



Article

# The Evaluation of Urban Renewal Waterfront Development: The Case of the Sava Riverfront in Belgrade, Serbia

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**Abstract:** Belgrade is the only capital in the world at the confluence of two major international rivers navigable for global shipment—the Danube and the Sava River. However, it was only after the unification of all riversides within Yugoslavia in 1918 that Belgrade started to develop its riverfront; initially, as green recreation areas during the socialist era. Since the post-socialist transition, this trajectory has sharply changed in order to create new urban nodes along the riverfront. The best example is the newest project of the urban renewal of waterfront development at the Sava River, the “Belgrade Waterfront Project.” This mega-project has sparked a lot of attention. The aim of this research is to present, evaluate, and spatially determine this attention before and after the project inauguration. This observational study is conducted by using two methods from social discourse: a survey, as a traditional method, and analysis based on social network data (Twitter) as a newer, “smarter” one. Comparing and mapping their results, this research offers recommendations on how to harmonize and modernize the development of this crucial potential of Belgrade.

**Keywords:** social media; survey; riverfront development; modernist urbanism; post-socialist urban transformation

## 1. Introduction: The Essence of Waterfront Development

Waterfront (re)development has been greeted as a panacea for newer urban evolution in post-industrial cities for the last 40 years [1]. This was noticed even at the beginning of this phenomenon, during the early transition from the industrial phase of urbanization in the late twentieth century [2]. Many cities have found a new ground for such development among the former industrial complexes and docklands, ideally located along their inner waterfronts [3,4]. In recent years, this type of urban project has become a new “normality” for tracing the future of contemporary cities at the global level [5]. Moreover, many mega-projects of new waterfronts that have emerged across the world have been praised as role models for modern urban development. Even cities piled with severe socio-economic problems, such as Detroit whose demographic loss in the last half of a century was more than 50% [6], have got new waterfront developments, such as the new mixed-use project on the site of former “Stroh” brewery in the city riverfront [7]. Europe, with many historic industrial cities, has many successful examples of city recovery managed through the waterfront-led regeneration. Bilbao in Northern Spain is probably the most famous for its outstanding culture-based waterfront regeneration, considering new Guggenheim Museum and the popular “Bilbao Effect.” which has further influenced the revitalization of the local art and culture scene [8].

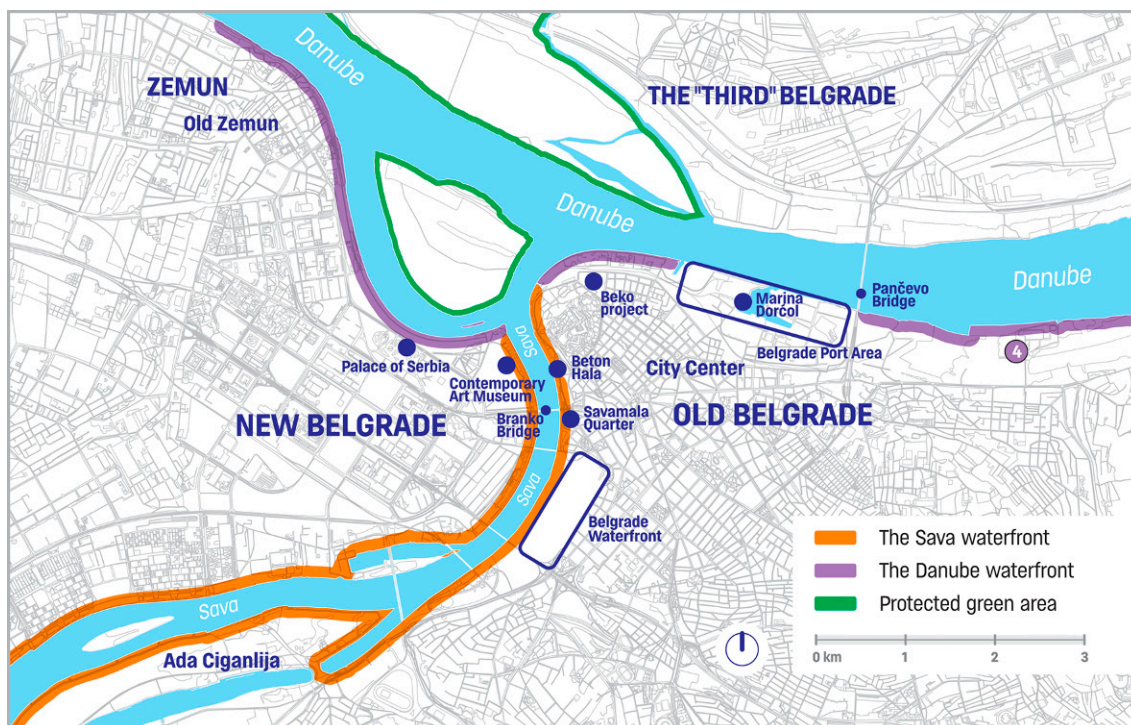
The significance of waterfront development can be observed in different ways. First, the former unused or insufficiently used industrial and/or transportation space is an economical and ecological burden for city authorities in the form of brownfield [9,10]. Furthermore, their successful transformation in new and vibrant urban nodes can be observed as a benefit regarding both physical and functional ways; the related changes can be noticed through the different personal perception of these urban spaces, as well as in the reconfiguration of existing social ties within them [11,12]. Finally, if the former structures in a waterfront area carry the significance of cultural heritage, the process of their transformation into new urban hubs can be even more complex [13–15].

This complexity of waterfront redevelopments is especially reflected in its influence on society. Newly established waterfront zones have become increasingly attached to newcomer elite groups since the first examples of waterfront development [3]. This contradiction of prospective waterfront development can be noticed even in the early stages of their transformation [16]. Typically, there is a gap in the vision of the waterfront transformation between city authorities, with elite groups in the background, and the local population, who are represented through activists' initiatives [17]. Such tensions are more often seen in the global cities that have faced the recent turbulences and socio-political transition, such as many major cities in post-socialist countries in the European east [18,19]. The socio-economical transition from a socialist to a capitalist state system has made a deep impact on the pioneer waterfront projects during the 1990s, thus their regeneration process has differed more greatly than the Western counterparts' [20]. Preliminary research concludes that the governments of the main post-socialist cities do not have a clear vision of the waterfront (re)development. These new waterfront projects are usually managed from one project to another, thus making the waterfront urban fabric more fragmented [20,21]. Nevertheless, many large and physically striking projects were built along the seafronts and riverfront of cities in post-socialist Europe, such as Okhta Center in St. Petersburg, Russia [22], Nowy Port in Gdansk, Poland [23], or Millennium City Center in Budapest, Hungary [21].

In relation to these evident social tensions in waterfront projects [24], the aim of this research is to examine current public opinion and the uses of the Belgrade waterfront, emphasizing the impact of the newest, post-socialist projects on its users. This is fundamentally a definition of sentiment analysis [25]. However, it is adjusted to reflect public opinion in the urban space, which is a new field of research [26]. Two methods used from a social research context were thereby customized to enable this approach—a survey as a traditional method and analysis based on data from a social network (Twitter) as a newer, “smarter” one. Tweets are data resources for extracting opinions and feelings in the real-time and the text data in tweets are used in research to analyze sentiments and obtain valuable results which cannot be provided otherwise [27,28]. Through comparing and mapping their results, this research offers recommendations on how to socially harmonize and eventually modernize the development of the Belgrade waterfronts as a crucial potential for the city's future.

## 2. Belgrade: The Timeline of Modern Riverfront Development

Although Belgrade is the only capital that lies on two big rivers, the Danube and Sava [29], these rivers have influenced the formation of the present-day city in an unusual way. The critical period of the Belgrade genesis was early modernity, from the late 17th to early 20th century. During this period, both rivers represented borders between two empires: the Habsburg Empire in the north and Ottoman Empire in the south. These empires were totally different regarding cultural, political, and religious realms that were in constant mutual conflict, which made the borders on the Danube and Sava Rivers a real military frontier [30]. Consequently, Belgrade retreated from both rivers to the ridge between them, as some kind of a “supervisor” on both riversides, which mainly consisted of marshlands. This “uphill” position of the city has been preserved until today; Belgrade's inner center is still on the top of the ridge above the confluence of the Sava into the Danube. Only a relatively short Sava riverfront with port facilities in the Savamala Quarter (see: Figure 1) was formed during this period [31].



**Figure 1.** Waterfront parts in present-day Belgrade with the most important quarters and structure (author: V. Kovač 2020).

A new impulse for the Belgrade waterfront on three riversides waited for the moment of the unification of all of the city riversides under one unity. This happened with the end of World War I in late 1918, with the formation of the State of Slovenes, Croats, and Serbs, known as Yugoslavia after 1929 [32]. The capital of this young country immediately spotted its riverfronts as a spatial potential to enlarge its territory, which was clearly outlined in the first general urban plan after the war, from 1922 [33]. However, only a few of the measures and projects proposed by the plan were implemented; the main ones considered a new Belgrade port on the Danube side of the city center, with the first city bridge across the Danube and Branko Bridge (Serb. *Brankov most*) on the Sava River [33] (See: Figure 1).

The present-day riverfront along the Danube and Sava (Figure 1) was shaped in the period after World War II, during socialist Yugoslavia (1945–1991). Most of the efforts were given to create New Belgrade (see: Figure 1), a new modernist core city within Belgrade, across the Sava River from Old Belgrade [34]. In line with the contemporary functionalist style, this part of the city was built in a super-blocks structure—open blocks with mass housing as a dominant urban function and a lot of greenery around it. Several blocks were dedicated to the most important institutions of socialist Yugoslavia, such as the Building of Federal Executive Council (today known as the Palace of Serbia) [35]. New Belgrade waterfronts on the Danube and Sava followed these modernist tenets; they were created as a pedestrian quay “inserted” between the river and green riverside belt.

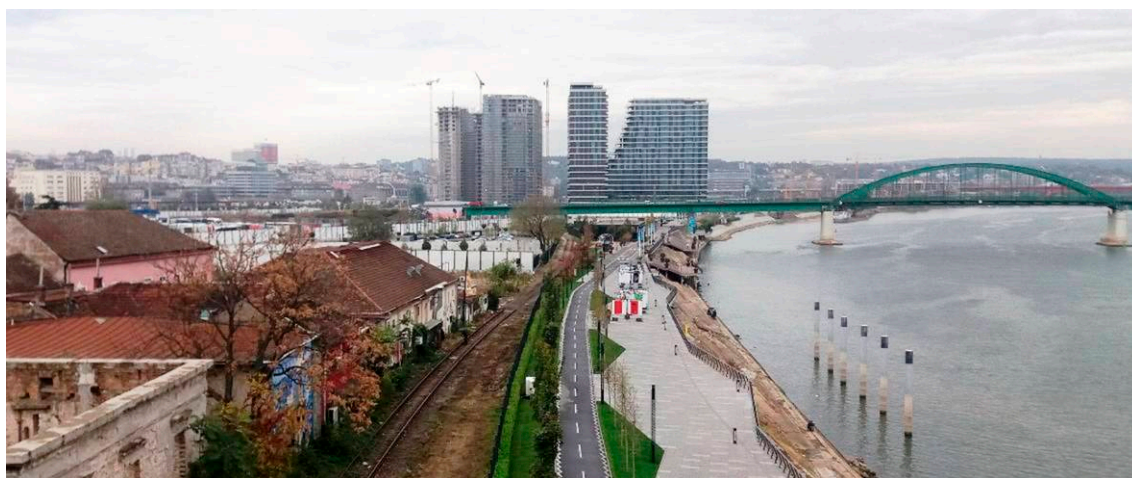
The same principle was used for the free waterfront areas in Old Belgrade on the eastern bank of the Sava River, such as Ada Ciganlija (see: Figure 1). This former river island was artificially connected with the mainland and gradually transformed into the largest sport and recreation area of the city [31]. However, most of the Old Belgrade waterfront was “frozen” in the state before World War II, neglected and dilapidated for several decades. This view was radically changed in the 1980s, during late socialism, with the international rise of post-modernist awareness of the values of the old urban fabric and traditional city. This new movement was capitalized in the first big redevelopment project of the central part of the Belgrade waterfront, located between the New Belgrade and Old

Belgrade centers, the International Competition for the New Belgrade Urban Structure Improvement (1984–1986) [33].

The turbulent 1990s prevented any kind of competition implementation. Nevertheless, the post-socialist transition has brought new, private “players” in the redevelopment of the central part of the Belgrade waterfront. Their interests were completely different in their essence due to a new, capitalist environment. The conditions of a market-led economy immediately refocused their attention from the peripheral parts of the Belgrade riverfront to more central locations “entrenched” with a post-industrial decline after the fall of socialism and ripe for urban renewal [36]. In such way, Belgrade riverfront visions were joined to a myriad of postponed post-industrial urban redevelopment attempts, plans, and projects, typical for young post-socialist societies in the eastern half of Europe [37].

The first attempts at urban redevelopment started in the 1990s with plans and open competitions for the so-called “Belgrade on Water” project [36]. However, they did not include the issue of land ownership, as a requirement for the project implementation, which led to a series of development issues [37]. On the other hand, new private investors rediscovered the potential of riverfront locations in Old Belgrade, gradually taking the initiative for (re)development projects from the public sector [38]. New projects firstly aimed at the less prominent locations of industrial and transport brownfield, like the spontaneous urban regeneration of industrial heritage called “Beton Hala”. The other redevelopment mixed-use projects like “Marina Dorćol” have been more controversial. These projects, authored by Arch. Daniel Libeskind and the “Beko” project by Arch. Zaha Hadid, have had the implications of “starchitecture” projects confined within a strict neoliberal context, thus excluding a noticeable social dimension [39]. It should be noted that not all of these projects were only economically driven; some of them were more prone to the social and cultural revitalization of the old urban fabric along the rivers, such as the regeneration of the historic Savamala Quarter, today known as the Savamala Cultural District [31].

However, the last and biggest of them, the “Belgrade Waterfront Project” (henceforth: BW Project), has been in progress since 2012, with on-site construction from 2015 (Figure 2). This ongoing project occupies the large area of the main railway and bus stations of Belgrade with supplementary technical facilities. Both stations are in the process of reallocation. Due to its size, physical appearance, and general importance for the city, this mega-project has received a lot of public and professional attention with diverse opinions, thus becoming the most important and most controversial project in Belgrade. It has proved to be a challenge for the whole city development [40]. Nevertheless, it certainly shows the new developmental trajectory of Belgrade as a whole [41].



**Figure 2.** The Belgrade Waterfront Project (BWP) in progress; the Savamala District is on the left. Both city areas are mapped in Figure 1 (author: B. Antonić 2018).

### 3. Methods and Materials

This research was organized into two major steps. The first one concerned the aforementioned historic development of the Belgrade waterfront. The focus was on urban development after World War II, comprising both socialist and post-socialist phases. The second step consisted of two analyses:

**Analysis A:** A survey that intended to gain an overview of the opinion of the local population about the ongoing transformation of the Sava and Danube riverfronts. It used a traditional method to obtain qualitative data but was carried out using modern technologies through an e-questionnaire. The survey with an e-questionnaire was conducted among the Belgrade population in July and August of 2018. In total, 281 respondents participated. It included eleven thematic semi-open questions relating to the opinion of the local population about the ongoing transformation of the Sava and Danube riverfronts. Before them, three introductory questions were given to distinguish the structure of respondents: their gender, age, and the living area in Belgrade.

**Analysis B:** The second analysis was quantitative and included “smart” and interactive technologies that promote the formation and sharing of information, ideas, and interests. It was the analysis of social media—Twitter. The use of tweets has been already confirmed as adequate to extract the geospatial data important for urban development [42]. The aim of this section was thereby tracking and measuring the intensity of users in the monitored territory of the Sava waterfront, with the testing of their latest behavioral patterns, as well as tracing the most attractive routes along this waterfront.

Both analyses have certain limitations, therefore the specific measures were undertaken to minimize their impact. The first one used an e-questionnaire, distributed through social media channels, with the respect of privacy and respondent anonymity. The option of an e-questionnaire is more suitable for younger generations. Therefore, the oldest contingent of the population (above 65 years) was successfully included in the survey through in-person support for completing the e-questionnaire. Nevertheless, this population contingent was a bit under-represented (9%). The second analysis opted for just one representative of social media to adequately cover all content regarding the proposed analysis. This was legitimized through the selection of Twitter because it is one of the most popular data sources for such research [43,44] with its transparency in an open network, which allows access to the information published through its platform. Microblog data like Twitter offer a varied kind of different information because its users post real-time reactions to every item.

The comparison and mapping of the results from these quantitative and qualitative analyses and the further link with the historic context of the research problem bring new insights in the form of recommendations regarding the very complex issue of waterfront development in Belgrade.

### 4. Results: Regarding the Current Use of Belgrade Waterfronts

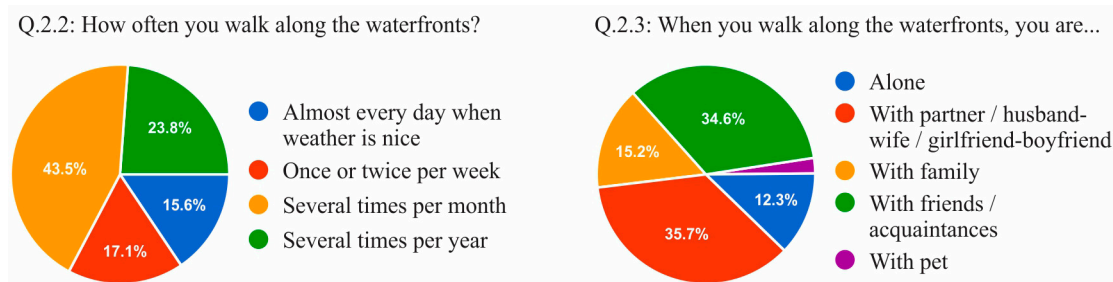
#### 4.1. Research A: Survey with Questionnaire

As it was mentioned in the previous section, the first three questions in the questionnaire were the introductory ones about a respondent profile. The results from these questions roughly concur with general figures for the Belgrade City:

- Female respondents were slightly more prevalent than males (56% and 44%, respectively);
- The place of living pointed to most respondents living in Old Belgrade (60%). The next most common was New Belgrade at 27%. Less frequent answers were “Zemun” and Trans-Danube/“the Third Belgrade” (8.5% and 4.3%, respectively);
- Age groups were rather evenly distributed but with a slight prevalence of younger generations from 25 to 34 years (32%). The other age groups were distributed as follows: 16–24 (24%), 35–49 (22%), 50–64 (13%), and above 65 years (9%).

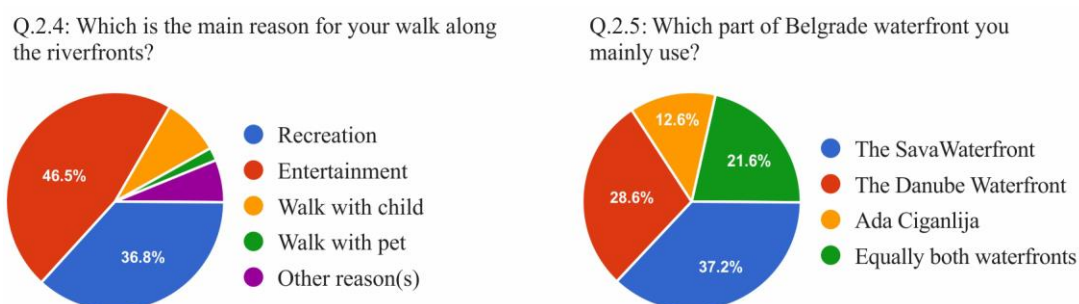
The first part of the questionnaire consisted of four thematic questions intended to clarify the general character of respondents’ use of the city riverfront. The first question was a key to continue to the survey, and 95% of respondents answered positively and thus continued to the next questions.

Even those people who did not use the riverfronts presented at 5%. Their participation in this survey shows that a general interest in the city riverfront development is not limited to just those Belgradians who actively use the city waterfront; the other ones are also interested in waterfront development due to its significance for the entire city. The overall majority of respondents (>95%), however, actively used Belgrade waterfronts (Figure 3, left). Almost one-sixth of all of them used the riverfront daily, and the majority of them (44%) stated they walked along the rivers several times per month.



**Figure 3.** The thematic questions No. 2 (left) and No. 3 (right) (author: B. Antonić 2018).

Participants mainly used the waterfront area with a partner or with friends (36% and 35%, respectively, Figure 3, right). This confirms that the Belgrade riverfront plays an important socializing role for the local population. This is indirectly repeated in the next question (Figure 4, left). The key reasons for using the Belgrade waterfront include the socially-responsive groups of activities, such as entertainment (46%) and recreation (37%). The other options, which can be described as a daily routine rather than a personal desire, were significantly less present in the responses.



**Figure 4.** The thematic questions No. 4 (left) and No. 5 (right) (author: B. Antonić 2018).

The second block of thematic questions pertained to the (different) patterns of use of the Sava and the Danube riverfronts. The fifth question made a distinction between these riverfronts regarding respondent use (Figure 4, right). Ada Ciganlija, the main and by far the largest recreation green area along the rivers, was given separately. The results show that the Sava Riverfront was more used with or without Ada Ciganlija included (50% and 37%, respectively). Nevertheless, more than one-quarter of all respondents mainly used the Danube riverfront, and more than one-fifth used both riverfronts equally. This distribution affirmatively confirms that different parts of the Belgrade riverfront are attractive to users.

Both riverfronts are not “monoliths” by use patterns yet. Many parts of the riverfronts are specific by their development, and their influence on users differs greatly (Figure 5). In the case of the Sava (Figure 5, left), New Belgrade Quay (48%) is most used. For the Danube (Figure 5, right), it is Zemun (37%), although answers were more dispersed. However, responses to both questions clearly indicate that the parts of the waterfronts located in Old Belgrade are not the most used ones, despite their central position (Figure 5).

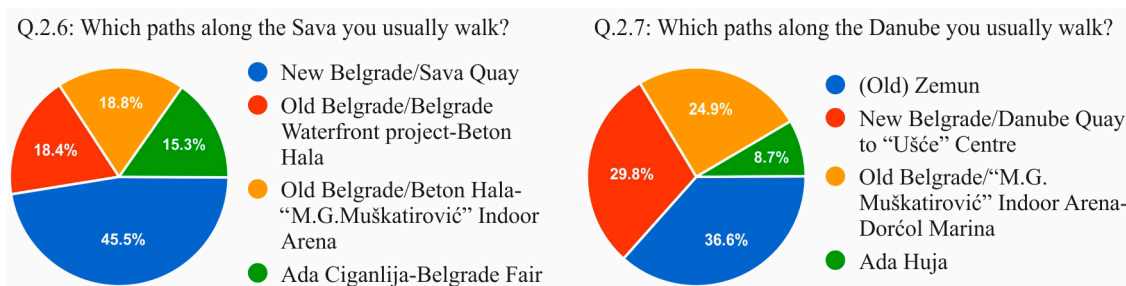


Figure 5. The thematic questions No. 6 (left) and No. 7 (right) (author: B. Antonić 2018).

The last two questions in this question block were connected to the quality evaluation of the spatially related elements of the Belgrade riverfront (Figure 6). The eighth question pertained to the spatially related reasons that are critical for personal decisions and preferences toward a certain part of the Belgrade waterfront. The most frequent option was related to the urban-planning level—accessibility (46% answers), followed by the choices from the urban-design field—pavement and path quality (31%), and the quality of greenery (28%).

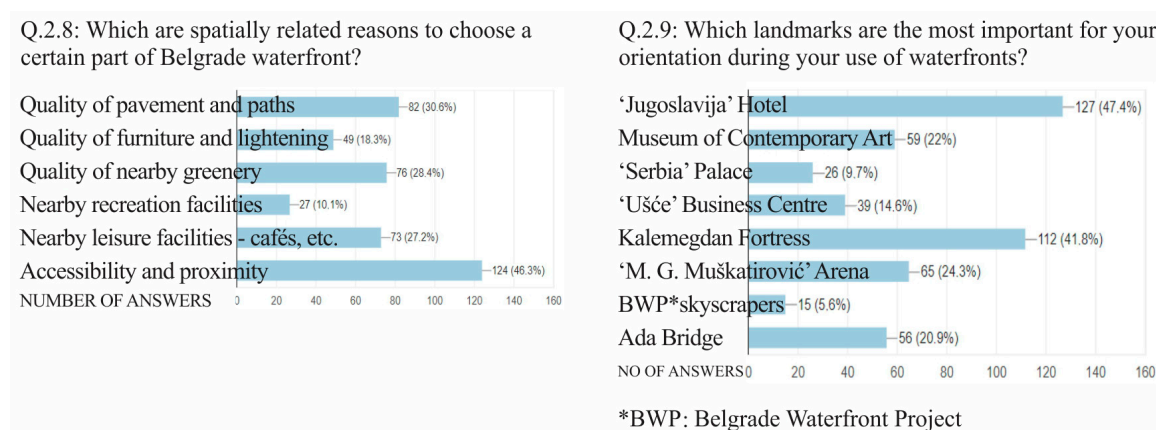
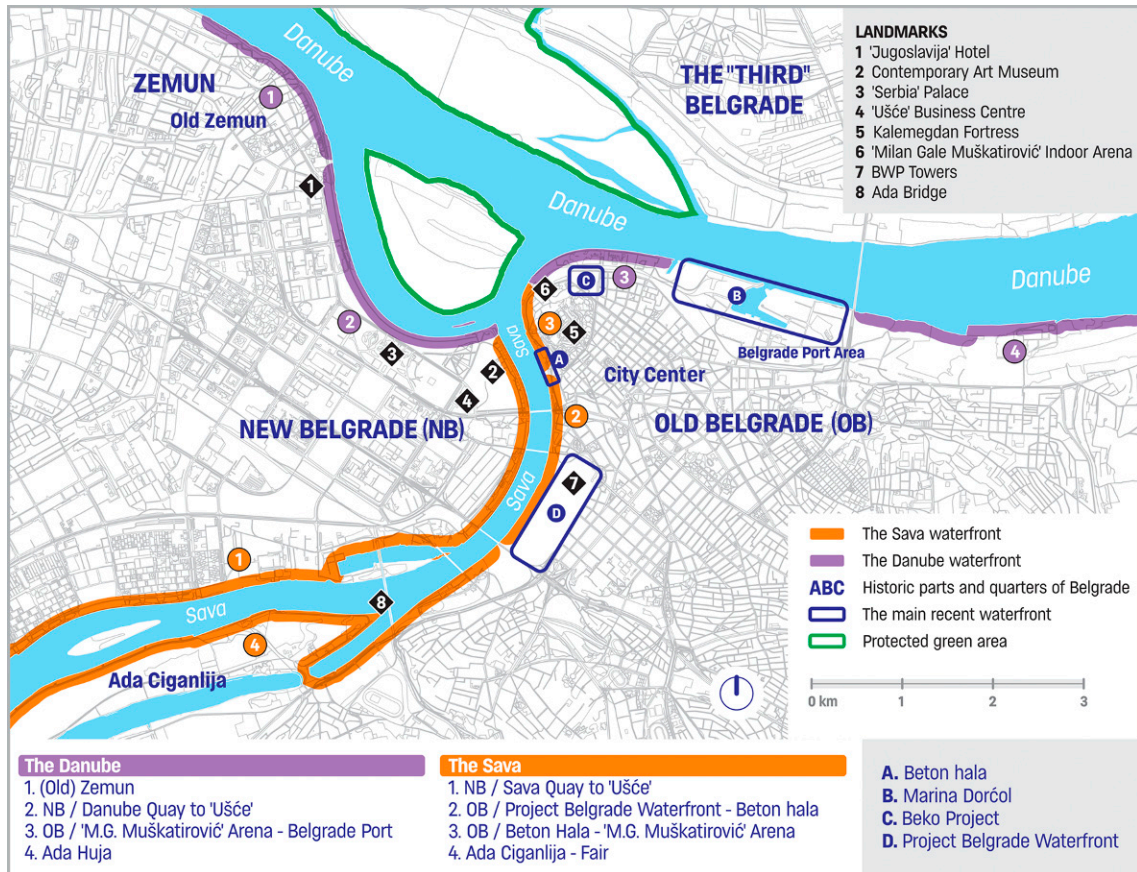


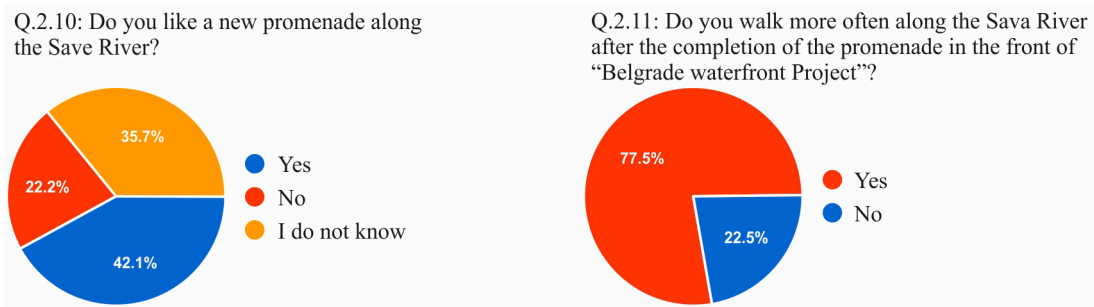
Figure 6. The thematic questions No. 8 (left) and No. 9 (right) (author: B. Antonić 2018).

Response ratio in the previous question was more or less expected. Thus, the next question was related to the issue of urban landmarks in the Belgrade waterfront, which are also recognizable physical elements in the urban fabric but have a deeper, psychological meaning; they help in individual orientation in urban space and thereby define an environment as familiar or unfamiliar [45]. The analysis shows that the most important landmarks for respondents were the “Jugoslavija” Hotel (47%) in Zemun and Kalemegdan Fortress (41%) in central Belgrade (Figure 7). The first result generally concurs with the significance of the Danube riverfront in Zemun. In contrast, the surrounding riverfront parts around the Kalemegdan Fortress, which is a monument of extraordinary national importance, were not the first choices by respondents.

The option that got the minimal support by respondents in the previous question—new towers in the BW Project—was somehow an overture in the last block of two questions. It concerned this project in progress, which is certainly the largest one along the entire riverfront in Belgrade. The first question was more related to the new promenade along the Sava River, in front of the new towers (Figure 2). The answers about the general affinity toward the promenade were rather divided by respondents (Figure 8, left), but the relative majority of respondents (42%) appreciated the new development. In the last question of the survey, which closely connected the promenade with the BW Project, to a large extent the attitude of respondents was a bit different (Figure 8, right). While the majority of respondents did not walk more often along the Sava River after the completion of the promenade in the front of the project, a sizable minority did (23%).



**Figure 7.** The characteristic parts of the Sava and the Danube riverfronts in the Belgrade urban area (author: V. Kovač 2020).



**Figure 8.** The thematic question No. 10 (left) and No. 11 (right) (author: B. AntoniĆ 2018).

4.2. Research B: Social Media

The second part of this research was focused on the analysis regarding information and communications technologies (ICTs) about urban space derived from social media. The ICT term in the context of this analysis should be understood as integrated telecommunication, software, and multimedia technology and systems, which ultimately allow users to manipulate the stored and transmitted data [46]. In this analysis, the data had to be related to the environment. Thus, geo-tagged data were selected as appropriate, due to their clear spatial visualization [47]. The synergy between technology and the built environment influences urban culture with digital streams. Furthermore, the future of urban space depends on the role of ICTs and the importance of their networks should be reconsidered since they have become indispensable ingredients of urban life [48]. ICT provides the overlapping of real and virtual spaces, thus allowing the creative participation of users.



The research experiment was based on the Twitter Search Engine application developed for Twitter data gathering, mining, and classification. This type of methodology uses Twitter REST API as a protocol allowing data mining and different type of analysis and representation of User-Generated Content. Twitter Search Engine is a web application that enables the collection, storage, processing, and analysis of data from the social network Twitter. It is the micro-blogging platform that provides a rich collection of real-time commentaries on almost every aspect of life. Data collection is based on the Twitter REST API [49] that allows the collection of tweets in the space defined with geo-referenced points and the given radius. This API provides a wide range of information related to tweets and users who post them. In addition to basic information, such as text, time, or the number of retweets, the number of likes and information about the application from which it was posted/sent, as well as the geographical location where the tweet was shared, present the basis for the analysis and processing of geospatial data [50].

The application Twitter Search Engine (TSE) allows collection and storage of data for an unlimited period of time; it offers a display, analysis, and execution of complex geospatial queries of the data stored in the database. These queries are executed with the help of relational geospatial functions offered by the MySQL database. TSE functions are correlated in terms of interrelationship between two objects determined with geo-referenced points. Furthermore, TSE has the option of drawing a polygon on the map of Google by using Google Maps JavaScript API. This polygon site must be within the area for which information was collected.

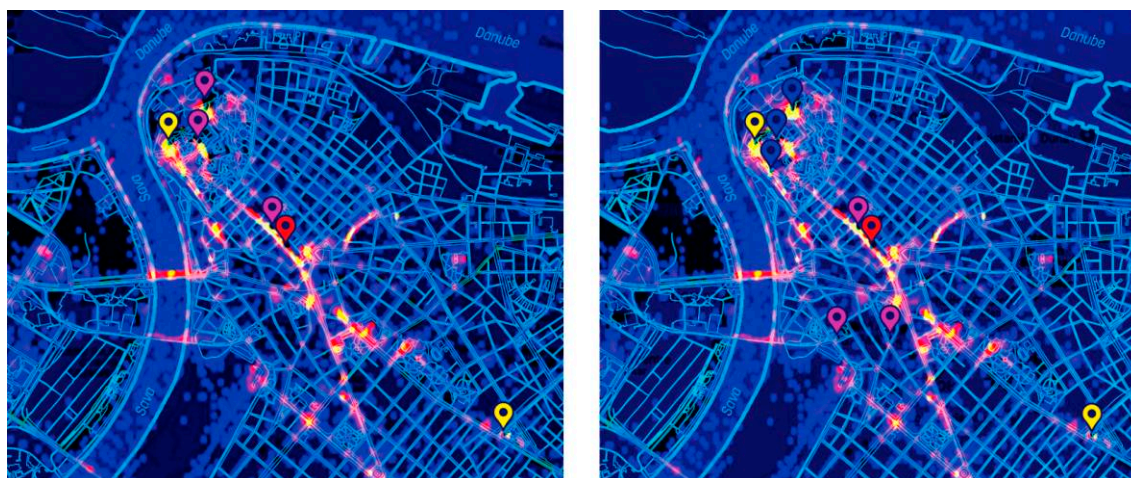
The research of Twitter data measured for the entire Sava riverfront in Old Belgrade, from the BW Project to the confluence of the Sava into the Danube near the “Milan Gale Muškatirović” Indoor Arena, was conducted. The geo-referenced tweets were collected from 2015 that concurred with the start of construction (July 2015) up to the period (August 2018) when the first two residential buildings were finished (Table 1). In the meantime, in 2017, a new promenade along the Sava was inaugurated and opened for public. From 2015 to 2018, the number of tweets noticeably changed. The average number of tweets for the analyzed waterfront per month for 2015, 2016, and 2017 was 19.83, 13.25, and 14.00, respectively, or 14.83 as a month average for the period 2015–2017. On the other hand, during 2018, the number of tweets more than doubled—31.75 per month.

**Table 1.** The comparison of the number of tweets for the Sava waterfront within the analyzed period from July 2015 until August 2018 (authors: J. Joković and N. Dinkić, 2018).

Number of Tweets	Year			
	2015	2016	2017	2018
January	/	8	6	39
February	/	19	17	25
March	/	21	19	39
April	/	15	14	35
May	/	14	12	34
June	/	9	11	23
July	12	15	14	28
August	13	10	10	31
September	25	8	17	/
October	28	8	13	/
November	14	19	14	/
December	26	13	21	/
<b>Total</b>	<b>118</b>	<b>159</b>	<b>168</b>	<b>254</b>
<b>Average</b>	<b>19.83</b>	<b>13.25</b>	<b>14.00</b>	<b>31.75</b>

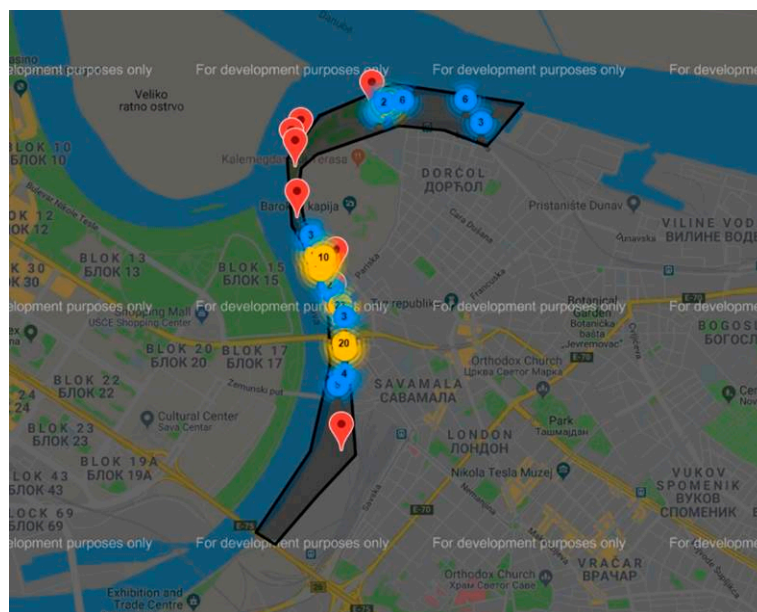
The spatial distribution of the photos taken by Twitter in Old Belgrade in the analyzed period (2015–2018) indirectly represents the increase of the importance of the Sava waterfront. In 2015, the only place on the riverfront that was a major Twitter spot by photos taken was the aforementioned Beton

Hala as an already established place for socialization on the riverfront (Figure 9, left). Nevertheless, two new places appeared in 2018; the area south to Beton Hala (passenger pier) and the BW Project site (Figure 9, right).



**Figure 9.** Hotness of a spot indicating the number of photos taken in Belgrade 2015 (left) and 2018 (right) (authors: J. Joković and N. Dinkić, 2016–18; graphical arrangement: V. Kovač 2020).

In order to properly illustrate the possibilities of the TSE, tweets that were collected for the Belgrade riverfront over a period of eight months (January–August 2018) were spatially analyzed and the results of this analysis are shown by the space defined by the corresponding polygon on the map, together with the spatial distribution of tweets (Figure 10).



**Figure 10.** Geospatial distribution of the tweets for the central part of the Belgrade riverfront for the period of January–August 2017 (authors: J. Joković and N. Dinkić 2018).

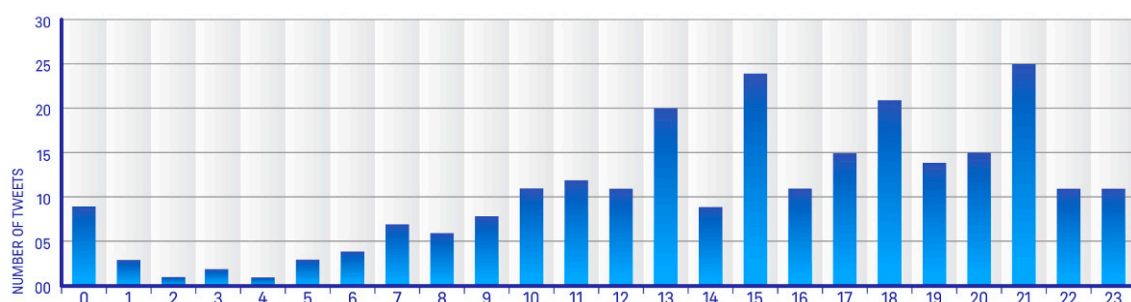
TSE also has the ability to detect the language using web service Language Detection API [51]. This API has the capacity to detect 160 different languages and to offer 5000 requests for free on a daily basis. Each request must contain a text and API key (The request example can be found at: <http://ws.detectlanguage.com/0.2/detect?q=buenos+dias+se~nor&key=demo>). Language Detection API produces results in the \*.json format. The response contains an array of language candidates.

Each object contains a language code, confidence score, and if it is reliable—true/false. The cumulative statistics for the considered period were as shown in Table 2.

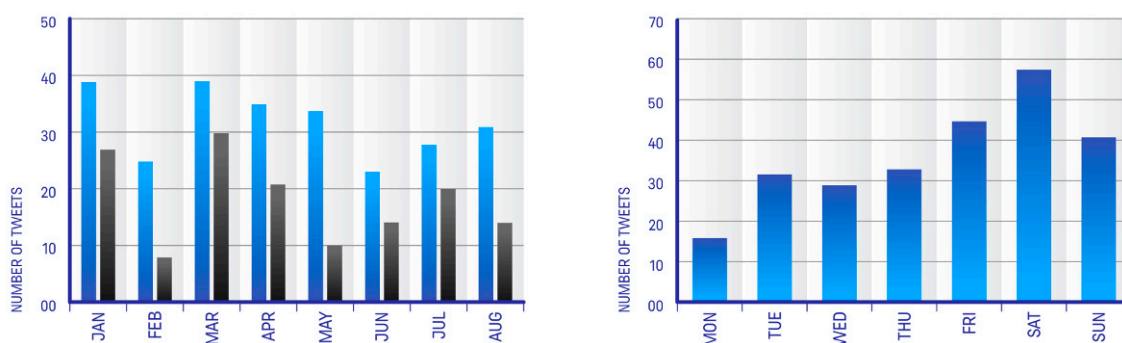
**Table 2.** Cumulative statistics of the tweets for the Sava waterfront collected in the period of January–August 2018 (authors: J. Joković and N. Dinkić 2018).

Number of Tweets	254
Number of Users	111
Number of Retweets	7
Number of Favorites	49
Number of Followers	339,010
Number of Friends	116,328
Number of Applications	8
Number of Languages	17

The results of data classification are also given by the time intervals related to user activities per hour, weekday, and month (Figures 11 and 12).

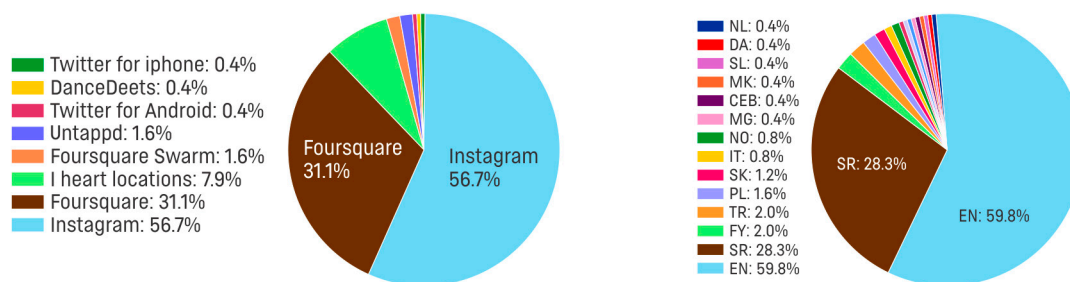


**Figure 11.** Temporal classifications of the tweets for the central part of the Belgrade riverfront per hour for January–August 2018 (Authors: J. Joković and N. Dinkić 2018).



**Figure 12.** Temporal classifications of Tweets for the central part of Belgrade riverfront per month (left) and per weekday (right) for January–August 2017. Left image: Blue columns—tweets; Dark columns—images posted on Instagram via Twitter (authors: J. Joković and N. Dinkić 2018).

In addition to the spatial and temporal distribution of tweets, their content can be analyzed and classified by language using the TSE application. To repeat, Twitter has the possibility to share the data through different applications, such as Instagram or Foursquare. All used applications by Twitter are included in the language analysis (Figure 13, left). The share of used languages on tweets collected in the analyzed area was as shown in Figure 13, right.



**Figure 13.** Distributions of tweets by used applications and languages for the analyzed part of the Belgrade riverfront (authors: J. Joković and N. Dinkić, 2018).

Interim conclusions regarding the tweets' classification, language determination, and sentiment analyses for the central part of the Sava waterfront in Belgrade are:

- Spatial frequency: Most tweets were located in the Savamala District along the Sava, with Beton Hala as its northern tip to the confluence (Figure 10). The Danube waterfront in the city center was far less vibrant considering the tweets. The only noticeable pole was around the “Milan Gale Muškatirović” Indoor Arena, which has a high concentration of different sport and recreation facilities.
- Temporal frequency: This zone was vibrant during the weekend days—Saturday and (late) Friday (Figure 11), as well as in the evening time; tweets were the most frequent at 9 p.m. and generally above the average until midnight.
- The zone is becoming international due to the high number of languages used in tweets (Figure 13, right). However, it seems that local users are still prevalent; for example, considering the period of January–August 2017 (Figure 12), the zone has more tweets during spring months than during summer ones, which is generally the only period when there are more foreign tourists than local people in central Belgrade.
- Despite the previous conclusion, the content of Figure 13 also reveals that international visitors (mainly tourists) have become the emerging user group of the Belgrade waterfront in recent years. There were 12 languages used with a noticeable share (0.4%–2.0%), but they were far behind the two most used languages, English (global/59.8%) and Serbian (domestic/28.3%).

## 5. Discussion

The results and interim conclusions derived from both research methods require the following in-depth examination and discussion.

In the case of the survey, some correlations between question results, as well as between respondent groups, are valuable to comprehend the general respondent opinion on the Belgrade waterfronts and their current development. They were done by Chi-squared statistical testing, which is used when a statistically important difference is anticipated between the expected frequencies. These differences can be the indicators of new and/or unexpected trends and tendencies. The most important observations in this testing are as follows:

- The Danube waterfront is more used by the “younger” population (the groups of 16–24, 25–34, and 35–49 years), while the Sava waterfront and Ada Ciganlija sport and recreation area are used equally among all age groups. The comparison between the Danube and the Sava is expected because the Danube waterfront is greener and with more sport and recreation areas than the Sava waterfront, but the case of Ada Ciganlija, which resembles the Danube waterfront more, is unexpected.
- There is no clear correlation between the certain age groups and the frequency of their use of the waterfronts. In other words, the entire Belgrade waterfront is still functionally and physically open and accessible to all Belgradians. This indirectly confirms that many people visit the waterfront

parts and areas that are the most accessible to their homes, i.e., there are no obstacles, for instance, heavily gentrified or gated ones, to opt for far-distant parts.

- Very interesting correlations can be extracted regarding the spatially related reasons for choosing a certain part of the Belgrade waterfront, with the preference of the Danube/Sava waterfront. The respondents who opted for the Danube part preferred it due to the greenery and better pavement and paths, while those who preferred the Sava part, chose it for accessibility and leisure facilities, such as cafes and restaurants. A clear distinction between them is visible: the Danube is more for active free time (sports, walking), while the Sava is more for slow free time related to the hospitality sector. The other enlisted reasons are not decisive between the Danube and the Sava waterfronts.
- In the case of the questions connected to the Belgrade Waterfront Project, there are two tendencies. The first one is that there is no specific difference regarding the satisfaction with the BWP and its Sava promenade between different age groups and between the respondent groups with a different frequency of use.
- The second tendency pertains to the observed dichotomies, such as between the groups relating to the main reason for which they used the waterfront. Participants who mainly used the waterfront area for their recreation or leisure supported the BWP more than the participants who used it for the other reasons, mostly related to their daily routine, such as walking with children or with the dog. The second dichotomy is in the satisfaction with the BWP between the respondents who used the opposite sides of the Sava River. Those who used the opposite side in New Belgrade were obviously not satisfied with the new skyline of the BWP. However, the respondents who preferred the BWP promenade along the Sava were satisfied with its ambient properties and facilities. The last dichotomy refers to the spatially related reasons for the use of the Belgrade waterfronts. The respondents who particularly appreciated the new design and width of pavement, cafes, and restaurants were fond of the BWP, while the others who preferred sports facilities, greenery, and the quality of urban furniture were more against the project.

The discussion about the interim conclusions of the Twitter social media leads to similar findings. This analysis is more focused on the central part of the Old Belgrade waterfront. A general finding is that this area has been more interesting for social media users since the start of the BWP, which underpins that this project has had an impact on the use of this part of the waterfront. Similarly, the well-established Savamala District, next to the BWP area, with a vibrant, alternative, and progressive night scene was the most “tweeted” area for the period of 2015–2018. The transition zone between Savamala and the BWP areas actually had the highest concentration of tweets, which alludes to the rise of the attractiveness of the BWP.

Expectedly, based on the previous findings, certain user groups are more visible. For example, tweets were more frequent during weekends as well as in the evenings, which indicate that this zone is becoming a place for going out and clubbing. This finding is further supported with the overall internationalization of this waterfront part, observable through the high preference of the use of English language in tweets. International visitors and tourists are known for their attachment to leisure facilities and the hospitality sector.

## 6. Conclusions

Findings from the two presented analyses demonstrate that recent riverfront development projects along the Sava River in Old Belgrade have already made a rather strong impact on its users. They are becoming familiar with new city parts, regardless of their (positive or negative) stance toward them. The last two questions in the survey show that the relative majority of respondents like and use the new riverfront along the Sava River in Old Belgrade, which can be appraised as a success for this relatively short section of the city waterfront. Similarly, the analysis of tweets, as a major social media channel, indicates the rise of users and hot spots for taking photos in the same part of the waterfront.

The survey also reveals that the Sava and the Danube are equally popular among the Belgrade population. However, considering the city center is situated in the Old Belgrade area, the Sava is far more popular than the Danube. Likewise, the Danube riverfront is not interesting enough for Twitter users. Knowing that the historic cores of the main Eastern European cities have witnessed a sharp increase of interest and in urban interventions during post-socialism, these facts demonstrate that the Sava riverfront in central Belgrade has been better exploited than the Danube, which certainly needs new incentives and projects.

The results from the Analysis B indirectly suggest that the group of international users is becoming significant in the waterfront areas in central Belgrade. The results from language-based content indicate that this group is highly heterogeneous, which indirectly means that the Belgrade waterfront has made a positive impact on the diverse groups of international visitors.

The previous findings clearly confirm that the potential of the Sava riverfront has been intensively developed and utilized in recent decades. Nevertheless, the focus from its transformation into a green and recreational zone during socialism has been redirected to the increase of its urbanity and centrality in post-socialism. The intensity of the use of the sport and recreation area around the “Milan Gale Muškatirović” Indoor Arena underpins that active leisure is still important for Belgrade dwellers, which can be promoted in both the improvement of already forming areas, such as the BWP area, and in completely new projects.

To conclude, it is crucial to omit any tension between these two approaches in the future. This means that new projects along the Sava require a balance between open public spaces, indicated as important for recreation and leisure by the survey, and buildings and unavoidable elements for the economic development of contemporary cities. Skyscrapers as prospective landmarks can be an imperative for users’ orientation along and familiarization with the riverfront projects, but they are also sensitive segments that require detailed planning and design to fulfill the general expectations of all citizens.

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