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Fig. 1 PSI points marked as black circles on city map of Maribor. The responders expose most of the points lying in the city centre, but only few points in the surrounding area. City on left river bank is more noticeable. On right river bank natural characteristic of green hinterland are depicted.

Sl. 1. Uporišne točke prostornog identiteta označene su kao tamni krugovi na planu Maribora. Ispitanici su naznačili većinu točaka u centru grada, a tek nekolicinu u gradskoj okolici. Na lijevoj obali rijeke uočljiva je gradska struktura dok desnu obalu više karakterizira zeleni pojas.

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Rethinking the City Spatial Identity through the Eyes of the Observer

Promišljanja o prostornom identitetu grada iz perspektive promatrača

CITY DEVELOPMENT
DECISION MAKING PROCESS
MENTAL MAP
PILLARS OF SPATIAL IDENTITY

RAZVOJ GRADA
PROCES ODLUČIVANJA
MENTALNA MAPA
UPORIŠNE TOČKE PROSTORNOG IDENTITETA

The article explores holistic approach of understanding that the concept of the city is not only material reality, it is also a mental structure that results subjective perception. Environmental perception differs during day and night. An empirical research was conducted, based on analytical method of mental mapping. The most often noticed points are pillars of city spatial identity. Their importance increases with occurrence frequency.

Rad istražuje holistički pristup konceptu grada koji nadilazi materijalnu stvarnost i predstavlja mentalni konstrukt kao rezultat subjektivne percepcije. Percepcija okoliša razlićita je danju i noću. Provedeno je empirijsko istraživanje utemeljeno na analitićkoj metodi mentalnog mapiranja. Točke koje se najćešće percipiraju predstavljaju uporišne točke prostornog identiteta grada. Njihova važnost povecava se s učestalošću pojavljivanja.

INTRODUCTION

UVOD

An urban environment can be understood as a system that covers many different spatial interests. In order to cover them all, there are numerous, more or less successful, spatial arrangements which are interconnected. Cities and urban areas are still the most interesting places to live in. They are generators of "creativity, innovation and economic growth".[1] Social development is a complex concept that covers a wide range of values, creating potential positive effects on local communities and individuals.[2] Environmental subjugation necessary for modern living patterns is the reason for studying public space development possibilities. Outdoor arrangements are important because of aesthetic appearance, personal safety, the safety of property, and traffic safety. Good environmental design represents satisfaction of socio-psychological needs and improves living and working conditions.[3]

A starting point of the presented contribution is the awareness that a city is not a constant form. Urban development is guided by social progress and technological capabilities. Changes cover the conditions of space use and they are global, regional or local. According to Pegan *et. al*.[4] they are perceived in size of the affected areas, their speed and frequency, and their predictability in time and space. It is not difficult to adapt to changes in a way to ensure good spatial arrangements of those cities with large and varied economic base. What about less known cities; cities with weak economic base and low infrastructure level? How to seek for their spatial opportunities? How to define which places used to be rearranged? Which places deserve to be set as priority? How can be ensured durable good living conditions to all (humans, animals, and plants) as highest priority? According to Vezilić Strmo *et al.*[5] sustainable renovation is not just reduced to care for the environment, but it involves cultural, social, economic, and institutional aspect of renovation process. Proposals for a set of complementary economic acceptable and cost effective interventions, designed for the external areas, should be without disrupting the authentic character of the building.[6]

We believe that the possible solution lies in providing high quality spatial organisation that corresponds to lifestyles which contribute spatial recognition and spatial identity. Places should be designed for people. Burden[7] recommends creating sense of place, connecting people to nature, to be authentic and to offer diversity. Knox[8] argues that "a good urban design fosters positive sense of place which is usually socially constructed, as in ordinary places, which do not have physical settings with important landmarks, the social construction of place is especially important". A good walking infrastructure and people using it for their daily activities may contribute to increased attractiveness of a place and development of its image, this directly influence the quality of life.[9]

On the other hand Gehl[10] present a probabilistic approach to understand how spatial perception influences behaviour. He argued that through design it is possible to influence how many people use open space, how long individual activities last, and which activity types can develop. Carmona *et al.*[11] believe that the crux of Gehl's argument is that, in poor-quality public spaces, only strictly necessary ac-

1 JELINČIĆ *et al.,* 2015
2 DOMSIĆ, 2015
3 ROZMAN CAFUTA, 2015
4 PEGAN *et al.,* 2014
5 VEZILIĆ STRMO *et al.,* 2014
6 VERŠIĆ *et al.,* 2015
7 BURDEN, 2000
8 KNOX, 2005
9 FARKIĆ *et al.,* 2015
10 GEHL, 2001: 11-14
11 CARMONA *et al*., 2003: 107
12 ROZMAN CAFUTA, 2014
13 MAIELLO *et al*., 2011; MORI *et al.,* 2012; MORI *et al.,* 2015
14 WILLIAMS, 2010
15 ROZMAN CAFUTA, 2015
16 Planners are decision-makers who make any decision regard to city.

tivities occur. In higher-quality public spaces, necessary activities take place with approximately the same frequency – although people choose to spend longer doing them – but, more importantly, a wide range of optional (social) activities also tend to occur.

Urban surfaces are always used by many users at the same time, by drivers, cyclists, pedestrians, and residents. Each group has their own spatial needs.[12] The environment should go along with it and create a good personal feeling. To ensure satisfied users environmental circumstances should be adjusted. How to achieve it? We have to know how different stakeholders see, perceive, and experience their environment in everyday life. Technical criteria of environment can be measured, but the citizen good feeling cannot be measured in the same way. Assessing the level of convergence between planners and users can be helpful in building a consensus.[13]

Urban development is often characterized as being split on "technical" and "social" grounds.[14] Research, practice, and expertise tend to coalesce around either the scientific and technological advances that need to be made or around social change, largely couched in terms of behaviour, economic, or governance shifts. The key to successful urban space development is allocation of resources forwarded through different branches of decision-makers. To achieve interaction between urban space and its users, it is necessary to understand how users perceive their environment.[15]

There are perceptual differences between two interest groups: planners[16] and users[17]. Planners experience the environment differently than other social groups, but their decisions about resource allocation have a great impact. This level has often been defined as the objective because it involves physically hard measures or expert judgments.[18] Planners operate in accordance with the principles of good practice. Their priorities are aesthetically functional, technological, economic, legal, and environmental. On the other hand, users' environmental perceptions are always subjective because they rely on individual responses.[19] Their observation is dependent upon the individual's sex, age, time, experience, and culture. Their priorities are psychologically-, sociologically-, and aesthetically- conditioned.

The article focuses on the spatial aspect of urban environment. Users play an important role. It is essential to know how they sense the city. Their environmental perceptions reflect their spatial priorities. Some points in the city are, for users, particularly important. In presented research they are named Pillars of Spatial Identity [PSI points]. Spatial identity is reflection of what users see and feel. PSI points are in the domain of users. Decision maker should follow their expressed needs.[20] If PSI points are not internalized, spatial purpose is not reached. For decision makers some points may seem trivial, for users they are importance carrier. Therefore it is necessary to identify the points that make the city distinctive.

PSI points often have specific characteristics that differentiate them from surroundings. They are distinguished by good visibility, good accessibility, transportation network involvement, high usage frequency, high quality of spatial arrangement, integration in tourist routes, higher property and rental values, etc. They should undergo special environmental care. Presented methodological approach helps in solving current societal challenges: how to recognize the most prosperous points and areas that contribute most to the spatial identity of the city. Where it is necessary and it pays to invest in spatial development, especially if resources are limited?

The research concentrates on scientific approach based on analytical method of mental mapping[21] as assessment tool. There is a tendency to answer all raised questions using the following hypothesis:

(1) Spatial identity of the city is users' mental image[22] reflection. PSI point's importance increases with the mental map occurrence frequency.

(2) Spatial identity of the city depends on time. Users' environmental perception of PSI points is different during day and night time.

For decision makers recognition of PSI points is strategic advantage. It enables influencing the city development and rearranging specific locations to be appropriate for various activities in long time period.

17 Users are inhabitants, visitors, actors, tourists, and all who use city any way.

18 Fornara *et. al.*, 2010

19 Fornara *et. al.*, 2010

20 Pocock and Hudson [1978, cit. by Polić, 2002: 52-53] speak about three modes of planning participation: (1) Planner as a leader; his conception of the city is crucial, users just follow him; (2) planner as imitator; planner responds and adapts to the users' needs; (3) planner – user interaction; it is a dialogue between the planner's vision and user's preferences.

21 A mental map, as an output of mental mapping, is a person's point-of-view perception of their area of interaction. The creation of a mental map relies on memory as opposed to being copied from a pre-existing map or image [https://en.wikipedia.org/wiki/Mental_mapping].

22 A mental image or mental picture is the representation in a person's mind of the physical world outside of that person [Eysenck, 2012].

SPACE AND PLACE COGNITIVE EXPERIENCE THROUGH MENTAL MAPPING

KOGNITIVNO ISKUSTVO PROSTORA I MJESTA KROZ MENTALNO MAPIRANJE

Environmental perception is a complex process, in which we collect and organize received information. Through this process it is possible to be aware of our relative spatial position in relation to existing boundaries. It has an impact on individual impressions, ability of environment identification, orientation ability, sense of safety, and ability to recognize spatial order or spatial segmentation. As such it is important for spatial development of a city. According to Canter[23] space concept is based on individual cognitive experience and designated by the composite conceptual system. We are informed about a place through "what behaviour is associated with, or is anticipated to be housed in it, what physical parameters of the settings are, and the description, or conceptions, which people hold of their behaviour in that physical environment".[24] Existing and recognized natural and historic values within a city district play an important role in maintaining and creation of the recognizable city image.[25] A place is set with a specific physical location, symbolic meanings, and activities taking place in it. It is humans' cognitive experience of the material world and offers a concrete visual metaphor. Space defines a cognitive image of a specific location, like any human performance that includes physical and mental links between an observed location and its surrounding.[26] The message of space ultimately depended on individual interpretation decomposing and recomposing its cryptic meanings.[27]

Eyesight provides the largest amount of information to explain what happens around us. Visual perception dominates over other perception modes such as: hearing, smell, taste, and type. We are supplied with a lot of information, e.g., distance, colours, shapes, textures, and contrasts. Vision gives us two thirds of all environmental information.[28] Sometimes the environment provides us with more information than we can accept. We select only those messages that are important and useful for us, but we accept only as much as we can process.[29] Polič *et al.*[30] consider that every approach that reveals the image of an environment in people's minds in all its variety, contributes to our knowledge of human-environment interactions. Urban space provides the most diverse experiences. Space perception depends on the individual's ability, geographical characteristics of specific environment, social conditions, gender and age of user.

In the late sixties and seventies began studying the relationship between the reality and the idea of the space.[31] First studies have shown that equal to actual space, our space perception can be articulated, evaluated and categorized.[32] Tolman was the first who introduced the idea of cognitive mapping when doing the experiment involving rats and mazes.[33] With his behavioural approach, he was a pioneer of spatial psychology. For Downs and Stea[34] *cognitive mapping* may be defined as a process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in their everyday spatial environment. Cognitive mapping is the mental structuring process leading to the creation of a cognitive map.

Cognitive map is the key to understand the process of environmental sensing. Obtained knowledge enable: identifying the identity of objects or whole area, and determine the distance between various points and patterns. Such comprehensive spatial visualization enables everyday movement, route planning, understanding the route descriptions and map reading. In more general terms, a cognitive map may be defined as "an overall mental image or representation of the space and layout of a setting".[35]

Cognitive maps have been studied in various fields, such as psychology, behavioural geography, architecture, landscape architecture, urban planning and more.[36] As a consequence, these mental models are often referred to, variously, as cognitive maps[37] or mental maps[38] for example. A cognitive map is a spatial representation of the outside world that is kept within the mind, until an actual manifestation (usually, a drawing) of this perceived knowledge is generated, a mental map. Cognitive mapping is the implicit, mental mapping the explicit part of the same process. In most cases, a cognitive map exists independently of a mental map, a researches

23 CANTER, 1977: 158
24 CANTER, 1977: 159
25 POPOVIĆ *et al.*, 2016
26 CANTER, 1977: 22-26
27 ŠERMAN, 1997
28 GREGORY, 1998
29 GIFFORD, 1997: 22
30 POLIČ *et al.*, 2004
31 EVANS, 1980; LIBEN *et al.*, 1981; LYNCH, 1960
32 GOLLEDGE, 1978; LYNCH, 1960; STEVENS, COUPE, 1978
33 A rat was placed in a cross shaped maze and allowed to explore it. After this initial exploration, the rat was placed at one arm of the cross and food was placed at the next arm to the immediate right. The rat was conditioned to this layout and learned to turn right at the intersection in order to get to the food. When placed at different arms of the cross maze however, the rat still went in the correct direction to obtain the food because of the initial mental map it had created of the maze. [TOLMAN, 1948]
34 DOWNS, STEA, 1973: 8-26

covering just cognitive maps remained limited to theoretical considerations.[39]

For example, Lynch[40] and Cullen[41] upgraded initial knowledge from planning theory to planning practise. They broke down city structure in a sequence of images that helps us to adapt. For Cullen[42] the city is like a puzzle of contrast like: open and closed, tense and relaxed, light and dark. It exist the awareness to move in or out of certain area. The place is perceived as being "here" and "there." Similarly according to Lynch[43], city structure represents a basis that helps humans in perception and spatial orientation. For him, a concept of urban landscape is not only a material reality, it is also a mental structure that results subjective perception. Lynch[44] divides urban space into individual components like: points, lines, surfaces, and volumes. The hierarchy, size, and visual recognition are important. He also noticed five key elements of high recognition value that makes reading spatial order possible. These are paths, edges, districts, nodes, and landmarks. Paths are linear elements along which the observers move. For many observers, they are dominant elements in space perception. Edges are linear elements that appear as a dividing line between two areas. Districts are closed spatial units, as well as areas of concentration or dispersion. Nodes are strategic spots allowing entrance from all possible directions. Landmarks are more or less exposed unique objects in the area.

Lynch[45] has left significant impact on urban planning theory in the field of city forms and its manifestation identity. His structural analysis enables spatial order reading. Later this technique was also used by others. Downs in Stea[46] regarded cognitive maps as an individual environmental image that is the result of cognitive mapping containing positional (where) and no positional (what) information. Evans[47] notes that the observer is interacting part of the environment and not just passive receiver. That is clearly reflected in his environmental picture. Therefore, found Milgram[48] in his map interpretation not only those components that are actually contained in the environment, but also those components associated with the experience and expectations of the place. Even Gould's[49] mental maps showed the popularity of various locations, multi-dimensional distances scaling and emotional techniques projection. Gifford[50] gave on the basis of Lynch's analysis concrete instructions to create a readable urban structure. Signs should mark major decision-making points in the road system. Their visibility should be increased. Main roads should be matched with functional city districts boundaries and they should emphasize edges. City districts need notable objects that serve as a good signs. If we have homogeneous area, we have to create it.

Mental mapping constantly developed over the years. Today it has a great theoretical and practical potential to understand human environmental exchange. It comprises a subjective awareness of the environment and provides an insight into an individual's environmental perception and evaluation. Nowadays mental map refers to a practice mostly done by urban theorists. City dwellers draw a map, from memory, of their city or the place they live. This allows the theorist to get a sense of which parts of the city or dwelling are more substantial or imaginable. Similar use of mental map is also applied in presented research in order to identify specific points of interest [PSI points], that have great potential for the development of micro locations as well as broader urban areas.

Determination of PSI points: Case study

Određivanje uporišnih točaka prostornog identiteta: studija slučaja

In order to show the usefulness and appropriateness of mental mapping technique as a base for determining the PSI points, empirical research was conducted based on the descriptive and causal experimental method of empirical research. Spatial impression was used as one of the key elements of environmental sensing. Architecture seeks visibility. It is attempts to give sensible form to the moods, feelings, and rhythms of functional life.[51] Most places are not such deliberate creations. They are built primarily to satisfy practical needs for local inhabitants and outsiders.

The experiment based on memorized drawing of city map and landmarks within it. We assumed that users' spatial perception dif-

35 Arthur, Passini, 1992
36 Kitchin, 1994
37 The term is mostly used by spatial psychologist.
38 The term is mostly used by behavioral geographist and urban theorists.
39 https://en.wikipedia.org/wiki/Cognitive_map
40 Lynch, 1962
41 Cullen, 1973
42 Cullen, 1971: 182-187
43 Lynch, 1962
44 Lynch, 1960
45 Lynch, 1960: 47-83
46 Downs, Stea, 1973
47 Evans, 1980
48 Milgram, 1992
49 Gould, 1975
50 Gifford, 1997: 30-37
51 Tuan, 2011: 164-166

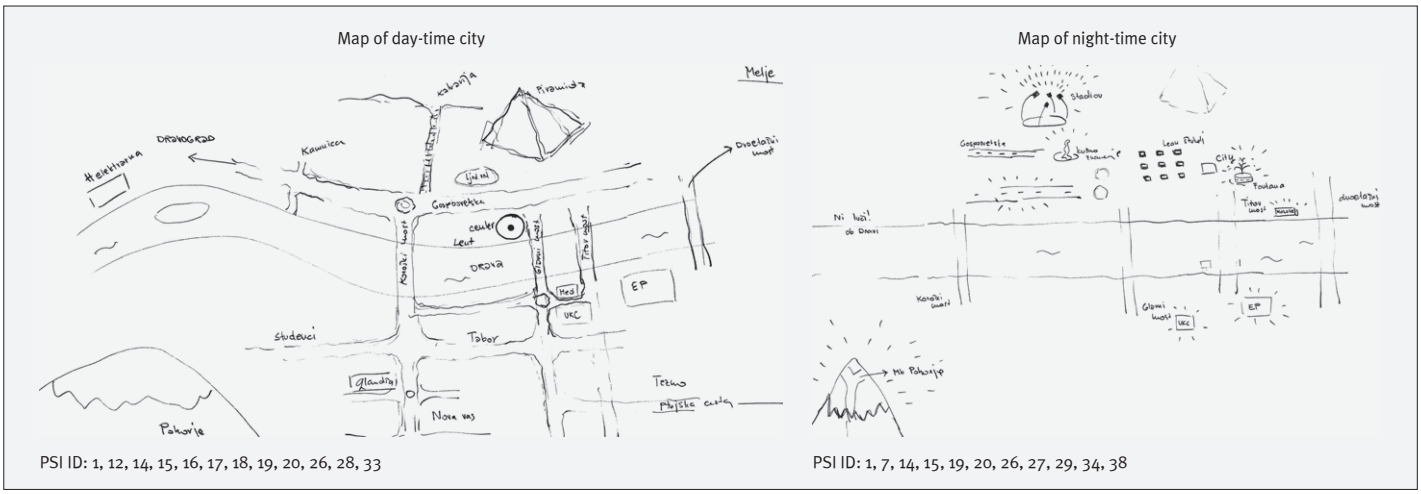

FIG. 2 A MENTAL MAP OF MARIBOR CITY DURING THE DAY-TIME AND NIGHT-TIME (GRAPHICAL OUTPUT OF PERSON 1): BOTH MAPS HAVE DIFFERENT DRAWING STYLE. THE FIRST MAP HAS ELEMENTS ARRANGED ALONG THE CORRIDORS (PATHS). BOTH OF THE RIVER BANKS ARE INCLUDED. NIGHT-TIME CITY MAP IS FOCUSED ON CITY CENTRE. NOTICED ELEMENTS ARE ARRANGED AS BRIGHT SPOTS ON DARK BACKGROUND.
SL. 2. MENTALNA MAPA MARIBORA TIJEKOM DANA I NOĆI (GRAFIČKI PRIKAZ OSOBE 1): OBJE MAPE IZVEDENE SU RAZLIČITIM STILOVIMA CRTANJA. PRVA MAPA IMA ELEMENTE ORGANIZIRANE DUŽ KORIDORA (PUTOVA). OBJE OBALE RIJEKE SU UKLJUČENE. MAPA GRADA NOĆU PRIKAZUJE CENTAR GRADA. UOČLJIVI ELEMENTI SU PREZENTIRANI KAO SVIJETLE TOČKE NA TAMNOJ PODLOZI.

fers during time period. The research focus was on space perception difference during day and night-time. Form and colour are perceived by the light. A boundary between light and dark is the most powerful contrast which defines relation between buildings and open space. This fact satisfies the modified conditions criterion. If spatial structure remains unchanged, illumination intensity can be stimulus that ensure a pleasant feeling of open and build environment. Because we are seeking for those locations with a great potential for our wellbeing, both sunlight and artificial light are equal important perception factors. Wellbeing still remains abstract characteristic, based on the individual physiological need.

The experiment was conducted during the time interval from May 2013 until June 2014 based on a sample of 200 respondents, 100 men and 100 women, aged between 18 and 34 years old. All participants were students at the University of Maribor in Slovenia. Respondents were asked to imagine the city. Within 20 minutes they were asked to put it down twice, once for the day-time city and once for the night-time city.

For research location, city of Maribor has been chosen. Maribor[52] is the second-largest city in Slovenia with about 96,000 inhabitants in 2015.[53] It is the largest city of the traditional region of Lower Styria and the seat of the City Municipality of Maribor. The city preserves its awareness of its exceptional natural and geographical position. It rests among the slopes of Piramida and Kalvarija hills and Mestni vrh (City peak) to the north, and of southern side of the Alps, Pekrska gorca, and Pohorje. The Drava River leaves behind its alpine character here, growing calm as it enters the flat Pannonian plan. The Drava as a dividing line in the city has become an important focus of urban ambience. Its aspiration and vision make Maribor increasingly recognizable in the wider region, which is otherwise defined by larger cities such as Ljubljana, Graz and Zagreb.[54] City centre on left river bank is a string of squares in the old heart of historical centre, churches, monuments and historical facades. Right river bank has primarily dwelling and industrial function. Today the spatial development of the city is determined by the following factors: structural and economic changes, increased population mobility, proximity to regional highway hub, the population prosperity, increasing demands for healthy environment, a higher level of environmental protection, cultural heritage protection and strengthening regional function of the city.[55]

STATISTICAL DATA COMPLIANCE OF CITY SPATIAL PERCEPTION DURING DAY AND NIGHT

STATISTIČKI PODACI O USKLAĐENOSTI PROSTORNE PERCEPCIJE GRADA DANJU I NOĆU

Obtained mental maps were analysed according to the included or excluded elements (points). When processing the results, 42 PSI points, more or less frequently detected, were exposed like: streets, squares, open green areas, morphological features, architectural attractions of individual buildings, unique urban equipment, and more (Table I).

52 After the Second World War, Maribor made good use of its proximity to Austria and its workforce, and developed into a major transit- and cultural centre of northern Slovenia [Maribor, 2017]. When Slovenia seceded from Yugoslavia in 1991, the loss of the Yugoslav market severely strained the city's economy, which was based on heavy industry. Slovenian entrance in the European Union in 2004 and joining the Schengen treaty have influenced the city development, but the economic circumstances remained difficult. The economic situation of Maribor worsened

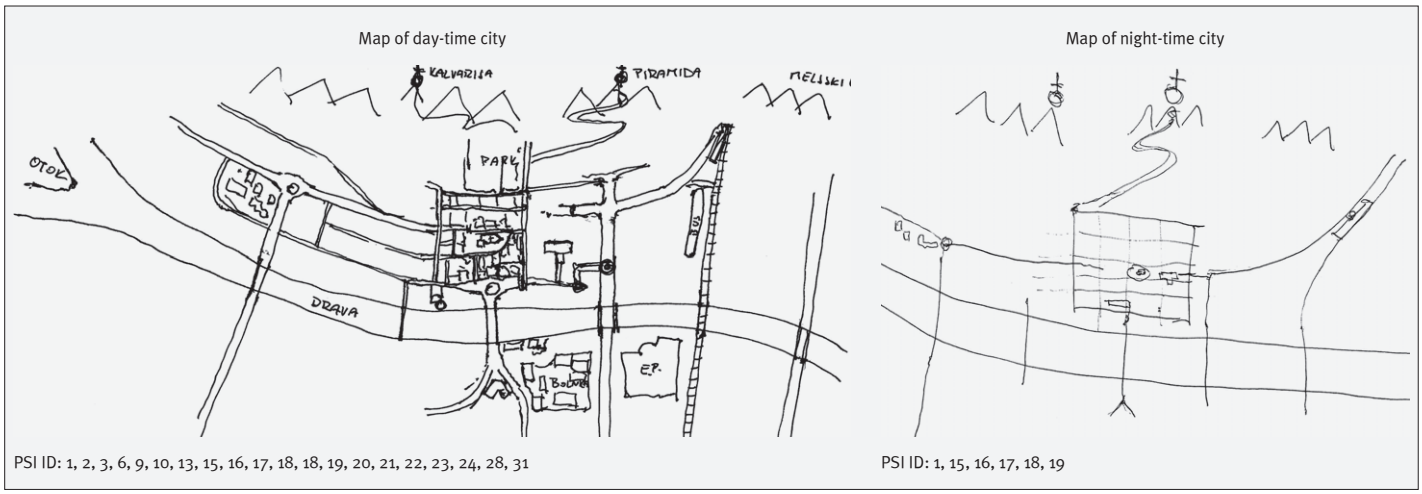

Fig. 3 A mental map of Maribor city during the day-time and night-time (graphical output of person 2): Both maps are drawn in ground plan, with a focus on river Drava left bank and emphasized road network. In contrast to day-time city map, night-time city map covers buildings as compact urban structure.

Sl. 3. Mentalna mapa Maribora tijekom dana i noći (grafički prikaz osobe 2): Obje mape su crtane u tlocrtu s lijevom obalom Drave u središtu i naglašenom cestovnom mrežom. Za razliku od mape grada danju, mapa grada noću pokriva zgrade kao kompaktnu gradsku strukturu.

The results show that the respondents expose most of the points lying in the city centre but only few points in the surrounding area. Such a point distribution confirms the assumption that city centre is most noticeable and therefore the most often depicted. Green hinterland is not so noticeable or it is not considered as part of the city. Maps of respondents vary in the following categories:

– drawing projection (top view drawing, perspective view drawing, a combination of the two projections);
– area size shown on the map (area of the historical centre, city on the left river bank, city on the left and right river bank);
– displayed elements (individual objects, linear elements, elements as points arranged at the both sides of linear elements), and
– number of appeared elements.

After completing a graphic analysis of the 400 examples of mental maps (200 maps of day-time city and 200 maps of the night-time city), the data were statistically processed and analysed using programme SPSS Windows. Methods of descriptive statistics (frequency numerical analysis and percentages) and inferential statistics (x2-test) were used. It was found that individual items appear with varying degrees of frequency. Table II shows frequencies, percentages and the results of x2-test for the occurrence of individual elements of the space on city maps for day-time and night-time.

The results in the Table II show that individual PSI points appear different often. The importance of PSI points increases with their frequency of repetition on mental maps. During the day the most often noticed points are river Drava (160 times), Main Bridge (133 times), Tito's Bridge (92 times), A.M. Slomšek Square (92 times), Shopping centre Europark (87 times), Main Square (84 times) and so on. During the night the most often noticed locations are river Drava (147 times), Main Bridge (115 times), Shopping centre Europark (87 times), Main Square (84 times), Tito's Bridge (84 times), A.M. Slomšek Square (73 times). It can be concluded, that some locations are in the group of the most often noticed ones, nearly in everyone's mind, regardless of the time section. Therefore, these points are the most prosperous urban areas with the great developing potential. They are strong pillars of spatial identity and as such they justify special environmental care and a strategic advantage over other points in the city.

Hypothesis one is confirmed. Spatial identity of the city is users' mental image reflection. Respondents have memorized and drawn points by themselves. Already every point that appears on respondents' mental map is spatial identity carrier [PSI point]. Its occurrence frequency is importance criterion. PSI points importance increase with occurrence frequency.

Some PSI points have different occurrence frequency on day-time and night-time mental map. Spatial identity of the city is not constant. On average, mental maps of night-time city has fewer elements than mental maps of day-time city. At night fewer objects was noticed and categorized as PSI point. But there are also some exceptions. Some PSI points are noticed more often at night, like: 7 (Leon Štukelj Square), 22 (Slovenian National Theatre), 30 (Hall Štuk), 31 (Main Bus station), 34

again with a global economic crisis combined with the European sovereign-debt crisis. During the year 2012 Maribor was one of two European Capitals of Culture and European Youth Capital the following year [Maribor, 2017]. But an opportunity for a new economic start and new identity was not used.

53 Maribor, 2017

54 Maribor Center, 2012: 25

55 Municipality Maribor, 2017

TABLE I NUMBERING [ID] AND IDENTIFYING PSI POINTS
TABL. I. NUMERACIJA I IDENTIFIKACIJA UPORIŠNIH TOČAKA PROSTORNOG IDENTITETA

ID	Pillar of Spatial Identity [PSI]
1.	River Drava
2.	Gosposka Street
3.	Poštna Street
4.	Street Kneza Koclja
5.	Krekova Street
6.	Koroška Street
7.	Leon Štukelj Square
8.	Castle Square
9.	Main Square
10.	A.M. Slomšek Square
11.	Square of Liberty
12.	Lent, Historical City Centre
13.	City Park Maribor
14.	Ski slope Mariborsko Pohorje
15.	Piramida, Kalvarija, Pekrska gorca
16.	Studenci Footbridge
17.	Main Bridge
18.	Tito's Bridge
19.	Koroška Bridge
20.	University Medical Centre
21.	University
22.	Slovenian National Theatre
23.	Town Hall
24.	Main Post Office
25.	Market
26.	Football Stadium Ljudski vrt
27.	Shopping Centre Europark
28.	Medical Faculty
29.	Shopping Centre City
30	Hall Štuk
31.	Main Bus Station
32.	Main Rail Station
33.	Shopping Centre Qulandia
34.	Movie Theatre Kolosej
35.	University Library Maribor
36.	Student Hostel
37.	Monument NOB
38.	Plague Monument
39.	Monument A.M. Slomšek
40.	Others
41.	Radar
42.	Engineering Faculties
43.	Franciscan Church

(Movie Theatre Kolosej), and 38 (Plague Monument).

The results of x2-test confirm that spatial identity of the city depends on time. In the majority of cases we reach a statistically characteristic difference in the incidence of PSI points between day and night at the statistically significant level p<0,05. This proves that Users' environmental perception of PSI points is different during day and night time. The conformation of hypothesis two is provided.

CONCLUSION

ZAKLJUČAK

People form their image of the city along the ways they commonly use. A picture is evolving from known against unknown space. It depends on: individual role and position, sex, age, time, culture and spatial experience. Mental map reflect individual abstract and generalised image of the environment. Graphics are introduced by expectations, views and symbolism. Therefore, such maps are incomplete, distorted, highly simplified, but still useful.

Obtained graphical results reflect a subjective mental image that reflects spatial idea of individual thinking mode. It is assumed that respondents draw maps according to the following scheme: first, they draw all areas of everyday errands, then all pleasing or not pleasing areas were added, in the end they added all detected spatial attractions, even if they are not located close to their movements. Parts of the city remain undetected. It is a place that individuals don't know, or it is not important enough to draw it.

Mental mapping successful developed over the years. Nowadays it has a great theoretical and practical potential to understand human environmental exchange. Presented research is a contribution to existing scientific work of Lynch[56], Cullen[57], Gifford[58], Gould[59], Milgram[60] and others about sensing, using and developing urban space. In some uses, mostly practiced by urban theorists, city inhabitants draw a map, from memory, of their city or the place they live. This allows the theorist to get a sense of which parts of the city or dwelling are more substantial or imaginable. This lends itself to a decisive idea of how well urban planning has been conducted.

The idea to use mental map to identify city spatial identity, and on the basis of this to determine the most prosperous urban areas or points, is an upgrade to existed scientific work on environmental analysis. Often smaller cities tend to copy successful models not bearing in mind that most of the cases it is just not possible to transfer them to another territory. Different spatial identities as well as different environments do not always respond in the same way. Using shown approach it is possible to construct spatial identity that is individually adapted to the city. Not only to Maribor as shown in present contribution, but for any other city in the world.

Every point that appears on user's mental map is spatial identity carrier named Pillar of spatial identity [PSI point]. Occurrence frequency is criterion of importance. More often noticed PSI points have higher importance. They must undergo special environmental care. PSI points are for users and planners particularly important. For users PSI points make sense of place. For planners they are an important starting point in spatial planning and in preparation of spatial documents, especially by developing the urban plan of the city. Maribor city has currently an outdated urban plan. Its makeover and updates are in progress.

After research analytical work it is confirmed that spatial identity of the city is users' mental image reflection. PSI point's importance increases with the mental map occurrence frequency, but users environmental perception is different during day and night time. The most frequent noticed locations are the most prosperous urban areas. Summarizing obtain results, it can be realized, that from amount of 43 PSI points, 36 were different evaluated by day and by night. It is possible to say, that modified spatial circumstances effect the perception and utilization of urban space. Spatial identity of the city depends on time. Both hypotheses are confirmed.

City of tomorrow strikes a balance among social, environmental and economic needs. It is very important to plan the best possible spatial interventions. Human well-being is the highest priority. Proposed scientific approach should become a good practise to find out the best possible locations or point worth to be invested in. Recognition the importance of PSI points enables leading the development of the city to be sufficient for various demands in specific time.

Obtained research results: (1) new definition of Pillars of spatial identity [PSI points] set for the most characteristic and prosperous urban areas, (2) the use of already known method of mental mapping for new purpose (to identify PSI points), and (3) hypotheses

56 LYNCH, 1960; LYNCH, 1962
57 CULLEN, 1948
58 GIFFORD, 1997
59 GOULD, 1975
60 MILGRAM, 1992

Table II Frequencies, percentages and the results of x2-test for the occurrence of PSI points on mental maps for day-time and night-time city
Tabl. II. Učestalost, postoci i rezultati x2-testa za utvrđivanje pojavnosti uporišnih točaka prostornog identiteta na mentalnim mapama grada tijekom dana i tijekom noći

PSI-ID	f (day) f %	f (night) f %	x^2	p	PSI-ID	f (day) f %	f (night) f %	x^2	p	PSI-ID	f (day) f %	f (night) f %	x^2	p
1.	160 80,0	147 73,5	33,269	0,000	**16.**	47 23,5	37 18,5	37,747	0,000	**31.**	43 21,5	34 17,0	33,811	0,000
2.	24 12,0	14 7,0	20,585	0,000	**17.**	133 66,5	115 57,5	42553	0,000	**32.**	45 22,5	27 13,5	34,918	0,000
3.	25 12,5	17 8,5	4,858	0,000	**18.**	92 46,0	84 42	34,253	0,000	**33.**	10 5.0	4 2,0	3,437	0,064
4.	3 1,5	0 0,0	not relevant		**19.**	68 34,0	56 28	35,651	0,000	**34.**	50 25,0	54 27,0	28,446	0,000
5.	1 0,5	0 0,0	not relevant		**20.**	51 25,5	34 17,0	49,742	0,000	**35.**	4 2.0	0 0,0	not relevant	
6.	26 13,0	19 9,5	10,552	0,001	**21.**	70 35,0	52 26,0	32,241	0,000	**36.**	20 10,0	12 6,0	7,723	0,000
7.	41 20,5	52 26,0	24,281	0,000	**22.**	25 12,5	26 13,0	9,120	0,003	**37.**	21 10,0	8 4,0	6,464	0,011
8.	26 13,0	19 9,5	21,926	0,000	**23.**	25 12,5	16 8,0	5,590	0,018	**38.**	20 10,0	26 13,0	14,324	0.000
9.	84 42,0	84 42,0	29528	0,000	**24.**	15 7,5	8 4,0	10,811	0,001	**39.**	1 0,5	0 0,0	not relevant	
10.	85 42,5	73 36,5	35,223	0,000	**25.**	12 6,0	5 2,5	10,551	0,001	**40.**	63 31,5	59 29,5	6,126	0,013
11.	8 4,0	7 3,5	0,302	0,582	**26.**	55 27,5	37 18,5	19,491	0,000	**41.**	1 0,5	1 0,5	not relevant	
12.	58 29,0	42 21	14,115	0,000	**27.**	87 43,5	87 43,5	44,380	0,000	**42.**	50 25,0	22 11,0	15,322	0,000
13.	58 29,0	17 8,5	15,607	0,000	**28.**	29 14,5	23 11,5	2,814	0,092	**43.**	28 14,0	17 8,5	16,730	0,000
14.	29 14,5	19 9,5	8,573	0,014	**29.**	25 12,5	25 12,5	14,426	0,000					
15.	54 27,0	35 17,5	27.674	0,000	**30.**	26 13,0	29 14,5	37319	0,000					

f – frequencies; f % – percentages; x2-test for the occurrence of individual elements; p – significance

confirmation are original scientific contributions presented in this paper. Proposed scientific approach is useful in decision making and urban planning process. Of course, other fields of development such as economy, ecology and legislation, should also be considered. Mental mapping on different locations with other observation purpose is a topic for future research. It is also recommended to expand the research to different geographic cultural and religious areas.

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SOURCES

IZVORI

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ILLUSTRATION AND TABLE SOURCES

IZVORI ILUSTRACIJA I TABLICA

FIG. 1 Cartographic background: Topographic map of Maribor city, 2017

TABLES I, II Authors

Summary

Sažetak

Promišljanja o prostornom identitetu grada iz perspektive promatrača

Gradovi i urbana područja najzanimljivija su mjesta za život. Potreba za prilagođavanjem okoliša modernim obrascima života poticaj je istraživanju razvojnih mogućnosti javnog prostora. Polazište ovoga doprinosa takvom tipu istraživanju jest u shvaćanju da grad nije nepromjenjiva struktura. Urbani razvoj rezultat je napretka društva i tehnoloških mogućnosti. Grad budućnosti treba uskladiti društvene, okolišne i ekonomske potrebe. Osobito je važno planirati najbolje načine prostornih intervencija jer je dobrobit ljudi od najvece važnosti. Gradovi se mijenjaju u prostoru i vremenu. Promijenjene okolnosti ne odnose se samo na materijalnu stvarnost, već su one mentalni konstrukti koji proistječu iz subjektivne percepcije. Veliki gradovi s raznolikom gospodarskom osnovom nemaju prevelikih teškoća u prilagođavanju promjenama na način koji bi omogućio kvalitetno uređenje prostora. No problemi se javljaju kod manjih gradova sa slabije razvijenim gospodarstvom i infrastrukturom. Vjerujemo da bi moguće rješenje moglo biti u osiguravanju kvalitetne prostorne organizacije koja bi odgovarala životnom stilu koji bi pridonio prostornom prepoznavanju i prostornom identitetu.

Članak se bavi prostornim aspektom urbanog okoliša. Korisnici prostora tu imaju važnu ulogu. Izuzetno je važno znati na koji način oni osjećaju grad. Njihove percepcije okoliša odražavaju njihove prostorne prioritete. Prostorni identitet je odraz onoga što korisnici vide i osjećaju. Neka su mjesta u gradu za korisnike iznimno važna. Ona su stoga u središtu istraživanja.

Ovo se istraživanje bavi znanstvenim pristupom utemeljenim u analitičkoj metodi mentalnog mapiranja na uzorku od 200 ispitanika koji su dobili zadatak da zamisle grad i u 20 minuta nacrtaju 2 karte grada: jednu koja bi prikazala grad tijekom dana i drugu koja bi ga prikazala tijekom noći. Istraživanje je provedeno na lokaciji grada Maribora, drugoga najvećega slovenskog grada koji ima važnu ulogu kao regionalni centar.

Dobiveni grafički rezultati odražavaju subjektivnu mentalnu sliku, koja pak odražava prostornu ideju individualnog načina razmišljanja. Zamisao da se iskoristi mentalna mapa kako bi se identificirao prostorni identitet grada i na toj osnovi odrede najrazvijenija urbana područja ili punktovi – predstavlja nadogradnju postojećih znanstvenih istraživanja o okolišu. Korištenjem ovoga pristupa moguće je konstruirati prostorni identitet koji je individualno prilagođen gradu, i to ne samo Mariboru, kako je to u ovome istraživanju, već bilo kojemu drugom gradu na svijetu.

Svaka točka koja se pojavljuje na mentalnoj mapi korisnika nosilac je prostornog identiteta i stoga je nazvana „uporišna točka prostornog identiteta". Ta uporišta često imaju specifične karakteristike koje ih razlikuju od okolnih prostora, kao što su: dobra vidljivost, pristupačnost, integriranost u prometnu mrežu, velika frekvencija korištenja, kvalitetno uređenje prostora, integriranost u turističke pravce, više cijene nekretnina ili prostora za iznajmljivanje itd. Važan je kriterij zasigurno frekvencija korištenja.

Najčešće percipirane uporišne točke prostornog identiteta imaju veću važnost. Pri svakom odlučivanju o njima mora se voditi posebna pažnja. Stoga su one od osobite važnosti za korisnike i stručnjake koji se bave urbanizmom i prostornim planiranjem. Za korisnike one predstavljaju smisao nekoga mjesta. Za stručnjake one su važno polazište u prostornom planiranju i pripremi prostorne dokumentacije, osobito pri izradi urbanističkog plana nekoga grada. Maribor trenutačno ima zastario urbanistički plan pa je stoga u tijeku njegova revizija radi osuvremenjivanja i poboljšanja. Prepoznavanje važnosti uporišnih točaka prostornog identiteta omogućava upravljanje razvojem grada kako bi se zadovoljile razne potrebe. Predloženi znanstveni pristup trebao bi postati dobra praksa u pronalaženju onih lokacija koje zaslužuju preuređenje i investicije.

Nakon analitičkog istraživanja na kognitivnim mapama potvrđeno je da prostorni identitet grada predstavlja odraz mentalne slike korisnika. Važnost uporišnih točaka prostornog identiteta povećava se u odnosu na učestalo pojavljivanje na mentalnoj mapi, ali korisnici imaju drukčiju percepciju okoliša tijekom dana ili tijekom noći. Najčešće percipirane lokacije jesu najprosperitetnija gradska područja. Analiza dobivenih rezultata pokazuje da od ukupno 43 uporišne točke prostornog identiteta, 36 ih je ocjenjivano drukčije tijekom dana negoli tijekom noći. Može se reći da modificirane prostorne okolnosti utječu na percepciju i korištenje urbanoga prostora. Prostorni identitet grada ovisi o vremenu.

Dobiveni rezultati istraživanja: (1) nova definicija uporišnih točaka prostornog identiteta za najtipičnija i najprosperitetnija urbana područja, (2) korištenje već poznate metode mentalnog mapiranja za nove potrebe (identificiranje uporišnih točaka) i (3) potvrda hipoteza predstavlja originalan znanstveni doprinos. Predloženi znanstveni pristup koristan je u procesima odlučivanja i urbanoga planiranja.

Mentalno mapiranje na drugim lokacijama i s drukčijim ciljevima može biti tema budućih istraživanja. Preporučljivo je proširiti istraživanje na različita geografska, kulturna i religijska područja. Kako bi se dobila holistička slika grada, također je potrebno proširiti istraživanje i na druga područja razvoja, kao što su ekonomija, ekologija i zakonodavstvo.

Biographies

Biografije

Melita Rozman Cafuta received her Ph.D. in landscape architecture at the Biotechnical Faculty, University of Ljubljana. She is Assistant Professor at the Faculty of Civil Engineering, Transportation Engineering and Architecture, University of Maribor. Her research field is sustainable spatial planning and spatial perception.

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