

CONFERENCE
PROCEEDINGS

**5th INTERNATIONAL
ACADEMIC CONFERENCE ON
PLACES AND TECHNOLOGIES**

EDITORS

ALEKSANDRA KRSTIĆ-FURUNDŽIĆ

MILENA VUKMIROVIĆ

EVA VANIŠTA LAZAREVIĆ

AND ALEKSANDRA ĐUKIĆ

PLACES AND TECHNOLOGIES 2018

THE 5TH INTERNATIONAL ACADEMIC CONFERENCE ON PLACES AND TECHNOLOGIES

EDITORS:

Aleksandra Krstić-Furundžić, Milena Vukmirović, Eva Vaništa Lazarević, Aleksandra Đukić

FOR PUBLISHER: Vladan Đokić

PUBLISHER: University of Belgrade - Faculty of Architecture

DESIGN: Stanislav Mirković

TECHNICAL SUPPORT: Jana Milovanović

PLACE AND YEAR: Belgrade 2018

ISBN: 978-86-7924-199-3

PRINTED BY: University of Belgrade - Faculty of Architecture

ORGANIZERS



URBANLAB®

PROFESSIONAL ASSOCIATION URBAN LABORATORY

CONFERENCE SUPPORT



Ministry of Education, Science
and Technological development
Ministry of Mining and Energy
Ministry of Civil engineering,
transport and infrastructure



Wienerberger

PLACES AND TECHNOLOGIES 2018

KEEPING UP WITH TECHNOLOGIES TO ADAPT CITIES FOR
FUTURE CHALLENGES

CONFERENCE PROCEEDINGS OF THE 5TH INTERNATIONAL ACADEMIC CONFERENCE ON PLACES AND TECHNOLOGIES

CONFERENCE ORGANISERS

University of Belgrade – Faculty of Architecture and
Professional Association Urban Laboratory

ORGANIZING COMMITTEE

Founding members of the Organizing committee

Dr. Aleksandra Krstić-Furundžić

Conference Director, University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr. Milena Vukmirović

Conference Executive Coordinator, University of Belgrade, Faculty of Forestry, Belgrade, Serbia

Dr. Eva Vaništa Lazarević

University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Dr. Aleksandra Đukić

University of Belgrade, Faculty of Architecture, Belgrade, Serbia

TECHNICAL COMMITTEE

Dr. Milena Vukmirović

Conference Executive Coordinator, University of Belgrade, Faculty of Forestry, Belgrade, Serbia

Branislav Antonić

University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Tamara Radić

University of Belgrade, Faculty of Architecture, Belgrade, Serbia

Jana Milovanović

University of Belgrade, Faculty of Architecture, Belgrade, Serbia

TABLE OF CONTENTS

IMAGE, IDENTITY AND QUALITY OF PLACE: URBAN ASPECTS

THE EFFECT OF BEHAVIOURAL SETTINGS ON THE REGENERATION OF URBAN DYNAMIC ARTS, CASE STUDY: TEHRAN AZADI SQUARE Yasaman NEKOU Ali Entezarinajafabadi	3
DEVELOPMENT SCENARIOS OF THE ZAGREB'S SATELLITE TOWN DUGOSELO - "THE CITY OF THE FUTURE" Lea Petrović Krajnik Damir Krajnik Ivan Mlinar	11
SUSTAINABILITY OF MODERN-DAY UTOPIAS AS SEEN IN MASS MEDIA Aleksandra Til	18
URBAN DENSIFICATION OF THE POST-SOCIALIST CITY AND ITS IMPLICATIONS UPON URBAN STRUCTURE: A STUDY OF NIS, SERBIA Milena Dinić Branković Ivana Bogdanović Protić Mihailo Mitković Jelena Đekić	25
MUSEUM QUARTERS VS CREATIVE CLUSTERS: FORMATION OF THE IDENTITY AND QUALITY OF THE URBAN ENVIRONMENT Ekaterina Kochergina	35
URBAN NON-MECHANICAL CODE AND PUBLIC SPACE Aleksandra Đukić Valentina Milovanović Dubravko Aleksić	43
ADDRESSING THE SOCIO-SANITARY EMERGENCY IN AFRICA: THEORIES AND TECHNIQUES FOR DESIGNING A COMMUNITY HEALTH CENTRE IN MALI Adolfo F. L. Baratta Laura Calcagnini Fabrizio Finucci Cecilia M. L. Luschi Antonio Magarò Massimo Mariani Alessandra Venturoli Alessandra Vezzi	50
THE NETWORK OF LOCAL CENTERS AS A TOOL FOR STRENGTHENING THE SUPER-BLOCK COMMUNITIES: BELGRADE VS. ROME Predrag Jovanović Aleksandra Stupar	58
TRANSFORMATION OF IDENTITY OF SAVAMALA DISTRICT IN BELGRADE Aleksandra Đukić Jelena Marić Tamara Radić	66
THE CULTURE OF MEMORY AND OPEN PUBLIC SPACE - BANJA LUKA Jelena Stankovic Milenko Stankovic	73

IMAGE, IDENTITY AND QUALITY OF PLACE: ARCHITECTURAL ASPECTS

IMPROVEMENT OF SOCIAL HOUSING THROUGH THE MIXING CONCEPT IMPLEMENTATION Nataša Petković Grozdanović Branislava Stoilković Vladana Petrović Aleksandar Keković Goran Jovanović	83
--	----

IMPROVING THE IDENTITY OF NON – SURROUNDED COMMUNAL SPACES WITH USING ARCHITECTURAL PROGRAMING. CASE STUDY: NAJAF ABAD (ESFAHAN), IMAM KHOMEINI SQUARE 91
Ali Entezarinajafabadi YasamanNekoui

A CONTRIBUTION TO THE STUDY OF THE ARCHITECTURAL OPUS OF NATIONAL STYLE WITH MODELS IN FOLK ARCHITECTURE AND NEW INTERPOLATIONS 100
Katarina Stojanović

SHOPPING CENTRE AS A LEISURE SPACE: CASE STUDY OF BELGRADE 108
Marija Cvetković Jelena Živković Ksenija Lalović

ARCHITECTURAL CREATION AND ITS INFLUENCE ON HUMANS 119
Nikola Z. Furundžić Dijana P. Furundžić Aleksandra Krstić-Furundžić

INNOVATIVE METHODS AND TECHNOLOGIES FOR SMART(ER) CITIES

POTENTIAL OF ADAPTING SMART CULTURAL MODEL: THE CASE OF JEDDAH OPEN- SCULPTURE MUSEUM 131
Sema Refae Aida Nayer

AN INNOVATIVE PROTOCOL TO ASSESS AND PROMOTE SUSTAINABILITY IN RESPONSIBLE COMMUNITIES 140
Lucia Martincigh Marina Di Guida Giovanni Perrucci

GEOHERMAL DISTRICT HEATING SYSTEMS DESIGN: CASE STUDY OF ARMUTLU DISTRICT 148
Ayşe Fidan ALTUN Muhsin KILIC

DATA COLLECTION METHODS FOR ASSESSMENT OF PUBLIC BUILDING STOCK REFURBISHMENT POTENTIAL 157
Ljiljana Đukanović Nataša Čuković Ignjatović Milica Jovanović Popović

SMART HOSPITALS IN SMART CITIES 165
Maria Grazia Giardinelli Luca Marzi Arch. PhD Valentina Santi

INNOVATIVE METHODS AND TOOLS

PRIMARY AND SECONDARY USES IN CITIES – PRINCIPLES, PATTERNS AND INTERDEPENDENCE 175
Marina Čarević Tomić Milica Kostreš Darko Reba

MODELLING AND ANALYSING LAND USE CHANGES WITH DATA-DRIVEN MODELS: A REVIEW OF APPLICATION ON THE BELGRADE STUDY AREA 183
Mileva Samardžić-Petrović Branislav Bajat Miloš Kovačević Suzana Dragičević

INNOVATIVE DECISION SUPPORT SYSTEM 190
Mariella Annese Silvana Milella Nicola La Macchia Letizia Chiapperino

URBAN FACILITY MANAGEMENT ROLE	196
Alenka Temeljotov Salaj Svein Bjørberg Carmel Margaret Lindkvist Jardar Lohne	
ANALYSES OF PUBLIC SPACES IN BELGRADE USING GEO-REFERENCED TWITTER DATA	205
Nikola Džaković Nikola Dinkić Jugoslav Joković Leonid Stoimenov Aleksandra Djukić	
SENTIMENT ANALYSIS OF TWITTER DATA FOR EXPLORATION OF PUBLIC SPACE SENTIMENTS	212
Miroslava Raspopovic Milic Milena Vukmirovic	
CITIES AND SCREENS: ARCHITECTURE AND INFORMATION IN THE AGE OF TRANSDUCTIVE REPRODUCTION	217
Catarina Patricio	
CITIZEN EMPOWERMENT, PUBLIC PARTICIPATION AND DEMOCRATIC CITIES	
CITIES AS PLATFORMS FOR SOCIAL INNOVATION: AN INVESTIGATION INTO HOW DIGITAL PLATFORMS AND TOOLS ARE USED TO SUPPORT ENTREPRENEURSHIP IN URBAN ENVIRONMENTS	227
Margarita Angelidou	
PROBLEM ISSUES OF PUBLIC PARTICIPATION IN HERITAGE CONSERVATION: GEO-MINING PARKIN SARDINIA	235
Nađa Beretić Arnaldo Cecchini Zoran Đukanović	
A METHODOLOGY FOR STAKEHOLDER EMPOWERMENT AND BENEFIT ASSESSMENT OF MUNICIPAL LONG-TERM DEEP RENOVATION STRATEGIES: A SURVEY WITHIN SOUTH-EASTERN EUROPEAN MUNICIPALITIES	242
Sebastian Botzler	
THE OPPORTUNITIES OF MEDIATED PUBLIC SPACES: CO-CREATION PROCESS FOR MORE INCLUSIVE URBAN PUBLIC SPACES	249
Inês Almeida Joana Solipa Batista Carlos Smaniotta Costa Marluci Menezes	
ARCHITECTURE AS SOCIAL INNOVATION: EDUCATION FOR NEW FORMS OF PROFESSIONAL PRACTICE	255
Danijela Milovanović Rodić, Božena Stojčić Aleksandra Milovanović	
CITY AS A PRODUCT, PLANNING AS A SERVICE	262
Viktorija Prilenska Katrin Paadam Roode Liias	
RAJKA: CHANGING SOCIAL, ETHNIC AND ARCHITECTURAL CHARACTER OF THE "HUNGARIAN SUBURB" OF BRATISLAVA	269
Dániel Balizs Péter Bajmócy	
POSSIBLE IMPACT OF MIGRANT CRISIS ON THE CONCEPT OF URBAN PLANNING	279
Nataša Danilović Hristić Žaklina Gligorijević Nebojša Stefanović	

TOWARDS DIMINUISHING DISADVANTAGES IN MIGRATION ISSUES IN SERBIA
(FROM 2015) THROUGH PROPOSAL OF SOME MODELS 287

Eva Vaništa Lazarević Jelena Marić Dragan Komatina

ARCHITECTURAL DESIGN AND ENERGY PERFORMANCE OF BUILDINGS

APPLICATION OF ENERGY SIMULATION OF AN ARCHITECTURAL HERITAGE
BUILDING 303

Norbert Harmathy Zoltán Magyar

APPLICATION OF TRADITIONAL MATERIALS IN DESIGN OF ENERGY EFFI-
CIENT INTERIORS 311

Vladana Petrović Nataša Petković Grozdanović Branislava Stoiljković Aleksandar Keković
Goran Jovanović

DETERMINATION OF THE LIMIT VALUE OF PERMITTED ENERGY CLASS FOR
THE KINDERGARTENS IN THE NORTH REGION OF BOSNIA AND HERZEGOVI-
NA 318

Darija Gajić Biljana Antunović Aleksandar Janković

ARCHITECTURAL ASPECTS OF ENERGY AND ECOLOGICALLY RESPONSIBLE
DESIGN OF STUDENT HOUSE BUILDINGS 326

Malina Čvoro Saša B. Čvoro Aleksandar Janković

ENERGY EFFICIENCY ANALYSES OF RESIDENTIAL BUILDINGS THROUGH
TRANSIENT SIMULATION 332

Ayşe Fidan ALTUN Muhsin KILIC

INNOVATIVE TECHNOLOGIES FOR PLANNING AND DESIGN OF “ZERO-ENER-
GY BUILDINGS” 340

Kosa Golić Vesna Kosorić Suzana Koprivica

ENERGY REFURBISHMENT OF A PUBLIC BUILDING IN BELGRADE 348

Mirjana Miletić Aleksandra Krstić-Furundžić

TPOLOGY OF SCHOOL BUILDINGS IN SERBIA: A TOOL FOR SUSTAINABLE
ENERGY REFURBISHMENT 357

Nataša Čuković Ignjatović Dušan Ignjatović Ljiljana Đukanović

ARCHITECTURAL DESIGN AND NEW TECHNOLOGIES

EVALUATION OF ADVANCED NATURAL VENTILATION POTENTIAL IN THE
MEDITERRANEAN COASTAL REGION OF CATALONIA 367

Nikola Pestic Jaime Roset Calzada Adrian MurosAlcojor

TRENDS IN INTEGRATION OF PHOTOVOLTAIC FACILITIES INTO THE BUILT
ENVIRONMENT 375

Aleksandra Krstić-Furundžić Alessandra Scognamiglio, Mirjana Devetaković, Francesco
Frontini, Budimir Sudimac

INTEGRATION OF NEW TECHNOLOGIES INTO BUILDINGS MADE FROM CLT	389
Milica Petrović Isidora Ilić	
INTEGRATION OF SOLAR WATER HEATING SYSTEMS INTO GREEN BUILDINGS BY APPLYING GIS AND BIM TECHNOLOGIES	394
Kosa Golić Vesna Kosorić Dragana Mecanov	
IMPLEMENTING ADAPTIVE FAÇADES CONCEPT IN BUILDINGS DESIGN: A CASE STUDY OF A SPORTS HALL	402
Aleksandar Petrovski Lepa Petrovska-Hristovska	
SIMULATION AIDED ENERGY PERFORMANCE ASSESSMENT OF A COMPLEX OFFICE BUILDING PROJECT	409
Norbert Harmathy László Szerdahelyi	

ARCHITECTURAL DESIGN AND PROCESS

THE HABITABLE BRIDGE: EXPLORING AN ARCHITECTURAL PARADIGM THAT COMBINES CONNECTIVITY WITH HABITATION	421
Ioanna Symeonidou	
REFURBISHMENT OF POST-WAR PREFABRICATED MULTIFAMILY BUILDINGS	428
Aleksandra Krstić-Furundžić, Tatjana Kosić, PhD	
THE FUTURE (OF) BUILDING	438
Morana Pap, Roberto Vdović, Bojan Baletić	
COMPARISON OF ARCHITECTS' AND USERS' ATTITUDES TOWARD SPATIAL CHARACTERISTICS OF APARTMENTS	445
Ivana Brkanić	
DIGITAL VS. TRADITIONAL DESIGN PROCESS	453
Igor Svetel Tatjana Kosić Milica Pejanović	
CREATING THE EASTERN CAMPUS CONCEPT AT THE UNIVERSITY OF PÉCS - CONNECTED THE FACULTY OF BUSINESS AND ECONOMICS	461
Péter Paári Gabriella Medvegy Bálint Bachmann	

BUILDING STRUCTURES AND MATERIALS

SUSTAINABILITY BENEFITS OF FERROCEMENT APPLICATION IN COMPOSITE BUILDING STRUCTURES	471
Aleksandra Nenadović Žikica Tekić	
POSSIBILITIES OF ENERGY EFFICIENT REFURBISHMENT OF A FAMILY VILLA IN BELGRADE: A CASE STUDY	479
Nenad Šekularac Jasna Čikić Tovarović Jelena Ivanović-Šekularac	

ENHANCING THE BUILDING ENVELOPE PERFORMANCE OF EXISTING BUILDINGS USING HYBRID VENTILATED FAÇADE SYSTEMS	485
Katerina Tsikaloudaki Theodore Theodosiou Stella Tsoka Dimitrios Bikas	
STRUCTURAL ASPECTS OF ADAPTIVE FACADES	493
Marcin Kozłowski Chiara Bedon Klára Machalická Thomas Wüest Dániel Honfi	
STRATEGIZING FOR INFORMAL SETTLEMENTS: THE CASE OF BEIRUT	500
Hassan Zaiter Francesca Giofrè	
THE IMPACT OF USERS' BEHAVIOUR ON SOLAR GAINS IN RESIDENTIAL BUILDINGS	509
Rajčić Aleksandar Radivojević Ana Đukanović Ljiljana	
PRESERVATION OF ORIGINAL APPEARANCE OF EXPOSED CONCRETE FACADES, CASE STUDY: RESIDENTIAL BLOCK 23, NEW BELGRADE	517
Nikola Macut Ana Radivojević	

ADAPTIVE REUSE

CONVERSION AS MODEL OF SUSTAINABLE SOLUTION FOR DEVASTATED INDUSTRIAL COMPLEXES	529
Branko AJ Turnšek Aleksandra Kostić Milun Rancić	
SILO CONVERSION - POTENTIALS, FLEXIBILITY AND CONSTRAINTS	537
Branko AJ Turnsek Ljiljana Jevremovic Ana Stanojevic	
ARCHITECTURE OF MULTIPLE BEGINNINGS AS A TOOL OF SUSTAINABLE URBAN DEVELOPMENT	545
Milan Brzaković Petar Mitković Aleksandar Milojković Marko Nikolić	
INHABITING THE TOWER. THE PARADIGM OF THE FORTIFIED TOWERS OF MANI AND THE REUSE PROJECT	556
Rachele Lomurno	
ADAPTIVE REUSE THROUGH CREATIVE INDUSTRY TOOLS: CASE OF URAL-MASH, YEKATERINBURG, RUSSIA	564
Eva Vaništa Lazarević Timur Abdullaev, Larisa Bannikova	

URBAN MOBILITY, TRANSPORT AND TRAFFIC SOLUTIONS

POLICY FOR REDUCING EMISSIONS IN AIRCRAFT OPERATIONS IN URBAN AEREAS BASED ON REGULATORY AND FISCAL MEASURES	579
Marija Glogovac Olja Čokorilo	
SIMULATING PEDESTRIAN BEHAVIOUR IN SCHOOL ZONES – POSSIBILITIES AND CHALLENGES	586
Ljupko Šimunović Mario Ćosić Dino Šojat Božo Radulović Domagoj Dijanić	

MODEL OF SMART PEDESTRIAN NETWORK DEVELOPMENT USING AN EDGE-NODE SPACE SYNTAX ABSTRACTION FOR URBAN CENTRES 593

Bálint Kádár

THE ROLE OF SMART PASSENGER INTERCHANGES IN THE URBAN TRANSPORT NETWORK 604

Bia Mandžuka, Marinko Jurčević, Davor Brčić

CLIMATE CHANGE, RESILIENCE OF PLACES AND HAZARD RISK MANAGEMENT

THE IMPACT OF CLIMATE CHANGES ON THE DESIGN ELEMENTS OF CONTEMPORARY WINERIES - CASE STUDIES 617

Branko AJ Turnšek Ana Stanojević LjiljanaJevremović

DETERMINATION OF COMMUNITY DEVELOPMENT POLICIES USING URBAN RESILIENCE AND SYSTEM DYNAMICS SIMULATION APPROACH 626

Zoran Keković Ozren Džigurski Vladimir Ninković

QUALITIES OF RESILIENT CITY IN SYSTEMS OF PLANNING SUSTAINABLE URBAN DEVELOPMENT. AN INTRODUCTORY REVIEW. 634

Brankica Milojević Isidora Karan

PLACE-BASED URBAN DESIGN EDUCATION FOR ADAPTING CITIES TO CLIMATE CHANGE 641

Jelena Živković Ksenija Lalović

IMPROVING URBAN RESILIENCE, INCREASING ENVIRONMENTAL AWARENESS: NEW CHALLENGE OF ARCHITECTURAL AND PLANNING EDUCATION 652

Aleksandra Stupar Vladimir Mihajlov Ivan Simic

URBAN RESILIENCE AND INDUSTRIAL DESIGN: TECHNOLOGIES, MATERIALS AND FORMS OF THE NEW PUBLIC SPACE 659

Vincenzo Paolo Bagnato

THERMAL COMFORT OF NIŠFORTRESS PARK IN THE SUMMER PERIOD 666

Ivana Bogdanović Protić Milena Dinić Branković Petar Mitković Milica Ljubenović

LANDSCAPE ARCHITECTURE AND NATURAL BASED SOLUTIONS

SMALL ISLANDS IN THE FRAMEWORK OF THE U.E. MARINE STRATEGY – CHERADI'S ARCHIPELAGO IN TARANTO 679

Giuseppe d'Agostino Federica Montalto

LANDSCAPE AWARENESS AND RENEWABLE ENERGY PRODUCTION IN BOSNIA AND HERZEGOVINA 686

Isidora Karan Igor Kuvac Radovan Vukomanovic

SAVAPARK – A RESILIENT AND SUSTAINABLE NEW DEVELOPMENT FOR ŠABAC 692

Milena Zindović Ksenija Lukić Marović

ADRIATIC LIGHTHOUSES. STRATEGIC VISIONS AND DESIGN FEATURES 702

Michele Montemurro

LANDSCAPE ARCHITECTURE AND INFRASTRUCTURES: TYPOLOGICAL INVENTORY OF GREEK WATER RESERVOIRS' LANDSCAPE 710

Marianna Nana Maria Ananiadou-Tzimopoulou

THE BASIN OF THE MAR PICCOLO OF TARANTO AS URBAN AND LANDSCAPE "THEATRE" 717

Francesco Paolo Protomastro

INTERWEAVING AND COMPLEXITIES OF THE MAN-MADE ENVIRONMENT AND NATURE 725

Dženana Bijedić Senaida Halilović Rada Čahtarević

BUILT HERITAGE, NEW TECHNOLOGIES AND DANUBE CORRIDOR

DIGITAL TOOLS IN RESEARCHING HISTORICAL DEVELOPMENT OF CITIES 737

Milena Vukmirović Nikola Samardžić

APPLICATION OF BIM TECHNOLOGY IN THE PROCESSES OF DOCUMENTING HERITAGE BUILDINGS 751

Mirjana Devetaković Milan Radojević

GIS-BASED MAPPING OF DEVELOPMENT POTENTIALS OF UNDERVALUED REGIONS – A CASE STUDY OF BAČKA PALANKA MUNICIPALITY IN SERBIA 758

Ranka Medenica Milica Kostreš Darko Reba Marina Carević Tomić

MAPPING THE ATTRACTIVITY OF TOURIST SITES ALL ALONG THE DANUBE USING GEOTAGGED IMAGES FROM FLICKR.COM 766

Bálint Kádár Mátyás Gede

INVENTARISATION AND SYSTEMATIZATION OF INDUSTRIAL HERITAGE DOCUMENTATION: A CROATIAN MATCH FACTORY CASE STUDY 777

Lucija Lončar Zlatko Karač

CULTURAL LANDSCAPE OF ANCIENT VIMINACIUM AND MODERN KOSTOLAC – CREATION OF A NEW APPROACH TO THE PRESERVATION AND PRESENTATION OF ITS ARCHAEOLOGICAL AND INDUSTRIAL HERITAGE 785

Emilija Nikolić Mirjana Roter-Blagojević

ALTERNATIVE TERRITORIAL CHANGES OF HOUSING ESTATES TOWARDS A SUSTAINABLE CONCEPTION 793

Regina Balla

HERITAGE, TOURISM AND DANUBE CORRIDOR

- CULTURAL TOURISM IN THE BALKANS: TRENDS AND PERSPECTIVES. 807
Kleoniki Gkioufi
- CULTURAL TOURISM AS A NEW DRIVING FORCE FOR A SETTLEMENT REVIT-
ALISATION: THE CASE OF GOLUBAC MUNICIPALITY IN IRON GATES REGION,
SERBIA 814
Branislav Antonić Aleksandra Djukić
- CULTURAL AND HISTORICAL IDENTITY OF TWIN CITIES KOMÁR-
NO-KOMÁROM 823
Kristína Kalašová
- PLACE NETWORKS. EXPERIENCE THE CITY ON FOOT 830
Milena Vukmirovic Aleksandra Djukić Branislav Antonić
- STORIES WITH SOUP - CULTURAL HERITAGE MOMENTS ALONG THE DAN-
UBE RIVER 837
Heidi Dumreicher Bettina Kolb Michael Anranter
- ETHNIC AND TOPONYMIC BACKGROUND OF THE SERBIAN CULTURAL HERI-
TAGE ALONG THE DANUBE 844
Dániel Balizs Béla Zsolt Gergely

SPATIAL AND RURAL DEVELOPMENT

- BEAUTIFUL VILLAGE PROJECT: AN ARCHITECTURAL AND LANDSCAPE DESIGN
STRATEGY FOR NON-HERITAGE VILLAGES IN HEBEI PROVINCE 859
Dapeng Zhao Bálint Bachmann Tie Wang
- CHANGES IN DEVELOPMENT OF NORTHERN CROATIA CITIES AND MUNICI-
PALITIES FROM 1991 TO 2011: MULTIVARIABLE ANALYTICAL APPROACH 869
Valentina Valjak
- SPECIFICS OF DYNAMICS OF SHRINKING SMALL TOWNS IN SERBIA 879
Milica Ljubenović Milica Igić Jelena Đekić Ivana Bogdanović-Protić Ana Momčilović-Petroni-
jević
- BALANCED REGIONAL DEVELOPMENT OF RURAL AREAS IN THE LIGHT OF
CLIMATE CHANGE IN SERBIA– OPPORTUNITIES AND CHALLENGES 888
Milica Igić Milica Ljubenović Jelena Đekić Mihailo Mitković
- COLLABORATIVE RESEARCH FOR SUSTAINABLE REGIONAL DEVELOPMENT:
EXPERIENCES FROM “LEARNING ECONOMIES” ITALY-SERBIA BILATERAL
PROJECT 899
Jelena Živković Ksenija Lalović Elena Battaglini Zoran Đukanović Vladan Đokić

ASSESSMENT OF VALUE OF BIOMASS ENERGY POTENTIAL FROM AGRICULTURAL WASTE IN LESKOVAC FIELD AND ITS IMPORTANCE IN THE SETTLEMENT DEVELOPMENT PLANNING 908

Mihailo Mitković Dragoljub Živković Petar Mitković Milena Dinić Branković Milica Igić

MULTIFUNCTIONAL FACILITIES – FROM PRIMARY FUNCTIONS TO SPATIAL LANDMARKS (STUDY OF TWO CASES IN SERBIA AND BOSNIA AND HERZEGOVINA) 918

Aleksandar Videnovic Milos Arandjelovic

URBAN NON-MECHANICAL CODE AND PUBLIC SPACE

Aleksandra Đukić¹

Faculty of Architecture, University of Belgrade, Bulevar Kralja Aleksandra 73/II, Belgrade, Serbia, adjukic@rcub.bg.ac.rs

Valentina Milovanović

Faculty of Architecture, University of Belgrade, Bulevar Kralja Aleksandra 73/II, Belgrade, Serbia, valentina.mil@live.com

Dubravko Aleksić

Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka, Stepe Stepanovića 77/II, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, dubravko.aleksic@aggf.unibl.org

ABSTRACT

Aligning urban planning and architectural design into mechanical production branches, as well as acting in the same way, leads to certain problems that mostly affect humans as primary users of every urban space. Elements which form cities are often a product of inadequate mode of thinking and interpreting of urban-architectural code. Turning off the real principles that underlie human life and existence of its natural environment, implies the creation of inadequate conditions and spaces with low “liveness” and usability. Lack of “liveness” in public spaces is reflected in features such as unattractiveness and inaccessibility, but also in the way of their using (major absence of user retention, usage only in necessary situations etc). Key to regeneration and further development of urban and architectural activities is echoed in enabling more quality and intense communication between space and users. By identifying and studying parameters the non-technical idea is based on, and through detection of established relations between them, it is possible to obtain relevant information and response to prevailing problem of current mechanical way of understanding nature, but also creating urban spaces which do not correspond to essence of people. Accordingly, the main idea of this paper is to present a new scientific and research approach, based on the integration and overlapping knowledge from completely different areas of science and everyday life. Non-mechanical approach is based on seven basic parameters, such as: attractors, fractals, iteration, algorithms, organized complexity, networking and manifest patterns. Recognition of each of these parameters in nature and structure of the human body, is kind of confirmation that their application in urban and architectural domain could bring a wide range of positive characteristics. So, it will be easier to overcome and solve the problems that arise as an outcome of the mechanical perception of nature and corresponding actions in cities.

Keywords: Non-mechanical, Code, Space Liveness, Public Space

Introduction

Incredible variety and complexity of life, in its essence is encoded in a very simple way. The reason for this is reflected in the way in which the DNA structure of living beings functions. It produces infinite number of different patterns, but it is essentially based on merely four simple molecules - adenine, thymine, cytosine, and guanine. Regardless of whether it is a human, as the most important representative of nature in the observed context, or any other plant or animal species, the principle of their formation and further functioning is the same. These are

¹ corresponding author

complex systems that are made up of a series of interconnected simple elements. In this way, we come to what the “natural code” actually implies, and what is ultimately reflected in everything that life is. Observing the complexity of life systems, but also the fact that people are at the same time natural beings and the primary users of urban spaces - cities, the idea arises that the actions of man in the urban-architectural domain (but in other areas, as well) should be harmonized with the basic parameters based on which the “natural code” is defined. In a certain way, Jencks (1997: 14) confirms the “natural code”, when he says that architects, designers and artists - as perhaps Ruskin argued - should look into their hearts and study the patterns. They show one different aesthetics: the aesthetics of life.

Bearing in mind the issues caused by the “mechanical” approach to scientific research, and later in practical work in the areas of architecture and urbanism, it can be concluded that the actions of man in these spheres should be based on what is represented by the “non-mechanical code”. By explaining the new scientific approach, based on the collection and overlapping of knowledge from various fields of everyday life and science, while proving its equivalence with the natural structure, it is possible to define the possibility and manner of “non-mechanical code” application in the urbanistic and architectural context. Therefore, the transposition of the “non-mechanical” ideas in the spatial area, enables the formation of urban and architectural model code, with characteristics corresponding to the nature, i.e. to the essence of human beings. The expected outcome of the application of the new “non-mechanical” code is to achieve the desired manifest pattern, more precisely, to open public city spaces with an adequate degree of “liveness” (which is conditioned by the “event” as the outcome of the interaction between the user and the city area). The manifest pattern, which is the result of the application of a “non-mechanical” approach, represents only one (final) of the total of seven parameters. Fractals, algorithms, iterations, attractors, organized complexity and networking, are the remaining factors that mutually might contribute to the creation of an urban environment which would be in line with the nature of the primary users - people. Jacobs (1961: 432) also discusses complex issues, and claims that this is not an unorganized complexity for which statistical methods have a solution. Namely, this is a problem that involves simultaneous confrontation with a fairly large number of factors, interconnected in the organic wholeness.

Attractors, fractals and iterations

The representation of all seven parameters of the new approach to scientific research, which integrates and/or overlaps knowledge from different scientific domains and everyday life in a unique way, is recognized in the process of creating manifest patterns in the overall natural structure (including human), practical and theoretical urban-architectural activities, but in many other areas as well. An innovative “non-mechanical” way of thinking and acting is reflected in the merging and interaction of everything defined through terms of networking, organized complexity, algorithms, iterations, fractals and attractors, with the aim of creating a specific manifest pattern. When it comes to the final result of the processes that take place in the fields of architecture and urbanism, i.e. the appearance of open public spaces, the factor of authenticity is indispensable. Mitchell (2005: 89) points out that even new technological capabilities are not always wisely used. Our new capacities for digital enabling of diversity and constructing unusual and irregular shapes, is sometimes developed only for the needs of sensational effects. However, the ingenious architects are starting to look beyond the short-term effect of the seductive surprise factor, and find new ways to react and respond. This new method excludes uniformized simplification and complies with the requirements of urban complex conditions.

Dobbins (2009: 74) distributes all elements of urban design into three spheres, which are in continuous interaction with one another: the physical environment, human activity and connections between them. Each area is made up of a set of characteristics that people are familiar with through their everyday experience. The most relevant ones for public space, urban design

and citizen engagement will be described in the paper. Dobbins further describes that the physical environment is composed of two parts: originally formed nature - soil, water, ecosystem, etc., and built structures that are the product of human activity over time - buildings, streets, and infrastructure and similar. Human activity is what people do, occasionally or often: work, sleep, play, driving, speech, etc. However, according to Dobbins' opinion, the most interesting issue is the relation between the physical environment (space) and human activity (user). In this way, we come to what the parameter of the attractors signifies in the areas of urbanism and architecture. In nature, attractors are recognized as connecting elements, regardless of whether it is their equalisation with connective tissues or with the process of crossing the parents' genetic traits through reproduction. The causal and consequential relationship in the functioning of all parts of the human body causes all of its actions, reactions and states. Generally, the outcome of the activity of the attractor is related to the genesis and maintenance of life. Transposed in the urban-architectural domain, attractors are elements that enable the establishment of an appropriate relationship between the user and space, and finally the state or behavior caused by the communication of the participants - an event. Accordingly, architecture is moving away from static compilation of separate parts and approaching a system that integrates and interacts with dynamic and interactive components (Redi and Schottner, 2005: 174).

The second parameter involved in the procedure of creating a "non-mechanical" urban-architectural model refers to the meaning and role of the fractals. The man and his natural environment are composed of numerous factors, arranged at different levels. This implies that manifest patterns that have emerged as a result of human activity - as an outcome of the action of living beings - should possess the same feature of layers and diversity at all levels. Accordingly, fractalization of an urban site, in the observed relationship, indicates the ability to recognize all layers of space and users. By defining the involved spatial fractals and acting in the sense of adequate improvement of their characteristics, the requirements for the activity of attractors (realization of events), which further influence the formation of "life" of a particular city segment, are realized. Communication between users and space should be developed at each possible instance, just as the life of a person depends on the stability and functioning of all body parts. On the grand scale, the authors Michael Batty and Paul Longley have identified a new way of thinking about life - their book, "Fractal Cities," from 1994, describes a dynamic, pulsating form of city growth and its death. [...] Real cities are completely different from mechanistic models that Le Corbusier and other modernists imposed on the life process in the city, and with the fractal paradigm in mind, planners can now approach the "fine-grained" and subtle growth, and work with it (Jencks, 1997: 11). It can be concluded that fractals are one of the key parameters for an adequate "non-mechanical" approach to architectural and urban planning activities, which in contemporary times has to be up to date with new developments and the advancement of technology, but also with the essential characteristics of the people as the primary users of the city. In line with the reasoning given by Jenks, the shift and moving away from the deep-rooted "mechanical" ideology is possible, even through appropriate treatment of simple and fragmented urban formations.

When analyzing different types of fractals, which can be recognized in the overall natural environment, it was concluded that they are composed of repeatedly reduced versions of their own structure. They appear in an identical, partially or completely transformed form, with mandatory retention of essential characteristics. Apart from the presence of fractal structures, it is important to note that the function of nature, among other things, is based on the fact that smaller units perform iterations and thus form more complex structures. Using iterations at different fractal levels, and including parameters that will be discussed in the paper later on, in the end we are able to define a unique outcome - the manifest pattern. One of the examples from the world of nature, referring to the iteration parameter, is related to the human DNA structure composed of smaller units that iterate. The specific order of repetition of pairs of DNA

chains - adenine and thymine, guanine and cytosine, greatly influences the formation of the human organism, and its essential physical and character features. As in the example of DNA structure, as in all other spheres of life (including urban-architectural), iterations are associated with the repetition of a process with the purpose of performing the most efficient task and creating the highest quality product. The formation and repetition of elements and actions related to users and space is necessary in order to correct the existing shortcomings and problems of the site, as well as to improve its general conditions. The path towards the desired manifest pattern implies constant involvement of iterations, which are a key factor for enabling the action of attractors at each fractal level. The gradual process of iterations should depend on the specific situation and the previously established algorithms, implying the preservation of original characteristics and binding in a global sense, with the purpose of the necessary preservation/achievement of identity and a striking image of the site. The importance of these components is confirmed by Arida (2002: 164), emphasising that a man has always strived for identification. The identity relies on duality rooted in socio-spatial-temporal infinity: group and spatial identity.

Algorithm, organized complexity, networking and appearance patterns of public spaces

Each segment of the nature and the human organism is built based on certain rules, and functions according to the appropriate "recipe". In addition, the use of algorithms in everyday life of people is constantly up-to-date, for example in a code of conduct or dress code, a manual for assembling furniture, a recipe for cooking dishes, legal regulations, building norms, etc. Having in mind the fact that the man as the basic user of built space actually came from the natural world, the significance of the application of the algorithm is unquestionable in terms of the adaptability of cities to the user structure. Therefore, transposing this parameter of a new scientific approach in the sphere of architecture and urban planning, refers to the creation and implementation of guidelines, which would allow the intensive use of space by all users - regardless of the site. Of course, the application of the algorithmic language (urban-architectural genotype) will not be unambiguous in all cases, since it would automatically imply production of monotony and uniformity of the manifest pattern. It would be changed in relation to the specific conditions, more precisely, it would be adjusted to the characteristics of the observed participants (space and users), through the processes of gradual iterations. Therefore, the urban-architectural genotype implies a starting point, a set of conditions and guidelines that have to be followed. However, the method of its application must be adapted to the original characteristics and the spirit of the observed space, leading to the urban-architectural phenotype, that by its application (by including the iteration parameter and attractors) ultimately provides a single product - a unique manifest pattern. Therefore, combining appropriate theoretical and empirical knowledge (guidelines derived from previous research on the new approach to scientific research and activities in the urbanistic and architectural domain, studying the general characteristics of open public urban spaces, proven and established building norms, etc.) with the conditions and characteristics of a specific place, represents a great potential when it comes to the process of creating an adequate manifest pattern. The desirability of interdisciplinarity, that is, the convenience of taking over and integrating different knowledge in a special form, is supported by numerous authors of today. For example, the experience arising from the research and action program "GRIBa" suggests that architects, planners and urban researchers have a common set of responsibilities that enable transdisciplinary research and action programs. In that way, in return, it would be possible to achieve identification of creative solutions to the complex problems of the city. However, in order to achieve this goal, future generations of professionals and researchers have to be trained to work closely together, and to show mutual respect of knowledge and skills to one another (Després et.al, 2011: 40).

The organized complexity and networking of all segments (and their interrelations) of the final

manifest pattern, are crucial features that are achieved through the application of the urban-architectural model, based on the new “non-mechanical” approach to scientific research. The natural code consists of a series of elements based on simple principles, which become more complex through development and interaction. The inclusion of algorithms and iterations at all fractal levels, and the action of attractors in the process of forming a particular manifest pattern, are parameters that imply the characteristics of organization and complexity. It is well known that a man acts in accordance with his character and physical abilities, and that each space has its own characteristics and conditions. The consequential activities of the participants (human and space), whose inclusion is also the basic goal of applying the new “non-mechanical” model of urban code, implies understanding and involvement of all necessary factors, as well as achieving the parameters of organized complexity. Gehl (2010: 63) expresses his view that a “living” city requires a diverse and complex city life, where recreational and social activities are mixed with the space for necessary pedestrian traffic, and opportunities for participation in urban life are open. Unlike Gehl, who primarily deals with users and their entrepreneurship when explaining the complexity, Grosz and Eisenman enter into the complexity theme in terms of relations between the man and city space. Although the relations between the body and the city are very complex and carefully fulfilled with behavioral, regulatory, psychological, legal and social components, the physicality of the city and the materiality of the body - relationship between exchange and production, habits, comfortism, destruction and reversals - items that are yet to be adequately observed as something tangible. The materiality of the city has the same order of complexity as the body (Grosz and Eisenman, 2001: 48). Generally speaking, cities represent some kind of reflection of events within social, cultural, economic and many other aspects. However, in the context of this study, the most important one is the sociological point of view - the design and the appearance of urban units, do not determine their own success or failure. The role of citizens, that is, accepting or rejecting of built structures by the user structure, is crucial for the final image of every urban place.

Synchronization and binding of all factors involved in the entire urban-architectural process (from analysis, through conceptual idea, to the implementation of the proposed solution) are very important when it comes to creating an appropriate manifest pattern, as an urban physical structure that constantly communicates with users. This characteristic is recognized in the system of the functioning of nature in several ways, and then adjusted to the domain of urbanism and architecture. The natural environment functions daily through all its factors, and the exclusion of only one of them could lead to the interruption of the continuity of action, as well as to the inability to continue the process. One example of natural networking and balance is the food chain, in which each participant has a clearly precised role and relation towards other participants. The occurrence of any inadequate changes in the nature functioning system could cause a disbalance of the whole with irreversible consequences to a comprehensive natural structure. Likewise, human actions in cities should be a product of a synchronized and binding effect of all the factors involved in the process, which is of particular importance for urban planning and architectural activity. By establishing and applying a new model of “non-mechanical” urban code, there are potentials for interconnection of manifest patterns, as well as the structures and processes creating them. Therefore, new possibilities are opened for establishing “non-mechanical” spaces, which would be adequate to the real human nature. Jacobs (1961: 433) considers that cities appear as problems within an organized complexity, as is the case with other sciences dealing with living organisms. Cities represent situations in which dozens of quantities are simultaneously different, but in a subtle and interconnected way. Again, cities are like life sciences that do not exhibit only one problem in organized complexity, which explains everything - if it is understood. They could be analyzed through a number of other problems and segments that, as in the case of science dealing with life issues, are also linked to one another.

Conclusions

It is proposed to examine the claim that 'urban designer is a designer of urban areas'. In short, 'design' is defined as an act of 'initiating changes in things created by man', which was extended to 'change in any environment', whether it is physical, psychological or virtual conversion. The term 'urban' refers to any human settlement, in its most generic sense (Arida, 2002: 110). Since it is a matter of human interference in the natural structure, it is necessary to base the whole urbanistic and architectural process on the principles of the functioning of nature. Correction of intense, lifeless and uniformized spaces that do not correspond to the user structure is possible through the change of attitude and the formation of the model according to the principles of the new "non-mechanical" approach to scientific research. By overlapping and integrating knowledge from different fields of science and everyday life, in the form of a "non-mechanical urban code", there is a chance to create preferred manifest patterns in cities. Lazarevic Bajec (187: 16) confirms that urban perception, as well as its connection with a complex process of knowledge of the environment, is a complex problem that has to be observed from several aspects.

One of the key aspects of the living world is the uniqueness of every part of it. Alexander believes that, if we learn to use life processes in the right way, their essential nature will be the creation of structures that are unique since they are perfectly adapted to local and unrepeatable conditions. Therefore, if a repetitive structure is built - let's say a group of houses or business objects, a series of windows, and even a series of similar office buildings or private offices - the life processes that are used will make each version of the repetitive structure similar, if appropriate. However, each repeating unit, each time it appears, will be slightly different, in line with the unique configuration of the circumstances in which it occurs (Alexander, 2005: 364). This claim focuses on the importance of the use of life processes and provides a guideline to address the global problem of incorrect "mechanical" interpretation of source code (in all spheres of everyday life and science). The original code of urbanism and architecture should be properly defined, since it represents the basic impulse for exiting the set limits, established architectural and urban dogmas, as well as forced school learning and institutions. In case of failure to do so, the chances of living in lifeless and uniformed areas are increasing. Ellin believes that globalization and accompanying standardization have simultaneously endangered the soul and nature of our landscapes, but also of ourselves. A man craves for unique and authentic experiences, as well as greater opportunities for freedom of expression. Just as people are interdependent, their activities in urban structures are also interdependent (2006: 7). The idea of a new scientific and research of "non-mechanical" approach and its corresponding action, in its core, represents the return to the essence of life, the real way of functioning of nature and the inner human being, and as such advocates to act in accordance with the "non-mechanical" principles in all spheres of life.

References

- Alexander, C. (2005.) *The Nature of Order, Book 3, A Vision of a Living World*, Berkeley, California: The Center for Environmental Structure in association with Patternlanguage.com.
- Arida, A. (2002.) *Quantum City*, Oxford, England: Architectural Press, An imprint of Elsevier Science.
- Després, C.; Vachon, G.; Fortin, A. (2011.), "Implementing Transdisciplinarity: Architecture and Urban Planning at Work." In *Urban and Landscape Perspectives: Transdisciplinary Knowledge Production in Architecture and Urbanism, Towards Hybrid Modes of Inquiry*, edited by Isabelle Doucet and Nel Janssens, 33-49. Springer Netherlands.
- Dobbins, M. (2009.) *Urban Design and People*, Hoboken, New Jersey, USA: John Wiley & Sons.
- Ellin, N. (2006.) *Integral urbanism*, Routledge, New York, USA: Taylor and Francis Group.
- Gehl, J. (2010.), *Cities for People*. Island Press.
- Grosz, E.; Eisenman, P. (2001.), *Architecture from the Outside, Essays on Virtual and real Space*. Massachusetts Institute of Technology.
- Jacobs, J. (1961.) *The Death and Life of Great American Cities*. New York, USA: Vintage Books, A Division of Random House.
- Jencks, C. (1997.), *The architecture of the Jumping Universe*. Academy Editions.
- Lazarević Bajec, N. (1987.) *Urbana percepcija*, Beograd: Centar za multidisciplinane studije Univerziteta u Beogradu.
- Mitchell, W. (2005.), "Constructing an Authentic Architecture of the Digital Era." In *Disappearing Architecture - From Real to Virtual to Quantum*, edited by Georg Flachbart and Peter Weibel, 80-89. Birkhauser - Publishers for Architecture, Basel, Switzerland.
- Redi, I.; Schottner, A. (2005.), "The Relationship between Architecture and Virtual Media." In *Disappearing Architecture - From Real to Virtual to Quantum*, edited by Georg Flachbart and Peter Weibel, 162-173. Birkhauser - Publishers for Architecture, Basel, Switzerland.

CIP - Каталогизacija 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 (5 ; 2018 ;
Belgrade)

Conference Proceedings [Elektronski izvor] / 5th international Academic
Conference on Places and Technologies, [Belgrade] ; [conference organisers
University of Belgrade - Faculty of Architecture and Professional
Association Urban Laboratory] ; editors Aleksandra Krstić-Furundžić ... [et
al.]. - Belgrade : University, Faculty of Architecture, 2018 (Belgrade :
University, 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 978-86-7924-199-3

1. Krstić-Furundžić, Aleksandra, 1954- [уредник] 2. Faculty of
Architecture (Belgrade)

а) Градови - Мултидисциплинарни приступ - Зборници б) Урбанистичко
планирање - Технолошки развој - Зборници

COBISS.SR-ID 262556428