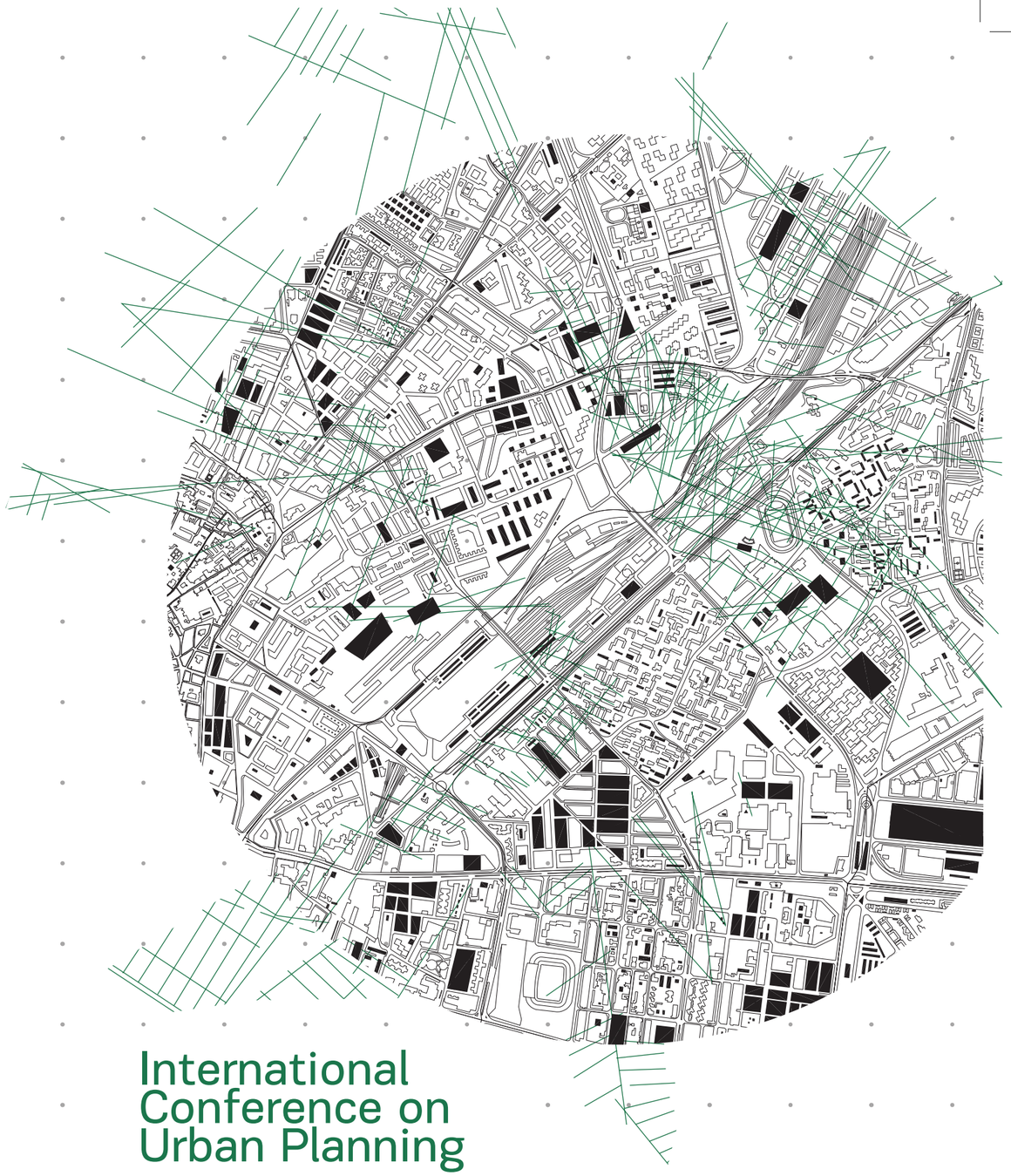
ICUP2025



International Conference on Urban Planning

ICUP2025

PROCEEDINGS

Serbia, Niš, April 10-11, 2025

urban planning cluster niš

International Conference on Urban Planning

ICUP2025

PROCEEDINGS

Serbia, Niš, April 10-11, 2025

International Conference on Urban Planning
ISSN 2738-0548

5th International Conference on Urban Planning - **ICUP2025**

Publisher
Urban Planning Cluster Niš
For Publisher
Miljana Ignjatović

Editor
Mladen Šoškić, PhD
Co-Editors
Milan Tanić, PhD
Slaviša Kondić, PhD
Milena Dinić Branković, PhD
Vuk Milošević, PhD

Text formatting, prepress and cover
Anđela Stevčić
Vukašin Stefanović
Vojislav Nikolić, PhD

ISBN-978-86-907796-0-4
Circulation
50 copies
Printing
Overprint Niš

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

711.4(082)(0.034.2)

INTERNATIONAL Conference on Urban Planning (5 ; 2025 ; Niš)
Proceedings [Elektronski izvor] / [5th] International Conference on Urban Planning - ICUP2025, Niš, April 10-11, 2025. ; [organized by Urban Planning Cluster, Nis] ; [editor Mladen Šoškić]. - Niš : Urban Planning Cluster Niš, 2025 (Niš : Overprint Niš). - 1 USB fleš memorija ; 6 x 2 x 1 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. - Tiraž 50. - Foreword / Mladen Šoškić. - Napomene i bibliografske reference uz tekst. - Bibliografija uz svaki rad.

ISBN 978-86-907796-0-4

a) Урбанистичко планирање -- Зборници

COBISS.SR-ID 169886729

5th International Conference on Urban Planning - **ICUP2025**

Organized by
Urban Planning Cluster, Nis

Co-organizers
Faculty of Civil Engineering and Architecture of the University of Niš
Faculty of Economics of the University of Niš
Faculty of Civil Engineering of the University of Belgrade
Faculty of Architecture of the University of Belgrade
Faculty of Geography of the University of Belgrade
Science and Technology Park Niš

Sub-organizer
Serbian Chamber of Engineers

ORGANIZING COMMITTEE

Senka Joković, Chairman, Urban Planning Cluster, Serbia
Miljana Ignjatović, Urban Planning Cluster, Serbia
Slaviša Kondić, PhD, Urban Planning Cluster, Serbia
Tanja Obradović, Ministry of Construction, Transport and Infrastructure
Vojislav Nikolić, PhD, Urban Planning Cluster
Aleksandra Mirić, PhD, Urban Planning Cluster
Milica Igić, PhD, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Jasmina Tamburić, PhD, Urban Planning Cluster, Serbia
Katarina Medar, PhD student, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milan Brzakovic, PhD student, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Marija Marinković, Urban Planning Cluster
Anđela Stevčić, PhD student, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Vukašin Stefanović, PhD student, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Jelena Đekić, PhD, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milica Ljubenović, PhD, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milica Jovanović, Faculty of Economics of the University of Niš
Ružica Petrović, Faculty of Economics of the University of Niš
Mileva Samrdžić Petrović, PhD, Faculty of Civil Engineering of the University of Belgrade
Marko Orešković, PhD, Faculty of Civil Engineering of the University of Belgrade
Jelena Marić, PhD, Faculty of Architecture of the University of Belgrade
Ksenija Lalović, PhD, Faculty of Architecture of the University of Belgrade
Bojana Pjanović, PhD, Faculty of Geography of the University of Belgrade
Branko Protić, Faculty of Geography of the University of Belgrade

SCIENTIFIC PROGRAM COMMITTEE

Mladen Šoškić, PhD, Chairman, Associate Professor, Faculty of Civil Engineering of the University of Belgrade
Slaviša Kondić, PhD, Urban Planning Cluster, Serbia
Vojislav Nikolić, PhD, Urban Planning Cluster, Serbia
Milan Tanić, PhD, Urban Planning Cluster, Serbia
Milena Dinić Branković, PhD, Associate Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milica Igić, PhD, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Aleksandra Mirić, PhD, Urban Planning Cluster, Serbia
Aleksandar Keković, PhD, Urban Planning Cluster, Serbia
Goran Jovanović, PhD, Urban Planning Cluster, Serbia
Vuk Milošević, PhD, Urban Planning Cluster, Serbia
Jasmina Tamburić, PhD, Urban Planning Cluster, Serbia
Slaviša Trajković, PhD, Full Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Marko Nikolić, PhD, Associate Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Ljiljana Vasilevska, PhD, Full Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Miomir Vasov, PhD, Full Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Ivana Bogdanović-Protić, PhD, Associate Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milica Ljubenović, PhD, Assistant Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Jelena Đekić, PhD, Assistant Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Mihailo Mitković, PhD, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Mirko Stanimirović, PhD, Assistant Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Branislava Stoiljković, PhD, Associate Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Danica Stanković, PhD, Full Professor, Faculty of Civil Engineering and Architecture, University of Niš, Serbia
Milan Ranđelović, PhD, Science technology park Niš
Sonja Lakić, PhD, Urban Planning Cluster, Serbia
Sebnem Hoskara, PhD, Urban Research and Development Center (URDC) Eastern Mediterranean University (EMU) Famagusta, North Cyprus
Michal Chodorowski, PhD, University of Technology, Bialystok, Poland
Željko Cvijetinović, PhD, Associate Professor, Faculty of Civil Engineering of the University of Belgrade
Marko Pejić, PhD, Associate Professor, Faculty of Civil Engineering of the University of Belgrade
Nenad Višnjevac, PhD, Assistant Professor, Faculty of Civil Engineering of the University of Belgrade
Milutin Pejović, PhD, Assistant Professor, Faculty of Civil Engineering of the University of Belgrade
Vladimir Lojanica, PhD, Full Professor, Faculty of Architecture of the University of Belgrade
Ana Nikezić, PhD, Full Professor, Faculty of Architecture of the University of Belgrade
Jelena Živković, PhD, Associate Professor, Faculty of Architecture of the University of Belgrade
Biserka Mitrović, PhD, Associate Professor, Faculty of Architecture of the University of Belgrade
Dragana Radenković Jocić, PhD, Full Professor, Faculty of Economics of the University of Niš
Vladislav Marjanović, PhD, Full Professor, Faculty of Economics of the University of Niš
Jelena Stanković, PhD, Full Professor, Faculty of Economics of the University of Niš
Velimir Šećerov, PhD, Full Professor, Faculty of Geography of the University of Belgrade
Zora Živanović, PhD, Associate Professor, Faculty of Geography of the University of Belgrade
Marija Jeftić, PhD, Associate Professor, Faculty of Geography of the University of Belgrade
Dejan Filipović, PhD, Full Professor, Faculty of Geography of the University of Belgrade
Branka Tošić, PhD, Full Professor, Faculty of Geography of the University of Belgrade
Siniša Trkulja, PhD in spatial planning, Agency for Spatial and Urban Planning of the Republic of Serbia
Ali A. Alraouf, PhD, Prof. of Architecture and Urbanism, Research and Development Urban Planning Dept. Doha, Qatar
Claudia Van der Laag, Professor of Urban Analytics, Oslo Metropolitan University
Todor Stojanovski, PhD, KTH Royal Institute of Technology, Stockholm, Sweden
Jose Pinto Duarte, Professor of Architecture and Landscape Architecture, The Pennsylvania State University, Stuckeman School of Architecture and Landscape Architecture
Wendy Tan, PhD, Land Use Planning Chair, Environmental Sciences Group Wageningen University & Research, The Netherlands
Ognen Marina, PhD, Director of the Center for Advanced and Postdoctoral Research – CAPRIS Ss. Cyril and Methodius University in Skopje, North Macedonia
Zorica Nedović-Budić, PhD, Professor Emerita, University of Illinois at Urbana- Champaign, Visiting professor, University College Dublin
Wen Jiang, Faculty of Architecture and Urban Planning, Chongqing University, China
Syafiqah Nazurah Binti Mukhtar, PhD, Department of Urban and Regional Planning, Faculty of Built Environment, Universiti Malaya
Philipp Ulbrich, Research Associate, Urban Big Data Centre, Urban Studies, School of Social and Political Sciences, University of Glasgow

CONTENTS

CONTENTS

ICUP2025
5th international conference on urban planning

IMPROVING THE QUALITY OF HOUSING IN THE CITY OF NIŠ THROUGH REVIVAL OF NIŠAVA'S RIVERBANK

Hristina Krstić

GAF, Serbia
PhD., Assistant Professor, hristina.krstic@gaf.ni.ac.rs

Branislava Stoiljković

GAF, Serbia
PhD., Associate Professor, branislava.stoiljkovic@gaf.ni.ac.rs

Nataša Petković

GAF, Serbia
PhD., Assistant Professor, natasa.petkovic@gaf.ni.ac.rs

Nataša Matić

GAF, Serbia
PhD student, nmatic.arch@gmail.com

ABSTRACT

The replacement of single-family with multi-family housing, as well as the construction of new multi-family buildings on unbuilt locations, in recent years, has led to the growth and concentration of the urban population in certain areas of Niš's urban municipalities. The increase in the population brings with it numerous other needs, among which the demand for amenities that complement residential functions stands out. The current situation in the field of housing design and construction in the city is largely influenced by investors' drive for maximum financial profit, resulting in new buildings being designed with minimal greenery, which is often not intended for the residents' relaxation or recreation, without spaces for socializing, children's play areas, and the like. In this context, residents of multi-family buildings are oriented toward public amenities of this type. However, despite the good potential, the quantitative and qualitative offer of such amenities in the city is inadequate. This paper deals with the idea of improving the quality of urban living by considering the possibilities of introducing public spaces designed for walking, rest, recreation, socializing, and children's play, along with revitalizing the banks of the Nišava River. The goal of the paper is to emphasize the need for a sustainable approach to urban planning that improves the quality of life for citizens and contributes to the preservation of natural resources. Such spaces can significantly enhance social interaction, physical activity, mental health, and the overall well-being of the population.

Keywords: *urban planning; multi-family housing in Niš; riverbanks; linear park*

1. INTRODUCTION

Increased construction of multi-family residential buildings in Niš has been evident in recent years. Multi-family residential buildings are not only being constructed on vacant plots, but also on plots occupied by family houses. Single-family housing in the urban fabric is gradually being replaced by multi-family housing, both in the downtown area and in the broader zones extending toward the periphery (Figure 1). By constructing apartments on the sites of former houses, the area of a plot that was once used by a single family is now inhabited by a much larger number of residents. One of the main characteristics of these newly built plots is their high occupancy, caused by the tendency of private investors, who are the main drivers of residential construction in Serbia, to maximize the profit. Parking spaces are often planned on the plot itself, rather than in

underground garages, for the sake of more cost-effective construction.[11] In this way, very little space remains for green areas on the plot, often none at all, and there is rarely any mention of other communal facilities that would serve for socializing, rest, recreation, or children's play. By conducting a detailed analysis of green spaces in multi-family residential buildings in Niš and the causes of their reduction, Kondić S. [11] provides guidelines and recommendations for addressing this issue, primarily emphasizing the need to revise regulations and the measures for their successful implementation in practice, through encouraging investors and raising awareness among homebuyers.

Figure 1: An example of four plots in the same neighborhood, where family houses are replaced or are being replaced by multi-family buildings, photos taken in 2013, 2014 and 2025, source: https://www.google.com/maps, Accessed 31st January 2025; https://a3.geosrbija.rs/, Accessed 31st January 2025; H. Krstić.

The quality of open spaces is an important factor that affects the quality of living. [16] Therefore, special attention should be given to this component when designing residential spaces, both at the architectural and urban planning levels. Considering the trend in residential architecture in Niš, dating back to the transitional period at the end of the 20th and the beginning of the 21st century, where the reduction of green spaces within residential buildings has become common, there is an urgent need to compensate for these spaces through public areas. Niš is a city with a decent number of parks, although their condition is unfortunately not up to an adequate level, along with large areas of undeveloped green spaces that hold enormous potential for improving the quality of life for citizens and generally enhancing the overall image of the city. One of the key potentials in this regard is the Nišava River, along the banks of which the city developed, and which will be the subject of discussion in this paper.

Considering the aforementioned facts, this paper explores the possibilities for improving housing in Niš by utilizing the potential of the Nišava River, specifically through the redevelopment and revitalization of its banks, along with the introduction of amenities aimed at enhancing the quality of life for the citizens. The aim of this paper is to identify models through urban planning that would compensate for the missing amenities in the structure of the existing housing stock, while simultaneously enhancing the overall attractiveness of the city. The methods applied in the research include analysis (primarily of the current state of multi-family housing in Niš, the potential of the Nišava River, and examples of good practices from abroad), synthesis (of the obtained results), comparison, description, and modeling. The paper is divided into six chapters.

2. THE NEED FOR COMMON GREEN SPACES IN NIŠ

Since the Rulebook on Conditions and Standards for the Design of Residential Buildings and Apartments [15] does not define open spaces (terraces, balconies, loggias, semi-loggias) as mandatory, it is possible for an apartment to be designed without open spaces or the areas of open spaces in the apartment can be maximally reduced in favor of increasing the area of residential premises. Due to the lack of space for outdoor living within the apartment and/or building, it is logical that residents turn to public open spaces in their surroundings, which highlights the significant need for such spaces in the city.

By analyzing the types of housing in the area covered by the latest General Urban Plan of Niš, the authors [12] conclude that greenery and open spaces for communal use are rarely present at the block level in residential

areas within reconstruction zones (mixed residential areas), and in newer multi-family housing, their absence is noted.

In this regard, it can be concluded that there is a need for common green spaces in Niš.

2.1. The number and quality of public green spaces in Niš.

Niš has several significant parks. The largest in terms of area are: Memorial Park Bubanj, Park within Niš Fortress, and Čair Park. Following these are medium and smaller parks, such as Sveti Sava (Saint Sava) Park, newly built parks near the Delta shopping center, parks along 7. Juli (the 7th of July) Quay and 29. Decembar (the 29th of December) Quay, as well as the parks in the vicinity of Kralja Aleksandra (King Alexander) and Sinđelić Squares. (Figure 2)

Figure 2: More important parks in Niš, source: https://a3.geosrbija.rs/, Accessed 31st January 2025.

Through field observation, it was assessed that the general condition of parks in Niš is poor in terms of equipment and physical condition. In general, the maintenance of parks by the public service responsible for them has been considered satisfactory. However, most parks are lacking urban furniture, such as benches, trash bins, lighting, playground equipment for children, outdoor exercise areas and equipment for adults, socialization spaces, water features, and fountains. An exception is the newly built park near the Delta shopping center, opened at the end of 2022. In terms of urban furniture, it is adequately equipped, but its size is not large enough to meet the needs of the surrounding buildings, whose residents gravitate towards it. The best-maintained larger park is the one within Niš Fortress, which is logical given its central location. Here, we do not consider the cultural and historical monuments within it and the adequacy of their treatment, as they are not the subject of this analysis.

It can also be observed that the majority of parks are located on the southern side of the Nišava River. If we exclude the Fortress, which is part of the old city center and its immediate surroundings, there are no significant parks on the northern side of the Nišava River.

3. POTENTIAL OF THE NIŠAVA RIVER FOR CREATING CONTENT THAT WOULD IMPROVE LIVING IN THE CITY

3.1. The importance and potential of the river in a city.

Riverbanks have historically been key factors in the development of cities, from early settlements to modern urban metropolises. They played a central role in shaping the economic, social, and cultural aspects of the city. Many ancient civilizations were founded along riverbanks, as rivers provided access to water, fertile land and transport routes, which allowed industries, crucial for the growth of settlements, such as agriculture and trade to develop.

In modern cities, riverbanks also play a key role. The numerous benefits provided by the presence of a river in a city, such as ecological (air quality, air temperature regulation, biodiversity preservation), social (community

and cultural contents, sports and recreation), and economic (tourism, for larger rivers also transport and trade), make riverbanks recognized as essential elements of the city.

In an era that is strongly fighting against global warming and its consequences, any natural element becomes a gem in the urban environment. Proper planning and preservation of riverbanks are essential for achieving sustainable development, protecting nature, and improving the quality of life in urban communities.

Ecological awareness and the understanding of the river's importance as an element of urban development have led many cities in recent decades to focus on the revitalization of their riverbanks. Rivers that were once industrial and polluted areas are now becoming spaces for tourism, recreation, and art, contributing to the renewal of the social and economic life of cities. Emphasizing the importance of riverbanks as urban spaces in cities, Raghda Najim Abed and Laila Akram discuss how the concept of humanization of the city is linked to sustainable development and that, in order to achieve a humane environment for people, it is necessary to add a human character to Riverbanks.[13] While, on one hand, ecologically and socially aware countries are working on the restoration and preservation of their riverbanks (two examples illustrating this are presented in Chapter 4), on the other hand, in many countries, the relationship between humans and nature has yet to be restored to balance, as depicted in the aforementioned paper [13], where authors point out the fact that at the present time it is noticeable "*the neglect of the human factor and a significant decline in human levels"* in riverbanks, "*as city planning focuses on creating spaces to accommodate vehicles instead of providing citizens with spaces that encourage social participation and social interaction"*, which "*has led to the lack of public spaces that enable citizens to enjoy the city*, *in addition to high pollution rates and the emergence of cities that are unfriendly to people and unsustainable"*.The study they made for the Tigris riverbank in Baghdad, also reveals many elements that could be recognized in the case of Nišava River in Niš, although these are two completely different cases in many aspects – cultural, historical, locational etc.

3.2. The potential of the Nišava River

The Nišava River cuts through the city in such a way that it becomes its focal linear element. Running in an east-west direction, it aligns with the longitudinal expansion of the city, passing through the city center itself. The riverbanks of the Nišava connect all five city municipalities, and along the river's course, it is possible to notice some significant urban parts that actively contribute to the life of the city. Heading upstream from the city center, these are the key locations: the city center (Kralja Milana (King Milan) Square – the main city square), Niš Fortress and the park around the Belgrade Gate within Niš Fortress (on the site of the former market), the University Building and University Park, the Kolo Srpskih Sestara Quay, the 7th of July Park, the 29th of December Quay, tennis courts, Delta shopping center (and two smaller parks nearby with furniture for children and their play), Green Oasis Park, Sinđelić Football Club, Merkator shopping center, and the Church of St. Vasilije of Ostrog (Sveti Vasilije Ostroški). Heading downstream from the city center, one encounters the complexes of the former Leather Factory "Đuka Dinić" and Rubber Factory "Vulkan," historical buildings and complexes with identified heritage value, which are privately owned and currently abandoned, at risk of complete devastation. [8, 9]

Based on the field analysis, the following conclusions can be drawn:

A) The banks of the Nišava River have been designed along a stretch of approximately 1.2 km between the Old Nišava Bridge and the Mladost Bridge (the Bridge of Youth), on both sides of the river. A part of the right bank of the river, approximately 460 meters long, from the Bridge of Youth to the Novobulevarski (New Boulevard) Bridge, has been partially developed. From the Bridge of Youth, passing under the Novobulevarski (New Boulevard), Pedestrian, and Proleterski (Proletarian) Bridges, along the left bank of the Nišava River, it is possible to walk up to the Vrežinski Bridge and the Church of St. Vasilije of Ostrog in Duvanište on a worn but undeveloped path, for a distance of about 3 km. In this area, on both sides of the river, wild greenery predominates, especially on the right bank, from the Pedestrian Bridge towards Duvanište. (Figure 3)

B) The Nišava River holds great potential for creating a linear park that, over a length of about 5 km, could unify the aforementioned features along the river, creating a continuous line that also connects all the city municipalities. By introducing new amenities (walking areas, cycling and fitness trails, spaces for recreation and outdoor relaxation, cultural spaces, playgrounds for children, etc.), adequately developing undeveloped areas, and improving the quality of existing ones, a significant urban zone could be created, bringing great benefits to the city.

Figure 3: A map of the developed sections along the Nišava River, source: author's drawing on a map downloaded from https://a3.geosrbija.rs/, Accessed 31st January 2025.

Based on the analysis of the current state of the Nišava riverbanks in the city of Niš, as well as a broader analysis of the main movement patterns of people in the city and an assessment of the needs of the population in residential areas adjacent to the riverbanks, the paper discusses the idea of creating a linear park along the Nišava River. This park would stretch from the Church of St. Vasilije of Ostrog in Duvanište to the complex of the former leather factory Đuka Dinić. These two points have been designated as the boundary points of the park due to their location and significance. The first, the Church of St. Vasilije of Ostrog, is a newly built Orthodox church that, even before its completion, became an important site not only for the residents of the Duvanište neighborhood but also for people from the entire city and beyond. This is evidenced by its high attendance, especially during major religious holidays, when the line to enter the church stretches far beyond the entrance. The second point, the Đuka Dinić leather factory, represents an important historical heritage from the pre-WW2 period, awaiting the continuation of its former life. The protection of cultural heritage is an imperative for every nation. Any neglect of buildings that have shaped the life of the city throughout its history is an act that directly endangers the city. In this regard, considering the importance of this complex as well as its location, this point emerged as a logical choice in defining the boundaries of the linear park. One of the possibilities proposed in this paper, drawing on similar examples from Europe and around the world, is the conversion of the mentioned industrial complexes (Đuka Dinić, Vulkan) into complexes with a primary cultural function (galleries, museums, concert halls, multifunctional spaces) and their connection to the river.

The creation of a linear park along the Nišava River has numerous justifications and strong chances for success. The starting assumption is that Niš needs functional, adequately equipped green open spaces, primarily to compensate for the lack of private greenery within multi-family housing. Additionally, Niš needs such spaces due to the inadequate condition of existing parks and the constant reduction of green areas within the city center to make way for new buildings (lack of inter-block greenery). Furthermore, in recent years, alarming cries from citizens regarding the city's pollution problem have been emerging in public. During the winter months, this primarily refers to the dangerous air pollution, for which concrete measures need to be taken. Another issue that stands out as essential is the improvement of the city's economic position.

Loss of public open space, particularly loss of green space in favour of buildings construction, is especially noticeable in the post-socialist cities due to rapid loss of greenery for a short time after the conversion from public to private ownership over land. [2] With the change in land ownership, specifically the shift from state to private investment, control over housing development is lost. The main goal of investor-driven architecture is personal profit, which leads to reducing areas that cannot be monetized to the legal minimum, while maximizing the square footage of areas that can be sold. The conditions from the Rulebook on Conditions and Standards for the Design of Residential Buildings and Apartments [15], as well as planning regulations, are followed only to meet the prescribed minimum, and in practice, there are often examples of completed buildings that show significant deviations from the regulations and/or the plan [11]. As a result, plots with a high building occupancy index emerge, with the free areas of the plots used for parking and very little or no

greenery. The greenery that appears within the plot is mostly a small grassy area, which is not functional, possibly with a few sparsely planted modest tree saplings. During the transition period, or the post-socialist period, a significant number of buildings were constructed without building permits, which were later legalized through a legalization process. Buildings constructed outside the regulations, as well as legally built multi-family residential buildings from the transition period, have greatly influenced the urban development of the city and its current appearance. During this period of construction, inter-block greenery was completely neglected, forcing residents to turn to larger public city parks. On the other hand, the situation in the field regarding public city greenery is very poor. Parks exist, but their equipment is largely inadequate (Chapter 2.1.). The need for their reconstruction and better maintenance is inevitable.

Figure 4: Linear park along the Nišava River could stretch from the former Đuka Dinić leather factory, a complex located near the city center, to the Church of St. Vasilije of Ostrog in the Duvanište neighborhood. The existing locations that could be connected are: A – Đuka Dinić and Old Vulkan Factories, B – King Milan Square (the main city square), C – Niš Fortress, D – Delta Shopping Center, E – Merkator Shopping Center, F – Church of St. Vasilije of Ostrog. Additional key points along the route are: 1 – Kolo srpskih sestara Quay, 2 – University Building and University Park, 3 – Park around the Belgrade Gate within Niš Fortress (on the site of the former marketplace), 4 – Park 7th July, 5 – Quay 29th December, 6 – Tennis courts, 7 – Park (near Delta Shopping Center), 8 – Park (near Delta Shopping Center), 9 – Green Oasis Park, 10 – Sinđelić Football Club. Source: author's drawing on a map downloaded from https://a3.geosrbija.rs/, Accessed 31st January 2025.

The need to increase green spaces in the city is essential, also due to the reduction of environmental pollution. This is especially true during the winter period, when air pollution levels in Niš are hazardous (Figure 5). Greenery would not completely solve this problem, but it would contribute to mitigating it. Rivers, particularly in urban areas, act as airways that provide the city with fresh air.[10] Built as a system, green areas improve the microclimate of settlements.[3]

From the economic point of view, the development of the Nišava Riverbank, specifically the creation of a linear park, would contribute to revitalizing the city and increasing its attractiveness. According to [14], streamside areas offer some of the most attractive sites for parks. Adequate shaping of the urban landscape can contribute to the creation of new urban landmarks. The realization of such a project would have a positive impact on the development of Niš as a tourist center. Additionally, by increasing land value, the city would attract other investments.

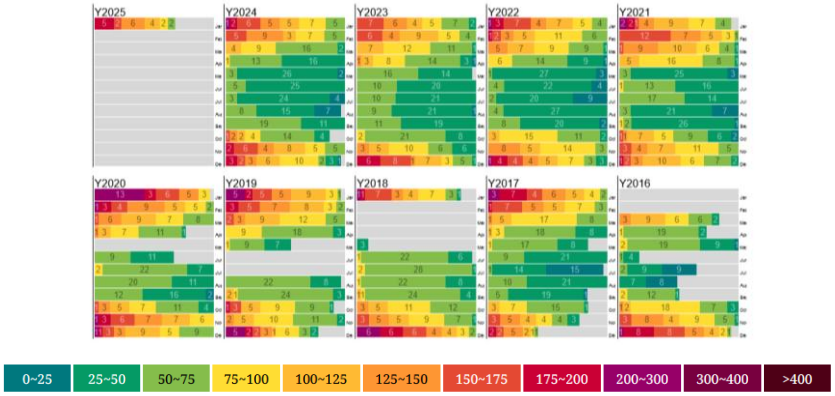


Figure 5: 2016-2025 daily average AQI measured in the Bulevard of Dr Zoran Djindjic in Niš
Scale: 0 – 50 - good, 51 -100 - moderate, 101-150 - unhealthy for sensitive groups, 151-200 - unhealthy, 201-300 - very unhealthy, 300+ - hazardous, source: https://aqicn.org/historical/#city:serbia/nis/izjz-nis, Accessed 12nd January 2025.

The Figure 4 shows an illustration of the the stretch of the linear park and the sections that, based on the analysis in this paper, would be justified to incorporate.

4.0. EXAMPLES OF PUTTING RIVERBANKS TO USE FOR CITIZENS – BEST PRACTICE EXAMPLES

Revitalization of riverbanks is an increasingly common urban intervention worldwide, particularly with the modernization of industry and its relocation outside cities. For better conclusions, this paper presents examples of successful reconstruction and regeneration of riverfronts near the central areas of two European cities. By analyzing these best practice examples and comparing them with the subject location, it is possible to discuss the advantages and disadvantages of interventions of this type.

4.1. Madrid Rio

Madrid Rio is one of the most important urban project in recent years in Madrid. [5] In order to improve traffic and reduce congestion, in the rapidly growing Madrid of the 1970s, the construction of the M-30 road began. This road, approximately 30 km long, enabled bypassing the central part of Madrid, connecting different parts of the city, and providing easier access to surrounding areas. Since the section of the road on the western side ran along the Manzanares River, this area became cut off from the central part of the city, inaccessible for pedestrians, overwhelmed by road traffic and with very few walking paths. According to Hernández-Lamas P. et al. [5], its heavy traffic turned it into an impenetrable and aggressive barrier, causing the river to remain completely isolated and disconnected from the city. It became a dividing element between the central and southwest neighborhoods, which over time led to a lack of safety and appeal in the area, turning it into a zone frequented by criminals and distancing it from the everyday use of residents. Giannelli A. et al. [4] mention that the western sector of the M-30 motorway, built between 1970 and 1974, transformed the area of the city of Madrid crossed by the river Manzanares into a "non-place".

Madrid Río (Figure 6) was developed between 2007 and 2011 after an international design competition organized by the Municipality of Madrid in 2005. The winning design, by the M-Río group specially formed for the competition, successfully brought the Manzanares River back to the people of Madrid, creating new green spaces, bridges, pedestrian walkways, bike paths, and a variety of services. These included sports facilities, playgrounds for both children and adults, cultural activities, kiosks, and restaurants. [4]

The overall project for the riverfront includes a comprehensive master plan that features 12 new pedestrian bridges, 6 hectares of public and sports facilities, as well as social, communal, and artistic amenities. It also introduces an urban beach, children's areas, the restoration of the river's hydraulic architectural heritage, and provides numerous benefits to the city of Madrid and its residents. Development plans were created for specific areas, including Salón de Pinos, Avenida de Portugal, Huerta de la Partida, Jardines del Puente de Segovia, Jardines del Puente de Toledo, Jardines de la Virgen del Puerto, and Arganzuela Park. [7]

Figure 6: (a) Spatial scope of the Madrid-Rio project, source: authors' illustration on the base of the map downloaded from https://www.bing.com/maps, Accessed 17th January 2025; (b) Madrid-Rio park, source: H. Krstić.

4.2. Rheinufer Promenade

The promenade along the Rhine was opened in Düsseldorf in 1902, along with a boulevard that was meant to ensure traffic connection with the city and the industrial zone along the river. However, progressive increase in motor traffic, primarily cars, especially after 1950, began to significantly affect the historical center of the city, as the land was turned into parking lots that started to cut off the city from its river, and the promenade became part of a highway used by around 50,000 vehicles daily, which led to the loss of the riverfront's function as an urban public space. At the same time, the city began to develop as an administrative metropolis, losing its role as an industrial center, which resulted in the consideration of new urban purposes for the former port area in the mid-1970s. A key element for urban transformation of the Rheine riverfront was the decision made in 1978 to locate the new federal parliament in the port area near the old district, as well as the construction of the communications tower in 1982. In order to build the parliament and the surrounding park, the traffic infrastructure in this area had to be reorganized, which led to the consideration of burying a section of the road along the Rhine, approximately 2 kilometers long. The realization of this idea would place motor traffic underground, freeing up the surface area that needed to be designed according to the needs of the users. Placing the main highway underground meant that the riverside promenade could be reestablished, the river with its landscape could be brought closer to the city, and the noise and other pollution could be reduced. Placing the roadway underground, not only reduced the traffic in its immediate vicinity but also throughout the entire old district, which also influenced the improvement of the residential environment. [6]

Figure 7: (a) Spatial scope of the Rheinufer, source: authors' illustration on the base of the map downloaded from https://www.bing.com/maps, Accessed 18th January 2025; (b) View of the descent into the tunnel near the Oberkasseler Brücke and Tonhalle, source: https://www.google.com/maps, Accessed 18th January 2025.

The new promenade, opened in June 1995, extends from the bridge Oberkasseler Brücke and a concert hall Tonhalle in north to the Rheinpark with Parliament buildings and high concrete telecommunications tower Rheinturm in south (Figure 7). The promenade stretches linearly through two levels: the lower one, in contact with the river, featuring outdoor seating areas and restaurant gardens, and the upper one, at the same level as the old town, with trees planted in lines. Burgplatz, located along the promenade, has regained its original significance as a gathering place for public events. The project also included the renovation of the old port area, now known as Schulstrasse, along with the restoration of the historic bastion as a reference to the old course of the Düssel River. The opening of the renovated promenade brought new spaces the citizens can enjoy, as well as the activities that transformed the area into a vibrant neighborhood. [6]

5.0. DISCUSSION – BENEFITS OF REVITALIZING RIVERBANKS

If we consider the success of the analyzed practical examples, we can conclude that the main benefits are primarily reflected in the improvement of citizens' quality of life (in terms of the availability of supplementary functions such as recreation and relaxation, the creation of spaces for social interactions and cultural events), the improvement of the living environment through the integration of the city with nature (in response to climate change, as well as contributing to the reduction of local air pollution), and the increased attractiveness of the city and its spatial value (impact on the economy, through new investments, boosting tourism), as well as the creation of a sustainable city while simultaneously promoting sustainable transport (encouraging cycling and walking), thus contributing to the humanization of the urban environment.

The positive impact can also be seen in the segment of improving public health and increasing the productivity of the population. Starting from the statement that there is an increasing need for healthy places like urban blue in cities and the assumption that these spaces are often not recognized as a beneficial health factor by planners and are regarded at best as a byproduct of green spaces, Völker Sebastian and Kistemann Thomas [17], examine the positive health outcomes and well-being generated by urban blue spaces. An exploratory case study, which deals with both health-enhancing and health-limiting aspects, concludes that health-enhancing aspects distinctly prevail over health-limiting factors presenting the evidence for the therapeutic value of urban blue.[17]

As one significant step towards creating a better city can be considered the recent amendments and supplements to the General Urban Plan of Niš 2010-2025 from 2024 [1], the fourth in line, which finally recognize the potential of the river. These amendments cover the entire area of the riverbank zone of the Nišava River, planned as the Nišava Riverbank Zone, which would be further developed through detailed urban planning. The zone extends through all five city municipalities. The conditions related to the construction of buildings and spatial planning within the Nišava Riverbank Zone should be elaborated in the general regulation plan, in accordance with the guidelines for further planning development. The amendments to the General Urban Plan foresee the planning of a continuous pedestrian, fitness, and bicycle path in the east-west direction. These modes of transport are given priority over vehicular traffic. The possibility of planning new pedestrian-bicycle bridges across the river is provided, based on needs. The guidelines related to the planning of paths through the area are as follows: The main bicycle path should be planned for cycling in both directions (one towards the east and the other towards the west), either as a one-way path or as two separate paths for each direction. The main pedestrian, fitness, and bicycle path should primarily be planned on one bank of the river, with the direction of the paths switched to the opposite bank only in the case of limiting spatial conditions. Along the main bicycle and fitness path, bicycle parking, rest stops, and resting areas should be planned, with shaded areas and access to public drinking water. Along the main pedestrian path, seating areas with shade and drinking water should be provided. The main pedestrian, fitness, and bicycle paths should be planned in such a way that at both the western and eastern ends, uninterrupted direction changes or circular movement are ensured. Linear greenery and tree rows should be planned along the bicycle, pedestrian, and fitness paths. The General Urban Plan mandates that at least 60% of the total riverbank area should be planned for predominant purposes such as recreation, sports, parks, and landscaped green spaces. A maximum of 10% of the total riverbank area is designated for all types of vehicular traffic. [1]

6.0. CONCLUSIONS

Spontaneous construction, which was characteristic of the transition period, has theoretically been 'brought into order' through the adoption of the Rulebook on Conditions and Standards for the Design of Residential Buildings and Apartments, as well as local urban planning regulations. However, numerous limitations, as well as interpretations of the regulations, influenced by investor-driven construction and the investors' desire for higher profits, while neglecting the needs of residents, have caused significant damage to the urban and architectural image of the city of Niš. The lack of space for rest, recreation, socialization, children's play, etc., as a supplement to the residential function, drastically lowers the comfort level of the residents. To compensate for this lack of amenities, the paper proposes utilizing the potential offered by the Nišava River. Due to its position in a relation to the city, the Nišava River could directly or indirectly compensate for the observed deficiency for a large number of residential blocks along its course. The paper highlights the possibility of activating a section of the Nišava riverbank, about 5 km long, through the integration of riverbanks with other urban zones, while introducing missing amenities at both the residential and public function levels.

Neglecting the riverbank causes significant harm to the city. The banks of the Nišava River hold great potential, which could significantly contribute to improving the quality of life in the city and create a more beautiful and healthier urban environment. Utilizing the potential of these area would influence the profiling of Niš as a sustainable and attractive city, focused on people. Recognizing the potential of the Nišava by planners is the initial, but very important step that could lead to the city's improvement.

ACKNOWLEDGMENTS

This research was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia under the Agreement on the Implementation and Financing of Scientific Research Work of the NIO in 2025 - Registration number: 451-03-136/2025-03/ 200095 dated 04/02/2025.

REFERENCES

1. Četvrtie izmename i dopuname Generalnog urbanističkog plana Niša 2010-2025, Niš, 2024.
2. Đekić J., Dinić Branković M., Mitković P., Igić M., Mitković M., 2017. *Urban green areas planning and developement: an assessment of general urban plans of the city of Niš***,** FACTA UNIVERSITATIS, Series: Architecture and Civil Engineering, Vol. 15, No 2, pp. 211-224
3. Đekić J., Dinić Branković M., Mitković P., Igić M., Mitković M., 2017. *Urban green areas planning and developement: an assessment of general urban plans of the city of Niš*, FACTA UNIVERSITATIS, Series: Architecture and Civil Engineering, Vol. 15, No 2, pp. 211-224
4. Giannelli A., Giuffrida S., Trovato M.R., 2018. *Madrid Río Park. Symbolic Values and Contingent Valuation*, Valori e valutazioni, No. 21, pp. 75-85
5. Hernández-Lamas P., Rubio Gavilán A., Bernabeu-Larena J. 2016. *Parks and roads build the cities: the M-30 and Madrid-Río project, building landscape*, A: Virtual City and Territory. "Back to the Sense of the City: International Monograph Book". Barcelona: Centre de Política de Sòl i Valoracions, pp. 415-428.
6. https://www.publicspace.org/works/-/project/w013-rheinufer-promenade, Accessed 18th January 2025.
7. https://www.west8.com/projects/madrid-rio/, Accessed 18th January 2025.
8. Jevremović L., Turnsek B., Milojković A., Jordanović M., Vasić M., 2017. *The built heritage of pre-WWII industrial architecture in Niš (Serbia). Current position and opportunities*, The 4th International Conference "The Importance of Place", Sarajevo, pp. 215-222
9. Jovanović M., Mirić A., 2014. *Leather factory „Djuka Dinic in Niš" – possibility of revitalisation*, Zbornik radova Građevinskog fakulteta, Međunarodna konferencija savremena dostignuća u građevinarstvu, Subotica, pp. 745-750
10. Katayama T., Hayashi T., Shiotsuki Y., Kitayama H., Ishii A., Nishida M., Tsutsumi J., Oguro M., 1991. *Cooling effects of a river and sea breeze on the thermal environment in a built-up area*, Energy and Buildings, Vol. 16 (3-4), pp. 973-978
11. Kondić S., 2021. *Arhitektura višeporodičnog stanovanja u Nišu u periodu tranzicije: stanje i modeli unapređenja*, Doktorska disertacija, Građevinsko-arhitektonski fakultet, Univerzitet u Nišu
12. Maksić Mulalić M., Manić B., Njegić T., 2024. Tipovi stanovanja na području Generalnog urbanističkog plana Niša / Types of housing in the area of the general urban plan of Niš, Arhitektura i urbanizam, Vol. 58, pp. 47-57
13. Najim Abed R., Akram L. 2024. *Employing Riverbanks to Humanize Cities*, Natural and Engineering Sciences (NESciences), Vol. 9, No. 3, pp. 177-192
14. Peter H., 2010. Urban Green: Innovative Parks for Resurgent Cities, ISLAND PRESS, Washington,
15. Pravilnik o uslovima i normativima za projektovanje stambenih zgrada i stanova, "Sl. glasnik RS", br. 58/2012, 74/2015 i 82/2015)

16. Vasilevska, Lj., 2021. *Towards more user-friendly public open space in low-rise high density housing areas*, 1st International Conference on Architecture & Urban Design Proceedings, EPOKA University, Department of Architecture, Tirana, pp. 855-865
17. Völker S., Kistemann T., 2013, Reprint of: "I'm always entirely happy when I'm here!" Urban blue enhancing human health and well- being in Cologne and Düsseldorf, Germany, Social Science & Medicine Vol. 91, pp. 141-152