

PROSTOR

27 [2019] 2 [58]

ZNANSTVENI ČASOPIS ZA ARHITEKTURU I URBANIZAM  
A SCHOLARLY JOURNAL OF ARCHITECTURE AND URBAN PLANNING

SVEUČILIŠTE  
U ZAGREBU,  
ARHITEKTONSKI  
FAKULTET  
UNIVERSITY  
OF ZAGREB,  
FACULTY OF  
ARCHITECTURE

ISSN 1330-0652  
[https://doi.org/  
10.31522/p](https://doi.org/10.31522/p)  
UDK | UDC 71/72  
CODEN PORREV  
27 [2019] 2 [58]  
191-416  
7-12 [2019]

POSEBNI OTISAK / SEPARAT | OFFPRINT

ZNANSTVENI PRILOZI | SCIENTIFIC PAPERS

298-309 **GORAN KOS**  
**HRVOJE ČARIĆ**  
**ANA PANDŽA KUNČEVIĆ**

EVALUATING AND SELECTING  
A CONGRESS CENTRE LOCATION BASED  
ON ANALYTIC HIERARCHY PROCESS  
CASE STUDY: CONGRESS CENTRE ZAGREB

SCIENTIFIC SUBJECT REVIEW  
[https://doi.org/10.31522/p.27-2\(58\).9](https://doi.org/10.31522/p.27-2(58).9)  
UDK 711.4:725.832 (497.5 ZAGREB) "20"

METODOLOGIJA  
ZA PROCJENU I IZBOR LOKACIJE  
KONGRESNOG CENTRA

ANALIZA PRIMJERA: KONGRESNI CENTAR ZAGREB

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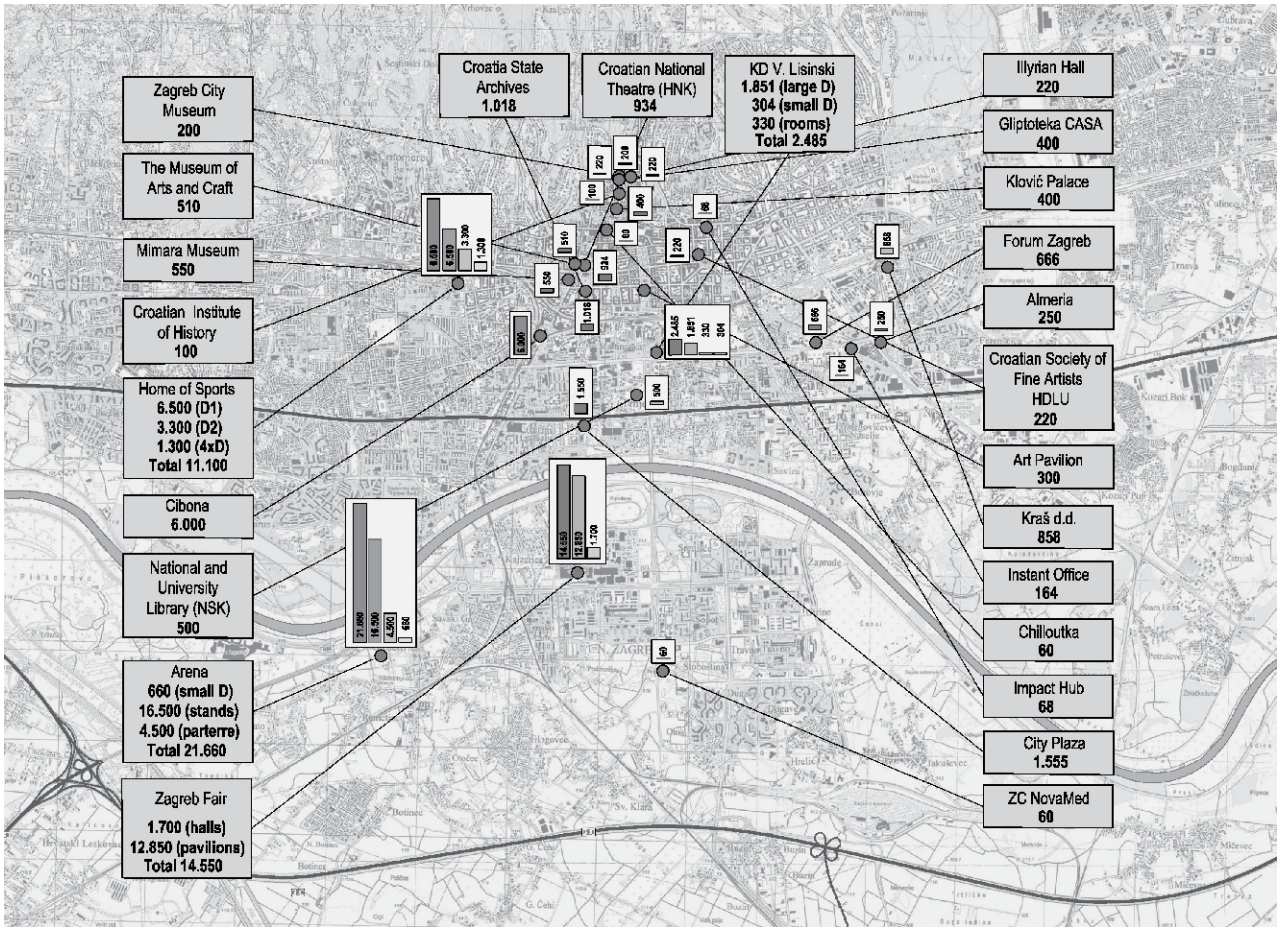


FIG. 1 LOCATIONS OF CONGRESS HALLS IN ZAGREB  
 SL. 1. PRIKAZ LOKACIJA KONGRESNIH DVORANA U GRADU ZAGREBU



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UDC 711.4:725.832 (497.5 ZAGREB) "20"

TECHNICAL SCIENCES / ARCHITECTURE AND URBAN PLANNING  
2.01.02. – URBAN AND PHYSICAL PLANNING

ARTICLE RECEIVED / ACCEPTED: 17. 7. 2019. / 16. 12. 2019.

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PREGLEDNI ZNANSTVENI ČLANAK

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UDK 711.4:725.832 (497.5 ZAGREB) "20"

TEHNIČKE ZNANOSTI / ARHITEKTURA I URBANIZAM  
2.01.02. – URBANIZAM I PROSTORNO PLANIRANJE

ČLANAK PRIMLJEN / PRIHVACEN: 17. 7. 2019. / 16. 12. 2019.

# EVALUATING AND SELECTING A CONGRESS CENTRE LOCATION BASED ON ANALYTIC HIERARCHY PROCESS CASE STUDY: CONGRESS CENTRE ZAGREB

## METODOLOGIJA ZA PROCJENU I IZBOR LOKACIJE KONGRESNOG CENTRA ANALIZA PRIMJERA: KONGRESNI CENTAR ZAGREB

ANALYTIC HIERARCHY PROCESS [AHP]  
BUSINESS TOURISM  
CONGRESS CENTRE ZAGREB

ANALITIČKI HIJERARHIJSKI PROCES [AHP]  
POSLOVNI TURIZAM  
KONGRESNI CENTAR ZAGREB

The paper describes the methodology used in selecting a location for the congress centre in Zagreb, based on the Analytic Hierarchy Process [AHP]. Delphi method was used to define parameters, criteria, and weight ratios for the analysis of physical parameters, land ownership, prescribed conservation, transport and tourism resources. The evaluation conducted proved adequate for the task and deemed useful for evaluating spatial resources and strategic projects.

U radu je opisana metodologija korištena pri odabiru lokacije za kongresni centar u Zagrebu, na temelju analitičkog hijerarhijskog procesa [AHP]. Delphi metoda je korištena za definiranje parametara, kriterija i težinskih odnosa za analizu fizičkih parametara, vlasništva zemljišta, propisane konzervacije te prometnih i turističkih resursa. Provedena evaluacija pokazala se prikladnom za provedeni zadatak i ocijenila se korisnom za procjenu prostornih resursa i strateskih projekata.

## INTRODUCTION

### UVOD

Professional interest, workplace, and occupation generates business tourism in form of business meetings, conferences, congresses, exhibitions and fairs as well as hosting the participants (incentive) or incentive travelling.<sup>1</sup> Hence, the acronym MICE – *Meetings, Incentives, Conferences, Exhibitions*. Within each of these domains variations are possible, first in relation to the number of participants, international or domicile character of events, and belonging to the sector or occupation (topic). Regarding the demand, trends and market share, business tourism is regarded one of the most profitable forms of tourism with following characteristics:

- financial aspects are focused on *do more with less*, i.e. value for money,
- they turn from global to *national* and *regional*: shift towards organizing conventions in closer destinations,
- the number of minor conventions is growing; the average size of the conventions is reduced, with the segment of conventions with 500 participants showing the fastest growth,
- the importance of technology: social networks, fast and free internet,
- they are based on innovativeness and stimulating environment: traditional halls for meetings are substituted or supplemented by *different* premises, such as premises *in the open*,

- they are ecologically sensitive: *green* concepts in all aspects including reduction of ecological imprint of the activities,
- the importance of the destination is growing: opportunities for recreation and learning in a relaxing atmosphere are preferred.

Specific factors of success in the context of MICE tourism include:

- availability and quality of various types of facilities for business conventions and multi-functional congress capacities (centre) in the destination,
- modern and high-quality technical equipment in congress centres (IT, audio, video),
- quality of DMC/PCO agencies and congress offices and the efficiency of placing of offers, with emphasis on direct sales, specialised agencies and internet,
- the closeness of the accommodation capacities of higher category with business facilities,
- high-quality traffic infrastructure and public transport.

Business tourism is estimated to participate in world international travel with 13%.<sup>2</sup> Business travel spending generated 22.5% of direct Travel & Tourism GDP in 2017, and it is expected to grow by 3.8% in 2018, and rise by 3.2%.<sup>3</sup> Financial crisis 2007-2008 and related recessions had a negative impact on the business segment and after the recovery certain new trends have been noted that persisted as permanent, such as increased control of costs.

According to the World Tourist Organization, the international arrivals grew 6.8% in 2017 to 1,323 million.<sup>4</sup> The rate of increase continued to be within the estimated long-term average growth of 3.8% annually until 2020. WTO also estimated that the number of arrivals until 2020 should amount to 1.4 billion, and until 2030 it should reach 1.8 billion.

In 2017, in the European cities, according to the research of the European Cities Marketing, 56,006 business meetings were held, of which 28,536 were non-corporate meetings, and 27,470 were corporate meetings. Non-corporate meetings were higher by 3% in relation to 2016, with an increase of participants by 4%, while corporate meetings were higher by 2% in relation to 2016, with increase of participants by 2%. The duration of the conventions grew by 7% for non-corporate meetings and 17% for corporate meetings.<sup>5</sup>

<sup>1</sup> This work is partially supported by two internal scientific projects: *Contemporary Approach to Spatial and Transport Planning on the Principles of Sustainable Development* (Institute for Tourism, Zagreb) and *Innovative Models of Public Spaces – Managing Visits to Protected Areas of Natural and Cultural Heritage* (Faculty of Architecture, Zagreb).

<sup>2</sup> UNWTO, Tourism Highlights, 2017



According to the measurements carried out by the International Congress and Convention Association<sup>6</sup> at the global level 12,558 conventions of international associations were held in 2017, which represents a new record. Since 6,000 conventions were recorded in 2006, the number of meetings more than doubled within a decade. In 2016, for the first time since 2004, Barcelona took first place with 195 meetings. Paris, Vienna and Berlin were placed second, third and fourth. Regarding top 10 country rankings, U.S.A. remains in the first place, followed by Germany and U.K.

According to the ICCA global index, Croatia remained in the 38<sup>th</sup> place despite the increase of 6 events totalling 108 congress events in 2018. Neighbouring countries made the following results:

- Slovenia gained 4 places (ranked 41. with 85 congress events in 2018),
- Hungary dropped 7 places (ranked 34. with 129 congress events in 2018),
- Serbia dropped 11 places (ranked 53. with 53 congress events in 2018).

City of Zagreb with 41 congress events in 2018 can be compared on the global and EU level with the cities of Cape Town, Gothenburg, Lyon – St. Étienne, Montevideo and Rotterdam who held 42 congress events each and with Bali and Jeju who held 40 congress events each.

Considering the above, three objectives were established in relation to for the congress centres:

- to explore the existence and applicability of existing methodologies for identifying optimal locations,
- to improve existing or to develop new methodology,
- to test the methodology by applying it the context of the City of Zagreb.

Although the venue has always been part of the offer, the trend is to interpret the conference area as its extension, i.e. provide information about key aspects and attractions of the destinations of the MICE event. In this respect noted innovations regarding connection with wider social issues such as: art, health, sustainability, altruism, etc. Apart from potential multifunctionality and openness to various segments and needs of the society, MICE offers show sensitivity and interest to improve not only the surrounding

area but the destination as well. Reason behind it could be in the fact that the MICE demand encompasses the above-average educated and financial able tourist. Subsequently, apart from business event, they are interested in the destination attractions, gastronomy, sport, wellness and entertainment offerings, and they travel all year round.

Since congress centres function in synergy with various industries related to tourism, such as accommodation, catering, food, transport, retail, etc. the destinations' benefits are calculated by multiplying the increase caused by congress offer by existing average expenditure. The micro-location, architecture and design, are crucial factors in the early phases of the planning process. The location of a congress centre needs to consider complementary and synergy with the surrounding area. Recognizing the fact that congress centres, apart from having the city, region and state importance, also have to be considered in relation to international projects, will determine the attractiveness to the investors.

Consequently, this paper incorporates above mentioned and offers the methodology for evaluating and selecting a location for the congress centre in Zagreb, Croatia, which is based on the methods of physical planning, traffic engineering and multi-criteria analysis. The methodological procedure presented in the paper provided the possibility of systemic solving of a given problem, taking into consideration interdisciplinary criteria, resulting in the selection of the optimal location.

## LITERATURE REVIEW

### PREGLED LITERATURE

The research made by Hazinski<sup>7</sup> was led by the hypothesis that not many congress centres generate revenue, and even when they do, this revenue is usually insufficient for justifying the return in construction investment. Hazinski directs his critique using the logic that the private sector will rarely construct a congress centre, so instead, the public sector justifies the investments in a congress centre recognizing the specific external benefits generated by this type of activity in the economy.

Rifai<sup>8</sup> claims that "MICE industry is one of the prime movers in the development of tourist destination and a significant generator of revenue, new employment and foreign investments. Apart from economic effects MICE industry represents a possibility for knowledge exchange, networking and strengthening of capacities, which makes it an important mover of intellectual development and regional cooperation."

Doyle<sup>9</sup> argues the expectations regarding demand as increasingly complex ones. He puts

3 \*\*\* 2017

4 UNWTO, Tourism Highlights, 2018

5 \*\*\* 2016-2017

6 ICCA Statistics Report, 2017

7 HAZINSKI, 2010

8 RIFAI, 2013

9 DOYLE, 2014

emphasis also on the large scope of requirements that range from plenary ones towards smaller and more intimate, interactive environment. Thus, the emphasis is placed increasingly on communication, interaction and networking.

In reviewing the research by Bensi and Nelli and Rogers<sup>10</sup> the following factors can be isolated as affecting the success of MICE tourism from the venue aspect:

- venue accessibility, especially by air,
- attractiveness and image of the venue and more specifically, how much the venue is attractive regarding culture, sport, gastronomy and shopping,
- reputation and image of the city,
- quality of the surroundings regarding quality of living, climate and pollution level as well as economic environment,
- quality and price of the hotel,
- richness of restaurant service and entertainment,
- diversity and quality of cultural facilities,
- possibilities for wellness, recreation and excursions,
- Quality of service at the venue,
- price level of the venue,
- “green” practice of the venue,
- safety.

Authors Meltem, Tahir and Turkan<sup>11</sup> have researched how to be competitive and successful in organizing congress tourism. They have concluded which tourist attributes, regarding congress tourism, are most important for the venue and how they can be enhanced regarding their main competitors.

Authors Falk and Hagsten<sup>12</sup> have carried out a research with the aim of providing new empirical insights into the attractiveness of the European cities for international conferences. For the analysis they used the data of the International Congress and Convention Association, for 943 cities in Europe for the time period from 2012 to 2016. They concluded that the possibility for venue development is greater regarding the cultural offer, quality of local universities, research centres, investments into hotels, closeness of airports and closeness to the seacoast.

Although urban planning literature covers extensively the facility planning, there is limited literature that relates to this paper's more specific objectives, i.e. locating congress centre. More precisely, dealing with site selection for congress facilities have some unique requirements and demands. In the following text relevant literature is presented that deals with: site suitability analysis, Multicriteria Evaluation [MCE], and Analytic Hierarchy Process [AHP].

In 1989 the AHP was introduced by Banai-Kashani<sup>13</sup> aiming to detect errors in judging the relative importance of factors in site suitability analysis and provide corrections to those errors. Framework proposed consists from: multiple criteria, factor diversity, and conditions of uncertainty. The author suggested the potential application of the AHP in public choice decisions involving complex, controversial, and conflictual site selection processes.

Collins, Steiner and Rushman<sup>14</sup> described in 2001. the evolution of the spatial analysis that is based on *Computer-Assisted Overlay Mapping* and advanced through redefinition of spatial data for *Multicriteria Evaluation*. Current stage was named *Replicating Expert Knowledge* in the process that will be followed in near future by *neural computing and evolutionary programming*, as machine learning and big data advances.

The union of mentioned computer assisted mapping, multicriteria evaluation and expert knowledge was demonstrated by Kamal and Venkata<sup>15</sup> five years later. They studied the urbanization trends to disclose the suitable sites for further urban development with the aid of GIS. GIS is valuable tool for spatial analysis of maps that involve many parameters and can be especially valuable when it is combined with non-spatial data. Kamal and Venkata demonstrated this in the everlasting problem of limited land availability within and intensive urbanization growth context.

Manish and Riyasat<sup>16</sup> furthered GIS use in urban development site identification by merging it with multicriteria evaluation [MCE] technique by using five parameters: slope, road proximity, land use/land cover, land values and geological formation. The generated thematic maps of these criteria were standardized using pairwise comparison matrix with AHP.

Recent example of AHP use in Croatian was in the traffic planning and it dealt with selecting locations for park and ride terminals and parking lots [Krasic&Lanovic].<sup>17</sup>

## METHODOLOGY OF CONGRESS CENTRE LOCATION SELECTION

### METODOLOGIJA IZBORA LOKACIJE KONGRESNOG CENTRA

The methodology presented here follows the log-frame of selecting infrastructure facilities but expanded with parameters concerning

<sup>10</sup> BENSI, NELLI, 2016; ROGERS, 2013

<sup>11</sup> MELTEM, TAHIR, TÜRKAN, 2017

<sup>12</sup> FALK, HAGSTEN, 2018

<sup>13</sup> BANAI-KASHANI, 1989

issues important to congress centre development. As the result the process presented here combines and relies on validities the Delphi and the AHP method.

In the optimal location-selection planning methodology it is necessary to define the analysis phases and steps. The selected location must be a result of comprehensive analysis and evaluation which considers all potential locations within a certain political, spatial, traffic, economic and social context.

The steps of the applied methodology in selecting the location of the congress centre applied in this research are the following:

- 1) overview of all the possible locations and initial filtering,
- 2) selecting the most promising locations that enter the process of evaluation (A and B),
- 3) zoning,
- 4) mapping the existing individual congress halls, and hotel congress halls,
- 5) mapping the existing hostels, apartments, catering facilities (restaurants, pizzerias, fast-food, bars, etc.) and shopping centres in the catchment zone,
- 6) mapping the existing sport facilities and recreation areas,
- 7) mapping the existing cinemas, theatres, museums, archaeological sites, etc.,
- 8) forming the expert team (architectural, civil engineering, traffic, environmental protection, tourist and other experts),
- 9) defining weight ratios between criteria,
- 10) valuation of criteria for two locations (expert team),
- 11) determining mutual value relations of the selected criteria (expert team),
- 12) assigning weights to alternatives (locations) in relation to every single criterion,
- 13) carrying out the comparisons of alternatives in pairs depending on a certain criterion (data normalization),
- 14) multi-criteria evaluation by specific software package and obtaining the final result.

Delphi method was used in steps 8 to 11 in order to determine weight ratios between criteria and assigning weights to the alternatives. Expert Choice 11 software tool was used to perform steps 12 and 13 for multicriteria analysis [AHP].

The purpose of infrastructural projects and projects of constructing the buildings of public use, unlike commercial projects, whose exclusive objective is the increase of the invested capital value, is to help raise the level

of the economy of local community, region or the entire country, to provide public services or to realize some other general purpose. From the aspect of society, the purpose is justified if the total benefit from the construction of such buildings is higher than the invested resources.

## CASE STUDY: ZAGREB CONGRESS CENTRE

### ANALIZA PRIMJERA: KONGRESNI CENTAR ZAGREB

Based on tradition and many years of the presence of business tourism in the City of Zagreb, there has been for a certain number of years a discussion about the need to build a modern, polyvalent congress centre that would provide Zagreb with a platform to attract larger and large conventions. The current congress capacities mainly consist of premises at hotels, specialised halls for meetings and congresses, at Zagreb Fair, Concert Hall *Vatroslav Lisinski*, and such. These premises do not correspond completely to the needs of the city for organizing more demanding business and tourist conventions.

Regarding the criteria of accessibility of the airport and the accommodation, catering and entertaining capacity of the venue for a larger number of participants, Zagreb is a possible potential location of such a centre. In the mentioned documents, business tourism is defined as one of the production groups with the strongest growing potential for the City of Zagreb, especially the products of Association convention and Corporation convention.

The City of Zagreb would enhance its business and tourist image by constructing an adequate congress centre, supplement its offer, direct the major part of congress activities to Zagreb and at the same time it would be ranked so that through a number of manifestations and events it can be presented to the world. Besides, such a centre should have a multi-purpose, i.e. polyvalent function so that in case of smaller demand for congresses it could be used for other purposes as well.

In favour of the building of a congress centre there are arguments of its potential contribution which is reflected through the reduction of the seasonality of tourist traffic, increase in the number of arrivals and overnight stays of the tourists, and increase of the average duration of the tourist stay, increase in the tourist spending, strengthening of the image/reputation and competitiveness of the venue, inclusion of the local economy and employment increase.

• **Tourist Traffic in Zagreb** – According to eVisitor data (database about tourists in the Republic of Croatia), the City of Zagreb par-

14 COLLINS, STEINER, RUSHMAN, 2001

15 KAMAL, VENKATA, 2007

16 MANISH, RIYASAT, 2013

17 KRASIC, LANOVIC, 2016



TABLE I ARRIVALS AND OVERNIGHTS OF TOURISTS IN ZAGREB IN 2016 AND 2017

TABL. I. DOLASCI I NOĆENJA TURISTA U GRADU ZAGREBU 2016. I 2017.

|                   | I-XII 2017 |            |                    | I-XII 2016 |            |                    | index 2017/2016 |            |
|-------------------|------------|------------|--------------------|------------|------------|--------------------|-----------------|------------|
|                   | Arrivals   | Overnights | percent Overnights | Arrivals   | Overnights | percent Overnights | Arrivals        | Overnights |
| Foreign tourists  | 1,085,523  | 1,915,359  | 83.88              | 907,869    | 1,643,265  | 82.660             | 120             | 117        |
| Domestic tourists | 204,421    | 368,119    | 16.12              | 194,793    | 344,716    | 17.340             | 105             | 107        |
| TOTAL             | 1,289,944  | 2,283,478  | 100.00             | 1,102,662  | 1,987,981  | 100.000            | 117             | 115        |

Source: tourist traffic in the City of Zagreb 2017-2016, Tourist board of the City of Zagreb, eVisitor

anticipated in 2017 with 7% in the overall number of tourist arrivals, whereas the overnight stays realized 2.3% of shares. The City of Zagreb realized 1,289,944 tourist arrivals, 17% more than the previous year and 2,283,478 overnight stays or 15% more than the previous year. As many as 84% of guests in the structure of overnight stays are foreign tourists which is an increase of 1% in relation to the previous year. The largest number of tourists arrive from South Korea, USA, and Germany, and the biggest increase is noted from the market of the United Arab Emirates. The average duration of the stay is shorter than two days (Table I).

The increase of the tourist traffic is accompanied also by an increase in the accommodation capacities, especially regarding facilities for providing catering services in households, the so-called family accommodation. At the end of 2013 Zagreb had 456 private renters and with the last day in 2017 there were 2,954 registered with 7,121 beds. Regarding hotel capacities, in Zagreb there are 62 ho-

tels, mostly of the 3-star category with 7,688 beds, which accounts for about 4.5% of all hotel beds in Croatia. In the city of Zagreb there are also 52 hostels with 2,361 beds. The highest concentration of accommodation capacities is in narrow centre of the City. The share of hotel accommodation in accommodation capacities within Zagreb city area amounts to 44.8%.

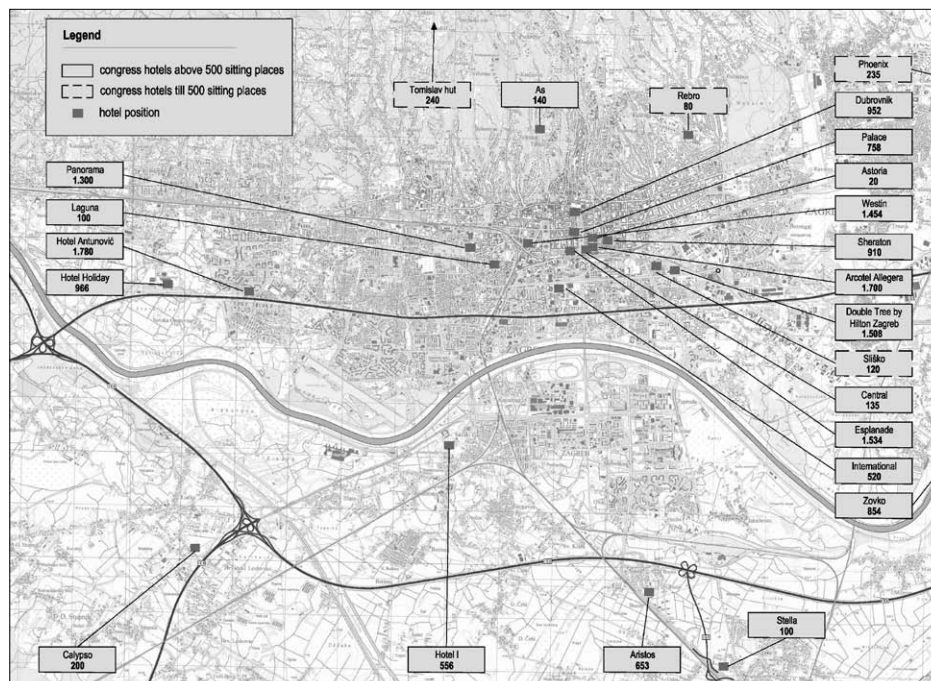
The analysis of the overall tourist traffic in Zagreb and in the Republic of Croatia (foreign and domestic tourists) indicates that the tourist traffic in the City of Zagreb is much less seasonal than the rest of Croatia. Whereas in Croatia approximately 50% of tourist arrivals and more than 60% of tourist overnight stays are distributed in only two months of high season – July and August, in the City of Zagreb in these two months only 23% of tourist arrivals and 22% of overnight stays are distributed.

#### • Overview of capacities for MICE in Zagreb

– As previously mentioned, the business conventions in Zagreb are held mostly in hotels whose list with the maximum number of seats and their positions on the City map are presented in Fig. 1.

FIG. 2 LOCATIONS OF CONGRESS HALLS IN THE HOTELS IN ZAGREB

SL. 2. PRIKAZ LOKACIJA KONGRESNIH DVORANA U HOTELIMA U GRADU ZAGREBU



The locations were chosen as test locations due to their comparative differences (centre vs. periphery): the location, closeness to the tourist attractions, accessibility, potential for polyvalent use, etc. Having the testing locations represent the opposing sides of the spectrum, makes it easier to include other locations subsequently. Also, the locations in question are being considered by the city authorities, so this process helps the informed decision making of the planning departments and the city council. Finally, due to extensive data requirements and multi-criteria evaluation software complexity, it is recommended to minimize the number of sites to be evaluated – at least in the initial phase.

For detailed analysis and comparison of locations, two sites have been taken into consideration and these are: (A) the Zagreb Fair area, and (B) the zone of The Westin Zagreb hotel. The position of the mentioned sites is presented in Fig. 3. In Figure 3 the circles (radially) present zones of up to 2 km from sites A – Zagreb Fair and B – Hotel The Westin Za-



greb, (isolines of catchment zones of 500 m). The zones of up to 2 km have been taken as end points that could be reached by walking from locations A and B. The zone will serve as a scope in which a list of accommodation capacities (hotels, hostels and apartments), cultural institutions (museums, cinemas, theatres), catering facilities (restaurants, pizzerias, fast food restaurants, bars, etc.), shopping centres and areas for recreation and sport has been made.

The Zagreb Fair zone reaches in the North the urban highway, in the East the new-Zagreb quarters Utrine, Zaprude, Travno, Dugave and Slobostina, in the South Siget and Savski Gaj in the West. The zone of the Westin Hotel includes the city centre and reaches in the North the foothills of the Medvednica Mountain, in the East the Square of the Fascism victims (*Trg žrtava fašizma*), in the South the River Sava and in the West the Selska Road.

## RESULTS OF SPATIAL PLANNING AND TRAFFIC ANALYSIS

### REZULTATI PROSTORNOPLANSKE I PROMETNE ANALIZE

• Spatial planning analysis disclosed the following for the locations:

– Location A – Zagreb Fair: The advantages of the location for the congress centre construction: undeveloped parcels north of the INA building, small number of cadastral parcels, one owner; the disadvantage is relative greater distance to the city centre.

– Location B – The Westin Zagreb Hotel Area: The advantages of the location for the congress centre construction: proximity to the city centre, hotel built to accommodate congress participants, proximity to the main railway station and proximity to the tram network. Disadvantages: large number of cadastral parcels and unclear ownership property rights, protected cultural heritage rules and regulations, narrow streets.

• Traffic analysis disclosed the following for the locations.

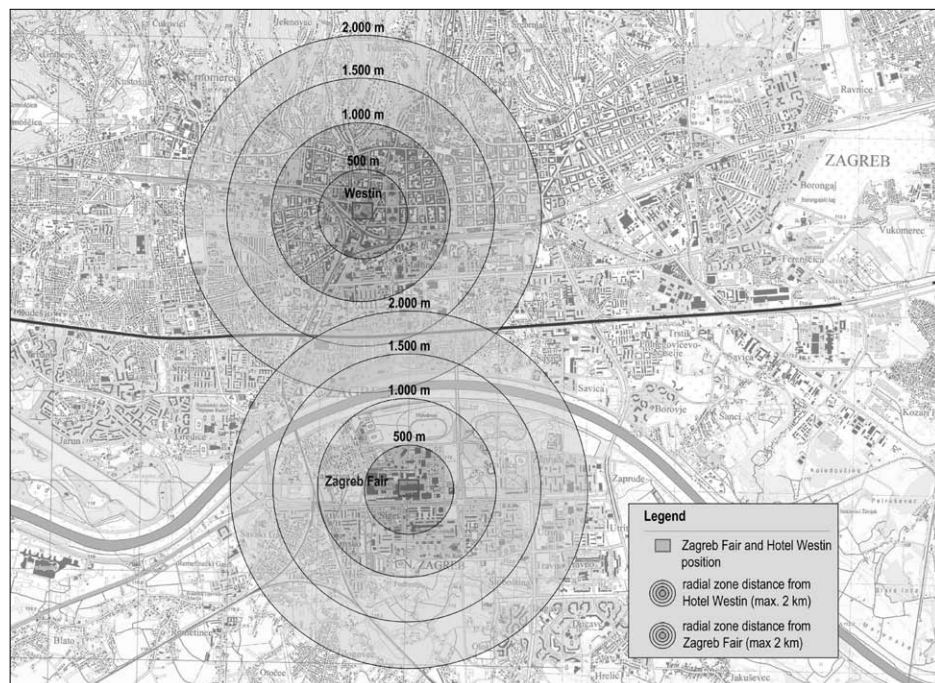
– Location A – Zagreb Fair: Favourable location within New Zagreb part of the town that is well connected with main avenues, public transport (tram and bus), with potential to develop adequate parking capacities. It is well connected to the highway system (A1, A2, A3) and the international airport (16,2 km). A new intermodal passenger terminal Sava North (railway – tram – road – pedestrian terminal) will also be built near the location. Vicinity of the central stations: 3.54 km to the train and 5.04 km to the bus. There are eight hotels and five hostels in the area, which indicates potentially under-developed accommodation capacities. There are 26 catering facilities and 8 shopping centres. Wide

pedestrian areas and adequate cycling routes are constructed. The location also is within planned cycling fast routes (Euro Velo). There are 15 gyms, playgrounds and recreational areas. There are two large cinema entertainment centres at Arena Centre and Avenue Mall and one cultural centre. The authorities have planned seven new strategic projects in the surroundings.

– Location B – The Westin Zagreb Hotel Area: Location next to one of the main Zagreb Hotels. Although this area is still the most densely populated part of Zagreb, data from recent censuses show that the residential function of this area is gradually weakening, in favour of an increasingly rich and diverse business, cultural and public life. The location is at the edges of the wider pedestrian zone of the city centre, well integrated to the road network and well connected to the tram network of the city centre. Vicinity of the central stations: 1.2 km to the train and 2.4 km to the bus. The location is located in an area with more than 30 hotels and 50 hostels with increasing offer of small-private apartments – placing the location in a convenient position. However, the downside are parking spaces. Parking on public roads has long been insufficient for even the residents, while the supply of garage spaces is insufficient. There are more than 18 major restaurants and 7 major shopping centres in the area. The Westin Hotel is in an area with over 21 museums and 5 recreational/sports areas (halls, playgrounds and open-air fitness/sport areas) and two public swimming pools. There are more than 14 cinemas and theatres in the

FIG. 3 RADIAL ZONES OF INFLUENCE UP TO 2 KM FROM LOCATIONS A – ZAGREB FAIR AND B – THE WESTIN HOTEL (ISOLINES OF CATCHMENT ZONES OF 500 M)

SL. 3. PRIKAZ RADIJALNIH ZONA UTJECAJA DO 2 KM OD LOKACIJA A – ZAGREBAČKI VELESAJAM I B – HOTEL WESTIN (IZOLINJE GRAVITACIJSKIH ZONA OD 500 M)





mated in real time, i.e. those for which the data are already available or can be obtained over a reasonable temporal and financial engagement. Consequently, the expert team selected the following criteria for the selection of the optimal location of the Congress Centre:

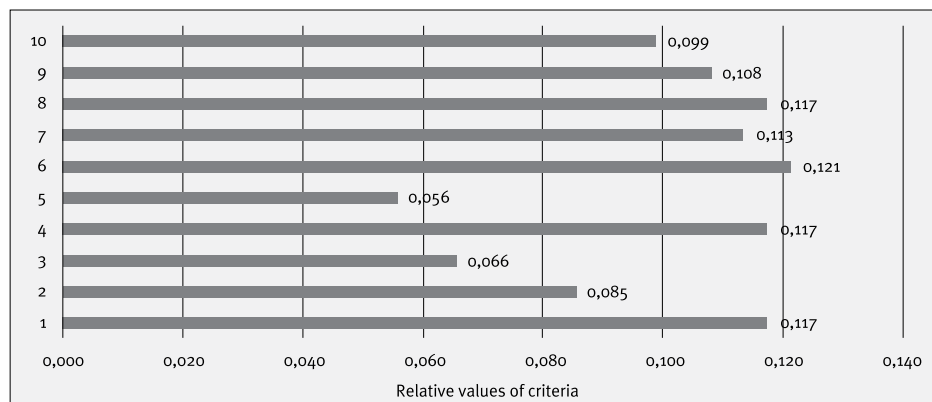
- 1) size, design and the existing level of construction of the lot for the congress centre,
- 2) land ownership,
- 3) protection of the space (cultural and natural heritage),
- 4) availability of road transport,
- 5) availability of railway transport,
- 6) availability of air transport,
- 7) availability of public urban transport,
- 8) available parking lots,
- 9) availability of accommodation, catering and commercial facilities,
- 10) accessibility of historical and cultural attractions and recreation.

To determine the weight relationships between criteria and individual values of criteria, Delphi method was employed for both locations as the most suitable forecasting method. It is based on the expert opinions of professionals from the fields of transport, tourism, urbanism (spatial planning), architecture, environmental protection, and similar fields.

For determining of the weight relations between criteria and individual values of criteria for both proposed locations the Delphi method has been applied. The methods of expert estimates represent a significant improvement of the classical methods for obtaining forecasts by mutual consultation of the group of experts, and it is methodologically organized usage of experts' knowledge in order to forecast the future conditions of certain phenomena. This method was used to estimate the values of parameters for which objective laws could not be derived since the mentioned criteria are difficult to be quantified since they are mainly of qualitative nature.

The selection of criteria is the most important part of the procedure of this multi-criteria method for decision-making support. The second step is determining the mutual values of the relations of selected criteria. The comparison of criteria was performed by assigning relative weights to single criterion, and the ponderers are determined by common expert evaluation. The results of the common average expert estimate of the value of criteria are presented in Table II.

The mentioned weights of the criteria are determined for each criterion in the model, allowing for a comparison of different and often unmeasurable elements in a rational and consistent way. The criterion weights have been determined by an expert evaluation for every alternative separately, Location A – Za-



greb Fair and Location B – The Westin Zagreb. After having assigned the weights to the criteria, the weights of the alternatives (locations) had to be assigned as well, in relation to every single criterion

Based on the carried-out research and the results of the analysis of expert opinions, the key criteria have been defined, ranked according to their importance. The weight coefficients have been determined and the level of preference for each single criterion of the optimisation model for the selection of the congress centre location has been defined (Table III).

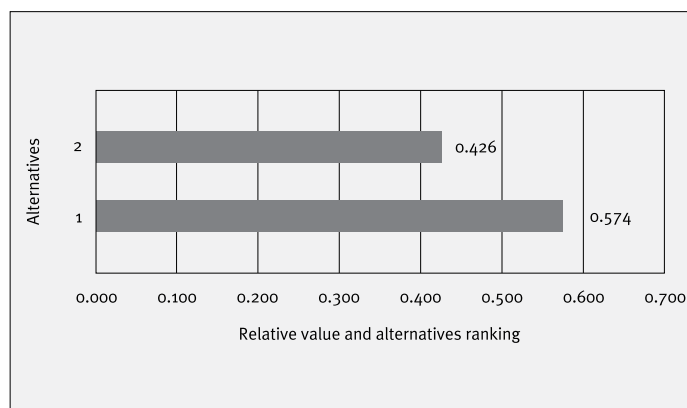
After comparing the criteria and determining the most important one, the alternatives are compared in pairs depending on the single criterion. Since there are quantitative values for each alternative, the comparison of alternatives is performed by performing the normalization of data so that their sum would be 1, as seen in Table IV.

As the most significant criterion, the criterion under number 6 has been obtained, and that is Availability of air transport, followed by the criterion Availability of road transport, criterion of Available parking lots and the criterion Size and level of lot construction. These four criteria account for over 53% in the siting of the congress centre.

FIG. 4 RELATIVE VALUES FOR THE CONGRESS CENTRE SELECTION CRITERIA IN AHP MODEL (MIN. AND MAX. VALUES OF CRITERIA)

SL. 4. RELATIVNE VRIJEDNOSTI KRITERIJA ZA ODABIR LOKACIJE KONGRESNOG CENTRA U AHP MODELU (MIN. I MAX. VRIJEDNOSTI KRITERIJA)

FIG. 5 ALTERNATIVES RANKING ACCORDING TO CRITERIA SL. 5. ALTERNATIVE RANGIRANE PREMA KRITERIJU





The final results of siting the congress centre are presented in Fig. 5. The Figure shows both offered alternatives with the respective percentage as the result of ranking. Since the AHP method takes the largest weight at the same time as the most significant one, the best location is location A (1). This could have been expected since for the most significant criteria location 1 had also bigger relative weights.

Accurate siting insures lower costs of construction, and thus also the bonded emissions and pollutions during the construction and the exploitation of the facilities (ecological footprint), better use of the capacities, possibility of forming a higher selling price of congress services, and, what is more important, higher level of profitability of the invested capital.

## CONCLUSIONS

### ZAKLJUČCI

Decision-making processes for the construction of infrastructure in cities are mainly related to political processes, dynamics and interests. The advantage of using the Delphi and AHP methods for deciding large infrastructure locations is primarily in relying on the merits of the knowledge and professional integrity. Once the policy makers determine the goal, and experts select the criteria and the data inputs, the multi-criteria evaluation optimizes the alternatives. The test locations presented in this work, represent opposing positions of the spectrum – centre vs. periphery. This allows decision makers to include subsequently other potential locations that fall in the spectrum between the “opposing” testing locations.

In this regard the expert team selected criteria for the selection of the optimal location of the congress centre: size, design, and existing level of construction of the lot intended for congress centre, Land ownership, Space protection (cultural and natural heritage), Availability of road transport, Availability of railway transport, Availability of air transport, Availability of public urban transport, Available parking lots, Availability of accommodation, catering and commercial facilities, Availability of historical and cultural attractions and recreation. For determining of weight relations between criteria and single criteria values for both proposed locations the Delphi method was applied.

Consequently, relative values of ranked alternatives amount to 0.426 for location B and 0.574 for location A. Since AHP method takes the largest weight at the same time as the most significant one, the best obtained location is location A – the Zagreb Fair area.

In conclusion, AHP proved to be appropriate multi-criteria analysis for optimized decision making with ability to be used for different occasions and scales.

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## SOURCE IZVOR

### ILLUSTRATION AND TABLES SOURCES

#### IZVORI ILUSTRACIJA I TABLICA

Authors

[Translated by MARINA MANUCCI, prof.,  
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## SUMMARY

## SAŽETAK

## METODOLOGIJA ODREĐIVANJA OPTIMALNE LOKACIJE IZGRADNJE KONGRESNOG CENTRA

## ANALIZA PRIMJERA: KONGRESNI CENTAR ZAGREB

U radu je objašnjen fenomen poslovnog turizma i njegov utjecaj na destinacije koje razvijaju kongresni turizam. Poslovni turizam je oblik turizma koji je vezan za profesionalni interes, radno mjesto i zanimanje putnika. Poslovni turizam podrazumijeva pružanje ugostiteljskih i specijaliziranih poslovnih usluga sudionicima poslovnih sastanaka, konferencija, kongresa, izložaba i sajмова te ugostivanje sudionika ili poticajnih putovanja. Stoga se u novije vrijeme sve učestalije koristi akronim MICE – *Meetings, Incentives, Conferences, Exhibitions*. Procjenjuje se da poslovni turizam sudjeluje u svjetskim međunarodnim putovanjima s udjelom od oko 13% i da troškovi nastali poslovnim putovanjima čine udio od 24% svjetskog turizma, s predviđenim rastom od 3,76% u 2027. godini.

Kongresni centri funkcioniraju u sinergiji s raznim industrijama vezanim za turizam, kao što su smještaj, ugostiteljska ponuda, prehrana, prijevoz, maloprodaja i dr. Upravo je zbog toga potrebno ponuditi nove kongresne sadržaje, odnosno izgraditi objekte i povezati kongresni centar s postojećom cestovnom mrežom i ostalom prometnom infrastrukturom. Za izgradnju kongresnog centra važna je i mikrolokacija, arhitektura i dizajn, odnosno za ovako velik, složen i razvojni kompleks traži se sagledavanje prostora u cjelini, a ne samo fragmentarno. U radu je prikazana i metodologija koja je korištena pri izboru nove lokacije za kongresni centar u Gradu Zagrebu. Pri izradi i implementaciji metodologije korištena je višekriterijska analiza [AHP] na kojoj je sudjelovao tim interdisciplinarnih stručnjaka, a napravljeno istraživanje olakšalo je odabir lokacije dionicima u lokalnoj zajednici.

Za izgradnju kongresnog centra važna je mikrolokacija, arhitektura i dizajn, odnosno za ovako velik, složen i razvojni kompleks traži se sagledavanje prostora u cjelini. To znači da je lokaciju kongresnog centra potrebno sagledavati na način da je komplementaran s okolnim prostorom, kao i da sadrži komplementarne namjene koje su međusobno u sinergiji. Uvažavajući činjenicu da kongresni centri, osim što imaju važnost za razinu grada, države i regije,

moraju biti promatrani u suradnji s međunarodnim projektima kako bi se privukli investitori.

S obzirom na sve navedeno, postavljaju se i novi zahtjevi za izgradnju kongresnih centara. U ovome radu prikazana je metodologija izbora lokacije Kongresnog centra u Zagrebu koja se temelji na metodama prostorno-prometnog planiranja i višekriterijskoj analizi. U radu je prikazani metodološki postupak pružio mogućnost sustavnog rješavanja zadanoga problema, pri čemu su uzeti u obzir brojni kriteriji, a rezultat je izbor lokacije koja je najbolje kompromisno rješenje u skladu s kriterijima što su ih definirali i evaluirali brojni stručnjaci. Lociranje Kongresnog centra često je i osjetljiva javnopolitička odluka. Dostupnost zemljišta, namjena zemljišta, javno mnijenje i druga pitanja zajednice mogu imati utjecaj na odabir tražene lokacije pa je stoga transparentnost prema lokalnoj zajednici važan dio procesa.

Koraci primijenjene metodologije pri izboru lokacije kongresnog centra primijenjeni u ovim istraživanjima jesu sljedeći: pregled svih potencijalnih lokacija na području grada i smanjenje lokacija na najmanji mogući broj potencijalnih lokacija; definiranje dviju lokacija koje ulaze u proces procjenjivanja, lociranje svih kongresnih dvorana u gradu, lociranje svih kongresnih dvorana u hotelima u gradu, lociranje svih hostela, apartmana, ugostiteljskih objekata (restorani, pizzerije, fast-foodovi, barovi itd.) i trgovačkih centara u zoni obuhvata, lociranje svih sportskih sadržaja (dvorane, igrališta, površine za rekreaciju), bazena, kupališta, lociranje kina, kazališta, muzeja, arheoloških nalazišta i sl., formiranje ekspertnog tima (arhitektonski, građevinski, prometni, ekološki, turistički i ostali stručnjaci), utvrđivanje težinskih odnosa između kriterija i pojedinačnih vrijednosti kriterija za obje predložene lokacije (ekspertna skupina), određivanje međusobnih vrijednosnih odnosa odabranih kriterija (ekspertna skupina), dodjeljivanje težine alternativama (lokacijama) u odnosu na svaki pojedini kriterij, provođenje usporedbe alternativa u parovima ovisno o pojedinom kriteriju (normalizacija podataka) i više-

kriterijsko vrjednovanje specifičnim programskim paketom, te dobivanje konačnog rezultata.

U ovome slučaju (zahvaljujući ranijim urbanističko-arhitektonskim analizama) izbor je smanjen na dvije potencijalne lokacije kongresnog centra (zona Hotela Westin i Zagrebački velesajam). Moguća rješenja postupka višekriterijske optimizacije mogu biti različita i ovisne ponajprije o samom izboru i ekspertnoj ocjeni vrijednosti pojedinog kriterija, koji prema zadanoj funkciji cilja utječu na rangiranje alternativa.

Zadatak ekspertnog tima bio je uključiti prostorno-prometne kriterije koje je moguće u realnom vremenu ocijeniti, odnosno one za koje su podaci već dostupni ili se uz razuman vremenski i financijski angažman mogu dobiti. U tom je smislu ekspertni tim odabrao sljedeće kriterije za odabir optimalne lokacije kongresnog centra: veličina, oblik i postojeća izgrađenost parcele za kongresni centar, vlasništvo parcele, zaštita prostora (kulturne i prirodne baštine), dostupnost cestovnog prometa, dostupnost željezničkog prometa, dostupnost zračnog prometa, dostupnost javnoga gradskog prometa, raspoložive površine za parkiranje, dostupnost smještaja, ugostiteljskih i trgovačkih sadržaja, kao i dostupnost povijesnih i kulturnih atrakcija te rekreacije.

Za utvrđivanje težinskih odnosa između kriterija i pojedinačnih vrijednosti kriterija za obje predložene lokacije primijenjena je Delfi metoda. Izbor kriterija je najvažniji dio postupka primijenjene višekriterijske metode za potporu u odlučivanju. Drugi je korak određivanje međusobnih vrijednosnih odnosa odabranih kriterija. Uspoređivanje kriterija obavljeno je dodjeljivanjem relativnih težina pojedinom kriteriju, a ponderi su utvrđeni zajedničkom ekspertnom ocjenom. Rezultatno, relativne vrijednosti rangiranih alternativa iznose 0,426 za lokaciju zone Hotela Westin i 0,574 za lokaciju Zagrebačkog velesajma. S obzirom na to da AHP metoda uzima najveću težinu ujedno i za najznačajniju, kao najbolja lokacija dobivena je lokacija Zagrebačkog velesajma.

## BIOGRAPHIES

## BIOGRAFIJE

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ISSN 1330-0652



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