CITTA

8TH ANNUAL CONFERENCE
ON PLANNING RESEARCH

AESOP TG

PUBLIC SPACES & URBAN
CULTURES ANNUAL MEETING

JOINT CONFERENCE

GENERATIVE PLACES
SMART APPROACHES
HAPPY PEOPLE

EDITED BY SARA SANTOS CRUZ | FERNANDO BRANDÃO ALVES | PAULO PINHO

THE RESEARCH CENTRE FOR TERRITORY, TRANSPORTS AND ENVIRONMENT

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F E U P   UNIVERSITY OF PORTO
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BOOK OF PROCEEDINGS

**JOINT CONFERENCE
CITTA 8TH ANNUAL CONFERENCE ON PLANNING RESEARCH
AESOP TG / PUBLIC SPACES & URBAN CULTURES MEETING**

GENERATIVE PLACES

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Preface

Paulo Pinho
Director of CITTA

This book includes a representative sample of the most relevant papers (42 in total) presented at the 8th CITTA Annual Conference on Planning Research. The conference took place in Oporto in September 2015 and resulted from a joint venture between our research centre CITTA and the AESOP's Thematic Group on *Public Spaces and Urban Cultures*.

The main theme and title of the conference "Generative Places, Smart Approaches, Happy People" proposes a reflection on an ambitious and wide scoped triangle in which seems to converge timeless and contemporary edge cutting planning issues, such as planning for inspiring and friendly places, planning with people for better equipped and happier communities, and innovative approaches and methodologies to design and jointly implement locally based and socially responsive policies and initiatives.

The book is organized in three main chapters. The first one, gathering ten papers, deals with the physical dimension of planning and with the increasingly subtle and fuzzy boundaries between the real and the virtual world, and the corresponding challenges for thinking and planning the cities of the XXI century. The second chapter deals with the social dimension of urban planning and, in particular, with the factors, conditions and participatory methodologies to build successful mediation processes. This chapter includes eleven papers. Finally, the third chapter, the bulkiest one with 21 papers, is dedicated to the cultural dimension of planning, embracing a wide range of topics related to local identities and meanings. Surely not by chance, this cultural dimension gathers the largest number of research papers presented at the conference, illustrating the increasing importance of culture and culture related topics, in the way we currently see a new and far-reaching role for urban planning and management.

Finally, I would like to express my deep thanks to all my colleagues and researchers that some ten years ago decided to embark in this adventure called CITTA and, in particular, to Sara Santos Cruz and Fernando Brandão Alves for the organization of the conference and for the joined preparation of this book of proceedings. In addition, I would like to thank Sabine Knierbein and Gabriella Esposito de Vita from the AESOP Thematic Group involved, for all their fruitful and rewarding collaboration as well. A word of thanks is also due to Joana Bailão for all her dedicated and competent work in the final editing and paging of this bulky book of proceedings.

Theme of the conference

Sara Santos Cruz, Fernando Brandão Alves

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Along the decades, planning has been evolving from expert-led or top-down approaches to more community-led, interactive and participatory approaches, valuing the social capital of local communities and putting citizens at the centre of planning processes. Research has been emphasizing the importance of local contexts to set goals and establish priorities through adaptive learning processes. Additionally, it is relevant to identify places here understood as 'generative places', where the emergence of local initiatives based on knowledge-based creativity and interactive learning occur. In other words, places should demonstrate the capacity to flourish and reinvent themselves - hopefully revealing their true genius loci, meaning the location's unique character - most of the times through spontaneous processes based on community action and groups of individuals' initiatives.

BECOMING LOCAL means that the contemporary rationale should zoom in to 'local' spaces and places, policies and practices, and everyday life; this way, the human capital (citizens and their social and cultural background) play an important role as key agents of urban change and, in particular, of defining what is meaningful within the city. The understanding and the production of these meaningful places is, nowadays, increasingly confronted with diversified real (material) and virtual (immaterial) spheres of urban spaces, either private or public. Planning has to be prepared to embrace both these spheres of the city, as they both contribute to the construction of meaningful places.

Moreover, the idea that the use of technological or smart driven approaches in planning processes can, firstly, facilitate political discourse and participation by strengthening the link between citizens and governors, and secondly, better respond to people needs and improve the quality of life of citizens, has been around in different contexts and dimensions. Several projects, applications and approaches are making evident that we are forced to live and use technology in our daily activities and inevitably in the city arena. Technology affects our behaviours and the way we move and live in urban areas at various levels. However, regarding the access to (new) technologies (transports, communication/ICT networks, etc.), a certain asymmetry still exists due to the vulnerability of some communities and deprived families. Also, the operative structures of public institutions and private representative bodies of local people interests are often different. Additional, in some regions, physical distance is not yet counterbalanced with technological proximity. Thus, participatory planning processes may be less efficient and even threatened. Though, it is imperative to investigate and discuss how these technological tools can lead to the idea of what is usually designated as e-inclusion and most importantly how it can promote, ultimately, social cohesion and integration.

Intensifying the role of citizens, by either community-led, interactive, or participatory approaches, is consensually argued as responding more directly to people's needs and aspirations. Nonetheless, the level of quality of life, and even the level of happiness, is far from being truly and completely achieved. Urban planning has been concerned in creating better places, but nowadays is also focusing in increasing the levels of happiness, following the wider trend in discussing what makes people happier.

Connecting places. Smart pedestrian space: network potentials based on user experiences and activities

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Considering the current trends of urban redevelopment of Belgrade's riverfronts with two megaprojects along the Sava and Danube rivers ("Belgrade Waterfront" and "City on Water"), Kosancicev venac could be developed as an important pedestrian connection between this sites and historical core of the city. The methods that were used in analysis include method of direct surveying of inhabitants based on the Kevin Lynch's determination of the image of the city, Space Syntax method, as well as the method of mapping users on social maps (via social networks).
The aim of the text was measuring the intensity of pedestrian movement in the monitored territory and concentrations of users in open public spaces. Summarizing and interpreting the collected data obtained three groups of results: the image of Kosancicev venac, composed of five elements: paths, edges, districts, nodes and landmarks; an overview of the intensity of pedestrian movement on the observed territory, compared with the content located along the path and with the distribution of elements of the image of the city and the intensity of users (space syntax) and data obtained through social networks, with the aim to measure the quality of open public spaces and concentration of users. This research has indicated the potential of the analyzed area for the formation of transverse and longitudinal pedestrian flows as well as concentrations. However, they could enable active use of the research area and integrate the connections of the Sava's and Danube's Amphitheatre.

Keywords: Open public spaces, Belgrade, Kosancicev venac, Social maps

1 Introduction

Kosancicev venac is placed in the historical urban core of Belgrade next to the confluence of Danube and Sava rivers and Belgrade fortress. Its network of open public spaces is isolated from other parts of the city although it is one of the most attractive and important urban ambient. During the last 20 century of its existence Belgrade's riverfronts have never been an integral part of the city, because of the barriers between historical urban core and the rivers like: railroads, rail facilities, roads and dense industrial zones. Furthermore, problems with flooding are still not resolved, especially along the right Sava riverbank. Today, Belgrade is faced with inadequate use of water and waterfront and devastated and neglected foreground that opens by looking at the river. Several studies, Master plans and detailed regulation plans were done during the last two decades with the overall aim to activate the significant potential of the waterfront and, as an integral part of the city, to build a high quality public spaces that will enhance the appearance and the importance not only of the location but the entire Belgrade as well (Djukic, Vukmirovic, 2014).

One of the main objectives of the Master plan of Belgrade 2021 is regeneration of neglected waterfronts. The achieving of this goal has been seen through relocation of industrial area, railroad and transit traffic along the riverfronts. The area along the rivers has got new land use with the focus on central, business and residential use. According to the plan, those changes should enable better connections between riverbanks and city and provide more live and vibrant open public spaces. One of the conclusions of the Belgrade waterfront Study, which first phase was finished in 2009, is that "the most valuable, central part of the waterfront, is the most neglected and

that the most attractive locations are almost completely degraded" (Urbanisticki zavod Beograda, 2009). This is in contrast to the potential of the location that include: the value of the waterfront areas in the strictest meaning of the term, inadequate disuse of potentially useful land, vast, diverse and valuable natural areas and large and important cultural heritage of the city, as part of the culture and history of the city in general (Djukic, Vukmirovic, 2014). The newest document adopted by the Belgrade City Authority titled as *Project IME: Identity_Mobility_Environement* (2015) of the City of Belgrade also point out the importance of the connection of the rivers' waterfronts as well as the extension of the pedestrian zone of Knez Mihailova street as one of twenty identified subprojects.

By placing an emphasis on pedestrian environment, a light is put on the significance of small/human scale, often neglected in contemporary projects and development strategies. Scenes that correspond to this point of view put focus on specific advantages of cities proportional to human dimensions, senses and walking speed and form a basis for more complex and diverse relations (Djukic and Vukmirovic 2014; Vukmirovic, 2014). They correspond to improving the quality of the smallest places in such way that people are simply attracted to go there and spend time there. Seen from this perspective, pedestrian movement is of twofold character (Vukmirovic, 2014; Gehl, 2010), since it is perceived as both mode of transport and an opportunity for many other activities. In accordance with this, the basic characteristics of walking and elements that influence it include the speed of pedestrian environment, distances, and the quality of route.

Walking has become a very popular topic after the 1960-ies, when numerous authors were engaged in these issues with the goal of developing models for designing street furniture (Schubert, 1967; Whyte, 1988); developing models based on relations between the level of services and pedestrian movement (Fruin, 1971; Polus and Schofer, 1983), and forming a rulebook for urban planning (Crawford, 2002) and pedestrian behaviour (Brilon and Grosmann, 1993; Kirsch, 1964). They have used the research methods that mainly pertain to direct monitoring, as well as the use of photographs and films of concrete locations filmed during an extended period of time. Numerous investigations have shown that it is possible to foresee the dynamics of pedestrian movement, that it is possible to influence pedestrian flows (via urban design), as well as that pedestrians can move relatively freely and independently only along short distances, while along longer paths movement is conditioned by other pedestrians (Djukic and Vukmirovic, 2012a).

FLAGSHIP PROJECTS LOCATED AT THE CONFLUENCE OF THE SAVA AND DANUBE

Figure 1: Flagship projects located at the confluence of the Sava and Danube. Source: Vukmirovic 2015

Because of its cultural and historical importance and its position within the urban structure of the City of Belgrade [1], Kosancicev venac was selected as the subject of this research. Considering the current trends of urban development of Belgrade with the aim of activating the areas along the banks of the Sava ("Belgrade on water", "Beton hala" international competition, etc.), Danube rivers ("Beko" and "City on water"), there is a need to study the ways that could achieve connection among them (see in Figure 1). The establishment of a network of pedestrian routes that connect Sava's and Danube's Amphitheatre and which could be passed through the old city centre is allocated as one of the possible ways of thinking as well as an important developmental path seen in the actual project of the extension of pedestrian zone of Knez Mihailova Street (City of Belgrade – Office of the Director of City Planning 2015). In accordance with this, the research presented in this paper is based on a theoretical framework in the domain of urban design, pedestrian movement and quality of the pedestrian environment with the aim to examine the actual trends of using the area of Kosancicev venac and the ways it could be reintegrated within the network of pedestrian spaces.

2 Methodologies

Having in mind the general aim of the research, measuring the intensity of the pedestrian movements and recording the status of attractiveness of open public spaces at Kosancicev venac, the focus is placed on spatial level of the problem, i.e. onto characteristics and elements of pedestrian environment seen from the physical aspect and on intensity and concentration of users and their satisfaction about the quality of open public spaces. The research has used the methods that are developed and tested for several years (Djukic and Vukmirovic, 2012) on University of Belgrade – Faculty of Architecture on elective course "Network of pedestrian flows in function of

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[1] Located between Sava River and pedestrian zone of Knez Mihajlova Street

urban redesign" on bachelor studies and on compulsory course "Urban design methods" on Master studies – Integral Urbanism, as well as new developed software application Twitter search engine at University of Nis - Faculty of Electronic engineering. The first part of the study was conducted with bachelor and master students during spring semester of the 2014/15 school year, while the software application was developed during the PhD course "Advanced topics in data and knowledge engineering".

However, the methods that were used in analysis could be divided into three parts and include: (1) method of direct surveying of inhabitants based on the Kevin Lynch's determination of the image of the city, (2) Space Syntax method, as well as (3) the method of mapping users on social maps (via social networks).

2.1 Image of the place

According to many authors there is a strong connection between the experiences of urban space and presence of people using open urban space (Gehl, 2010; Jacobs, 2011; Lynch, 1974, Hiller and Henson, 1984). It is related with the people's activities, cognitive experiences and also depends on the way the people interact between each other. In that regard, Whyte considers that the number of the people in urban space is not the only important fact, it should include time they spend in the place, as well as the fact are they come alone or in groups (1980). Quality space and critical mass of users are prerequisites for processes in which small events can blossom (Jacobs, 2011) and on the other hand, it is the main precondition for successful public space. Furthermore, cultural context as the main factor of identity is an unavoidable part of collective memory with its incorporated signs   (Djukic, 2011). The intensity of use of urban space is related to the users' experience, created through everyday rhythms. During the time such a places usually become a part of the collective memory (Dovey, 2008; Boyer, 2001).

The analysis of physical qualities of open spaces was enabled through a method of direct population survey that included 200 inhabitants of Belgrade. The socio-demographic structure of the group was similar to the structure of the inhabitants and users of open public spaces. The survey has been done during the April 2015. It covered the area of Kosancicev venac as well as the contact zones: Sava riverbank, Danube riverbank and the main pedestrian area within the city centre. The questionnaire was structured around five sections/thematic entities i.e. elements of mental maps defined by Kevin Lynch (1960) – paths, edges, districts, nodes and landmarks.

2.2 Characteristics of intensity of use - space syntax method

Jane Jacobs stress the importance of the relations between users and their physical environment, as well as the diversity between the users who shape the place, for the quality of the space an everyday life. However, diversity of uses and concentration of activities, especially in the ground floors of the buildings next to the pedestrian paths, are necessary for the creation of lively and vibrant city spaces (Vukmirovic 2013; Dobbins, 2009; Gehl, 2006; Hillier, Henson, 1984). The wide ranges of activities in the ground floors that generate inviting entrances towards passers directly influence the activity of users (Habraken, 1999).

Observation of the intensity of pedestrian movement has been done applying Space Syntax method. This method defined by Bill Hillier (Hillier, Hanson, 1984) was used to evaluate the intensity of pedestrian movement around and through the area of Kosancicev venac, as well as to define the connections between the concentration of activities in the ground floor of the buildings and number of the users of the open public spaces. Networks of pedestrian flows are presented in the form of a hierarchy, according to the number of pedestrians.

Measurements were conducted on workdays, four times a day and during the weekend. During the workdays, the number of pedestrians and bicyclists were measured: in the morning, period from 8am to 9am, when local inhabitants perform activities such as going to work or school or for grocery supplies; from 11am to 12 noon, which coincides with end of school hours for elementary school students, breaks for high school students and the lunch break for the employed (this period also coincides with the start of working hours of cafes and restaurants); in the afternoon, from 4pm to 5pm, when local inhabitants come back from work; and from 9pm to 10pm, in the so-called evening hours. During the weekends, the measurements have been done three times a day. On Saturday the number of pedestrians was measured in the morning period from 11am to 12noon, during the afternoon hours from 4pm to 5pm and during the evening from 10pm to 11pm. On Sunday it was measured in the morning period from 11am to 12noon, during the afternoon hours from 4pm to 5pm and during the evening from 8pm to 9pm.

2.3 Geo mapping - social maps

The phenomenon of the city cannot be observed only through the functional relationship (Rossi, 1999), neither the morphology of urban space (Zukin, 2010). City is a complex cultural process, and everyday life of places and their inhabitants is an outcome of that process. Cultural context is referred to the meanings that persons, individuals or groups, associated to the place. Those meanings are outcomes of cultural, traditional, historical and particular experiences of certain place (Djukic, 2011). Open public spaces should provide a spatial framework for different kinds of gathering and multileveled interaction, and also should include virtual flows, stimulating merging of physical and digital reality (Stupar, Djukic, 2015). Exchange of information between users is expanded, "from one-to-one to many-to-many" (Carroll, Rosson, 2003).

Digital social media is a medium that allows creative participation of users and social maps are important indicators for measuring the concentration of users and their satisfaction about the quality of open public spaces. The importance of data-exchange is increasing and its intensity becomes a significant characteristic of urban environment (Vukmirovic and Vanista Lazarevic 2015; Abreu Torres, Sá Antunes Costa, 2014; Vidler, 1992) and its 'visibility' (Stupar and Djukic, 2015; Vukmirovic and Vanista Lazarevic 2015). Geo-social or location-based networking systems which is globally widespread, have been shaping a parallel digital space based on the interactions between citizens and the urban open spaces during the last decade (Gordon, de Souza e Silva, 2011; Abreu Torres, Sá Antunes Costa, 2014; Cranshaw at all, 2010). Those digital tools, networks and applications (Vukmirovic and Vanista Lazarevic 2015), allowing users to capture, produce and process information in real time and communicate, spreading information in real time. That

information full of cognitive and perceptive clues provides local government and urban designers and planners a good base for redevelopment and retrofitting of the open urban spaces.

On the other side by careful observation and interpretation of results of these analysis *it is possible to form 1) ranking list of most visited cities and their specific locations, 2) separate locations within a city which are most visited by tourists, i.e. inhabitants, 3) ways in which people move throughout the city, 4) separate most visited locations and periods during the day when that occurs, 5) map attractiveness of specific contents on certain location and temporal interval in which this content is most visited, etc* (Vukmirovic and Vanista Lazarevic 2015).

Online social media has become an integral part of urban development study and there are now a many researchers utilizing these services for analyses. Particularly, Twitter is the most popular data sources for research because of its open network allowing access to information published through the platform. There are many studies based on data from Twitter, focused on the text of the tweets or the network graph connecting users. Some studies are devoted to geographic information attached to tweets, based on the user location and relying on a geographic metadata indicating the location where the tweet was authored, provided via GPS (Global Positioning System) or cellular/wireless triangulation.

Since the Twitter data available via APIs (Application Programming Interface) enables real-time programmatic access to tweets archive, it is possible to develop software application for collecting, filtering and analyzing tweets in a different ways. The software application Twitter search engine is developed using PHP programming language, as a common server-side scripting language designed for web development and also used as a general-purpose programming language. The Twitter API is used for collecting information regarding location and time of tweets in order to create a maps of considered places in Belgrade with public and geo-taged tweets. The application has interface for query criteria selection (location coordinates, date range). When criteria is defined, the application sends query to Twitter service and as response receives collection of tweets satisfied given criteria and stores collected tweets in local database.

Generally, the software application Twitter search engine provides functionalities regarding information on twitter social network – user name, tweet content, the user's geographic location (latitude and longitude) at the time each tweet is sent. The application relies on data available in twitter geocode that collect data in area determined by geo-coordinates (latitude and longitude) and chosen radius with resolution of 100m.

The user interface is shown in the Figure 2, illustrating information and possibilities of software application protype, that can be upgraded regarding different select criteria including data mining - tweet content analyses, temporal and spatial filtering as well as trend analyses, type of used operating sistem, user tracebillity etc.

Figure 2: Overview of the collected geocoded tweets: user ID, time and text.

For the purpose of the research presented here, the application is adapted in terms of possibility to choose pre-defined places (Republic Square, Sava Quay, Park near Vuk's Monument, and Slavija Square), and thus to analyse twitter user activity in a given time interval including presentation on the map (see Figure 3).

Figure 3: Interface of the Twitter search engine with user ID, time, place and position

Figure 4: Presentation of the geo-location of Twitter users

The purpose of the developed software is to provide automated data collection, as an initial step for the analysis of the data obtained from Twitter users. In addition to determining the number of users and messages, as well as their distribution in time, processing the collected data it is possible to present the geo-location users within considered area or any its part defined as a structure of polygons. The software automatically determines the geo - location of twitter users on the map and his username that can be seen by selecting tweet mark on the map (see Figure 4). The research results obtained after the application of offered methodologies are presented below.

3 Results

Following the structure of the research methodologies presented in the previous chapter, results of the research of the territory of Kosancicev venac will be presented.

Figure 5: Image of Kosancicev venac

3.1.Image of Kosancicev venac

There were five groups of the questions related to the landmarks, districts, paths, edges and nodes. The results gathered by surveying the local inhabitants can be seen on the map (see Figure 5).

The first group of the questions was considering the topic of the landmarks. The users indicated five landmarks within the research territory (see Figure 5a): Main church (Saborna church), Orthodox patriarchy, Beton hala (adaptive reuse of industrial heritage next to the Sava riverbank), Brankos' bridge and Big stairs (which connect Kosancicev venac with Sava riverbank).
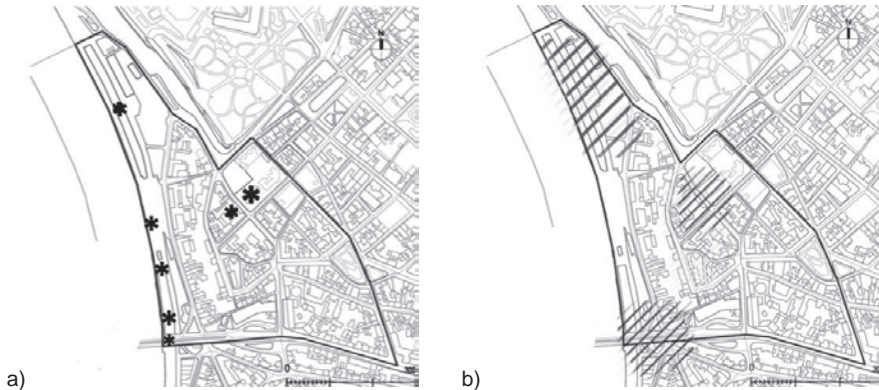

a)   b)

Figure 6: a) Landmarks and b) districts of Kosancicev venac

The second group was dedicated to the districts. Four districts are identified on the research polygons (see Figure 6b). Those are: area around Orthodox patriarchy, Beton hala, district around the National library (destroyed during the bombing in 1941) and district around the Brankos' bridge (on the right riverbank of the Sava river). By interpreting the received answers it was determined that the most visited is the area of the Kosancicev Venac Street, because of its aesthetic and ambient qualities and hospitality facilities, like cafes, restaurants and wine bars. This area is visited during the day, but also during the evening.

In relation to the paths, Kosancicev Venac Street has also been recognised as the most visited and the most pleasant because of its aesthetic and ambient qualities. In addition, Kosancicev Venac Street is marked as the public place that need reconstruction, better maintenance and improvements. Kralja Petra Street, Pariska Street and pedestrian path along the right Sava riverbank are also recognised as important paths of the research location (see Figure 7a).

Pariska Street is identified as an edge, or clear boundary between the area of Kosancicev venac and Kalemegradn's park on the north. Karadjordjeva Street is also recognized as an edge or barrier between the area and riverbank (see Figure 7b). On the south, respondents have allocated Brankova Street as a borderline, as well as barrier between the area of Kosancicev venac and the area of Savamala.
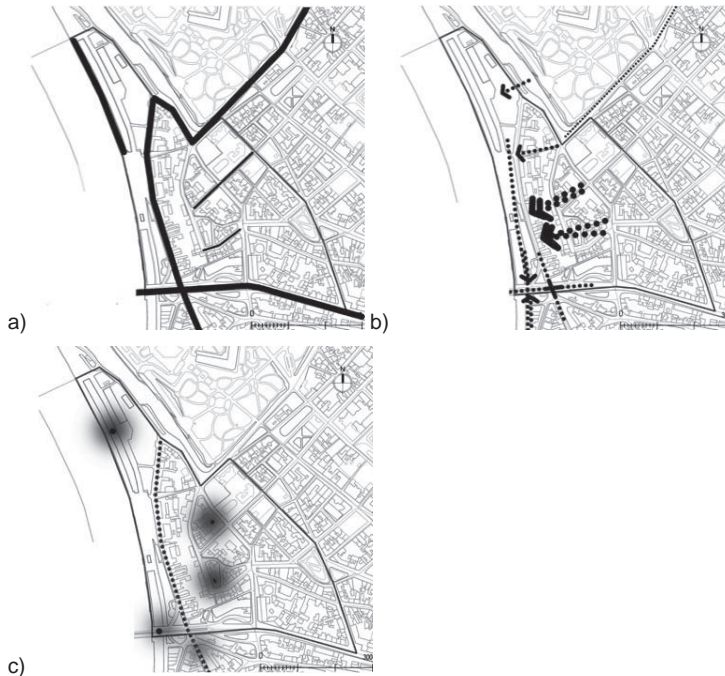
Figure 7: a) Paths, b) edges and c) nodes of Kosancicev venac

As nodes the most respondents have recognised cafes in Kosancicev Venac Street and crossing of Pariska and Sime Merkovica Street as the most frequently used point (see Figure 6c). The cafes are seen as popular meeting points. On the other side, crossing of Pariska and Sime Markovica Street is the transport hub of two important streets of the city.

3.2 Space syntax

Flows and concentration of pedestrian movement is demonstrated by using coloured diagrams. The highest results are presented in violet, while the lowest in blue. Between those two extremes are other values, shown in red, yellow and green (violet lines - more than 700 pedestrians per hour, red lines – from 500 to 700 pedestrians, yellow lines – from 300 to 500 pedestrians per hour, green lines – from 100 to 300 pedestrians per hour and blue lines – from 0 to 100 pedestrians per hour).

The first graphic demonstrates the intensity of pedestrian movements during the working days at the selected four intervals from 8-9h, 11-12h, 17-18h and 21-22h (see Figure 8), the second graphic presents the situation that happened during Saturday at the three defined intervals from 11-12h, 17-18h and 21-22h (see Figure 9), and the third one shows situation related to Sunday also at the three selected periods of the day from 11-12h, 17-18h and 21-22h (see Figure 9).

Figure 8: Intensity of the pedestrian movement during the working days at the Kosancicev venac
a) 8-9h, b) 12-13h, c) 17-18h and d) 21-22h. Source: Petrovic S., Vlajic A., Stojic B. (2015)

Figure 9: Intensity of the pedestrian movement during Saturday at the Kosancicev venac
a) 12-13h, b) 17-18h and c) 21-22h. Source: Petrovic S., Vlajic A., Stojic B. (2015)

The highest intensity of pedestrian movement, as seen from diagrams, (see Figure 10), which corresponds to the lines, marked in violet accounts to more than 700 pedestrians per hour is recorded around one of the main public bus nodes, next to the open green market (Zeleni venac) towards Branko bridge and pedestrian zone Knez Mihajlova Street. The intensity is highest at this point during the whole week at all measured times.
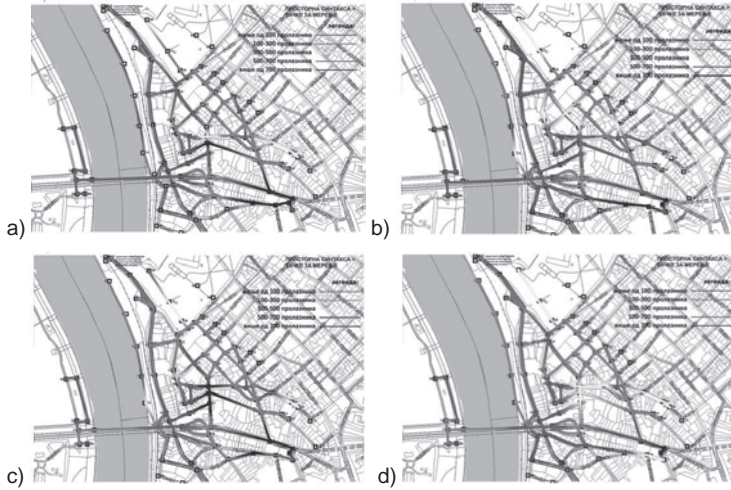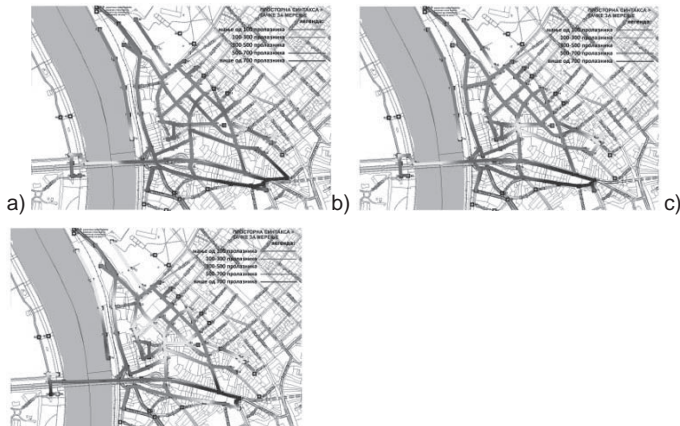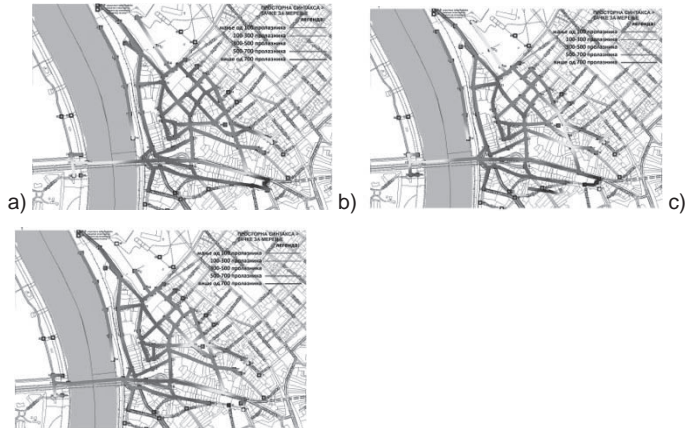
Figure 10: Intensity of the pedestrian movement during Sunday at the Kosancicev venac
a) 12-13h, b) 17-18h and c) 21-22h. Source: Petrovic S., Vlajic A., Stojic B. (2015)

Besides this, measurements have shown that pedestrian movements are most intensive along the streets which connect the main traffic nodes, pedestrian zone of Knez Mihailova Street and park within Belgrade fortress. The most intensive pedestrian flows are along Pop Lukina Street, especially in time interval during afternoon working days, when inhabitants returning back home from work. High intensity of pedestrian movements is also recorded along Brankova Street, Carice Milice Street and Jug Bogdanova Street. Those paths are recognized as the main pedestrian connections between the open public spaces, pedestrian zone and main bus stops (next to the open green market).

Increased intensity of pedestrian movements occurs during weekends along Brankova Street, across the Brankos' bridge and Toplicin Venac Street. The most of those paths connect parks, squares, shopping zone, recreation area and shopping mall Usce on the other side of the river Sava.

The lowest intensity of pedestrian movements is recorded along Karadjordjeva Street that is predominant traffic street, the paths under the Branko's bridge and the last stop of tram No 2 next to the Kalemegdan fortress.

Figure 11: Analysis of activities in the ground floors: a) types of activities, b) detail analysis of ground floor activities and c) densities of activities. Source: Jelisavac J., Skerovic J. and Vukovic T., 2014

The analysis of the content units in ground floors of buildings consists is the second part of space syntax method. The results show 12 types of activities that could be find on the territory of

Kosancicev venac. Identified types of activities include: services, commerce, restaurants and cafes, transport, business, culture, health, administration, churches, playgrounds, crafts and other activities. In general, this location is mixed-use in its character (see Figure 11), but there are specific parts of the territory dominated by certain activities (area of Saborna church, part of the Kosancicev Venac Street with cafes, etc.).

3.3 Geo-mapping

As a first step of analyses regarding geo-maping, we collected all geocoded tweets sent between June 25 and July 25, 2015. It is important to point out that tweets in predefined places of interest determining by coordinates and radius. The data illustrating attractiveness of places, based on activities of twitter users at the Kosancicev Venac, as well as connected places – Republic Square, Sava Quay, Park near Vuk's Monument, and Slavija Square, in the considered period, are presented in the Table 1. The data about the number of geocoded tweets emanating from these places reveals a large amount of inequality in the user activity. The largest places in terms of information production through Twitter are Republic Square and Kosancicev Venac.

Table 1: Number of users and number of tweets at Kosancicev venac and other important open public spaces near it, in the period 25th June to 25th July 2015. Source: Jokovic J. (2015)

Place	Kosancicev Venac	Republic Square	Sava Quay	Park near Vuk's Monument	Slavija Square
Number of users	22	103	5	5	2
Number of tweets	50	242	6	15	2

The map of the spatial distribution of tweets is allowing better understanding of the geography of content on the platform. The georeferenced map of Kosancicev map, with marked twitter users is presented in Figure 12. It shows the density of use of Kosancicev venac and areas in the immediate vicinity.
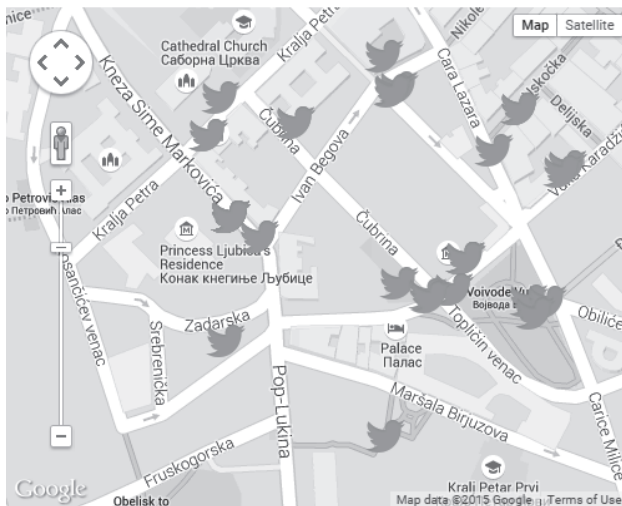

Figure 12: Density of Twitter users at Kosancicev venac. Source: Dincic N., Dzakovic N. (2015)
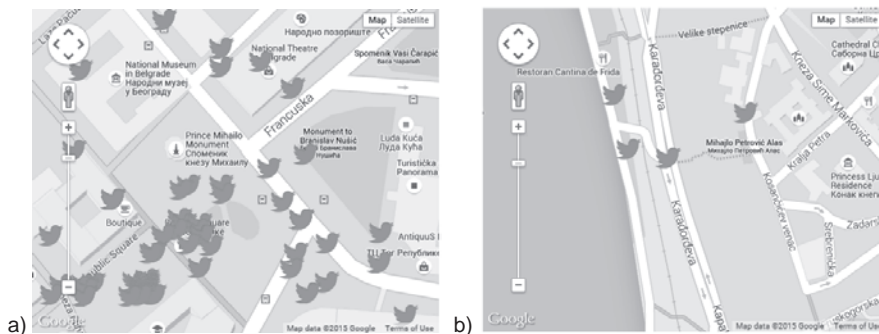
Figure 13: Density of tweets at a) Republic Square and b) Sava Quay. Source: Dincic N., Dzakovic N. (2015)

The Figure 13 presents the maps with marked tweets in considered period at the Republic Square and Sava quay. The results shown at the map could be also interpreted as an illustration of the attractiveness and liveability of the selected areas. In accordance with that perspective, we can conclude that Kosancicev venac is not attractive as other public places in its surroundings like Vojvode Vuka's Park, Kralja Petra Street as well as Republic Square and Sava Quay.

Similar to the situation with the intensities of pedestrian movement the reason for this could be find in the domain of activities in the buildings' ground floors. If we omit the Republic Square as one of the most important open public spaces at the city level, in relation to the other analysed public spaces we can say that the most visited areas are near by Museum of Applied Arts, Cafe Amelie and Supermarket Deli restaurant and shop at Toplicin venac and Beton Hall with lot of restaurants and bars at area at Sava Quai. On the other side, the most visited place that belongs to the area of Kosancicev venac is Princess Ljubica's Residence (Konak kneginje Ljubice).

4 Discussions

It is necessary to compare the results of the intensity of pedestrian movements between different areas as well as different open public spaces and its relationship with the character and density of activities. While the districts are recognised according the physical characteristics, nodes are identified through the intensity and concentration of users and activities.

Comparing the number of pedestrians of inner zone of Kosancicev venac with the connected area, it is oblivious that it is significant lower within the zone. Accessibility, lack of maintenance, sporadic activities and predominant residential function of the whole area are the main causes for such situation.

Based on the results of analysis of the number of pedestrians on observes public spaces it can be concluded that the highest concentration of users can be found in streets that belong to the parts of the area that are close to the Knez Mihajlova street, as the main pedestrian street in Belgrade. During the whole week, pedestrian movement a high intensity (more than 500 pedestrians per hour) is recorded in this area.

However, the distribution and character of activities and functions in ground floor objects is of importance for the analysis of pedestrian movement. The relationship between density and diversity of activities in the ground floor and the intensity of pedestrian movement has been recognised along the direction of Kralja Petra and Toplicin venac streets. The residential function is predominant at the whole area. The most frequent and most diverse activities are located along Kralja Petra Street, Kosancicev venac Street and Pop Lukina Street (see Figures 11 and 14). Other activities are distributed at various points so there is no continuity observed.
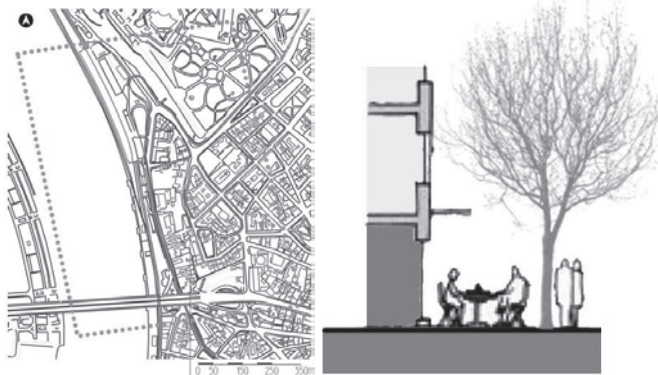

Figure 14: Parts of the streets where the ground floors are opened to the street and the way they are used. Source: Minic M. and Uzelac M. (2015)

According to the data provided by the research, the number of connected lines through the site is satisfied, the existing landmarks are sufficient and easily readable and recognizable but the position of nodes and their connections should be improved. Furthermore, it is possible to solve the problem of geomorphological barriers between the site and right Sava riverbank with lifts, mechanical stairs and cable car.

Citizens´ digital footprints, such as the case of geo-tagged information could be used for different purposes and interpret in different ways such as measurement of intensity of use of particular areas, evaluation of the attractiveness of specific activities and contents, determination of the significance of particular buildings and open public spaces with both point of view of inhabitants and visitors. In the context of open public space qualities like safety, accessibility, comfort, attractiveness and liveability, the general interpretation can be that a geotag confirms someone's presence at a certain location in a certain time, which is also a confirmation that at that place at that time something interesting happens.

The maps with remarkable detail offers a starting point - the example presented in this research demonstrating the ability of the application, and even more important only allows us to visualise the quantity of geocoded tweets that pass through the platform. However, it will become more important to understand the geographies of information. These information could be use in interpreting how inhabitants and visitors experience the city, where are their favourite places or places of fear, what program that city offer is interesting and the most visited, etc. On the other hand it provide an opportunity to create and develop new methods in analysing the actual state of

open public spaces, thanks to new, more technologically advanced tools, as well as in evaluating the potentials of public spaces for future interventions.

In general, the geo locative medias may be used in urban design for better communication between practitioners, local government and users as well as could be an auxiliary tool for urban planning and design. The reason for this could be found in its special possibility for establishing a certain spatio-social relationships that could not be identified and analysed in this way in this way until now.

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