7TH INTERNATIONAL ACADEMIC CONFERENCE ON PLACES AND TECHNOLOGIES

Proceedings

EDITORS

۲

•

•

Aleksandra Djukić Aleksandra Krstić-Furundžić Eva Vaništa Lazarević Milena Vukmirović

KEEPING UP WITH TECHNOLOGIES TO ACT RESPONSIVELY IN URBAN ENVIRONMENT

PLACES AND	
TECHNOLOGIE	S
2020	

7th International Academic Conference on Places and Technologies Proceedings

DOI: 10.18485/arh_pt.2020

- EDITORS Aleksandra Djukić Aleksandra Krstić-Furundžić Eva Vaništa Lazarević Milena Vukmirović
 - JBLISHER University of Belgrade Faculty of Architecture
- FOR PUBLISHER Vladan Đokić
 - ESIGN Vladimir Kovač Danira Sovilj
- TECHNICAL SUPPORT Branislav Antonić Miloš Tomić
- PRINTED BY University of Belgrade Faculty of Architecture
- SUPPORTED BY Ministry of Education, Science and Technological Development of the Republic of Serbia
- PLACE AND YEAR Belgrade 2020

ISBN: 978-86-7924-240-2

CONTENT

//// COMMITTEES

- 11 SCIENTIFIC COMMITTEE
- 12 ORGANIZING COMMITTEE
- 10 TECHNICAL COMMITTEE

//// KEYNOTES

- 13 THE NEXT GENERATION OF SMART CITIZENS: EXPERIENCES AND INSPIRATION FROM THE +CITYXCHANGE PROJECT _Alenka Temeljotov-Salaj _ Bradley Loewen
- 23 DESIGN-DRIVEN RESEARCH ON PHOTOVOLTAIC TECHNOLOGIES – SYSTEM PERFORMANCE AND SOLAR INTEGRATION IN BUILDINGS, MOBILITY AND OUR ENVIRONMENT _Angèle Reinders
- 24 MAINTENANCE AND MANAGEMENT OF RESIDENTIAL BUILDINGS: TECHNOLOGY AND ITS IMPACT ON CONDOMINIUM LIVING _Dr Nir Mualam
- 25 SPACE AND TECHNIQUE _ Dražen Juračić _ Jelena Skorup

//// RESPONSIVE URBAN DESIGN [URB]

- 28 RE-INVENTED WATER-RELATED SPACES IN THE BUILT ENVIRONMENT _Gábor Heckenast _ Marcel Ferencz Habil _ András Tibor Kertész
- 35 MASS HOUSING ESTATES IN CSEPEL, BUDAPEST: URBAN FORM EVALUATION IN RELATION TO SUSTAINABILITY _Hlib Antypenko _ Melinda Benko
- 43 SHARED SPACE IS HUMAN TECHNOLOGY _Pieter de Haan
- 49 THE SUSTAINABLE CONSTRUCTION OF THE OLD COMMUNITY IN BEIJING NO.72 OF TIANQIAO AS AN EXAMPLE _ Xue Kang _ Yufang Zhou _ Gabriella Medvegy
- 57 SPACES THAT STIMULATE INNOVATION AND CREATIVITY AND PROVIDE A SENSE OF COMMUNITY AND PLACE – THREE CASE STUDIES FROM ZAGREB **_Bojan Baletić _ Kristina Careva _ Morana Pap**
- 64 INFLUENCE OF VISUAL INTEGRATION AND PEDESTRIAN MOBILITY ON EVERYDAY EXPERIENCE OF PUBLIC SPACE _ Stefan Škorić _ Aleksandra Milinković _ Dijana Brkljač _ Milena Krklješ

- 72 THE IMPORTANCE OF YOUNGSTERS' RESPONSIBLE ACTION IN THE URBAN ENVIRONMENT: AN EXPERIENCE OF STREET CO-DESIGN _Lucia Martincigh _ Marina Di Guida
- 80 THE CULTIVATION OF IDEAS _ Aleksandra Djukić _ Admir Islamčević _ Dubravko Aleksić
- 87 SECURITY ASPECTS OF URBAN PLANNING AND DESIGN: "THE EUROPEAN MODEL" _Milos Tomic _ Jovana Dinic _ Elena Priorova
- 95 THE ROLE OF IDENTITY IN SHAPING RESILIENT OPEN PUBLIC SPACES SURROUNDING SMALL URBAN STREAMS _ Aleksandra Djukić _ Višnja Sretović Brković
- 104 AN URBAN DESIGN TECHNIQUE REGARDING ACTIVE AGING IN OUTDOOR SPACES Fernando Brandão Alves Lara Mendes António Brandão Alves
- 112 SAFE COMMUNITIES THROUGH ENVIRONMENTAL DESIGN _ Giovanni Sergi
- 119 THE CHALLENGES OF DOCKLESS CYCLING IN THE CITIES OF SE EUROPE: THE EXAMPLE OF BANJALUKA _ Mladen Milaković _ Aleksandra Stupar
- 131 SKOPJE PUBLIC SPACES EVALUATED: ANALYSIS AND TYPOLOGIES _ Divna Penchikj _ Jasmina Siljanoska _ Dana Jovanovska
- 139 THE PLACES OF (NON)REMEMBRANCE THE USE OF DIGITAL TECHNOLOGIES IN CREATING THE PLACES OF COLLECTIVE MEMORY _Milja Mladenović
- 145 TRANSITIONING THE PUBLIC SPACE THE CASE OF BELGRADE SHOPPING MALL _ Marija Cvetković _ Ivan Simić _ Aleksandar Grujičić
- 155 THE RESTORATIVE EFFECTS OF MULTI-SENSORY OPEN SPACE DESIGN – THE EXAMPLE OF JAPANESE GARDENS _Eva Vanista Lazarevic _ Tena Lazarevic _ Jelena Maric
- 165 URBAN LIVING LABS FOR SENSITIVE CITY CULTURAL HERITAGE REGENERATION _ Jasmina Siljanoska
- 173 OBSERVING THECITY'SUSERS BEHAVIOURS:PRODUCTION OF A SOCIAL CYCLELEADING TO A SPACE OF COMMUNICATION; CASE OF SIDI-BOUSAID _Ons Ben Dhaou _Norbert Vasváry-Nádor

/// RESPONSIVE TECHNOLOGIES IN ARCHITECTURE [TECH]

- 180 APPLICATION OF VENEER BASED PANELS IN EXOSKELETON ARCHITECTURE _Neda Sokolović _ Ana Kontić _ Andrej Josifovski
- 188 RESEARCH ON ENERGY SAVING PERFORMANCE AND PROMOTION STRATEGY OF WATER PURIFICATION PLANT IN NORTH CHINA –
 – CASE OF WATER SUPPLY SUP PORTING PROJECT IN SHENYANG _He Jin _ Bálint Bachmann
- 196 RAISING CLIMATE RESILIENCE IN BUILDINGS ON THE WESTERN MEDITERRANEAN COAST-MERGING PASSIVE AND ACTIVE NATURAL VENTILATIVE COOLING TECHNIQUES _Nikola Pesic _ Adrian Muros Alcojor _ Jaime Roset Calzada

DIGITAL PLANNING, CONSTRUCTION SUBMISSION 208 AND APPROVAL PROCESSES IN AUSTRIA _ Kurt Battisti _ Markus Dörn _ Christoph Eichler _ Jacqueline Scherret _ Torsten Ullrich INTEGRATION OF ARCHITECTURAL AND STRUCTURAL ASPECTS 215 THROUGH THE DESIGN PROCESS: INDIVIDUAL RESIDENTIAL BUILDING Dimitar Papasterevski Toni Arangielovski SUSTAINABLE URBAN DEVELOPMENT BY MEANS OF GREEN WALLS 223 _ Budimir Sudimac _ Aleksandra Ugrinović _ Radojko Obradović IN-SITU MEASURING INDOOR ENVIRONMENTAL OUALITY 232 IN PUBLIC KINDERGARTEN IN SLOVENIA. A CASE STUDY _ Vesna Lovec _ Miroslav Premrov _ Vesna Žegarac Leskovar MODELS FOR CONTEMPORARY EXPLOITATION OF 241 BALNEOLOGICAL POTENTIAL IN VOJVODINA _ Nataša Ćuković Ignjatović _ Dušan Ignjatović 248 NEARLY ZERO ENERGY BUILDING CO2 EMISSIONS _ Marin Binički _ Zoran Veršić _ Iva Muraj OPEN BIM FOR CITIZEN ENGAGEMENT IN SUSTAINABLE 255 **RENOVATION PROJECTS** _ Coline Senior NEW TECHNOLOGIES OF CONSTRUCTION ON SERBIAN WATERS 263 _ Tijana Jacovic Maksimovic _ Aleksandra Krstić-Furundžić 270 EVOLUTION OF TECHNOLOGIES FOR CONSTRUCTION OF APARTMENT BUILDINGS - A TEMPORAL PERSPECTIVE _ Ivana Brkanić Mihić _ Matej Mihić _ Zvonko Sigmund ORIGIN OF CITIZENS AND IMPACT ON CITY 279 _ Nikola Z. Furundžić _ Dijana P. Furundžić _ Aleksandra Krstić-Furundžić 289 CONVENTIONAL VS PREFABRICATED BUILDINGS: PURSUING THE GOAL OF SUSTAINABILITY _ Katerina Tsikaloudaki _ Theodore Theodosiou _ Stella Tsoka _ Panagiotis Chastas 297 ON THE ESTABLISHMENT OF A COMPUTATIONAL METHOD TO ASSESS THE IMPACT OF URBAN CLIMATE ON THE BUILDINGS' ENERGY PERFORMANCE SIMULATIONS _ Stella Tsoka _ Katerina Tsikaloudaki _ Konstantia Tolika 305 ALGORITHM-BASED BIM MODEL ANALYSIS METHODOLOGY AT URBAN LEVEL _ Olivér Rák _ Ágnes Borsos _ Péter Iványi

//// RESPONSIVE HERITAGE PROTECTION [HER]

- 314 DIGITAL DESIGN TECHNIQUES TO ASSIST IN THE COMPOSITION OF TRADITIONAL URBAN BUILDINGS _James Dougherty
- 322 SYSTEMIC APPROACHES IN REVITALIZATION OF SEMARANG OLD CITY HERITAGE SITE: FROM NEGLECTED AREA TO TOURISM DESTINATION _Bintang Noor Prabowo _ Alenka Temeljotov Salaj
- 330 FUTURE DEVELOPMENT OF FORMER PULA NAVAL FORTRESS _Lea Petrović Krajnik _ Ivan Mlinar _ Damir Krajnik

- 336 THE "ART FORTRESS" AS A RESPONSIBLE APPROACH MODEL FOR REGENERATION OF SKOPJE'S SPATIAL IDENTITY _Meri Batakoja _ Jovan Ivanovski _ Goran Mickovski
- 345 HERITAGE PERCEPTIONS: AN APPROACH FOR THE REVITALIZATION OF THE URBAN EXPERIENCES AND THE FRENCH CHECKBOARD IMAGE _Barbara Hiba _ Molnár Tamás
- 353 PRESERVING THE MATERIAL AUTHENTICITY: A METHOD OF PRESERVING THE TRUTH _ Jovana Tošić
- LOST AND FOUND: A QUEST FOR SUSTAINABILITY
 AND RESILIENCE IN RURAL AREAS
 Nataša Ćuković Ignjatović _ Dušan Ignjatović _ Nikola Miletić
- 370 REVITALISING THE OLD INDUSTRIAL MOVE ALONG DANUBE WATERFRONT _Milena Vukmirovic _ Marko Nikolic

//// RESPONSIVE ARCHITECTURE [ARCH]

- 382 ENHANCING EAGLE PASS-PIEDRAS NEGRAS INTERNATIONAL BRIDGE DESIGN TO FUNCTION AS A TEMPORARY ACCOMMODATION FACILITY FOR ASYLUM SEEKERS _ Chang Lu _ Ons Ben Dhaou _ Shaha Mazen Maiteh _ Tianyu Zhao
- 390 BIM BASED PROJECT AND DIGITAL BUILDING MODEL MANAGEMENT: APPLICATIONS AND EMERGING STANDARDS _lgor Svetel_Nenad Ivanišević_Dušan Isailović
- A PROJECT OF LABORATORY CIRCO IN ROME: RETHINKING A PUBLIC INSTITUTES OF ASSISTANCE AND CHARITY (IPAB) IN ROME
 Francesco Careri _ Fabrizio Finucci _ Chiara Luchetti _ Alberto Marzo
 Sara Monaco _ Serena Olcuire _ Enrico Perini _ Maria Rocco
- 405 FROM RECEPTION TO HOSPITALITY: CULTURAL, METHODOLOGICAL AND ECONOMIC ASPECTS OF THE LABORATORY CIRCO IN ROME _Francesco Careri _ Fabrizio Finucci _ Chiara Luchetti _ Alberto Marzo _ Sara Monaco _ Serena Olcuire _ Enrico Perini _ Maria Rocco
- 413 DWELLING WITH THE WATER
 - _ Michele Montemurro
- 421 ARCHITECTURAL ANALYSIS OF THERAPEUTIC CANTERS FOR DRUG ADDICTS _ Sadoud Nesma _ Erzsébet Szeréna Zoltán
- 428 HUMAN COMFORT IN ARTIFICIAL PLACE _ Ramos Gonzalez, Nicolas _ Medvegy Gabriella _ Borsos Ágnes _ Zoltán Erzsébet Szeréna _ Gazdag Gábor _ Noori Pooya
- 436 VAPOURABLE SUBLIME: AQUATECTURE EXPERIMENT AND PROJECT REVIEW _Miloš Stojković
- 444 COLLECTIVE HOUSING AS NEW IDENTITY IN RURAL AREAS _ Miloš Arandjelović _ Aleksandar Videnović
- 450 ARCHITECTURE-INSTRUMENT: THE ARCHITECTURE-MACHINE ORIGINS AND FRAMEWORKS OF MACHINIC LINE OF THINKING IN ARCHITECTURE _Dragana Ćirić

CHALLENGES OF DESIGNING REMOTE COMMUNITIES 467 IN EOUATORIAL AFRICA: OKOLASSI EXAMPLE _ Dejan Vasović _ Ruža Okrajnov Bajić _ Darko Pavićević _ Goran Gogov • •

.

.....

••••••

.....

••••

.....

......

••••

.....

.

••••

• • • • •

.....

• • • •

• • •

......

••••••

.

....

......

......

......

......

......

.....

.....

• •

• • •

• • •

••••

....

..... ••••• ••••• •••• • • • •

.....

.

. .

RESPONSIVE TERRITORIAL PLANNING [PLAN] ////

- 476 ARE SHRINKING CITIES A COMPLETELY NEW PHENOMENON IN POST-SOCIALIST SPACE? URBAN SHRINKAGE IN EASTERN EUROPE BEFORE AND DURING SOCIALISM Branislav Antonić Aleksandra Diukić
- THE POSITION OF TOWNS IN DIGITAL. 485 CONSTRUCTION TECHNOLOGY ENVIRONMENT _ Velimir Stojanović
- TRIP GENERATION AND TOUR DISTRIBUTION OF PUBLIC 494 TRANSPORT TRIPS IN THE CITY OF SLAVONSKI BROD _ Ljupko Šimunović _ Julijan Jurak _ Božo Radulović _ Matija Sikirić
- POTENTIAL OF MAKER MOVEMENT ON SUSTAINABLE 501 DEVELOPMENT OF REMOTE CROATIAN ISLANDS Rene Lisac Morana Pap Roberto Vdović
- THE IMPACT OF ECONOMIC FACTOR ON TRANSFORMING 508 THE URBAN FORM OF ERBIL IN KURDISTAN REGION-IRAO Rebaz Khoshnaw
- 515 SEGREGATED NEIGHBOURHOODS AND THEIR INTEGRATION ATTEMPTS: PARTICIPATORY SLUM-UPGRADING IN THE MAKING Tímea Csaba
- PHYSICAL PLANNING INFORMATION SYSTEM OF CROATIA: OVERVIEW 523 OF THE CONTENTS AND CURRENT STATUS OF DEVELOPMENT Sunčana Habrun
- **BELATIONSHIP BETWEEN CHANGES IN TECHNOLOGICAL** 530 CULTURES AND SPATIAL DEVELOPMENT OF CITIES _ Dmitrii Klimov _ Sofi ia Feofanova
- IMPROVEMENT OF LIFE OUALITY USING NATURE BASED SOLUTIONS -536 CASE STUDY SETTLEMENTS IN SOUTH-EASTERN SERBIA Milica Igić Petar Mitković Milena Dinić Branković Jelena Đekić Ivana Bogdanović Protić Milica Liubenović Mihailo Mitković

DESIGN OF CULTURAL TRAILS - AS A RESULT OF 547 BELGRADE'S GREEN INFRASTRUCTURE CONCEPT _ Suzana Gavrilović _ Nevena Vasiljević _ Boris Radić _ Dejan Skočajić _ Nevenka Galečić

COMMITTEES

SCIENTIFIC COMMITTEE

Dr Djukić Aleksandra University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Milena Vukmirović University of Belgrade - Faculty of Forestry, Serbia

Dr Krstić-Furundžić Aleksandra University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Vaništa Lazarević Eva University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Antunović Biljana University of Banja Luka, Faculty of Architecture, Civil Engineering and Geodesy, Banja Luka, Bosnia and Herzegovina

Dr Bachmann Bálint University of Pécs Faculty of Engineering and Information Technology, Institute of Architecture, Pécs, Hungary

Begović Saša <u>Owner and Par</u>tner in Charge of 3LHD studio, Zagreb, Croatia

Dr Benko Melinda Budapest University of Technology and Economics, Budapest, Hungary

Dr Brandão Alves Fernando Department of Civil Engineering, Faculty of Engineering of Oporto, Portugal

Dr Choy Lennon Associate Head and Associate Professor, Department of Real Estate and Construction, The University of Hong Kong

Dr Čokorilo Olja University of Belgrade Faculty of Transport and Traffic Sciences, Belgrade, Serbia Dr Đokić Vladan University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Doytchinov Grygor Institute for Urban Design, Technical University of Graz, Austria

Dr Alenka Temeljotov Salaj Norwegian University of Science and Technology Department of Civil and Environmental Engineering, Norway

Dr Katerina Tsikaloudaki Aristotle University of Thessaloniki Faculty of Engineering

Dr Mirjana Devetaković University of Belgrade, Faculty of Architecture, Belgrade

Dr Filipović Dejan University of Belgrade, Faculty of Geography, Belgrade, Serbia

Dr Gajić Darija University of Banja Luka, Faculty of Architecture and Civil Engineering, Banja Luka, Republic of Srpska, Bosnia and Herzegovina

Dr Giddings Bob Northumbria University Faculty of Engineering and Environment, Newcastle upon Tyne, United Kingdom

Dr Gospodini Aspa University of Thessaly, Faculty of Engineering, Department of Planning & Regional Development, Volos, Greece

Dr Harmathy Norbert Budapest University of Technology and Economics, Faculty of Architecture, Budapest, Hungary

Dr Ivanović Šekularac Jelena University of Belgrade Faculty of Architecture, Belgrade, Serbia

MSc Ir. Ivković Milena ISOCARP, The Hague, Netherlands Prof. Lojanica Vladimir University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Tomasz Majda Vicepresident of Society of Polish Town Planners and Head of Polish National Delegation in International Society Of City And Regional Planners

Dr Martincigh Lucia University RomaTre, Faculty of Architecture, Rome, Italy

Dr Martinelli Nicola DICAR of Polytechnic of Bari, Bari Italy

Dr Medvegy Gabriella University of Pécs Faculty of Engineering and Information Technology, Institute of Architecture, Pécs, Hungary

MSc Miščević Ljubomir University of Zagreb, Faculty of Architecture, Zagreb, Croatia

Dr Mitković Petar University of Niš Faculty of Civil Engineering and Architecture, Niš, Serbia

Dr Mualam Nir Faculty of Architecture and Town Planning at the Technion, Haifa, Israel

Dr Nepravishta Florian Polytechnic University of Tirana, Faculty of Architecture and Urbanism, Tirana, Albania

Dr Ohnmacht Timo Lucerne University of Applied Sciences and Arts, Switzerland

Dr Petrović Krajnik Lea Assistant Professor at the University of Zagreb, Faculty of Architecture, Zagreb, Croatia

Dr Popović Svetislav University of Podgorica - Faculty of Architecture, Podgorica, Montenegro

Dr Pottgiesser Uta University of Antwerp, Faculty of Design Sciences, Belgium

Dr Radic Boris Department of Landscape Architecture and Horticulture, University of Belgrade, Faculty of Forestry, Belgrade, Serbi

Dr Radonjanin Vlastimir University of Novi Sad, Novi Sad, Serb

Dr Raspopović Miroslava Faculty of Information Technology, Belgrade Metropolitan University, Belgrade, Serbia

Dr Reba Darko University of Novi Sad Faculty of Technical Sciences, Novi Sad, Serbia

Dr Risser Ralf Palacky University, Olomouc, Czech Republi

Dr Rivas Navarro Juan Luis University of Granada Department of Urban and Regional Planning, Granada, Spain

Dr Rotondo Francesco Polytechnic University of Bari, Bari, Italy Dr Samardžić Nikola University of Belgrade, Faculty of Philosophy, Department of History, Belgrade, Serbia

Dr Seduikyte Lina Kaunas University of Technology, Faculty of Civil Engineering and Architecture, Kaunas, Lithuania

Dr Šimunović Ljupko University of Zagreb Faculty of Transport and Traffic Sciences, Zagreb, Croatia

Dr Sitar Metka University of Maribor, Faculty of Civil Engineering, Traffic Engineering and Architecture, Maribor, Slovenia

Dr Stanarević Svetlana University of Belgrade, Faculty of Security Studies, Belgrade, Serbia

Dr Stavrić Milena Graz University of Technology, Graz, Austria

Dr Stupar Aleksandra University of Belgrade Faculty of Architecture, Belgrade, Serbia

Dr Sudimac Budimir University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr van der Spek Stefan Delft University of Technology, Faculty of Architecture and Built Environment. Delft. Netherlands

Dr Yilmaz Salih Izmir Katib Celebi University, Department of Engineering and Architecture, Izmir, Turkey

ORGANIZING COMMITTEE

Founding members of the Places and Technologies Conference and the Organizing Committee committee

Dr Aleksandra Djukić Conference Director, University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr Aleksandra Krstić-Furundžić Head of Publishing, University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr Eva Vaništa Lazarević Head of Marketing and Communications University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr Milena Vukmirović Conference Program Director, University of Belgrade, Faculty of Forestry, Belgrade, Serbia

TECHNICAL COMMITTEE

Dr Branislav Antonić Conference Exacutive Coordinator, University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Miloš Tomić Technical Committee Member, University of Belgrade, Faculty of Architecture, Belgrade, Serbia

ARE SHRINKING CITIES A COMPLETELY NEW PHENOMENON IN POST-SOCIALIST SPACE? URBAN SHRINKAGE IN EASTERN EUROPE BEFORE AND DURING SOCIALISM

DOI: 10.18485/arh_pt.2020.7.ch56

_ Branislav Antonić

PhD, Teaching assistant, University of Belgrade – Faculty of Architecture, Bulevar kralja Aleksandra 73/2, Belgrade, Serbia, antonic83@gmail.com

_ Aleksandra Djukić

PhD, Associate professor, University of Belgrade – Faculty of Architecture, Bulevar kralja Aleksandra 73/2, Belgrade, Serbia, adjukic@afrodita.rcub.bg.ac.rs

ABSTRACT

Shrinking cities present the prevalent type of present-day urbanisation in post-socialist countries in the eastern half of Europe. The outspread and the socialism-related features of their shrinkage have made them a compelling topic for scholars internationally. Thus, they are well-documented today. However, this straight focus of researchers on post-socialist shrinking cities has somehow formed the opinion that this phenomenon is completely new for this region. If such research is oriented to the past of urbanisation in this part of Europe, it usually examines the causes of post-socialist urban shrinkage originated in the specificities of socialism. Nevertheless, urban shrinkage existed in the eastern half of Europe before the fall of socialism. Concrete data covers the examples of shrinking cities in inter-war (pre-socialist) and post-war (socialist) periods. Although these cities were not very frequent, they represent the predecessors of many shrinking cities in this part of Europe today. They can even be categorised by the various factors that were crucial for their shrinkage: change of borders, fall of industrial production, internal/national spatial planning policies or the loss of dependent area. The aim of this research is to systematise this knowledge relating pre-socialist and socialist urban shrinkage in Eastern Europe. Hence, this paper is organised as a scientific review, with a special intention to present the different categories of affected cities. In that way, this paper contributes to the further understanding of the circumstances that have provoked urban shrinkage to be so widespread in this part of Europe.

KEYWORDS _ shrinking cities, Eastern Europe, socialism, pre-socialism, urban development, border cities, deindustrialised cities

INTRODUCTION - POST-SOCIALIST URBAN SHRINKAGE

Shrinking cities present the prevalent type of present-day urbanisation in post-socialist countries in the central-eastern, eastern and south-eastern regions of Europe. The process of widespread and rapid urban shrinkage in this region started with the collapse of socialist system in the early 1990s. Just one decade after, in the early 2000s, more than 82% major cities in post-socialist European countries were shrinking. This was twice more than an average for the whole continent (Turok and Mykhnenko, 2007). The process of urban shrinkage is persistently widespread even today. The recent report done by the World Bank summarises that more than half of cities in the former socialist space were demographically declining in 2010s. This percentage is more severe by excluding Central Asia. In this constellation, post-socialist countries in Europe have more than 70% of cities with shrinking patterns. The 'recorders' are Romania and Bulgaria where more than 90% of cities are losing population (Restrepo Cadavid et al, 2017). To conclude, urban shrinkage in post-socialist countries in Eastern Europe is the most acute among all world regions.

Why shrinking cities in Eastern Europe are so unique? A. Haase, D. Rink and K. Grossmann (2016) point out that the (post)-socialist character of these cities is exactly the main feature that defines the uniqueness of their shrinkage. This means that the patterns of urbanisation during socialism and after its collapse have left so immense influence on the cities in this region that it is a key determinant to differentiate post-socialist shrinking cities as a type within the global discourse relating urban shrinkage (Batunova, 2015). In brief, aside of globally well-known shrinking problems in economic and demographic sphere, post-socialist shrinking cities posses the further burden based on the fast and weakly controlled change of political and economic systems. The transformation of the former socialist countries from one-party systems with planned economy to multi-party democracies with market and capitalist economy has had a deep negative impact on their cities, urban economy and urban government (Stryjakiewicz et al, 2012).

The explained outspread and the socialism-related features of urban shrinkage in cities in Eastern Europe have made the straight focus of researchers on them. This situation has somehow formed the general opinion that this phenomenon is completely new for this region. If such research is oriented to the past of urbanisation in this part of Europe, it usually examines the causes of post-socialist urban shrinkage originated in the specificities of socialism. Nevertheless, urban shrinkage existed in the eastern half of Europe before the fall of socialism. However, the present-day known construct Eastern Europe did not exist before 1945 (Gutkind, 1972), which significantly complicate the research of pre-socialist urbanisation in this region as an entity.

Although shrinking cities before and during socialism were not very frequent, they represent the predecessors of many shrinking cities in this part of Europe today. They can even be categorised by the still valid factors that were crucial for their shrinkage: change of borders, fall of industrial production, internal/national spatial planning policies or the loss of dependent area. The aim of this research is to systematise this knowledge relating pre-socialist and socialist urban shrinkage in Eastern Europe. In that way, this paper contributes to the further understanding of the circumstances that have provoked the current urban shrinkage to be so widespread in Eastern Europe.

METHODOLOGY

This paper is organised as a scientific review, with a special intention to present the different categories of affected shrinking cities. Categorisation is divided in two parts: inter-war (pre-socialist) and post-war (socialist) period. Each type of a shrinking city is demonstrated through a showcase(s). Before this illustration through showcases, historic circumstances and their influence on urbanisation and urban shrinkage are explained in brief. All extracted types of shrinking cities from both periods are discussed together in final conclusions, to clarify ongoing situation about urban shrinkage in Eastern/post-socialist Europe.

URBAN SHRINKAGE IN EASTERN EUROPE BEFORE SOCIALISM

Urbanisation in Eastern Europe has had a different pace then at the west of the continent from its early beginnings. Western part has been always more developed and the main historic powers were there (Musterd & Kovács, 2013). Hence, Eastern Europe had postponed urbanisation, as well as the relatively late development of capitalist economy and modern society (Musil, 2005). The same pattern was followed in industrial revolution, which reached Eastern Europe in the second half of 19th century, i.e. one century after its start in England (Clossick, 2014). Despite its late initiation, the industrialisation on the turn of 19th to 20th century of Austro-Hungarian and Russian empires, which

covered the most of Eastern Europe, was very rapid, enabling their fast economic development and urbanisation. The economic and demographic growth of cities as the centres of industrialisation was great in both empires, but also followed with uncontrolled construction, substandard housing and the rise of social inequalities (Berenger, 1997).

After the World War I (WWI), the simply organised political space of Eastern Europe, mainly divided between three empires, German, Austro-Hungarian and Russian, was profoundly reconfigured; these empires were collapsed and many national states were born (Boeckh, 2014). New states had much smaller space and a lot of new borderland thereof. The new borders further cut many previous trade routes and divided former markets and gravitation zones. This consequently left many East-European cities and towns in an unenviable position and brought economic obstacles, which was reflected through demographic stagnation or decline.

Type 1a: New border cities

Some cities began to shrink due to their physical proximity to new borders. Some of them even became border cities or new twin cities, i.e. the cities divided by border.

The first presented case is Sopron in present-day western Hungary. The city was the historic seat of western Hungarian lands, today organised within the eastern Austrian Province of Burgenland. In contrast to the rest of these lands, mainly inhabited with Germans, Sopron became a city with dominantly Hungarian-speaking population, as a consequence of the fast urban growth due to industrialisation during late Austro-Hungarian period. After the WWI, newly-created Austria and Hungary were demarked along ethnic lines. The city was left to Hungary, but in the form of a 'pocket' mostly surrounded by Austrian territory (Beigbeder, 1994). This border location and the dwarfed gravitation zone of few villages hindered the development of Sopron; the city stalled and, after the WWII, entered four-decade long urban decline when nearby border with Austria was an "Iron Curtain" (Sik, 2015).



_ Fig. 1: Unplanned twin cities – View on Esztergom Basilica in Hungary across the Danube River from Štúrovo/Párkány in Slovakia (author: B. Antonić)

Even more severe destiny stricken the cities divided by new borders, such as the former Hungarian royal city of Esztergom on the middle Danube (Fig. 1). The river became a border between Hungary and Czechoslovakia at the end of 1918. The core of the city was assigned to Hungary, while its northern suburb of Párkány across the Danube was inaugurated by Czechoslovak authorities as the Town of Štúrovo. The both urban settlements have passed through the periods of stagnation and shrinkage since this division. Only after both Hungary and Slovakia entered EU Schengen area in 2003, the situation between two cities relaxed.

Type 1b: Industrial hubs with reduced market

The second type of the shrinking cities and towns made during the interwar period is also related to

new borders, but in different way. Newly-established countries outlined their own national markets, usually much smaller than the previous ones of three huge imperial powers. For example, many Finnish and Polish cities belonged to the most western and the most developed part of vast Russian Empire and their industrial products prevailed there; their early industrialisation in the second half of 19th century (comparing to the other parts of Imperial Russia) was definitely initiated and led by this huge and underused market (Branch et al, 1995). Riga, the capital of newly-established Latvia, was an interesting case; it compensated its role as the main Baltic port of the former empire with the new functions of a capital city (Morawski, 2017). However, many cities could not find the right solution for this gap in local economy. The City of Łódź in Poland was illustrative for this situation. This city was the most western major city of Russian Empire, developed mainly between the abolition of serfdom in 1861 and the start of the WWI in 1914. This can easily be presented through demographic growth - from 13,000 in 1840 to approximately 600,000 in 1915. Łódź was known as a "Polish Manchester" due to its advanced textile industry (Fleming, 2012). However, city entered urban shrinkage after the WWI and the city recovery lasted till the WWII. After the war, Łódź grew slowly comparing the other cities in Communist Poland. Finally, after the fall of communism in the early 1990s, the city founded it in an even more acute position that after the WWI due to the complete collapse of local industry. This has been followed by population decline (-20%), as well as the other forms of urban shrinkage (Fig. 2) since that (Holm et al, 2015).



_ Fig. 2: The visibility of urban shrinkage in present-day Łódź in Poland on street (author: B. Antonić)

Type 1c: Former imperial cities

The third interwar type is well-documented, because it refers to two large imperial capitals that lost their significance with the decomposition of their vast empires: St. Petersburg and Vienna. However, their urban shrinkage had noticeable differences.

Vienna was the capital of long-lasting Habsburg Monarchy that transformed itself into dual Austro-Hungarian Empire in 1867. This year is approximately the outset of industrial era of this empire, which was reflected in its fast urbanisation, too. Vienna exemplified this development. The city population quadrupled from 1850 to 1910, passing remarkable two-million threshold at the last imperial census in 1910 (Berenger, 1997). Although Vienna preserved its position of a capital after the WWI, new Austrian Republics was incomparably smaller than the former Monarchy. This was immediately observable in the city demographics; Vienna lost approximately 10% of population after the war. Then, the city had a peripheral position in Austria, close to national borders to Czechoslovakia (east and northeast) and Hungary (southeast). This precipitated much smaller gravitation zone than previous, especially after the WWII, when these borders became an "Iron Curtain" between the West and the East. The post-WWII urban shrinkage of Vienna lasted several decades. The reurbanisation of the city started only after the opening of the borders in 1990 and after the launching of the mass reconstruction of old building stock in the 1980s (Fig. 3) (AW, 2008).



_ Fig. 3: Reconstructed building in central Vienna, Austria, as a role-model for the city regeneration in the 1980s and 1990s and reurbanisation thereof (author: B. Antonić)

The developmental trajectory of St. Petersburg, the capital of Imperial Russia, was unique. The city lost the most of its western gravitation zone in Finland and Estonia, as well as the role of national capital in favour of centrally located Moscow. The city lost almost 40% between the censuses in 1910 and 1920, but this was overcome by reurbanisation within the socialist mass-industrialisation of the early USSR (Eliseeva & Gribova, 2003). The planned economy in the USSR prevented the scenario seen in the case of Vienna.

URBAN SHRINKAGE IN EASTERN EUROPE DURING SOCIALISM

One of the main premises of socialist urbanisation is the controlled development and growth of cities as the hubs of the constant development of industry and the enlightenment of proletariat (Enyedi, 1998). The exemptions from this 'canon' were rare. They were neglected in contemporary scientific sources, too. Yet, shrinking cities existed in a small proportion in all censuses in the post-war USSR (Cottineau, 2016). On the other hand, there were the relatively numerous examples of the cities with very slow growth due to the planned measures of the deconcentration of urban population. An example is the deliberate demographic slowdown of Prague and Budapest after the WWII in favour of secondary cities in socialist Czechoslovakia and Hungary (Musil, 2005). Similar measures were taken in the USSR, but with more modest outcomes. In addition, shrinking cities during socialism were often somewhat opposite from the typical model of a socialist city. Three cases of socialist shrinking cities can be signed out.

Type 2a: Border cities

The first interwar type – shrinking cities close to and thereby isolated by national borders – got its post-war replica. They were more often in the socialist countries with slower demographic growth. Then, the location of such declining cities was someway different, because they prevailed along "hard" borders, like "Iron Curtain". For instance, many small cities in the westernmost Czechoslo-vakia, along the border with its 'problematic' neighbour, Western Germany, were shrinking during socialism due to this unwanted location (Musil, 2005). The most of them were ethnically German before the WWII, so the border issue was not very visible during interwar years. The case of the Town of Aš, situated in Czech semi-enclave surrounded by German territory, was more than useful. The town lost almost the half of its interwar population during socialism. Finally, the town population stabilised after the 1990s (ČSU, 2007).

Type 2b: Shrinking towns due to spatial isolation

The second post-war type is a bit ambiguous, because it is strictly reserved to small historic cities and towns without a real industrial base. They are formed and have existed as trade and service centres for their rural surroundings. Thus, it is questionable if they can count as modern urban settlements in their essence. Nevertheless, they were probably the most often type of shrinking urban settlements during socialist era, because this type of settlement has been quite common across the eastern half of Europe. The main reason that these cities and towns began to shrink due to the rural exodus in the areas around them, which was very intensive in socialist states (Musil, 2005). In the other side, the second reason is their isolation and the distance from major cities and development corridors, which limited the industrial growth of such places. This trend was more noticeable in the last decades of socialism, with the decrease of birth rate and with the more severe demographic exhaustion of countryside.

Furthermore, the trend was especially visible in the countries with already low population density, such as Russia (Wegren, 1995). The right showcase is the Town of Yuryevets (Rus. Юрьевец) in Ivanovo Oblast. This town was the first urban settlement in this region, established in 13th century and was the important port on Volga River till 20th century (Trevish, 2003). However, modern development bypassed Yuryevets, while river activities could sustain the previous glory. Hence, the town has been shrinking since the 1960s despite rich urban heritage.

Type 2c: The first shrinking cities due to industrial decline

The shrinking of cities in old industrial areas in northern Bohemia and southern Eastern Germany (Saxony) is the third type. It differs from the previous two types, because their urban shrinkage is essentially linked to industrial decline. Two mentioned areas were already well-industrialised and urbanised before socialism and their metalworking industry and mining were pretty outdated even during socialist era (Musil, 2005). Quite small rural surrounding could not replace the negative demographic implications in the cities with diminishing industry.

A well-known example is Leipzig in Saxony (Fig. 4), which was the second biggest city in the former Eastern Germany. The city was industrialised before the WWI (Bontje, 2005). This industry was mainly obsolete after the war. Moreover, the socialist state intentionally suppressed the further development of Leipzig and its urbanised vicinity due to its high density and inherited high development (Florentin, 2010). Thus, the city lost almost 25% of its pre-war population or more than 200 thousand inhabitants till 1990 (Rink et al, 2011). The urban shrinkage of Leipzig even continued after the fall of socialism, eventually re-growing from 2010s.



_ Fig. 4: Leipzig was a shrinking city in (Eastern) Germany with typical socialist features (source: flickr. com)

CONCLUSIONS

The last type of socialist shrinking cities described is particularly indicative for the present-day urban shrinkage in Eastern Europe. As places where an 'industrial congestion' and its technological anachronism caused an early urban decline during socialism, they are precursors to the incomparably larger shrinkage process after the collapse of socialist system in Europe, in the early 1990s. The explained example of Leipzig and many similar major cities in Eastern Germany (Dresden, Rostock, and Magdeburg) that have entered reurbanisation last years confirms also that their long struggle with deindustrialisation and pre-orientation to a service economy was eventually successful and that they can be a role-model for many other cities across post-socialist space.

However, the named cities are probably a good example for the reurbanisation and redevelopment of major cities, because middle-size and small cities and towns are still shrinking across the region, regardless of the development level of the country they belong. The future is still triggering even in the most development (Eastern) Germany (Kühn and Liebmann, 2012). The majority of pre-socialist and socialist shrinking cities also point that these cities are particularly prone to general urban decline if they are further isolate, such as the cities close to 'hard' borders, without dependent (rural) area and far away from the main transport/development corridors and nodes. This is one of the key conclusions in the recent World Bank report about shrinking cities in post-socialist countries; the most vulnerable cities and towns are those with smaller population and spatially isolated ("single cities") (Restrepo Cadavid et al, 2017).

The last conclusion reveals that the causes of urban shrinkage have not changed drastically in the last hundred years, regardless of different political and economic context. The slower urbanisation before modern period, the anomaly of many new borders during interwar period and, finally, the consequences of the improper maintenance of old industrial facilities in socialism are certainly the factors that are significant for the research of widespread post-socialist urban shrinkage in Eastern Europe. The fall of socialism was only a trigger for the outspread of urban shrinkage. In accordance with this, the further research on the character and examples of urban shrinkage in Eastern Europe before post-socialist transition matters from contemporary perspective and it had to be more in the agenda of the future research across this region.

ACKNOWLEDGEMENTS

This paper is done as a contribution for two international scientific-research projects: (1) "CREATIVE DANUBE" (2019-2022), Erasmus+ KA203 Cooperation Programme, financed by the EU; and (2) DANube Urban Brand + Building Regional and Local Resilience through the Valorization of Danube's Cultural Heritage – DANUrB+ (2020-22), INTERREG EU Danube Transnational Programme.

REFERENCES

_ Architekturzentrum Wien – AW (2008). Housing in Vienna: Innovative, Social and Ecological. Vienna: AW.

_ Batunova, Elena. 2015. "Shrinking Cities of Southern Russia: Specifics of the Shrinkage Pattern." In Proceedings of the International Conference on Changing Cities II Spatial, Design, Landscape & Socio-economic Dimensions, edited by Aspa Gospodini. doi: 10.13140/RG.2.1.4671.2160.

_ Beigbeder, Yves. 1994. International Monitoring of Plebiscites, Referenda and National Elections. Leiden: Brill-Nijhoff.

Berenger, Jean. 1997. The Habsburg Empire 1700-1918. Oxon, UK; New York, NY: Routledge.

_ Boeckh, Katrin. 2014. "Crumbling of Empires and Emerging States: Czechoslovakia and Yugoslavia as

(Multi)national Countries." In International Encyclopedia of the First World War Online. Retrieved from https://encyclopedia.1914-1918-online.net/pdf/1914-1918-Online-crumbling_of_empires_and _emerg-ing_states_czechoslovakia_and_yugoslavia_as_multinational_countries-2014-10-08.pdf.

_ Bontje, Marco. 2005. "Understanding Shrinkage in European Regions." *Built Environment*, 38, no 2, 153–161. doi: 10.2148/benv.38.2.153.

_ Branch, Michael, Hartley, Janet and Mączak, Antoni. eds. 1995. *Finland and Poland in the Russian Empire. A Comparative Study.* London: University of London Press

Český statistický úřad – ČSU. 2007. Historický lexikon obcí ČR 1869–2005. Prague: ČSU.

_ Clossick, Jane. 2014. "Industrial City." In *Atlas of Cities*, edited by In Paul Knox (pp. 70-87). Princeton, NJ: Princeton University Press.

_ Cottineau, Clémentine. 2016. "A Multilevel Portrait of Shrinking Urban Russia." *Espace populations societies*, 15, no 3 and 16, no 1, 2016. doi: 10.4000/eps.6123.

_ Eliseeva, Irina & Gribova, Elena. eds. 2003. Санкт-Петербург 1703-2003: Юбилейный статистический сборник [St Petersburg 1703-2003: Jubilee statistical bulletin]. St Petersburg: Sudostroenie.

_ Enyedi, Gyorgy. 1998. *Transformation in Central European postsocialist cities*. Budapest: Akadémiai Kiadó. Retrieved from http://webdoc.sub.gwdg.de/ebook/serien/qg/rkk/21.pdf.

_ Fleming, Michael. 2012. "Legitimating Urban "Revitalisation" Strategies in Post-socialist Łódź." East European Politics and Societies and Cultures, 26, no. 2, 254–273. doi: 10.1177/0888325411415400.

_ Florentin, Daniel. 2010. "The "Perforated City:" Leipzig's Model of Urban Shrinkage Management." Berkeley Planning Journal, 23, no 1, 83–101. doi: https://doi.org/10.5070/BP323111432.

_ Gutkind, Erwin Anton. 1972. International History of City Development: Urban Development in East/ Central Europe - Poland, Czechoslovakia and Hungary: Volume 7. New York: Free Press of Glencoe; London: Collier-Macmillan.

_ Haase, Annegret, Rink, Dieter and Grossmann, Katrin. 2016. "Shrinking Cities in Post-Socialist Europe: What Can We Learn from Their Analysis for Theory Building Today?" Geografiska Annaler: Series B, Human Geography 98, no 4, 305–319. doi: 10.1111/geob.12106.

_ Holm, Andrej, Marcińczak, Szymon and Ogrodowczyk, Agnieszka. 2015. "New-build gentrification in the post-socialist city: Łódź and Leipzig two decades after socialism." Geografie – Sborník ČGSR, 120, no 2, 164–187.

_ Kühn, Manfred and Liebmann, Heike. 2012. Urban regeneration – strategies of shrinking cities in Eastern Germany. *Die Erde*, 143, no 1-2, 135–152. Retrieved from https://www.die-erde.org/index.php/dieerde/article/view/26.

_ Morawski, Wojciech. 2017. "Post-war Economies (East Central Europe)". In International Encyclopaedia of the First World War Online. Retrieved from https://encyclopedia.1914-1918-online.net/article/ post-war_economies_east_central_europe.

_ Musil, Jiří. 2005. "City development in Central and Eastern Europe before 1990: Historical context and socialist legacies." In *Transformation of cities in central and Eastern Europe: Towards globalization*, edited by Ian Hamilton, Kaliopa Dimitrovska Andrews and Nataša Pichler-Milanović, 22–43. Tokyo; New York; Paris: UN University Press.

_ Musterd, Sako and Kovács, Zoltan. Eds. 2013. *Place-making and Policies for Competitive Cities*. Hoboken, NY: Wiley-Blackwell.

_ Restrepo Cadavid, Paula, Cineas, Grace, Quintero, Luis and Zhukova, Sofia. 2017. *Cities in Eastern Europe and Central Asia: A Story of Urban Growth and Decline.* Washington, DC: World Bank.

_ Rink, D., Haase, A., Bernt, M. & Großmann, K., Bernt, M., Couch, C., Cocks, M., Violante, A., Cortese, C. & Calza Bini, P. 2011. How shrinkage and local governance are interrelated across urban Europe: a comparative view. D12 Discussion paper on governance responses. Leipzig: Helmholtz Centre for Environmental Research.

_ Sik, Domonkos. 2015. "Incubating Radicalism in Hungary – the Case of Sopron and Ózd." *East European Journal of Society and Politics*, 1, 100–121. doi: https://doi.org/10.17356/ieejsp.v1i1.31.

_ Stryjakiewicz, Tadeusz, Ciesiółka, Przemysław and Jaroszewska, Emilia. 2012. "Urban Shrinkage and the Post-Socialist Transformation: The Case of Poland". *Built Environment*, 38, no 2, pp. 196–213.

_ Trevish, Andrei. 2003. Ivanovo long-Term Socio-economic and Urban Development. In Ivanovo: One

City in Post-socialist Transformation (pp. 11-27). Berlin: Philip Osvalt Company. Retrieved from: http://www.shrinkingcities.com/fileadmin/shrink/downloads/pdfs/WP_Band_1_lvanovo.pdf.

_ Turok, Ivan and Mykhnenko, Vlad . 2007. "The trajectories of European cities, 1960–2005." *Cities 24*, no 3, p. 165–182. doi: 10.1016/j.cities.2007.01.007.

_ Wegren, Stephen. 1995. "Rural migration and agrarian reform in Russia: A research note." *Europe-Asia Studies*, 47, no 5, 877–888. doi: 10.1080/09668139508412292.

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

711.4.01(082)(0.034.2) 711.4:005.591.6(082)(0.034.2)

INTERNATIONAL Academic Conference on Places and Technologies (7 ; 2018 ; Beograd)

Keeping up with technologies to act responsively in urban environment [Elektronski izvor] : conference proceedings / 7th international Academic Conference on Places and Technologies ; editors Aleksandra Djukić ... [et al.]. - Belgrade : University of Belgrade, Faculty of Architecture, 2020 (Belgrade : University of Belgrade, Faculty of Architecture). - 1 elektronski optički disk (CD-ROM); 12 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovnog ekrana. - Tiraž 150. - Bibliografija uz svaki rad.

ISBN 978-86-7924-240-2

 Đukić, Aleksandra, 1964- [urednik] а) Градови - Мултидисциплинарни приступ - Зборници b) Урбанистичко планирање - Технолошки развој - Зборници

COBISS.SR-ID 27113481

ISBN: 978-86-7924-240-2

•••

•

۲

•

•

4



Ċ

•

•