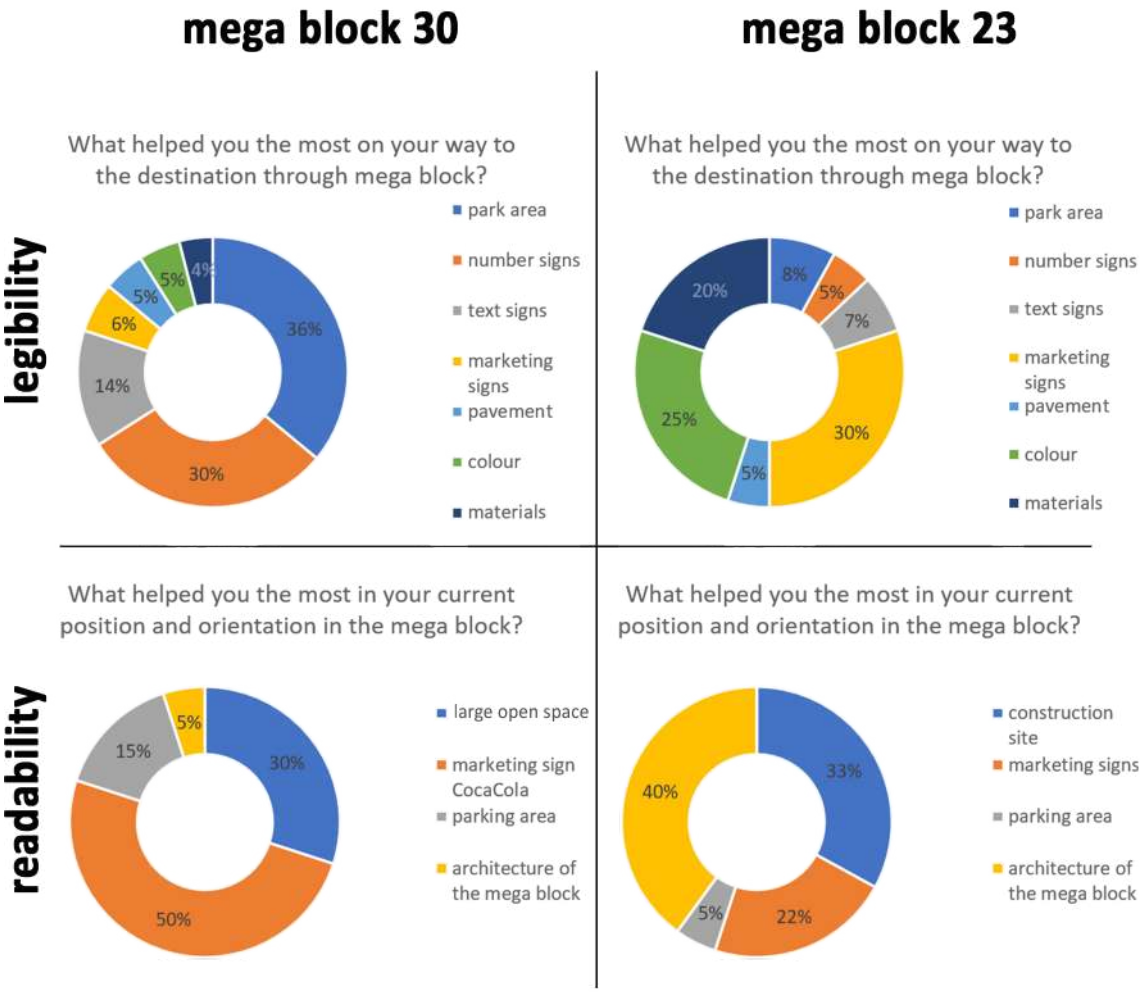
walks through a mega block. It can be said that in mega block 30, the legibility of the route is based on the small park areas near the paths as common spaces of the mega block, and elements of signage systems, especially number signs more than text signs, while in mega block 23, the legibility of the route is based on the marketing signs, colour and materials as landmarks, because the signs are smaller than in mega block 30, and it contributes to wayfinding; also colour and materials have more affection in mega block 23 than in mega block 30. When we talk about readability, we can confirm that in mega block 30 large open space does not contribute to legibility, but readability, while it is the opposite in mega block 23. In the middle of mega block 23, there are school and kindergarten facades, materialisation, roofs and windows contribute to the readability of the space in contrast to the edge buildings of the mega block. While in mega block 30, a large open area has potential for future interventions. An interesting fact is that the big marketing sign Coca-Cola definitely contributes to orientation in the mega block, and its readability. The comparison is shown in Charts 1.

Furthermore, in mega block 30, there are more spaces without fences or some kind of edge, which contributes to a bigger influence on visibility and also the readability of pedestrian routes and usage of space. Also, one of the important aspects in this comparison is definitely the enclosure of open spaces, in addition to the mentioned position.

In addition, privatization of space is the biggest difference between mega blocks. Mega block 30 has buildings that are realised during eighties and has no additional reconstructions and new constructiones until nowdays. It also has a large open public place in the middle of the block as a potential for future interventions. Unlike mega block 30, mega block 23 has been reconstructed and realised in etapes and has many privatized spaces, such as tennis courts, playgrounds and others, but also a school and kindergarten with enclosed spaces which do not contribute to the legibility of walking paths.

Discussion

The research of the space of mega blocks according to the presented criteria shows that the position, size and ownership of communal open spaces affects legibility and readability of route and that in urban design we should reconsider their position and enclosure during the



Charts.01 - Legibility vs. readability – Comparison of results: Mega block 30 vs. Mega block 23 - Source: Author 2022

design process to meet the users` needs. According to the behavioural observations, activity is not the only indicator of legibility or readability of the walking route, because there are some parts of the mega block with a big intensity of activities but with a lack of overall legibility, such as the large open area in mega block 30. If the large open space is fragmented into smaller parts, such as a small park within a large area, the wayfinding is better because the presence of small details and small paths contributes to legibility. Furthermore, in mega block 23, a cardinal path for a quick pass through the mega block, contributes to the less visibility, legibility and readability of a place. While walking through the mega block user does not know his or her position within the block, nor the position of the cardinal path, because of the enclosure of nearby open spaces. The position of new landmarks or semi-enclosed spaces can contribute to the better orientation.

Also, despite the big activity usage in mega block 23, there is a problem with the legibility of the space based on the position and enclosure of the small park areas. The legibility and readability are based on between marketing sign system and architecture of the mega block.

Furthermore, there is a psychological influence of colour, material, graffiti art, enclosure, and positions of communal open space on the user. There is a need for the user to examine a list of internal factors before the decision of route choice.

As for the methodology, we can conclude that the results have not been examined enough. It can be measured with more quantitative tools, such as space syntax in order more precisely define the intensity usage of space. Also, one of the disadvantages of the survey is that results represent the respondents' assessment as subjective results and it is based on a large number of respondents such as residents of the block who know that area and have a psychological background in that environment. There is a need to make a new kind of questionnaire for the new users who are not residents of the mega block. However, some types of psychological methods with tracking devices will help aim to examine the internal strategies of making decisions and the cognitive skills of the user.

Conclusions

Although we have parts of mega blocks with a good signage system,

the pedestrian activity is modest. It can be concluded that good readability/legibility and signs don't contribute to the activity, but to the orientation, navigation, and wayfinding in space which is very important in post-modern and post-socialist neighbourhoods. However, the constitutive buildings of the blocks have many similar elements based on modular repetition, concrete and brick which do not contribute to distinctions and orientation in space.

There is a need for universal signage that is not part of commercial usage, but for functional usage and better orientation in the mega block, connection with surroundings and above all, better wayfinding.

The guideline elements of transformation mega blocks' pedestrian networks should be focused on:

- place of the new semi-public or communal open spaces (such as parks or shared activity spaces) that should be concentrated around intersections rather than widely distributed along the route
- making routes with smaller turns or just making one cardinal route through the mega block which can contribute to pedestrian connection with a wider network of New Belgrade
- different types of enclosure of communal open spaces.

These findings indicate that the process and method of this research can be used as a model for future studies in walkability literature, pedestrian, and transport planning within different sizes of cities and different types of environments. It can help in defining the transformation of different types of pedestrian networks and recognising/studying its important elements of activity.

Acknowledgement

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