



ClicHE

**participatory
urban design**

Valjevo, 2023.

Climate Change, Cities,
Communities and
Equity in Health



CliCCE Participatory Urban Design





TITLE

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The book is published as an integral part of the project:

Climate Change, Cities, Communities and Equity in Health

Erasmus+ cooperation partnerships in higher education

Project code: 2021-1-IT02-KA220-HED-000032223

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TOTAL DESIGN: Tamara Mladenović

TRANSLATION : Tamara Mladenović

PRINTED BY: Službeni Glasnik / Jovana Ristića 1, 11040 Beograd

NUMBER OF COPIES: 300

PLACE AND YEAR EDITION: Belgrade, 2023

ISBN-978-86-7924-348-5



Co-funded by the
Erasmus+ Programme
of the European Union

This project is co-funded by the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Introduction

Editors

This book is a presentation of the results of the work of the University of Belgrade, Faculty of Architecture during the 2022-2023 school year in the frame of the Erasmus+ European project Climate changes, Cities, Communities and equity to Health (CliCCHE), which aims to develop and test new experiences in teaching and studying at the technical faculties of European universities in order to improve knowledge about strategies for adapting to climate change and for mitigating the impact on human health within urban regeneration projects.

The CliCCHE partnership brings together four academic partners, one research center and four cities from Italy, Cyprus, Portugal and Serbia: University of Camerino, Camerino, Italy; University of Belgrade, Belgrade, Serbia; National Research Council, Rome, Italy; Cyprus Institute, Nicosia, Cyprus; University Institute of Lisbon, Lisbon, Portugal and associated cities: City of Valjevo, Serbia; San Benedetto del Tronto, Italy; Lisbon, Portugal; Municipality of Strovolos, Nicosia, Cyprus.

The University of Belgrade, Faculty of Architecture, during the entire cycle of the CliCCHE project (January 2022 - January 2024), applied the principles and results of the CliCCHE project in its regular teaching and research and thus widely promoted the mission, vision and values of the CliCCHE project within its own academic community. In addition, during that entire period, most of the practical research and educational activities were realized in the city of Valjevo, the local academic partner of the project, and thus the dissemination of the project was also extensively realized in the local community of the partner city, at all levels of social organization: public, private and civilian sector.

As part of research and educational activities at the University of Belgrade, Faculty of Architecture, the results of the CliCCHE project were realized within:

- Public Art & Public Space, international, interdisciplinary, scientific-research and educational program of the University of Belgrade - Faculty of Architecture
- Research laboratory 17: Participatory urban design and participatory public art

Elective courses:

- Urban open spaces (3rd year of undergraduate studies - Prof. Zoran Đukanović)
- Artistic design of public urban spaces (1st year of master's study - Prof. Zoran Đukanović)
- Urban recreation (1st year of master's study - Prof. Jelena Živković)

Compulsory subjects:

- STUDIO-M02U – Participatory urban design – project (1st year of master's study - Prof. Zoran Đukanović)
- STUDIO-M02U – Participatory urban design – seminar (1st year of master's study - Prof. Zoran Đukanović)

More than 80 students from all levels of education (bachelor, master and doctoral studies), 5 associates, 5 professors from the University of Belgrade, 10 international and domestic experts and professors, as well as all members of CliCCHE teams from all partner institutions participated in these activities.

In the realization of research and design of solutions for mitigating the effects of climate change on people's health in the city of Valjevo, numerous sources from the theoretical, legislative and planning corpus of the EU were used, and documents from the local legislative and planning framework of the Republic of Serbia, the Kolubara region and the city of Valjevo were specifically used. Here we will list and very briefly comment on only the most important ones:

Spatial plan of the Republic of Serbia from 2021 to 2035 (2021)

General assessment of the state of adaptation to climate change

The field of climate change in the Republic of Serbia is regulated through the implementation of a large number of ratified conventions and international obligations, which are further implemented through the legal basis. A draft of the Law on Climate Change has been prepared, which establishes a system for reducing greenhouse gas emissions and adapting to changed climate conditions. Adopting that law fulfills obligations under the UN Framework Convention on Climate Change and the Paris Agreement, and aligns domestic legislation with EU acquis. The law prescribes the adoption of two key documents - Low-carbon development strategy with an action plan, which determines the strategic directions of action and public policies related to the limitations of GHG emissions; and the concept of adaptation policy to changed climate conditions, in order to identify the impact of climate change on sectors and systems, the possibility of reducing

the adverse impacts of climate change, and taking courses of action related to the reduction of adverse impacts. The research of climate changes in Serbia is of particular importance considering its position between Mediterranean and continental climate conditions. A significant increase in air temperature was observed at most meteorological stations. During the last ten years (2008-2017), the deviation of the average annual temperature was greater than 1.5°C in the largest part of the territory of Serbia, while in the western and eastern parts the deviation was greater than 2°C. The number of frosty days (days when the minimum temperature is below 0°C) in Serbia in the period 1998-2017, decreased by 5 to 10 days. The change in the number of summer days (days when the observed maximum temperature is higher than 25°C) shows that in the period 2008-2017, in a large part of Serbia, on average during the year there were more than 25 summer days compared to the values of the reference period (1961-1990). In the analysis of the risk of high temperatures and the threat to the ecosystem, the economy and human health, the duration of heat waves and their frequency are particularly important. On average for the last 10 years, there were more than 20 days of heat waves per year, and an increase of more than 30 days was observed in western and central Serbia. In the period 2008-2017, in 134, the average number of extreme heat waves increased by 2-3 per year compared to the reference period, with the highest frequency of occurrence in western and southwestern Serbia, where the increase amounted to over 4 heat waves. In Serbia, there was an increase in the intensity of the occurrence of heavy rainfall compared to the reference period, with more pronounced changes during the last decade. The number of days with very heavy precipitation (days with precipitation over 20 mm) increased by 1-2 times on average. The frequency of more extreme weather events (days with precipitation over 40 mm) in certain parts of Serbia increased by more than 5 times compared to the reference period. The tendency of decreasing precipitation, as well as the trend of seasonal distribution of precipitation in Serbia can have consequences on ecological, economic, agricultural and social processes. The current adaptive capacity of the Republic of Serbia to climate change cannot be considered adequate. The development of the climate change adaptation system has not yet been sufficiently recognized in sectoral policies, as well as in the adopted spatial and urban plans on the territory of the Republic of Serbia. In recent years, capacities for strategic planning and consideration of climate change issues have begun to strengthen. Activities are focused on the processes necessary to reduce the causes of climate change (mitigation), and consideration of adaptation to climate change is actualized through the legal basis. In addition, Serbia has significantly improved its capacities in the field of climate change monitoring, especially through the improvement of databases.

Assessment of potential and limitations

The potentials are: the existence of a system for monitoring and early warning of extreme weather events (Climate Watch System - CWS) and a geospatial database of climate data obtained by climate models; and defined zones of greatest vulnerability to climate change on the territory of Serbia.

The limitations are: the slow inclusion of climate change issues in planning documents at the national, regional and local level; modest adaptive capacity of the Republic of Serbia to climate change; insufficient level of flood protection, especially during the planning, construction and maintenance of flood defense systems; the country's energy orientation towards traditional energy sources and the small share of renewable energy sources in relation to the country's total energy needs; inconsistency of sectoral policies with policies and strategic frameworks in the field of climate change; insufficiently effective regional and international cooperation in the field of climate change, and especially in the field of adaptation to climate change.

Starting points for protection and improvement of the environment's quality

In order to achieve sustainable development and arrangement of the territory of the Republic of Serbia, the strategic commitment is to integrate aspects of the impact on the environment into the development policies of other areas, primarily energy, industry, agriculture, transport, water management, etc. The protection and improvement of the quality of the environment in the time horizon until 2035 is based on the implementation of the following activities: - preservation of all elements of the environment: water, air, soil, natural and cultural heritage, biodiversity; - integral planning based on the principles of preventing congestion in space and rational use of natural resources (agricultural and forest land, water, raw materials, etc.) respecting the capacity of space and the environment; - prevention and remediation by applying the precautionary principle for activities that may cause greater pressure on the environment or uncertainty and by applying remedial measures in degraded and polluted areas; - defining protective zones, zones of influence and protective distances around objects and activities that emit significant pollution or pose a risk to the environment and human health. Priority activities will be directed to areas with extremely polluted environment and great pressures on space, resources, population and environment (urban, industrial, mining, electricity production areas and other threatened areas with exceeded values of pollutants in air, water and soil, endangered living world and habitats, endangered human health) and sensitive areas in terms of pollution and pressures on the environment (areas of protected natural and cultural assets, as well as areas of high quality environment, with preserved potentials and

without the presence of sources of pollution or with pollution far below the permitted limits).

Adaptation to climate change

Adapting to climate change from the aspect of planning and building residential and public facilities, public spaces and supporting infrastructure in urban areas implies integrative, adaptable and flexible urban planning and architectural design that takes into account climate change and extreme weather events. Policies in the field of spatial and urban planning have so far not established an adequate connection between urbanization and climate change, which results in uncontrolled expansion of cities and settlements, unsustainable use of natural resources and direct negative impacts of inadequate city planning on climate change. When planning settlements or parts of settlements it is necessary to take into account the need to reduce urban heat islands and increase air circulation in city centers, as well as to adequately protect settlements from floods, landslides, erosion and extreme weather events (hail, stormy winds, large amounts of precipitation, drought, heat waves, blizzards and drifts, etc.). For all scenarios of the effects of climate change, it is necessary to develop and implement action plans for adapting to climate change at the national, regional and LGU levels. It is also necessary to adapt the planning system and develop adequate planning instruments at different decision-making levels.

In this regard, the methodology of spatial and urban planning must go in the direction of adapting residential, especially urban, environments to global climate changes. The potential for reducing GHG emissions lies primarily in the energy sector, through increased energy efficiency and the use of renewable energy sources. The use of renewable energy sources in industry should double compared to 2015, increasing from 126 ktoe to 282 ktoe, and increasing energy efficiency should reduce consumption from 483 ktoe to 358 ktoe. Household energy consumption, not including electricity, per square meter of living space should decrease from 90 kWh/m² to 81 kWh/m².

Agriculture is highly dependent on climate change. Various technological solutions are being developed and applied in order to reduce the dependence of agricultural production on unpredictable climatic conditions (application of protective measures, drainage, irrigation, etc.). The sensitivity of agricultural systems to climate change varies among regions.

The effects of climate change will be considered in the regions of Serbia, but different regional adaptation scenarios cannot yet be reliably defined. The most important agricultural regions of Serbia are located in AP Vojvodina and in the valleys of larger rivers, and it is precisely in these lower parts that drier climate conditions are expected. For the territory of AP Vojvodina, it is projected that the rise in temperature and summer drought will significantly threaten the yields of spring crops compared to winter. On the other hand, with winter crops, the positive effects (extension of the growing season) are expected to outweigh the indirect negative effects. The assumed higher frequency of extreme weather conditions will also affect agricultural production, primarily crop production. Among the most significant drought adaptation measures is irrigation, which should be implemented on an additional 100,000ha by 2035. The water areas of Bačka and Banat have the greatest potential. The areas of Srem and Mačva have limited potential, as do certain parts of Belgrade (e.g. Barajevo) and the areas of Toplica, Južna Morava and Šumadija, which, without accumulations and reuse of purified water, have no potential for irrigation. The construction or improvement of the irrigation system in particular should be reviewed in the vicinity of Čačak, Arilje, Lučani, Požega, Gornji Milanovac, Bor, Požarevac, Veliko Gradište, Lučani, Lazarevac, Kikinda, Zrenjanin, Topola, Lajkovac, Kraljevo and Čuprije, where a quality problem is identified and water availability. The expected increase in air temperature, and more frequent and longer dry periods will contribute to the faster spread and increase of forest fires.

It is expected that the additional deficit of precipitation and the increase in temperature in the future will cause even more pronounced negative impacts. Increasing the area under forests, as well as improving forest management practices, represent a significant measure that can contribute to the reduction of GHG emissions. Estimates are that they can lead to an increase in the carbon sink in forests by 17% by 2030 and between 22% and 132% by 2050 (compared to 2010). Emissions of greenhouse gases in the industry sector closely follow economic activities. Assessments of mitigation opportunities indicate the need to limit the growth of GHG emissions in industrial processes and product use to 7% by 2030 and keep emissions at a level between +3% to -3 by 2050. Unlike agriculture, forestry and tourism, climate change has no direct effects on the functioning of industrial activity. The synergistic impact of climate change and extreme weather events occurs together with other potential natural disasters. Climate changes in Serbia are already showing a significant impact on the existing tourist offer. Since a favorable climate is one of the most important factors in the tourist attraction of a place, it is obvious that due to unfavorable climate changes, there will be significant delays in this sector. The development of tourism must rely on adapting to possible changes and mitigating the damages caused by various weather disasters. Climate change and the resulting natural disasters can harm tourism infrastructure, natural values and cultural heritage, biodiversity and landscape, as well as local communities and the comfort of tourists. The changes directly affect the limitation of existing activities in certain tourist destinations, especially in winter tourist centers, due to the decrease in snowfall, i.e. raising the upper limit of snow retention. These impacts will be felt less in high mountain destinations

(Kopaonik, Stara planina, Šar planina, Prokletije) where most of the winter offer is located above 1500 m.a.s.l. These destinations will maintain a year-round offer, but will be exposed to greater pressure from tourist demand, especially in the winter period. In addition to the mentioned direct effects, climate change also has an indirect impact on the economic, ecological and social aspects of tourism, due to the necessity of allocating additional funds for the remediation of the consequences, the development and adaptation of accommodation facilities and tourist infrastructure, losses due to the reduction of supply (especially in winter), etc. The development of tourism adapted to climate changes should be based on variant solutions and rapid adaptability of tourist capacities and offers in the area, as well as on the replanning of tourist destinations, places and centers.

National Strategy for Sustainable Development (2008)

The goal of the National Sustainable Development Strategy is to balance three key factors, i.e. three pillars of sustainable development: sustainable economic growth and economic and technological development, sustainable development of society based on social balance, environmental protection with rational disposal of natural resources, combining them into one a whole supported by an appropriate institutional framework.

Protection and improvement of the environment and rational use of natural resources, preservation and improvement of the environmental protection system, reduction of pollution and pressures on the environment, use of natural resources so that they remain available for future generations, for which it is necessary to achieve: - establishment of a system of protection and sustainable use of natural resources, i.e. resources (air, water, soil, mineral raw materials, forests, fish, wild plant and animal species); - strengthening mutual action and achieving significant mutual effects of environmental protection and economic growth, inclusion of environmental policy in the development policies of other sectors; - investing in reducing environmental pollution and developing cleaner technologies; - reduction of the high energy intensity of the economy of the Republic of Serbia and more efficient use of fossil fuels; - encouraging the use of renewable energy sources; - planning of sustainable production and consumption and reduction of waste per product unit; - protection and preservation of biodiversity.

Regional spatial plan of the Kolubara district affected by the earthquake

One of the main pillars of the Regional Spatial Plan relates to savings, rational use and protection of natural resources, especially deficit and strategically important for development and quality of life. Emphasis is also given to the improvement and protection of the environment, the protection and promotion of valuable natural heritage and the preservation of special purpose areas with natural values of importance for biodiversity and environmental quality.

Regional spatial plan for the area of Kolubara and Mačva administrative districts (2012 Draft)

The following environmental categories were determined on the territory of the city of Valjevo: 1) higher level of pollution (area of polluted and degraded environment) in the regional center and industrial zones of Valjevo, 2) low level of pollution (area of predominantly quality environment) and 3) unpolluted area (area of quality environment).

Spatial plan of the city of Valjevo (2013)

On the territory of the town of Valjevo, there are four categories of environmental quality. The urban center belongs to category I of environmental quality - an area of polluted and degraded environment, with negative impacts on humans, flora and fauna and quality of life. It is characterized by cross-border pollution values, increased noise intensity, inadequate handling of wastewater, industrial and municipal waste, and risks of accidents during the transportation and/or use of hazardous materials. Category II - areas of endangered environment with minor impacts on humans, the living world and quality of life, can be classified in the peri-urban zone, primarily settlements with more than 1000 inhabitants (Popučke, Gornja Grabovica, Sedlari, Gornja Bukovica, Lukavac) where there are problems with waste water treatment, disposal of municipal waste and agricultural waste and improper use of agrochemicals, the tourist center of Divčibare, areas along the corridors of national roads of the first and second order and the railway line. Category III - areas of quality environment with predominant positive effects on people, the living world and quality of life include uninhabited forest areas, agricultural, fruit-growing and wine-growing zones, Class II watercourses, Brankovina, territories of small rural settlements. Category IV - areas of high quality environment dominated by positive influences on humans and the living world, include areas of protected natural resources, mountain areas/peaks, difficult-to-access terrains and Class I watercourses. In the area of the city of Valjevo, it is the gorge of the river

Gradac (an area of exceptional quality and a watercourse of the 1st class), Petnička Pečina (natural monument), Crna Reka (a strict nature reserve), Taorska vrela and Valjevska mountains. According to available data, the main causes of environmental pollution are unsatisfactory communal infrastructure and services, traffic, industrial production.

In terms of environmental protection, the city primarily faces the following problems: solid waste management throughout its territory; waste water management and development of the sewage network in the city and in the countryside, especially when it comes to the protection of the planned reservoir "Stuborovni"; air pollution in Valjevo and suburban settlements, due to inadequately resolved heating and traffic, especially transit traffic through the city. In the area of the city, there are significant potentials for the development of water management, forestry, organic agriculture and tourism, provided that the goals and appropriate conditions of environmental protection are realized. The potential is also represented by areas classified into categories II and III of environmental quality, where with a minimum of communal space planning, more categories of environmental quality can be achieved, as well as areas in category IV that need to be preserved and protected.

Master plan of Valjevo (2013)

General objectives of the general urban plan of Valjevo and basic program elements

- Valjevo as the center of the district and city should satisfy the need of current and future residents for a general improvement in the quality of life.
- Considering transitional and other socio-economic changes, the needs for restructuring the economy and a new way of forming the economic base of society on market principles should be met.
- To plan rationally and realistically, in a sustainable way, through democratic management of natural and created resources of the local community and the space being planned.
- Make the general plan as flexible as possible in relation to the variety of requirements for the use of space.
- To preserve and improve the specialness and uniqueness of Valjevo with historical places and monuments
- To improve the traffic accessibility of Valjevo and the connection of all parts of the city and its surroundings.

In order to reduce anthropogenic impacts on the environment and climate change, the reconstruction of the energy sector in the city is foreseen by expanding the gas pipeline network, investing in the development of new and renewable energy sources in the personal and general consumption and agriculture sectors, and less in the industry and power industry. With the necessary investments and more intensive scientific and research work, the share of new and renewable sources in the final energy consumption in the area of the Spatial Plan will amount to about 5%. Of the new and renewable energy sources, the use/application of hydropower will increase the most. The possibility of using biomass, geothermal, solar and wind energy will also be significant in accordance with the research results and established investment justification. Small hydropower plants will be used for decentralized production of electricity in the mountainous area of the city for local supply of consumers in remote settlements. Also, extensive expansion of the centralized thermal energy supply network of Valjevo is foreseen, which should be supported by the construction of a new city heating plant on natural gas.

Environmental protection rules and measures / Air protection: Preservation of air quality in the city area and achieving higher air quality in the urban center will be based on the application of the following rules and protection measures for:

- reducing the level of emissions from existing sources of air pollution - by applying more environmentally friendly technology and air purification systems in industry in order to meet emission limit values; - by reviewing the traffic regime in the wider urban center, increasing the flow of vehicles and realizing the northern bypass around Valjevo for transit traffic; - by expanding and technically improving the centralized district heating system and harmonizing the operating mode of the existing boiler houses with the regulations; - by switching from coal to liquid fuels in boiler rooms, and then to gas after the realization of the gas pipeline network; - by reducing the consumption of coal and increasing the consumption of renewable energy sources for the heating needs of households;
- maintenance of emissions from new plants within prescribed limits - by preventing additional emissions from new sources that would worsen the air quality in settlements and zones in the city area; - limiting emissions from industry by applying the best available technology (BAT) and maximum protection techniques for highly toxic, carcinogenic and mutagenic substances; - for projects for which no environmental impact assessment is prescribed by designing the dimensions and height of chimneys and other air pollution discharges according to European standards; - prospectively, using gas as fuel in new public city and suburban transport vehicles and delivery vehicles; and
- establishment of an air quality monitoring system in accordance with the European directive on assessment and management of ambient air quality.

The basic measures and policy instruments of environmental protection, natural and immovable cultural assets are: 1) Establishment of the city fund for environmental protection. 2) Provision of funds from the budget of the Republic of Serbia through the ministry responsible for environmental protection and from the city's public revenues for the implementation of planned environmental protection programs, informing and educating the population about the possibilities and effects of improving the quality of the environment and for taking an active part in the decision-making process from importance for the environment, especially in deciding on the strategic assessment of the impact of plans and the assessment of the impact of projects on the environment. 3) Formation of an integral register of pollutants and emissions of polluting substances provided by the city administration, in cooperation with the ministry responsible for environmental protection. 4) Increased supervision over the performance and control of the impact of activities (WWWW, traffic, agriculture, tourism, etc.) on the quality of the environment, provided by the city administration and the ministry responsible for environmental protection. 5) Formation and maintenance of land instability cadastre based on special geological research, detection, recording and monitoring of instability phenomena, provided by the city administration in cooperation with the Republic Geodetic Institute. 6) Provision of funds from the budget of the Republic of Serbia through the ministries responsible for the environment and culture, public revenues of the city and funds from the private sector for the implementation of the protection of natural and immovable cultural assets.

General regulation plan "Center", Valjevo (2014)

Objectives of the development of the central zone (CZ) of the city of Valjevo: (1) Improvement of the overall structure of functions, contents and public spaces, suitable for the central city zone and the narrowest center of Valjevo in accordance with real development trends, needs, but also possibilities of the city and environment. (2) Defining an adequate concept of urban regulation and composition that enable measured, rational, sustainable, continuous and market-effective reconstruction and construction, and in accordance with the real interests of citizens and all interested actors, as well as the capacity of space, scales, values and features of the urban environment. (3) Defining a high-quality traffic concept in terms of efficient external and internal connectivity of the subject area and comfortable accessibility to different spatial units and all activities and contents. (4) Affirmation of ecological requirements and values of the existing environment, as well as functional and formative integration of the coast of Kolubara and Gradac into the wider environment. (5) Symbolic marking and improvement of recognition of the whole, parts and elements of the historical and cultural identity of the city. (6) Affirmation and development of ideas that enable the broad interest and participation of all citizens and different investors in the future reconstruction, arrangement and use of the city center space, as well as professional approaches and proposals that can be effectively implemented through the institutional practice of planning, construction land management and construction of the city. (7) Provision of attractive, recognizable and contextually argued design, arrangement and multifunctional use of the functional and spatial unit of the (planned) new town square at the subject location with the contents of the city library, various leisure activities, supplies, business, commercial and other contents.

One of the initial goals in the planning of the CZ is the re-examination of the relationship between the CZ and the Kolubara river:

- affirmation of the river and the coast as an integrative spatial, content, ambient and functional factor in the constitution of the CZ,
- qualitative planning direction of the pronounced trends of city life that show a tendency to accept the river after decades of indifference,
- activation of valuable spatial potentials on the right bank (between Tešnja and the mouth of Gradac in Kolubara), where today undefined and unused spaces or spaces of inadequate purpose predominate in terms of content and ambience,
- defining the character of the coast, i.e. the coastal part of the CZ in a possible range of: (1) predominantly urban character with a higher level of construction (2) predominant elements of the natural environment (parks, recreational purposes...) or (3) a combination of the previous two treatments - researching the dialogic concept of the two banks, shaping the void of the riverbed profile with regard to its human-scale width, to the extent of a person's gaze and voice (an example of a lucid intervention from the 80s, the stage was built on the left, and the auditorium on the right bank near the "Grand" hotel).
- Substantive and formative research of marginal coastal zones developed image of coasts.
- Affirmation of the pedestrian, vehicular and perceptual links of the two coasts.
- Review of the Tešnja complex: preservation of the physical fund and environment in accordance with the existing monument protection, on the one hand, and examination of flexibility in terms of purpose, on the other hand.
- Verification of the hypothesis about placing the compositional axis of the CZ in the longitudinal axis of the river bed, as well as about the gravitation towards the river of physical structures, communication and visual flows from the depth of existing blocks on the left and newly planned structures on the right bank. Starting from the principles of the new urbanism strategy, which proclaims the creation of a concept in an inductive way (from the individual to the general) while respecting the contextual conditions and resources of the

environment, we formulate the following general and special goals:

- Affirmation of the evolutionary process of methods in conceiving the further development of the city and CZ, i.e. the principle of historical continuity. (This position is based on the existence of a high-quality spatially functional, orthogonal block matrix on the left bank of Kolubara, which was confirmed by the passing of time in the life of the city)
- Application of the principle of moderate reconstruction of the existing physical structure and environment (revitalization and improvement of the existing model). - All interventions in the CZ area should be aimed at preserving the independent and, in the wider environment, affirmed character of the city, its valuable traditional elements and the identity of the city environment.
- Affirmation of a mixed structure in existing and newly planned urban blocks or other forms of urban organization of space (different typological forms of housing, public facilities, environmentally friendly production activities...)
- Affirmation of a hierarchical and dispersive spatial organization of central functions in narrower and wider CZ with content and ambient characterization. - Introducing the category of urban protection for certain ambient units and individual objects that bear the urban identity of the city (urban protection covers units and objects that are not covered by the regime of monument protection)
- Defining principles, rules and recommendations for urban-architectural design of physical structures and environments, especially in the area the banks of the Kolubara river (it is possible to use Lynch's method).
- Introduction of the obligation to announce public urban-architectural tenders for significant environmental units and facilities in cooperation with professional associations.

Local environmental action plan of the city of Valjevo (2010)

In February 2005, the city of Valjevo adopted the Local Environmental Action Plan prepared for a period of five years, ending in 2009. The local environmental action plan of the city of Valjevo was prepared according to the methodology adopted within the project "Strengthening capacities in environmental protection in Serbia in 2003", which was approved by the European Agency for Reconstruction. The goals that were assessed as priority during the creation of the LEAP of the city of Valjevo, according to the assessment of the working group and the Community Forum, are classified into seven areas: 1. air pollution 2. solid municipal waste 3. education, information and public awareness 4. industrial waste water 5. municipal wastewater 6. medical waste 7. protected natural resources.

Air quality plan of the city of Valjevo for the period 2022 to 2027 (2023 draft)

The Constitution of the Republic of Serbia guarantees the right of every citizen to a healthy environment. The Law on Environmental Protection, Article 78, stipulates the obligation of local self-government units to regularly, timely, completely and objectively inform the public about the state of the environment ("Official Gazette of RS", no. 135/04, 36/09, 36/09 - Dr. Law, 72/09, 43/11 - US decision, 14/16, 76/18, 95/18- Dr. Law, 95/18- Dr. Law). Based on Article 31, paragraph 1 of the Law on Air Protection ("Official Gazette of RS", no. 36/09, 10/13 and 26/21), in spatial zones where the air is of the third category, i.e. when air pollution exceeds the effects measures that are taken, i.e. when the capacity of the environment is threatened or there is constant air pollution in a certain area, the competent authority of the local self-government unit is obliged to adopt an Air Quality Plan with the aim of achieving the appropriate limit values or target values within the deadlines stipulated in the Regulation on conditions for air quality monitoring and requirements ("Official Gazette of RS", no. 11/10, 75/10 and 63/13).

The air quality plan is adopted on the basis of the assessment of the state of air quality and includes all the main polluting substances and the main sources of air pollution that have led to pollution, as well as the measures to be taken in order to prevent or reduce pollution and improve air quality. In addition to the measures applied with the aim of reducing pollution, air quality plans also determine specific measures intended to protect vulnerable groups of the population, especially children, as well as measures prescribed in short-term action plans. The plan, as a basic document for air quality management at the local level, ensures decision-makers to act in accordance with the proposed measures from their jurisdiction, the time frames defined in the Action Plan, but also to monitor the implementation of the implemented measures and the results of the set goals.

Measures to reduce air pollution before adopting the air quality plan in Valjevo

- Preparation of a study on the impact of air quality on health;
- Improvement of spatial planning with strict principles of protection of ecological capacities: - Expansion of pedestrian zones and improvement of pedestrian mobility; - Improvement of urban mobility in Valjevo; - Greening of urban areas in order to improve microclimatic conditions, reduce solar radiation, increase air humidity, protect

against wind, protect soil from erosion, create a source of clean air, ensure the flow of air currents in order to ventilate the city and reduce air pollution, preserve the biodiversity of habitats and species; - Gasification of the town of Valjevo; • Improvement of monitoring; • Creating a cadastre of environmental polluters; • Raising the level of awareness of the population about the importance of cleaner air and the possibilities to contribute to a better situation in the city of Valjevo; • Expansion of the existing hot water network; • Gasification of parts of the city and construction of container gas boiler houses; • Use of renewable energy sources through the use of solar panels and geothermal energy; • Establishment of cooperatives for the production of renewable energy; • Improving the energy efficiency of family houses, apartments and residential buildings; • Energy rehabilitation of public facilities; • Raising awareness of the importance of energy efficiency; • Improving energy efficiency in the public lighting system; • Reduction of emissions of polluting substances from industrial plants; • Reduction of the number of passenger vehicles in central city areas; • Construction of infrastructure for electric vehicles; • Construction of bicycle infrastructure and promotion of bicycle traffic; • Favoring pedestrian movements; • Reduce traffic pressure on air quality in the city; • Increasing the quality of public transportation with electric or hybrid powered vehicles; • Increasing the number of connections to the remote heating system, that is, reducing the number of individual furnaces and boiler rooms and increasing the energy efficiency of equipment and drives.

Dissemination

In addition to presentations at the faculty and in the city of Valjevo, the results of the CliCCE project, as well as the results of scientific research and educational activities carried out at the University of Belgrade, were presented to the Faculty of Architecture at the most prestigious professional exhibitions in Serbia: the Salon of Architecture and the Salon of Landscape Architecture during 2023. In addition, dissemination of results was done through mass media, daily newspapers, TV shows, websites (CliCCE, University of Belgrade - Faculty of Architecture, city of Valjevo as well as websites of local partners and mass media), social networks (instagram, facebook, twitter), youtube channels, email communications, etc. These presentations and accompanying events (performances, lectures, public art installations, etc.) were visited by hundreds of people in the city of Valjevo, and several thousand at the national level, and if we take into account the usually high viewership of local TV programs, then the total visibility of our results can be counted in tens of thousands of viewers both at the local and national level.

Instead of a conclusion

Last but not least, we would like to take this opportunity to express our sincere gratitude and respect to all participants in this work, especially to the city administration and the citizens of the city of Valjevo for the sincere and creative conversations, as well as for their open friendly hearts filled with kindness, in which they have nested all of us forever.

Local sources used in research

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REVIEWS

The „CliCCHE Participatory Urban Design“ book represents a detailed overview of new approaches in architectural urban design education experimented with and tested at the University of Belgrade - Faculty of Architecture during the 2022-2023 school year. The overall aim was to improve the competencies of young professionals to develop urban design climate change mitigation and adaptation strategies that improve human health within urban regeneration projects. The new educational approaches, both methodology and tools, were developed within the frame of the Erasmus+ European project Climate Changes, Cities, Communities and Equity to Health (CliCCHE), as a result of the collaboration of, 5 professors and 5 associates from the University of Belgrade, and 10 international and domestic experts and professors. More than 80 students from all levels of education (bachelor, master and doctoral studies) within seven program courses participated in the new experimental educational process developing the research and design of solutions for mitigating the effects of climate change on people's health in the city of Valjevo. This book represents how numerous sources from the theoretical, legislative and planning corpus of the EU, and documents from the local legislative and planning framework of the Republic of Serbia, the Kolubara region and the city of Valjevo were used in the local participatory urban design process to gain the effectiveness of sustainable urban design strategies.

The presented overview of the educational process and gained results, enable deep insight into many details of methodical tailoring and organisation of architectural education. It inspires the reader to question current academic practices and broaden the perspectives on the importance of bringing in co-creative practices in academic education and community life. This book shows how different solutions could be generated from the interaction of academy and community, simultaneously more realistic and grounded in everyday community life, and yet still creative and lively. Throughout the experimentation process, an educative „wave“ overflowed not only the students but also the teaching staff and the whole community. It resulted in transitioning the local context through networking, building trust and „seeding“ the new culture of sustainable action. Therefore it could be recommended as a reference reading, not only for educators and students but also for local communities and authorities.

dr Ksenija Lalović, Associate Professor
University of Belgrade – Faculty of Architecture
December 5th 2023

Systematically presenting the results of student projects realized within the global framework of CliCCHE, this publication is a comprehensively completed workbook with a set of tools that shows a complex approach to the wicked problem - without “true-false” solutions, strongly and consequently related to others - such climate change is. In the context of Serbia, which does not have laws on climate change, this educational tool not only contributes to the thematic field from the aspect of planning and urban design, but also talks about the education of young generations who, as future experts, will definitely confront this problem more and more intensively.

This publication is primarily an easy-to-read educational material for young researchers and students interested in the topics of climate change, urban design and planning, public participation, and decision-making processes. An integral and wide topical framework presented in the publication is potentially interesting for a wide range of disciplines and their intersections such as urban and territorial planners, environmentalists, landscape architects and architects, but also all those interested in urban health, models, and management, estimation, statistics, and economics. On the other hand, this publication may divert and stimulate those involved in communication and dissemination involving the practice of public art - i.e. exhibit design, fine arts, or innovative forms of journalism.

Finally, the database on climate change in Serbia has been improved, as stated in the publication, but in the Serbian context, unlike many EU countries, many case studies that face the problem of climate change are needed. Therefore, this publication can be useful to local governments with a dual goal: raising awareness of issues of climate change and urban quality, and developing tools for mitigating climate change at the local level.

dr Nađa Beretić, Research Fellow
University of Sassari – Department of Architecture, Design and Urban Planning
December 4th 2023

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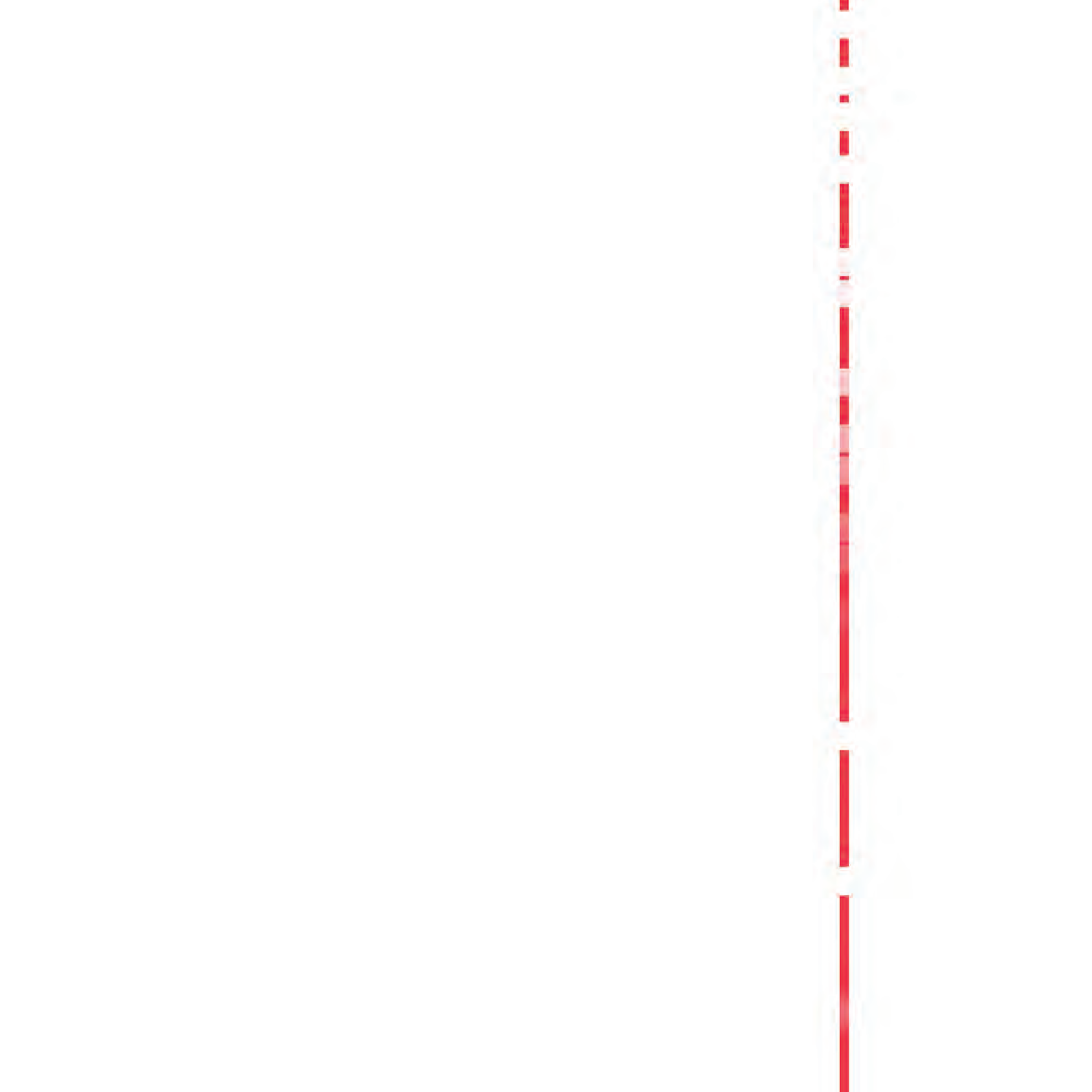
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GRAPH DEPICTING CLICCHE WORKSHOP THEMES ADAPTATIONS FOR OUR STUDIO PRO

CLICCHE WORKSHOP THEMES

A1. Integrated vision of
"Urban health" regeneration



A2. Local inquiry and mapping:
Get to know the neighborhood
from above and from within



A3. Heath and Climate Profile Model



A4. Framework for model Evaluation



A5. Project Scenarios



A6. Project proposals selection



A7. Results communication
and dissemination



JECT

	DATES:		WORKSHOP DYNAMICS
	13.3.2023. 16.3.2023.	A1 ●	Beginning of the workshop exercises at the Faculty
	20.3.2023. 23.3.2023. 24.3.2023.	A2 ●	Valjevo Workshop March 24th 2023.
	3.4.2023.	A3 ●	Continuing the workshop : participation and analysis Physical Structure of Valjevo Socio-cultural aspect of Valjevo Functional Structure Climate Change in Valjevo Health in Valjevo
	6.4.2023.	A4 ●	Combining group results
	10.4.2023. 13.4.2023. 24.4.2023. 27.4.2023.	A5 ●	Individual solutions: Student idea presentations Urban Health Evaluation tools
	8.5.2023. 11.5.2023.	A6 ●	Urban health evaluation tools Project Proposals Selection
	from the beggining of the project, till the end	A7 ●	Results communication and dissemination

Beginning of the workshop exercises at the Faculty

01



The workshop was held within the CLICCHE program.

Here in Belgrade, students and professors followed the program sent to us by the CLICCHE workshop organizers. The professors explained the workshop dynamics and also discussed it with the students. The students were introduced to concepts of healthy city urban design, and shared their previous knowledge on the topics of climate change, ecology, and their relations to city design. These topics were already quite familiar to the student group, but we aimed to deepen it by doing short researches on words and phrases such as “climate change”, “healthy city”, etc. Together, we listened to audio-visual presentations on the subject: Methodical instructions for teaching healthy urban planning, divided into seven shorter themes:

- 4.1 Integrated vision of “Urban Health” regeneration***
- 4.2 Local survey and mapping: Get to know the neighborhood from above and inside***
- 4.3 Heat and climate profile model***
- 4.4 Model evaluation framework***
- 4.5 Project scenarios***
- 4.6 Selection of project proposals***
- 4.7 Communication and dissemination of results***

Presentations on these themes were sent to us by the organizers of the workshop and listened to during group exercises. Students were also tasked to listen to these topics individually at home, as it would help them in their project designs. These presentations hold important tools for analyzing the city of Valjevo.

During this first workshop cycle we the group participated in stakeholder analysis. Students then later invited their chosen stakeholders to participate in the Valjevo workshop.

Thursday, March 16th 2023.

This workshop class was an introduction to the project assignment for the studio. During this class, we also discussed further work and project dynamics.

Every student had to choose one important stakeholder for the city of Valjevo, to analyze and present to all the other students and teachers. The main questions were how was the stakeholder important for the project, does he have any benefits from it, or does he have fears regarding the project implementations.

A discussion was held on individual conclusions, in which both professors and students participated.

This activity was done by filling in tables and drawing graphs on the importance of stakeholders over time and through different participation phases. The students then divided stakeholders into 4 different categories.

1. The first one was for the stakeholders that have a great interest and great influence on the future project,
2. the second had great interest but little influence,
3. the third had little interest but great influence,
4. and finally, stakeholders could have both little interest and little influence for the project. Some stakeholders could not be classified into any of these four categories and were later placed somewhere in the middle.

Ten students were then divided into groups of two - 10 students worked on 5 different topics related to the city of Valjevo for the next class

Задатак 2 – опишите вид учешћа стејкхолдера у појединим фазама партиципативног процеса уцртавањем графикана

ОДЛУЧИВАЊЕ				
КОНСУЛТОВАЊЕ				
ИНФОРМИСАЊЕ				
	ПРИПРЕМА	ПЛАНИРАЊЕ	ОДАБИР РЕШЕЊА	ИМПЛЕМЕНТАЦИЈА

Задатак 3 – објасните позицију стејкхолдера у односу на интензитет његовог утицаја и интереса текстуално у одговарајућем квадранту

	МАЛИ УТИЦАЈ	ВЕЛИКИ УТИЦАЈ
МАЛИ ИНТЕРЕС		
ВЕЛИКИ ИНТЕРЕС	<p>„Еко герила“ као еколошка организација која броји више од 1700 чланова на фејсбук страници, може имати велики утицај на становништво, тако што ће својом едукацијом и идејама побољшати живот својим грађанима. Свакако да је интерес за пројекат велики јер се директно бави питањима које „герилци“ покушавају да реше и проблемима које покушавају да искорене, самим тим њихово учешће и консултовање директно утиче на жеље Ваљеваца.</p>	„

Задатак 2 – опишите вид учешћа стејкхолдера у појединим фазама партиципативног процеса уцртавањем графикана



Задатак 3 – објасните позицију стејкхолдера у односу на интензитет његовог утицаја и интереса текстуално у одговарајућем квадранту

	МАЛИ УТИЦАЈ	ВЕЛИКИ УТИЦАЈ
МАЛИ ИНТЕРЕС		
ВЕЛИКИ ИНТЕРЕС		Директорка опште болнице има могућност иницирања пројеката везаних за болницу као и подржавања пројеката који узимају у обзир људско здравље. Давањем свог позитивног или негативног стручног мишљења може да подстакне или обустави пројекат који сматра да има утицај на здравље људи.

01.2. Workshop Dynamics

Monday, March 20th 2023.

This class started with students filling out a questionnaire that precedes the beginning of the workshop - **pre-TQs**. The questionnaire was translated into Serbian in order to make it easier to fill out, and professors left enough time for this activity. We then listened to Introductory presentation named **4.1 Integrated vision of "Urban Health" regeneration**.

Prof. dr Jelena Živković held a lecture on the topic of **"A healthy city and climate changes"**. She also shared important literature with the students on the Microsoft Teams platform.

The lecturer focused on definitions of health, healthy cities and public health. She also presented a case study of Drama/Greece. She suggested that students independently study the tools for simulating microclimatic conditions - **"Ladybug"** as well as **Healthcitygenerator.com**

These tools will be used by students in their further work to explore the climate and health potential of the city center of Valjevo in an interactive way.

The screenshot shows the Ladybug Tools website. At the top, there is a navigation bar with 'TOOLS', 'RESOURCES', 'PRODUCTS', and 'ABOUT'. The main heading is 'What is Ladybug Tools?'. Below this, a paragraph states: 'Ladybug Tools is a collection of free computer applications that support environmental design and education. Of all the available environmental design software packages, Ladybug Tools is among the most comprehensive, connecting 3D Computer-Aided Design (CAD) interfaces to a host of validated simulation engines.' There are three columns of features: 1. 'VALIDATED' with a checkmark icon, stating 'Ladybug Tools is built on top of several validated simulation engines: Radiance, EnergyPlus, OpenStudio, Therm, Window and OpenFOAM.' 2. 'FREE + OPEN SOURCE' with a GitHub icon, stating 'Ladybug Tools is the only open source interface that unites all of its underlying open source engines. Like these engines, it evolves through the consensus of an open community of experts.' 3. 'COMMUNITY-SUPPORTED' with a group of people icon, stating 'Ladybug Tools is supported by a passionate and diverse community from around the world. Visit our online forum to see the discussions that shape our future development.'

Get to the heart of healthy urban planning

Generate health in your city with our revolutionary planning tool.

Get in touch

Try the tool



Choose your approach



Planning

Assess your urban planning actions to determine their health impact

Start



Health

Select your health goals to guide your urban planning strategy

Start



Ten students were divided into groups of two - working on five different topics related to the city of Valjevo, analysing it and explaining to other group members. The analysed topics were:

- 1. Physical aspect of the city**
- 2. Functional aspect**
- 3. Socio-cultural aspect**
- 4. Ecological aspect and climate change**
- 5. and Health aspect**

For this workshop, students also read texts "*Multifunctionality of open spaces in the context of adaptation of cities to climate change*", as well as "*Open urban spaces in adaptation of cities to climate change_recommendations for Serbian cities*".



Products of this class were presented partly during this lecture, and continued on the next workshop and group work. All the above-mentioned aspects of the city were illustrated through schematic sketches, diagrams, and maps, on which the students showed the important characteristics of the aspect they were dealing with. One of the students made a 3D model of the city, which everyone could later use. The other students could participate in supplementing and refining all aspects through discussion and conversation.

Thursday, March 23rd, 2023.

As the visit to the city of Valjevo was planned for Friday, March 24, 2023. the workshop the day before was dedicated to preparing for the trip and meeting with stakeholders. The students prepared material, flyers and familiarized themselves with surveys and questionnaires that they will ask the city's residents.

Presentation 4.2 was shown, the topic of which is:

“Local inquiry and mapping: Get to know the neighborhood from above and inside”

Professor Zoran Đukanović spoke about Simulation Urban Games (example of Jan Gehl pedestrian street) and about the meaning of climate change (form of discussion without accompanying presentations)

A simulation of a conversation with stakeholders should have been done, where each student would represent the interests of one stakeholder. This activity was postponed due to lack of time.

Contents and Goals

Training objectives...

- train students to select data in the neighborhood
- summarize, and to interpret different types of information from different types of origin



1. From ABOVE



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2. From WITHIN

- Observing the district: walking as a -research method
- Meeting and knowing the community
- Participating with the community
 - develop new skills and sensitivity towards complex situations, and to take note of the dimension of the experience in the field and of living in proximity.



24, март 2023.

- 09:30 Дозаок делегације Универзитета у Београду, Архитектонског факултета у Ваљево
- 09:45 Регистрација учесника и подела радног материјала
- 10:00 Отварање радионице у великој сали градске управе
- 10:15 Поздравна реч
- 10:30 Радни део радионице - трибина
- 13:00 Радни део радионице - обилазак града и рад са грађанима
- 17:00 Одлазак делегације Универзитета у Београду, Архитектонског факултета у Ваљево

Почетак априла 2023.

Презентација варијанти сценарија развоја града ка жељеној будућности Ваљева. Избор најадекватније развојне варијанте.

Друга половина маја 2023.

Презентација стратегија урбаног дизајна израђеног на основу усвојеног развојног сценарија.

Крај јуна 2023.

Презентација финалних решења и нацрта финалног еланората.

Септембар - октобар 2023.

Изложба-конференција на тему S0S AIR прилагођавање климатским променама и квалитет живота у градовима



Consortium

Lead Organization



University of Camerino

Partner Organizations



The Cyprus Institute



Italian National Research Council



University Institute of Lisbon



University of Belgrade

Associated Partner Cities



San Benedetto del Tronto, Italy



Strovolos Municipality, Cyprus



City of Lisbon, Portugal



City of Valjevo, Serbia



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WELCOME
TO Cliche

Climate Change, Cities, Communities and Equity in Health
Ka230 HED-Progetto n. 2021-1-IT02-KA320-HED-00003223

WORKSHOP

24 Март 2023, Град Ваљево

Ulica Karadorđeva 64, 14000 Valjevo, Serbia



Co-funded by the
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Valjevo Workshop **02**
March 24th 2023.



02.1. Introduction

CLICHE workshop was held in March 2023, in the beautiful city of Valjevo – Serbia. It was an important event, that many stakeholders from different sectors in Valjevo visited. Together, we discussed the challenges and possibilities of urban design in Valjevo, that would result in the city’s better health condition, higher satisfaction rate among the people, as well as mitigation of climate change.

The meeting in the Valjevo City Hall began with the presentation held by the professor and UB Project Manager dr. Zoran Đukanović. He also started a discussion on the problems and potentials of Valjevo. Numerous stakeholders from GO and NGO participated and debated about the main topics – air quality and air pollution in the city. Everyone shared insights, experiences, and concerns, which were sometimes very personal. That is the main point of participation – taking into consideration various opinions from the people living in the city.

Participants were all eager to learn more about the workshop, expressing their excitement both in a positive and conformist way! But, the event was very successful, and many insights from within were taken.



02.2. Workshop in the municipality of Valjevo - Conversations with Stakeholders



All stakeholders recognized by students and professors as important for this topic were invited to the workshop in the municipal building.

There were representatives of local newspapers, members of various non-governmental organizations, representatives from the sphere of health, planning, urbanism and architecture, as well as other citizens. During the presentation of the workshop and the project, there was an exchange of various opinions, conflicts and reconciliation, which added to the **success of the participatory process of this workshop.**



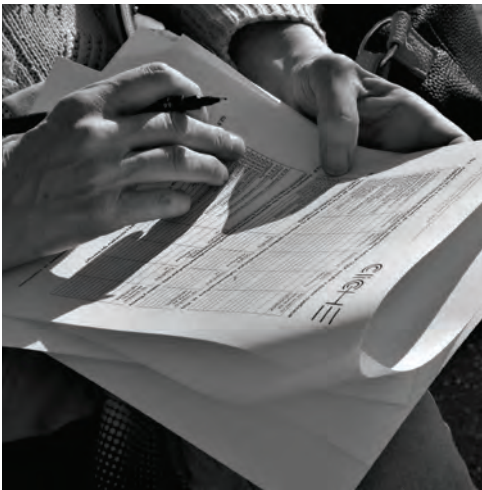
All opinions are welcome, and through a joint discussion, various interventions were proposed that would contribute to the mentioned problems of the city.

One of the biggest problems of the city of Valjevo, according to residents, is air pollution, which is exacerbated by the negative effects of climate change - such as changes in air temperature and air pressure, wind direction, etc.

02.3. Site Tour

The visit to Valjevo consisted of a workshop held in the building of their municipality, discussions with citizens of Valjevo and stakeholders, as well as a tour of the city.

In the second part of the day, after the workshop, the students were divided into groups, where they surveyed passers-by and residents of Valjevo, asking them questions about life in their city, climate change and general health. The survey was followed by a joint tour of the part of the city around the Kolubara river, as well as a trip to Vidrak hill above the city, from where it is possible to observe the entire city from above.









WELCOME TO CLICHE

Climate Change, Cities, Communities and Equity in Health
Ka220 HED-Projekt n. 2021-1-IT02-KA220-HED-000032223

WORKSHOP

24 Март 2023, Град Ваљево

Ulica Karadorđeva 64, 14000 Valjevo, Serbia



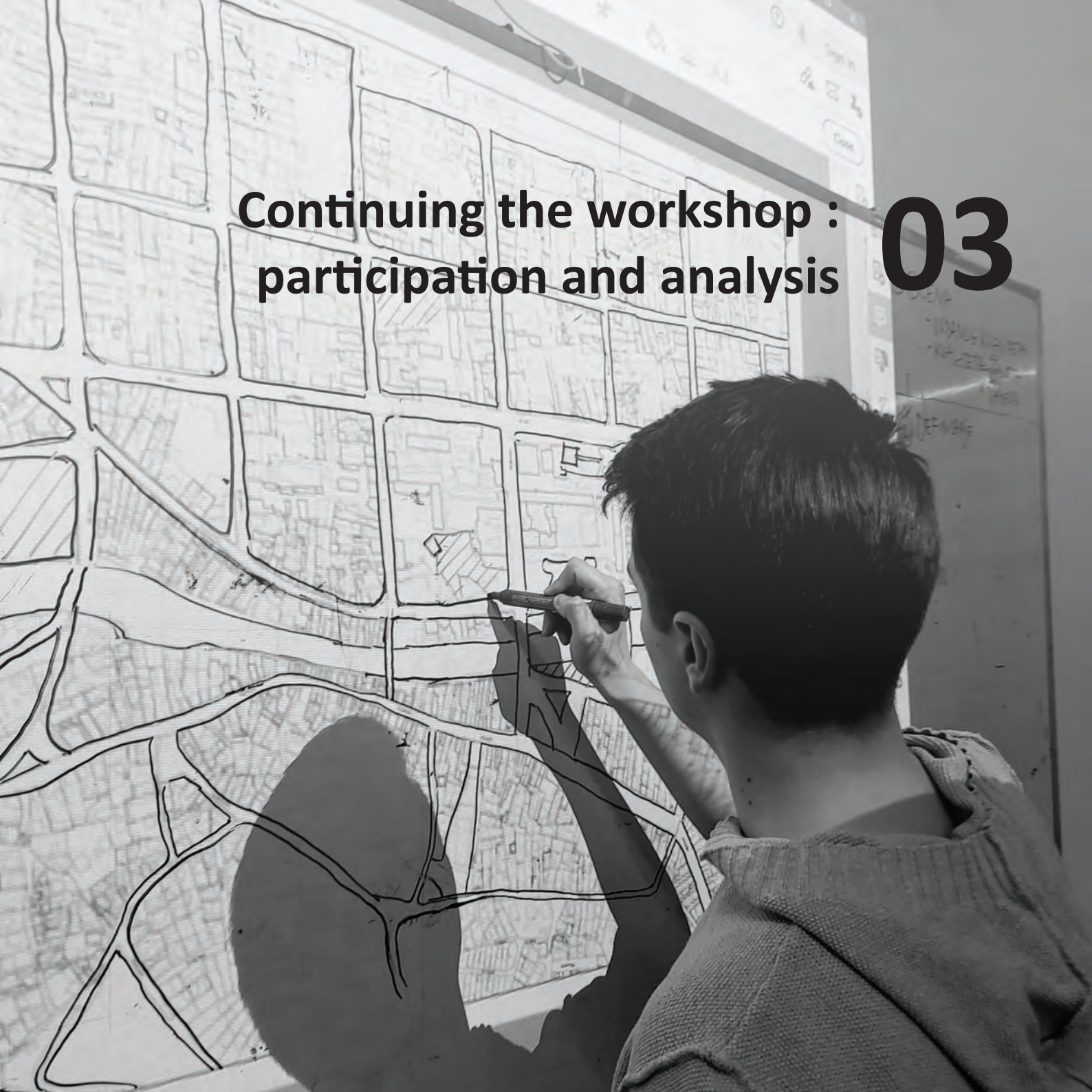
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**Continuing the workshop :
participation and analysis**

03



Monday, April 3rd, 2023.

After the visit to the city of Valjevo, the workshop continued as before.

The topics of:

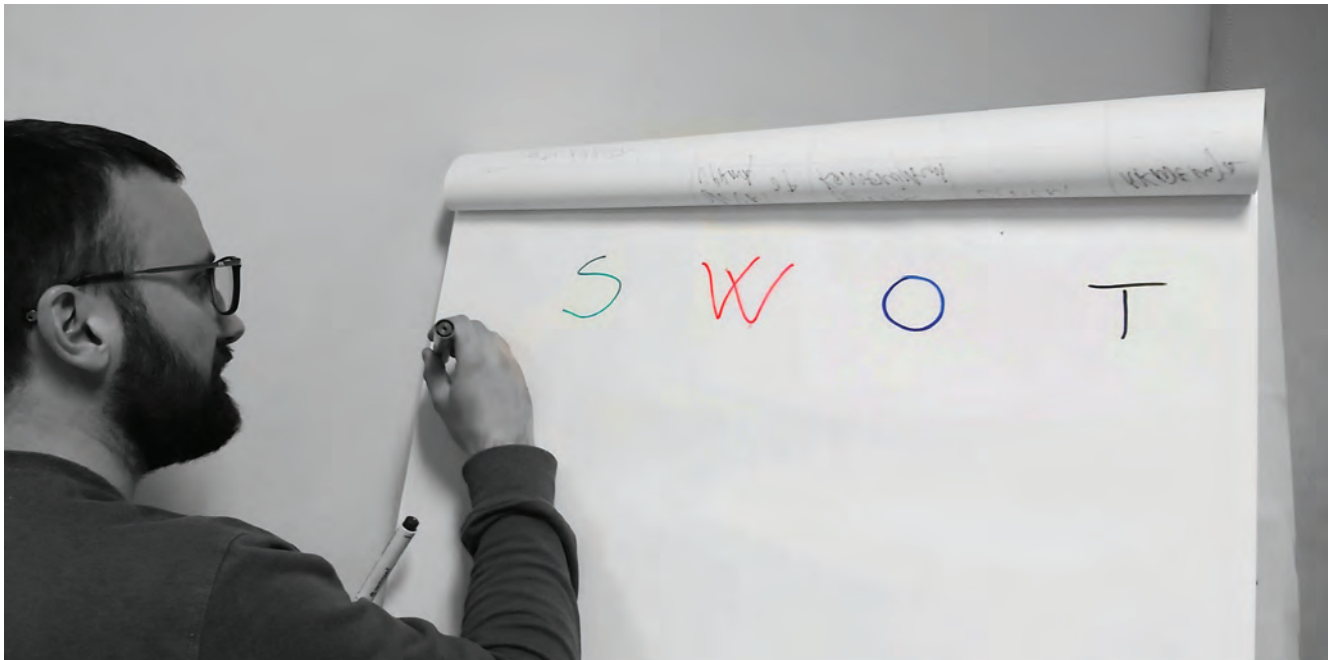
“Physical structure of the central zone of Valjevo”, “Socio-cultural aspect of the central zone of Valjevo” and “Health in Valjevo” were presented by the three groups of students.

We held a review of presentation 4.3 **“Heat and climate profile model”**, analysis of climate change, and again mentioned the concept of the Ladybug program. One student, Teodora Živković, showed great initiative in exploring the possibilities of using this tool, and professors gave her the opportunity to further explore

it by analyzing the projects of other students in the Ladybug tool.

Later, the class focused on explaining the use of SWOT analysis, which will be used, and presented, in the following exercises, and later in the book.

SWOT analysis is a very common tool used in the planning of urban spaces. It involves identifying the Strengths, Weaknesses, Opportunities, and Threats of a particular urban area. SWOT is a great tool for both professionals and students.



STRENGTHS

WEAKNESSES

OPPORTUNITIES

THREATS

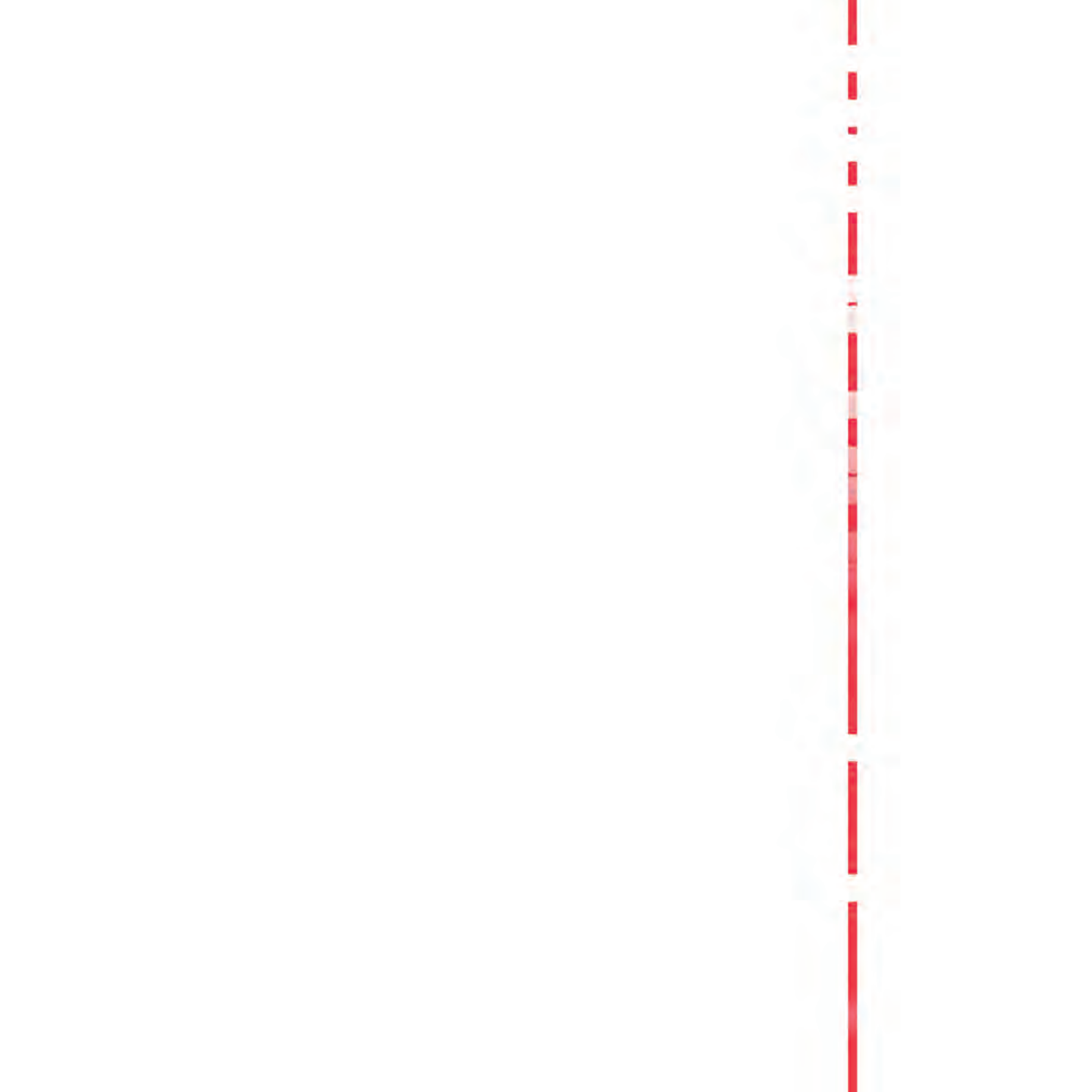
**Analysis of different aspects of
the city of Valjevo**

03.1. PHYSICAL STRUCTURE

Students: Filip Mijailović, Iva Bajić

Physical structure analysis is probably the first thing that comes to our minds when we think about any analysis of a city. It focuses on built structures, height, spacing, and position of buildings and public spaces. It also takes into consideration large greenery (trees) as an important physical element in the city. The physical structure of a city differs from place to place, city to city, and from time to time. By understanding the context in which the city emerged, we can better understand its physical factors. For instance, the city of Valjevo has two different types of street and block configurations. One of them is more organic, and the other is completely orthogonal. The organic one is older, and the orthogonal one is newer.

It is important for us to take into great consideration all the scores provided by the physical structure analysis.



Physical aspect of the city of Valjevo



residential and commercial building



historical archive



district Court



building of the national museum

Zone of cultural property

The city of Valjevo is predominantly a low-rise city with buildings up to P+3. As a result of this situation, the majority of buildings are exclusively ground-floor or some extremely high-rise buildings that represent a characteristic type of architecture and have a special purpose. The most common are buildings with lower floors up to P+1, followed by buildings of medium height up to P+3, and the numerically smallest group consists of buildings of high floors such as churches and silos.



Low story objects



Medium story objects



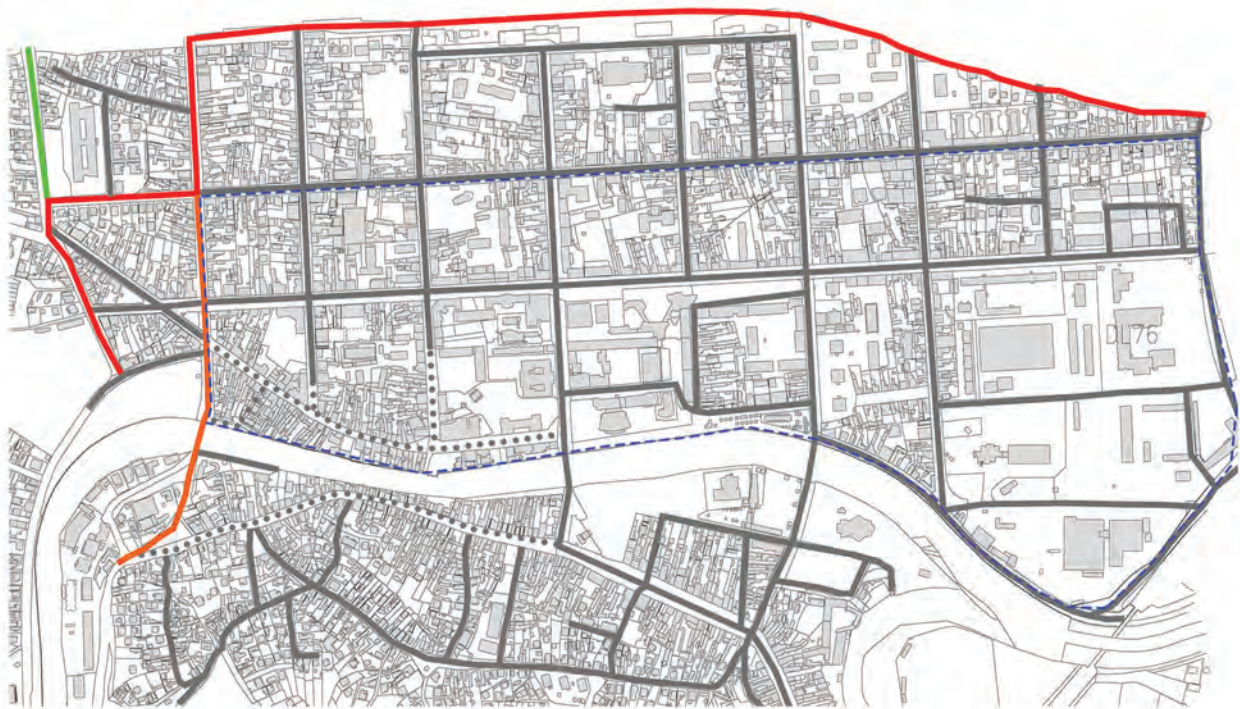
High story objects



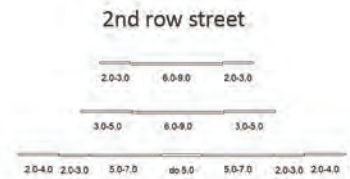
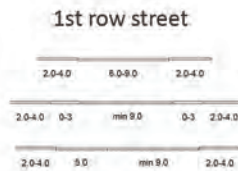
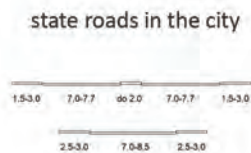
Map of building floors

The city of Valjevo has a well-developed traffic network and includes roads of the first and second order, numerous access and collection streets, but also roads of national importance (main roads). In addition to streets of the first and second order, bicycle traffic is widespread. The biggest problem is improper stopping and parking of vehicles on sidewalks in such a way

that it disturbs and endangers the safety of pedestrians. The northern new center is much better networked with main streets, while the southern older parts are in a much worse condition because the streets developed organically in accordance with the built structure. The street profiles are quite small and most of the streets are sloped in cobblestones.



- state roads of the 1st B order —
- state roads of the 2nd A order —
- state roads of the 2nd B order —
- public roads —
- bicycle paths - - -



The traffic network of the city of Valjevo

STRENGTHS

- Professional and high-quality staff of urban planners
- Well-crafted plans, GUP, regional plans
- A large percentage of greenery within the urban fabric, especially around the city in the form of parks (Vidrak, Krusik, Pecina)
- The possibility of conversion of the silo

WEAKNESSES

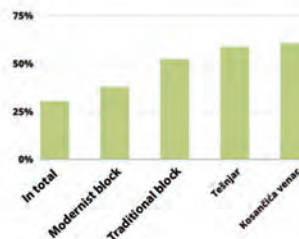
- Poor state of traffic infrastructure in certain parts of the city, both roadways and traffic signals. + bridge
- Existing problem areas that can prevent good, healthy and smart development of the city: city landfill, brownfield facilities, Krusik factory.
- Poor or non-existent integration of water courses, as well as the devastation of the Kamenicka and Kukovačka rivers.
- Lack of parking places, which hinders the further development of the city, because it prevents adequate movement, thus a large amount of illegal parking.
- Poor quality of bridges connecting two parts of the city where different types of traffic cross inadequately.
- Insufficient and inadequate care of the market, which can be a threat to the health of users.

OPPORTUNITIES

- Interest of national and European institutions/programs in the development of the city.
- Restoration of Tešnjak as a devastated area into an area for cultural and tourist purposes.
- Activation of the coast of Kolubare.
- Activation of the Gradac river and its surroundings as a picnic spot for the city.
- Existing problematic areas that can prevent good, healthy and smart development of the city: brownfield buildings, the Krusik factory, Pecina and Vidrak, but they represent potential.

THREATS

- Unregulated construction and up-grading of buildings, which reduces the quality of the space in which to live and move.
- Unplanned construction in the surrounding settlement of Divčibare.
- Construction in the vicinity of the dam on Jablanica and the direct danger of that to the city itself.
- Investors' interest in construction (also an opportunity).
- A large number of heat islands in the strict center of the city due to the lack of porous surfaces.



VALJEVO OCCUPATION OF SURFACES



S

- Professional and high-quality staff of urban planners
- Well-crafted plans, GUP, regional plans
- A large percentage of greenery within the urban fabric, especially around the city in the form of parks (Vidrak, Krusik, Pećina)
- The possibility of conversion of the silo

W

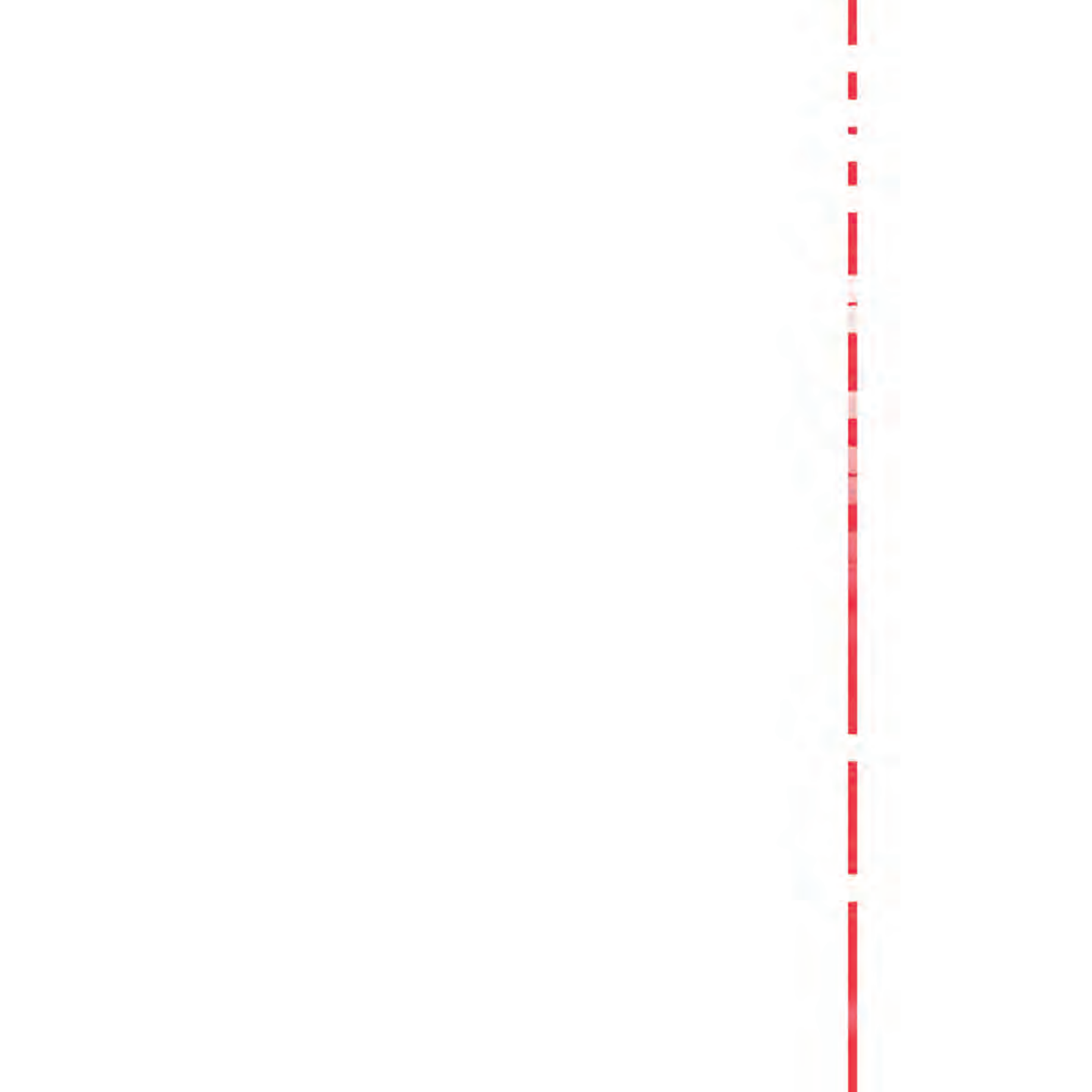
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O

- Interest of national and European institutions in the development of the city.
- Restoration of Tešnja as a devastated area into an area for cultural and tourist purposes.
- Activation of the coast of Kolubara river.
- Activation of the Gradac river and its surroundings as a picnic spot for the city.
- Existing problematic areas that can prevent good, healthy and smart development of the city: brownfield buildings, the Krusik factory, Pećina and Vidrak, but they represent potential.

T

- Unregulated construction and building restoration
- Unplanned construction in the surrounding settlement of Divčibare.
- Construction in the vicinity of the dam on Jablanica and the direct danger of that to the city itself
- Investors' interest in construction (also an opportunity).
- A large number of heat islands in the center of the city - lack of porous surfaces.



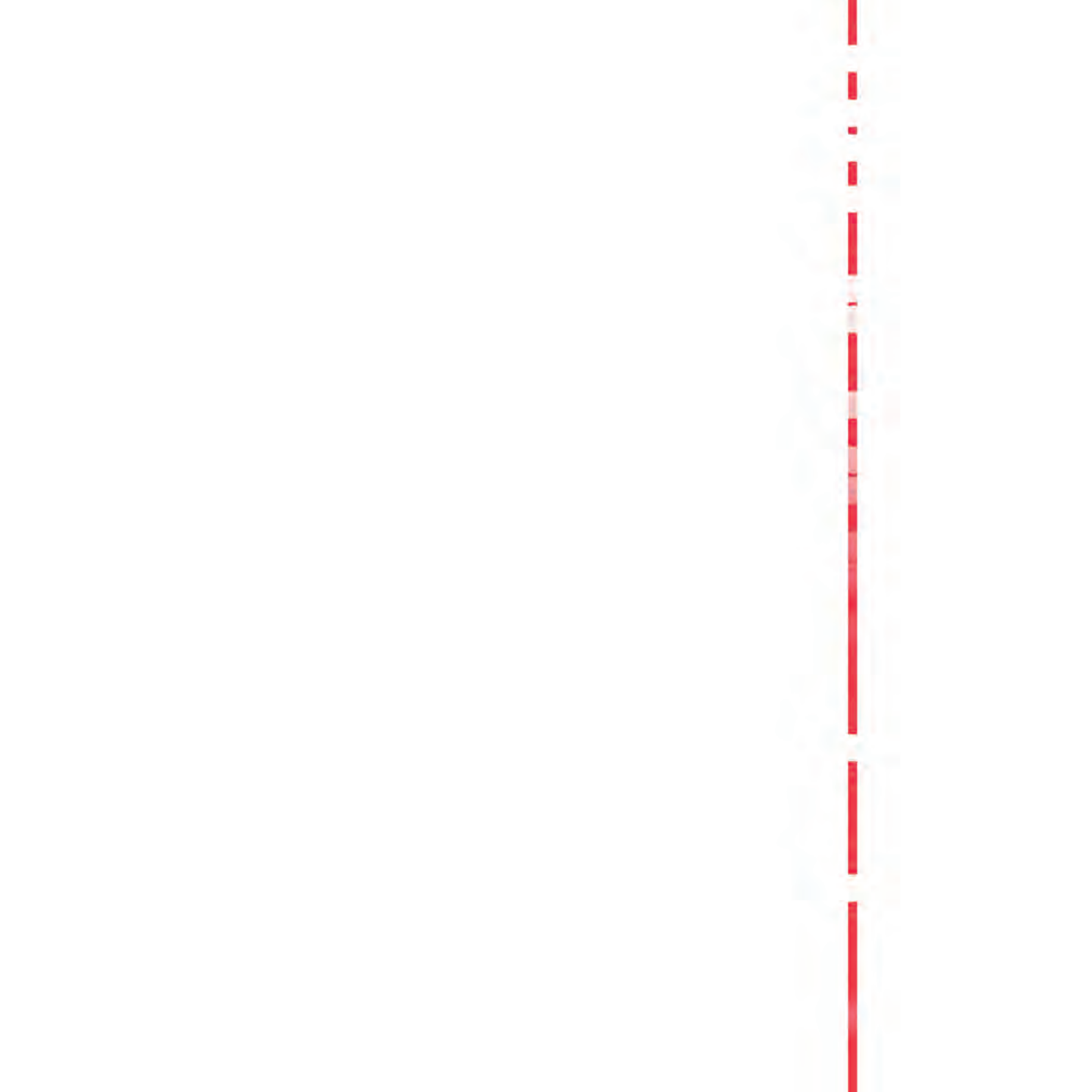
03.2. SOCIO-CULTURAL ASPECT

Students: Milica Spajić, Edita Ljalja

A socio-cultural analysis is a broad aspect of urban design that helps in understanding different city dynamics regarding culture and social factors. Factors considered are demographics, cultural practices, social norms, and community values, all of which are crucial for understanding the relationships between people and public spaces, as well as the relationships between people and communities. By understanding these dynamics, we can create more inclusive urban spaces that meet the various needs of different communities.

It is important to analyze a space by its cultural practices because sometimes they can tell a lot about the design of spaces and architecture. Urban design should be a reflection of some traditions in the city itself.

This analysis can also help us create more sustainable and resilient urban environments. By understanding the social and cultural dynamics of a city, we can identify areas where active community and participation are essential for the success of architecture and urban design interventions.



Socio-cultural aspect

General information

City area: 905 km²

Number of settlements: 78

Number of inhabitants according to the 2022 census: 83,677

Number of inhabitants per square kilometer: 93

The city of Valjevo has 83,677 inhabitants who live in 78 settlements. About 35 percent of the population lives in the countryside. On average, 93 inhabitants live per square kilometer. According to the first results of the recently completed population census, Valjevo and its surroundings lost almost 8,000 more inhabitants, the city itself lost 6,460 inhabitants. If we look at the age structure of the population, the average age is 44.7 years, and the average number of household members is 2.9. From the educational aspect, the city of Valjevo has 12 kindergartens, 51 primary schools, 6 secondary schools and 1 higher education institution. The average salary is 58 37 RSD.



Male Female

Diagram 1. Gender structure of the population

50

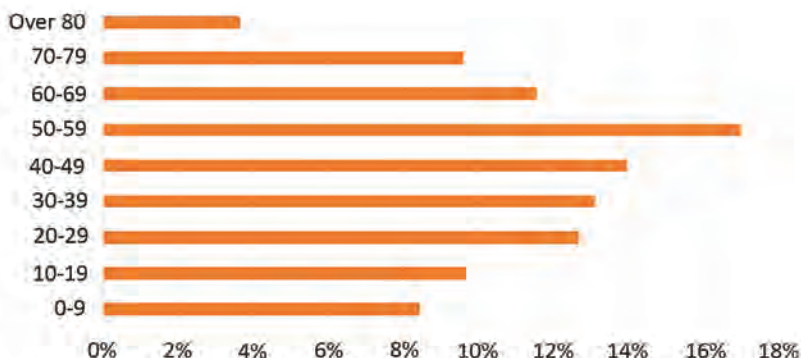


Diagram 2. Age structure of the population

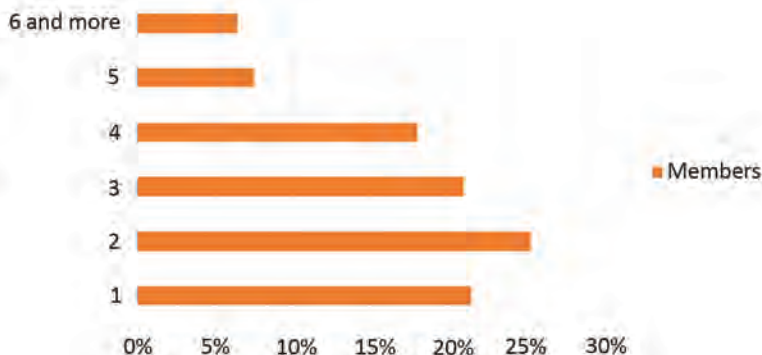


Diagram 3. Average number of household members

Structure of registered employment

The primary sector includes agriculture and forestry. The secondary sector includes mining, construction and manufacturing trades, while the third sector includes transport, trade, tourism, catering, crafts, banking and communal economy. The fourth sector includes education, that is, science, culture, health, and social protection. The highest percentage of the employed population of Valjevo belongs to the secondary or manufacturing sector with a total of 43%. Thereof, 33.2% belongs to the processing branch of the industry, which deals with the processing of plant, animal and mineral raw materials. The lowest percentage of the employed population is in the primary sector and is 6.3%.

Education

The number of illiterate people, people with incomplete education and people with only basic education has decreased. This is also a consequence of the unfavorable demographic age, but there is also a noticeable increase in the number of residents who have acquired secondary and higher education in the meantime. The increase of highly educated people is especially noticeable. This data best explains the increased number of higher education institutions in the city of Valjevo after the 2001 census.

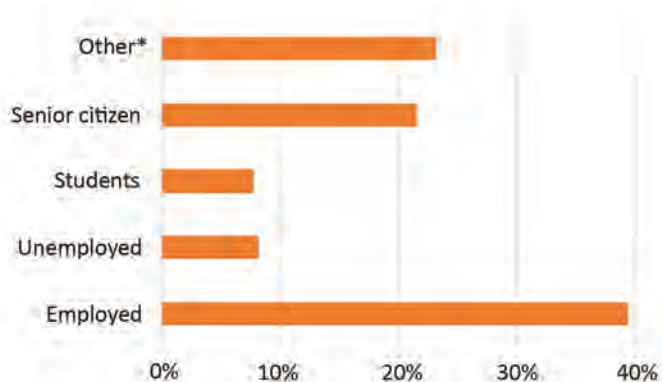


Diagram 4. Employment structure
(*This includes children under the age of 15, housewives...)

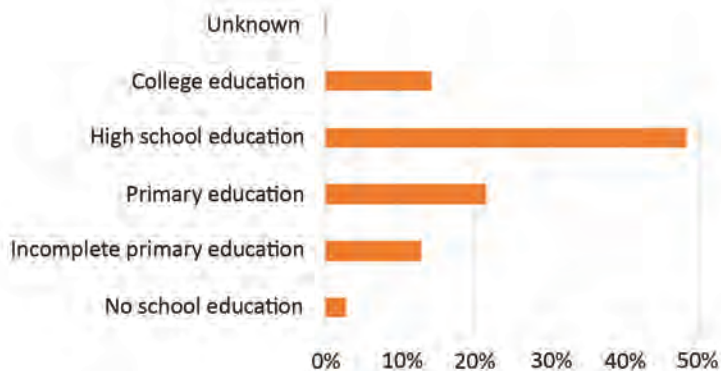


Diagram 5. Educational structure

Local Gathering Centers/Quality of Life

The main town square was renovated in 2010. With the construction of the "new" city square, the space in the city's central Karađorđeva Street is put into use, which turns the existing green area into a representative unit with a fountain and thus enables citizens to move through the green areas. This has become a new center for the gathering of citizens and visitors of Valjevo.



The Main town square.

Karađorđeva Street was reconstructed in 2009 in a length of 720 m. With the reconstruction, the street became safer, parking was made possible at the level of the roadway, some more frequent pedestrian crossings were raised at the level of the sidewalks, which were widened and paved with lanes for the visually impaired.



Karađorđeva square.

Tešnjara is an old bazaar, formed in Turkish times and stretching along the right bank of Kolubara. Walking around Tešnjara, passing by the low buildings of Bondruč, one can feel the spirit of an oriental market and shop in one of the many workshops of old craftsmen.



Tešnjara.

In the thirties of the 19th century, on the left bank of Kolubara, a new trade and crafts quarter began to develop, as a European parallel to the oriental Tešnar, today's Kneza Miloša Street. With the construction of commercial and catering facilities, this street became the core of city life. Today, this street is the stage for many cultural and artistic events and the backbone of evening outings for young people as well as walks for older citizens.

The city of Valjevo has a branched network of institutions such as: Historical Archive, Library, Cultural Center, Museum, Institute for the Protection of Monuments, Modern Gallery, rich artistic life and numerous cultural manifestations.

Events: Tešnar evenings, Jazz fest, Spreg, Festival duvan čvaraka...



Kneza Miloša street.



Festival duvan čvaraka.

S

- Active participation of the local population in problem solving
- Presence of numerous NGOs working on environmental protection, climate change, and health issues, educating people through local media and workshops
- Increasing number of educated residents, leading to higher awareness about climate change, pollution, and health problems
- Intensive use of public spaces by the local population, such as squares and the Kolubara coast

W

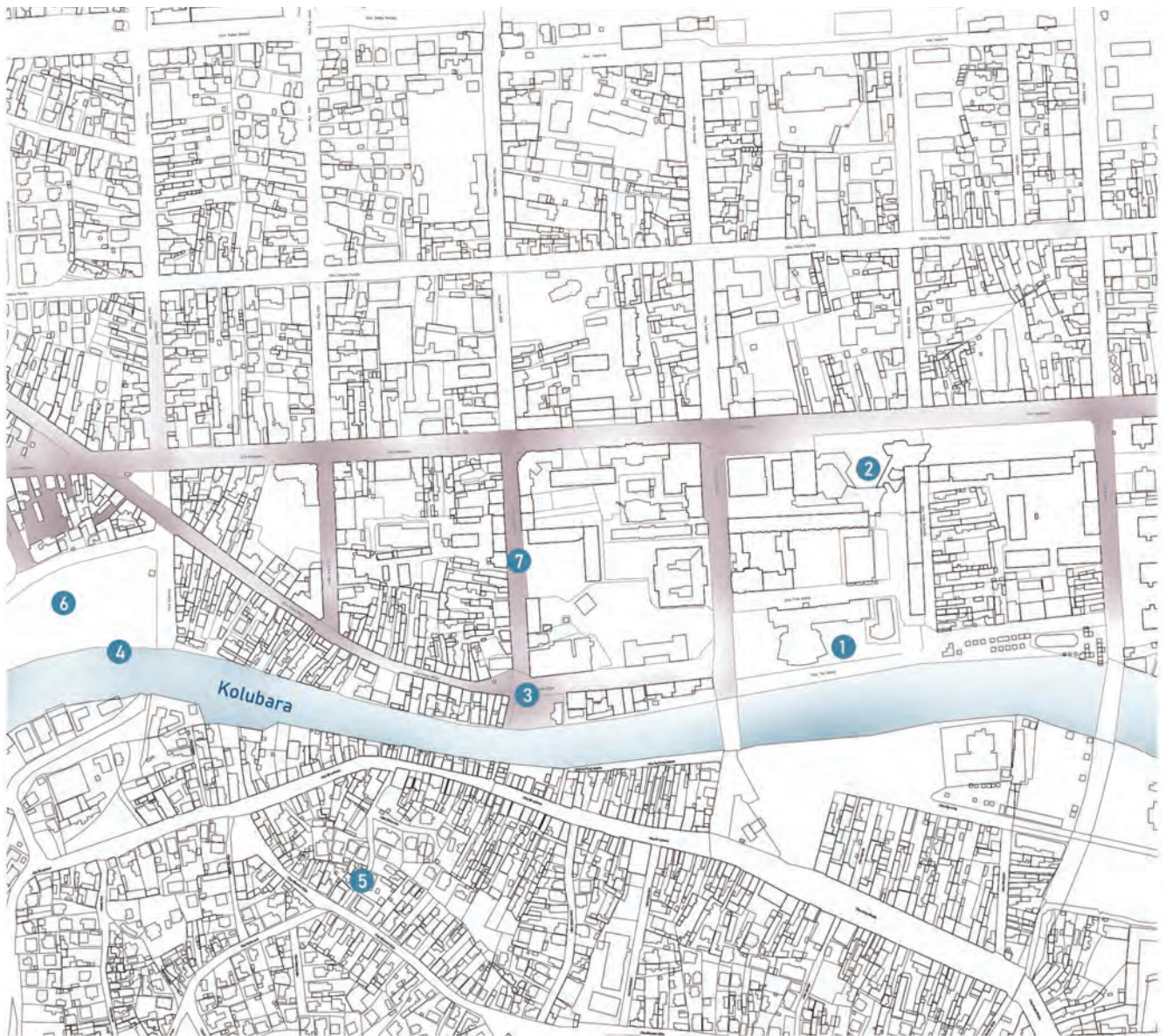
- High levels of air pollution in the city, especially affecting people aged 50 to 59 during the winter period
- Majority of employed population in the secondary sector, exposed to outdoor work and pollution
- Improper waste disposal leading to illegal landfills, polluted air and water, and unpleasant odors
- Individual combustion plants used for heating, contributing to air pollution

O

- Activating the Kolubara coast and the old town area "Tešnja"
- Pedestrianizing the city center
- Educating the local population through media and events
- Connecting to the heating plant to reduce the number of individual fire pits

T

- Decreasing number of inhabitants and increasing average age making the environment less adaptable to climate change and vulnerable to diseases
- Reduced number of green areas leading to high temperatures and heat waves, affecting vulnerable populations such as the elderly and children..



1. The plateau in front of the House of Culture
2. Town Square
3. Square of Živojina Mišića
4. Coast of Kolubarea - promenade
5. Tešnjar
6. Park Vida Jocić
7. Square of Desanka Maksimović

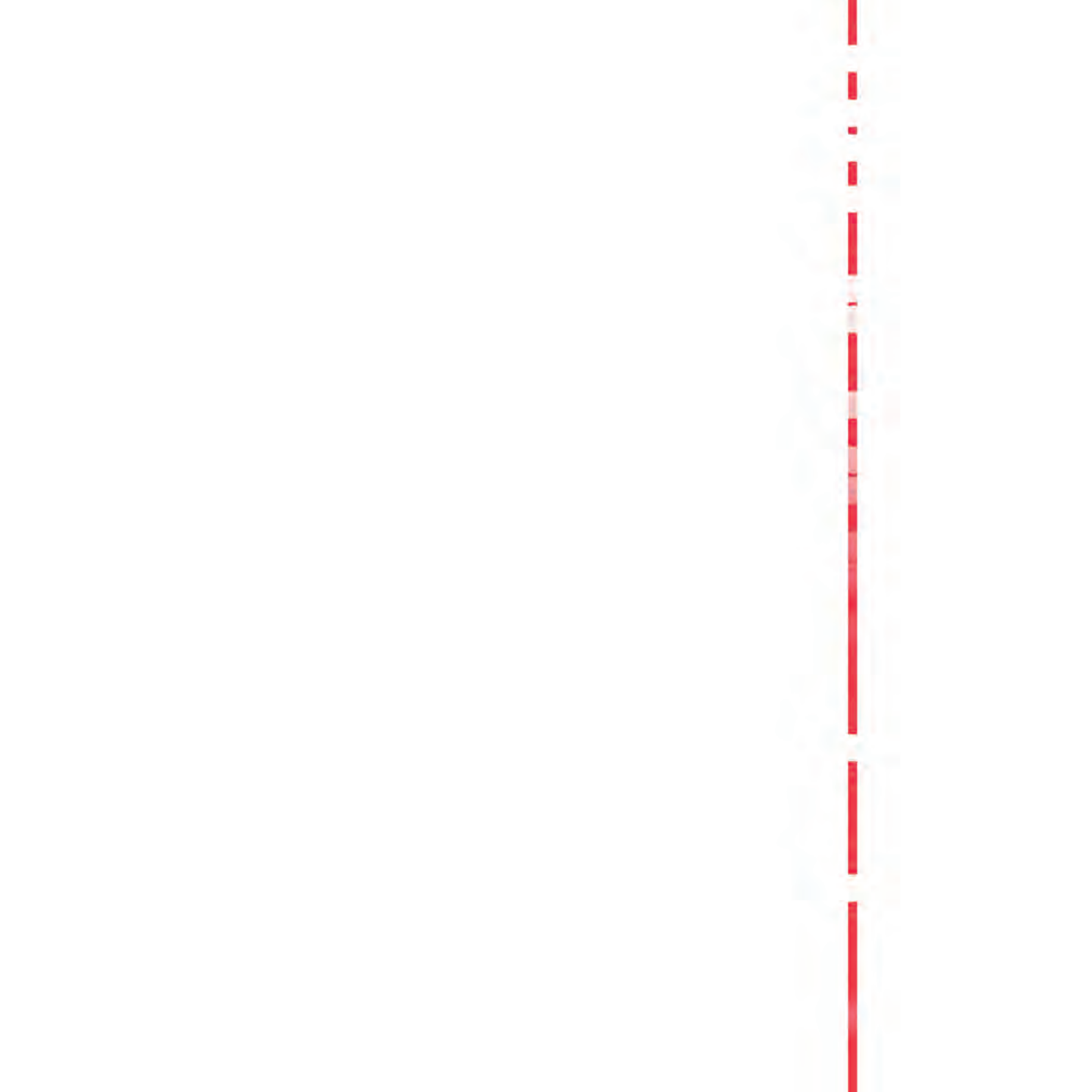
Main directions of movement and meeting places in the center of Valjevo

03.3. FUNCTIONAL STRUCTURE

Students: Ivana Tomić, Hristina Tomašević

Functional structure is one of the most important aspects of urban design. It examines the ways in which a city is organised. It answers the questions regarding the basic city functionality – is the city meeting the needs of its inhabitants? This analysis considers elements such as transportation networks, land use, and the availability of public amenities. By analyzing the functional structure of a city, we can identify opportunities for improvement and develop strategies to enhance the overall functionality and livability of the urban environment.

The functional structure of a city can be examined from different perspectives. For example, by analyzing a city's transportation network, we can identify areas where there is a lot of congestion, reduced accessibility, etc. Functional analysis also focuses on the importance of good placing of different spaces – where the residential areas are placed, commercial, industrial, and green spaces, and how they are all working together to make a cohesive city.

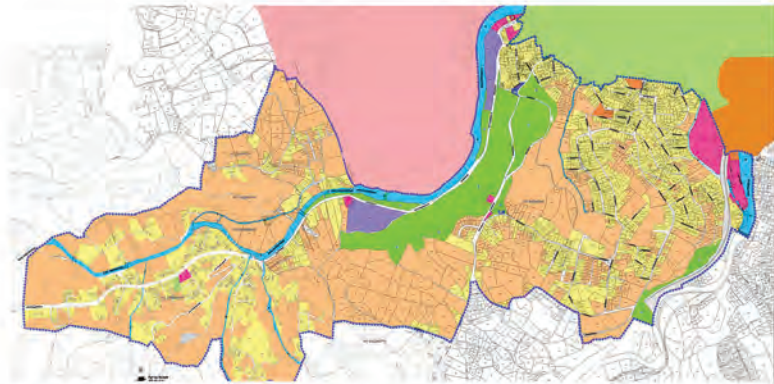


Functional aspect of purpose and traffic

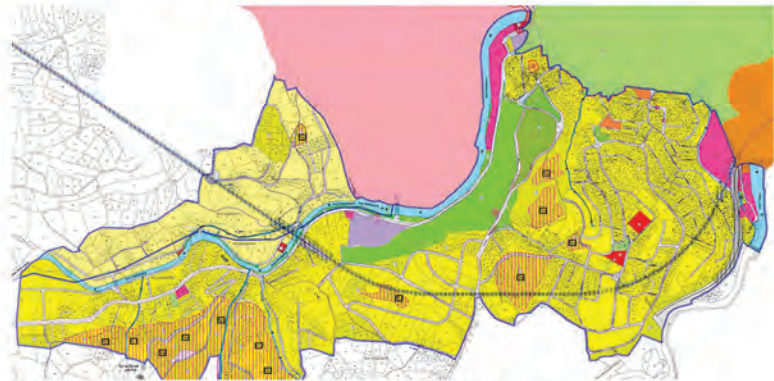
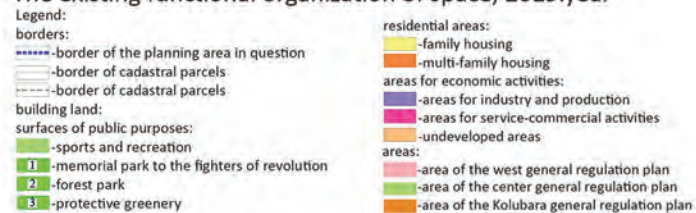
By analyzing the functional aspect of the purpose, we found 5 fundamentally different purposes, shown in the illustration. Attached are plans for the current and planned purposes of the town of Valjevo.

The existing use map shows us the dominant functions of single-family housing and undeveloped areas. There are also larger green areas, but they are concentrated in one area and are almost non-existent in the rest of the city.

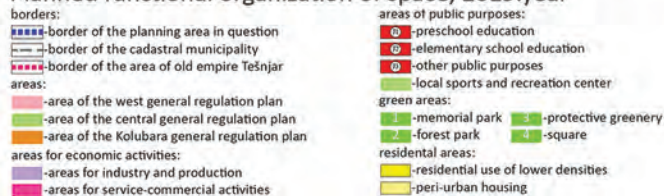
The planned uses map shows us the dominant functions of low-density single-family housing and suburban housing. Almost all undeveloped areas have become residential. Greenery in the plan remains concentrated in one area. Larger areas of unstable soil for construction were observed. The plan is to build a new Belgrade-Vrbinac railway. Public purpose contents are defined. The construction of a new bridge over the Kolubara River is also planned.

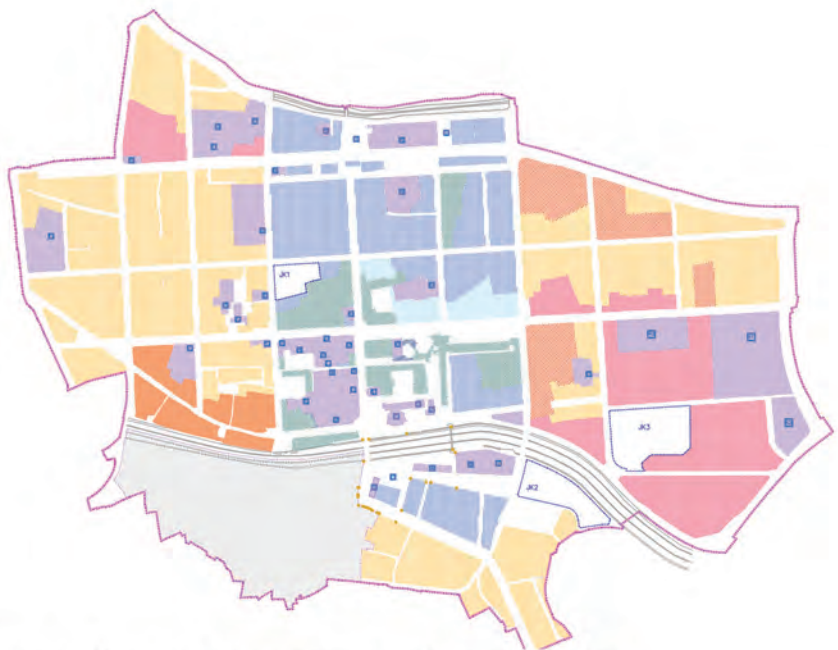


The existing functional organization of space, 2019.year

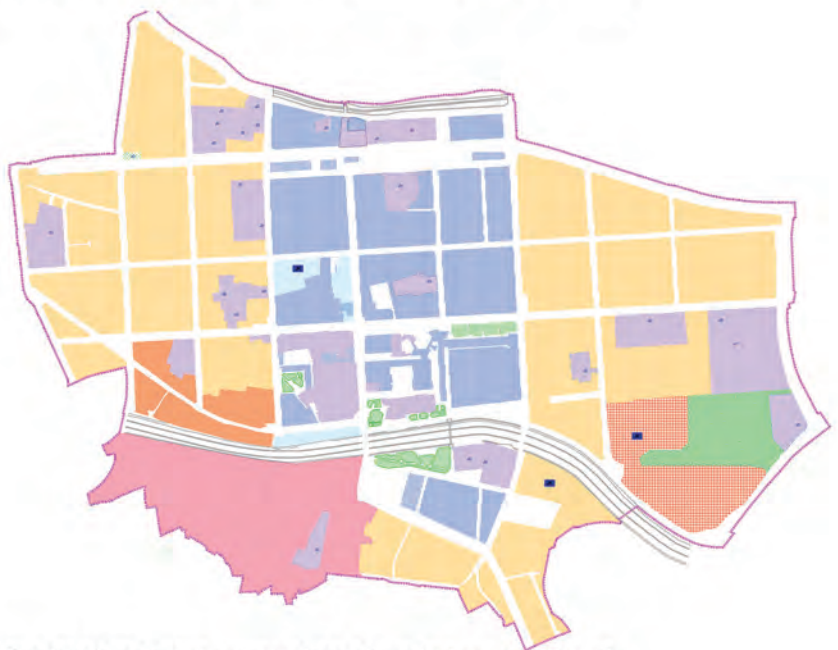


Planned functional organization of space, 2019.year





Planned functional organisation of central zone of the city

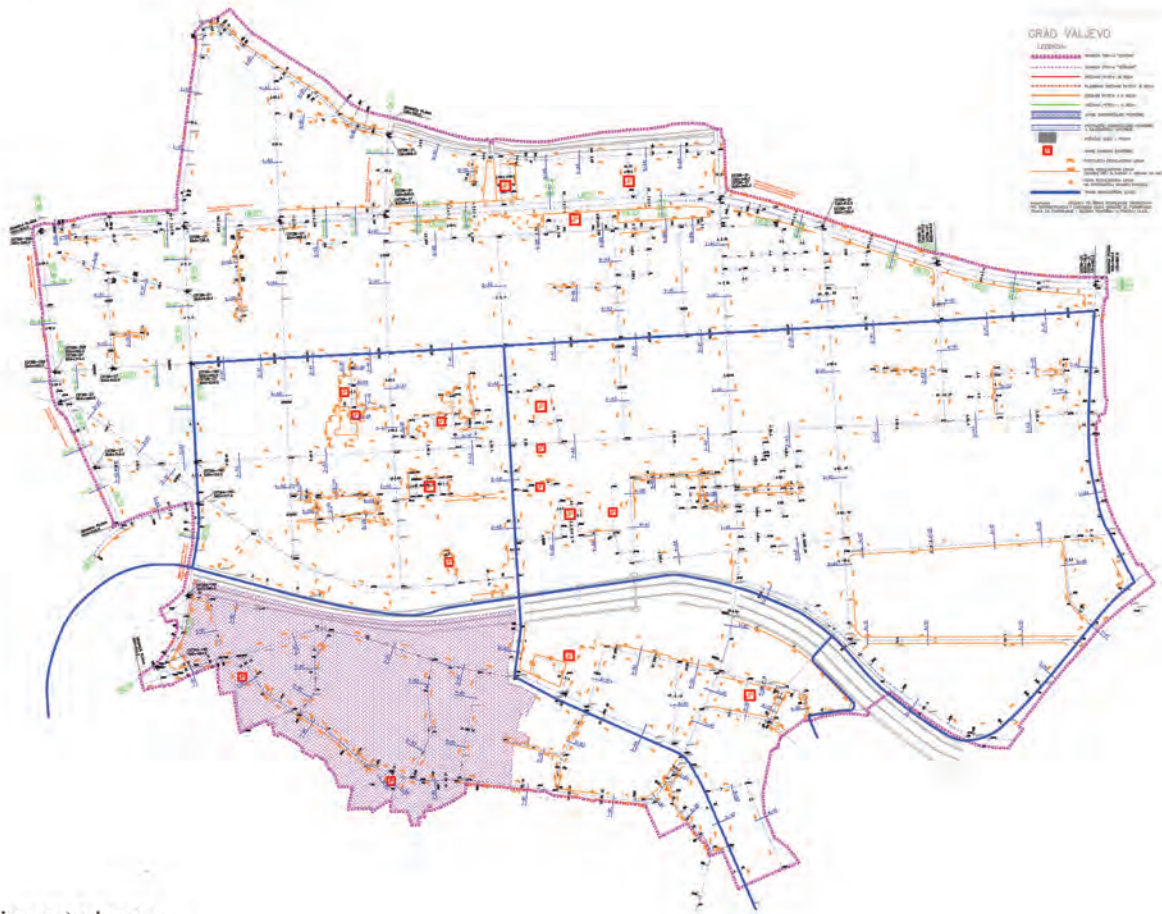


Existing functional organisation of central zone of the city

Traffic of central zone

In the general regulation plan of the city of Valjevo, we note that there are several state roads I and II - A, B and C class. Bicycle paths are planned only in some streets. It is also planned that, if the width of the street allows, each street will have parking spaces and green corridors. The legend allows us to see the street fronts.

A is a sign of the existing state of the street, B is a sign for a planned change, V is a newly planned street. The division was made according to the 1st streets of the first row - A, B and V; 2nd street of the second row - A; 3. collecting streets - A; 4. access streets - A, B, V; 5. traffic and pedestrian streets - A, B, V. We note that streets II and collector streets





Map illustrating swot analyses and conclusions of research

S

- Greenery within the urban fabric
- Good connections with bridges

O

- Expansion of bicycle paths
- Activating city center

W

- Lack of widespread greenery
- Lack of parking spaces

T

- Heating islands
- Air pollution

S

- Greenery within the urban fabric
- Good connections with bridges

W

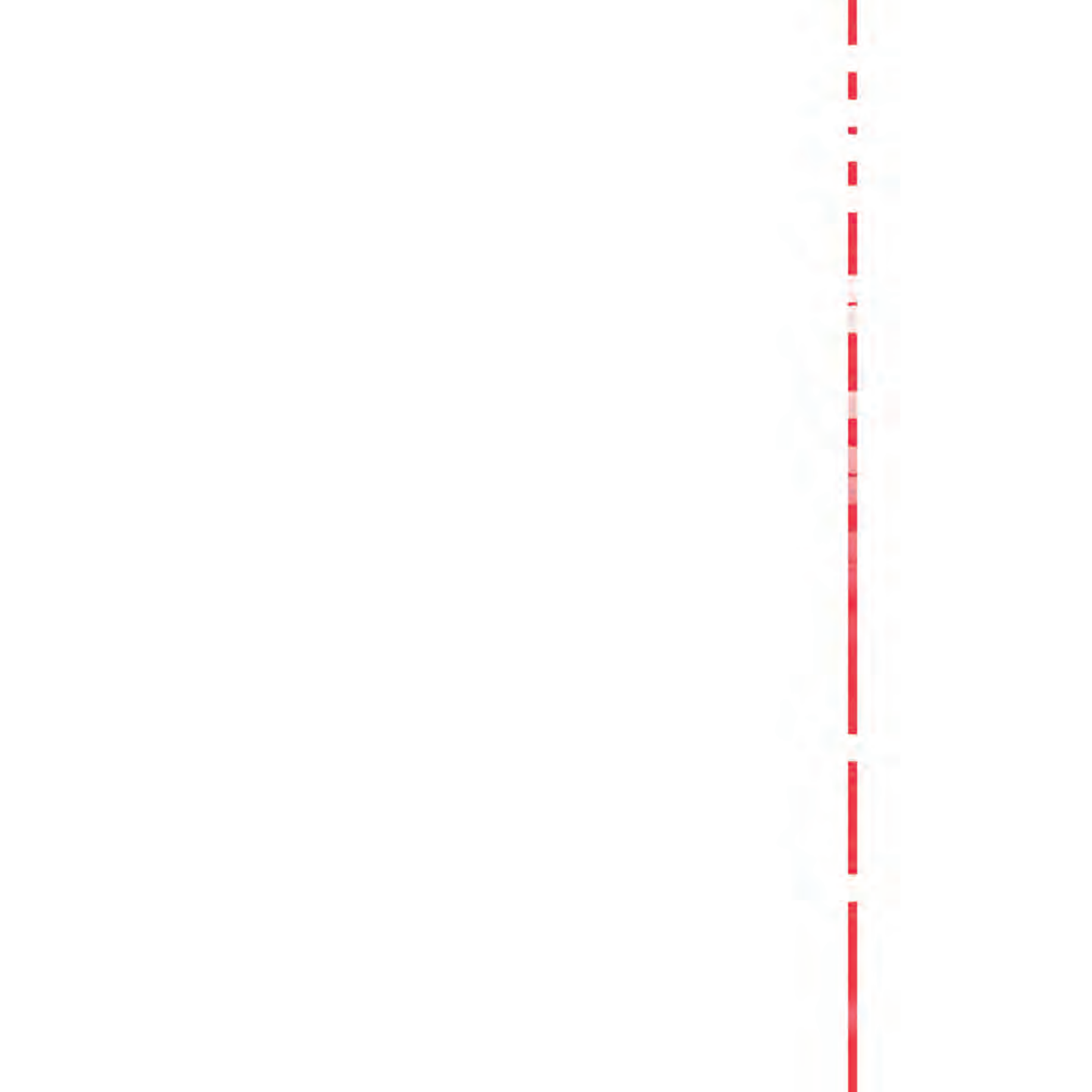
- Lack of widespread greenery
- Lack of parking spaces

O

- Expansion of bicycle paths
- Activating city center

T

- Heating Islands
- Air pollution



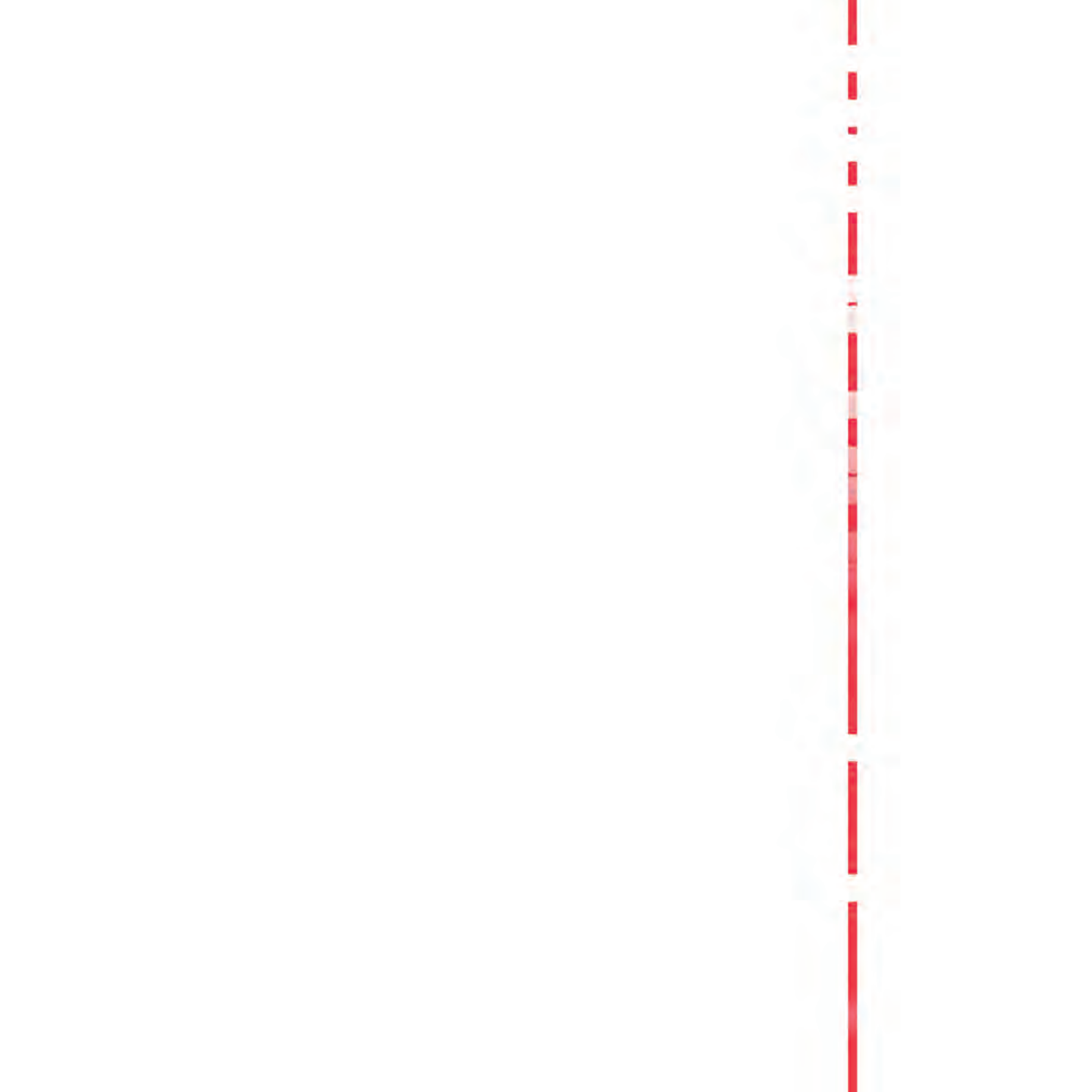
03.4. CLIMATE CHANGE

Students: Jana Mijailović, Nikola Marković

Climate change is a significant challenge facing cities around the world, and urban designers have a critical role to play in creating more sustainable urban environments. In the city of Valjevo, Serbia, climate change analysis is particularly important due to the city's susceptibility to extreme weather events such as floods and heat waves.

The climate change analysis in urban design involves examining the current and future impacts of climate change on the urban environment and developing strategies to mitigate these impacts.

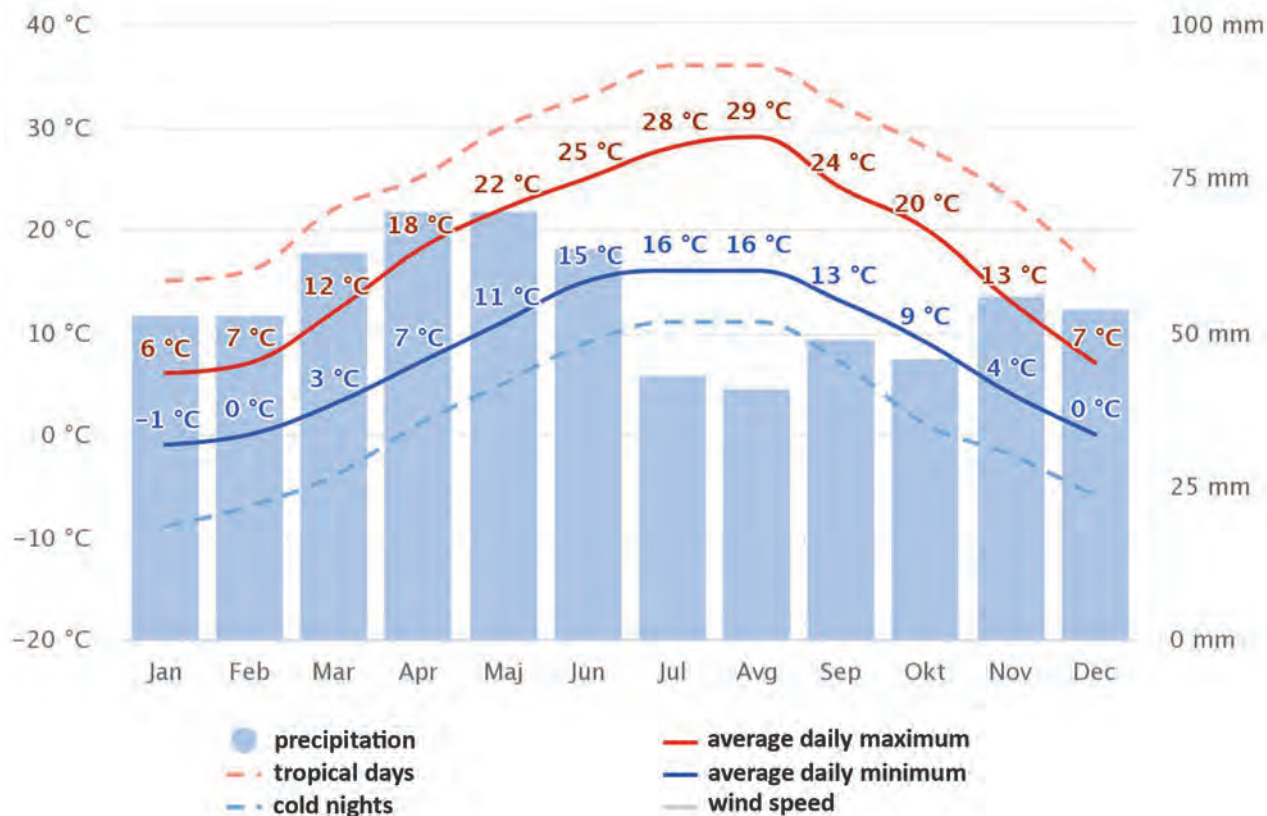
In Valjevo, this analysis may include assessing the vulnerability of different areas of the city to flooding, identifying measures to reduce the risk of damage to buildings and infrastructure. It may also involve identifying areas of the city that are particularly susceptible to the urban heat island effect and developing strategies to increase green spaces and reduce the use of heat-absorbing materials such as asphalt and concrete.



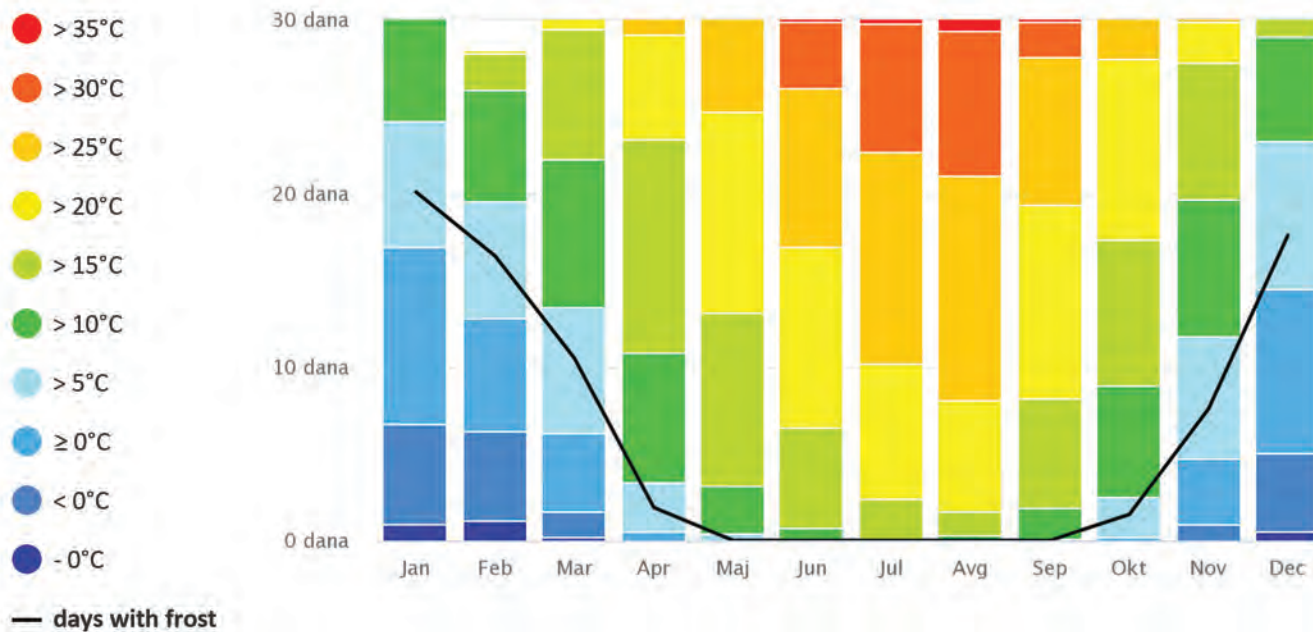
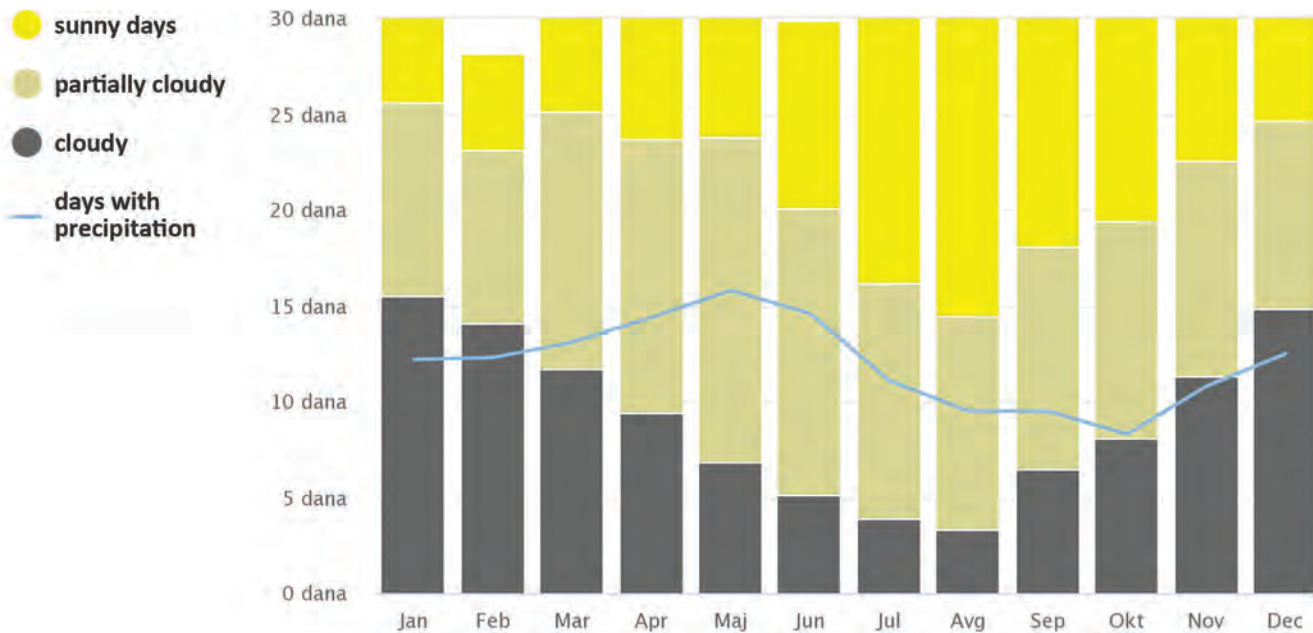
Temperature

The climate of the Valjevo region can be characterized as moderate-continental. Medium air pressure in Valjevo is about 998 mb. Air pressure changes are significantly greater in winter, than in the summer. The coldest month is January, and the warmest is July and August. Average annual amount of sunshine is 198.9 hours, with the sunniest month, July (281.8 hours) and the cloudiest month, December (68.6 hours).

The average annual temperature is 11°C. The coldest month is January (-0.2°C), and the warmest is July (21.4°C). In the area of Valjevo, the average annual amount of sunshine is 1998.9 hours, with the sunniest month, July, and the cloudiest, December.



https://www.meteoblue.com/sr/vreme/historyclimate/climatemodellied/%D0%92%D0%B0%D1%99%D0%B5%D0%B2%D0%BE_%D0%A1%D1%80%D0%B1%D0%B8%D1%98%D0%B0_3188402



<https://www.meteoblue.com/sr/vreme/historyclimate/climatemodelled/%D0%92%D0%B0%D1%99%D0%B5%D0%B2%D0%BE%D0%A1%D1%80%D0%B1%D0%B8%D1%98%D0%B03188402>

Temperature Heat islands

<https://earth.google.com/web/@44.26760026,19.8921141,1,180.49941242a,4992.79422215d,35y,354.19244873h,0t,0r>

chart showing heat islands chart showing heat islands

● potential heat islands in the city



Rivers in city of Valjevo

Reka	Klasa	Ekološki status	Objašnjenje zagađenja
Kolubara (pre PPOV)	IV	Slab	Escherichia coli, BPK5 i nitriti
Kolubara (posle PPOV)	V	Loš	Escherichia coli, BPK5
Kamenica (Divčibare)	V	Loš	Escherichia coli, Enterococcus faecalis BPK5, fosfati
Bukovska reka	IV	Slab	Citrobacter spp, amonijak
Gradac (pre vdzhvt)	II	Dobar	Escherichia coli
Gradac (posle vdzhvt)	I	Odličan	Escherichia coli
Kolubara (Šušcoka)	V	Loš	Escherichia coli, Amonijum joni, fosfati, nitrati
Obnica (Zlatarić)	III	Umeren	Escherichia coli, Amonijum joni
Jablanica (Sedlari)	II	Dobar	Escherichia coli, BPK5, amonijum joni
Petničko jezero	III	Umeren	Citrobacter spp, Amonijum joni, % saturacije kiseonika
Ljubostinja (Student)	V	Loš	Esch.coli, Enter. faecalis, BPK5, HPK, amonijum joni, fosfati

In the period from September to October 2022, microbiological and physical-chemical tests of Valjevo rivers were carried out. These analyzes revealed that the vast majority of rivers are polluted and pose a threat to human health.

Kolubara, Kamenica river in Divčibare and Bukovska river are surface waters where there is almost no life. The water of the Petnica lake, Obnica and Jablanica rivers are on the verge of health and hygiene. Ljubostinja is biologically dead, and the only river that flows away despite the challenges is Gradac.

The current condition of the surface floors in Valjevo is primarily responsible for poor wastewater treatment, an outdated and defective wastewater treatment plant (PPOV Gorić). Poorly developed sewage network - waste water is discharged directly into waterways.

The major responsibility for the contamination of rivers falls on the industrial zone, where toxic chemical substances are poured directly into the rivers, without prior treatment.



<https://earth.google.com/web/@44.27270648,19.93453292,165.20545604a,5042.66648251d,35y,358.65946288h,0t,0r>





<https://www.valjevskaposla.info/viva-reke-valjevskog-kraja-su-vrlo-zagadene-i-predstavljaju-opasnost-za-zdravlje/>



Aerial characteristics of the city of Valjevo

The climate of the Valjevo region can be characterized as moderate-continental. The average air pressure in Valjevo is about 998 mb. Changes in air pressure are significantly greater in winter than in summer. The coldest month is January, and the warmest is July and August.

Ensuring air circulation

It implies the harmonization of three-dimensional natural and created structures with sources of air flow. It can be achieved by greening as well as by building cooling towers (they are a traditional form of cooling in hot and dry climates).

Increase in air humidity

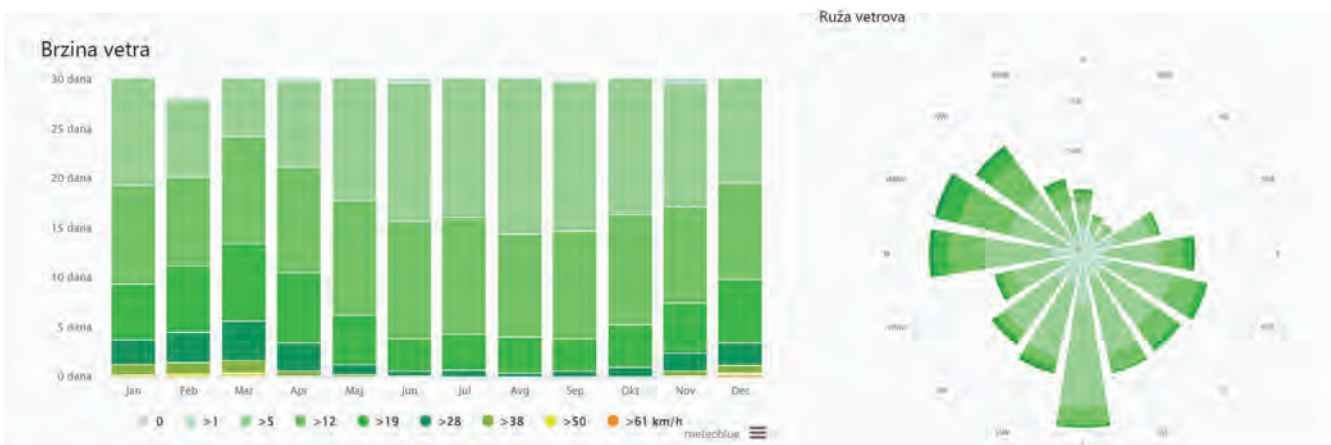
It is achieved by planting vegetation and arranging water surfaces. It is used in a limited area, primarily in hot and dry climates.

Protection from strong, cold and turbulent winds

Wind exposure can be modified by landscape elements (built structures, vegetation and soil modeling).

Efficiency

wind protection depends on the size, construction and shape of the barriers. The denser the barrier, the greater the effect it will have on wind protection, but the protected area will also be smaller.



<https://www.meteoblue.com/>

Energy efficiency of the city of Valjevo

The city of Valjevo has announced a tender for the development of the energy efficiency program and plan of Valjevo for the period 2023-2025. year.

As stated, the plan should include public purpose facilities, facilities used by public services, public utility companies and public companies founded by the City of Valjevo, as well as facilities for which the local self-government unit directly or indirectly bears the costs of energy consumption, i.e. the costs of current and/or investment maintenance.

The plan will enable the improvement of the energy systems of communal services (district heating system, district cooling system, water supply, provision of public lighting, municipal waste management, urban and suburban passenger transport, and others).

As part of USAID's "Better Energy" project, contracts were signed in Valjevo for the implementation of the project of co-financing energy rehabilitation measures with managers of five residential communities and contractors.

Renovation of residential buildings foresees installation of thermal insulation and replacement of entrance doors and windows in common areas, and as stated at today's signing, in the coming period there is a possibility for additional energy efficiency measures, which would make these buildings achieve even greater savings.



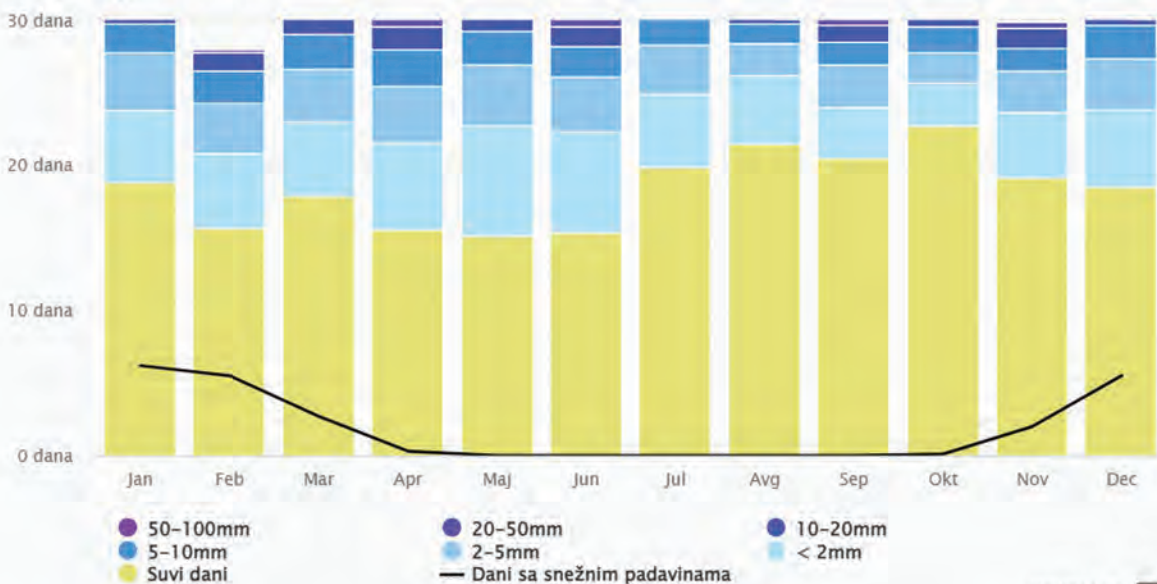
<https://www.ekapija.com/news/4051699/valjevo-pravi-plan-energetske-efikasnosti-do-2025-godine>

Percipitation

Percipitation in the Valjevo region has the characteristics of a Central European, Danube regime annual distribution. The average annual rainfall in Valjevo is 785.7 mm; the rainiest month is June, with 100.1 mm, and the driest is February, with 45.9 mm.

Various types and materializations of shelters are possible as protection against precipitation. Shelters are most often made of waterproof materials, but vegetation can also be used provide protection (eg from snow drifts).

Količina padavina



Waste management includes the functions of collection, transfer, treatment, recycling, reuse and disposal of waste. Waste management is a complex process that involves control of the entire waste management system, from waste generation, through collection and transportation, to waste treatment and disposal as the final stage in this system.

Municipal waste management

Analyzing the situation in the field of municipal waste management in Valjevo, it can be concluded that the City Administration has invested a lot of effort in previous years and financial resources in order to build a regional waste management system, and therefore sustainability in this area. It should certainly be noted that problems in waste management in the territory of the city of Valjevo still exist.



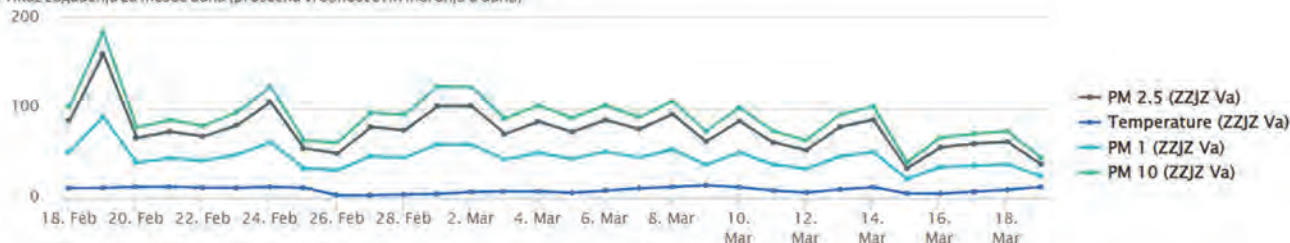
<https://www.vamedia.info/2022/07/decenijaska-saga-o-deponiji/>

AIR POLLUTION

Local effects of air pollution are defined as modified microclimatic indicators in urban compared to rural areas, such as an increase in air temperature, a decrease in relative humidity, a decrease in solar radiation, increased cloudiness, possible occurrence of acid rain, which can further cause changes in the concentration of pollutants in the air of the environment in urban areas and consequently affect the environment and human health.

Polluted air is one of the main factors that determine the quality of life in urban areas environments, in such a way that it increases the risk to human health and the environment.

Prikaz zagađenja za mesec dana (prosečna vrednost svih merenja u danu)



<https://www.meteoblue.com/>

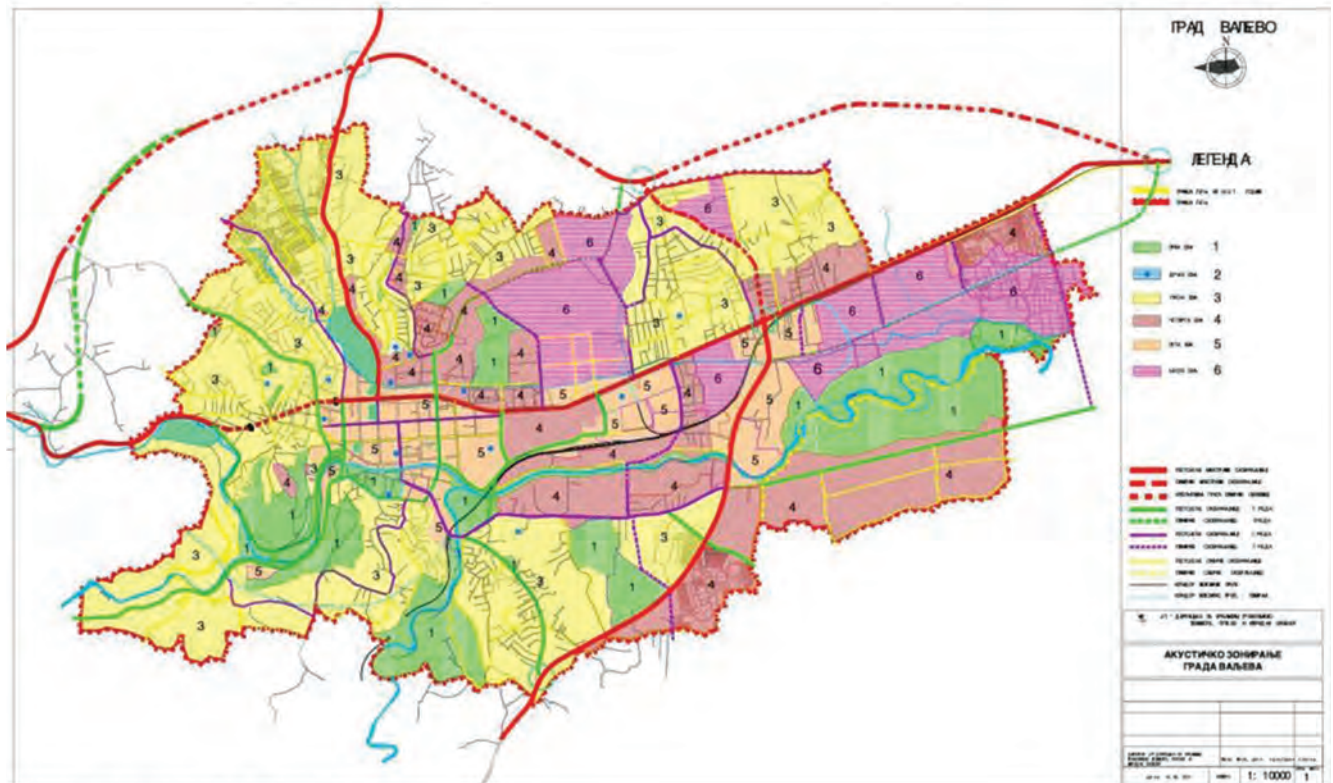
Based on the analysis of the situation, it can be concluded that the main problems of the city of Valjevo in the area of air are the following:

- increased concentrations of soot and total sediments during the heating season due to emissions from municipal and individual boiler houses and fireplaces in households, as well as the use of low-quality heating fuel
- insufficient gasification and heating of parts of the city
- inadequate solutions in the field of traffic
- Regarding the control of allergenic pollen in the air, it can be concluded that they are the largest the following problems:
 - the absence of a program for controlling weed allergenic species
 - systematic monitoring of pollen concentration on the territory of the city

Noise pollution

From 2008 to 2015, noise level measurements were made in the environment in the area of the city of Valjevo (measurements were not made in 2011, 2013 and 2014). In the same period, the area of the city of Valjevo was divided into acoustic zones, these zones were determined in accordance with the purpose of the specific area and further determine the permitted noise level in the same area.

The last measurement was carried out in 2015 at 16 different locations throughout the city, and it was the largest to date.



Acoustic zoning of the city of Valjevo

https://valjevo.rs/Dokumenta/GradValjevo/Zastita_Sredine/LPZZS_Valjevo.pdf

Noise in the city of Valjevo originates mostly from traffic, including highways and main roads city roads, and the schools located next to them are most at risk the busiest and noisiest roads. Also, there is an increased level of noise in during the night period that originates from hospitality establishments. Based on the situational analysis of noise in the environment, the following can be distinguished problems:

// Absence of a strategic noise map

// Absence of an action plan for noise protection in the environment

// Inadequate solution of traffic in the city center and transit traffic

// Lack of green and other barriers along the main city roads

// Annual reports on the results of noise level measurements have not been prepared

// Information about the noise level is not available to the public (there is no information on the Internet city administration website)

Ред.бр.	Мерно место	Измерене вредности		Дозвољени ниво буке (дВ) – за дан и ноћ
		XI	XII	
1.	Угао Кнеза Милоша, Браће недића и Цаке Миливојевић	59	62	55
		58	56	45
2.	Улица Мајора Илића, парк Пећина	51	50	50
		43	44	40
3.	Угао улица Кнеза Милоша и Душанове, пешачка зона	64	58	65
		48	53	55
4.	Кула Ненадовића	44	43	50
		44	40	45
5.	Улица Карађорђева, код зграде стоматологије	61	62	65
		56	57	55
6.	Булевар Палих бораца 91.-92. између Колубаре 2, Инос Балкана и ж.стан	56	54	60
		47	46	50
7.	Угао улица Ужичке и Никшићке	60	57	55
8.	Ул. Суворовска бр.48, испред ОШ „ Владика Николај Велимировић	52	50	50
		46	41	45
9.	Обилазни пут, сточни пијач, стругара	69	65	60
		55	55	50
10.	Улица Јована Дучића, код Ватрогасног дома	57	57	60
		54	50	50
11.	Индустријска зона, круг „ Стефил”-а	55	48	65
		53	47	55
12.	Тешњар, између ресторана „ Интермецо” и „ Јефимија”	58	58	50
		52	72	40
13.	Десанкин трг	59	52	65
		46	48	55
14.	Трг Кнегиње Љубице	61	51	65
		54	51	55
15.	Угао улица Карађорђеве и Нушићеве	63	62	65
		54	58	55
16.	Угао улица Карађорђеве и Синђелићеве	62	64	65
		58	60	55

S

- The local community and NGOs have launched an initiative focused on addressing climate change and ecology.
- The city authorities have implemented various legal documents and initiatives to support environmental protection programs, such as the Environmental Protection Program 2016-2025.
- Efforts to improve energy efficiency in residential buildings are underway, with some already being implemented as part of the Better Energy program.
- The Gradac River serves as evidence that it's possible to preserve and sustain the ecosystem of water surfaces, as it is recognized as one of the cleanest rivers in Serbia.

W

- Valjevo has a high number of individual pollution sources
- The absence of sewage systems, illegal dumps, and industrial facilities that discharge toxic materials into rivers have led to poor surface water conditions
- Heat islands are a significant issue for Valjevo, with many built surfaces in one area without proper accompanying vegetation, such as numerous parking lots, large asphalt surfaces, and new buildings without necessary vegetation.
- The uncontrolled industrial zone is having detrimental effects on the soil, water, and air quality.

O

- Valjevo boasts a significant number of surface waters, such as Gradac, Kolubara, Jablanica, Obnica, and Ljubostinja.
- The surrounding areas of Valjevo have abundant forested areas.
- The municipal authorities and local population are interested in and committed to energy efficiency.
- The exceptional cleanliness of Gradac River, one of the cleanest in Serbia, demonstrates the possibility of preserving and maintaining aquatic ecosystems.

T

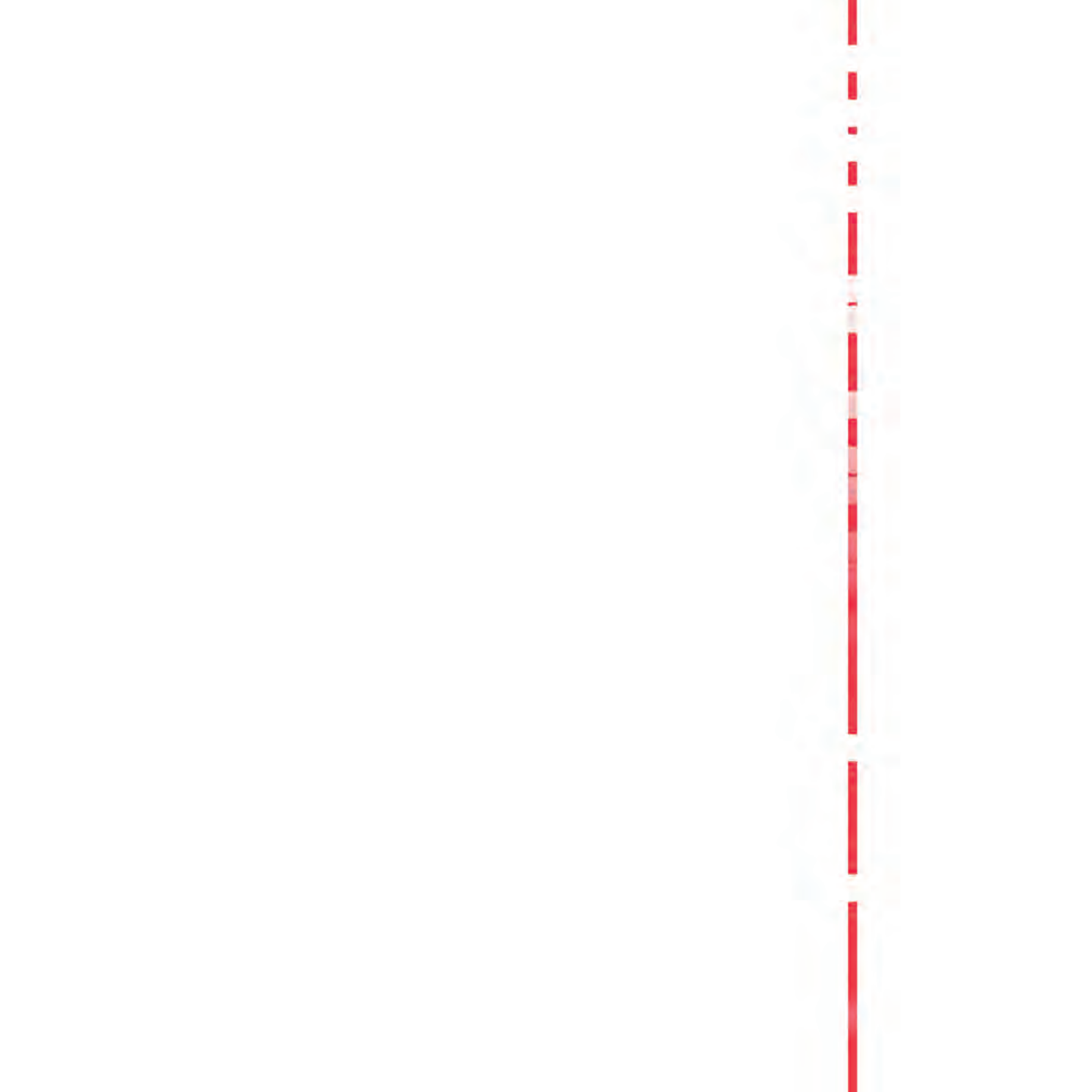
- The contamination of air poses a significant threat to human health
- Improper management of rivers can result in severe consequences, such as the floods that Valjevo experienced in 2014.
- The noticeable increase in construction across all sectors could exacerbate the already poor condition of these aspects if not properly regulated.
- Uncontrolled industrial zones have detrimental impacts on land, water, and air quality.

03.5. HEALTH IN VALJEVO

Students: Teodora Živković, Jelena Ilić

Health in the cities is and will always be one of the biggest challenges faced by not only urban designers but every other profession regarding the city in general. As mentioned before, health is not only the absence of illness, but also happiness, low-stress environments, and many other things that impact us, humans.

Many factors affect human health in the cities, such as air quality, pollution, water quality and water management, heat, the absence of green spaces, and many more.



Healthcare - General Hospital Valjevo

Basic record of environmental risk factor monitoring

Article 26

Basic records of environmental risk factor monitoring shall be kept in a health facility, and another at a legal entity that carries out the activity of environmental risk factor monitoring.

Basic environmental risk factor monitoring records are:

- 1)** Records of the health suitability of drinking water;
- 2)** Records of the health suitability of packaged natural mineral water, natural spring water, and table water;
- 3)** Records of health and food safety;
- 4)** Records of the correctness and safety of items of general use;
- 5)** Records of the health safety of water used for recreation, whether it is part of a surface water body or is in an open or closed basin;
- 6)** Air quality monitoring records;

7) Soil quality monitoring records;

8) Records of wastewater and surface water quality (receptors);

9) Medical waste records;

10) Records of environmental (municipal) noise;

11) records of ionizing radiation, other harmful substances, phenomena and agents threatening human life.

Based on the records from paragraph 2 of this Article, authorized laboratories, competent institutions and other legal entities involved in monitoring of environmental risk factors are obliged to submit reports to the regulatory institution, i.e. the Institute of Public Health.

Responsible for the accuracy of data from basic environmental risk factor monitoring records from paragraph 2 of this Article is the competent public health personnel, i.e. public health workers and other authorized persons.

The first Antituberculosis Dispensary started working in the old hospital in Valjevo right after the end of World War II. The dispensary was headed by prof. Dr. Sava Ljubisavljević. The first specialist in lung diseases was Dr. Zora Radovanović.

The pneumophthisiology service has 51 beds. There are double and triple rooms, each with its own bathroom and excellent conditions for accommodating patients.

Monitoring and continuous oxygenation, as well as a device for non-invasive mechanical ventilation, are provided in the pulmonology intensive care unit.

Nine pneumophthisiologists and one internal medicine specialist are employed in the Pneumophthisiology Service. One doctor is specializing in pneumophthisiology. Out of the total number of doctors, two are subspecialists. 26 nurses work in the service.

Source:https://www.obvaljevo.rs/index.php?option=com_content&view=article&id=104&Itemid=124



Image : <https://www.obvaljevo.rs/images/sluzbe/ob/141.jpg>

Air quality/The main problem

The most important thing that affects health of Valjevo residents is quality of air. Valjevo is one of the most air polluted cities in Serbia. That's a problem the city has been dealing with for years.

In 2021. the air on the territory of the city of Valjevo was category IV (polluted air), but now in the beginning of 2023. it is category V (heavily polluted). It is all due to exceeding the limit values of the concentration of suspended particles.

According to the report of the Environmental Protection Agency in Serbia, the highest measured concentration of PM 10 particles was measured precisely in Valjevo and was 806 micrograms per cubic meter of air.

Suspended particles PM 10 and PM 2.5 are among the most dangerous pollutants, and they are the products of individual fireplaces and materials that citizens use for firewood. PM10 is a mixture of smoke, soot and acids with heavy metals such as lead, cadmium, nickel and arsenic.



image 1: https://gdb.rferl.org/cfc92cd5-c7cf-4375-af53-50e91d53cf8b_cx0_cy18_cw0_w1023_r1_s.jpg

image 2: https://cms.iqair.com/sites/default/files/inline-images/AQI%29Chart_US.png

According to EU directives, in order for the air to be considered clean, the concentration of these particles should not exceed 40 micrograms per cubic meter, and exceedances should not exceed 35 days a year.

According to the data transmitted by the xEco air application, since the beginning of 2023, in Valjevo, the average daily limit value for microscopic dust type PM10 in the air has been exceeded 35 times, which has already reached the legal limit for the whole year.

The main pollution problem is heating. That's why the measured concentrations of suspended PM10 particles in the spring-summer period were lower than in the autumn-winter period.

The negative impact of air quality on the health of the population in autumn-winter period was minimally expressed.

According to information from "Toplana" in Valjevo, only 20 percent of the total heating surface is connected to the district heating system. The rest of almost 80 percent is made up of individual fireplaces.

The reasons for this are economic. Citizens believe that the connection is expensive, and the bills are high. Even the authorities at the Hospital refused to connect to the district heating system for years, justifying it by the high cost of heating.

Date	Air quality			The highest daily concentrations (suspended particles) $\mu\text{g}/\text{m}^3$			
	Index	Average daily concentrations $\mu\text{g}/\text{m}^3$		PM ₁₀	Čas	PM _{2.5}	Čas
		PM ₁₀	PM _{2.5}				
13.2.2023.	Very unhealthy	94,31	77,60	195,33	17	114,70	20
14.2.2023.	Very unhealthy	81,63	55,83	165,46	18	102,60	18
15.2.2023.	Very unhealthy	82,31	67,65	200,85	19	154,68	19
16.2.2023.	Very unhealthy	89,11	67,96	196,21	18	135,33	19
17.2.2023.	Very unhealthy	84,17	58,09	188,33	18	122,74	20
18.2.2023.	Very unhealthy	92,59	64,27	226,60	18	149,16	18
19.2.2023.	Very unhealthy	77,47	58,64	205,18	21	129,72	19

Image: https://cdn.shortpixel.ai/spai/w_672+q_glossy+ret_img+to_web-p/https://balkangreenenergynews.com/rs/wp-content/uploads/2023/02/Kvalitet-vazduha-u-Valjevu.jpg

Impact/Healthcare analysis

The impact on city residents can be very serious and is most often manifested through diseases. Since the air in the city of Valjevo belongs to category V in air quality index, anyone can feel the serious negative impact of polluted air on health (difficulty breathing, coughing, a feeling of tightness and hissing in the chest, watery eyes, increased secretions from the nose and scratching in the throat). People with heart and lung diseases, the elderly and children should avoid any outdoor activity. The rest of the population should avoid prolonged and strenuous physical activity. It is not recommended to open windows and ventilate closed rooms.

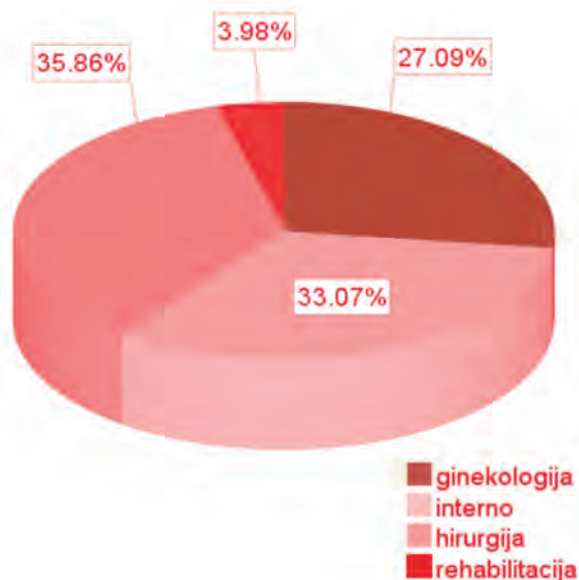
A study was recently published that found a link between long-term exposure to traffic and industrial air pollutants and the onset of autoimmune diseases, such as rheumatoid arthritis, connective tissue disease and inflammatory bowel disease. Micro-particles can reach every cell in the human body and damage every organ.

In Valjevo, there is an increase in the number of children suffering from asthma, which is associated with the influence of polluted air. Of the total number of premature deaths, which can be attributed to the influence of polluted air in Serbia, almost a fifth or 18 percent falls on Valjevo. This international organization estimated that in the



251 patients participated in the user satisfaction survey, the largest number of whom were residents in hospital treatment in surgery departments and internal medicine departments, while only 10% of patients surveyed after hospital treatment in the rehabilitation department.

According to the 2002 census, 192,204 inhabitants live in the area of the Kolubara district. A comparative comparison indicates a decrease in the number of inhabitants compared to the 1991 census.



The growth rate is present only in the administrative center of the district - Valjevo.

The distribution according to gender is 97,462 women and 94,742 men. Children (from 0 to 19 years) make 21.61%, 19.37% are older than 65, 1.37% are disabled, and 9.37% are unemployed. Able to work make group up to 76% and their age is between 20 and 50 years old.



Image1: https://www.obvaljevo.rs/_down/proцена_zadovoljstva_bolnicki_lecenih_pacijenata_u_opstoj_bolnici_valjevo.pdf

Image2: https://www.obvaljevo.rs/_down/strategija_razvoja_2011.pdf

Solutions/Interviews with stakeholders

In previous years, the city authorities in Valjevo adopted important acts - the Air Quality Plan from 2016 to 2021, as well as a set of measures to reduce air pollution. However, Valjevo has not had an air quality plan for two years.

It was suggested approving subsidies to citizens in order to reduce the number of individual fireplaces, but city authorities say that people are disinterested.

The inertia of local self-government motivated Local Response to turn to the community. Together with the Institute for Public Health of the city of Valjevo, a children's education program was launched in two primary schools. Children show great interest in the problem of pollution and this inspires hope for change.

The citizens of Valjevo are now pinning their hopes on announcements of possible gasification of the city.

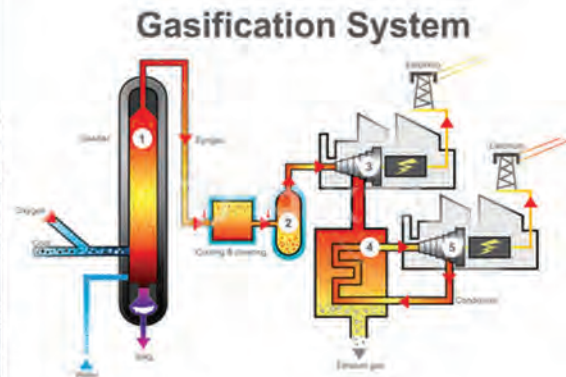
Measures to reduce the negative impact of polluted air on the health of the population include The expansion of the existing hot water network enables an even larger number of households to be supplied with thermal energy produced within large plants that control their emissions, which would reduce the number of users of individual furnaces.

Construction of a gas pipeline network which would enable the connection of individual combustion plants, and which would reduce the number of users of individual combustion plants that use fuels with a higher degree of emission of pollutants than gas as energy sources.



Image 1: https://bizportal.rs/wp-content/uploads/2022/02/monolithic-part-of-the-waters-gcd14a0642_1920-1024x647.jpg

Image 2: <https://en.pimg.jp/031/727/271/1/31727271.jpg>



“Toplana Valjevo”

After speaking to the stakeholder of “Toplana Valjevo” we can see that a lot of people are discouraged with the current situation in Valjevo. They think they do not have much influence on the situation and that it will be very hard to fix.

“Zaštita životne sredine”

Stakeholder of this institution also has a discouraged attitude towards the resolution of the problem. But her opinion on the solution for the climate change impact on human health comes from a different perspective. She states that the city is throwing money away but it is not getting better. Her reaction would be working on the solution for the preservation of the environment. She was surprised by the facts which stated that most of the deaths in Valjevo are caused by lung and respiratory issues. Her solution would be preventing these issues caused by the environment, by treating the environment and with that we will be treating ourselves.

S

- Free spaces by the rivers (which can be used for various projects that would contribute to urban health)
- Good equipment of health institutions

W

- Polluted rivers
- Sewage problem
- Problem with investing money in the preservation of the environment
- Resistance of the population to contribute to solving the problem

O

- Possibility of connection to district heating system (reduction in the number of individual fireplaces)
- Existence of organizations which are dealing with pollution problems

T

- Toplana, Krušik, individual fireplaces (sources of air pollution)
- Landfill
- PM 10 particles (which concentration is not controlled at the Valjevo Institute)

PHYSICAL ASPECT



-Traffic: air pollution that leads to certain health problems

FUNCTIONAL ASPECT



-Areas for sports and recreation: lack of physical activity; obesity.
-Single-family housing: individual fireplaces

SOCIO-CULTURAL ASPECT



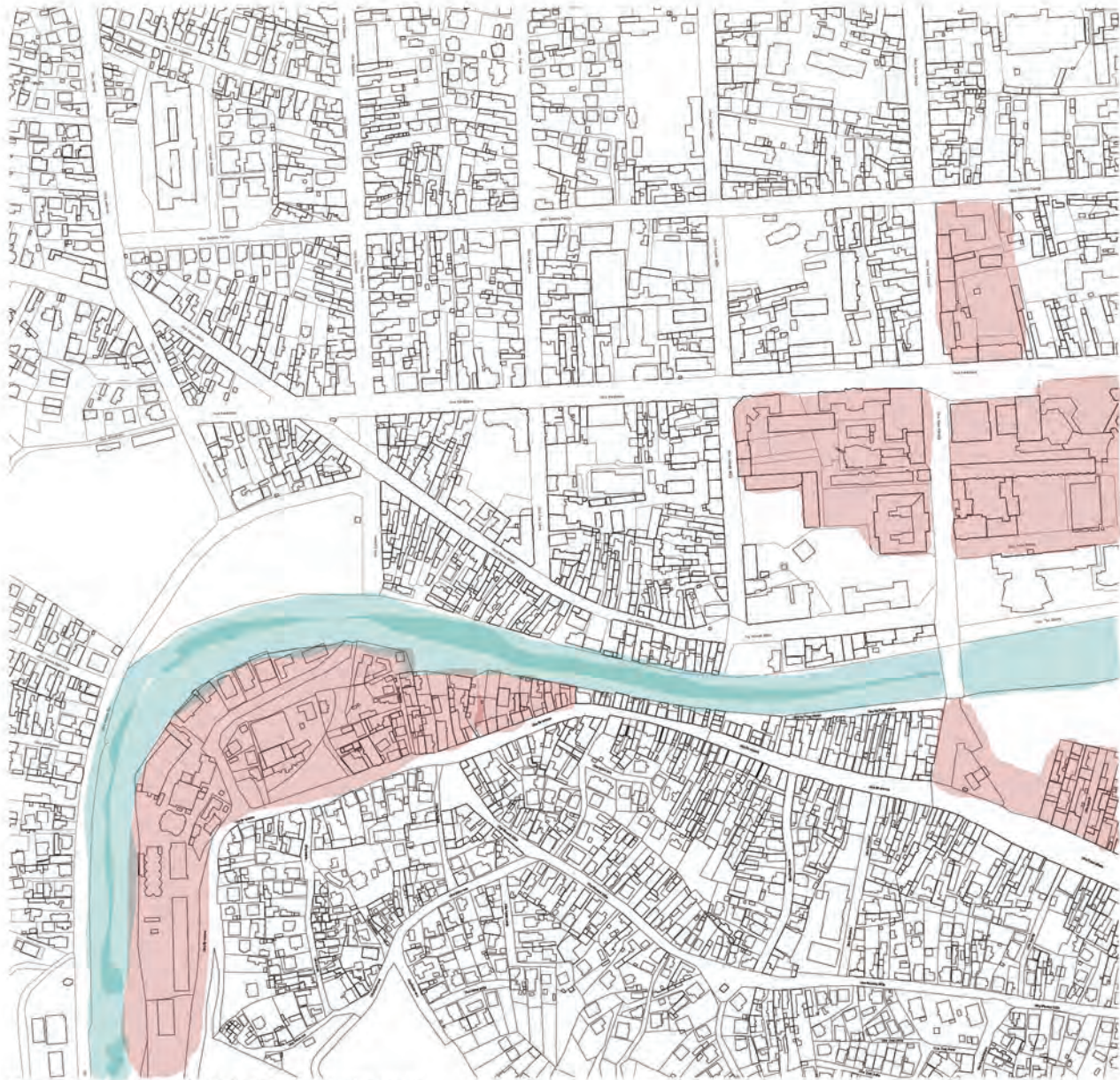
-Meeting places in the city (mostly squares): heat islands

ECOLOGICAL ASPECT AND
CLIMATE CHANGES

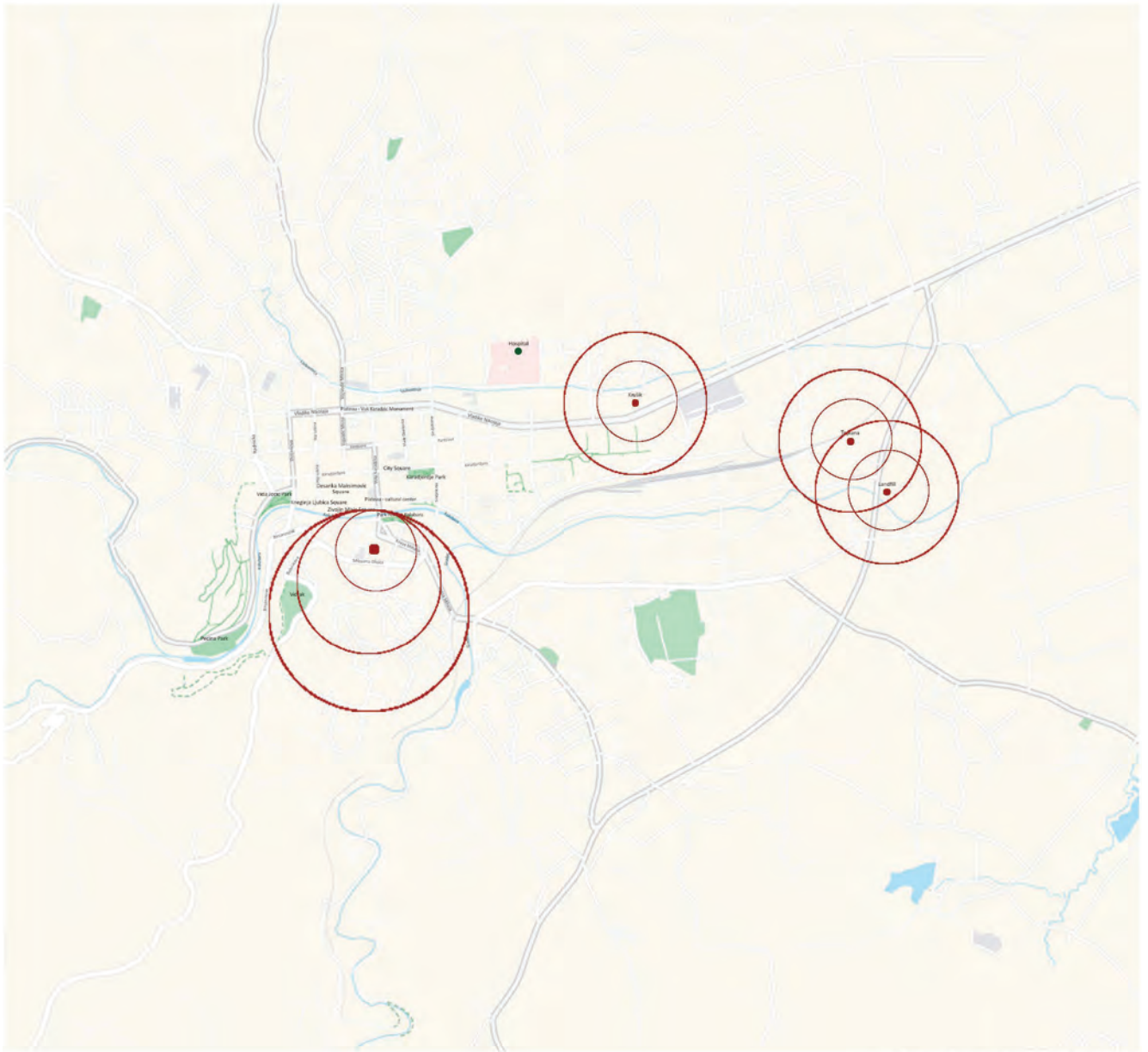


- Air pollution: breathing problems; death...
-Increase in temperature: sunstroke, heat stress..
-Heat islands: sunstroke, heat stress..
- Polluted rivers: infectious diseases
- Contaminated soil

Maps of weaknesses and threats



Heat islands and polluted water - Weaknesses



Pollution sources - Threats



03.6.COMBINING GROUP

RESULTS

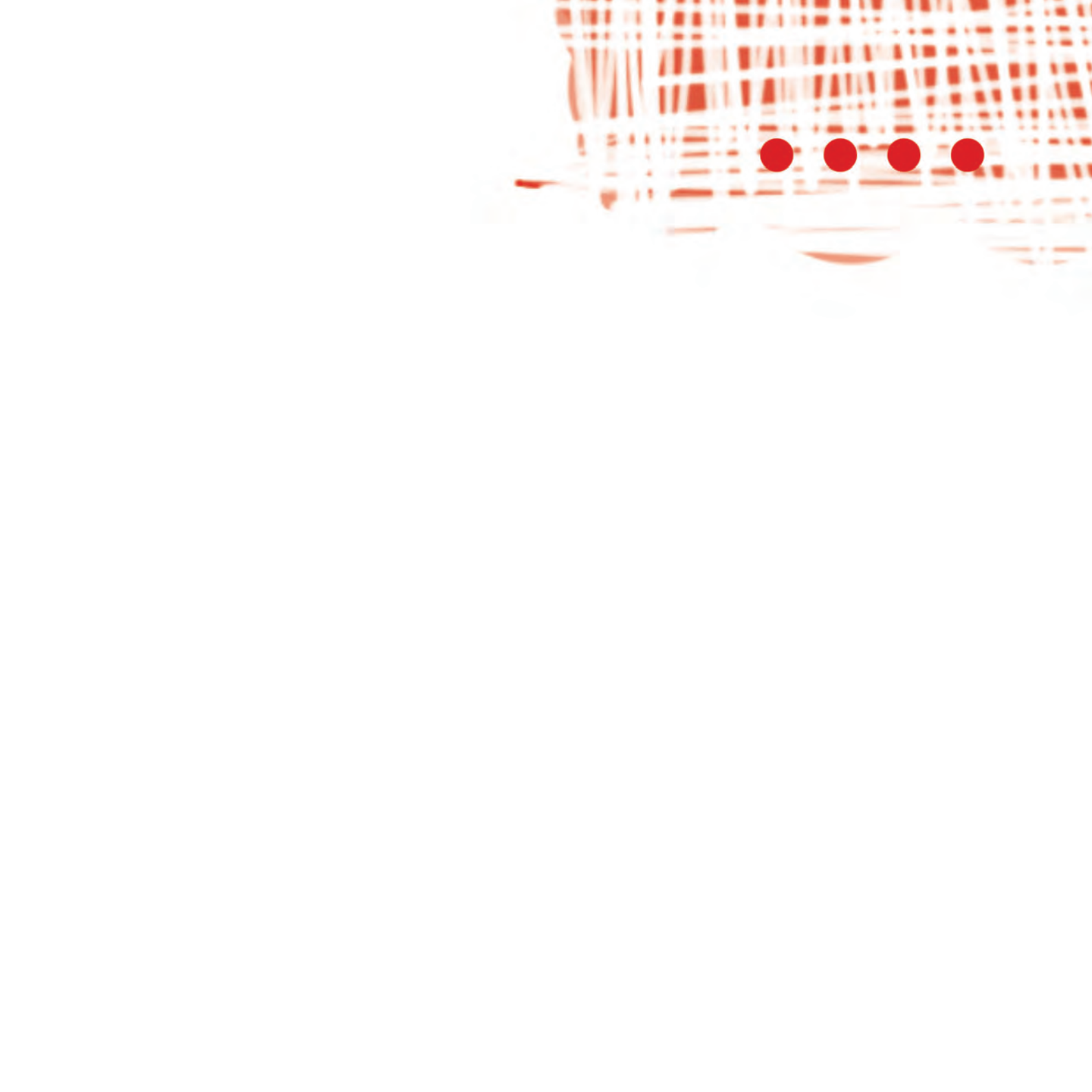
Thursday, April 6th, 2023.

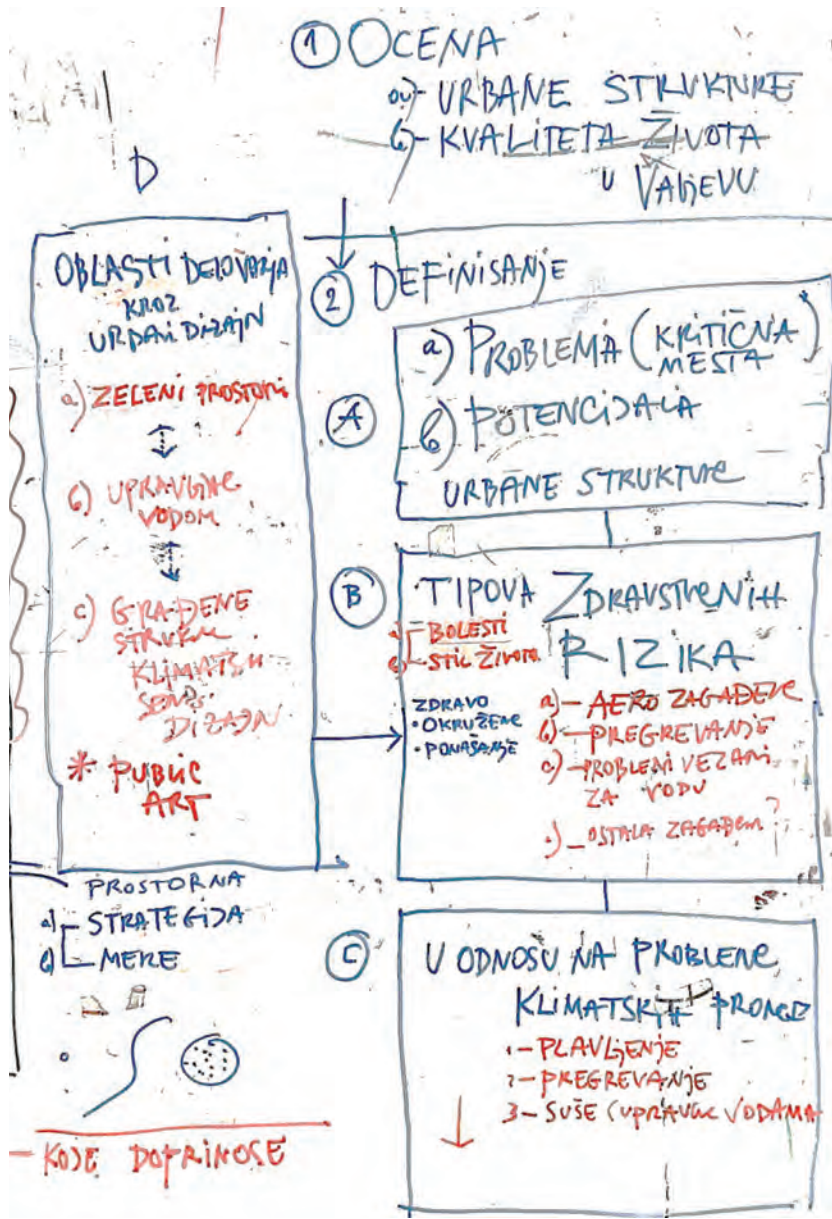
The remaining two out of five groups presented their findings of the topics “Climate changes in Valjevo” and “Functional structure of the central zone of Valjevo”.

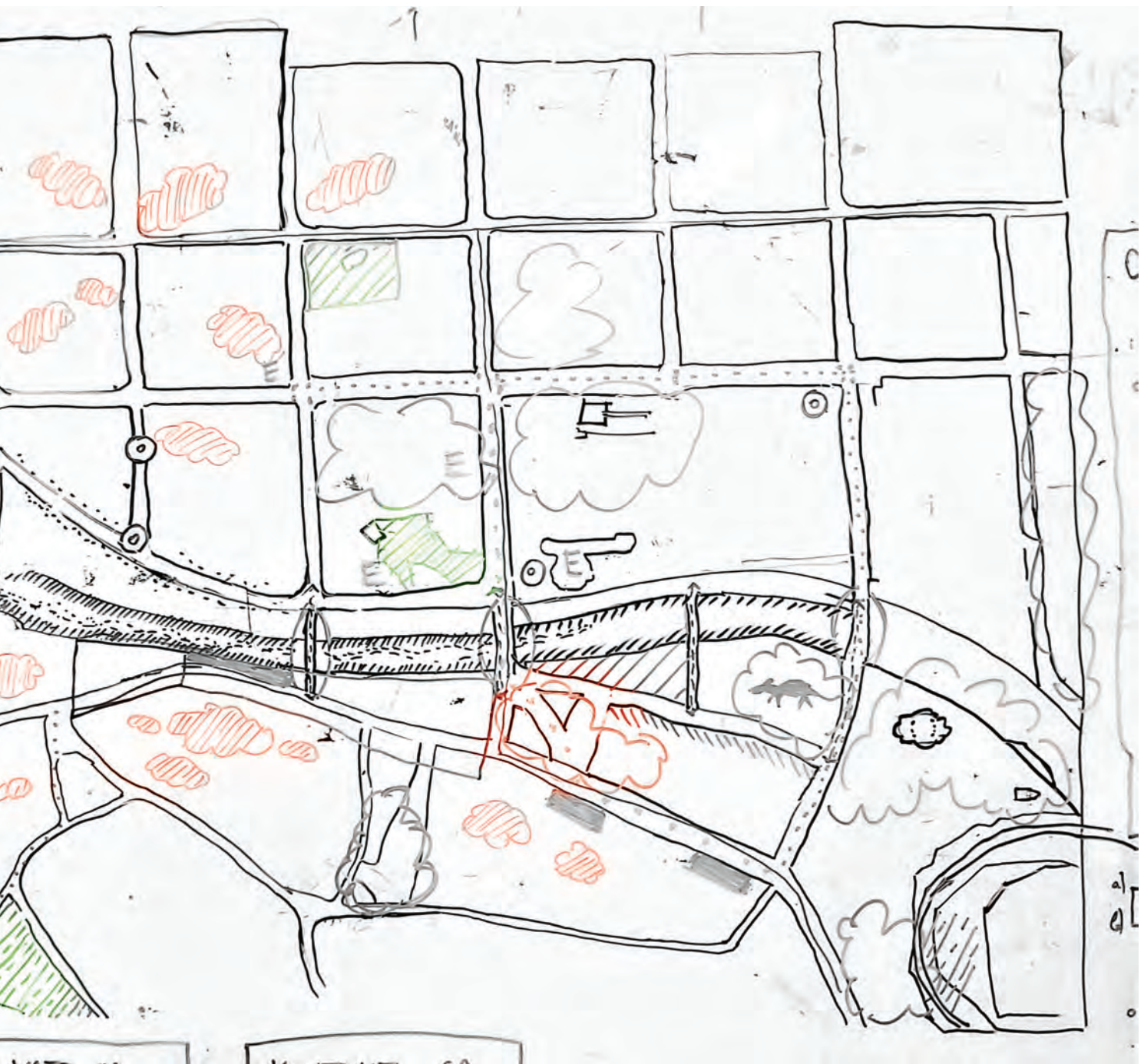
On the white-board in room 218, all groups wrote the summary conclusions of the SWOT analysis related to their topics. At the same time the students marked these locations on a common drawn map on the board. Everyone participated in a group discussion and commented their thoughts on the particular mapped topics. Students concluded the main problems, strenghts, opportunities and weaknesses of the Valjevo city centre, based on the explanations provided by their colleagues. The SWOT analysis presented on this page, and the map shown on the next page, correspond between one another. In the SWOT analysis, students showed pictograms for each strenght, problem etc. in the same way they are marked on the map.

The conclusion was, that the **main strenghts are** greenery within the urban fabric, the presence of educational institutions, local community gathering places, the habit of residents to go to the natural environment

Problems are : air pollution, lack of parking spaces, potential heat islands, individual fireplaces, lack of shade in certain parts of the city (lack of trees).







S

- Зеленило унутар градског ткива



- Могућност ренање шлоса

- Присуство образовних институу. (ширење
свесно о КП) E

- Места окупљања локалне зај.

- Добра повезаност
мостовима преко реке

- II највећи храм

- Навика сласка у природно окружење

W

- Степан проток саобраћаја (улице и мостови)

- Евидентан недостатак паркинг места

- Лоше стање пијаце



- Потенцијална топлотна острва



- Индивидуална лонџита



- Недовољна развијеност језикара






- Недостатак распрострањеног (тачкасто)
зеленила

- Недостатак хлада




- Недовољно улагање у оживљавање околине

- Индивидуални интереси

O

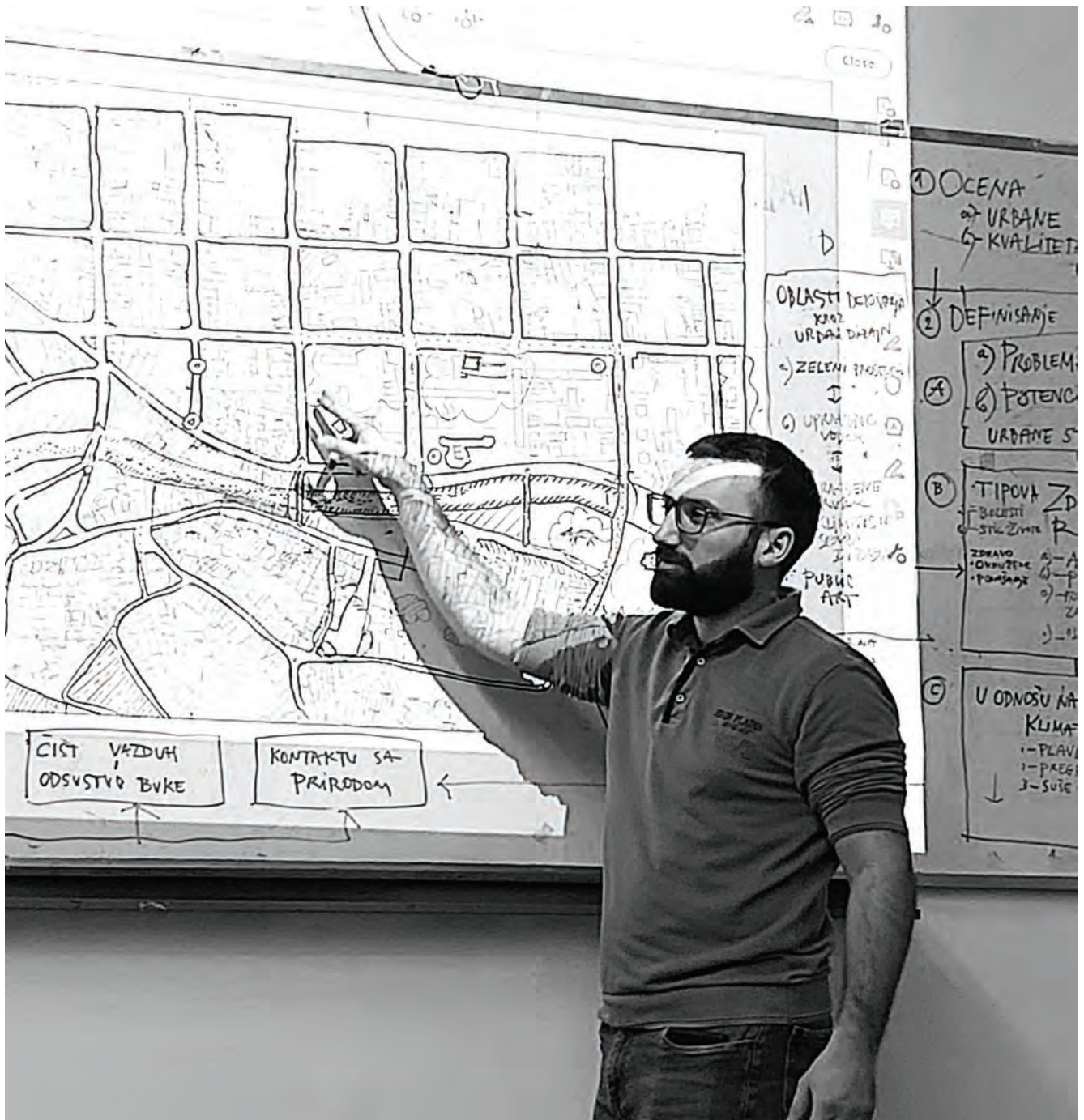
- Зелени потенцијал: Петина, Вудрак, Крушик 
- Могућност премене брањила, локација
- Рестаурација Тешњара 
- Активација приобада Колубаре  ↓
- РЕКА ГРАДАЦ 
- ОРГАНИЗОВАЊЕ СЕЗОНСКИХ МАНИФ. (Тешњар, ограда Колубаре...)
- активација центра 
- Проширење бициклистичких стаза |

T

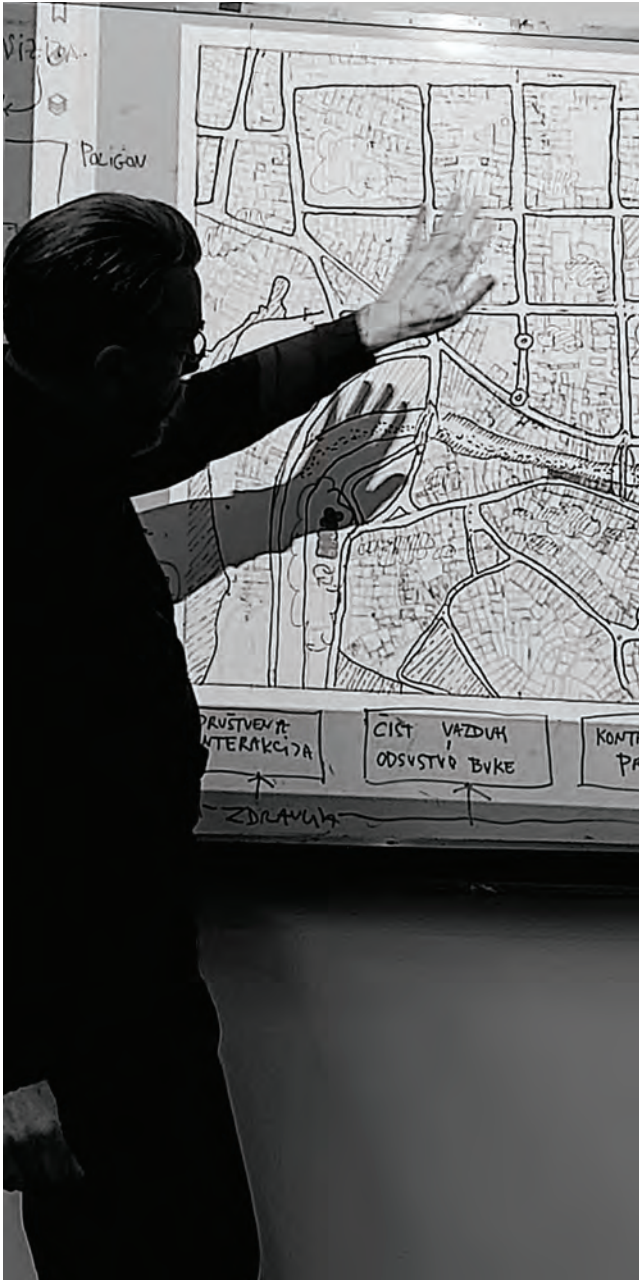
- Загађивачи: депоније и Крушик, индустријска зона 
- НЕАДЕКВАТНА (НАД)ГРАДЊА 
- Брана на Јабланицу
- Топлотна централа
- ЗАГАЂЕНОСТ КОЛУБАРЕ 











Monday, April 10th 2023.

In this class, presentations 4 and 5 were viewed. (**4.4 Model evaluation framework, 4.5 Project scenarios**)

The professor dr Zoran Djukanović spoke about and emphasized the importance of the opinion of the residents of the city of Valjevo, about the future individual student project proposals. He talked about the participatory process, about conversations held at the Valjevo, and also emphasized the biggest problems of the city - expressed by the locals.

The students then presented their individual ideas and proposals for health improvement projects and the impact of climate change on the city in question. Topics that were open are water management, waste management, topics of river purification, air purification and prevention of further air pollution, activation of the embankment of the Kolubara River, and so on.

The notion of equality in health was especially important and mentioned by both professors and students, who based their proposals on the health of certain parts of the city.



Urban health evaluation tools **04**



04.1.URBAN DESIGN TOOLS

Monday, April 24th and Thursday, April 27th 2023.

In this activity the students were divided into 3 groups. Each group had a task to prepare a presentation about tools used for detecting climate change and health problems in cities. The three discussed tools were the **“Healthy Urban City Generator,” “Urban Determinants of Health,”** and **“Healthy Urban Planning Checklist.”**

The **“Healthy Urban City Generator”** is a practical tool that helps in integrating health planing into an urbanism project. It considers factors such as air quality, noise pollution, and accessibility to green spaces. With this easy to understand tool, almost everyone can detect impacts which some urban design solutons have on a planned site.

The **“Healthy Urban Planning Checklist”** is another tool, similar to the one above, that focuses on the health impacts which urban desgin projects have on the city. It considers factors such as walkability, access to healthy food, and availability of public transportation. Both of these tools have a use in determining positive and negative impacts on the health of the people, as well as climate change.



The “**Healthy Built Environment Checklist**” is a tool used to evaluate the health impacts of urban design projects and built environments. It also considers factors similar to the checklist above. The checklist can be used by urban planners and designers to identify potential health risks and opportunities for creating healthier living environments in cities. By using the checklist, urban planners and designers can design and build communities that support physical activity, social interaction, and access to healthy food, ultimately contributing to improved health and well-being for individuals and communities.

Each group of students analyzed the same project provided by the professor using one of these tools. Through their analysis, they had to determine whether the tool was useful for assessing the urban design project.

The professor dr Jelena Živković had an lecture about the Place Standard tool. The tool was also assesed by students who filled a questionare regarding the city of Valjevo.

Students also analysed the “Place Standard with a Climate Lens tool, and together on the whiteboard tried to answer two Big questions the tool presents :

1. How can we achieve our target of net zero emissions by 2045?
2. How can we adapt this place to already unavoidable climate change?

① Kako možemo postići cilj nulte emisije do 2045? ② Kako da

• kretanje	RAZVOJ MREŽE BIKIKLISTIČKIH STAZA
• javni prevoz	1. UVOĐENJE DODATNIH LINIJA JP ZA UŽI GRADSKI CENTAR
• Saobraćaj i parking	1. ZABRANA KOLSKEG SAOBRAĆAJA U STROGOM CENTRU (TŽŠNJAF, K.M.) 2. REDORGANIZACIJA PARKINGA (PODOZIMO/NADZEHNO)
• Ulice i prostori	1. REDIZAJN ULICA (OSVETLJENJE, POPLOČANJE, MOBILIJAR...)
• prirodna sredina	1. POBOLJŠANJE KVALITETA ZELENIH POKRIVINA (MINI ŠUME, ZELENI KORIDORI...)
• igra i rekreacija	1. TEHNOLOŠKI INOVATIVNA DEČIJA IGRALIŠTA (STVARANJE ENERGIJE, MATERIJALIZACIJA...)
• objekti i usluge	1. PREUREĐITI POSTOJEĆE STANJE TIJME

prilagodimo mesto već neizbežnim klimatskim promenama!

- rad i lokalna ekonomija

- Stanovanje i zajednica

- društvena interakcija

- identitet i pripadnost

- osećaj bezbednosti

- nega i održavanje

- Uticaj i osećaj kontrole

STIMULISANJE ZELENE
TEHNOLOGIJE

PRELAZAK SA INDIVIDUALNIH KOLIŠTA NA
SISTEME GREJANJA

UNAPREDITI SARADNJU IZMEDU
JAVNOG, PRIVATNOG I CIV. SEKTORA

EDUKACIJA O KOMUNIKACIJI
(RADIONICE) → UNAPREĐENJE

UNAPREĐENJE IZVORA OSVETLEŃENJA,
PRELAZAK NAPUŠTENIH OBJEKATA
UNAPREĐENJE OSNOVNE INFRASTRUKTURE,
KIŠNE KANALIZACIJE, POPLOČAVANJE...

UNAPREDITI POSTOJEĆE JAVNE
POVRŠINE

RAZVIJANJE MOB. APLIKACIJA
GIS ALATA



04.2. Tool 1: Healthy Urban City Generator

Planning

Healthy urban planning can be challenging and complex. With this practical, evidence-based tool, users can quickly assess the health impact of their entire plan, and see how small adjustments could make a big difference to the lives of local people. This approach guides you through the assessment of an existing urban plan.

Who is it for?



Urban planners



Health professionals



Decision makers



Citizens



Local government



Innovation projects



Los Cardales, un pueblo saludable

Model Resources Get in touch Logout

Planning Actions

Guidance

1 2 3 4 5

Active Name

Rec de ciclovias por toda el pueblo

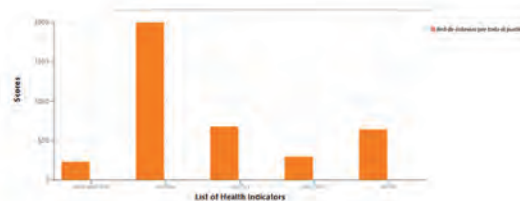
Action's Description

Instalacion de separaciones de tránsito vehicular, camenería asfaltada y pintura asfalto marcando carriles y señales de tránsito.

- 1 Population Density (Density)
- 1 Business Density (Density)
- 1 Street Connectivity (Mobility And Transport)
- 1 Location Connectivity (Mobility And Transport)
- 1 Cyclability (Mobility And Transport)
- 1 Walkability (Mobility And Transport)
- 1 Public Transport (Mobility And Transport)
- 1 Traffic (Mobility And Transport)
- 1 Social Services (Mixed Use And Proximity)
- 1 Sport Infrastructure (Mixed Use And Proximity)

View Final Results

Urban determinants: find out more



Internet site

The urban determinants of health

There are several determinants that show how the urban environment impacts our health in it.

Those determinants are segmented into several chapters.

A) Density: Compact Cities

Compact cities have a medium density of services and housing, so everything is accessible in 15 minutes.



01 - Population and residential density

It refers to the number of people/housing per unit area.

A healthy city should have medium population density (between 50-150 dw/Ha), buildings between 3 to 6 storeys high, avoid low-density development, prioritise the re-use of existing buildings, and enhance continuity between the city centre and suburbs.

Impact on health:

- Environmental health: Medium density areas require less motorised travel, improving noise and air pollution levels.

02 - Business density

Business density refers to the ratio of economic activity per inhabitant.

A healthy city should create space for economic activity in accessible and well-connected areas, foster commerce in a balanced way alongside housing, prioritise the re-use of existing buildings, promote locally-based businesses, and link new areas of economic activity with existing ones.

Impact on health:

- Mental health: Easy access to economic activity can contribute to improved mental health and happiness, reducing the risk of depression.
- Behaviour: Access to economic activity encourages physical activity and reduces sedentary behaviour

B) MOBILITY: Connected Cities

Connected cities have high quality walking routes, cycle paths, and public transport networks connecting the places people want to go.



03 - Street connectivity and intersection density

Street connectivity refers to the way streets are connected to each other, which determines how easy it is to move around.

A healthy city should avoid dead-end streets and distances greater than 120m between intersections. Different mobility networks should be interlinked, and pedestrians and cyclists should have priority at intersections.

Impact on health:

- Physical health: Well connected streets are associated with improved obesity, BMI, and type 2 diabetes outcomes

04 - Connection to points of interest

Direct connection to the places that people want to go, such as services, shops, parks and public transport routes. A healthy city should ensure good connection between points of interest like public services, green spaces and commercial areas. Likewise, neighbourhoods should be well connected to each other and to the city centre.

Impact on health:

- Environmental health: Connectivity has a positive impact on noise pollution levels
- Behaviour: Good connectivity increases rates of physical activity during leisure and travel.

05 - Cyclability

Cyclability refers to the length, structure, extension and quality of the city's bicycle lane network.

A healthy city should ensure that the cycle network connects residential areas, different neighbourhoods, public services, green spaces and commercial areas. The cycle network should also be connected to a natural environment network.

Impact on health:

- Physical health: Good cyclability is associated with improvements in BMI, obesity, premature mortality, birth outcomes, cardiovascular diseases, asthma and functional capacity.
- Behaviour: Good cyclability increases rates of physical activity during leisure and travel.

06 - Walkability

Walkability refers to the ability to move comfortably, safely and pleasantly around a city on foot.

A healthy city should ensure quality pedestrian infrastructure provides access to public services from the houses. Pedestrian infrastructure should be sufficiently wide, separate from motorised traffic and maintain continuity at intersections, avoiding physical barriers and level changes. High quality, comfortable streets also include greenery, commercial activity at street level, sheltered spaces (from sun or rain) and resting places along the routes.

Impact on health:

- Behaviour: Walkability is strongly related to increased physical activity and reduced sedentary behaviour. The perception of a walkable environment increases the likelihood of walking, especially in more socio-economically deprived areas.

07 - Public Transport

Public transport refers to the structure, connectivity and availability of the public transport network.

A healthy city should ensure that public transport has a clear structure and good coverage with a network that covers the main streets and facilitates access from all neighbourhoods.

Impact on health:

- Behaviour: Availability of public transport is strongly related to increasing physical activity and reducing sedentary behaviour

08 - Traffic

Traffic refers to the density, type and speed of vehicles. A healthy city should implement measures to reduce the speed and volume of motorised traffic. These include restrictions for motorised vehicles in urban areas, alternative parking in city outskirts, minimising space for motorised private transport, and speed reduction measures.

Impact on health:

- Physical health: Reducing traffic volume is directly related to reducing respiratory diseases (e.g. asthma). Reducing vehicle speed is directly related to reducing accidents and falls.
- Mental health: Exposure to motor traffic noise and proximity to the main roads affects children's cognitive development, leading to attention deficit disorders.
- Environmental health: Traffic reduction is directly related to improved air quality and reduced noise pollution.

C) VARIETY: Complete neighbourhoods

Complete neighbourhoods include a mix of accessible public services, green spaces, healthy food options and commerce.



09 - Availability of diverse public services

Residential proximity to diverse public services, especially those related to healthcare, education, cultural and community centres.

A healthy city should ensure residents have good access to health, social, educational and cultural services and facilities.

Social services and facilities should be properly sized, based on population density, and distributed in a balanced way throughout the city.

Impact on health:

- Physical health: The proximity of housing to educational, cultural, social and health services is directly associated with improved general perception of health.
- Mental health: A wider variety of destinations close to home is associated with an increase in physical and mental well-being. It reduces factors such as stress,

10 - Availability of physical activity and sport infrastructure

Residential proximity to indoor and outdoor physical activity and sport infrastructure.

A healthy city should plan new sports facilities, ensuring they are appropriately sized based on population density and well distributed through the city. Housing should have access to sports facilities within a 300m radius.

Impact on health:

- Physical health: The availability of sports facilities is significantly associated with reducing BMI.
- Mental health: There is also a relationship with improved mental health and happiness.

11 - Availability of commerce and economic activity

Residential proximity to recreation amenities, commerce, retail, shops and other economic activities. A healthy city should foster commercial use of street level units, encourage local commerce and ensure access to shops within a 10 minute walking distance from housing.

Impact on health:

- Mental health: A wider presence of destinations close to home is associated with an increase in physical and mental well-being. It reduces factors such as stress, anxiety or depression, leading to a better quality of life and increased population happiness.
- Behaviour: In adults, a diversity of uses in the environment is related to higher levels of physical activity, as well as reduced sedentary behaviour.

12 - Availability of public open spaces and natural areas

A healthy city should ensure access from housing to green areas at a distance of 300-400m. Public spaces and green areas should be equitably distributed through out the city, linked to each other via green or pedestrianised routes, and linked to health and educational facilities.

Impact on health:

- Environmental health: Increased availability of green space is associated with improved air quality and reduced noise pollution.
- Behaviour: Proximity to public spaces and natural areas is associated with high rates of physical activity and increased social interaction.

13 - Food environment

A healthy city should promote a healthy food environment, improving access and connection to municipal markets and implementing planning measures to support grocery stores and fresh-food shops in all the neighbourhoods. Urban planning can also limit fast food restaurants in certain environments and encourage the use of urban gardens or allotments.

Impact on health:

- Behaviour: In general, more food-related services, and a greater access to fresh and healthy products, is related to an improvement in food habits.

D) LANDSCAPE: Green cities

Green cities are made up of diverse green spaces and public areas that encourage leisure and socialising.



14 - Green coverage

Green coverage refers to the total amount of greenery in the city. Urban planning and landscaping must ensure the incorporation of greenery in the city. It is important to increase the presence of greenery and ensure its visibility. Measures should encourage green roofs, green facades, and greenery in private courtyards or gardens.

Impact on health:

- Mental health: Increasing in green spaces is associated with improvements in all indicators of mental health, especially depression, stress, cognitive function, emotional well-being, general mental health and happiness.
- Environmental health: Increased presence of green is associated with improved air quality and reduced noise pollution, and is particularly relevant for improved biodiversity.

15 - Blue spaces

Blue spaces refers to the presence of water, whether natural such as rivers, canals, lakes or sea, or the incorporation of water as an element of play and design in public spaces.

Impacts of health:

- Physical health: The presence of water and blue spaces is particularly important to reducing heat stress.
- Mental health: The presence of water is associated with an improvement in indicators of depression and anxiety.

16 - Green space diversity

Different types of vegetation in green areas should be encouraged, not only grasses and trees, but all types of shrubs and bushes, which shelter a diversity of animal and plant species. A rich and diverse ecosystem reduces the need for pest control, enabling ecological management of green areas.

Impact on health:

- Physical health: Green space diversity is related to improvements in premature mortality, birth outcomes, type 2 diabetes, cardiovascular and respiratory diseases.
- Environmental health: Green space diversity is directly associated with improvements in biodiversity.

17 - Continuity of green infrastructure

A healthy city should improve the continuity of green infrastructure, by planning green routes to connect green and blue areas, considering the connection between urban green areas and the wider natural environment, incorporating vegetation in all new streets, and planning wildlife passages at critical points.

Impact on health:

- Physical health: Continuous green infrastructure is associated with improvements in cardiovascular and respiratory diseases.
- Environmental health: Green continuity is directly associated with an improvement in biodiversity and noise pollution.

18 - Urban landscape

Urban landscape refers to the aspects of the urban environment that promote the use of the space, such as urban furniture or lighting. It also refers to aesthetic aspects, maintenance and cleaning.

Impact on health:

- Physical health: An improved urban landscape is associated with improved general health and obesity, especially with a lower rate of accidents, falls and injuries and an improved functional capacity.
- Mental health: An improved urban landscape is associated with improved perception of safety and happiness.

E) HOUSING & ENERGY: Quality homes

Quality homes are equitably distributed, comfortable, and warm.



19 - Quality of housing

A healthy city should take measures to improve the quality of housing (such as minimum size, ventilation, materials, orientation, etc.), as well as grant access to outdoor space or to community spaces (like rooftops or shared gardens).

Impact on health:

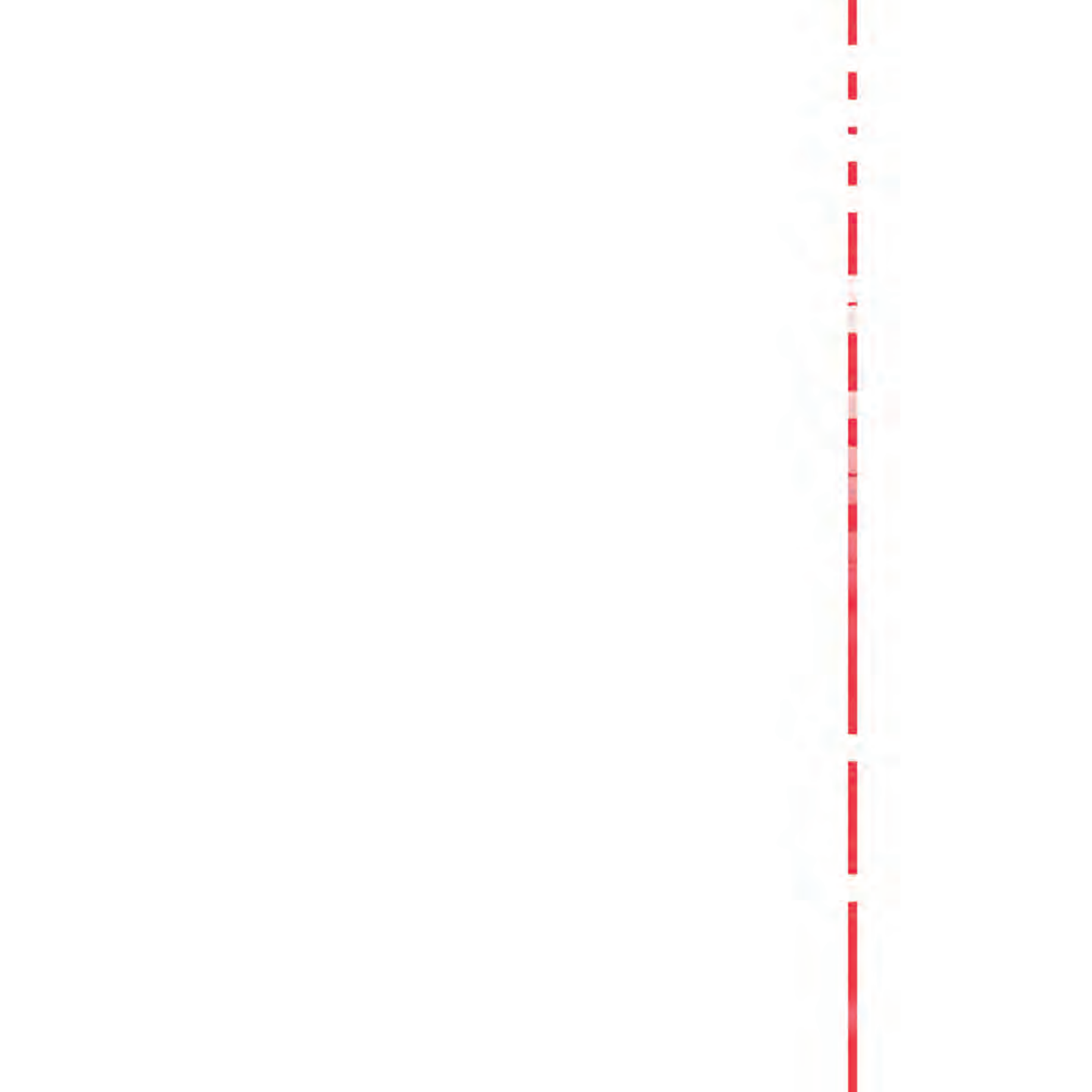
- Physical health: Housing quality is especially related to an improvement in respiratory diseases
- Mental health: Access to and quality of housing is a fundamental aspect of mental health, and especially related to improvements in depression, quality of life and general mental health

20 - Energy efficiency measures

Energy efficiency refers to the different measures related to energy savings and efficiency within homes (heating, insulation, etc.).

Impact on health:

- Physical health: Energy efficiency is especially related to an improvement in respiratory diseases



04.2. Tool 2: **Healthy Urban Planning Checklist**

Purpose of the checklist

The checklist aims to promote healthy urban planning by ensuring that health and wellbeing implications are taken into account in local plans and major planning applications. It brings together planning policy requirements and standards that influence health and wellbeing to assist the decision-making process. A "healthy" development **can be achieved** by meeting and exceeding these requirements and standards. The checklist seeks to mainstream health into the planning system.



Illustration 1 - Assessments and standards

Who is the checklist for?

- Developers, to screen and scope the health impacts of development proposals

- Planning officers, to help identify and address the health impacts of plans and development proposals

- Public health and environmental health professionals, to comment and scrutinise plans and development proposals

- Neighbourhood forums, community groups and housing associations to comment on major planning applications to help foster community engagement

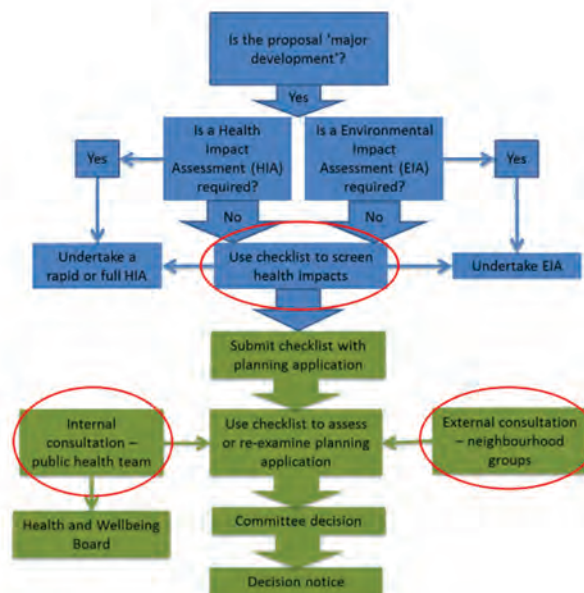


Illustration 2 - The planning application process

How to use the checklist

Under each theme there are a number of related health and wellbeing.

- Obesity and diseases related to physical inactivity and poor diet
- Excess winter deaths
- Air and noise pollution
- Road safety
- Social isolation

Healthy urban planning

The concept of healthy urban planning recognizes the role of planning and design in promoting good health and raising standards. Poorly planned and designed buildings and spaces can discourage healthy lifestyles and exacerbate physical and mental health problems. The principles of healthy urban **planning apply** to both new developments and urban regeneration programs, such as housing estate renewal schemes.

Illustration 3 - Planning application information requirements

	Air Quality assessment	Biodiversity and ecology report	Code for Sustainable Homes	Design and Access Statement	Flood risk assessment	Landscaping Strategy	Noise impact assessment	Open space assessment	Planning Statement	Regeneration statement	Retail impact assessment	Sustainability statement	Transport Assessment and Travel Plan
Healthy homes			✓	✓					✓	✓		✓	
Active Travel				✓					✓				✓
Healthy environment	✓	✓	✓		✓	✓	✓	✓	✓			✓	
Vibrant neighbourhoods				✓		✓			✓	✓	✓		

Theme	Planning issue	Health and wellbeing issue
1. Healthy housing	<ul style="list-style-type: none"> • Housing design • Accessible housing • Healthy living • Housing mix and affordability 	<ul style="list-style-type: none"> • Lack of living space - overcrowding • Unhealthy living environment – daylight, ventilation, noise • Excess deaths due to cold / overheating • Injuries in the home • Mental illness from social isolation and fear of crime
2. Active travel	<ul style="list-style-type: none"> • Promoting walking and cycling • Safety • Connectivity • Minimising car use 	<ul style="list-style-type: none"> • Physical inactivity, cardiovascular disease and obesity • Road and traffic injuries • Mental illness from social isolation • Noise and air pollution from traffic
3. Healthy environment	<ul style="list-style-type: none"> • Construction • Air quality • Noise • Contaminated land • Open space • Play space • Biodiversity • Local food growing • Flood risk • Overheating 	<ul style="list-style-type: none"> • Disturbance and stress caused by construction activity • Poor air quality - lung and heart disease • Disturbance from noisy activities and uses • Health risks from toxicity of contaminated land • Physical inactivity, cardiovascular disease and obesity • Mental health benefits from access to nature and green space and water • Opportunities for food growing – active lifestyles, healthy diet and tackling food poverty • Excess summer deaths due to overheating
4. Vibrant neighbourhoods	<ul style="list-style-type: none"> • Healthcare services • Education • Access to social infrastructure • Local employment and healthy workplaces • Access to local food shops • Public buildings and spaces 	<ul style="list-style-type: none"> • Access to services and health inequalities • Mental illness and poor self-esteem associated with unemployment and poverty • Limited access to healthy food linked to obesity and related diseases • Poor environment leading to physical inactivity • Ill health exacerbated through isolation, lack of social contact and fear of crime

Healthy Housing

- Healthy housing can improve quality of life and reduce carbon emissions.
- Good daylighting and sound insulation can enhance living conditions.
- Private outdoor spaces can contribute to a better quality of life.
- Accessible and adaptable homes can meet the changing needs of occupants.
- Adequate space for food preparation and consumption is essential.
- Affordable housing can create socially inclusive communities and improve physical and mental health. Housing, whether affordable or private, should be designed to a high standard without differentiation.

Active Travel

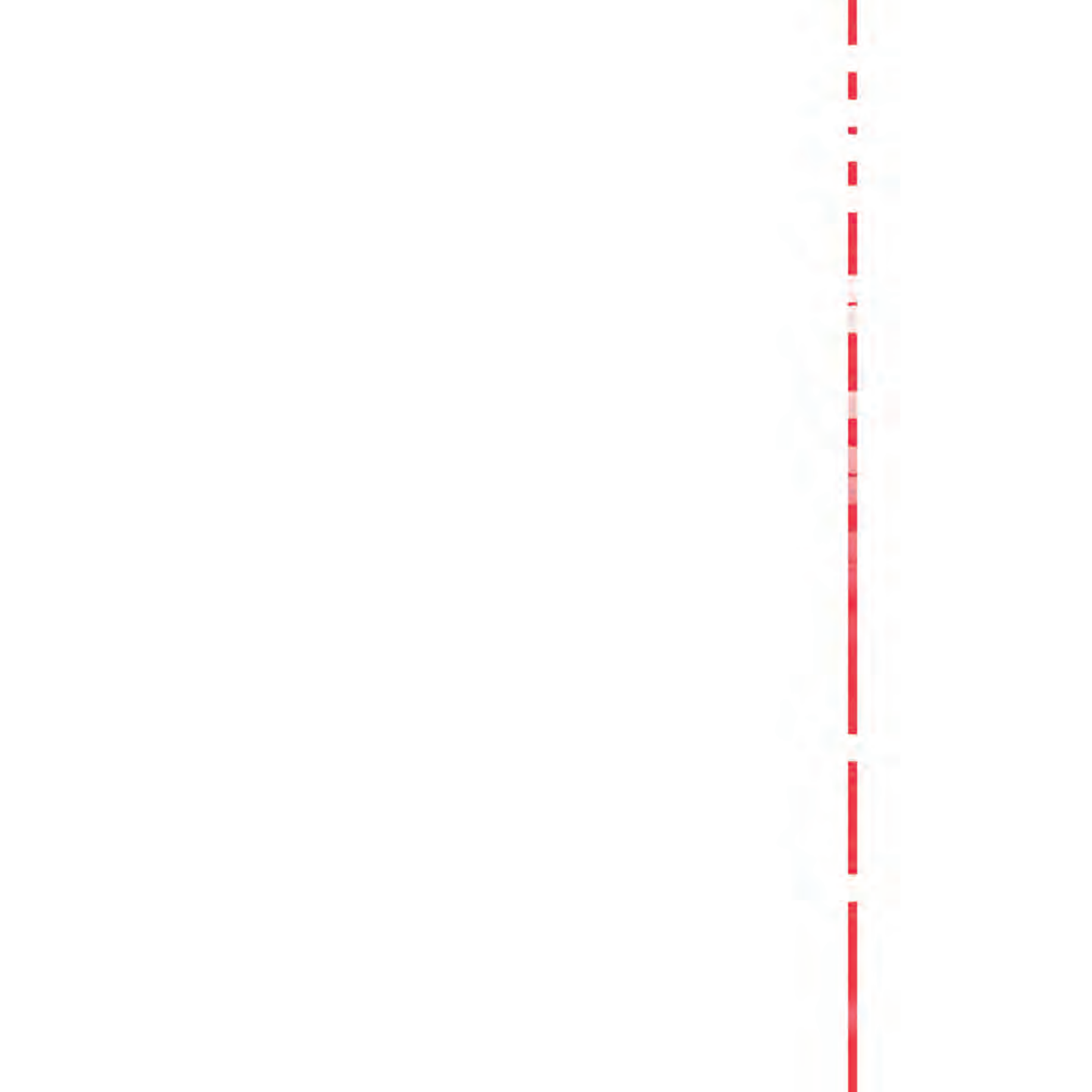
- Travel plans can promote sustainable transportation and address environmental and health impacts.
- Encouraging cycling can be done by providing cycle parking and storage in residential dwellings.
- Traffic management and safe crossings can reduce road accidents involving cyclists and pedestrians and increase walking and cycling levels.
- Prioritizing the access needs of cyclists and pedestrians is crucial.
- Developments should be accessible by public transport.
- Space for pedestrians and cyclists should be prioritized over commercial and private vehicles.
- Car parking provision should be reduced as far as possible, and car clubs can help to reduce parking demand at new residential developments.

Healthy environment

- Construction sites can have negative impacts, so it's important to control pollution and vehicle movements .
- Reducing noise pollution can improve the quality of urban life.
- Physical activity is important for children's growth and development, and play spaces should be accessible by walking and cycling routes.
- Access to nature and biodiversity can contribute to mental health and well-being,
- Space for local food growing can promote more active lifestyles, better diets, and social benefits.
- Flooding can have impact on mental health and well-being, and increasing development densities and extreme weather events can increase urban flood risk.
- Urban greening, can help prevent summer overheating and the urban heat island effect.

Vibrant neighbourhoods

- Access to healthcare services and advice on healthy living can prevent ill health.
- Access to a range of education improves self-esteem, job opportunities and earning capability.
- Good access to local services is important for a lifetime neighbourhood, and additional services will be required to support new development.
- Employment can aid recovery from physical and mental illnesses, and creating healthier workplaces can reduce ill health and sickness absence.
- A proliferation of hot food takeaways and other outlets selling fast food can harm the vitality and viability of local centres and undermine attempts to promote the consumption of healthy food, particularly in areas close to schools.
- The public realm plays an important role in promoting walking and cycling, activity, and social interaction. Shelter, landscaping, street lighting and seating can make spaces attractive and inviting.



04.2. Tool 3: Healthy Built Environment Checklist

A well-designed built environment can help reduce health risks and improve health outcomes. Creating built environments that encourage people to walk, cycle, take part in physical activity, use public transport and interact with community members can contribute to lifelong health and wellbeing. In contrast, poorly designed built environments can have negative effects on the physiological, psychological and social wellbeing of communities.

The Healthy Built Environment Checklist is a practical tool to help assess built environment factors that impact on health. It is designed to support engagement with planning processes and guide feedback on development policies and plans. The Checklist aims to improve the amenity of the built environment for people, places and public spaces. It supports the capacity of health professionals to promote healthy planning as a core component of good design.



Illustration of checklist themes

How to use this Checklist

Pre-checklist activities should be carried out before you complete the detailed checklists in Part 4. These steps are designed to help you understand the policy, plan or proposal, the community it will affect and specific considerations for the development type and context.

1. Understanding the policy, plan or proposal

This part of the Checklist will help you to determine the type of development or plan, where it fits in the planning and development cycle and key intervention points. It may be helpful to engage with council officers, government agencies, the consent authority of a particular development or the council duty planner.

*e.g: What is being proposed? Is it a design concept, a new strategic plan, a re-zoning proposal, a mixed-use development or planning policy?

2. Understanding a particular development

*e.g: What local government area is it in? Is there a commitment to open space, active transport infrastructure (such as cycleways and pedestrian pathways) and community infrastructure?

3. Understanding the context

*e.g: Health determinants including housing conditions, types of housing, environmental and social issues, socio-economic status, employment levels, transport, social support, access to healthcare and sport and recreation facilities

4. Equity considerations

*e.g: Who will benefit and who will most likely be affected? How are vulnerable groups in the community being impacted?

+We need to consult with people in the local area who understand the community and its dynamics.

Applying the Checklist

Once you have completed the pre-checklist activities, go through chapters in part 3 of the Checklist.

Part 4 sets out the checklist questions. The questions are grouped under 'general' and 'built form' headings. General questions relate to the objectives or intent of a policy, plan or proposal. Built form questions relate to physical aspects of the policy, plan or proposal and can be determined by looking at maps and plans that accompany a policy, plan or proposal.

Tips for drafting your responses

Step one: Drafting your response

Decide which of the points you have gathered are most relevant and add them to the written response form.

Step two: Shape your response

Complete the relevant part of the Checklist for each chapter. It identifies whether there are any significant concerns and possible recommendations or suggestions.



identify positive and negative points



use the strongest evidence you have



take care when citing evidence of cumulative effects



talk to the person who will receive the advice if you can



your response is likely to be one of several submissions

04.2. EXAMPLE PROJECT

ANALYSIS

Using each of these tools, students in the pairs of two did a short analysis of the same project, provided by the professors.

Analized project is also located in Valjevo, Serbia, and it was chosen for it's simplicity in desgin, as well as a decent location for analysing different aspects of urban design. This project is located in the central part of Valjevo - in the space between the Tešnar street on the West, and the city church in the East.

Healthy Urban City Generator

The first student group analysed the project based on it's density, mobility, variety, landscape and housing and energy. They gave a score for "Health indicators" of the project, including : **enviromental aspect, physical, mental, wellbeing, and lifestyle**. The coclusions and scores will be discussed later.

Healthy Urban Planning Checklist

The second student group did the analysis according to a checklist they presented. **Healthy homes, active travel, healthy enviroment and vibrant neighbourhoods**, were all "checked" for air quality, biodiversity, sustainability, flood risks, transport etc.

Healthy Built Environment Checklist

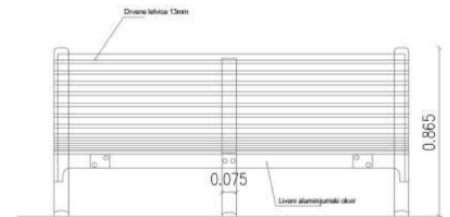
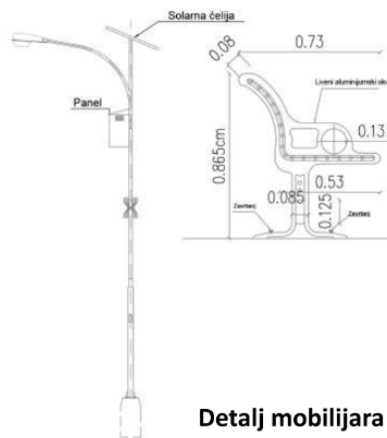
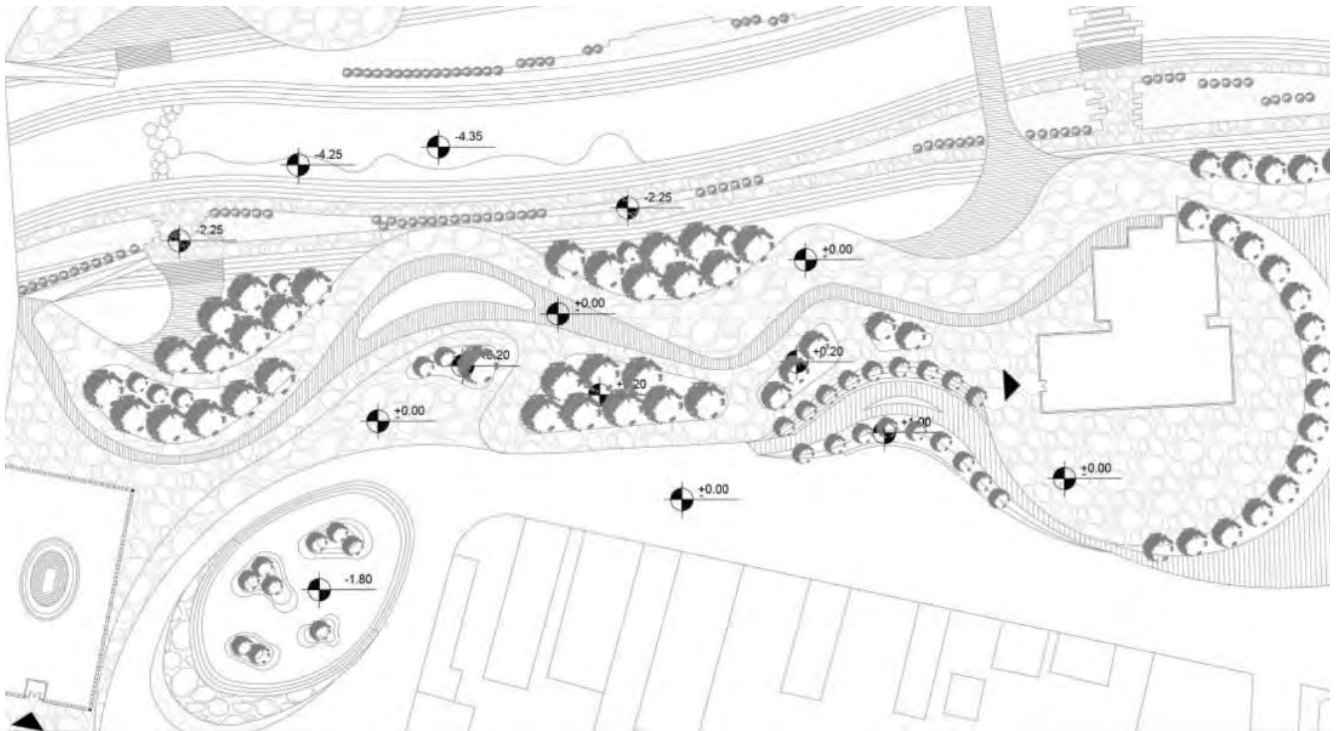
The third group focused on answering specific questions:

1. Did the project meet the environmental sustainability objectives?
2. Is the project considering climate change mitigation?
3. Are measures adopted for adapting to climate change?
4. Is the project promoting community resilience?

On the next pages, we will discuss conclusions, similarities and differences that every group had for the same project. We will also go through a comparative analysis between these tools, that were used for scoring the project.



The analysed project, by Merjem Latović, 2022.



Detalj mobilijara



Density: Compact Cities

Compact cities have a medium density of services and housing, so everything is accessible in 15 minutes.

Mobility: Connected Cities

Connected cities have high quality walking routes, cycle paths, and public transport networks connecting the places people want to go.



Variety: Complete Neighbourhoods

Complete neighbourhoods include a mix of accessible public services, green spaces, healthy food options and commerce.

Landscape: Green Cities

Green cities are made up of diverse green spaces and public areas that encourage leisure and socialising.



Housing: Quality Homes

Quality homes are equitably distributed, energy-efficient, comfortable, and warm.



Density

Compact cities



Mobility

Connected cities



Variety

Complete



Landscape

Green cities



Housing

Quality homes

According to the determinants from the application, we can conclude that the given project mainly focuses on the area concerning content diversity and on the Landscape: Green cities area.

DENSITY: Compact Cities

By demolishing smaller parts of existing buildings and building new ones in the same place, capacities and built structures do not change much.

MOBILITY: Connected Cities

There is a slight improvement in the mobility of the site, because the impact of the project focuses only on some segments of mobility.

VARIETY: Complete neighbourhoods

Various facilities such as the planned library, skate park, exhibition spaces, green areas, market, etc., have a positive effect on diversity in urban planning.

LANDSCAPE: Green cities

Definitely the biggest progress was achieved in the greening of the location, where the success factor increased in every category, therefore.

HOUSING & ENERGY: Quality homes

Housing and energy efficiency are not affected by this project.

Total Actions
Analised project



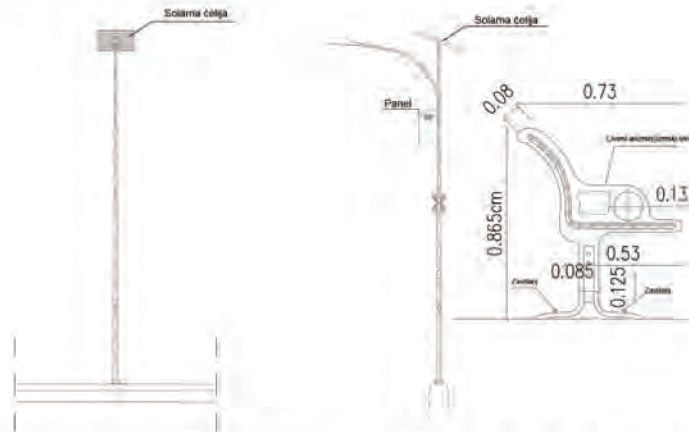
Theme 2: Active Travel

1. Does the proposal encourage cycling and walking through measures outlined in a travel plan, such as providing adequate cycle parking and storage?

The project includes numerous pedestrian paths that can also be used for cycling and enjoying nature, but it does not specifically designate bicycle lanes or bike parking.

2. Does the proposal incorporate traffic management and calming measures, safe and well-lit pedestrian and cycle crossings and routes?

Yes, the project has focused on pedestrian pathways and has extensively detailed lighting and seating arrangements alongside them.



3. Does the proposal aim to reduce car use by limiting car parking availability, implementing controlled parking zones, developing car-free areas, and promoting car-sharing clubs?

The project encourages pedestrian traffic by renovating a large green area and pedestrian paths, but it does not extensively address reducing car traffic in the project's vicinity.

Theme 3: Healthy Environment

1. Does the proposal include traffic management and calming measures and safe and well-lit pedestrian and cycle crossings and routes?

Yes, the project focused on pedestrian paths, and the details include lighting and seating along the paths.

2. Does the proposal minimize air pollution caused by traffic and energy facilities?

Yes. By activating and further greening the park as the project location, it aims to trap dust particles and increase oxygen levels through numerous greenery. Additionally, the lamps have solar panels, so they should not consume additional energy.

3. Does the proposal minimize the impact of noise caused by traffic and commercial uses through insulation, site layout, and landscaping?

Yes, greenery reduces noise levels.

4. Does the proposal retain or replace existing open space, and in areas of deficiency, provide new open or natural space, or improve access to existing spaces?

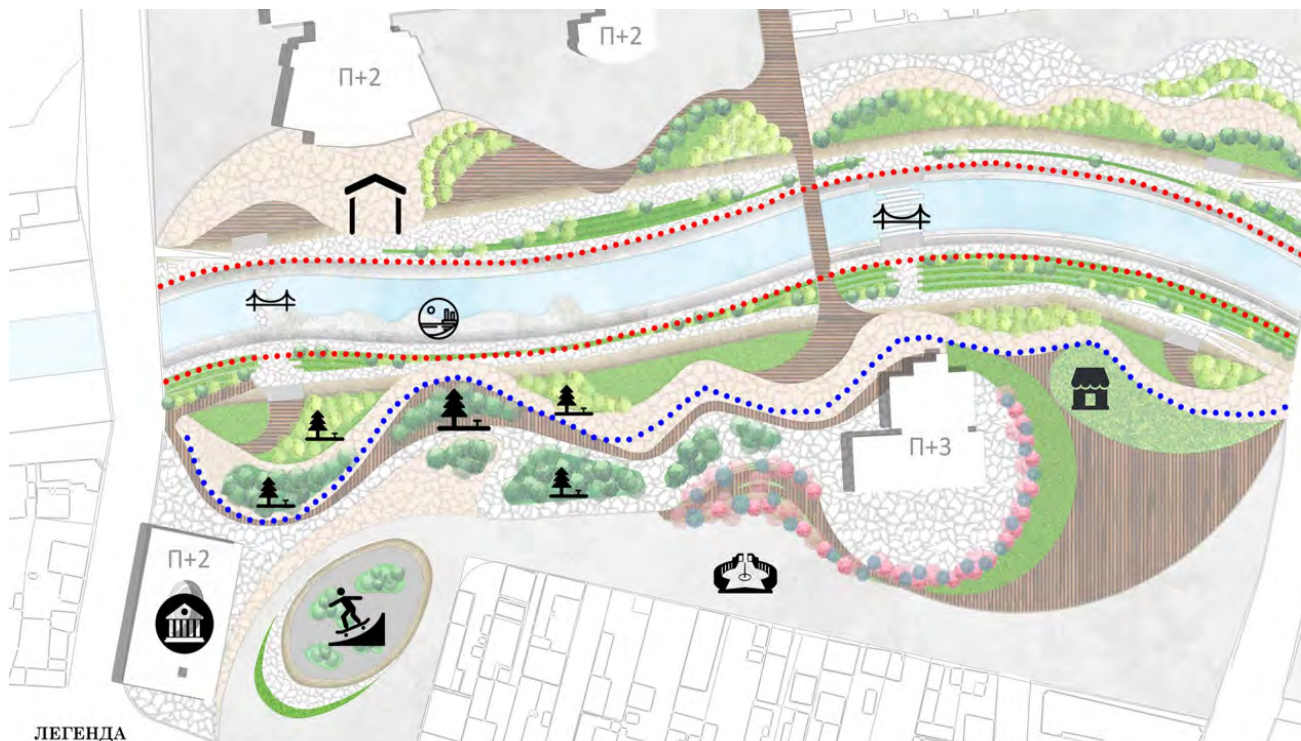
Yes, the project partially replaces the former gas station's concrete and asphalt surfaces with new green space.

5. Does the proposal set out how new open space will be managed and maintained?

Not so much, this would be a step towards improving the project.

6. Does the proposal provide a range of play spaces for children and young people?

Yes, the project plans for a multifunctional playground, a library, and exhibition spaces.



ЛЕГЕНДА



мултифункционално игралиште, скејт парк, могућност упијања воде током веће количине падавина



изложбени простор за различите културне манифестације



камене плоче у нивоу реке које служе као мостови



отворени трг са погледом на цркву



платформа на води за посматрање, игру на води



зелене површине са дрвећем



библиотека са пролазном формом и амфитеатром



пијаца са зеленом надстрешницом

..... пешачке стазе, које излазе до обале у виду платформи

..... шеталиште, уређена обала са степеништем и трибинама за седење

Theme 4: Vibrant neighbourhoods

1. Has the impact on healthcare services been addressed?

Not really, the project did not address this topic.

2. Have opportunities for multi-use and the co-location of services been explored?

Yes, to some extent. The project provides open public spaces that are flexible and can be used for various purposes.

3. Does the proposal include commercial uses and provide opportunities for local employment and training, including temporary construction and permanent 'end-use' jobs?

Somewhat. The project includes a new library and exhibition space that could potentially create new job opportunities.

4. Does the design of the public realm maximise opportunities for social interaction and connect the proposal with neighbouring communities?

Yes, the new park would connect different communities who could meet here in a healthy way, as it is located in the relatively central part of the city.





Key questions

How does the policy, plan or proposal:

- a meet environmental sustainability objectives?
- b consider climate change mitigation?
- c adopt measures to adapt to climate change?
- d promote community resilience?



Why environmental sustainability and climate change matter

1. Direct and indirect effects of climate change on health are widespread and significant
2. Environmental sustainability focuses on the needs of future generations
3. Good environmental management is part of environmental sustainability
4. All built environments should consider ways to mitigate climate change
5. Adapting to climate change will help communities cope with its effects
6. Resilient communities are more able to deal with the effects of climate change



Evidence and leading practice

1. Meet environmental sustainability objectives

- Climate change will bring extreme weather that will affect population health
- Coastal areas are particularly vulnerable
- Urban heat islands demand more energy for cooling

2. Consider climate change mitigation

- Infrastructure choices affect sustainability

3. Adopt measures to adapt to climate change

- Health professionals need to work across disciplines and at all levels
- Responses to climate change can bring positive health benefits
- Some communities are more vulnerable to climate change than others

4. Promote community resilience

- Resilient communities are better at adapting to change



Effective action on the health impacts of climate change requires integrated policy and planning from all levels of government.

a) Meet environmental sustainability objectives

resource efficiency



Does it include strategies to minimise the consumption of resources (such as water, energy, materials)?

It does include strategy to minimise the consumption of some resources as materials, but does not include strategy for less consumption of water and energy

natural environment



Does it include strategies to enhance or maintain the natural environment (such as biodiversity, landscape, remediation)?

Project include strategy to enhance natural environment and biodiversity.

b) Consider climate change mitigation

energy efficiency



Does it explicitly incorporate energy efficient design?

It does explicitly incorporate energy efficient through solar panels.

renewable energy

Does it explicitly incorporate renewable energy design features or technologies?

Not defined.

c) Adopt measures to adapt to climate change

natural disasters



Does it include strategies for managing the impacts of disasters associated with natural hazards (including flooding, heatwaves, bushfires, disease, and drought)?

Project include strategies for managing the impact of disasters as flooding and heatwaves, but does not include strategies for disease and drought.

d) Promote community resilience

information networks



Does it promote local knowledge sharing and information networks?

There are object designed to promote cultural and local knowledge.

	Density	Mobility	Variety
1 <i>Healthy Urban City Generator</i>	By demolishing smaller parts of existing buildings and building new ones in the same place, capacities and built structures do not change much.	There is a slight improvement in the mobility of the site, because the impact of the project focuses only on some segments of mobility.	Various facilities such as the planned library, skate park, exhibition spaces, green areas, market, etc., have a positive effect on diversity in urban planning.
		Active travel	Vibrant Neighbourhoods
2 <i>Healthy Urban Planning Checklist</i>		There are many pedestrian paths, which are also good for cyclists. However, there are no separate bike lanes and the project did not focus much on reducing traffic issues.	The project doesn't have many new facilities that would provide jobs for the local population. The green space in would connect different communities in one place.
			Community Resilience
3 <i>Healthy Built Environment Checklist</i>			There are objects designed for promoting-cultural and local knowledge.
Conclusions	Out of the three urban design tools, only one mentions density as an important factor in urban health. However, the other two checklists do not explicitly exclude this factor, but rather combine it with broader factors such as "planning".	Two of the three urban design tools consider being "active", mobile, and accessible as important factors. The first tool notes that the project improved the mobility of the site, while the second tool emphasizes the consideration of design, traffic, and open space planning in this aspect of the project.	The three urban design tools share both similarities and differences when it comes to the concept of variety. One key similarity between all three tools is their emphasis on the importance of design and planning in promoting variety. Specifically, the second tool places a strong emphasis on the role of landscaping, planning, and regeneration in creating diverse urban spaces.

Landscape	Housing		
Definitely the biggest progress was achieved in the greening of the location, where the success factor increased in every category, therefore.	Housing and energy efficiency are not affected by this project.		
Healthy Environment	Healthy Homes		
The project includes solar-powered lamps, replaces concrete with large green spaces, and encourages community activation.	/		
Environmental Sustainability		Climate change mitigation	Measures for adapting to climate change
Project includes strategies to minimise the consumption of some resources, such as building materials but does not include strategies for less consumption of water and energy		It does explicitly incorporate energy efficiency through solar panels.	Project includes strategies for managing the impact of disasters as flooding and heatwaves, but does not include strategies for disease and drought.
All three urban design tools share a common interest in the environment factor. Specifically, the project implemented measures to increase greenery, improve air quality, and promote biodiversity. Additionally, the project included strategies for monitoring resource consumption to promote sustainability.	Two out of the three urban design tools discuss the issue of housing, but both have a negative view of the situation in the city of Valjevo. Housing is considered one of the problems in Valjevo, as individual heating systems that rely on coal have a severe impact on air quality.	While only one of the three urban design tools explicitly defines climate change mitigation as a factor, the other tools also consider this issue through other factors. For example, the project includes the installation of solar panels and the creation of numerous green spaces, grassy areas, and trees, all of which contribute to reducing the impact of climate change on the local environment.	It seems that the project gives certain solutions for flooding and heatwaves, but only one tool analysed this topic.

04.3.The PLACE

STANDARD TOOL

“The Place Standard Tool is a simple tool to structure a conversation about a place. It helps people to think about both physical and social aspects of places, and the important relationships between them. It has 14 themes, each with a main question and further prompts to support conversation, inform the assessment and identify issues for improvement”.

The tool can help identify the strengths of the place, and where improvements may be needed. Research shows that the way a place functions, looks and feels can influence our health and wellbeing.

We can begin to understand this by asking:

- How does this place make me feel?
- What do I need to live my life?
- Can I access what I need locally?
- What makes this place good now?
- How could it be better in the future?

PLACE STA



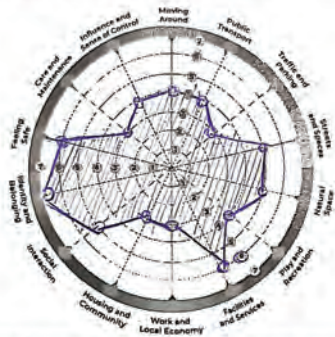
The 14 themes are:

- 1. Moving around**
- 2. Public Transport**
- 3. Traffic and parking**
- 4. Streets and spaces**
- 5. Natural space**
- 6. Play and recreation**
- 7. Facilities and services**
- 8. Work and local economy**
- 9. Housing and community**
- 10. Social interaction**
- 11. Identity and belonging**
- 12. Feeling safe**
- 13. Care and maintenance**
- 14. Influence and sense of control**

Students evaluated each of these themes for the city of Valjevo, and at the end filled a graph containing all the scores for these themes. The graphs and the scores will be presented on the next pages.

ANDARD TOOL

When you have answered all the questions, plot each score on the compass diagram.



Which theme has the highest score?

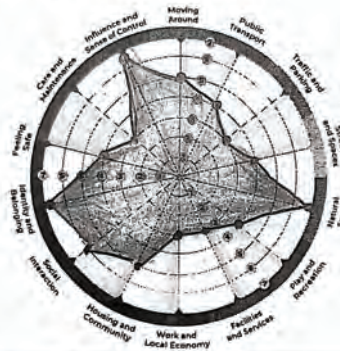
Identity and belonging

Which theme has the lowest score?

Please use page 25 if you wish to add further comment referencing the question.

22

When you have answered all the questions, plot each score on the compass diagram.



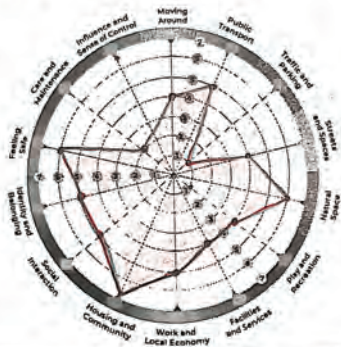
Which theme has the highest score?

Which theme has the lowest score?

Please use page 25 if you wish to add further comment referencing the question.

23

When you have answered all the questions, plot each score on the compass diagram.



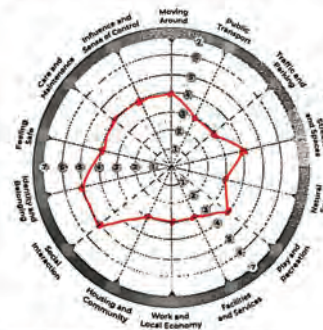
Which theme has the highest score?

Which theme has the lowest score?

Please use page 25 if you wish to add further comment referencing the question.

22

When you have answered all the questions, plot each score on the compass diagram.



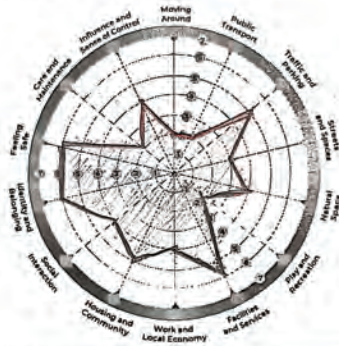
Which theme has the highest score?

Which theme has the lowest score?

Please use page 25 if you wish to add further comment referencing the question.

23

When you have answered all the questions, plot each score on the compass diagram.

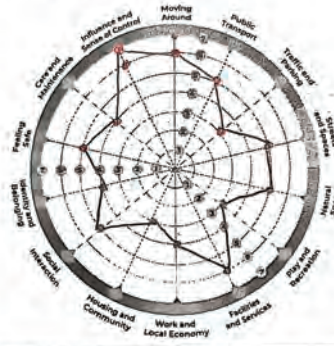


Which theme has the highest score?

Which theme has the lowest score?

22 Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.



Which theme has the highest score?

Which theme has the lowest score?

22 Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.

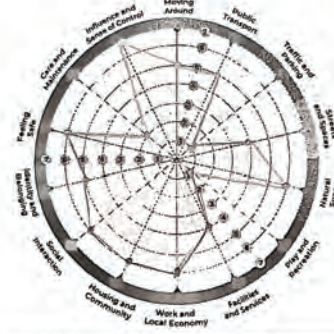


Which theme has the highest score?

Which theme has the lowest score?

22 Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.

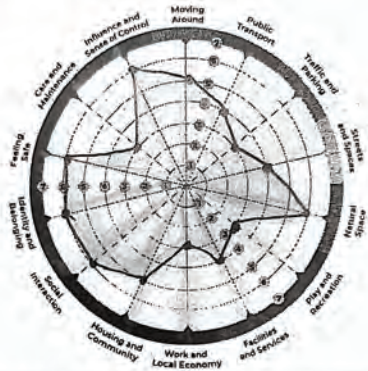


Which theme has the highest score?

Which theme has the lowest score?

22 Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.



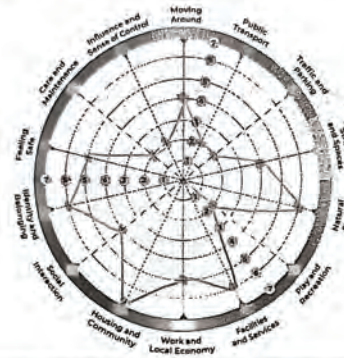
Which theme has the highest score?

Which theme has the lowest score?

22

Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.



Which theme has the highest score?

Housing and Community

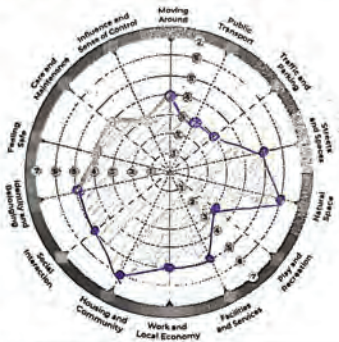
Which theme has the lowest score?

Few of them, with score of 2

22

Please use page 25 if you wish to add further comment referencing the question.

When you have answered all the questions, plot each score on the compass diagram.



Which theme has the highest score?

Which theme has the lowest score?

22

Please use page 25 if you wish to add further comment referencing the question.

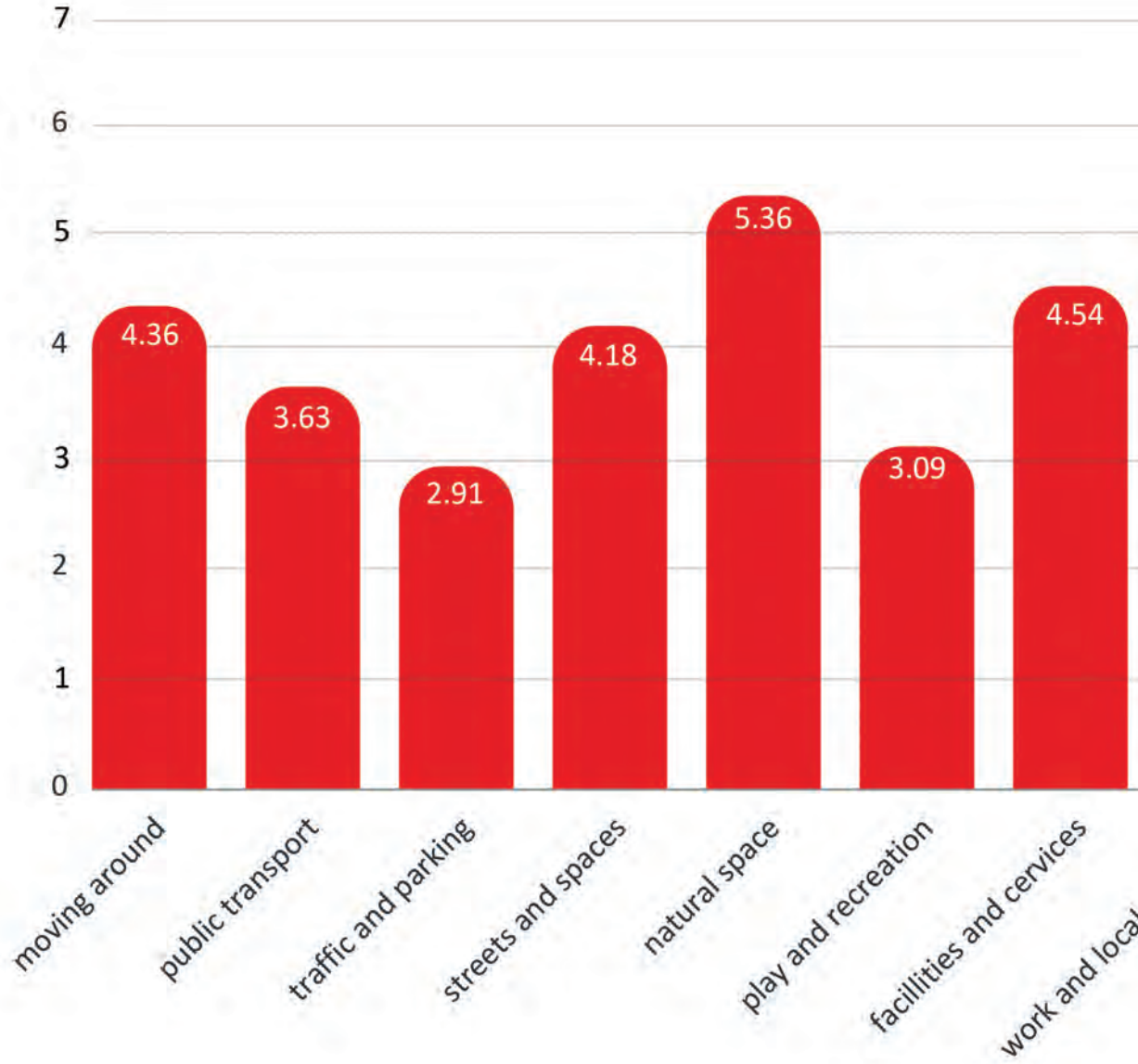
what did we find out?

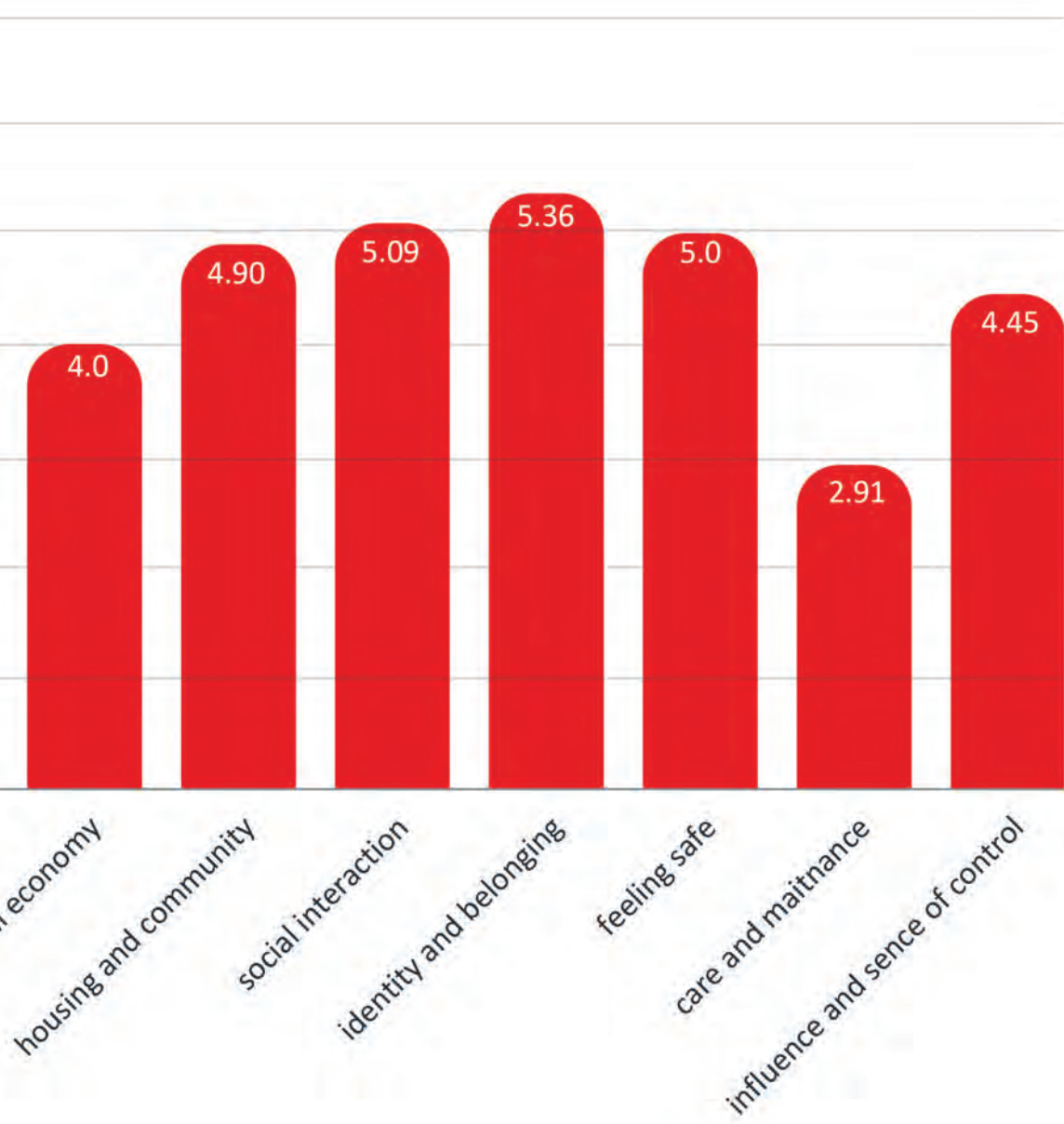
It is clear that the graphs depicting the ratings do not exhibit an exact match. Different opinions among the students have resulted in certain topics differing by as much as five points, with grades ranging from 2 to 7 in the final topic.

The topics of traffic and parking, as well as care and maintenance, received the **lowest scores with a rating of 2.91**.

The topics of natural space and identity and belonging were the **highest rated with a score of 5.36**. These ratings suggest that the perception of the city, even amongst architecture students who belong to a particular group of experts, is highly subjective.

THE RESULTS





PLANNING CHECKLIST

On May 8th, 2023, students analyzed their projects based on the “Healthy Urban Planning Checklist”.

This checklist contains a set of questions for each of the 4 main topics, which would help students identify the strengths and weaknesses of their projects. The 4 main topics are “Healthy Homes”, “Active Travel”, “Healthy Environments”, and “Vibrant Neighborhoods”. Each of these topics has 4, 5, or 6 sub-questions. Students focused on the last three topics as the first topic was somewhat outside the scope of their projects.

The “Active Travel” topic has 4 sub-questions that promote walking and cycling, safety, connectivity, and reduced car usage.

The second topic focuses on air quality, pollution reduction, noise, open spaces, and greenery.

The last topic brings up questions for analyzing employment opportunities, local food production, education, and health services. On the following pages, a completed student survey will be presented.

Theme	Planning issue	Health and wellbeing issue
1. Healthy housing	<ul style="list-style-type: none"> • Housing design • Accessible housing • Healthy living • Housing mix and affordability 	<ul style="list-style-type: none"> • Lack of living space - overcrowding • Unhealthy living environment - daylight, ventilation, noise • Excess deaths due to cold / overheating • Injuries in the home • Mental illness from social isolation and fear of crime
2. Active travel	<ul style="list-style-type: none"> • Promoting walking and cycling • Safety • Connectivity • Minimising car use 	<ul style="list-style-type: none"> • Physical inactivity, cardiovascular disease and obesity • Road and traffic injuries • Mental illness from social isolation • Noise and air pollution from traffic
3. Healthy environment	<ul style="list-style-type: none"> • Construction • Air quality • Noise • Contaminated land • Open space • Play space • Biodiversity • Local food growing • Flood risk • Overheating 	<ul style="list-style-type: none"> • Disturbance and stress caused by construction activity • Poor air quality - lung and heart disease • Disturbance from noisy activities and uses • Health risks from toxicity of contaminated land • Physical inactivity, cardiovascular disease
4. Vibrant neighbourhoods	<ul style="list-style-type: none"> • Healthcare services • Education • Access to social infrastructure • Local employment and healthy workplaces • Access to local food shops • Public buildings and 	<ul style="list-style-type: none"> • Mental health issues from • Opportunities for food growing • lifestyles, healthy diet and • Excess summer deaths • Access to services and health inequalities • Mental illness and poor self-esteem associated with unemployment and poverty • Limited access to healthy food and related diseases • Poor environment leading to physical ill health exacerbated through isolation • social contact and fear of crime

Theme 2: Active Travel

Issue	Key questions	Yes / No / Not relevant Comment	Policy requirements and standards	Why is it important
a. Promoting walking and cycling	Does the proposal promote cycling and walking through measures in a travel plan, including adequate cycle parking and cycle storage?	Yes, The project implement cycling lanes in the park along the Kolubara river.	London Plan Policy 6.3 (C) Travel Plans London Plan Policy 6.9 Cycling London Plan Policy 6.10 Walking London Plan Table 6.3 minimum standards for cycle parking provision Housing SPG cycle storage space standards (design standards 3.4.1 and 3.4.2)	A travel plan can address the environmental and health impacts of development by promoting sustainable transport, including walking and cycling. Cycle parking and storage in residential dwellings can encourage cycle participation.
b. Safety	Does the proposal include traffic management and calming measures and safe and well lit pedestrian and cycle crossings and routes?	Yes, it includes cutting down driving lanes, and it proposes integral street.	London Plan Policy 6.9 Cycling London Plan Policy 6.10 Walking	Traffic management and calming measures and safe crossings can reduce road accidents involving cyclists and pedestrians and increase levels of walking and cycling.
c. Connectivity	Does the proposal connect public realm and internal routes to local and strategic cycle and walking networks and public transport?	The project connects different public spaces	London Plan Policy 6.9 Cycling, Map 6.2 Cycle Super Highways London Plan Policy 6.10 Walking, Map 6.3 Strategic walking routes All London Green Grid SPG. Transport for London 'Legible London' Transport for London Bus Service Planning Guidelines	Developments should prioritise the access needs of cyclists and pedestrians. Routes should be safe, direct and convenient and barriers and gated communities should be avoided. Developments should be accessible by public transport.
d. Minimising car use	Does the proposal seek to minimise car use by reducing car parking provision, supported by the controlled parking zones, car free development and car clubs?	The project tackles the problem of parking by providing new underground parking areas.	London Plan Policy 6.13. Maximum parking standards in Table 6.2. Housing SPG Annex 3 Car parking provision guidance.	Space for pedestrians and cyclists should be given priority over commercial and private vehicles. Maximum car parking levels allows for provision to be reduced as far as practicable. Car clubs can be effective in reducing car use and parking demand at new residential developments

Theme 3: Healthy environment

Issue	Key questions	Yes / No / Not relevant Comment	Policy requirements and standards	Why is it important
a. Construction	Does the proposal minimise construction impacts such as dust, noise, vibration and odours?	<i>Not relevant</i>	<p>London Plan Policy 5.3 Sustainable Design and Construction</p> <p>London Plan Policy 5.18 Construction, excavation and demolition waste</p> <p>Mayor of London 'The Control of Dust and Emissions from Construction Sites'.</p>	<p>Construction sites can have a negative impact on an area and can be perceived to be unsafe. Construction activity can cause disturbance and stress which can have an adverse effect on physical and mental health. Mechanisms should be put in place to control hours of construction, vehicle movements and pollution.</p> <p>Community engagement before and during construction can help alleviate fears and concerns.</p>
b. Air Quality	Does the proposal minimise air pollution caused by traffic and energy facilities?	<i>Yes - underground parking</i>	<p>London Plan Policy 7.14 Improving Air Quality</p> <p>At least 'air quality neutral' – Housing SPG Design standard 5.6.1</p> <p>London Plan Policy 5.10 Implementing Urban Greening</p> <p>London Plan Policy 5.3 Sustainable Design and Construction</p>	<p>The long-term impact of poor air quality has been linked to life-shortening lung and heart conditions, cancer and diabetes.</p>
c. Noise	Does the proposal minimise the impact of noise caused by traffic and commercial uses through insulation, site layout and landscaping?	<i>Yes, through landscaping</i>	<p>London Plan Policy 7.15 Reducing noise and enhancing soundscapes</p>	<p>Reducing noise pollution helps improve the quality of urban life.</p>
d. Open space	<p>Does the proposal retain or replace existing open space and in areas of deficiency, provide new open or natural space, or improve access to existing spaces?</p> <p>Does the proposal set out how new open space will be managed and maintained?</p>	<i>The project replaces concrete and asphalt parkings and gas station with new green parks with detention basins.</i>	<p>London Plan Policy 7.1 Building London's neighbourhoods and communities</p> <p>London Plan Policy 7.18 Protecting Local Open Space and Addressing Deficiency, Table 7.2 Public open space categorisation</p> <p>London Plan Policy 7.19 Biodiversity and Access to nature</p>	<p>Access to open space has a positive impact on health and wellbeing. Living close to areas of green space, parks, woodland and other open space can improve physical and mental health regardless of social background.</p> <p>To maintain the quality and usability of open spaces an effective management and maintenance regime should be put in place.</p>

Theme 3: Healthy environment

Issue	Key questions	Yes / No / Not relevant Comment	Policy requirements and standards	Why is it important
e. Play space	Does the proposal provide a range of play spaces for children and young people?	Yes, in the open green areas and open public spaces.	London Plan Policy 3.6 Children and Young People's Play and Informal Recreation Facilities Shaping Neighbourhoods: Play and Informal Recreation SPG - benchmark standard of a minimum of 10sq.m per child regardless of age. Table 4.4 Accessibility to Play Space	Regular participation in physical activity among children and young people is vital for healthy growth and development. The location of play spaces should be accessible by walking and cycling routes which are suitable for children to use.
f. Biodiversity	Does the proposal contribute to nature conservation and biodiversity?	Yes, both, by saving the existing park along Koli Baba and creating new space for new and enhanced biodiversity.	London Plan Policy 7.19 Biodiversity and access to nature. Table 7.3 London regional BAP habitat targets for 2020	Access to nature and biodiversity can contribute to mental health and wellbeing. New development can improve existing, or create new, habitats or use design solutions (green roofs, living walls) to enhance biodiversity.
g. Local food growing	Does the proposal provide opportunities for food growing, for example by providing allotments, private and community gardens and green roofs?	No	London Plan Policy 5.10 Urban Greening London Plan Policy 7.22 Land for Food London Plan Policy 5.11 Green Roofs and development site environs	Providing space for local food growing helps promote more active lifestyles, better diets and social benefits.
h. Flood risk	Does the proposal reduce surface water flood risk through sustainable urban drainage techniques, including storing rainwater, use of permeable surfaces and green roofs?	Yes, that is the main theme of the project. It contains water detention pools and basins, both as small pools and green basins.	London Plan policy 5.3 Sustainable Design and Construction, Policy 5.11 Green Roofs and development site environs, Policy 5.13 Sustainable Drainage, Housing SPG design standard 6.4.3	Flooding can result in risks to physical and mental health. The stress of being flooded and cleaning up can have a significant impact on mental health and wellbeing. It is likely that increasing development densities and building coverage coupled with more frequent extreme weather events will increase urban flood risk.
i. Overheating	Does the design of buildings and spaces avoid internal and external overheating, through use of passive cooling techniques and urban greening?	Yes, green spaces	London Plan Policy 5.3 Sustainable Design and Construction Policy 5.9 Overheating and Cooling Policy 5.10 Urban Greening Policy 5.11 Green Roofs and development site environs Housing SPG Design Standard 6.3.1	Climate change with higher average summer temperatures is likely to intensify the urban heat island effect and result in discomfort and excess summer deaths amongst vulnerable people. Urban greening - tree planting, green roofs and walls and soft landscaping can help prevent summer overheating.

Theme 4: Vibrant neighbourhoods

Issue	Key questions	Yes/No / Not relevant Comment	Policy requirements and standards	Why is it important
a. Health services	Has the impact on healthcare services been addressed?	<i>Not relevant</i>	London Plan Policy 3.17 Health and social care facilities NHS London Healthy Urban Development Unit Planning Contributions Tool (the HUDU Model)	Poor access and quality of healthcare services exacerbates ill-health, making treatment more difficult. The provision of support services, including advice on healthy living can prevent ill health.
b. Education	Has the impact on primary, secondary and post-19 education been addressed?	<i>Not relevant</i>	London Plan Policy 3.18 Education facilities	Access to a range of primary, secondary and post-19 education improves self-esteem, job opportunities and earning capability.
Access to social infrastructure	Does the proposal contribute to new social infrastructure provision that is accessible, affordable and timely? Have opportunities for multi-use and the co-location of services been explored?	<i>-/-</i>	London Plan Policy 3.16 Protection and enhancement of social infrastructure London Plan Policy 7.1 Building London's neighbourhoods and communities	Good access to local services is a key element of a lifetime neighbourhood and additional services will be required to support new development. Failure to do so will place pressure on existing services. Future social infrastructure requirements are set out in Borough infrastructure plans and developments will be
d. Local employment and healthy workplaces	Does the proposal include commercial uses and provide opportunities for local employment and training, including temporary construction and permanent 'end-use' jobs? Does the proposal promote the health and well-being of future employees by achieving BREEAM health and wellbeing credits?	<i>Yes by creating new public spaces suitable for commercial use</i>	London Plan Policies 4.12 Improving opportunities for all and Policy 8.2 Planning obligations. London Plan Policy 7.1 Building London's neighbourhoods and communities Workplace environment - BREEAM health and wellbeing credits	Unemployment generally leads to poverty, illness and a reduction in personal and social esteem. Employment can aid recovery from physical and mental illnesses. Creating healthier workplaces can reduce ill health and employee sickness absence.
e. Access to local food shops	Does the proposal provide opportunities for local food shops? Does the proposal avoid an over concentration or clustering of hot food takeaways in the local area?	<i>Not relevant</i>	London Plan Policy 4.7 Retail and Town Centre Development London Plan Policy 4.8 Supporting a Successful and Diverse Retail Sector London Plan Policy 4.9 Small Shops London Plan Policy 7.1 Building London's Neighbourhoods and Communities	A proliferation of hot food takeaways and other outlets selling fast food can harm the vitality and viability of local centres and undermine attempts to promote the consumption of healthy food, particularly in areas close to schools.

04.5.THE LADYBUG TOOL

LADYBUG UTCI ANALYSIS



Ladybug tools

Applications that support environmental design and education (Ladybug, Honeybee)

LADYBUG is a plugin in Rhino (Grasshopper). Ladybug imports standard EnergyPlus Weather files (.EPW) into Grasshopper. It samples 20 and 30 different interactive climate graphics that support decision-making during the early stages of design.

Possibilities of ladybug

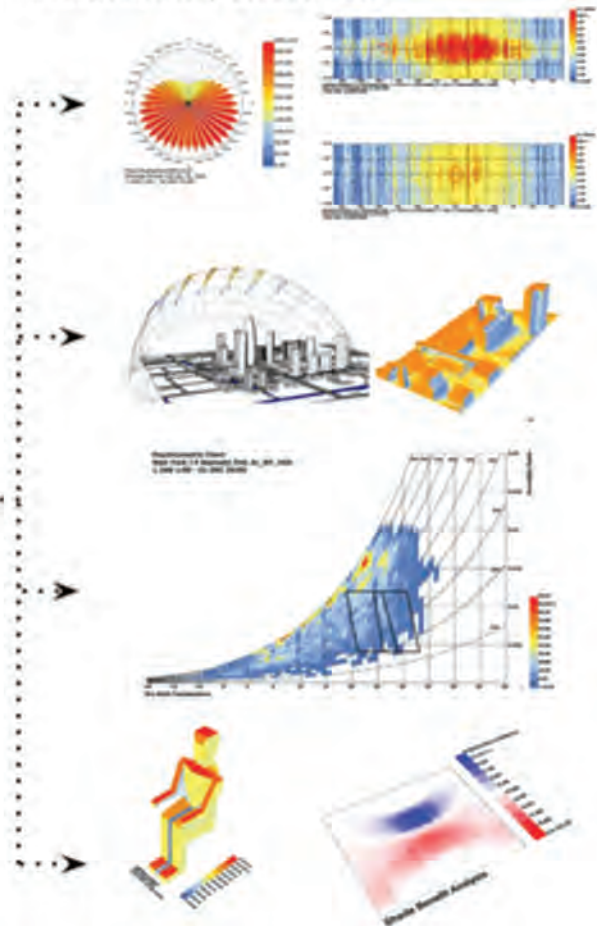
- Environmental Analysis (daylighting, solar radiation, energy simulation, and outdoor comfort assessment)
- Open-source and Free
- Iterative Design Process
- Climate-Based Analysis
- Interdisciplinary Collaboration



Rhino + GH

.epw

Weather Data



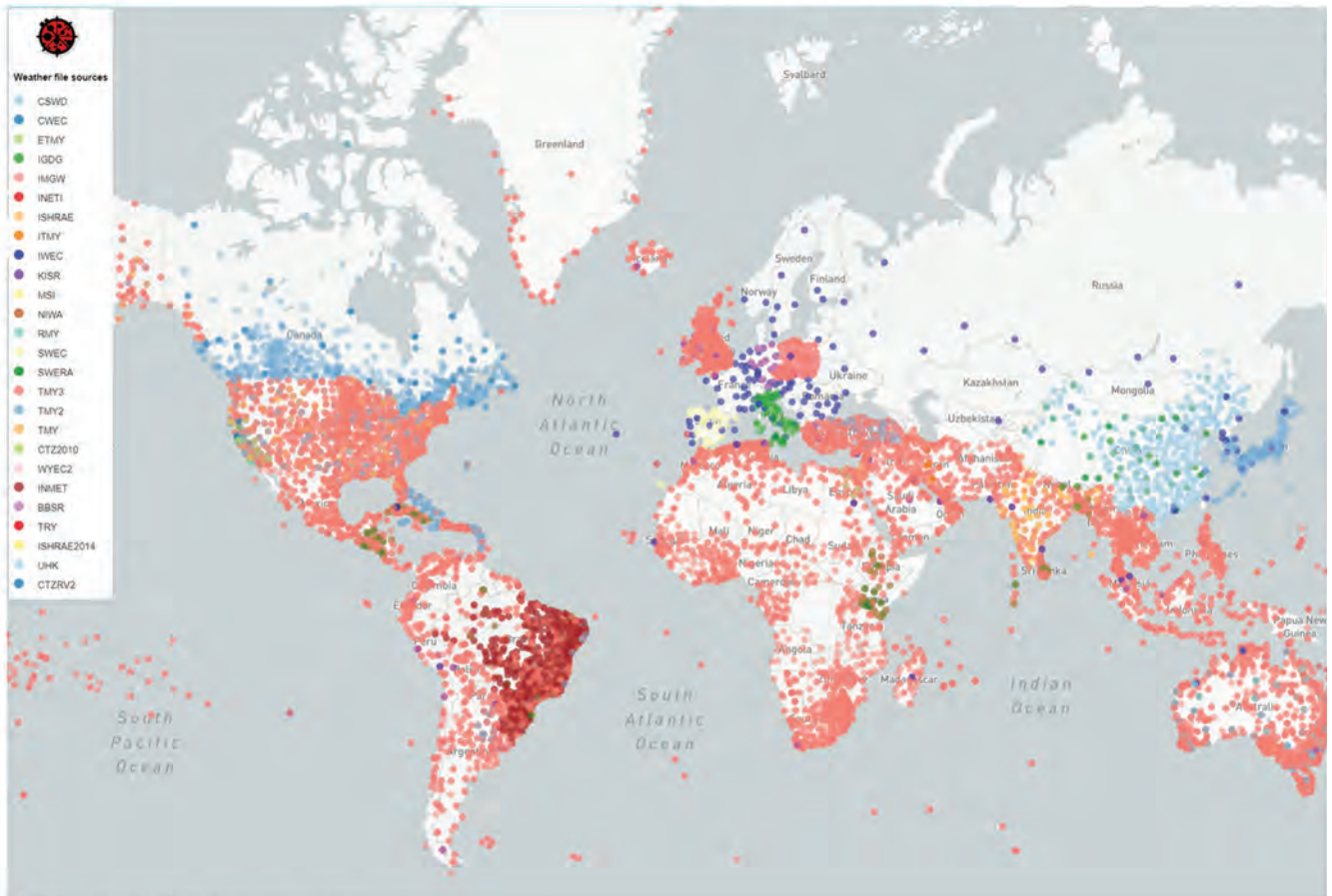
Schematic illustration of Ladybug input and output data

Evaluation with ladybug

Ladybug is able to evaluate initial design options through solar radiation studies, view analysis, and sun hour modeling. Integration with visual programming environments enables instant feedback on design modifications and a high degree of customization.

Locating the .epw file

Ladybug has a large number of options, through which we can see how climatic conditions affect the given 3d model. By inserting the corresponding .epw file, we enter the data for the corresponding city or municipality for which we want to analyze the conditions. Epw files can be found on the <https://www.ladybug.tools/epwmap/> site, but in case it does not contain data for a specific place we need, we can just search for a file in that format for the place we need.



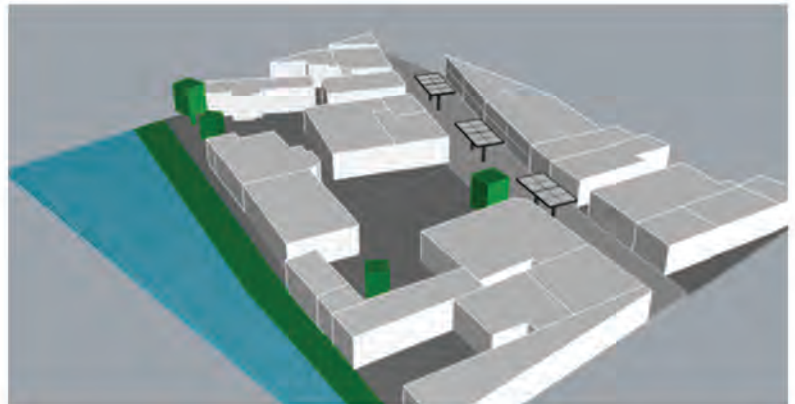
Ladybug website with .epw data

Ladybug tool application

WSUD, AS A CLIMATE ADAPTATION STRATEGY, Milica S.

Project proposal before thermal analysis

- Problem : Flooding, heat islands, poor space condition
- Solution : Water collecting systems



After thermal analysis

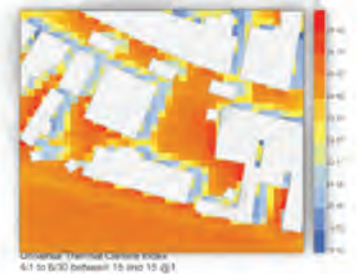
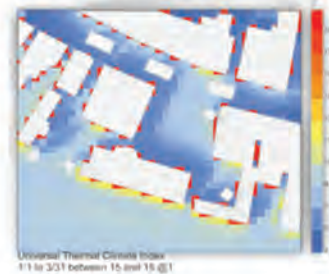
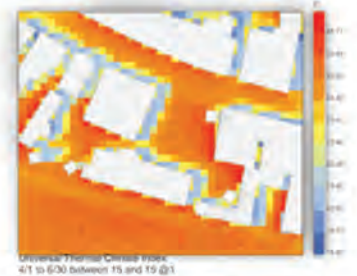
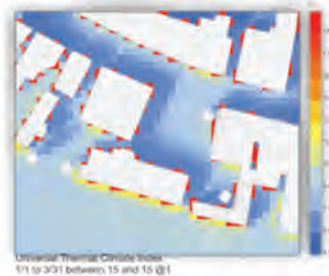
- Problem : Heat islands
- Solution : More green surfaces

After this process we can see the improvements we can make in the future development of our projects. This analysis allows us to change our projects accordingly. This iterative design process is good for early stages of the design, since it doesn't require detailed project model. The model can be changed before making a more detailed model, which can also be placed in the analysis.

Problem specific for this project was:

The model was made in a different modeling program, which makes it difficult to place in rhino and to run UTCI analysis. The model had to be remade and placed in Rhino.

3D model after intervention



UTCI - Before and after intervention

Ladybug tool – Project application

Ladybug tool application

WATER SENSITIVE URBAN DESIGN
(WSUD) Filip M.

Project proposal before thermal analysis

- Problem : Heat islands, air pollution, lack of greenery
- Solution : Stopping and collecting rain-water, Greening city center



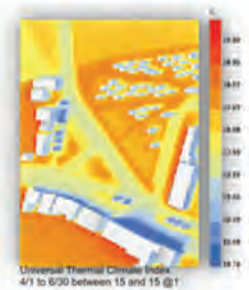
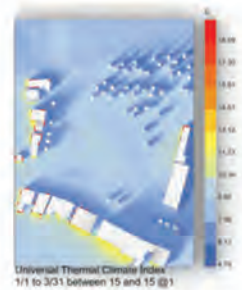
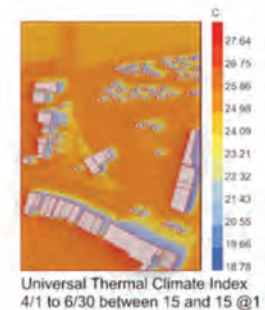
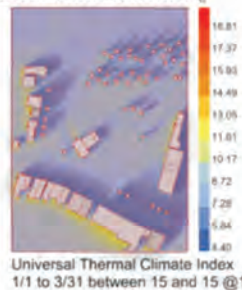
3D model after intervention

After thermal analysis

- Problem : Lack of awnings
- Solution : More trees and awning type structures

Problem specific for this project was:

There was a large number of smaller, curved elements which could not be loaded in the ladybug UTCL analysis. The program can not compute smaller elements, so the materials don't load and it doesn't show accurate data, as we can see in this example.



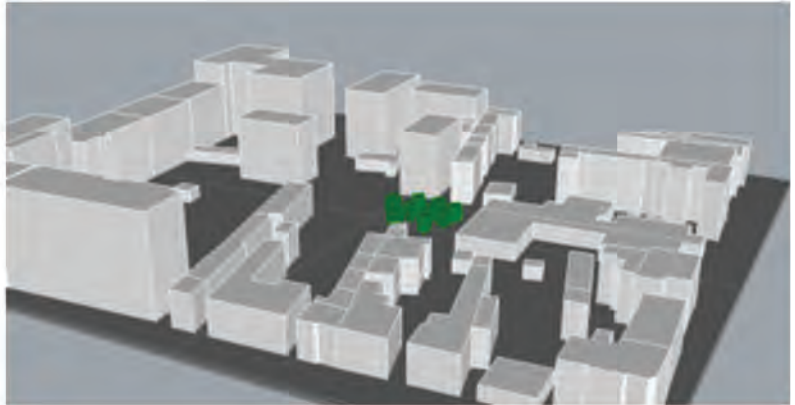
UTCI - Before and after intervention

Ladybug tool application

MINI URBAN FORESTS – Jelena I.

Project proposal before thermal analysis

- Problem : Air pollution, lack of greenery, heat islands
- Solution : Urban mini forests – prevent air pollution, increasing urban greenery and play a big role in soil regeneration

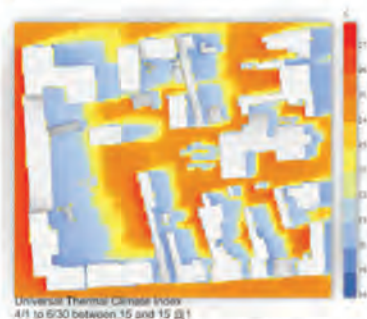
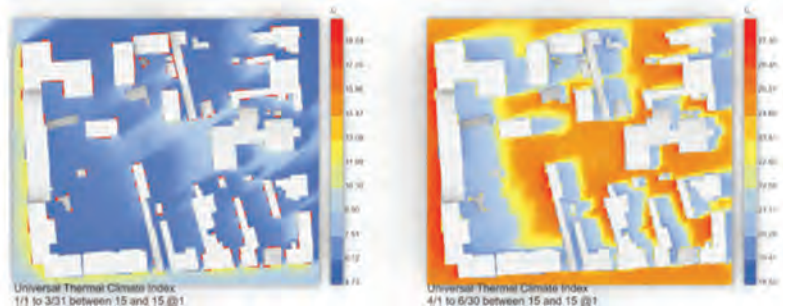


3D model after intervention

After thermal analysis

- Problem : Quantity of this solution needed
- Solution : More greenery

Problem specific for this project was:
Because the project was based on different types of greenery, the program is very difficult to set like there are different kinds of greenery, and their specific influence on the UTCI comfort levels.



UTCI - Before and after intervention

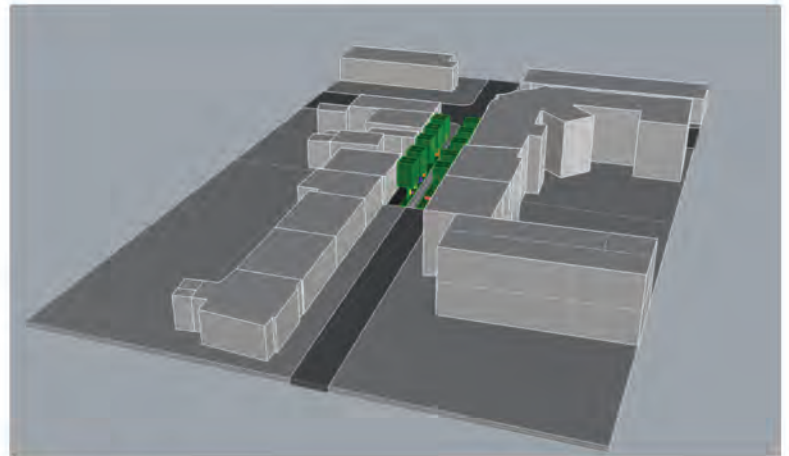
Ladybug tool – Project application

Ladybug tool application

A PLAN FOR VALJEVO - Ivana T.

Project proposal before thermal analysis

- Problem : Heat islands, air pollution, lack of greenery, lack of shade, individual fireplaces
- Solution : Street redesign, Improved bicycle paths, Public art

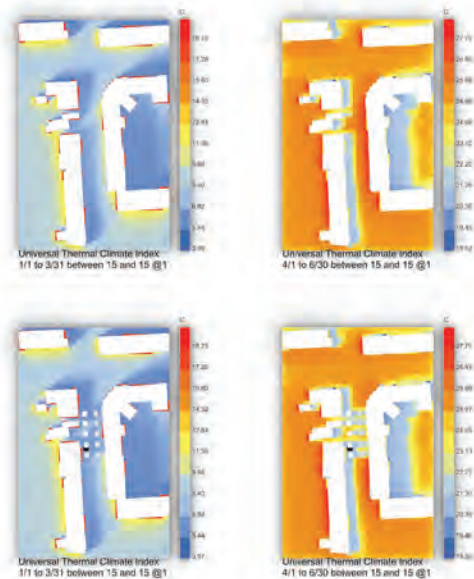


After thermal analysis

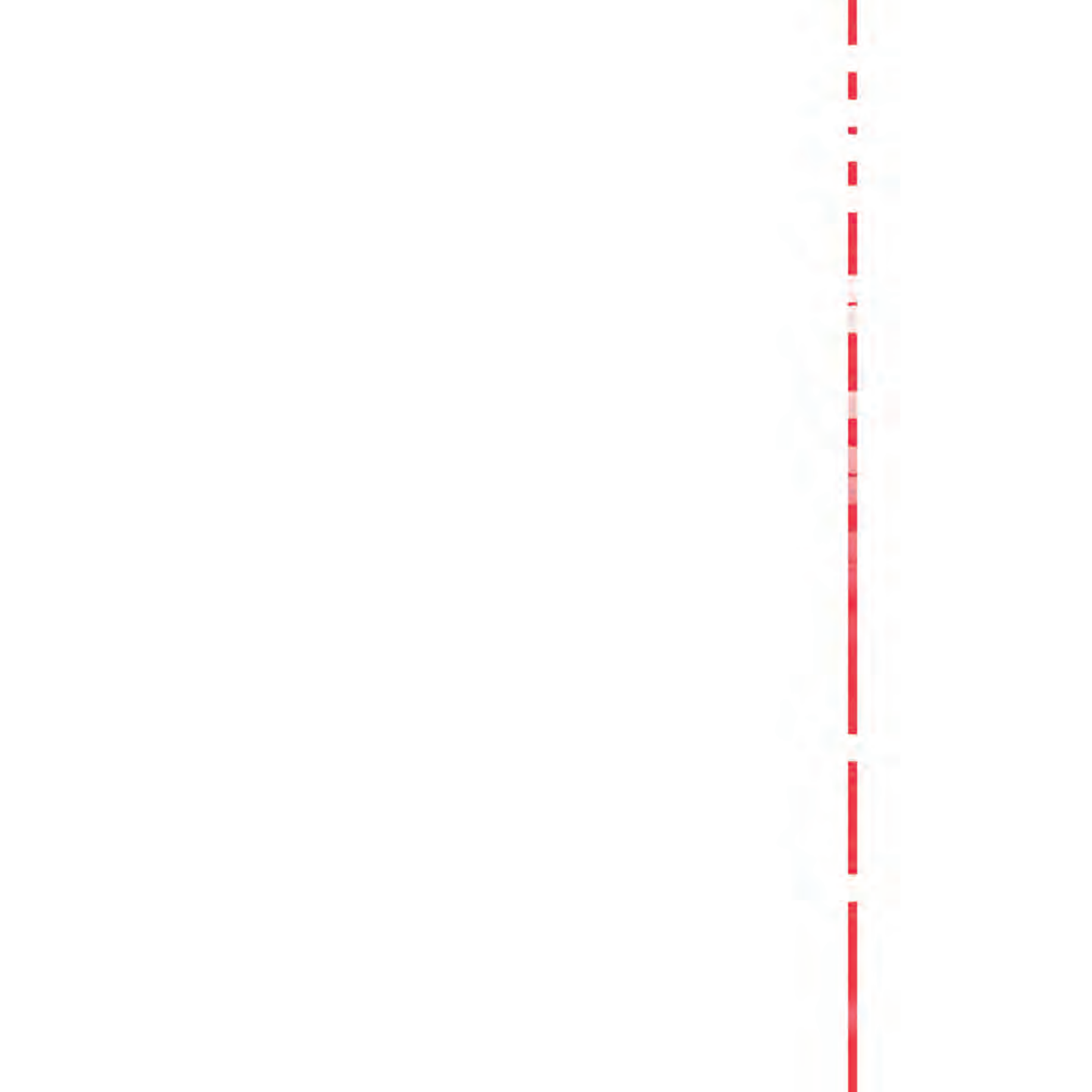
- Problem : Lack of environment friendly materials
- Solution : Placing wood as part of design

Problem specific for this project was Wood as a material is not available in ladybug material library. There should be more environment friendly materials available.

3D model after intervention



UTCI - Before and after intervention



Project Proposals Selection 05

 <p>Jelena Ilić Naziv projekta: Urbane mini šume Sviđa mi se</p> <p>Ne sviđa mi se</p>	 <p>Nara Tomić Naziv projekta: Dnevni Sviđa mi se</p> <p>Ne sviđa mi se</p>
 <p>Nikola Marković Naziv projekta: <i>Urban</i> Sviđa mi se</p> <p>Ne sviđa mi se</p>	 <p>Milica Šušić Naziv projekta: <i>Urban</i> Sviđa mi se</p> <p>Ne sviđa mi se</p>
 <p>Jana Mijalović Naziv projekta: Uređenje prostora rizičnih Sviđa mi se</p> <p>Ne sviđa mi se</p>	 <p>Sviđa mi se</p> <p>Ne sviđa mi se</p>

Stakeholder simulation/Workshop

The workshop started with the presentation of the student projects that they developed during the semester, the topics that the projects deal with and the problems that would be solved by implementing their solutions in the central area of the city of Valjevo. Some of the projects were related to air pollution prevention, stormwater management in the urban tissue, landfill remediation and recycling.

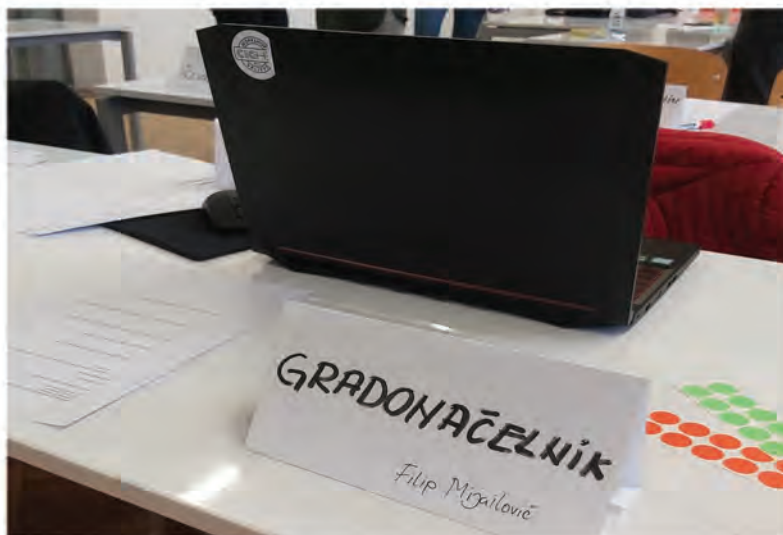
The workshop is based on the fact that students from the role of a given stakeholder express their opinion and explain which projects are best suited to the topic of health and climate change, how much they contribute to the city of Valjevo and what they think needs to be further improved.

The workshop has three parts:

- First part: Presentation of stakeholders, discussion on the potential and problems of Valjevo, suggestions for improvement of the presented projects
- Second part: survey
- Third part: Dot-Voting, evaluation of solutions



Atmosphere during the workshop



Filip in the role of the mayor of Valjevo

Students were divided into three sectors: public, private and civil (Table 1).

With such a division of roles, we managed to achieve a simulation of the participatory decision-making process. Stakeholder interests differ depending on the sector to which that stakeholder belongs.

The public sector, as a representative of the authorities and state institutions, represented the interests that would benefit the citizens the most and that would help in the promotion of Valjevo in the best possible way.

The private sector consisted of the owners of private companies whose main criterion for evaluating projects was personal prosperity. While the civil sector this time was made up of organizations that deal with environmental protection, they were also extremely interested in this topic because it is in direct contact with their field of action. In addition to them, there was also represent of the local online portal, as a form of reporting and informing the public about events in the city.

Mediators of the workshop were students Edita Ljalja and Milica Spajić.

SECTOR	STAKEHOLDER	STUDENT'S NAME
PUBLIC SECTOR	The mayor of Valjevo	Filip Mijailović
PUBLIC SECTOR	Chief city architect	Hristina Tomašević
PUBLIC SECTOR	Director of Valjevo Hospital	Teodora Živković
PUBLIC SECTOR	Tourist Organization of Valjevo	Iva Bajić
PRIVATE SECTOR	Nursery garden „Jovanja“	Jelena Ilić
PRIVATE SECTOR	Slaven Batočanin	Nikola Marković
CIVILIAN SECTOR	ecological movement - EkoGerila	Jana Mijailović
CIVILIAN SECTOR	ecological movement - iRevolucija	Ivana Tomić
PUBLIC/PRIVATE SECTOR	online portal/media - Kolubarske.rs	Tamara Mladenović

Table 1. Selection of stakeholders by sector

Parts of the workshop

First part: discussion

After the projects were presented, the mediators first introduced all the stakeholders present, so that everyone would be informed at the beginning of who represents which role in the workshop. Then the discussion began. mediators asked questions regarding the climate and health conditions in Valjevo. Some of the questions are:

"What do you consider to be the biggest problem that Valjevo is struggling with?"

"What is the most effective way to solve these problems?"

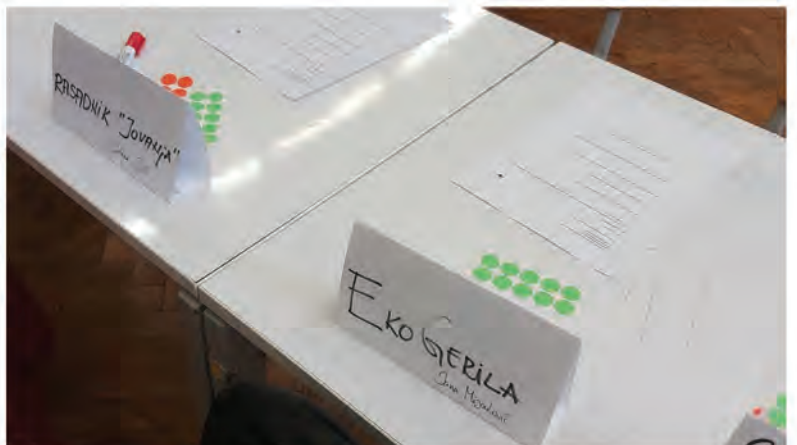
"What do you consider to be the greatest potential of the city of Valjevo and how can it be used?"

In this way, the discussion started and all stakeholders expressed their opinion on the given topic; new topics for discussion were spontaneously opened, we came to some new conclusions, set priority goals, namely the prevention of air pollution, flooding, and the reduction of waste in the urban tissue.

In the continuation of the workshop, it was necessary to make the first decisions regarding the presented projects.



Hristina as a city architect



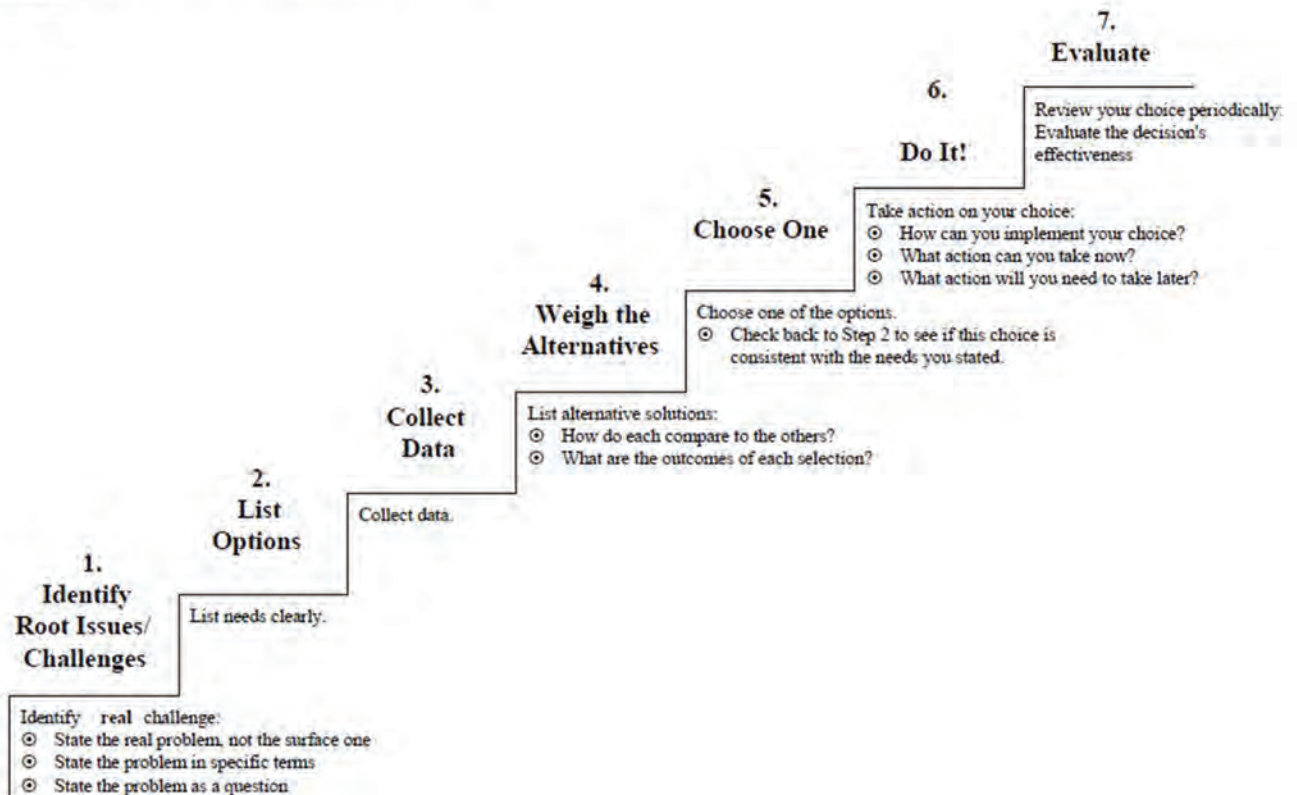
Preparations for the poll and dot voting

How Do You Make a "Good" Decision?

A good decision is one that gets you what/where you want...and creates a lasting solution, one that you won't have to revisit again and again. There are some basic steps which help ensure that you have a good chance of making strong, effective, lasting decisions.

Decision criteria

Whenever a group must make a decision or choice, identify ahead of time the criteria you will use for the final decision(s). When the group has agreed on criteria early in the process, all possible choices can be judged against the criteria.



Basic steps to making a good decision;

source of information: FACILITATOR TOOL KIT, A GUIDE FOR HELPING GROUPS GET RESULTS

Prikaz ilustracije. Calibri regular 10pt

Parts of the workshop

Second part: survey

The survey consisted of 6 questions. It was necessary for the students to write the name of the stakeholder they represent and answer the given questions from his point of view. The purpose of the survey was for students to evaluate the given projects in writing. The questions are:

1. Which three projects would you single out as the ones that best fit the topic of health and climate change?
2. Rate the above projects from 1 to 10?
3. Why did you choose the previous three projects?
4. Which project would you most like to implement in the city of Valjevo and why?
5. In what way does he respond to the problems defined by SWOT analysis?
6. What would you improve/change in project?



Stakeholders complete a poll

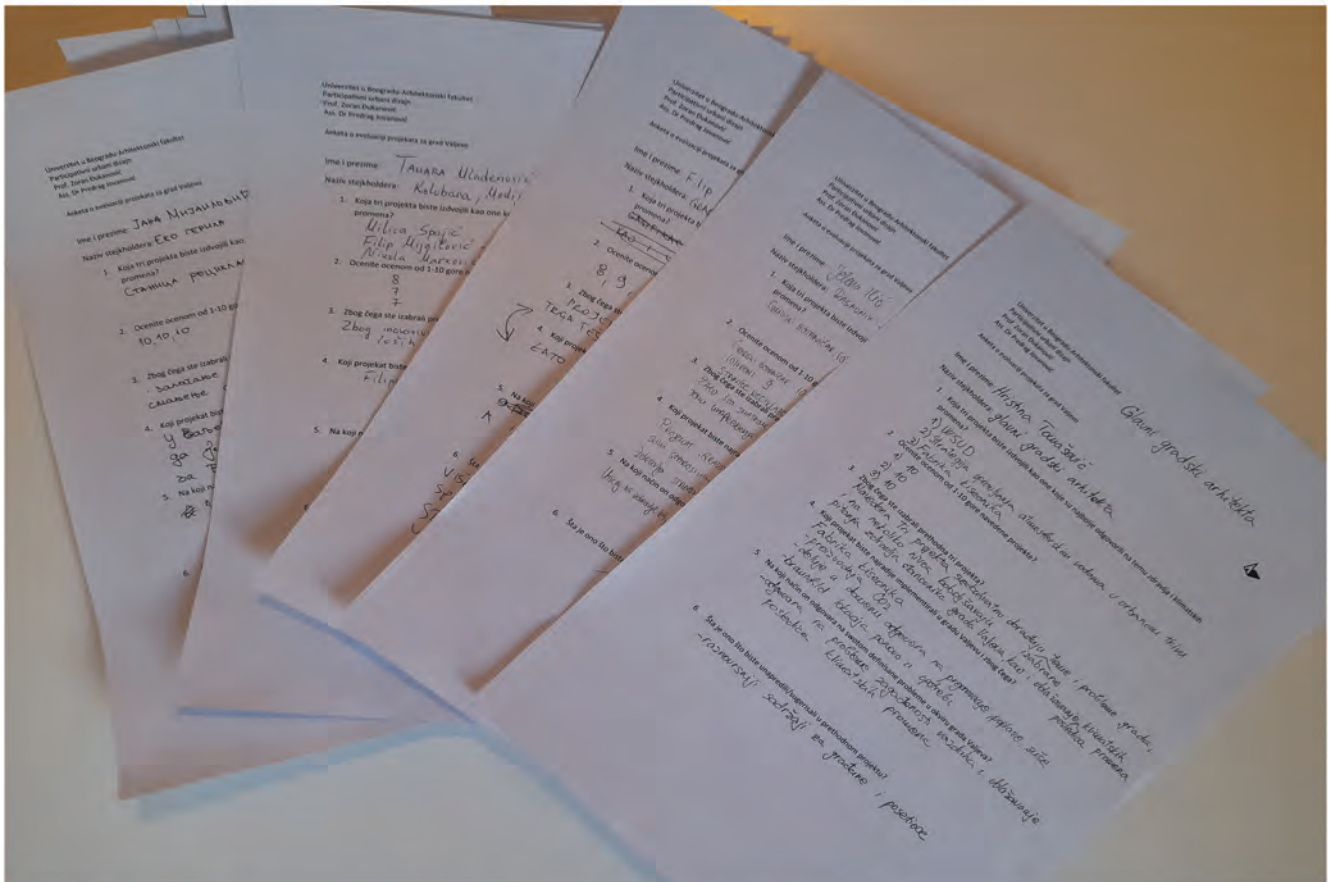


Stakeholders complete a poll

As a result of a poll conducted among stakeholders, we came to the conclusion that the projects dealing with the prevention of air pollution, overheating, flood and drought prevention are those that the stakeholders consider best to be implemented from the territory of the city center of Valjevo.

more new parking spaces, development of storm water collection and storage technology, more green areas connected with some new contents, as well as more bicycle paths was singled out.

As what would be improved in the projects, the need for a greater number of more diverse contents for citizens and tourists,



Completed polls, now we can move on to the third part: dot-voting

Parts of the workshop

The third part: Dot-voting

We devoted the third part of the workshop to voting. In order to evaluate our projects as realistically as possible, we fully immersed ourselves in the role of stakeholders, thinking about the potential interests of our roles, so there was no bias among colleagues. We decided on the dot voting system. This method of assessment gave phenomenal results, and at the same time made the workshop much more fun.

Dot Voting

Dot voting is a very simple and quick method for groups to use in setting priorities when there are many options. It can be used to identify where to start in addressing an issue, which project to start first, what is our top core value, etc.

Steps in the Dot Voting Method

1. Begin by brainstorming all the options and list on a flipchart in any order. Leave enough space between the items to place sticky dots.
2. Give each person in the group 10 dots (for this exercise, color is irrelevant). Instruct them that to indicate their priorities, they are to “use all 10 dots but no more than 4 on any ONE item.”



Workshop. Dot voting student projects.



Student Ivana Tomić as iRevolucija stakeholder.

Therefore, 4 dots would indicate their top priority. Some items will have no dots.

3. Participants walk up to the flipcharts and place their dots under the items. If you have a larger group, split the items on 2 flipcharts on opposite sides of the room so as not to take too much time or cause congestion. Start half the group on each chart.

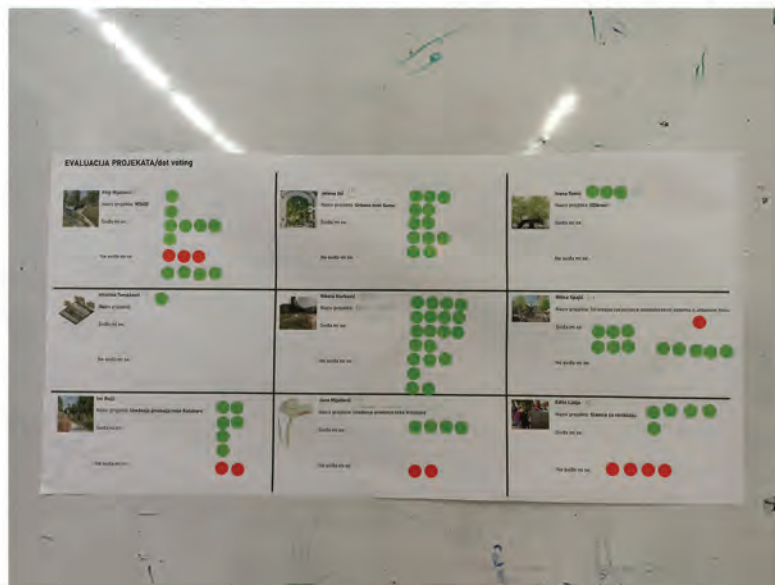
4. When everyone has placed his/her dots, count the number of dots for each item and make a priority listing on a new flipchart page. There usually are a few clear winners. You may then discuss with the group if they agree those should be top priorities on which to start working. It does not mean the others are eliminated.

This exercise creates a “fun” activity, good visual, and limits discussion if it has gone on too long, as well as getting input from the entire group.

At the end of the workshop, we received very useful results and suggestions from each other that will help us further define our projects and ideas.



Students Jana Mijailović and Tamara Mladenović giving their “dots”.



Final result of our workshop.

Results communication and dissemination 06



cliche_org · Follow

||| Miley Cyrus · Midnight Sky



06.1.ONLINE PRESENCE

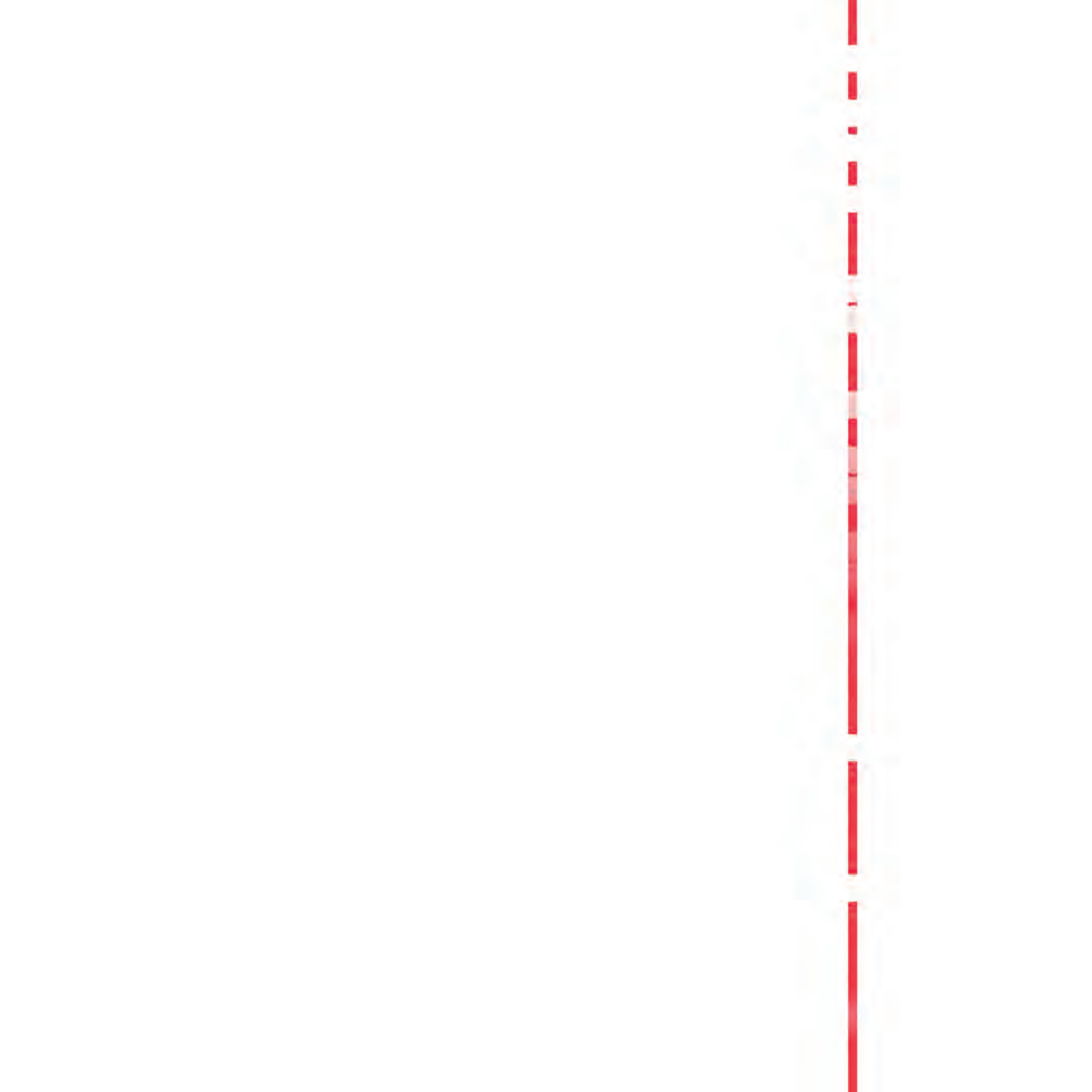
Results communication and dissemination is a very important part in projects such as Clicche. Without the necessary dissemination, the project remains within its academic institution's limits. That's why Clicche has a website, Instagram, Facebook and YouTube profiles, where we can get to a larger specter of people.

Official website: clicche.org

Facebook: <https://www.facebook.com/clicche>

Twitter: https://twitter.com/clicche_org

YouTube: <https://youtube.com/@clicche-org>



06.2.THE WEBSITE

The website presents the vision, mission, and values of the project. Here you can also find everything that happened during the workshop, as well as planned meetings, online or in person. Not only is the website a place where you can find more information about the workshop within the studio but also within some other classes such as “Public Art and Public Space” or “Paps” which also participated in the Clicche project.

The logo for Clicche, featuring the word 'Clicche' in a stylized, rounded font. The 'i' and 'c' are black, the 'c' is black, the '+' is red, the 'h' is black, and the 'e' is black.

Erasmus+ cooperation partnerships in higher education

The logo for Clicche, featuring the word 'Clicche' in a stylized, rounded font. The 'i' and 'c' are black, the 'c' is black, the '+' is red, the 'h' is black, and the 'e' is black.

**Climate Change, Cities, Communities
and Equity in Health**

January 2022 – January 2024

Co-funded by the

Erasmus + Programme of the European Union





add3 Public Art & Public Space + Urban Open Spaces

2023 February 10, PaPs, University of Belgrade

The elective course “Public Art & Public Space” on Master level within University of Belgrade – Faculty of Architecture that was held during the fall semester 2022-2023 was dedicated to the project ClicCHE.

Read more...



Climate Change, Cities, Communities and Equity in Health
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migrations

gordana trajković





06.3. INSTAGRAM

Clicche Instagram is only in the making, and there is a lot more work to be done in order for the page to live up to its name. There are several methods for reach boosting on Instagram.

One approach could be to create “trptychs” or sets of three consecutive images that appear as one large image when viewed on the profile. This has proven to be an interesting way to present significant updates. It could look something like this.

Additionally, creating reels would help expand the reach, as the Instagram algorithm currently favors video content over regular photos and gives them priority in terms of promotion.

The logo for 'Clicche' features the word in a stylized, sans-serif font. The letter 'C' is notably larger and more prominent than the other letters, and a red cross-like symbol is integrated into the letter 'H'.

clicche_org

Following ▾

Message



3 posts

32 followers

4 following

clicche

College & university

Climate Change, Cities, Communities
and Equity in Health

clicche.org

Followed by [tomic_ivana](#), [tomasevicch](#), [alekmil_](#) + 7 more

POSTS

TAGGED



WELCOME
TO CLICCHE

Climate Change, Cities, Communities and Equity in Health
Ka220 HED-Progetto n. 2021-1-IT02-KA220-HED-099932223



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“Instagram Page Layout Proposal - Triptych”

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Following ▾

Message



3 posts

32 followers

4 following

clicche

College & university

Climate Change, Cities, Communities
and Equity in Health

clicche.org

Followed by [tomic_ivana](#), [tomasevicch](#), [alekmil_](#) + 7 more

🗪 POSTS

🏷 TAGGED



Instagram Ideas, posts and reels...



9:41



Reels



[cliche_org](#) · Follow

🎵 Miley Cyrus · Midnight Sky



CLICCHE LISBON : **07**
Joint intensive course

AUDITÓRIO

Ferreira de Almeida

B 203

07.1.WORKSHOP

PRESENTATIONS

This activity took place in Lisbon, Portugal, where all participants gathered to take part in the CLicche joint intensive course. Our host, Rita Avila Cachado, welcomed us all on May 23rd in the auditorium of Lisbon's University Building 2.

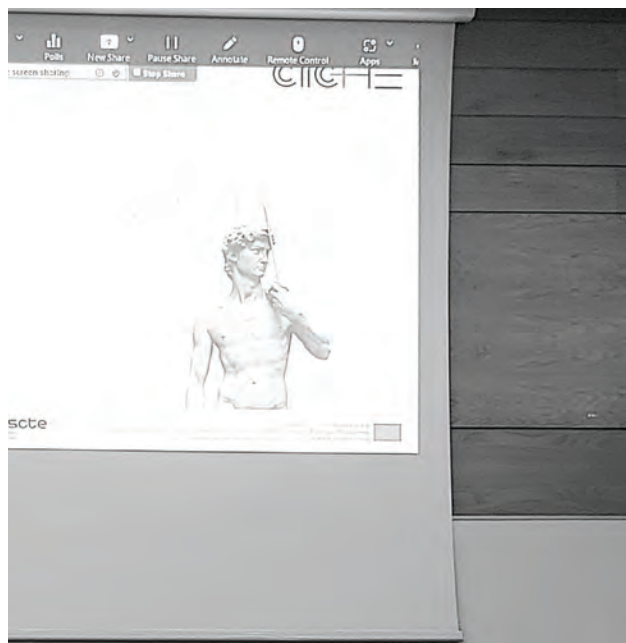






The building itself was a beautiful working spot, carefully planned to be accessible for anyone who wants to go inside. The ambience was calm and inviting, but also lively from many students from all around the world.





The workshop lasted for four days. In the first two days, each university held a presentation on how the Cliche project was implemented in their working contexts. Each participant implemented the workshop in their own unique way at their university, resulting in a wide range of outcomes and very interesting conclusions from everyone. On the first day, the presentation was held by the University of Camerino in Italy and by the Cyprus Institute. What made the presentations even better was that the participants were from different areas of expertise – some were architects, urban designers, some scientists, and physicists. Everyone was analyzing themes of urban health and climate change in their own way.

This diversity was very desirable and everyone had the opportunity to learn from other professional branches. On the second day, the University of Belgrade and scientists from Palermo delivered their presentations, as well as the host University - ISCTE.

Italy- University of Camerino
UNICAM presentation
San Benedetto del Tronto

The screenshot shows a Zoom meeting interface with a slide. The slide title is "C.2 Joint intensive course/students" with a subtitle "Erbion, May 23-26, 2023". The main content of the slide is "Session 2: Presentation of Local Workshop by UNICAM" and "Rosalba D'Onofrio, Chiara Caramanna, Antonella Camporotondo". A central image depicts a classical statue of a young man. At the bottom, logos for "UNIVERSITY OF BELGRADE", "THE CITY OF SASSUOLO", and "iscte" are visible. The Zoom toolbar at the top includes icons for Mute, Stop Video, Security, Participants, Chat, Polls, New Share, Pause Share, Annotate, Remote Control, and Apps.





Institute of Cyprus - CYI
Presentation of Strovolos



Italy- Palermo presentation



University of Belgrade, UB Studio Workshop and Valjevo presentation





GROUP WORKSHOP

On the second day of the course, students were divided into four international groups, each representing one of the partner cities – Lisbon, San Benedetto del Tronto, Strovolos, and Valjevo. The idea was that every team should have one or two students from each of the universities.

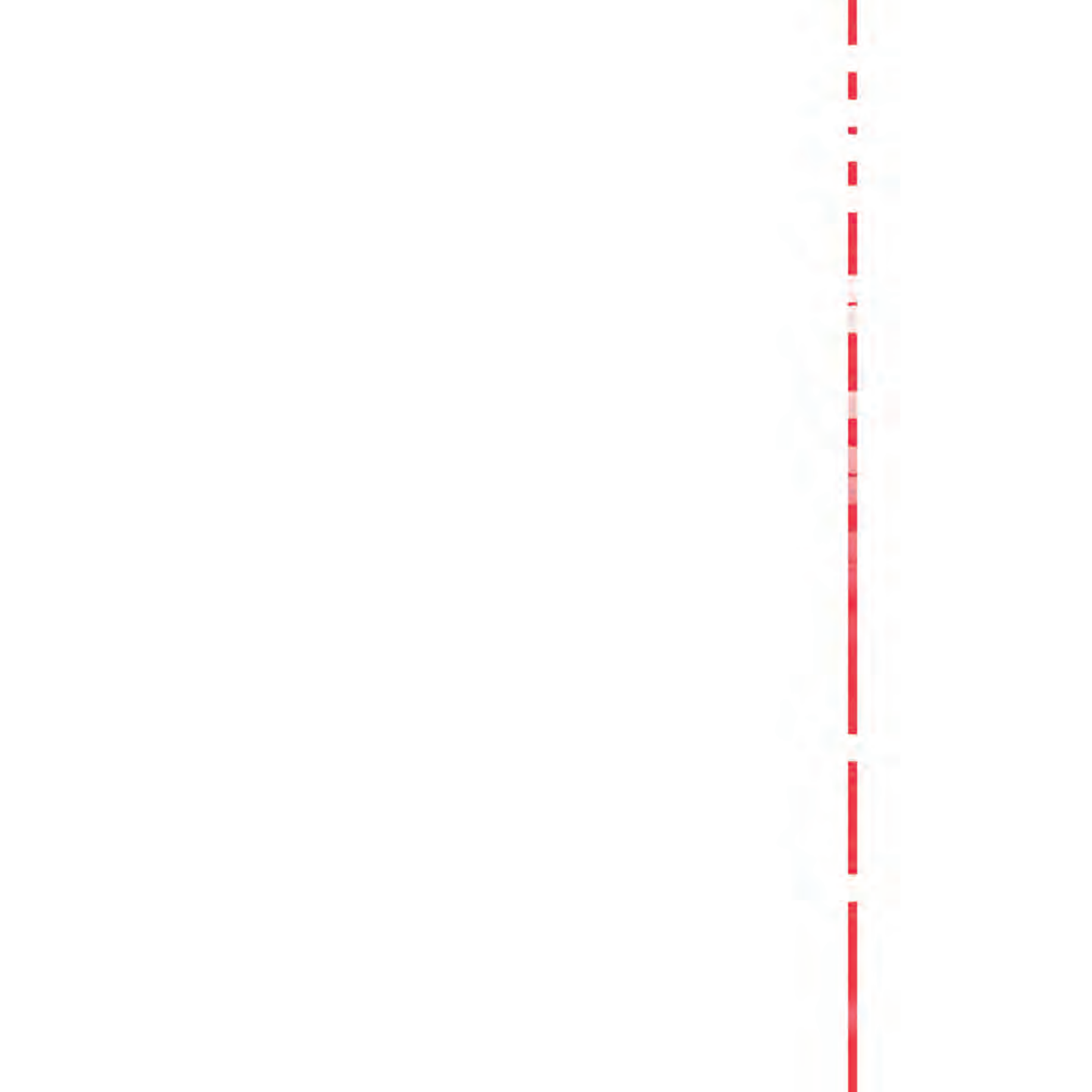
Lisbon team :

San Benedetto del Tronto team: Martina Baffi, Sara Crocetti, Konstantina Koutroumanou, Tamara Mladenović

Strovolos team : Davide Falcioni, Filip Mijailović, Anna Tzyrkalli, Giandomenico Vurro

Valjevo team: Alessandro Giantomasso, Nikola Marković, Milica Spajić

Each team was assigned with one project theme – such as „I never thought that trees are so important to the city“, „Water as a friend“, expressing the issues those cities have.





Sara Crocetti and Martina Baffi working with Tamara Mladenović on “Water as a friend” project for San Benedetto del Tronto, Italy

Alessandro Giantomasso with Milica and Nikola working on “Smokey Mirror” project for Valjevo, Serbia.





Filip Mijailović with Davide falconi, Anna Tzyrkalli and Giandomenico Vurro working on the Strovolos, Cyprus project.

Teodora Živković with Pierrepaulo for Lisbon, Portugal project.

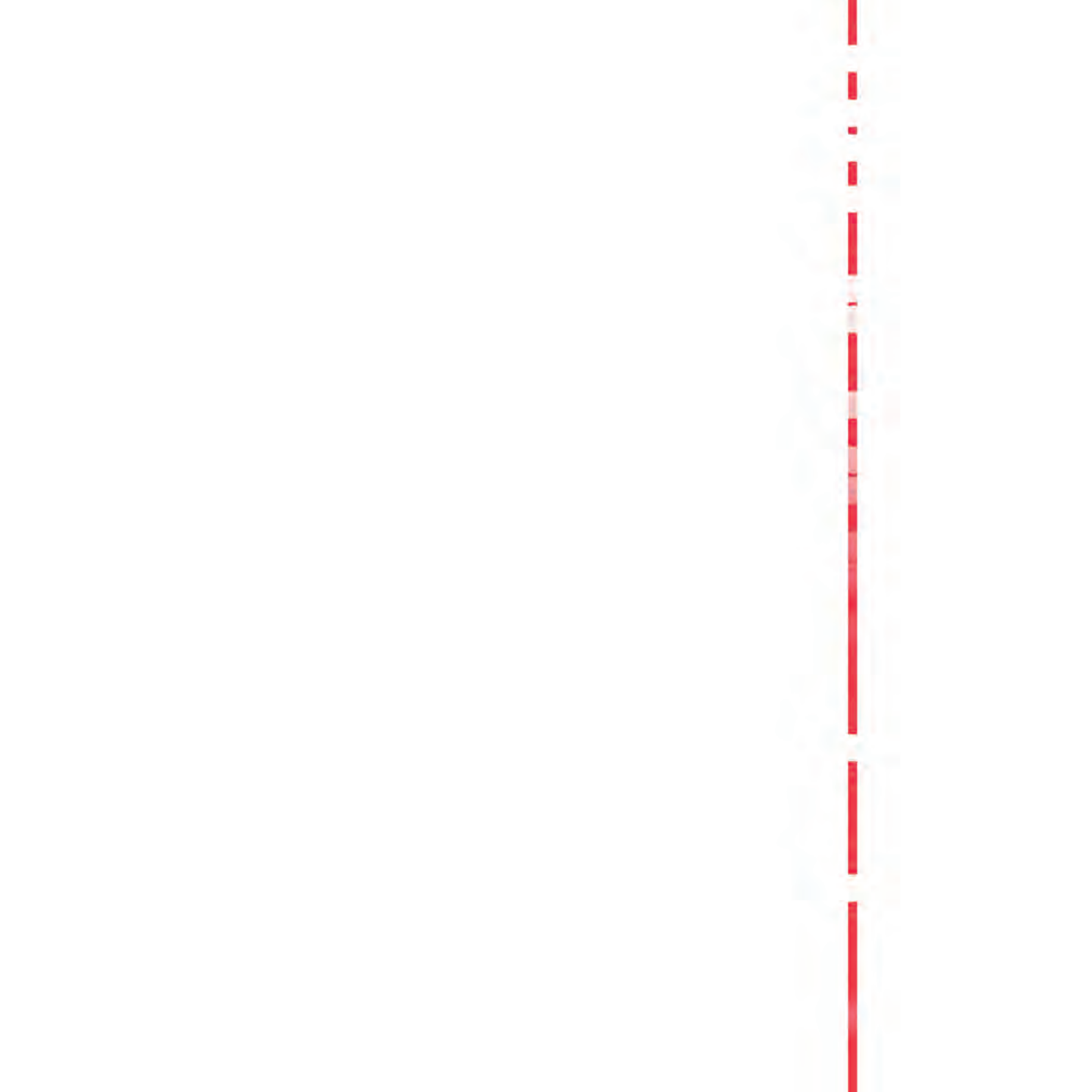


07.3.GROUP PRESENTATIONS

Working in groups was very fun. Students had the opportunity to talk to and work together with new people, and collect memories and friendships. Every person brought something different to the table and participated equally in the group assignment.

One thing that all students asked for was more time to work together, as they only had a couple of hours during two days to complete the projects.

Either way, the results were very good and every group did their best. The presentations of the group projects were held on the last day of the workshop – Friday 26th of May.



Smokey Mirror - Valjevo project

The „Smokey Mirror“ project was the project of Valjevo group. Nikola, Milica, Alessandro and (name) came up with the idea for drawing attention to the health risks in Valjevo related to air pollution. This air pollution mostly comes from individual furnaces – homes of people using coal for heating in the winter months. People are aware of this problem but most of the time are not ready to take the necessary steps for transitioning to other forms of heating, mainly because of the lack of finances. The group wanted to place „smederevac“ – a common Serbian heating and cooking stove in the city center, near the Municipality of Valjevo, which would be painted in red and when opened – would present a mirror. This would serve as a metaphor for people being the ones to blame for bad air quality, for using such means of heating.



Valjevo is located in a valley, without enough air flow, so in periods when the temperature drops and the air humidity increases, a thick yellow-gray cloud appears behind the city. In the annual reports of the Environmental Protection Agency, Valjevo was marked as one of the cities with the most polluted air in Serbia. Since 2012, when measurements have been taken, the air in Valjevo has been classified as category III,

excessively polluted, due to increased concentrations of suspended PM10 particles. Valjevo is at the very top in Serbia, both in terms of multiple exceeding of limit values, and in terms of the number of days with exceeding. Every year in Valjevo, 220-500 people lose their lives prematurely due to exposure to air pollution, which places this city in the middle with the highest proportion of premature deaths in Serbia.



All necessary material for installations can be found at the city landfill.



SMOKEY MIRROR



I never thought that trees are so important to the city - Strovolos project

Heard about the guy who fell off a skyscraper? On his way down past each floor, he kept saying to reassure himself: So far so good... so far so good... so far so good. How you fall doesn't matter. It's how you land!

- La Haine

The project of Strovolos had the lack of trees as their main problem. The group wanted to show the benefit of having trees near the streets, and therefore shade in reducing heat islands in the city. They did a little experiment using colored ice – they put red colored ice in two small glass bottles and placed one on the pavement in the sun, and the other one on the grass in the shade of a tree. Then they recorded the melting of ice, which naturally showed the ice in the sun melting sooner than the other one. This melting time was not drastically different, but it would be if the scale of the installation were bigger. Nonetheless, it was a very interesting experiment, simple and easy to show to even the younger audiences.







Water as a friend, Music of the rain - San Benedetto del Tronto project

The San Benedetto del Tronto group had to tackle the impact of floods in the city. Rather than always viewing water as an enemy in the city, Martina, Tamara, Sara and Konstantina wanted to draw attention to the flooding problem from heavy rains in the city in a positive way.

Analysis showed that most of the rainfall in the city usually gathers in the main street, causing many issues. The water sometimes leaks into metro and train stations through the roof, and the city places buckets to hang on the roof to collect water. The idea was to place buckets on the main street in front of the two schools and the government building of San Benedetto, in a way that the buckets could create music. Bigger, smaller metal buckets, more or less full of water, or placed upside down would when tapped with a stick create many different sounds. This would be an interesting playspace for the kids, and the adults would get the message of the flooding issue.



Water as a friend

Martina Baffi (UNICAM)

Sara Crocetti (UNICAM)

Konstantina Koutroumanou (CYI)

Tamara Mladenovic (UB)

Music of the rain

San Benedetto del Tronto

San Benedetto del Tronto has a problem with **rain and flooding**. As the buckets collect the rainwater, they will make different sounds when being tapped. The kids can play with them, **create music, and different sounds**, and choose from many colors and bucket sizes. With the collected rain we can water the plants, trees, wash the streets.

The buckets can be **recycled products** from the harbor. Anyone can bring metal or plastic bucket or something similar that can catch water. The materials are fairly easy to find and **require minimal to no money at all**.



Co-funded by the
Erasmus+ Programme
of the European Union



Consiglio Nazionale
delle Ricerche



UNIVERSITY OF
BELGRADE



Climate Change, Cities, Communities and Equity in Health
CLIC+HE PROJECT - 2021-10107-1-000-000000000

iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA



THE CYPRUS
INSTITUTE



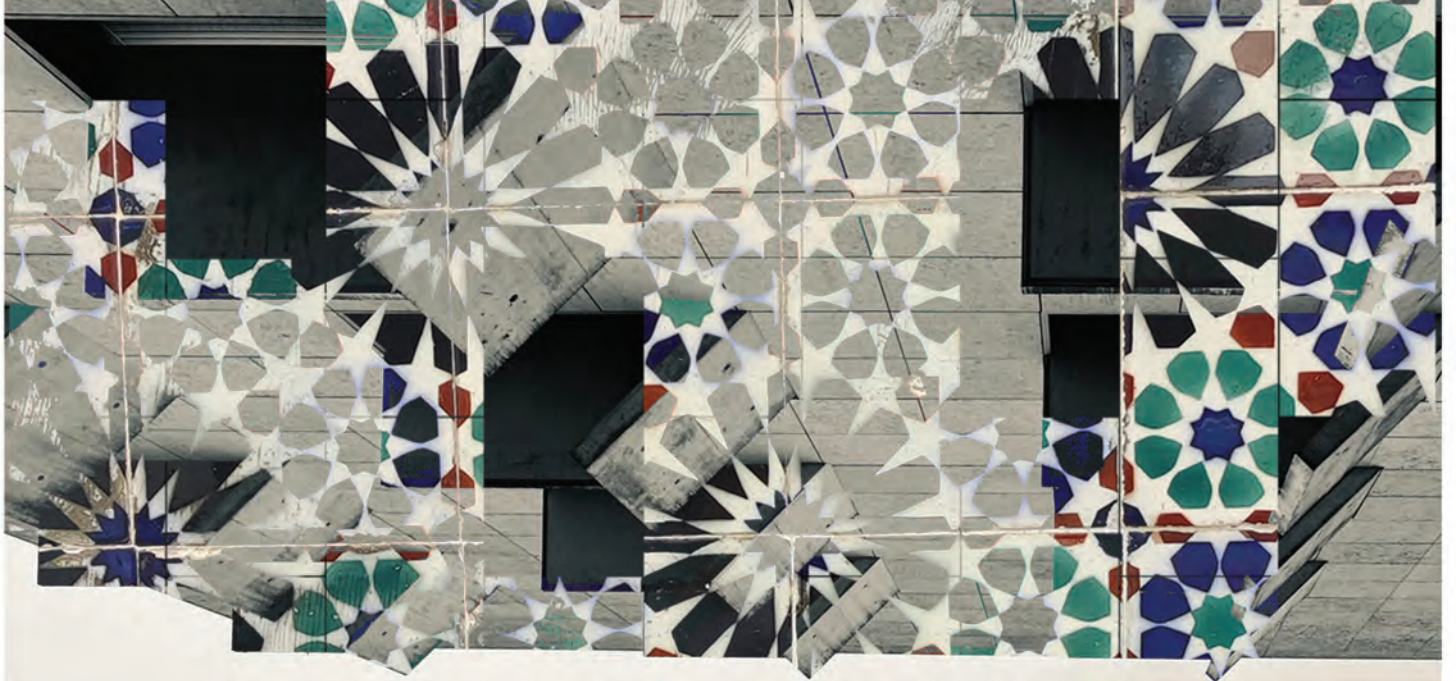
Espaço seguro para os teus ouvidos - “Safe space for your ears” - Lisbon project

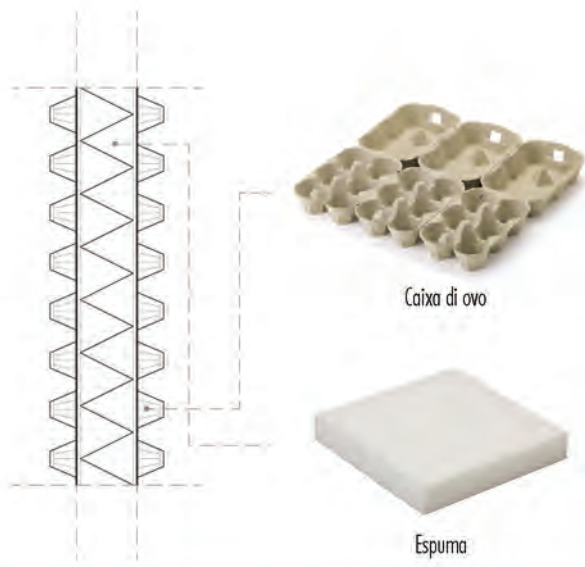
The Lisbon group tackled the problem of a small neighborhood in Lisbon just next to the airport. Living there sometimes requires earplugs, because of the loud noise that the planes make during take-off and landing. Many residents are used to it, and sometimes they don't even see the issue of living in this environment.

The group wanted to create a „safe space for the ears“ of the residents – a small pop-up see-through house that would provide sound insulation when inside. That way the residents would really see the difference between hearing and not hearing the noise, and could come there to enjoy a few minutes of peace and quiet. This installation could be a project for the whole community – kids could paint the inside and the outside of it, creating Lisbon's famous patterns like on ceramic tiles.



Espaço Seguro Para Os Teus Ouvidos





BAIRRO SAO JOAO DE BRITO







ST OF HEALTH

ENVIRONMENTAL EFFECTS ON HUMAN HEALTH IN VALJEVO

HEALING CORNERS

Student projects: Individual solutions for Valjevo 08



SOLUTION - SUSTAINABLE



SITE ANALYSIS



INTERVIEWS WITH STAKEHOLDERS

Interviews with stakeholders...



The conceptual solution for the project appears as a reaction to the existing problems at the chosen location in Valjevo, such as the lack of green infrastructure, air pollution, river pollution, impaired human health... By its very existence, the project affects the purification of the river and, therefore, the greater number of vegetation that affects the increased oxygen concentration and healthier air. The transformation of the location into a space intended for various activities affects people's awareness of the importance of preserving such environments and potentially affects their care for them.



Location analysis

The conceptual solution for the project arises as a reaction to existing problems on the site such as the lack of green infrastructure, air pollution, river pollution, impaired human health...

With its existence, the project affects the purification of the river and, therefore, a greater number of vegetation, which affects the increased concentration of oxygen and healthier air.

The transformation of the location into a space intended for various activities affects people's awareness of the importance of preserving such environments and potentially affects their care for them.



An example of good practice

Award for urban public space

Studio: OKRA

Year: 2022

Location: Utrecht, Netherlands

The project includes the total transformation of the urban space of the former very important and busy thoroughfare in the strict center of Utrecht.

This move was once the main source of the

city's pollution and overheating problems. With this project, the area would be

transformed into a natural park environment that includes the canal as the main transport route in addition to pedestrian and bicycle routes, thereby activating the population and establishing a healthier environment.

Image and text sources: <https://www.okra.nl/en/projects/catharijnesingel/>

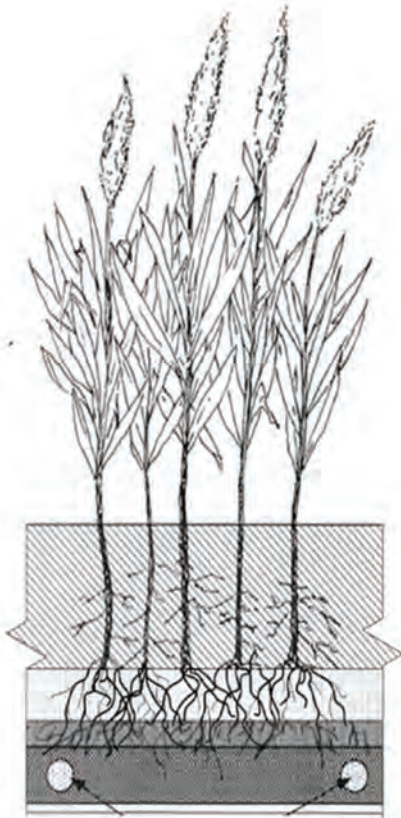


Project ambience

An example of good practice

SELECTING flowers

The plants used for water purification are carefully selected according to their characteristics. When choosing seedlings, it is necessary to pay attention to their ability to absorb certain harmful substances, the possibility of staying in a constantly moist habitat, and their natural habitat must be in accordance with the design.



Waste water filtration process (reed bed)

By forming planters (troughs) with certain layers for planting plants, ideal conditions are created for one of the innovative solutions for filtering and purifying water. When sewage is poured into these troughs, the water purification process takes place because the reeds contain certain organisms that have the ability to break down pollutants. The final product, clean drinking water, is delivered through drainage channels, without any unpleasant odors.

Image and text source: <https://moss-design.com/chicago-river-floating-islands/>



Iris pseudacorus



Lythrum salicaria



Menyanthes trifoliata



Phragmites communis



Alisma plantago-aquatica



Canna indica



The conceptual solution is based on several aspects in terms of spatial programming, which include the following goals:

- Purification of the river
- Returning nature to the city center
- Re-establishing the connection between man and nature
- Recreation and relaxation of people

- Line park
- A healthier environment
- Cleaner air

All these goals are included in one concept of the linear park with an emphasis on river purification, education and reducing the effects of climate change on human health in terms of heat islands.

- pedestrian trail 
- bicycle trail 
- gardening 
- greening 
- relax 
- education 
- socialization 



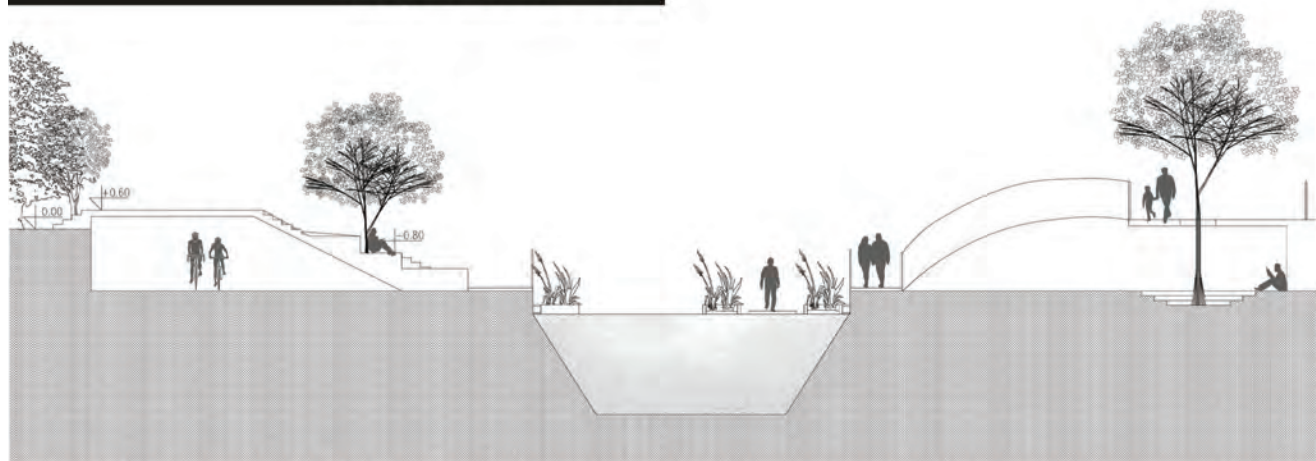
Prikaz ilustracije. Calibri regular 10pt

Project “Better Line”

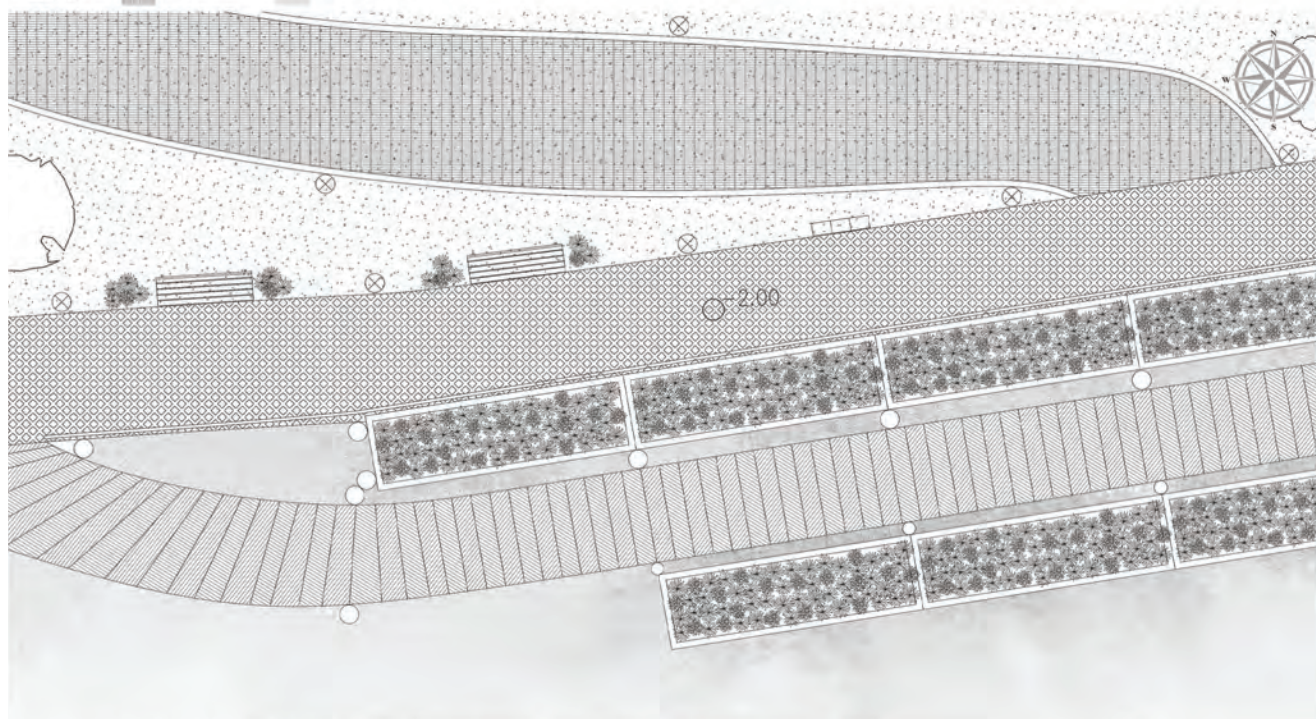


Project ambience

Project "Better line"



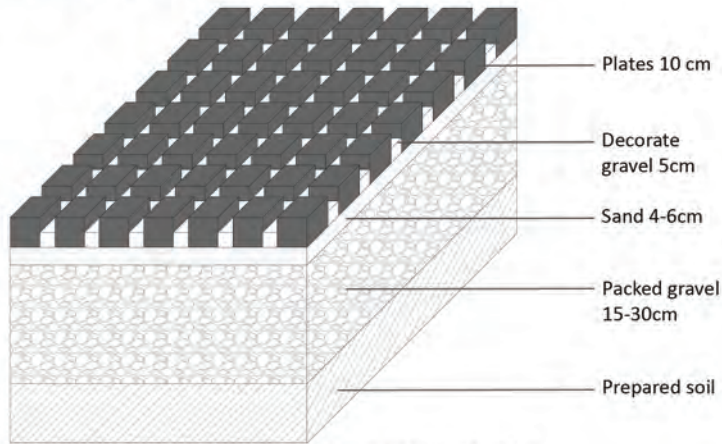
LEGEND Land Kolubara river



LEGEND wooden trail construction of ramp green land porous paving pillars lighting

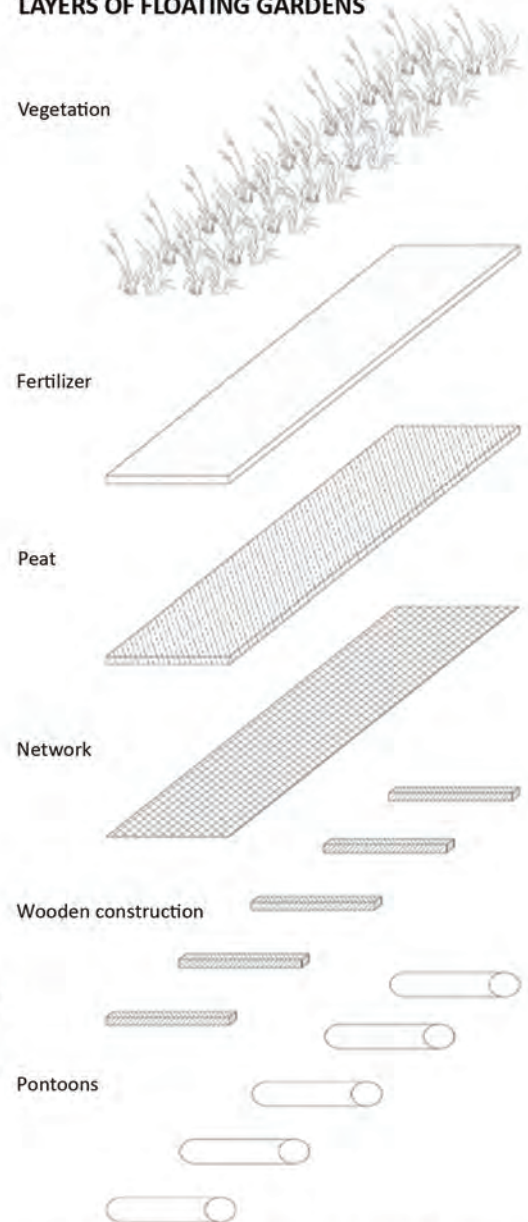
Section plan R 1:100 and situation plan R 1:50

LAYERS OF POROUS PAVING



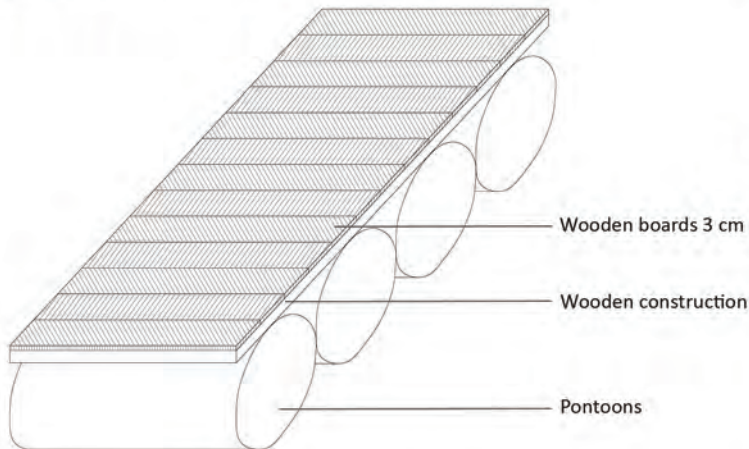
Source: <http://behatonleskovac.weebly.com/nacin-postavljanja-behaton-ploca.html>

LAYERS OF FLOATING GARDENS



Source: https://www.researchgate.net/figure/Floating-garden-set-up_fig1_334177047

LAYERS OF THE TRACK ON THE WATER



Source: <http://behatonleskovac.weebly.com/nacin-postavljanja-behaton-ploca.html>

Details of trails

Project "Better line"

IDEAL SOLUTION

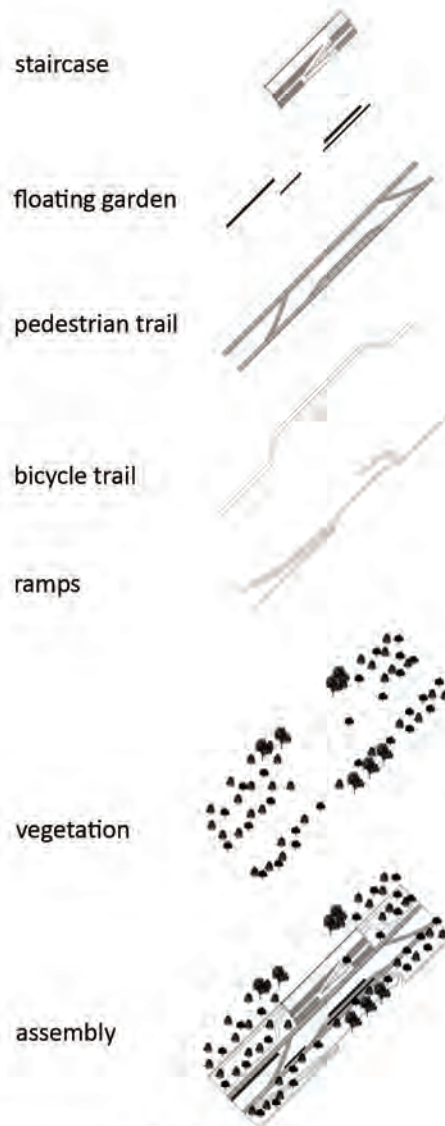
By arranging the coast and transforming it into a linear park environment, it enables the activation of this zone as a representative place in the city.

Its users will be more active, recreate, but also have a special atmosphere for relaxation in nature.

With the presence of a green buffer zone, a healthier environment is promoted and the impact of air pollution is reduced.

A special type of solution in the form of water purification is easily applicable on the coast itself, which includes other activities along this stretch, such as the preparation and planting of these plants, education, active use in the form of pedestrian and bicycle paths, new environments for sitting, socializing, and relaxing. ...

Image source: <https://www.okra.nl/en/projects/catharijnesingel/>



Exploded Axonometry of the assembly



BETTER LINE

Stwierdzenie: 1000, 21000



PRZYKŁADY PRACZY 1



PRZYKŁADY PRACZY 2



WYKONANIE PRACZY

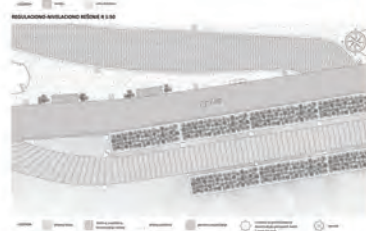
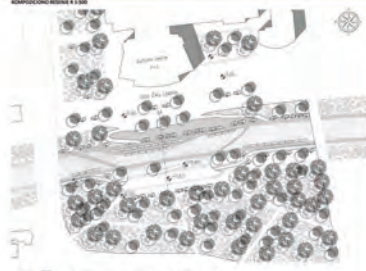


WYKONANIE PRACZY



BETTER LINE

Stwierdzenie: 1000, 21000



The area around the NIS pump is one of the most unhealthy parts of Valjevo, the pump itself polluting the environment and the large parking lot surrounding it make this area unhealthy, as large amounts of asphalt and concrete heat up environment and create a heat island. Cars that are parked in this area also heat up very quickly in the sun and additionally release that heat into the environment. This is why it is necessary to arrange this area, and this would be done with the help of detention pools, which would make this area better quality and healthier, as well as more attractive, which would activate the right bank of Kolubara, i.e. Tešnar.

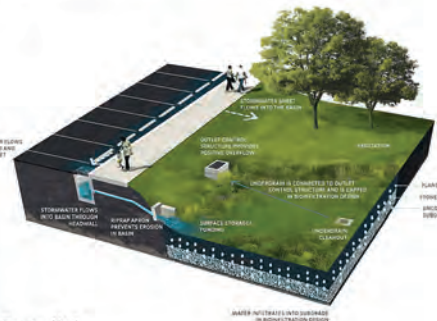


Water Sensitive urban design

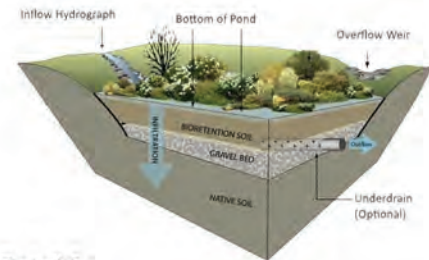
Location

The area around the NIS pump is one of the most unhealthy parts of Valjevo, the pump itself polluting the environment and the large parking lot surrounding it make this area unhealthy, as large amounts of asphalt and concrete heat up environment and create a heat island. Cars

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Detail 1
<https://www.pngegg.com/en/png-yosrt>








Detail 2
<https://learn.hydrologystudio.com/hydrology-studio/knowledge-base/bioretention-ponds/>



Project location: Area around NIS gas station

S W O T

- | | | | |
|--|---|---|--|
| <ul style="list-style-type: none"> - Professional and high-quality staff of urban planners.  - Commitment and desire of the city administration in the quality development of the city. - Citizens' active desire to participate in the development of the city. - Well-crafted plans, GUP, Regional plans... - Active media that transmit information. - Ongoing programs of sewerage, as well as gasification of Valjevo.  | <ul style="list-style-type: none"> - Poor infrastructure in certain parts of the city, both roadways and traffic signals.  - Existing problem areas that can prevent good, healthy and smart development of the city: City landfill, brownfield facilities, Krušik factory. - Poor or non-existent integration of water courses, as well as the devastation of the Kamenička and Kukovačka rivers. - The lack of parking spaces, their very lack hinders the further development of the city, because it prevents adequate movement.  | <ul style="list-style-type: none"> - Interest of national and European institutions/programs in the development of the city. - Help from architecture faculty students. - Investors' interest in construction (also a threat). | <ul style="list-style-type: none"> - Unregulated construction and upgrading of buildings, which reduces the quality of the space in which to live and move.  - Unplanned construction in the surrounding Divčbare settlement. - Construction in the vicinity of the dam on Jablanica and the direct danger of it to the city itself. - Investors' interest in construction (also an opportunity). |
|--|---|---|--|

1. In case of heavy rainfall, the reservoir receives a large amount of water; and in winter it becomes an ice rink.
 Example: Water Squares on Bentheplein, Rotterdam, Netherlands



2. The detention lake as a continuation of the park expands the green areas in this unhealthy part of the city.
 Example: MD Anderson Cancer Center, Houston, Texas



SPATIAL PROGRAM SCHEME

Zone 1:

This zone suffers the least changes in the project, it still represents the end point of the rainwater catchment, which this time is carried out through detention basins. In addition, efforts are being made to establish a better connection between the park and Kolubara. However, this time Kolubara becomes the beginning of the green zone, which stretches across the park and the green square to Tešnar itself.

Zone 2:

The park expands to a triangular parking lot, and in its place a greened detention pool is created, which is designed to serve as a place for public art at the same time. Therefore, this part of zone 2 has a little less greenery than the park itself, thus creating a gentle transition from the undeveloped park to the activated Tešnar district.

Zone 3:

This zone has been divided into Zone 2 and 4 by the main road, that defines the new established areas.

Zone 4:

Tešnar becomes the new socio-cultural center of the city, in this place the parking lot is moved in the form of an underground garage, which simultaneously serves as a base for the detention pool located there. This pool would simultaneously serve as a gathering place, as a square, and as a defense mechanism against torrential rain. In this way, the area of Tešnar, which is currently an abandoned place and creates insecure feelings during the night, would be activated.



Greening

- Is an important factor in improving air quality, biodiversity and heat stress. This activity is focused on **Zone 2**.

Blue spaces

- The presence of water and blue spaces is particularly important to reducing heat stress. This activity is focused on **Zone 4** where the built detention basin is build.

Green space diversity

- Adding diversity into **Zone 2**, into the existing park and the newbuilt green detention basin will have many physical and mental benefits for its users.

Green space continuity

- A healthy city should improve the continuity of green infrastructure, by planning green routes cto connect green and blue areas.

Urban landscape

- A healthy city should improve the urban landscape and general amenities in public open spaces. This is applied in the prior **Zone 3**.

Housing quality

- Housing quality is generally bad in the location, especially in the marked areas.

Social services

- A healthy city should ensure residents have good access to health, social, educational and cultural services and facilities.

Public spaces

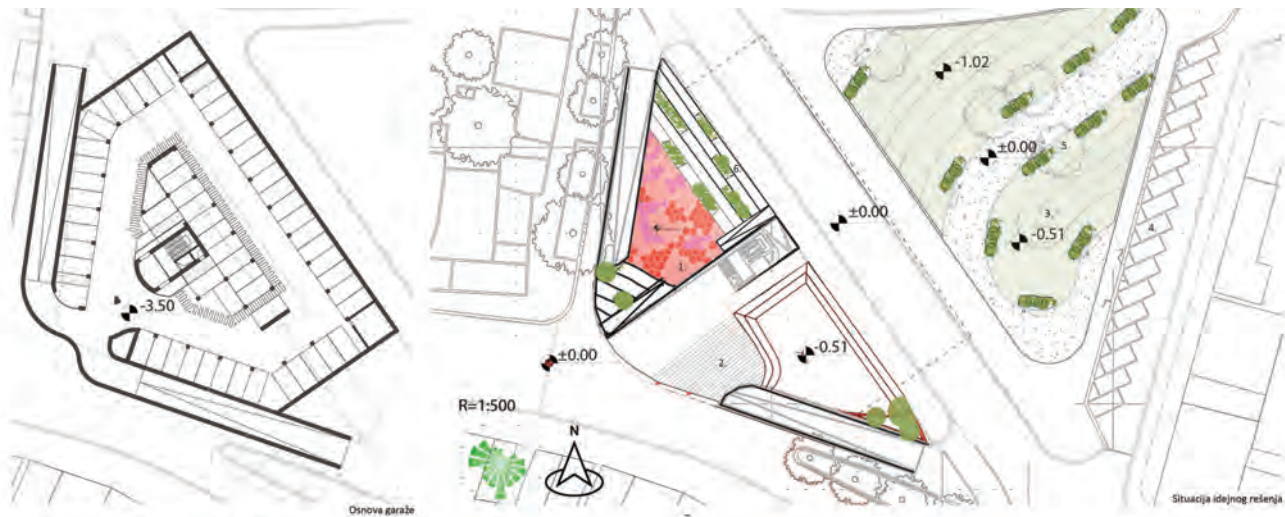
- Increased availability of green space is associated with improved air quality and reduced noise pollution.

Business density

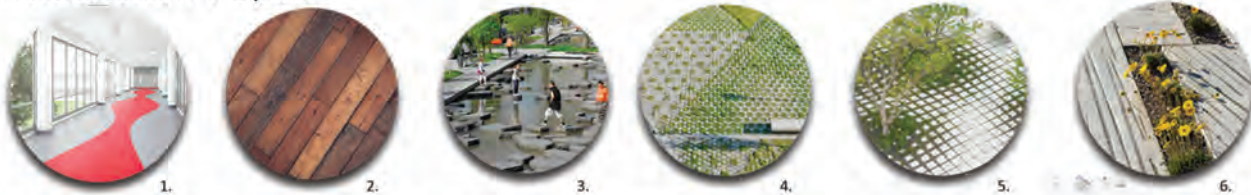
- Business density is highly important for the development of Tešnar, in broader sense, it represents **Zone 4**.

Traffic

- Streets are redesigned so that now they are primarily used by pedestrian. Traffic goes thru the center and splits the green and build zone.



Materials used in the parter:



1. Industrial rubber base, good for color retention and resistant to trampling.
https://www.american-biltrite.com/flooring_us/products/rubber-flooring/
2. Wooden slats that add naturalness to the square, and in addition collect much less heat than concrete.
3. Large stone slabs that can be added to detention basins provide opportunities for play.
4. Parking places that are not pure asphalt slabs, but a combination of stone and grass are a much better option for maintaining normal temperature in the space.
5. It is possible to plant trees only in the ground or add a stone that is so complex that it forms a porous surface.
6. Smaller plantings of flowers are very important in order to preserve the mental and spiritual health of the users.

Conclusion

Why does WSUD matter? WSUD is important because it enables the preservation of water quality, water management in urban areas and the connection of urban communities to the natural environment. The implementation of WSUD has a positive impact on the environment, the sustainability of urban areas and the well-being of people. WSUD encourages the preservation and restoration of natural ecosystems in urban environments. Green spaces, water surfaces and habitats for plants and animals contribute to increasing biodiversity and maintaining ecological balance.



Axonometric view of location



Ambient 1
250





Water sensitive urban design

Student: Filip Mihaljević 2022_21004



Water sensitive urban design

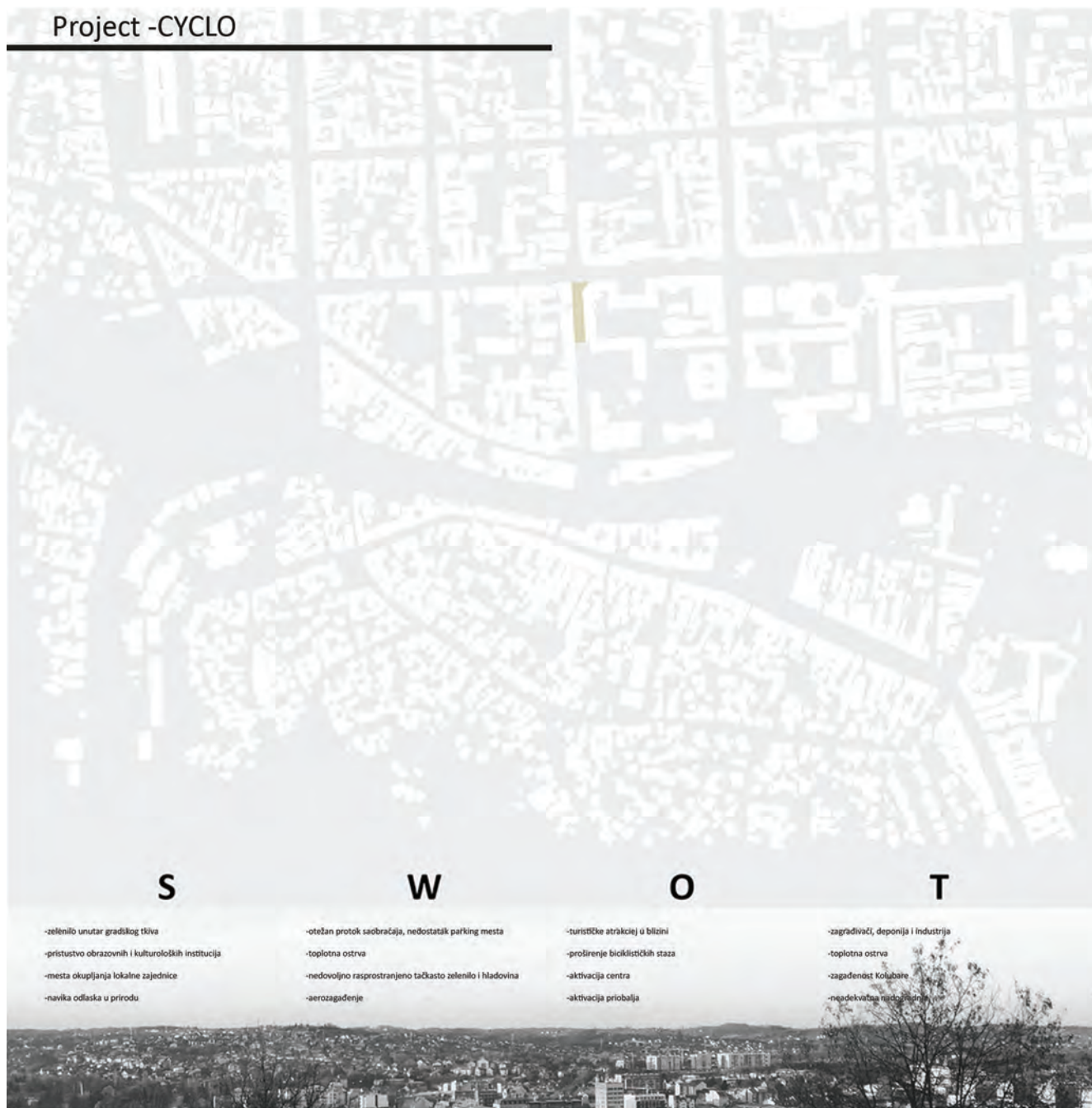
Student: Filip Mihaljević 2022_21004



The subject of the project is the redesign of the street. That is, as we can see from the attached illustrations, by canceling vehicular traffic in certain movements, the combination and integration of bicycle traffic. By introducing this type of movement through the urban fabric, we reduce the emission of exhaust gases, activate the population and take care of health. Because health is not only the absence of disease, but well-being.



Project -CYCLO



SWOT analysis

Through the SWOT analysis, we arrive at the definition of crucial tests, which are:

- non-porous soil
- lack of greenery
- individual fireplaces
- air pollution
- insufficiently distributed bicycle paths
- lack of coolness
- lost contact with nature

However, the location itself has a lot of potential..

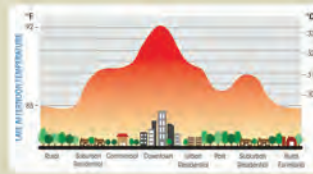
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aerozagađenje



Illustration of the problem

pregrevanje



ulična mreža



Picture of needs of residents



Image of the Indiana Bike Path Project

Effect of suspension of car traffic

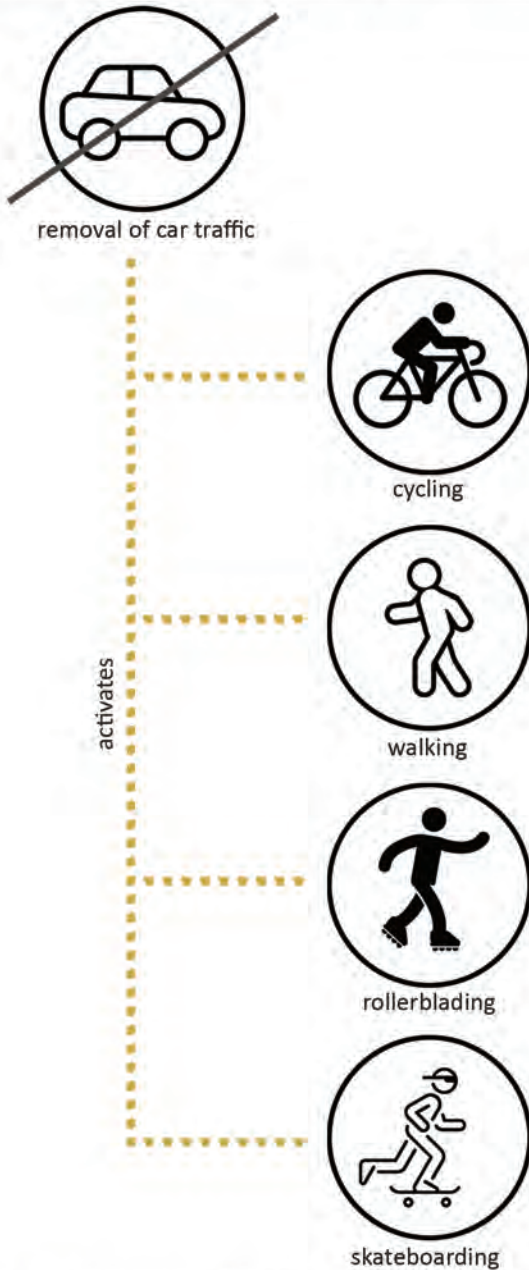


Illustration of the traffic change



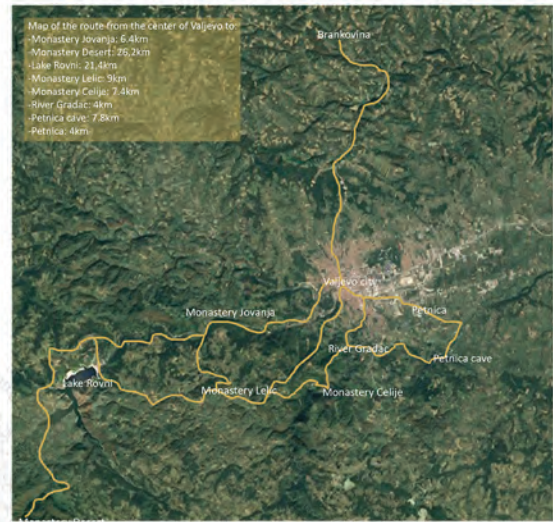
Illustration of the health benefits

Legend of must visit:

1. Historical archive of Valjevo
2. Temple of the Shroud of the Holy Virgin
3. Museum of important writers of Valjevo
4. Monument to Desanka Maksimović
5. Musselin's lodging
6. Valjevo National Museum
7. Modern gallery
8. Valjevo cultural center
9. City square
10. Kolubara river
11. Serbian Orthodox Church of the Resurrection
12. Serbian Orthodox Church of St. Nectaria of Aegina
13. Tešnjari
14. Prince Miloseva
15. A clock
16. Grain tank

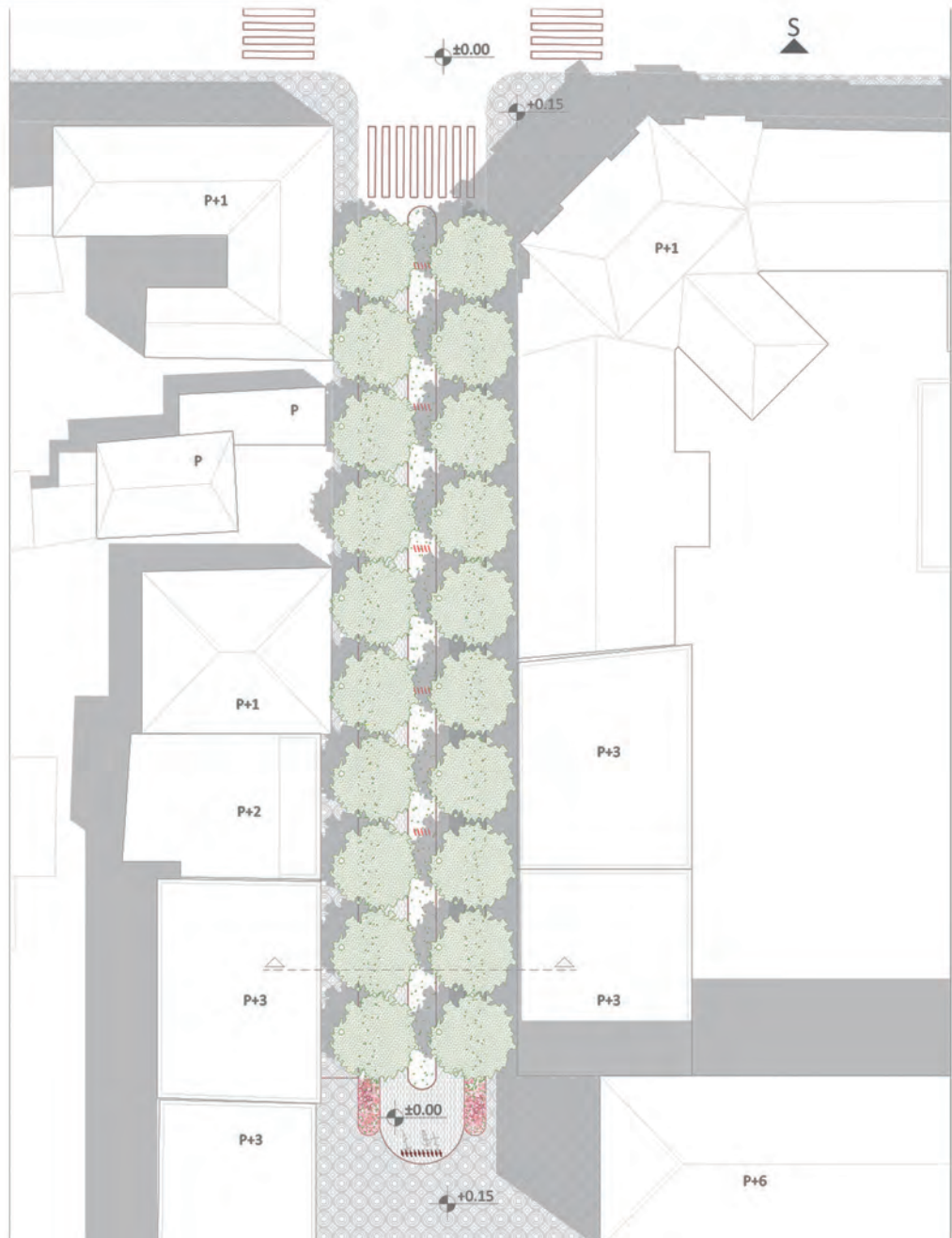
Legend of symbols:

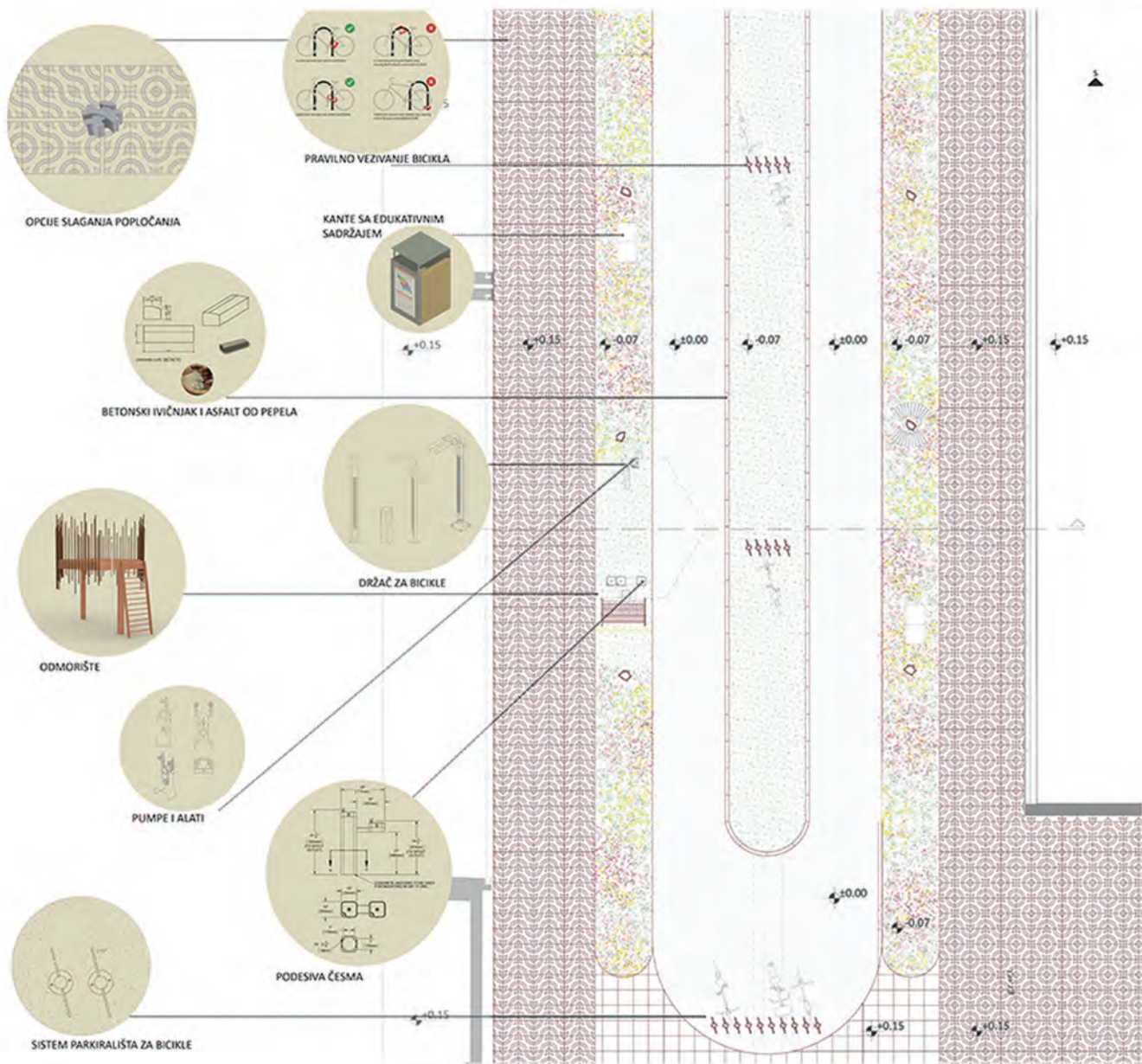
- pedestrian route
- bicycle route
- car route
- cars and bikes parking garage
- bikes parking garage
- rest zone



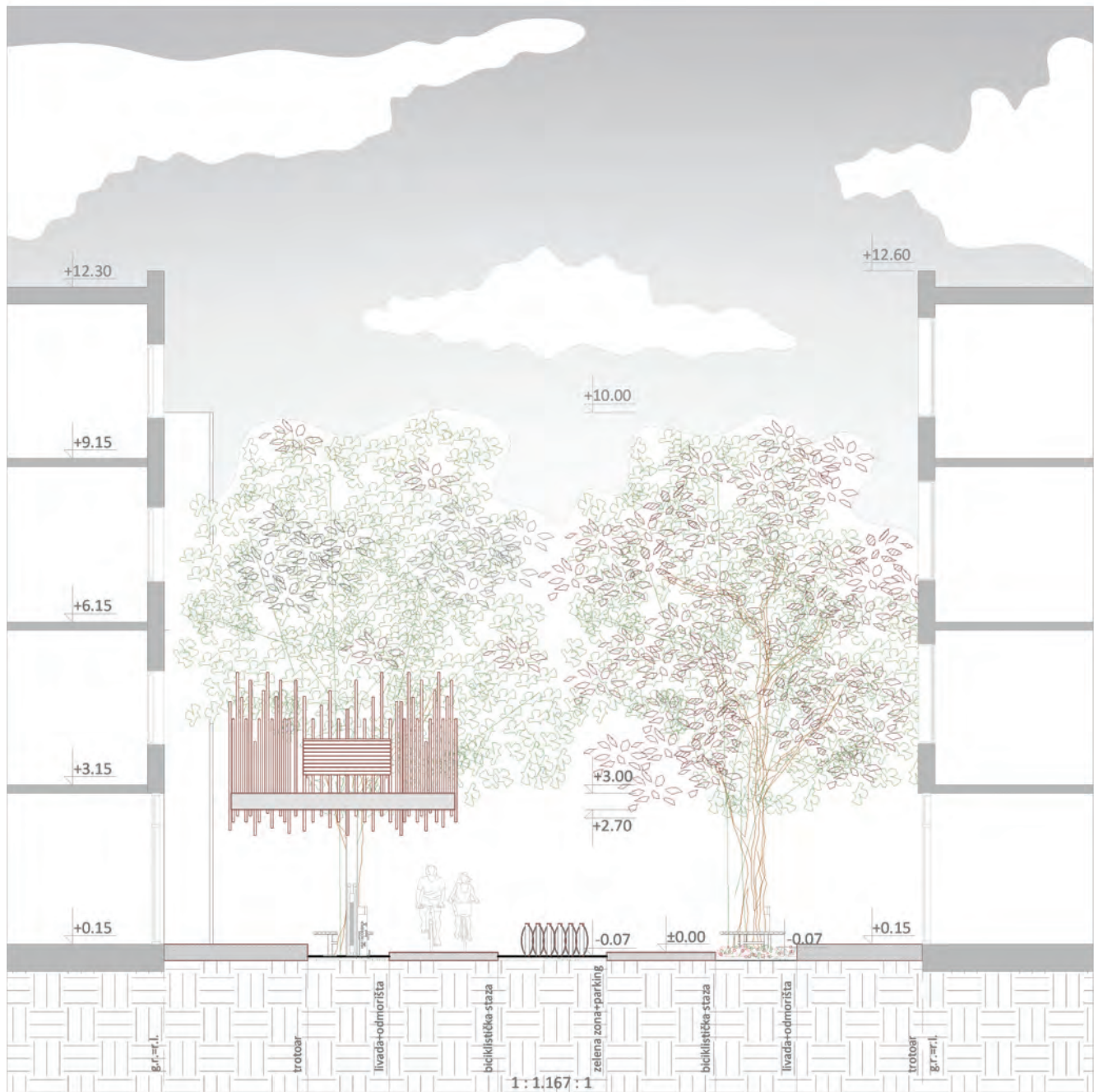
Spatial program map

Site plan





Ground floor solution with details



Section





Ambience



Bicycle parking

Street design for bicycle parking typically involves providing: secure, convenient, and accessible locations for cyclists to lock up their bikes.

Effective street design for bicycle parking include:

1. Bike racks: Installing bike racks on sidewalks or other public spaces can make it easy for cyclists to park their bikes while they run errands or visit local businesses.
2. Bike corrals: A bike corral is a larger version of a bike rack that can accommodate multiple bicycles. These are often located on streets with heavy pedestrian traffic or near popular destinations such as cafes and shops.

3. Bike shelters: A bike shelter provides a covered space for cyclists to park their bikes, protecting them from the elements. These can be especially useful in areas with inclement weather.

4. Bike parking garages: In larger cities, bike parking garages can provide a secure and convenient location for cyclists to store their bikes for longer periods of time.

It's important to locate bicycle parking in visible, well-lit areas that are easily accessible from the street. It can help cyclists find parking locations and reduce the risk of theft or vandalism.

source: <https://clinicadamama.com.br/how-to-lock-your-bike-correctly-stolen-ride-ff-46305721>



U-Lock secures rear wheel and frame.



U-Lock secures bicycle frame only, leaving both wheels vulnerable to theft.



Cable lock secures rear wheel and frame.



Cable lock secures rear wheel only, leaving rest of bicycle vulnerable to theft.

Illustration how to secure bicycle safely

Types of bikes to rent

<https://bicikl.bikegrem->

1. city bike *for adults and kids



2. recumbent bike



3. electric bike



4. tandem bike



5. cargo bike



6. family bike



Quality of bike paths

Quality and maintenance are the most important for every bike path. However, classic asphalt is quickly damaged, especially in winter when the tracks are de-iced with salt. But this chemical compound damages the concrete wear layer. Standard portland cement contains calcium hydroxide that reacts with industrial road salt (calcium chloride) and together your calcium oxychloride. Unfortunately, when calcium oxychloride is formed it expands causing cracks and then cracks in the concrete.

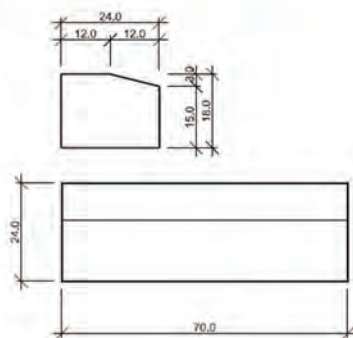
Instead of cement, ash from coal furnaces, slag and silicon dioxide would be used, which in contact with salt produces far less of the problematic calcium oxychloride.

Upon further analysis, I noticed all the benefits of building from ash. In Serbia, there is a problem of ash being deposited in landfills, where it pollutes the land and water. By using ash as a by-product of the coal burning process, it is possible to build 2 km of road, for the same funds that can be used to build 1 km with traditional materials. In addition to the fact that this method is 2 times cheaper, the impact this change would have on the health level is multiple.

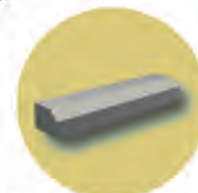
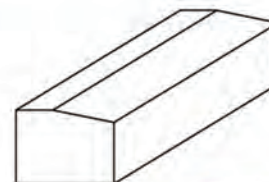
the next very important item for the comfort of the bike path is the way it interacts with the asphalt, i.e. the path.



materials for bike lines



concrete curb 18/24/70



<https://ingrapomni.rs/proizvodi>

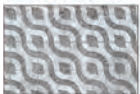
Virage pavers paths

Due to excessive heating of the soil, especially in urban areas, the effect of heat islands occurs. One of the biggest problems is the lack of porous surfaces. Such soil heats up more intensively and stores heat, but in addition, in rainy seasons it retains water, creates floods and does not allow the soil to cool down. Naturally, green soil is much more resistant and adapted to the conditions. So it is one of the paving that has the characteristics of natural soil. The Virage pavers, inspired by European innovations, transform any exterior design into a true architectural masterpiece. With only a single paver, six laying patterns are possible, each more creative than the other. Whether they are filled with clean aggregates to improve water infiltration into the soil or vegetated to reduce urban heat islands and capture harmful CO₂ from the air, Virage pavers allow you to create an environment-friendly space that values of healthy city.



range scandina grey

6 installation patterns to create unique designs



beaded



circle



link



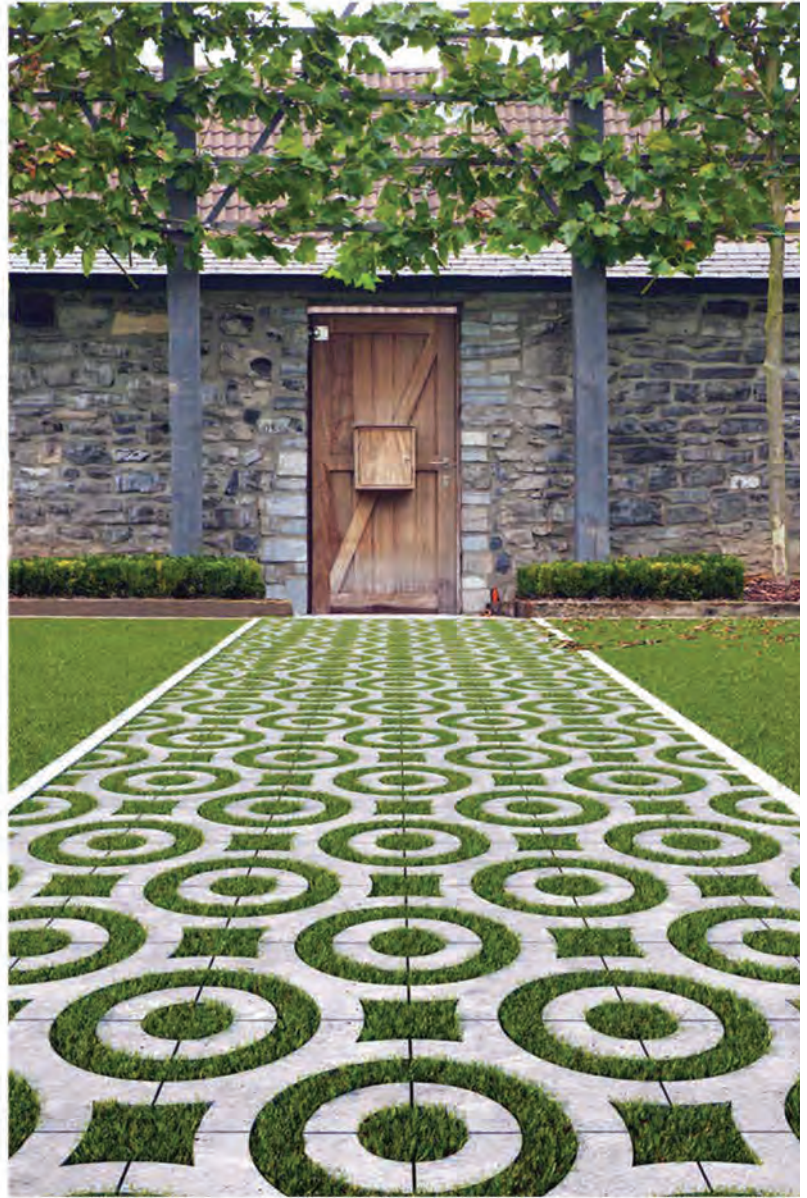
mosaic



random



wave



<https://permacon.ca/app/uploads/2023/05/BroArchAmen2023-EN-Spreads-1.pdf>

image of the path applied

Wildflowers

If you replace your lawn with wildflowers, you will reduce harmful emissions, enrich biodiversity and save time.

Four years ago, King's College, which is part of the prestigious English University of Cambridge, broke a tradition that dates back to 1722: they replaced a part of the distinctive green lawn in the courtyard with wild flowers.

At the very beginning, the scientists sowed 33 types of plants (poppies, cornflowers, cornflowers...), and that number has since grown to 84. Instead of grass, on an area roughly equal to a football field (0.36 hectares)

Plants make the landscape more colorful, but aesthetics were certainly not the only goal and result of the undertaking. The authors of the study from the University of Cambridge recognized multiple benefits. approximately three times more plant species, as well as three times more species and individuals of spiders and beetles were recorded on the flower meadow compared to the grassy area.

Shortly after wildflowers flooded the area, insects arrived, and with them predators. Local bats in the flower meadow feed three times more often.

Compared to the grassland, the measured biomass of terrestrial invertebrates is 25 times higher, and the flower meadow was visited by twice as many species that require conservation.

However, not only the biodiversity has become richer, but there is no need for mowing, irrigation, use of fertilizers and application of pesticides.

flower meadows store 1.36 tonnes of carbon per hectare per year more than grasslands. This is equivalent to the harmful emissions released, per individual passenger, during a return, transoceanic flight between London and New York.

Also, wild flowers reflect more solar radiation than grass, which, according to scientific claims, can help maintain a cooler microclimate in cities during future warming.

The research shows how important small flower meadows in urban centers are for local biodiversity, ecosystem services and climate change mitigation. And all this with lower costs than when it comes to grass surfaces.



Prikaz ilustracije. Calibri regular 10pt

Modular Outdoor Double Drinking Fountain

source: <https://www.bimobject.com/en-us/hawscorporation/product/haws-3602>

The Haws 3602 heavy-duty modular outdoor pedestal drinking fountain can be configured in multiple variations before or after installation. Model 3602 is standard with two drinking fountain stations, and the option of adding/changing a drinking fountain, bottle filler, dog bowl and/or hose bib at any time. Water is delivered by patented push-button stainless steel valve assemblies allowing for front access stream adjustment as well as cartridge and strainer access. Equipped with vandal resistant components for long lasting durability.



STANDARD
COLOR OPTIONS

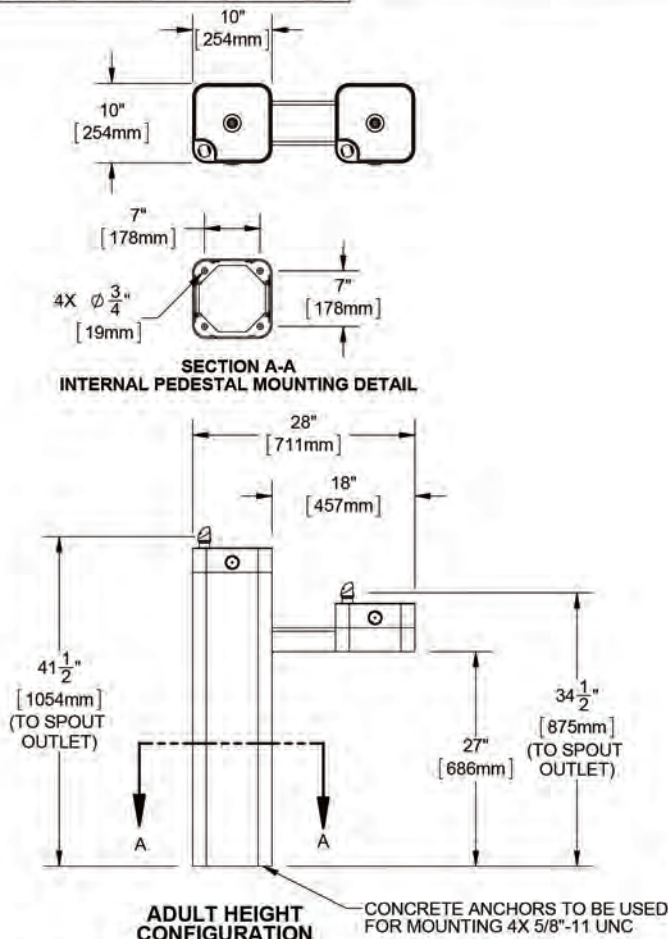
Silver - 01 shown

 Blue - 02

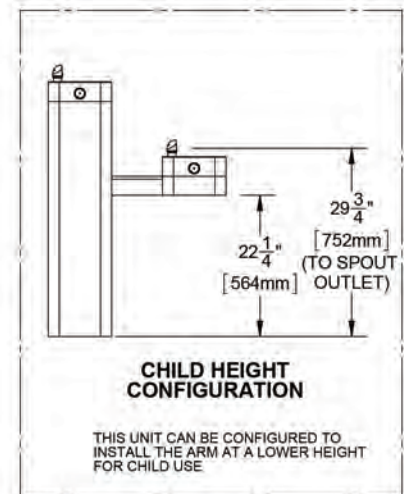
 Green - 03

Illustration of fountain

THIS DOCUMENT IS TRUE AND CORRECT AT TIME OF PUBLICATION. CONTINUED PRODUCT IMPROVEMENTS MAKE SPECIFICATIONS AND MEASUREMENTS SUBJECT TO CHANGE WITHOUT NOTICE.



detail



			1456 KLEFFE LANE SPARKS, NEVADA 89431 (775) 359-4712 FAX (775) 359-7424 E-MAIL: HAWS@HAWSCO.COM WEBSITE: WWW.HAWSCO.COM	
REV. 5/28	REV. 5/28	BY: MB	MODEL(S)	0510000752.D
DRAWING NO.	DATE	CHG'D BY	3602 - MODULAR OUTDOOR FOUNTAIN SYSTEM	REVISION
APPROVED: MA	DATE	10/09/17	SCALE: 1"=1'	1
			DRAWING TYPE: INSTALLATION	SHEET OF 1

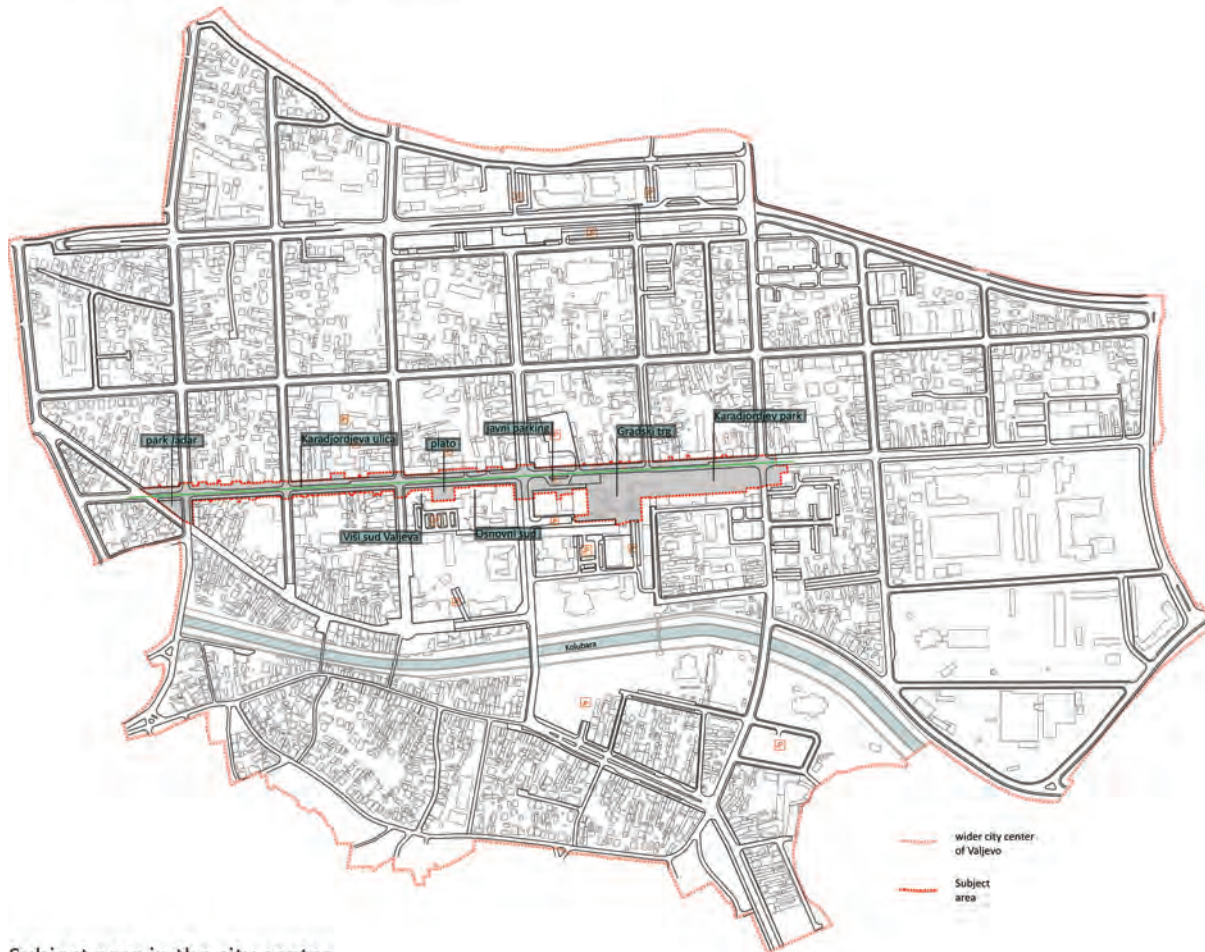
The project is focused on achieving a higher level of comfort in the urban fabric, primarily in the streets of the central city zone. It deals with the problems of air pollution with exhaust gases and noise, the danger of the threatening appearance of heat islands, the lack of green infrastructure and the absence of covered areas that create shade, where people could spend time and gather. The main objectives of the project are the activation of the street front, the introduction of a bicycle path, the implementation of green areas, as well as linear and dotted greenery and modular urban gardens, which are easily adapted to different street profiles and have a multiple impact on improving the quality of urban space and the health of residents.



Comfort in the urban fabric

The question of the feeling of comfort in the urban fabric in conjunction with the impact of climate change gives us answers to the questions of arranging and improving the main streets in the city. It is necessary to include the feeling of comfort and convenience of the inhabitants during urban planning and design, in

order to reach the result and goal - a healthy city for all. The area where the interventions will be implemented includes Karadjordjeva Street from Jadar Park to Karadjordjeva Park. However, the principles that will be used can also be applied to the rest of the urban fabric.



Subject area in the city center

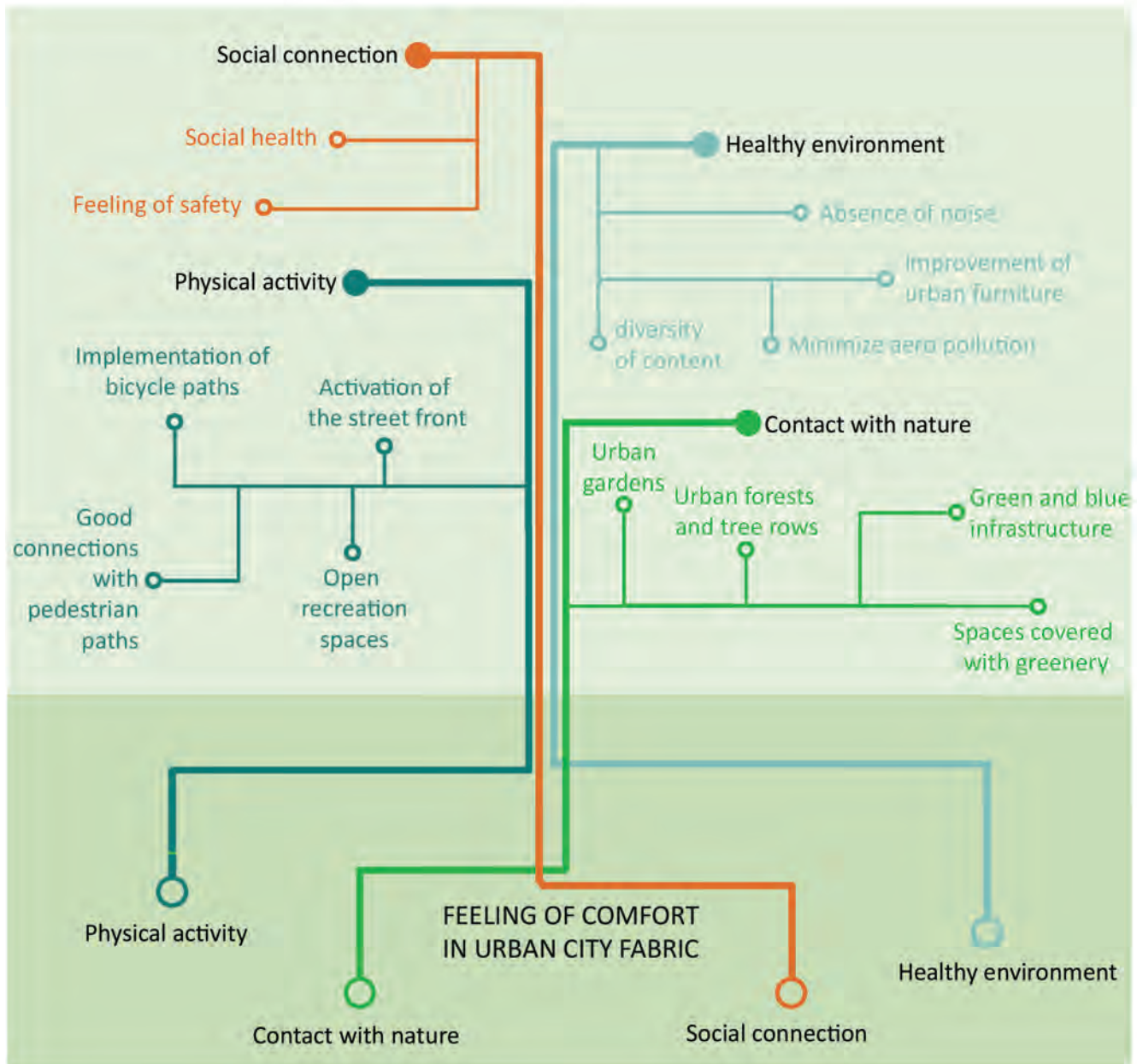
By analyzing the built structures, green and blue infrastructure and life in the city of Valjevo, we came to the following conclusions: Although there are dangers that threaten to damage the quality of life in the city, there is also room for improvement of life, which implies activation of the street front, stimulation

of physical activity, implementation of open green areas, improvement of bicycle and pedestrian paths. The mentioned interventions would be implemented with the aim of establishing comfort while staying in the city and reducing the effect of climate change.

S	<ul style="list-style-type: none"> - greenery within the urban fabric - gathering places of the local community - the culture of spending time in the natural environment
W	<ul style="list-style-type: none"> - lack of widespread linear and dotted greenery - lack of covered areas in the city center (lack of shade) - difficult traffic flow - lack of parking space
O	<ul style="list-style-type: none"> - extension of bicycle paths - activation of the street front - possibility of implementing open green spaces (contributes to comfort)
T	<ul style="list-style-type: none"> - threatening danger of the appearance of heat islands - insufficient investment in environmental protection - individual interests

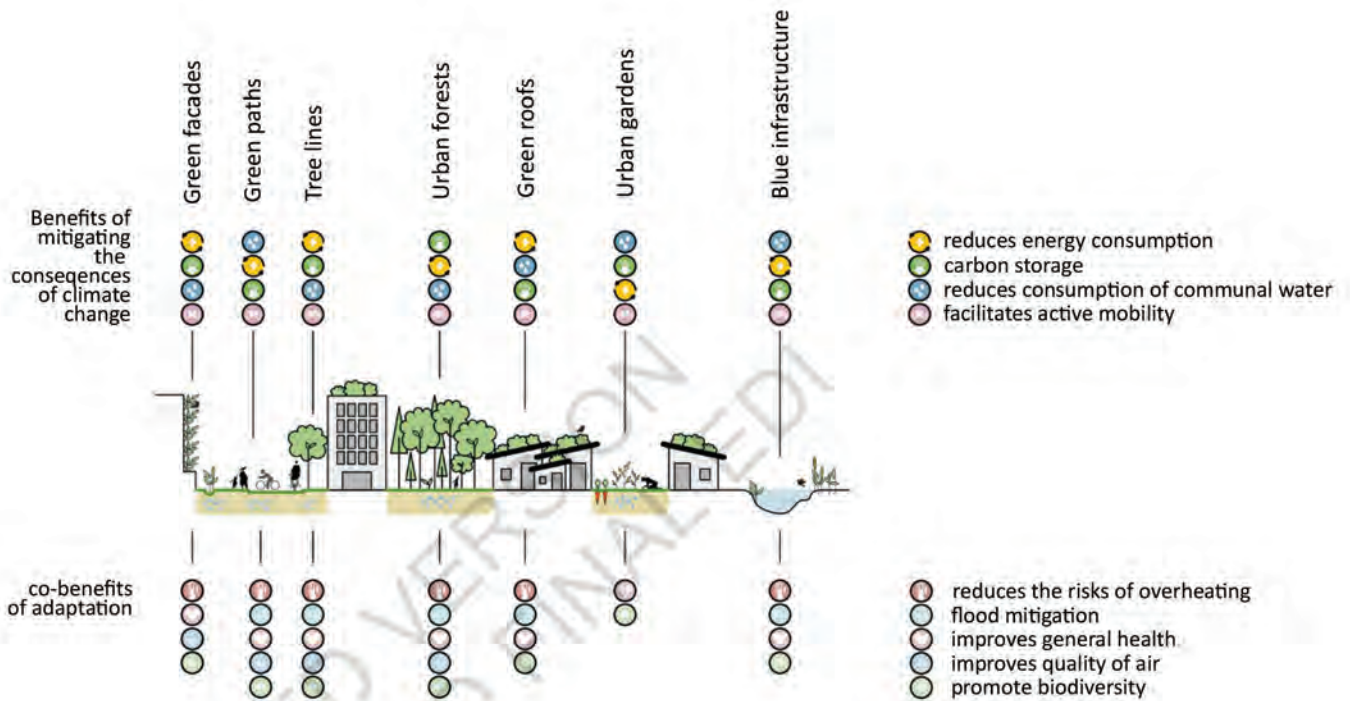
SWOT analysis

Project goals and visions





Planning and design in accordance with the feeling of comfort in an urban environment



Green and blue infrastructure and its benefits

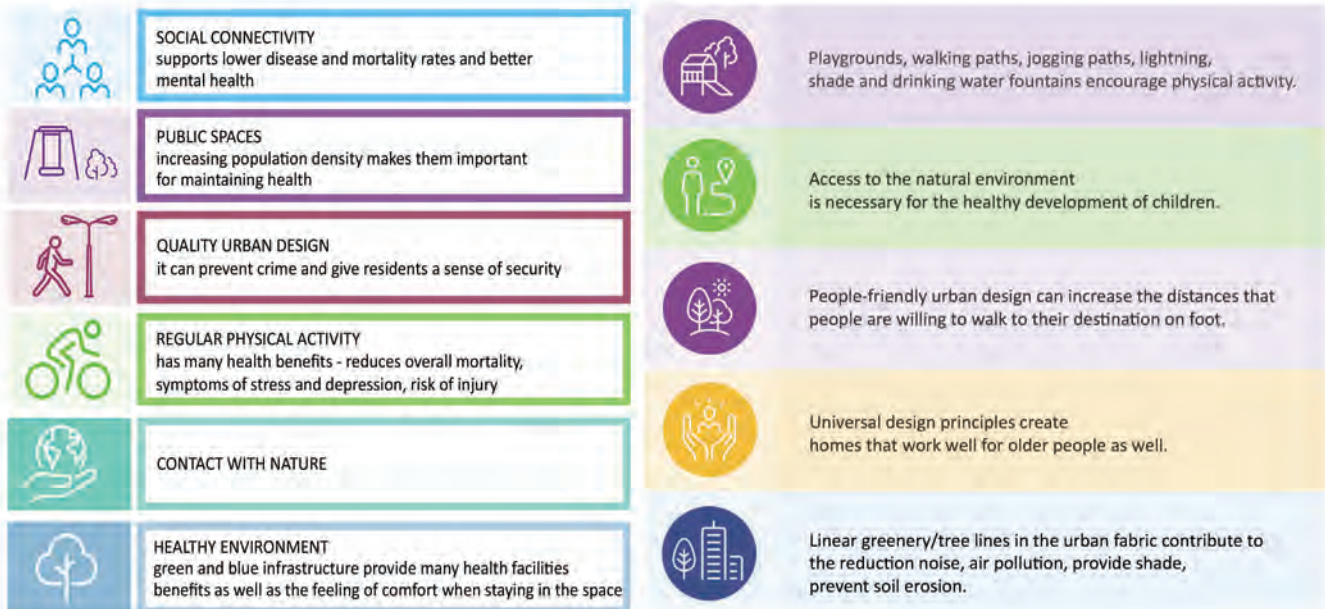
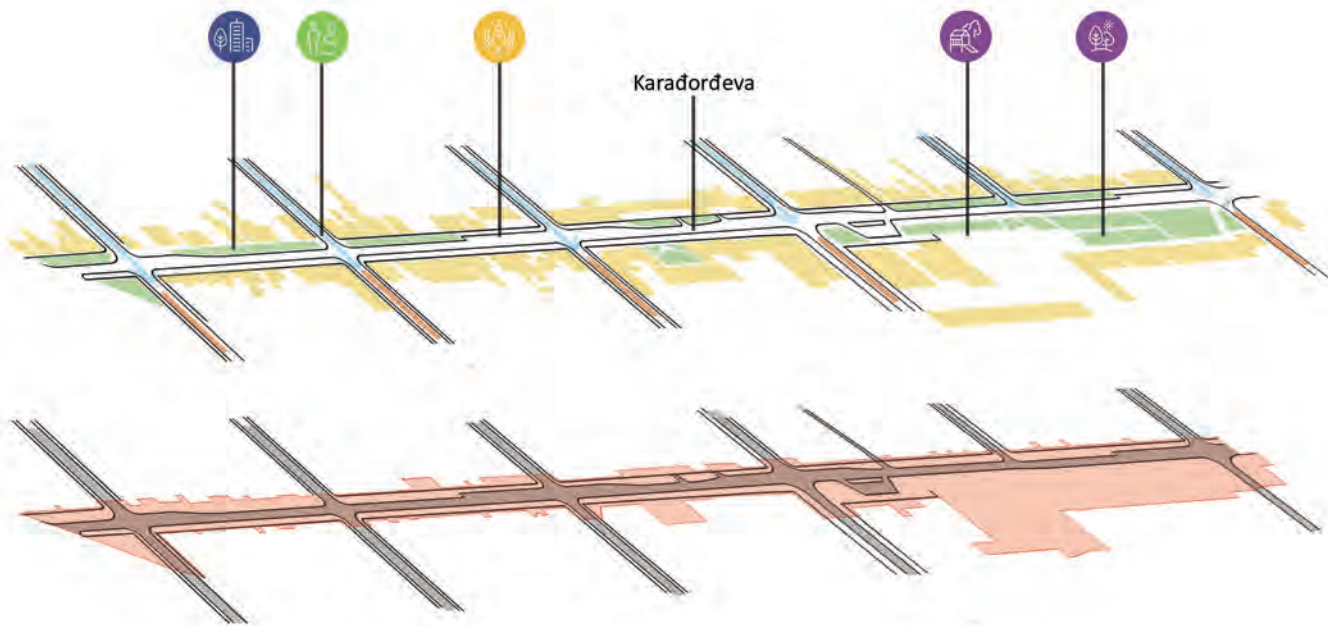


Illustration 1.2: C40 Cities. Integrating Climate Adaptation. GEF



Examples of good practice

sources:

- 1) IPCC, Climate Change 2022, Mitigation of Climate Change, WGIII
- 2) C40 Cities, Integrating Climate Adaptation, GEF
- 3) Zelena Infrastruktura u Kompakt Gradu, Beograd, 2022.
- 4) <http://sudsostenible.com/sistemas-urbanos-de-drenaje-sostenible/>

Chosen specific location for the project



Important landmarks in the city center



1) Examples in practice in the domain of urban gardening

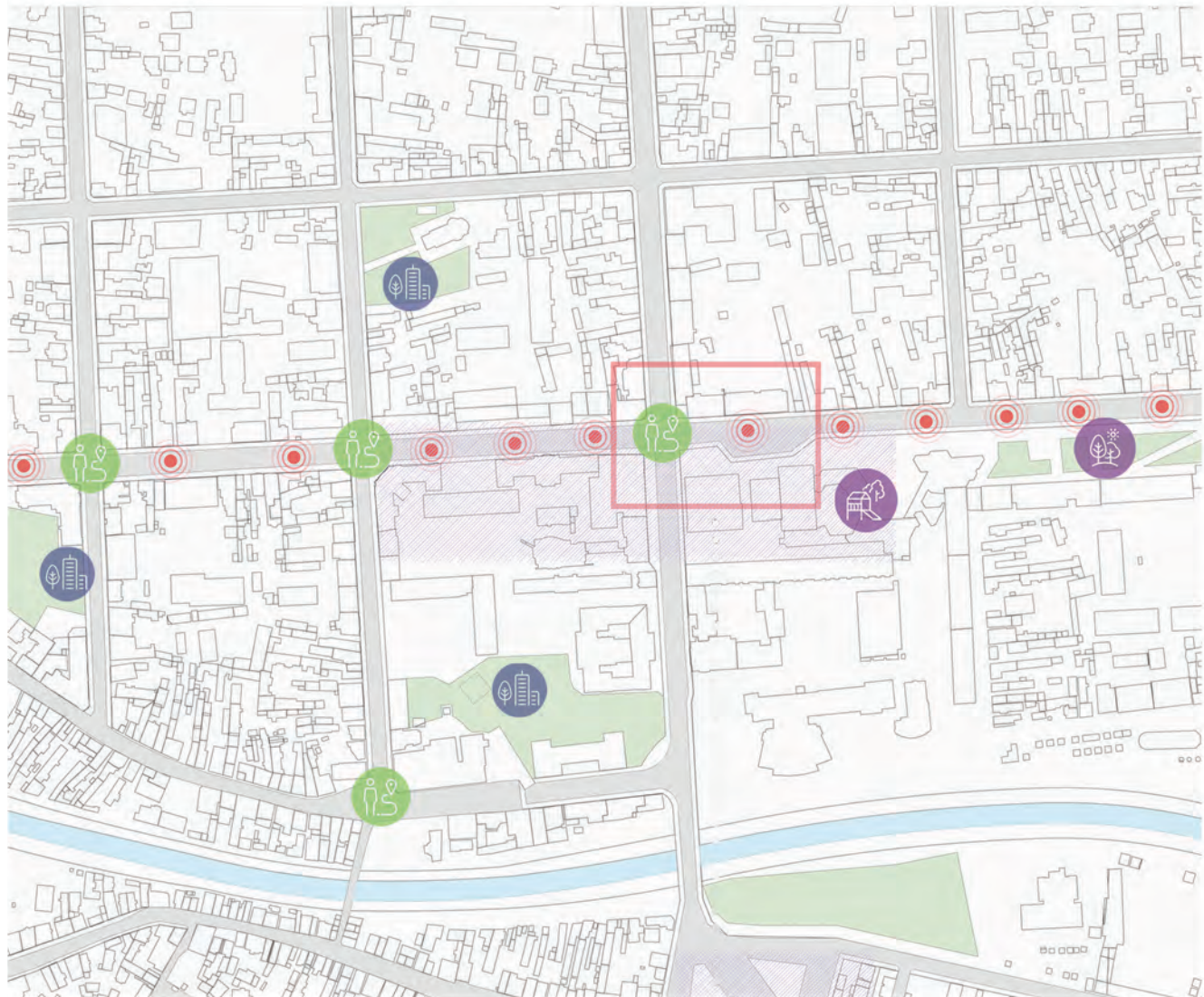
Source: <https://www.baunetz-architekten.de/atelier-loidl/2368095/news/3330825>



1) Examples in practice in the domain of urban gardening

Source: <https://www.designboom.com/architecture/present-architecture-green-loop-clean-up-waste-processing-3-9-2014/>

Wider context of the location



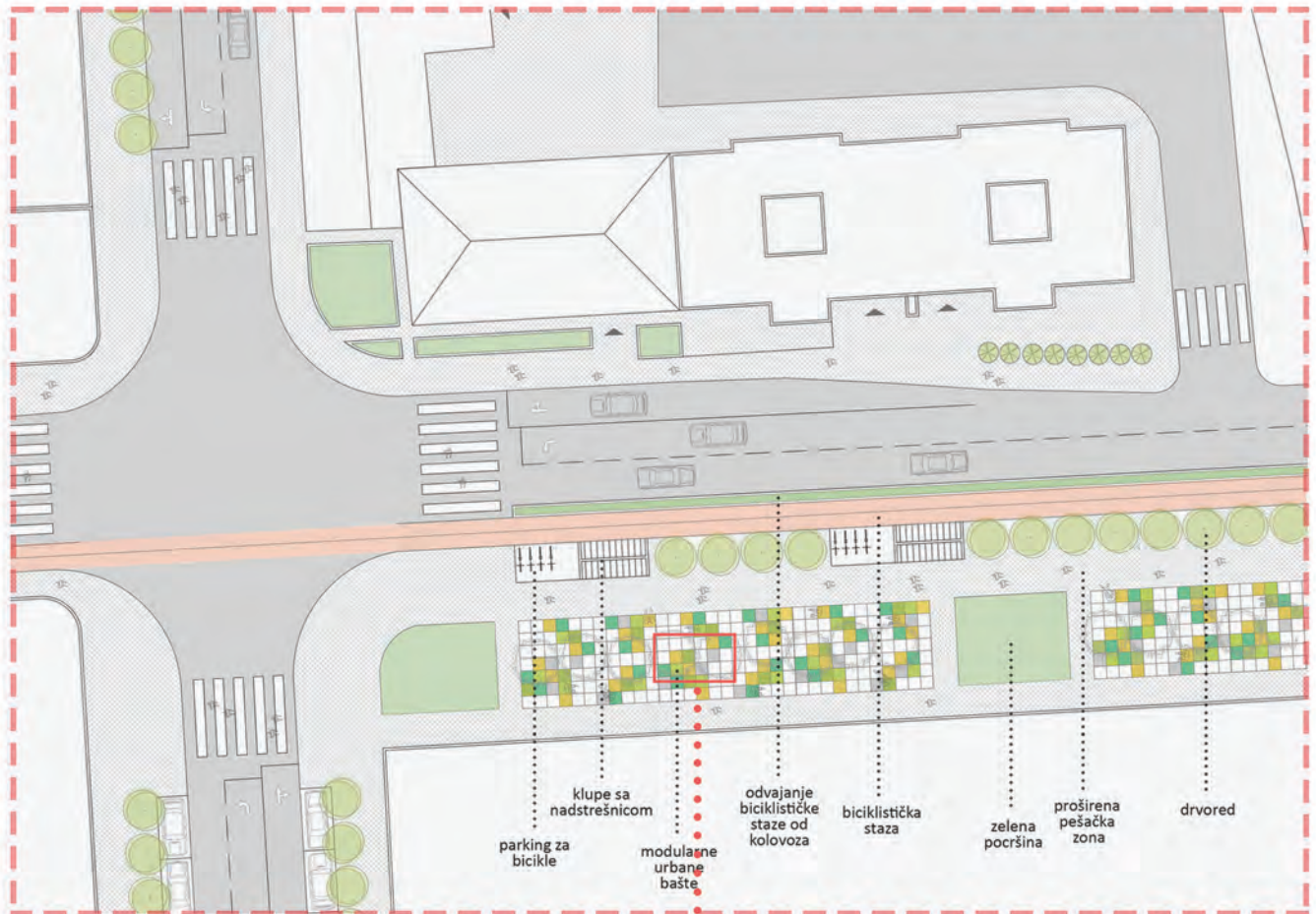
Access to natural environment



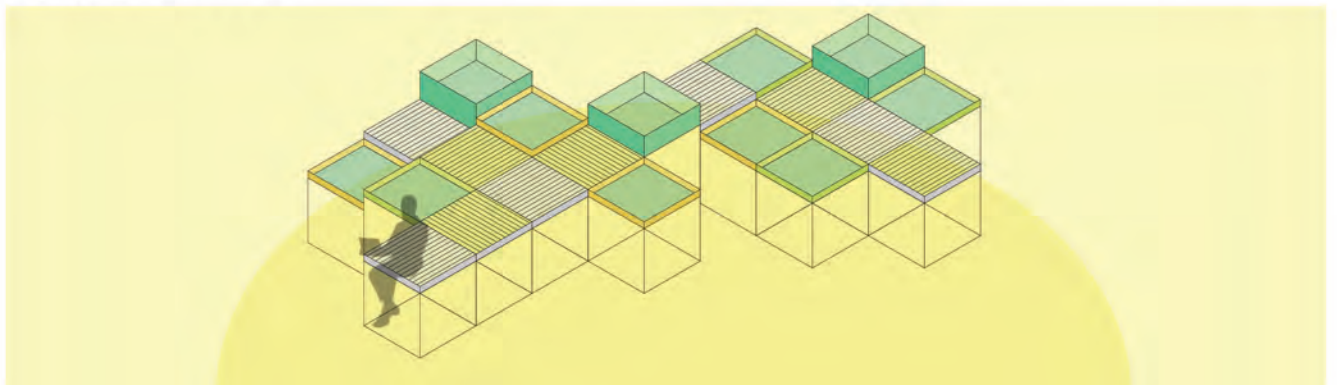
Tree lines



Bicycle trails, playgrounds



Development of the form



Urban garden - development of the form

Problems the project is focused on solving:

- 1) air pollution with noise and exhaust gases
- 2) imminent danger of the appearance of heat islands
- 3) lack of widespread linear and dotted greenery
- 4) lack of shade/covered areas

Measures implemented in order to solve the mentioned problems:

- 1) implementation of linear greenery (tree rows)
- 2) introduction of a bicycle path
- 3) expansion of pedestrian zones
- 4) implementation of modular urban gardens

How the mentioned measures treat the problems of climate change:

- 1) tree rows - store carbon, reduce risks of overheating, mitigate floods (if on porous soil), improve air quality, promote biodiversity...
- 2) bicycle paths and pedestrian zones - promote a healthy way of moving, activate free mobility, improve general health
- 3) urban gardens - promote biodiversity, improve air quality, contribute to the aesthetic impression of the city image, store carbon.



Situation R 1:1000



Ground floor R 1:500



3D view



3D view 2

Values and principles of urban design/theoretical basis for the project

Urban determinants of health

1) **Compact cities** have a medium density of services and housing, i.e. everything is available in 15 minutes.

A healthy city should have medium population density, buildings between 3 to 6 floors, avoid low-density development, prioritize the reuse of existing buildings, and improve connectivity between the city center and suburbs.

Impact on health: Medium population density is associated with lower rates of obesity, diabetes and cardiovascular disease in adults and older people.

2) **Connected cities** - mobility has high-quality pedestrian routes, cycle paths and public transport networks that connect the places where people want to go. Street connectivity refers to the way streets are interconnected, which determines how easy and accessible movement and traffic is. Cycling refers to the length, structure, extension and quality of the city's cycling path network. A healthy city should ensure that the bicycle network connects residential areas, public services, green areas and commercial facilities. The cycle path network should also be connected to the network of green spaces.

Impact on health: Mobility in cities, which provides different types of pedestrian/cycling traffic and calls for active transport that excludes transportation by motor vehicles, is related to reducing the consequences of obesity, type 2 diabetes, cardiovascular diseases, reducing premature mortality, improving the general physical and mental health of the population .

3) **Green cities** - consist of various green areas and public areas that encourage free time and socializing in the open space. Green coverage refers to the total amount of greenery in the city. A healthy city should increase green coverage and green visibility of all types of greenery including public green areas, private green areas, street tree lines, etc. Urban planning and arrangement must ensure the incorporation of greenery into the city. It is important to increase the presence of greenery and ensure its visibility. Different types of green spaces should match the needs of the neighborhood and the city, including different locations, sizes, structure and vegetation. A healthy city should provide different types and typologies of green areas according to the different needs of residents and location conditions. A healthy city should also improve the continuity of green infrastructure, by planning a green route to connect green and blue areas, considering the connection between urban green areas and the wider natural environment, including vegetation in all new streets.

Impact on health: A high-quality urban landscape is associated with improved general health and reduced obesity, with good perceptions of safety and general citizen satisfaction. A diversity of green spaces is associated with reduced premature mortality, birth outcomes, type 2 diabetes, cardiovascular and respiratory diseases.



URBAN GARDEN

Student: mroslava Tomáškovič 2022_21113

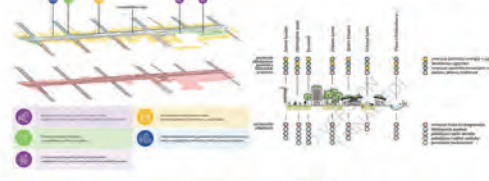
Architect: Miroslava Tomáškovič
 Faculty: Faculty of Architecture, University of Applied Sciences in Bratislava
 Department: Department of Architecture and Urban Planning
 Course: Bachelor's Degree Program in Architecture
 Subject: Urban Planning and Design



SMALL URBAN PROJECTS



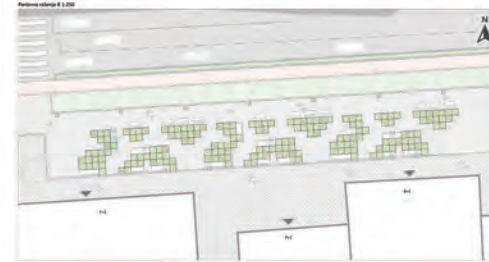
SMALL URBAN PROJECTS (CONTINUED)



URBAN GARDEN

Student: mroslava Tomáškovič 2022_21113

Architect: Miroslava Tomáškovič
 Faculty: Faculty of Architecture, University of Applied Sciences in Bratislava
 Department: Department of Architecture and Urban Planning
 Course: Bachelor's Degree Program in Architecture
 Subject: Urban Planning and Design



The main theme of the project is the collection of recycling waste, its further use and raising awareness about recycling. The idea is to implement recycling stations in parks and public places as well as inside educational institutions. In this way, this intervention acquires an educational character and spreads awareness among the youngest part of the population.

Since Valjevo has a problem with illegal landfills, the goal is to create a new lifestyle. In addition to reducing the carbon footprint, recycling also saves energy, reduces greenhouse gas emissions, prevents pollution, etc. We can better conserve our natural resources by recycling more. The recycling stations are conceived as a garden based on a playful network from which containers in various shapes emerge.

Containers contain:

textile, batteries, drink cans, plastic bottles, paper, cardboard, plastic bags, electronic waste.

Each container is a different shape, hinting at what's inside and offering playful openings for dropping waste in and out for reuse. The containers also provide built-in benches and steps around them to create an outdoor learning and sitting space, and to allow children of different heights to access openings.



Recycling

WHY IS IT IMPORTANT TO RECYCLE?

In addition to reducing the carbon footprint, recycling also save energy, reduce greenhouse gas emissions, prevent pollution, etc. We can better conserve our natural resources by recycling more. These techniques can also serve as interior products and design.

Recycling play a vital role in sustaining sustainability and creating creative thinking among diverse individuals. Environmental benefits include preventing waste from going to landfill, reducing the use of resources, which leads to a reduction in the need for raw materials, thereby reducing the level of pollution and energy consumption.



What is UPCYCLING and RECYCLING?

By **recycling** we mean, the industrial process whereby a waste product is transformed into a new material, which will be used as a raw material to create another product.

While **upcycling** is a recycling process based on creativity, in which objects that are no longer used, that will probably be thrown away, are given a new form or use.

Upcycling aims to keep a products in circulation for as long as possible, providing greater value products compared to the original ones.



An Educational Recycling park, Kfar Saba, Israel

The Urban Farm of Kfar Saba is an educational facility dedicated to teaching school children about farming, agriculture, nature and environment. Since the municipality of Kfar Saba embarked on a recycling campaign across the city, the Urban Farm is seen as a “Green Campus” and a key facility for educating the public on environmental issues. It was therefore decided to enhance its program and facilities, and build a workshop for instructing school children and city citizens about material cycles, the importance and practice of recycling, and various ways to re-use waste.

The objective behind the design was to create a playful environment that raises curiosity and aims to change the way waste is perceived and treated. To emphasize the potential for re-use, the waste needed to be displayed, rather than merely contained. Beyond this, the park was to serve as an “outdoor classroom” and allow various activities (teaching, sorting waste, and selecting materials for the re-use workshop).



An Educational Recvling park, , Kfar Saba, Israel; images: <http://www.savarch.com/recycling-park-kfar-saba-israel/511/>

Problems and potentials

PROBLEMS



/ The problem of inadequate disposal of waste (it pollutes nature and things the greenhouse effect leading to air pollution).

/Lack of green areas.



/Potential heat islands.

/Insufficient investment in the preservation of the environment.

POTENTIALS



/ Places of gathering of local communities (high frequency of population in the very center).



/ Good connection of the old and new urban fabric with bridges.

/ Awareness of the population about air pollution problems and inadequate-waste disposal.



/Population ready to participate in problem solving (stakeholders whose interest is based on ecology and solving key pollution problems in Valjevo).

GOALS/ HEALTHY CITY!



/A place for everyone (to create an attractive place to which we return, a it is suitable for all ages).



/ Raising awareness about climate change (activating the population, mostly the youngest,through socialization and education contribute to their environment).



/ Promoting health (through recreational activities and contents that environment offers).



/ Redesign of public space.

/ Higher percentage of porous surfaces (paved and green).



Recycle park in Valjevo, ambient.

Advantages

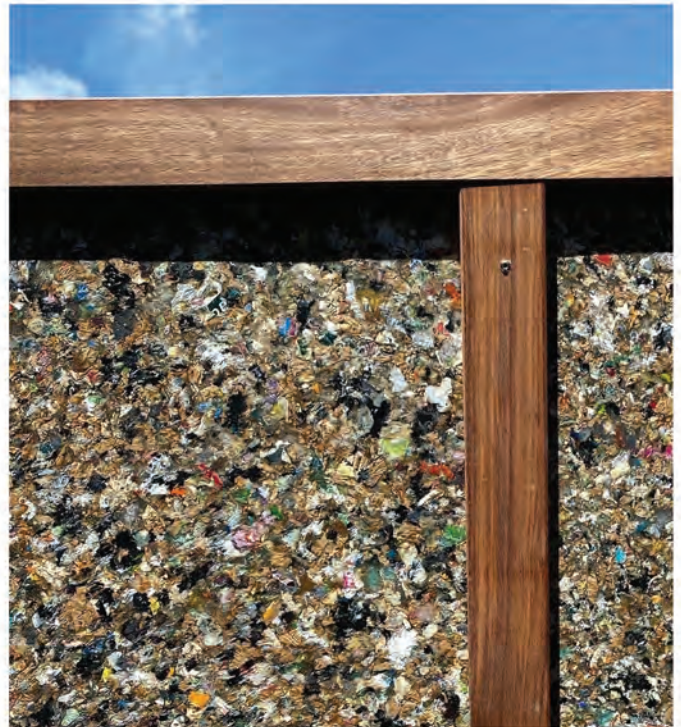
In addition to reducing the carbon footprint, recycling also saves energy, reduces greenhouse gas emissions, prevents pollution, etc. We can better conserve our natural resources by recycling more. These techniques can also serve as interior products and design. Recycling plays a vital role in maintaining sustainability and creating creative thinking among different individuals.

Environmental benefits include preventing waste from going to landfill, reducing the use of resources, leading to a reduced need for raw materials, thereby reducing pollution levels and energy consumption.



image:<https://www.rd.com/article/upcycling/>





An example of upcycling.



Recycling park



City of Valjevo, area of intervention

-  Kolubara river
-  Heat islands
-  Recycling park
-  Recycling stations



Karadžorđeva square



Vida Jocić Park



Valjevo gymnasium



preschool Milica Nožica



school Sestre Ilić

The recycling stations are conceived as a garden based on a playful network from which containers in various shapes emerge. Containers contain:

textile
batteries
drink cans
plastic bottles
paper, cardboard
plastic bags
electronic waste

Each container is a different shape, hinting at what's inside and offering playful openings for dropping waste in and out for reuse. The containers also provide built-in benches and steps around them to create an outdoor learning and sitting space, and to allow children of different heights to access openings.

Recycling stations are practical, do not take up too much space and can be integrated into public spaces of Valjevo such as parks and squares. They can also be part of educational institutions such as kindergartens, schools and gymnasiums. In this way, this intervention acquires an educational character and spreads awareness among the youngest part of the population.



RECYCLING PARK

(between Market Quay and Kolubara)

/a large percentage of porous surfaces (urban greenery and porous paving)

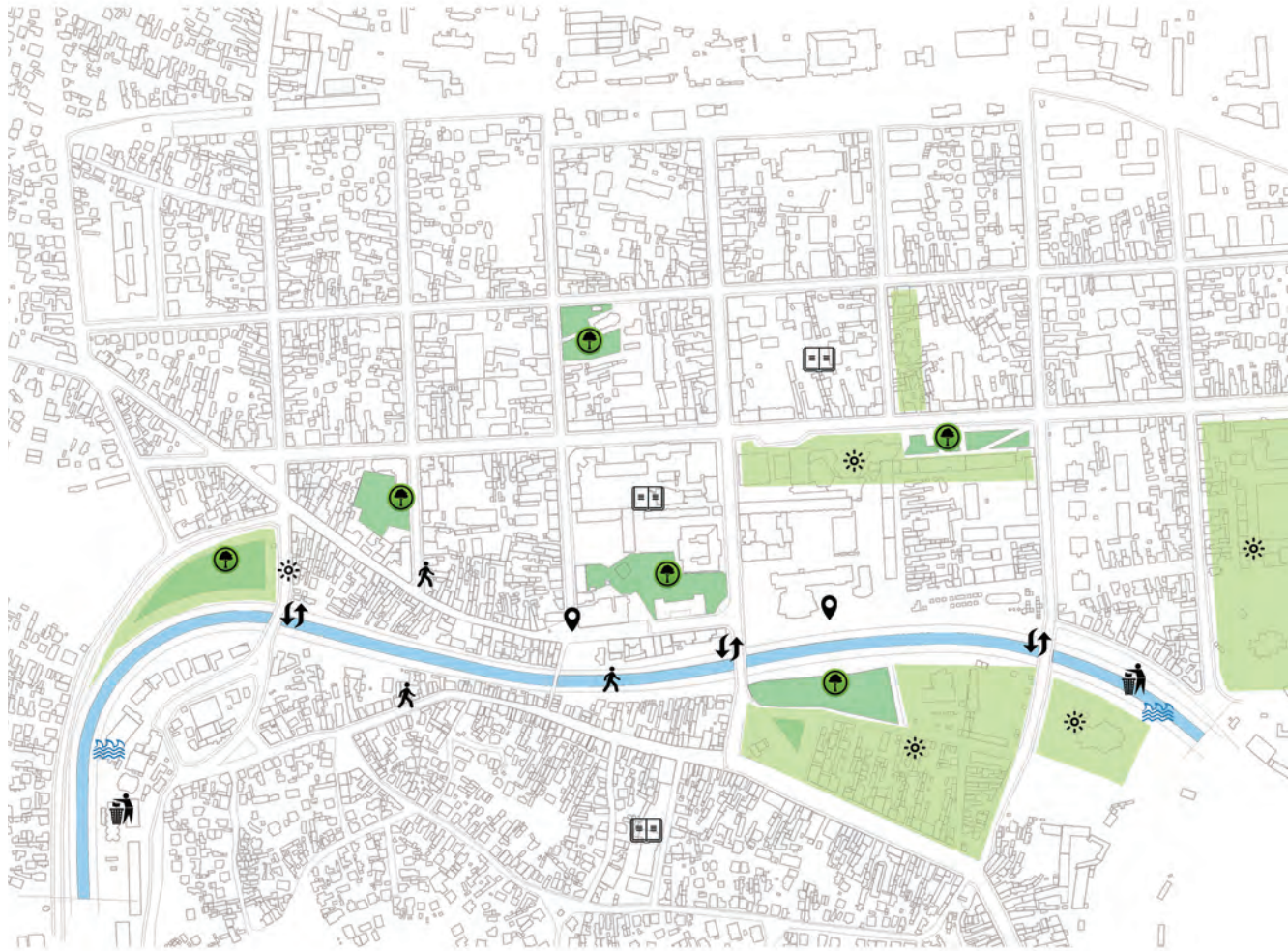
/amphitheatre (outdoor classroom)

/urban furniture (suitable for everyone)

/bioretention (rain gardens)

/recycling station (possibility of a creative workshop where upcycling is applied, i.e. turning waste materials, unwanted or undesirable things into innovative products)

SWOT analysis



S

A large percentage of greenery within the urban fabric, especially around the city in the form of parks (Vidrak, Krušik, Pečina)



Good connection of both sides of Kolubara with bridges



The existence of a large number of non-governmental organizations that deal with environmental protection, climate change and the health of residents; through local media and workshops, they are trying to fight for a better life in Valjevo.

The local population intensively uses the spaces of the squares (plateau in front of the Cultural Center) as well as the coast of Kolubara as a promenade



The population is ready to participate in solving the problem.

O

Interest of national and European institutions/programs in the development of the city.

Education of the local population through local media, events, workshops.



Reconstruction of hiking trails, introduction of bicycle routes, introduction of adequate hiking trails along the riverbeds - i.e. activation of the coast.



W

Existing problem areas that can prevent good, healthy and smart development of the city: City landfill, brownfield facilities, Krušik factory.

The population does not dispose of waste in a proper manner, in the places provided for it, which leads to the creation of illegal landfills, disposal of waste in rivers, and further pollutes the air and water and creates an unpleasant smell.



Heat islands represent another big problem for the city of Valjevo, there is a large number of built-up areas in one place, without adequate accompanying vegetation (a large number of parking lots, large paved areas, as well as new buildings without the necessary vegetation, etc.)



T

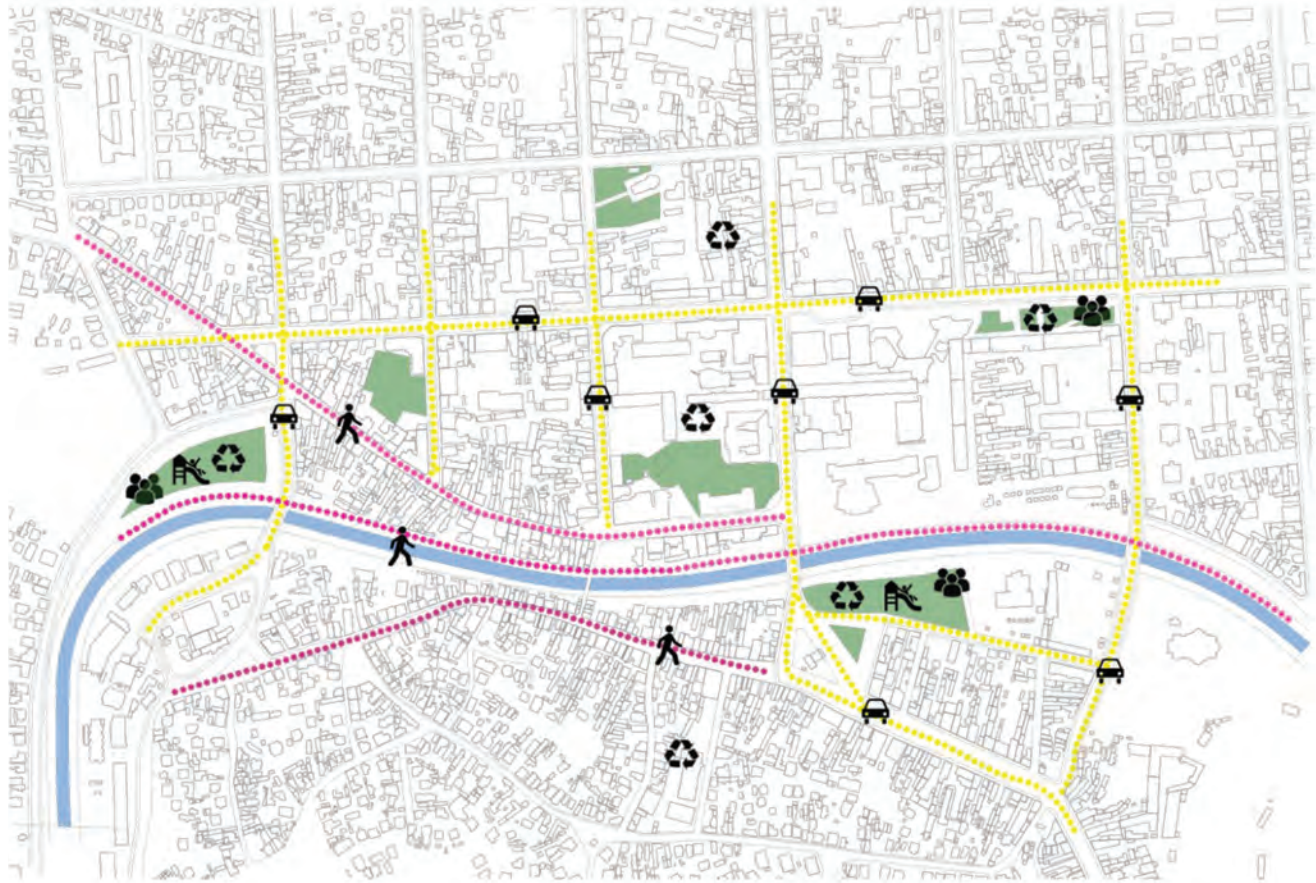
Air pollution is a threat to human health, soil pollution and water pollution.



Sources of air pollution (Heating plant, Krušik, individual combustion plants, landfills)

A noticeable increase in construction in all sectors, which can further worsen the already bad state of all these aspects in case it goes unchecked.


Programme




recycle station


eco park


amphitheater

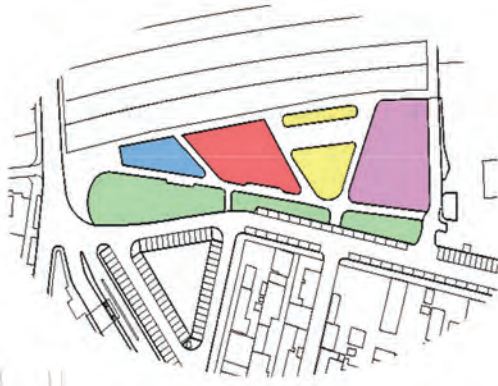

river Kolubara


green areas


main walking routes


vehicular traffic

Recycled stations



-  recycled stations
-  eco park
-  rest area
-  amphitheater
-  buffer zone /green area



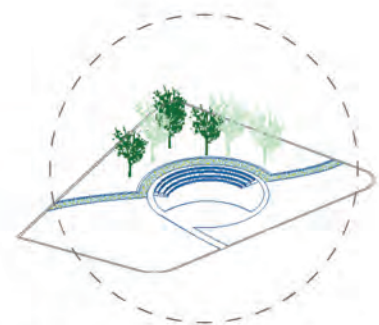
Situation



The recycling stations are conceived as a garden based on a playful network from which containers in various shapes emerge. Containers contain: textiles, batteries, drink cans, plastic bottles, paper, cardboard, plastic bags, electronic waste.

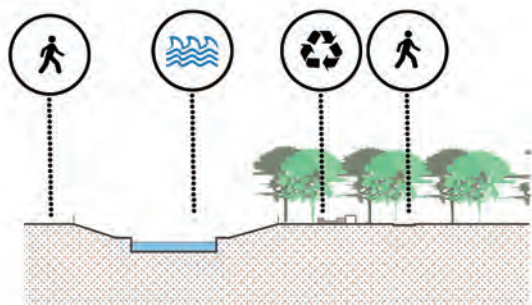
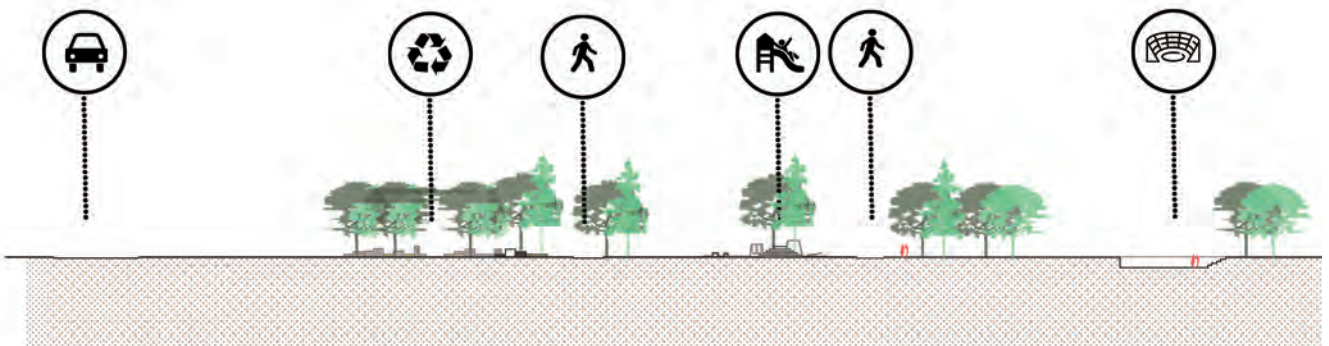


ECO-Playgrounds are special spaces intended for children's play that are created by the renovation of neglected parks or other areas, using recycled and/or natural materials suitable for children's play.



The Water Amphitheater has a double function. Generally, it is a gathering place, a recreation area, but during bad weather it becomes a pool for retaining water. After the riots have passed, the water evaporates over time and the square has its basic function again.





vehicular traffic



pedestrian traffic



river Kolubara



recycled station



eco playground



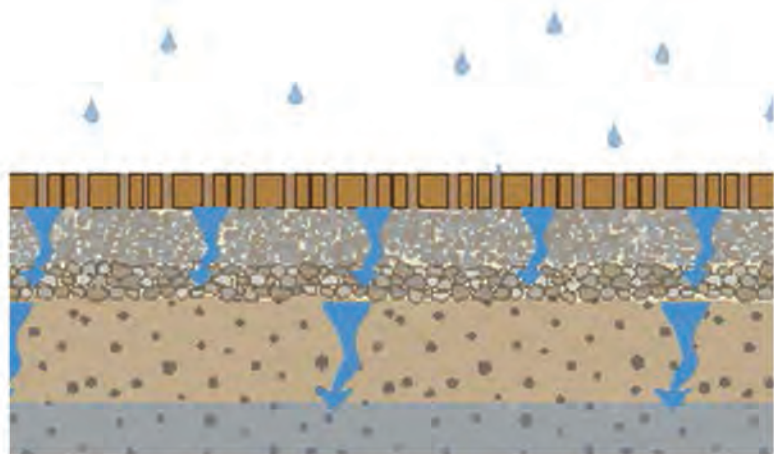
amphitheater

Section

Principles of a healthy city

Porous pavement, also known as permeable or pervious pavement, is a storm-water management system that allows water to move through void spaces within the pavement and eventually infiltrate into underlying soils. In most cases, porous pavement can substitute for conventional, impervious pavements—used by pedestrians and vehicles alike—without the need for any additional stormwater management feature such as a detention basin or rain garden.

Sustainability startup BiFusion developed it which they describe as “the first building material construction quality made entirely from recycled plastic waste which often cannot be recycled”. To create **BiBlock**, the company collects discarded plastic, which is shredded and overheated before it is joined into the finished block without the use of fillers or adhesives. They are blocks same dimensions as standard concrete blocks (40x20x20 cm), but generate 41% less greenhouse gas emissions than concrete blocks during production. The blocks are sized same dimensions as standard concrete blocks (40x20x20 cm), but generate 41% less greenhouse gas emissions than concrete blocks during production, and hold the same thermal resistance value despite this which are 10 pounds lighter.



Porous pavement



Recycled blocks



Ambijent/ reciklažna stanica

Green corridors in cities can be defined as linear natural infrastructure, such as trees and plants, that link up other green and open spaces to form a green urban network.

These networks provide both ecological services, such as habitats and resources for urban wildlife; whilst also providing services to urban populations such as mobility networks and access to green spaces through the provision of sustainable and active transport routes that link transport with mixed land use (residential, commercial, education, recreation etc) and open spaces.

These green corridors are designed to provide a mobility network between the recycling stations in Valjevo.

Rain gardens or rain retention are depressions that are most often built near roads or impervious soil, and as such they have the task of absorbing excess atmospheric water created by sudden heavy rainfall with the aim of relieving the sewerage network.



Example of green corridor



Rain gardens



S W O T

STANICE RECIKLAŽE
Studenti: Edita Lujša 2022_23208

ZADROJ ZA VAŽNO DA RECIKLIRAMO!

Prilikom odlaganja otpada u kontejner, uvijek pazite na oznake i boje. Ovo će vam pomoći da odaberete pravi kontejner za vaš otpad. Također, uvijek pokušajte odabrati najbliži kontejner za vaš otpad. Ovo će vam pomoći da smanjite svoje emisije ugljika.



Šta je SPECIFIKUMI RECIKLIRATI?

Specifikum je svojstvo koje određuje vrstu materijala koji se može reciklirati. Na primjer, papir i karton su specifični materijali koji se mogu reciklirati zajedno. Međutim, ne mogu se reciklirati zajedno s drugim materijalima kao što su plastika ili metal.



- PROBLEMI**
 - Nedostatak prostora za odlaganje otpada
 - Nedostatak informacija o tome kako reciklirati
 - Nedostatak motivacije za recikliranje
- POMOĆI**
 - Edukacija građana o važnosti recikliranja
 - Uvođenje sistema nagrada za recikliranje
 - Uvođenje sistema kazni za nepravilno odlaganje otpada
- OLAKŠAVANJE**
 - Uvođenje sistema besplatnog odlaganja otpada
 - Uvođenje sistema besplatnog odlaganja otpada
 - Uvođenje sistema besplatnog odlaganja otpada

VAŠA OBLASTI RECIKLIRATI, OVAJ NAJLAKŠI NAČIN!

Ovo je najlakši način da reciklirate svoj otpad. Svi otpadni materijali koji su prihvatljivi za recikliranje mogu biti odlagani u ovaj kontejner. Ovo će vam pomoći da smanjite svoje emisije ugljika i zaštitite našu planetu.



Logos and institutional affiliations at the bottom of the page.



STANICE RECIKLAŽE

Studenti: Edita Lujša 2022_23208

STANICNI NEŠENI



- STANICNI NEŠENI**
 - Recikliranje papira i kartona
 - Recikliranje plastike
 - Recikliranje metala
 - Recikliranje stakla

STANICNI NEŠENI



- STANICNI NEŠENI**
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 - Recikliranje metala
 - Recikliranje stakla

STANICNI NEŠENI



- STANICNI NEŠENI**
 - Recikliranje papira i kartona
 - Recikliranje plastike
 - Recikliranje metala
 - Recikliranje stakla

Logos and institutional affiliations at the bottom of the page.

Urban mini-forests have proven to be an excellent solution to the problem of air pollution in many cities. As we know, Valjevo has been struggling with this problem for years and these forests are excellent opportunity to finally solve this problem. Since they can be planted on any green surface, there are several suitable locations in Valjevo. I chose three main locations - Vida Jocić park, the courtyard of the military home and the kindergarten courtyard. In those locations these forests have additional content, in the park there are 3 zones, an education zone with small amphitheater, benches and tables as well as a planting area so that the entire process of planting forests can be seen, then a rest zone with various seating furniture and a game zone for the youngest. In the other two forests, there is furniture for rest and socializing, as well as playground elements. Other mini forests in Valjevo are of the classic type without any special furniture. They are also located in private yards, which is very important, because the biggest air pollution problem in Valjevo is caused by individual fireplaces. In addition to the problem of air pollution, these mini urban forests also solve the problems of heat islands and overheating, and are also good noise insulators.

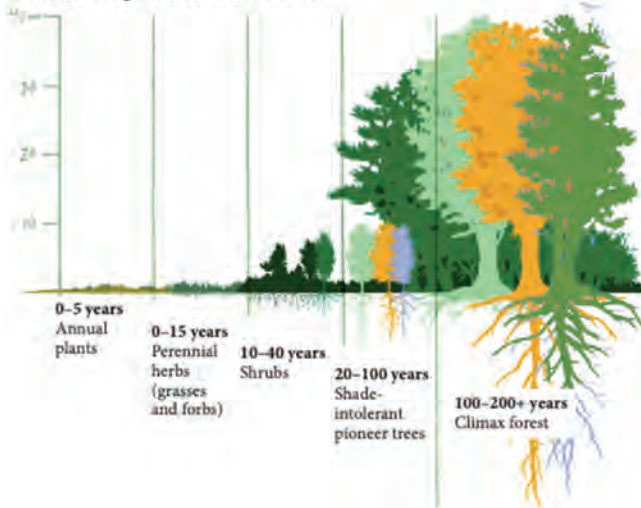


Miyawaki forest - introduction / SWOT

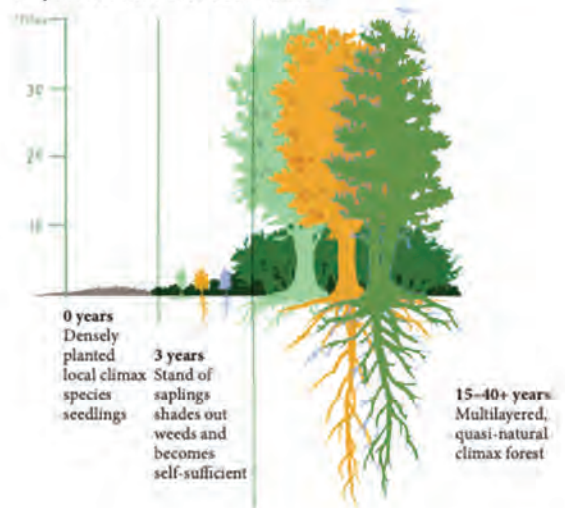
The idea of mini forests was conceived by Akira Miyawaki in the 1970s. He observed that mature forests in Japan have greater biodiversity than landscaped gardens. Mature forests take centuries to grow and acres of land. Miyawaki wondered if there was a way to speed up the process, to develop a mature forest that would grow quickly in a small space. Miyawaki's idea was successful. By discovering which species were native to Japan, he was able to select trees, shrubs, and herbaceous plants that would grow naturally in old-growth forests. Under the right conditions, his methods quickly produced forests in small spaces—sometimes in a tenth of the time it would take for a diverse forest to grow naturally.

Small forests can thrive anywhere. Overcrowded and polluted urban areas that need the most help in maintaining clean air and water are suitable locations for mini-forests. The benefits of adding native trees to urban areas go beyond their beauty. Trees remove carbon dioxide and air pollution, reduce water pollution and act as noise buffers. They also provide habitat for other organisms such as birds and insects. Although mini forests are small, they can even restore biodiversity in cities almost as much as a larger natural forest.

Natural vegetation succession



Miyawaki mini-forest method



S

STRENGTHS

- Urban greenery
- The presence of educational institutions
- Local community gathering places
- The habit of going to the natural environment

W

WEAKNESSES

- Potential heat islands
- Individual fireplaces
- Lack of widespread greenery
- Lack of shade

O

OPPORTUNITIES

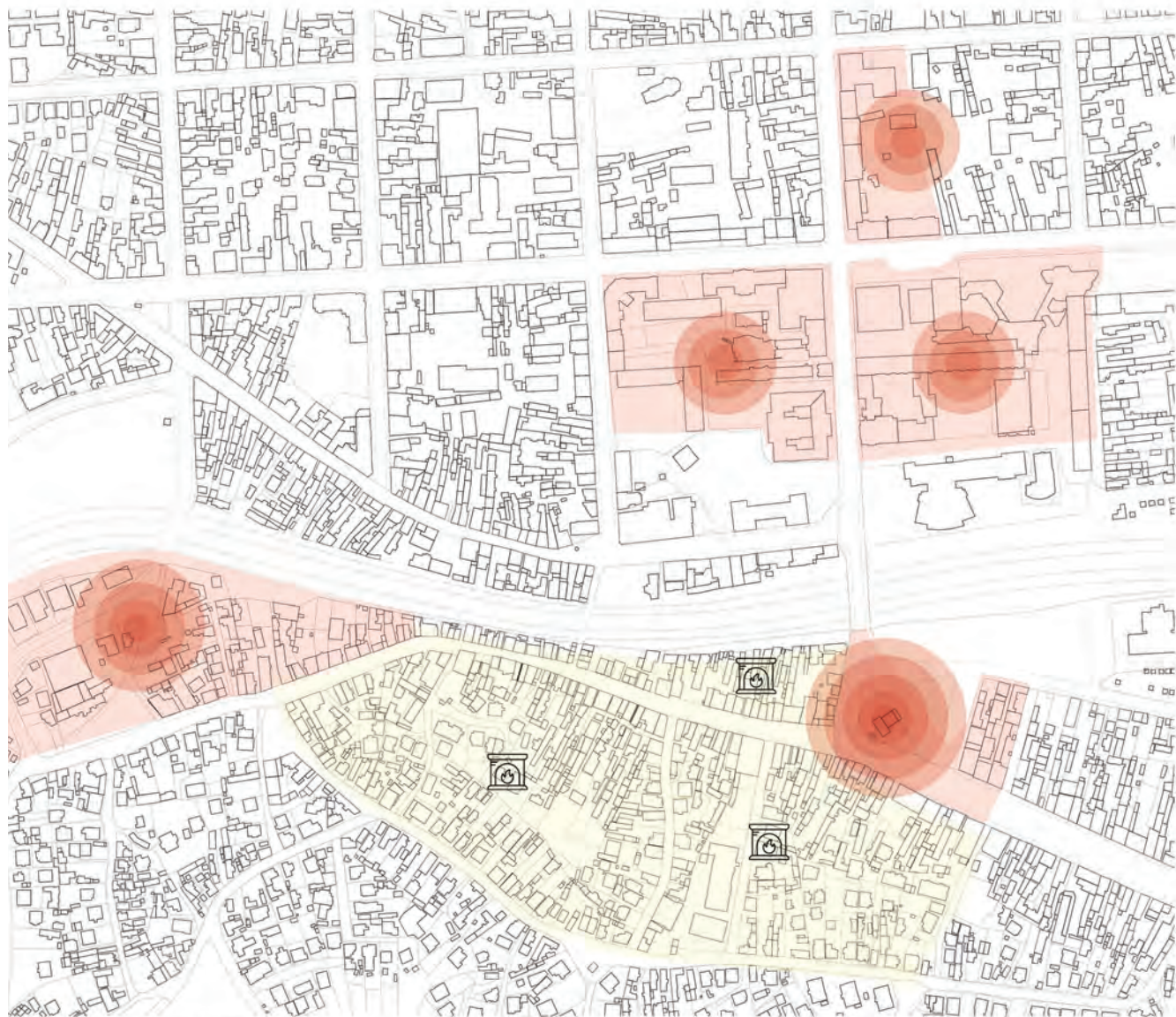
- Green potential (park Vide Jocić)
- Organizing seasonal events
- Activation of abandoned spaces

T

THREATS

- Pollutants
- Heat islands

Problems/Potential locations



potential heat islands

individual fireplaces

The project of urban mini-forests primarily solves the problem of air pollution that Valjevo has been struggling with for years, and thus it also responds to the problem of individual fireplaces, which are the main cause of air pollution. In addition, these mini forests also respond to the problem of overheating, ie. heat islands and heat waves because trees cool the climate. Due to their high density, they also represent a noise buffer zone. They do not need a large green area, so there are plenty of locations in Valjevo where they could be found. An area of only 10 square meters is enough for them. In Valjevo, the most ideal would be to find them inside the blocks where the lack of greenery and green areas is most visible.



GOALS

-Air purification: The main problem that makes Valjevo an unhealthy city is air pollution. Urban mini-forests have so far proven to be excellent air purifiers and effectively solve that problem.

-Increasing urban greenery: The city of Valjevo lacks green areas, especially in the central zone, so these urban mini-forests are ideal for an accelerated increase in greenery.

-Raising the ecological awareness of citizens and educating the youngest: Given that the implementation of the project requires a relatively short time and that it is of a participatory nature, all those interested can participate in it and at the same time be informed about the importance of urban greenery.

-Soil regeneration: Apart from being good at purifying the air, these forests also play a big role in soil regeneration.

-Overheating/heat islands: Another problem facing Valjevo is overheating due to the large number of heat islands, most of which are located in the central zone, and urban greenery plays a big role in solving this problem.

-Longevity: If plants are properly cared for during the first year, valuable space is obtained that will last for years.

-A space that connects nature and people: a green space rich in nature and an outdoor classroom.

Case study - mini forest in Pakistan;UK

Pakistan is suffering a disproportionate effect of climate change. The Miyawaki Method adopts the theory of Potential Natural Vegetation (PNV), which basically states that only those species of trees should be planted which are native to the area where they are being planted, and from the time before human habitation and human intervention. These species, according to the PNV Theory, have the highest and most successful rate of deep growth, and would be most beneficial to any and all specific ecosystems where they are being planted.

Another related benefit of the Miyawaki Method is that it encourages 100 times for biodiversity, and 30 times the amount of carbon sequestration on average that is done through traditional plantation techniques. A major event was planned and executed in August 2018. Tree plantation not only sequesters carbon, but also purifies the air we breathe, acting as lungs for our environment. Trees cool the climate, and so also help the terrible condition of Karachi's extremely high Urban Heat Island effect, which has even taken lives of hundreds of Karachiites in the heatwave of 2015.



https://www.thenews.com.pk/assets/uploads/akhbar/2020-12-05/753938_1237260_How-the-Miyawaki-Method-can-save_akhbar.jpg



Program scheme/Project development duration table



Master plan/Project price table



Master plan R 1:5000

Metoda Miyawaki	Količina	Cena po jedinici	Budžet	u %
Mlade biljke	300	4.0e	1200e	40%
Drenažne cevi	1500	0.3e	450e	15%
Stajnjak/kompost	500	1.0e	500e	17%
Malčiranje	200	1.8e	360e	12%
Biorazgrađiva užad	200	0.4e	80e	3%
Kolac za biljke	75	1.0e	75e	3%
Ukupno			2665e	89 %

Sadni materijal	Količina	Cena po jedinici	Budžet	u %
Veliki rezervoari za vodu	1	100e	100e	3%
Kante	2	10e	20e	1%
Čekići	2	19e	38e	1%
Lopate	15	7e	105e	4%
Grabulje	6	7e	42e	1%
Baštenske vile	2	15e	30e	1%
Ukupno			335e	11 %

ukupna cena projekta	3000e
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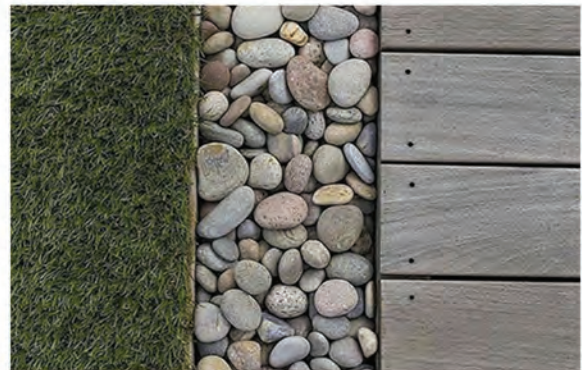
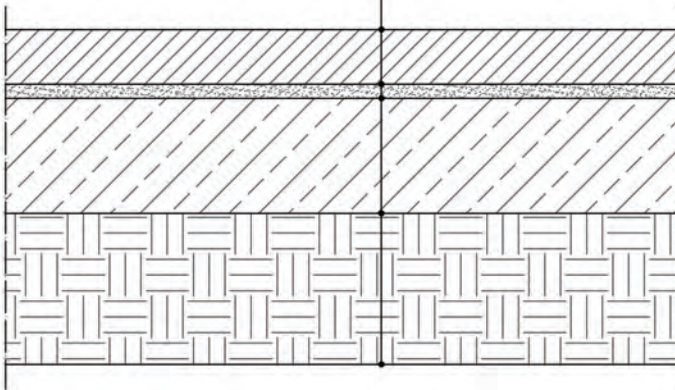
Mini forest - Dom Vojske



Kompoziciono rešenje R 1:500



- Drvene daske 4cm
- Zbijeni pesak 1cm
- Zbijeni granulaarni osnovni mat.
- Teren

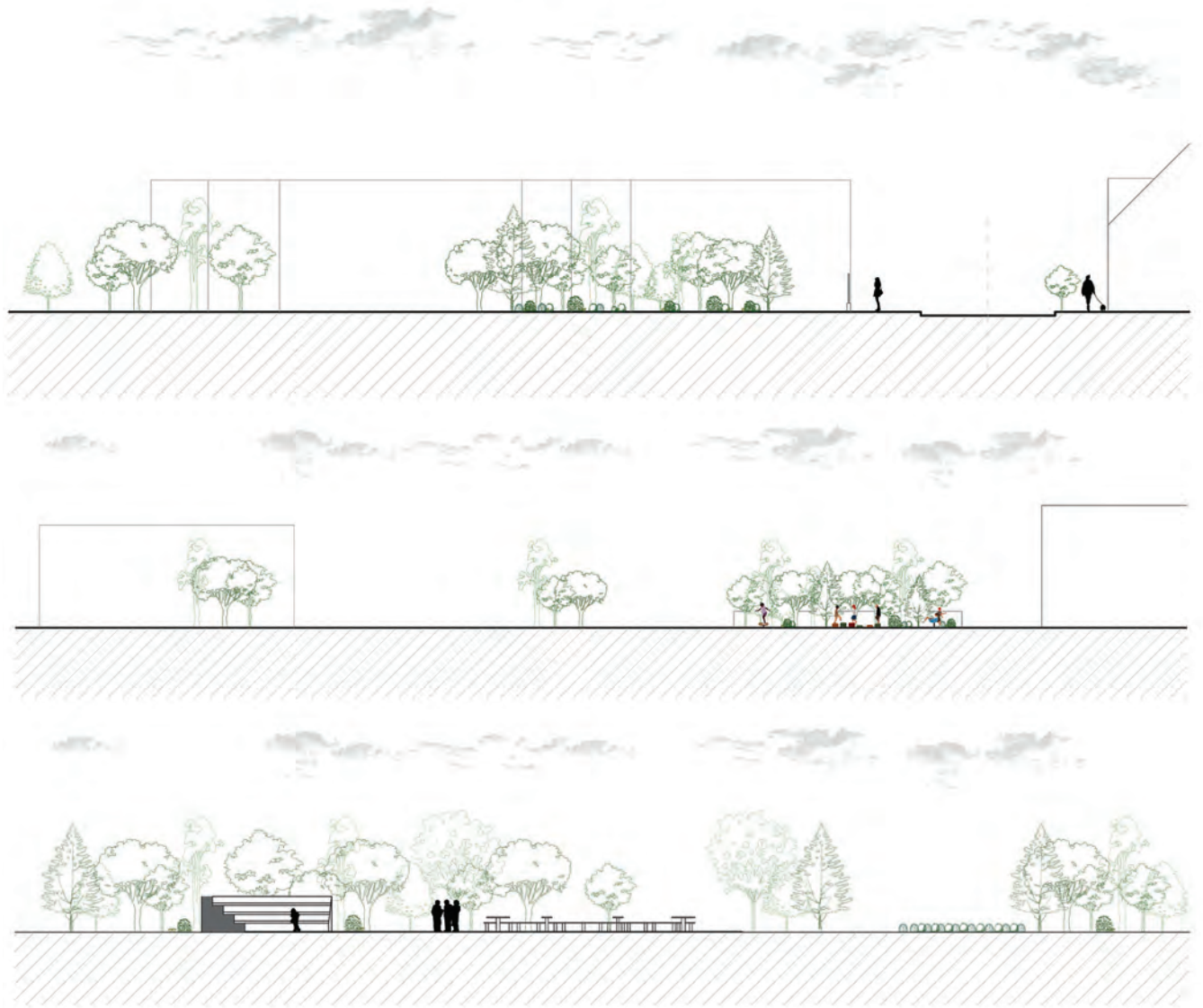


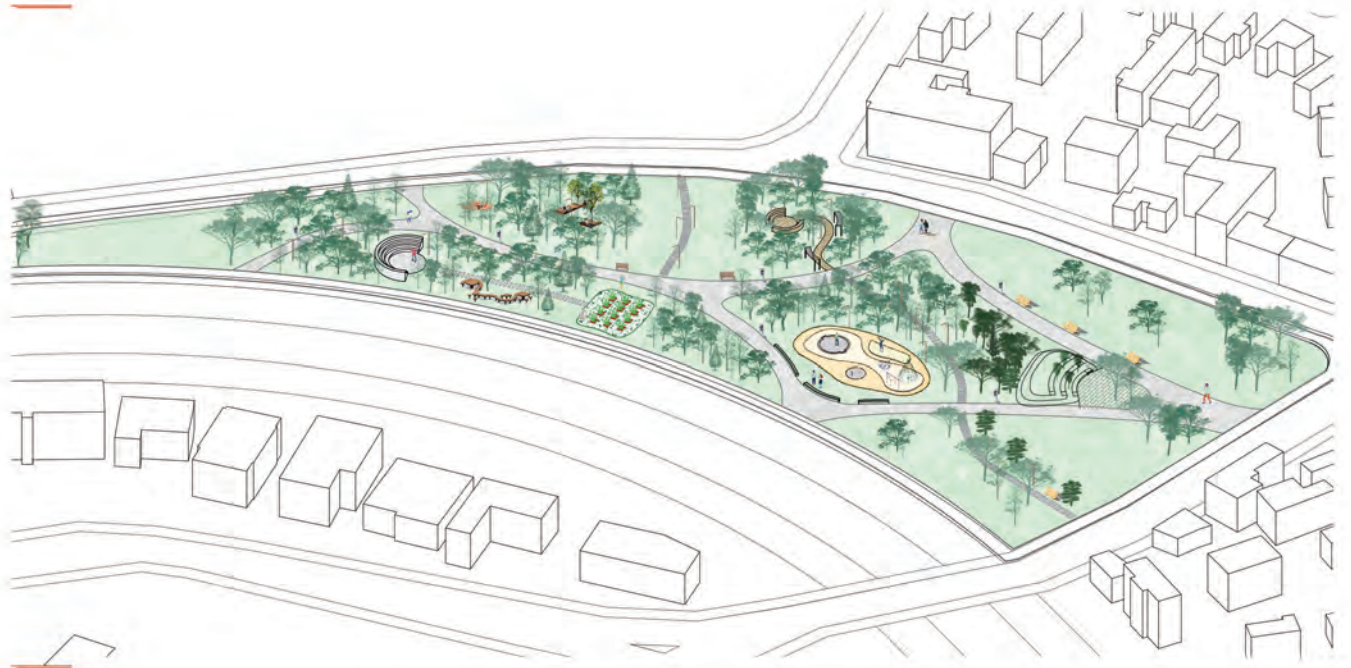
Mini forest - Vida Jovic park



Kompoziciono resenje R 1:500

Sections/Axonometry





Implementation in Valjevo - before and after



Collage - parking lot in Valjevo before and after mini urban forest





URBANE MINI ŠUME

Studij: Sofija RIČ 2022_21136

MINIŠUMI ŠUMI

Urbane mini šume su male, ali funkcionalne i održive šume koje se mogu postaviti u bilo kojem prostoru u gradu. Oni su idealna rešenja za poboljšanje kvaliteta zraka, smanjenje efekta granične temperature, smanjenje buke i poboljšanje mentalnog zdravlja građana. Ove šume mogu biti postavljene u parkovima, na ulazima zgrada, u dvorištima i na drugim otvorenim prostorima u gradu. One su jednostavne za održavanje i mogu biti postavljene u bilo kojem prostoru u gradu.

PROBLEMI I POTENCIJALI

Urbane mini šume mogu biti postavljene u bilo kojem prostoru u gradu. One su jednostavne za održavanje i mogu biti postavljene u bilo kojem prostoru u gradu. One su idealna rešenja za poboljšanje kvaliteta zraka, smanjenje efekta granične temperature, smanjenje buke i poboljšanje mentalnog zdravlja građana.

CELJEVI

Urbane mini šume mogu biti postavljene u bilo kojem prostoru u gradu. One su jednostavne za održavanje i mogu biti postavljene u bilo kojem prostoru u gradu. One su idealna rešenja za poboljšanje kvaliteta zraka, smanjenje efekta granične temperature, smanjenje buke i poboljšanje mentalnog zdravlja građana.

PRIMERI URBANE MINIŠUMI U SVETAU

PROJEKTOVANJE URBANE MINIŠUMI

PRILAZI URBANE MINIŠUMI

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97. ulaz	98. ulaz	99. ulaz	100. ulaz



URBANE MINI ŠUME

Studij: Sofija RIČ 2022_21136

MINI ŠUMI NA TERENU IZOLACIJE

TABLA URBANE MINIŠUMI ZA POKRYVANJE OD ŠUMI

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OPŠTIŠTVO PROJEKTA

Urbane mini šume mogu biti postavljene u bilo kojem prostoru u gradu. One su jednostavne za održavanje i mogu biti postavljene u bilo kojem prostoru u gradu. One su idealna rešenja za poboljšanje kvaliteta zraka, smanjenje efekta granične temperature, smanjenje buke i poboljšanje mentalnog zdravlja građana.

MINI ŠUMI - URBANE VILUKE

MINI ŠUMI - URBANE VILUKE



The project is based on the creation of a sustainable urban oasis that is a combination of nature and architecture, has an impact on people's health, both mental and physical, supports biodiversity, introduces people to the numerous healing properties of plants, and contributes to reducing the emission of harmful gases in order to fight climate change. Parts of the project are a farm market, local gardening, sensory garden, edible garden, and healing garden. The project aims to raise awareness about health, but also through local gatherings and activities to bring people together in a joint fight against air pollution.



Location

S

- Green areas
- Gathering places
- Citizen activism
- Good connectivity
- The habit of going to the natural environment

W

- Lack of tall greenery
- Bad state of the market
- Lack of shade

O

- Activation of the center
- Creating a green oasis

T

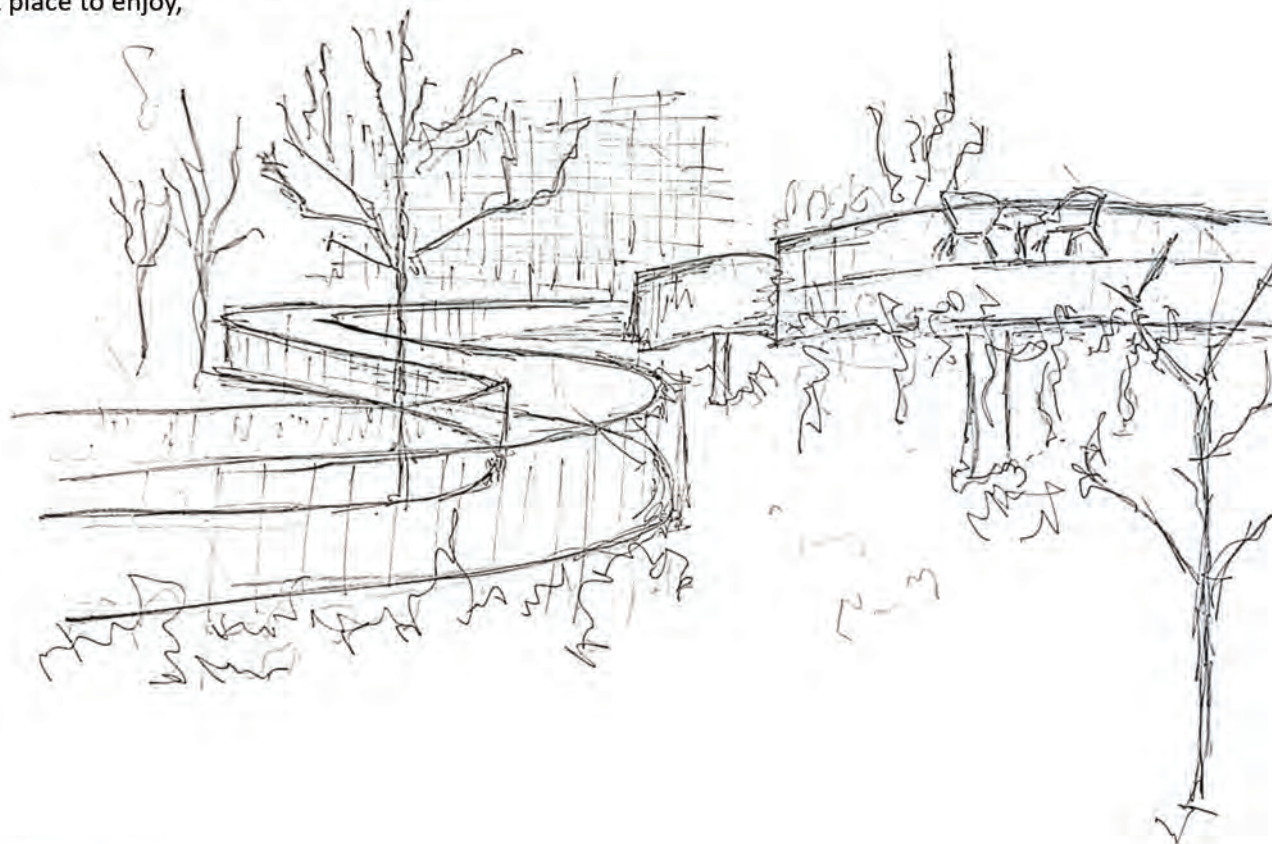
- Heat islands
- Air pollution
- Pollution of Kolubara



CONCEPT

After realizing that air pollution is one of the biggest problems faced by the residents of Valjevo, the location for the studio project became the area of the former barracks. Since there is nothing in that area today except green space, the concept was to keep everything that already exists on the site and to create a small oasis in that place. The concept is based on the research of different types of gardens and plants that have a positive effect on the mental and physical health of people, incorporated into architecture that can represent an excellent place to enjoy,

escape from the world but also in need of socialization because this place offers facilities for different types of enjoyment as well as raising dha in people. In addition to the gardens, we also have a botanical garden with a market in front of which there is local fruit and vegetable cultivation.



Ručna skica koncepta

Examples of good practice

World Horticultural Exhibition in Beijing 2019.

The entire layout of the Sangai Garden meets the needs of the exhibition, fully using the space to shape different landscape spaces from hermetically sealed to open, from exterior to interior, from natural to artificial. Three different levels of movement have been prepared for visitors, an aerial bridge and a narrow path, so that they can appreciate the beauty of gardening from different heights, as if they were surrounded by the beauty of endless flowers.

The design of the Sangai Garden was inspired by the art of drawing, referring to the techniques of "polishing", "splashing ink", "spot colors", "smudges" and "dry brushes" to present landscapes with various textures.

According to the unique design of the exhibition garden, there are nine special areas for displaying plants, including an area for dark-loving plants such as ferns, an area for irises and calamus, an herb area with aromatic plants, water, a forest area with trees in water.



<https://www.archdaily.com/924222/shanghai-garden-arcplus-architectural-decoration-and-landscape-design-research-institute>



<https://www.archdaily.com/924222/shanghai-garden-arcplus-architectural-decoration-and-landscape-design-research-institute>

Market: a place where local producers can sell their products directly to customers. The market promotes local production, increases the availability of fresh and seasonal fruits and vegetables, and allows customers to learn more about the products they are buying.

Local gardening: Local gardening refers to growing food in gardens in cities and towns. This is a way to connect cities with nature and to encourage joint action in communities. It also promotes healthy eating and sustainability.

Sensory garden: Sensory garden is a garden designed to stimulate visitors' senses.

This garden contains different types of plants that differ in smell, taste, texture and color. Sensory garden has a therapeutic function and can be especially useful for people with disabilities or sensory disorders.

Healing garden: It represents a type of garden or greenery that is specially designed and intended to improve the mental and physical health of people. This type of garden has certain features that encourage relaxation and stress reduction, and may include elements such as walking paths, benches, water features, medicinal plants, flowers and trees that have therapeutic properties.

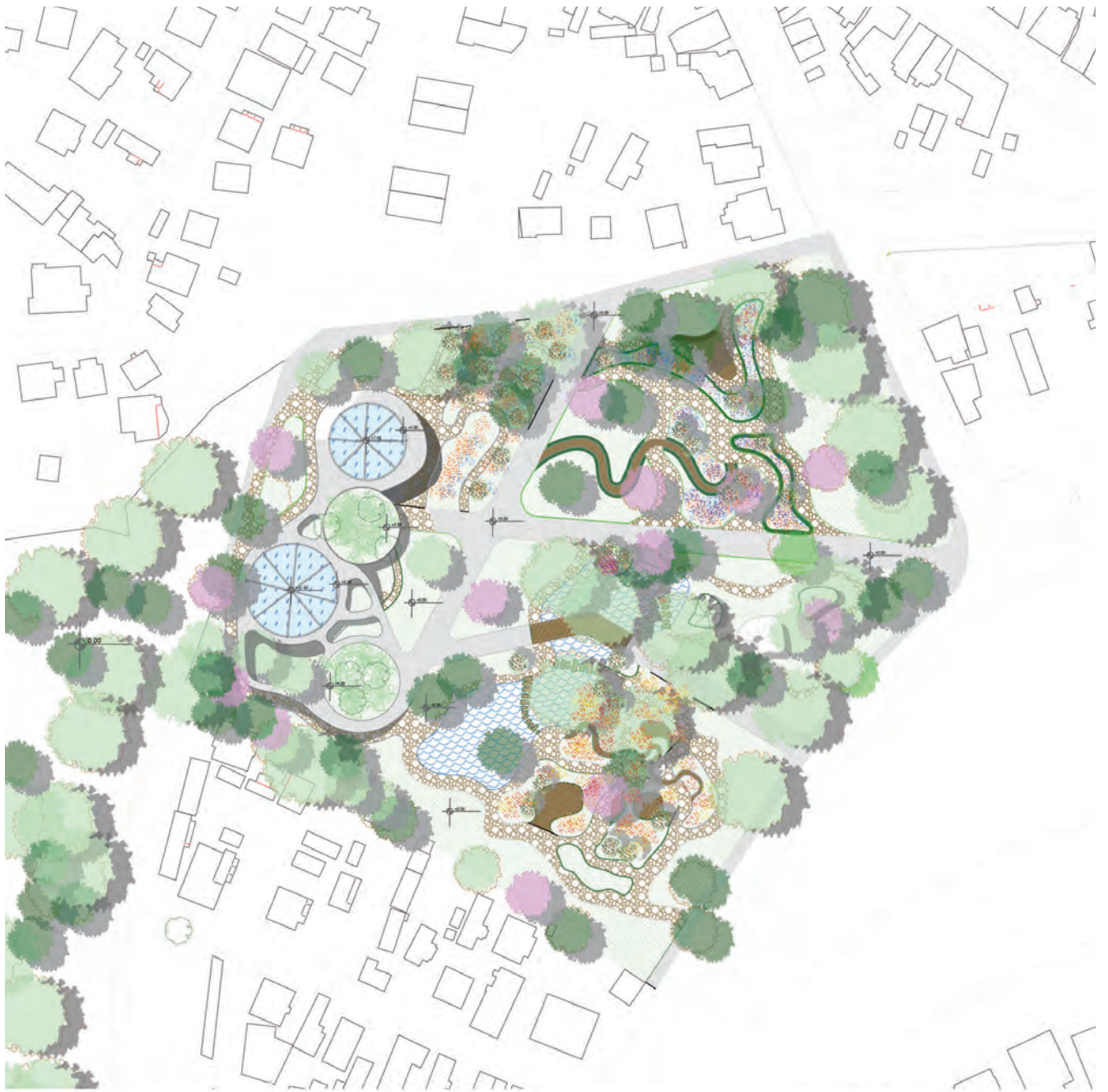


spatial-programmatic solution

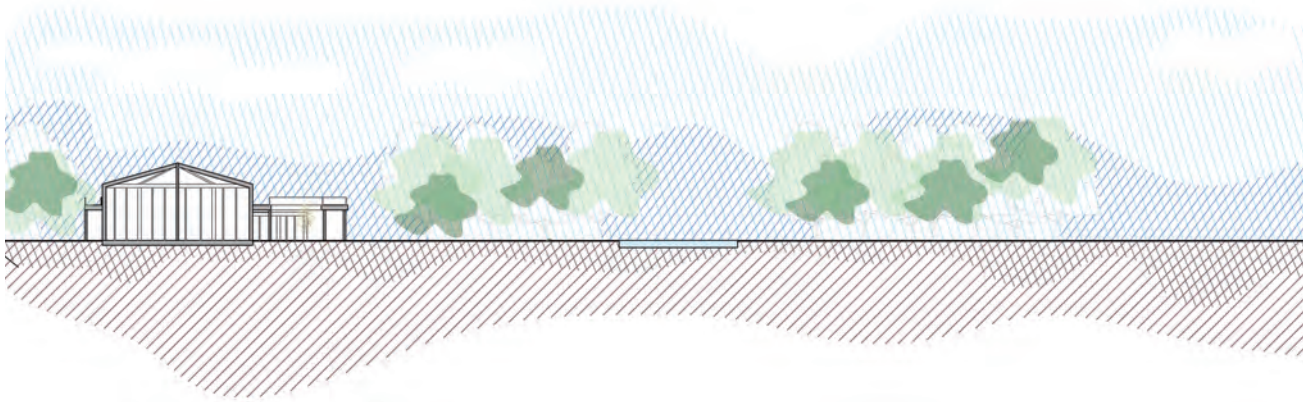


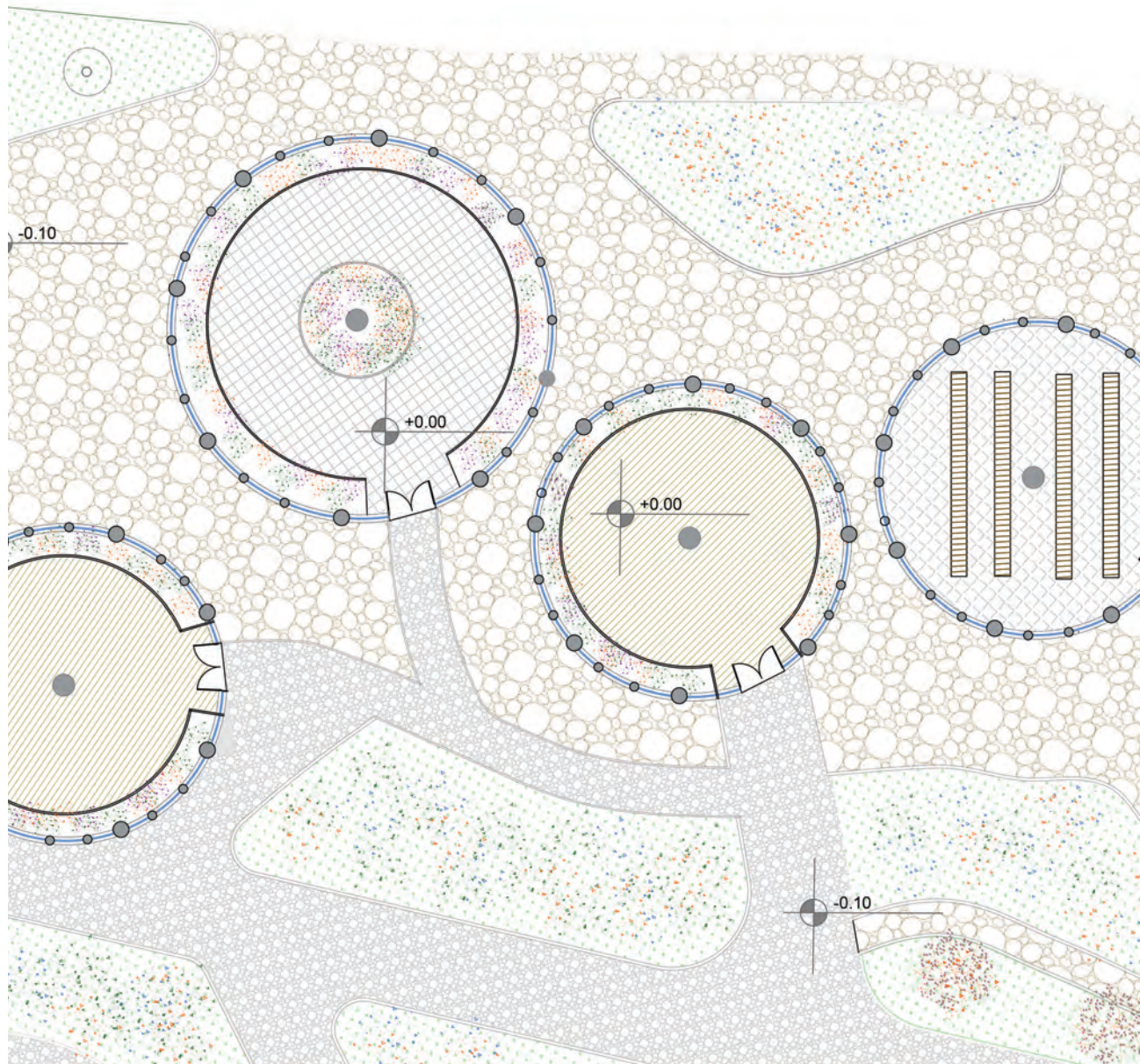
urroundings

330



Situation/compositional solution









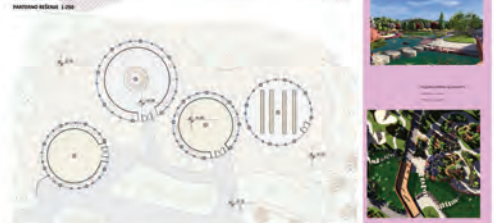
GRADSKI BOTANIČAR

Student: Jaka Mijatović 2022_21125



GRADSKI BOTANIČAR

Student: Jaka Mijatović 2022_21125



Nikola Marković - Oxygen Factory

The oxygen factory was created as a project to restore the brownfield site of the old silos in Valjevo. This derelict industrial site, which symbolically represents air pollution due to its huge chimneys, is now growing into something opposite - a place where oxygen is produced.



SWOT analysis



S

REKA KOLUBARA - prisustvo vodene površine na samoj predmetnoj lokaciji

VEGETACIJA - vegetacija koja se nalazi po obodu lokacije i u neposrednom okruženju

LOKACIJA - lokacija se nalazi na idealnom mestu, kontaktna zona između prirodne i urbane sredine, takođe je i vremenski pristupačna, udaljenost od samog užeg centra grada

W

ZAGAĐENJE VODE - na lokaciji se nalazi velika količina smeća, čiji je uzrok verovatno trenutno ne korišćenje lokacije

AERIZAGADENJE - periodično zagađenje vazduha, najprimetnije tokom zimskog perioda, izazvano velikim brojem individualnim ložištima

TOPLOTNO OSTRVO - na lokaciji je, osim velikih betonskih objekata, prisutna i velika količina betonskih površina koje akumuliraju i emituju toplotu, tokom letnjeg perioda

NEPOROZNE POKRŠINE - veliki broj neporoznih površina koje sprečavaju absorpciju vode

O

NEIZGRADENE PROSTOR - velike količine neiskorišćenog prostora, koji jeste pod betonom, ali je moguće izvršiti revitalizaciju prostora i dati mu novu namenu, takođe osim otvorenih prostora, ogroman potencijal predstavljaju i postojeći objekti koji se takođe mogu revitalizovati i ponovo koristiti bez potrebe za rušenjem istih.

VODENI POTENCIJAL - reka Kolubara predstavlja ogroman potencijal za razvoj lokacije i privlačenje ljudi

SILOS - svojevrsni reper i posle crkve Vaskrsenja Gosposidnjeg najviši objekat u gradu Valjevu

T

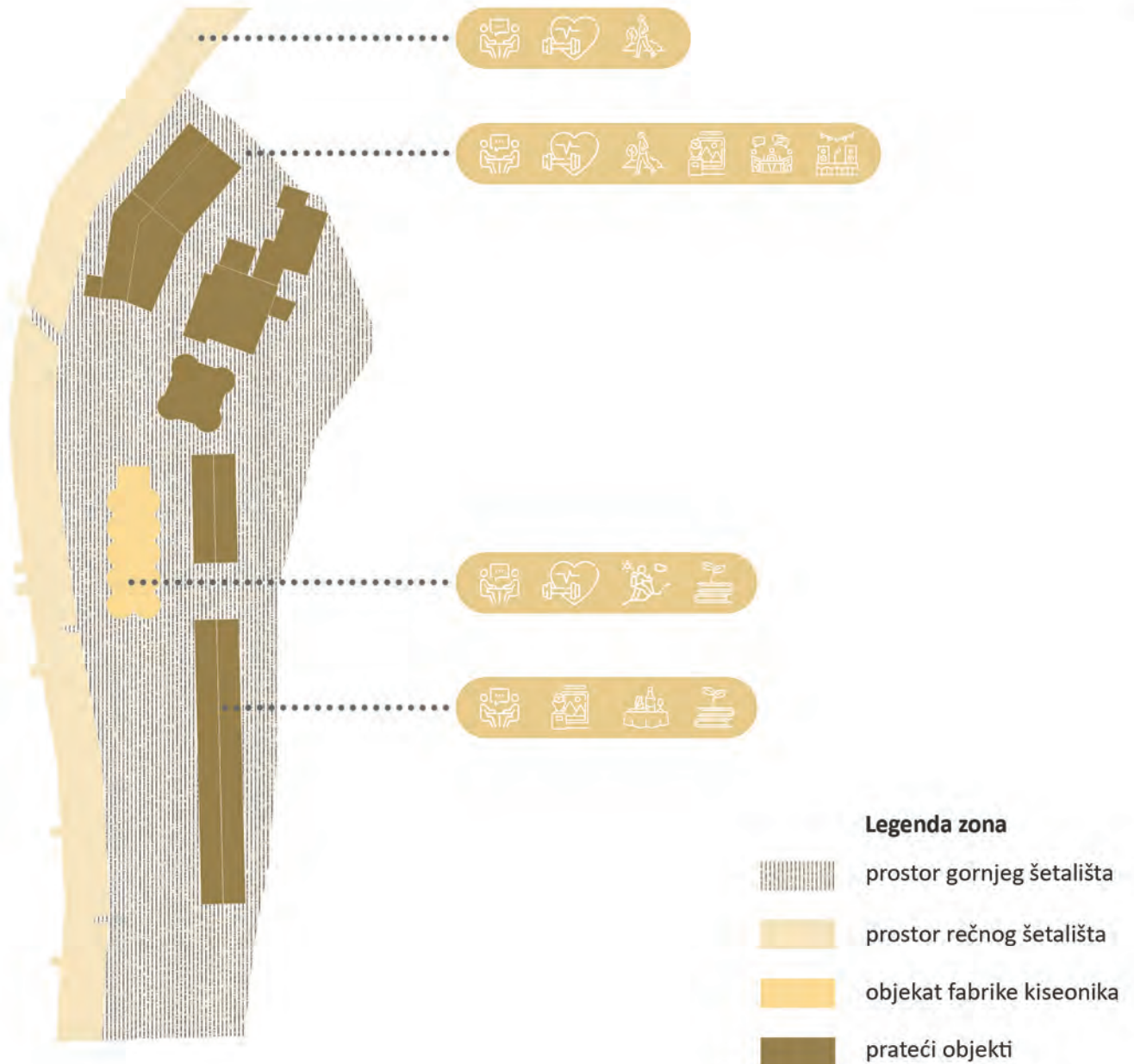
RIZIK OD POPLAVA - kada neporoznim površinama na samom keju i na celoj lokaciji generalno dodamo protok Kolubare duž lokacije dolazimo do zaključka da postoji rizik od poplava

BEZBEDNOST - potencijalno mesto okupljanja bezbednosno rizičnih grupa ljudi

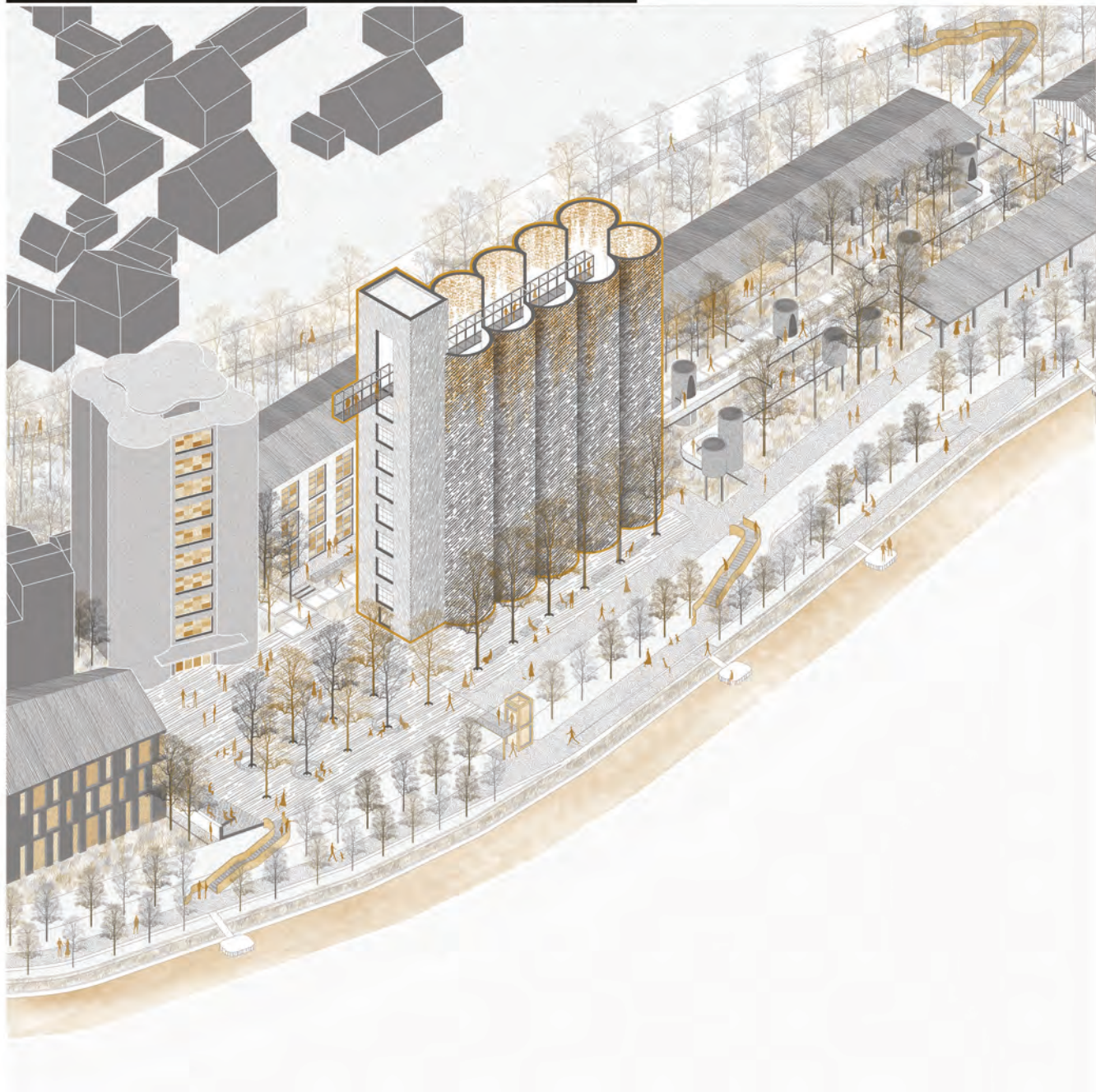
SANITARNI RIZIK - potencijalni rizik da lokacija postane divlja deponija koja bi bila štetna po više faktora

ZAGAĐENJE REKE - trenutno je po hemijskim analizama biološki mrtva reka, što može da dalje ugrozi biodiverzitet van same reke

Program scheme

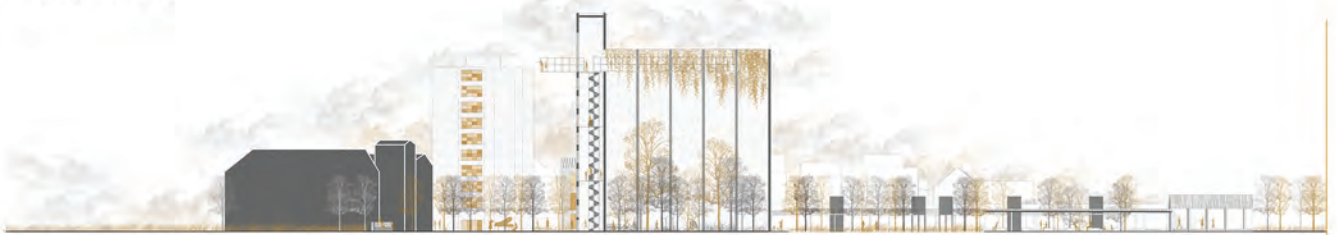


Axonometric scheme of the project

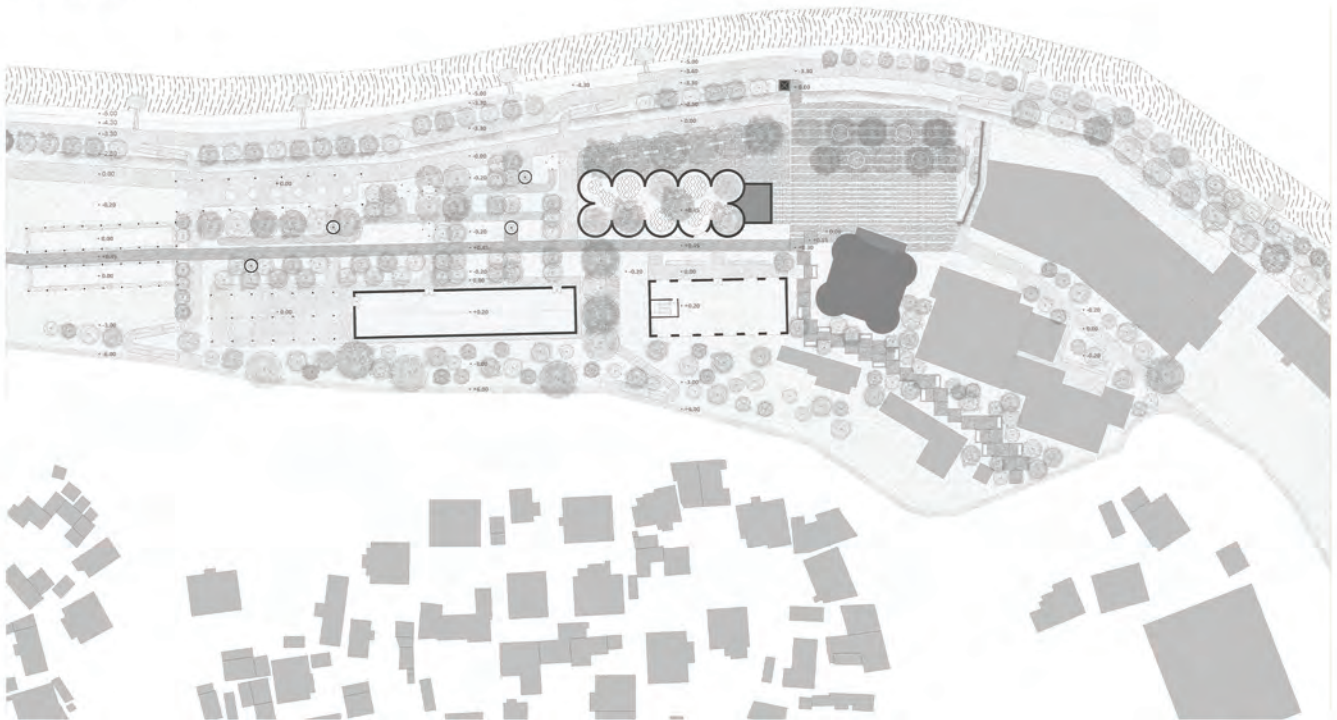


Parterre solution with section

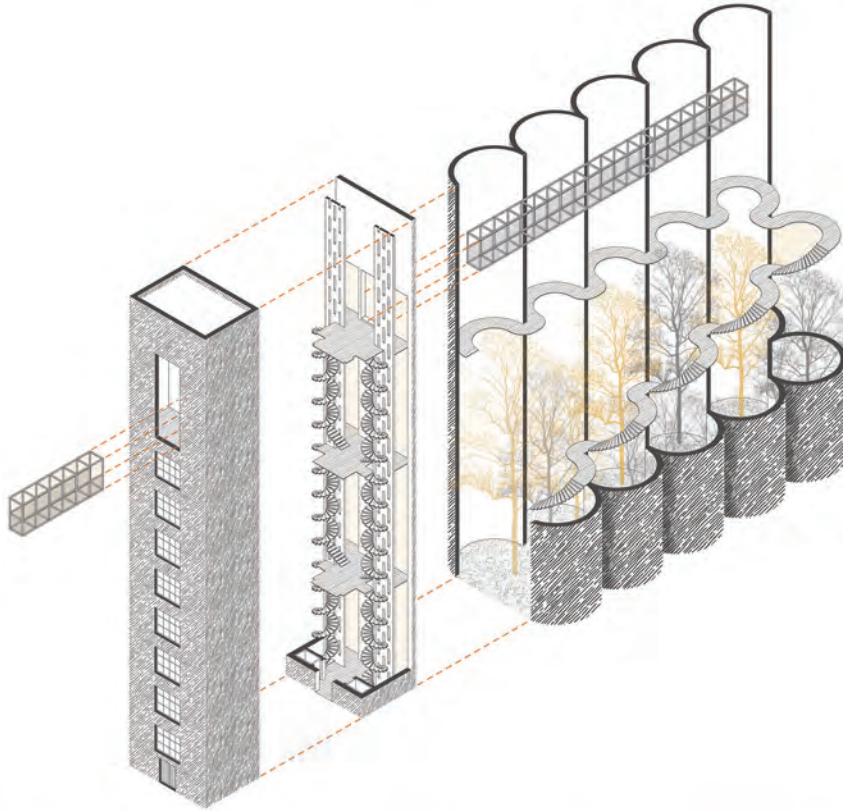
Section 1:500



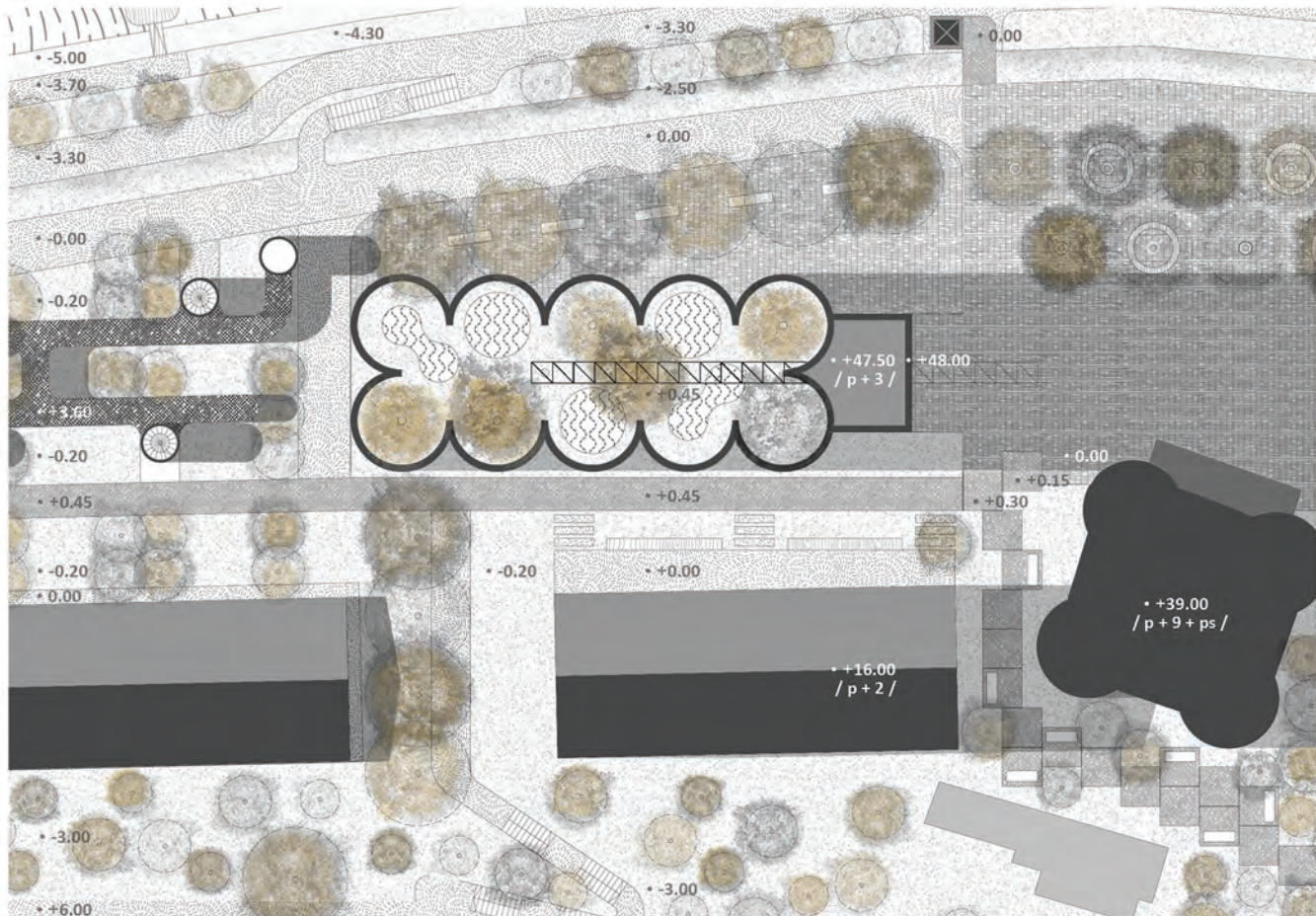
Parterre solution



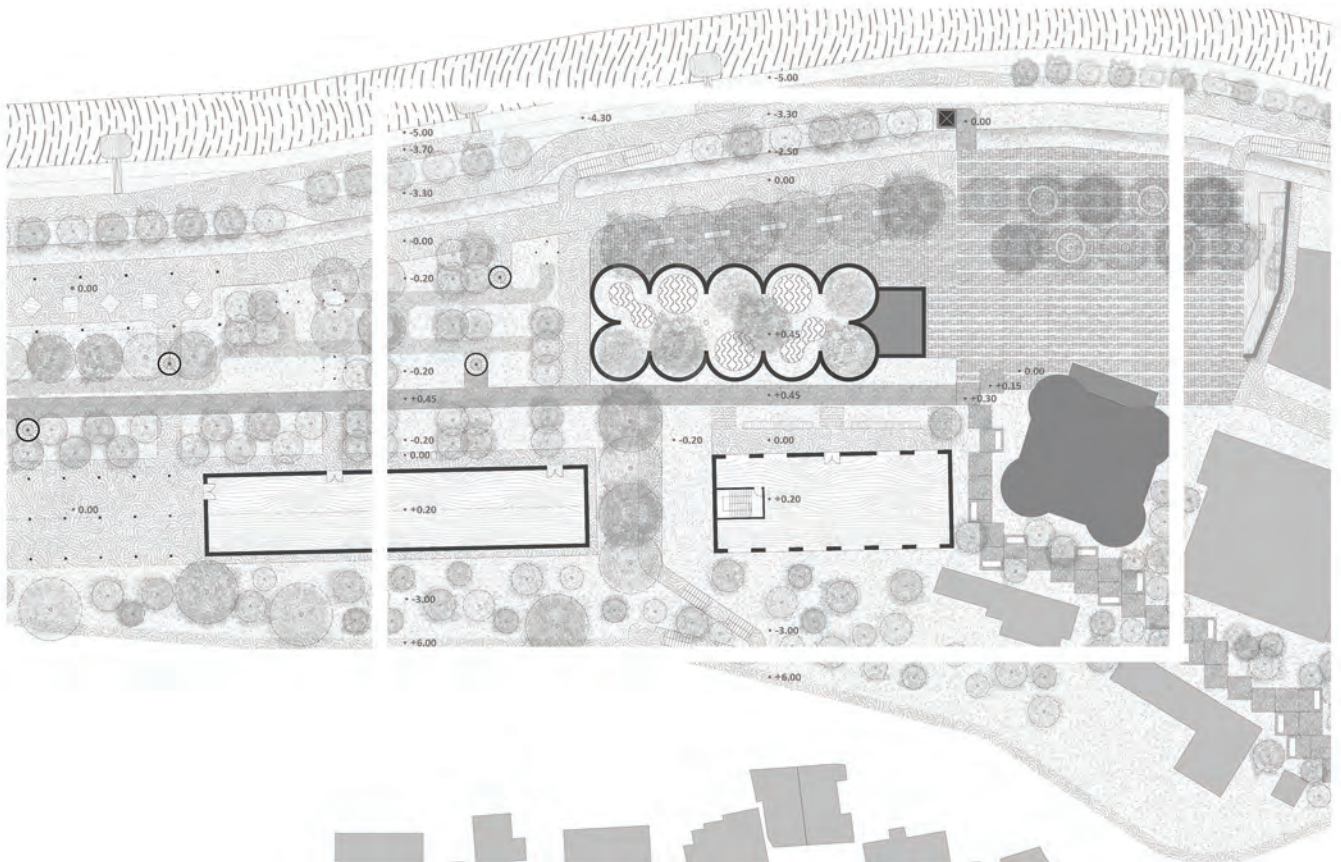
Axonometry and ambients



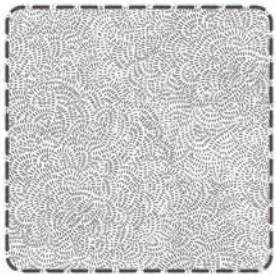
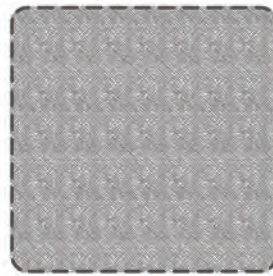
Situational solution of silos



Parterre solution of the silo

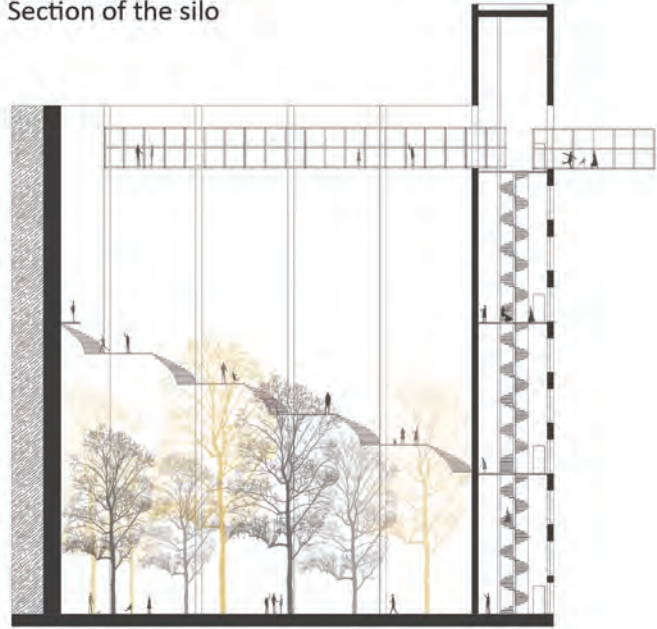


Materials used

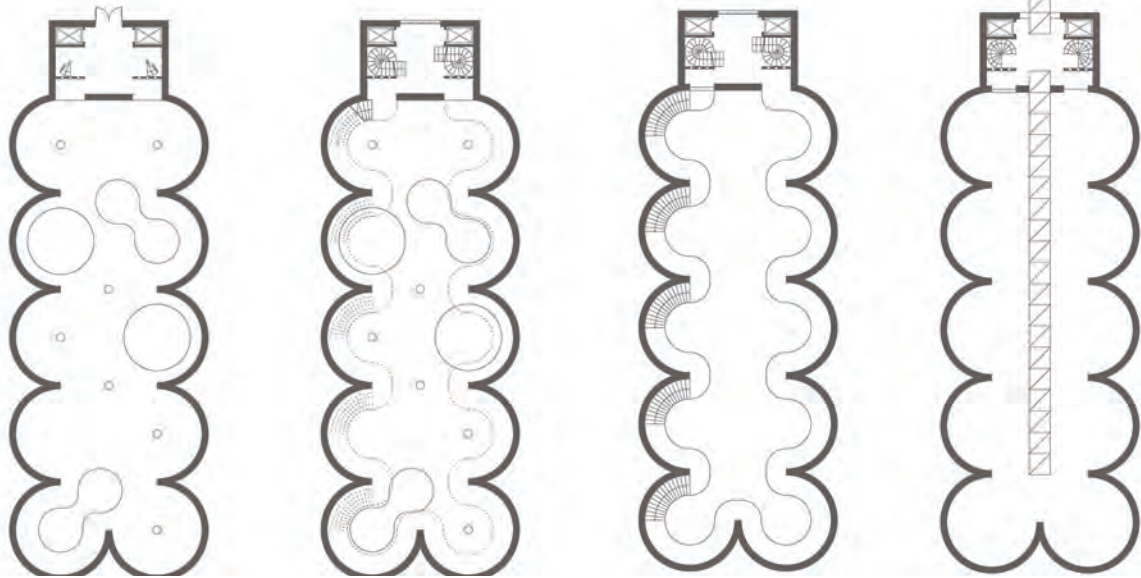


Floor plan and section for the silo

Section of the silo



Floor plans
of the silo

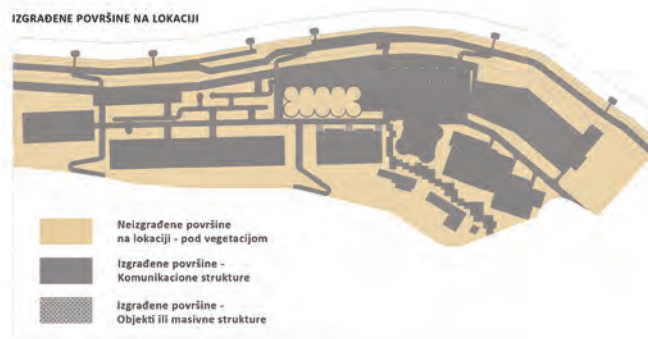


Diagrams

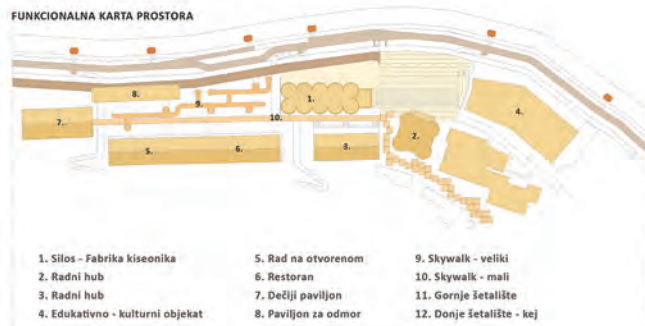
RASPROSTRANJENOST ZELENIH POVRŠINA



IZGRAĐENE POVRŠINE NA LOKACIJI



FUNKCIONALNA KARTA PROSTORA




KOMUNIKACIJSKA ŠEMA PROSTORA





The topic that the project deals with is the storm water management strategy in the urban tissue of Valjevo. Every five to ten years, Valjevo faces floods that, in addition to the coastal areas, devastate the city center as well. The landfill selected for the implementation of the project is Kneza Miloša Street. It is necessary to increase the porosity of the surfaces in that street, to design systems that will collect and purify rainwater, but also to create zones that will cool the space on hot days. The plan is to add structures that resemble an inverted umbrella that will have multiple functions; on warm days it will provide shade, while on rainy days it will collect rainwater. In addition to that structure, the project also includes green facades, porous paving and bioretentions that will ensure a natural cycle of water movement. Also, it is planned to connect the city center with the coast by creating structures for sitting and resting on the coast, which will attract people from the city center to go down to the coast and enjoy the river.




S


GREEN AREAS 

EDUCATIONAL INSTITUTIONS 


GATHERING PLACES 


GOOD CONNECTIVITY (BRIDGES) 


W

LACK OF PARKING SPACE 

HEAT ISLANDS 


LACK OF GREENERY 

DISCHARGE OF SEWAGE 

NON-POROUS SURFACES 

O


ACTIVATION OF THE COAST 


NEW FOOTPATHS ALONG THE RIVER 


ACTIVATION OF THE CITY CENTER 

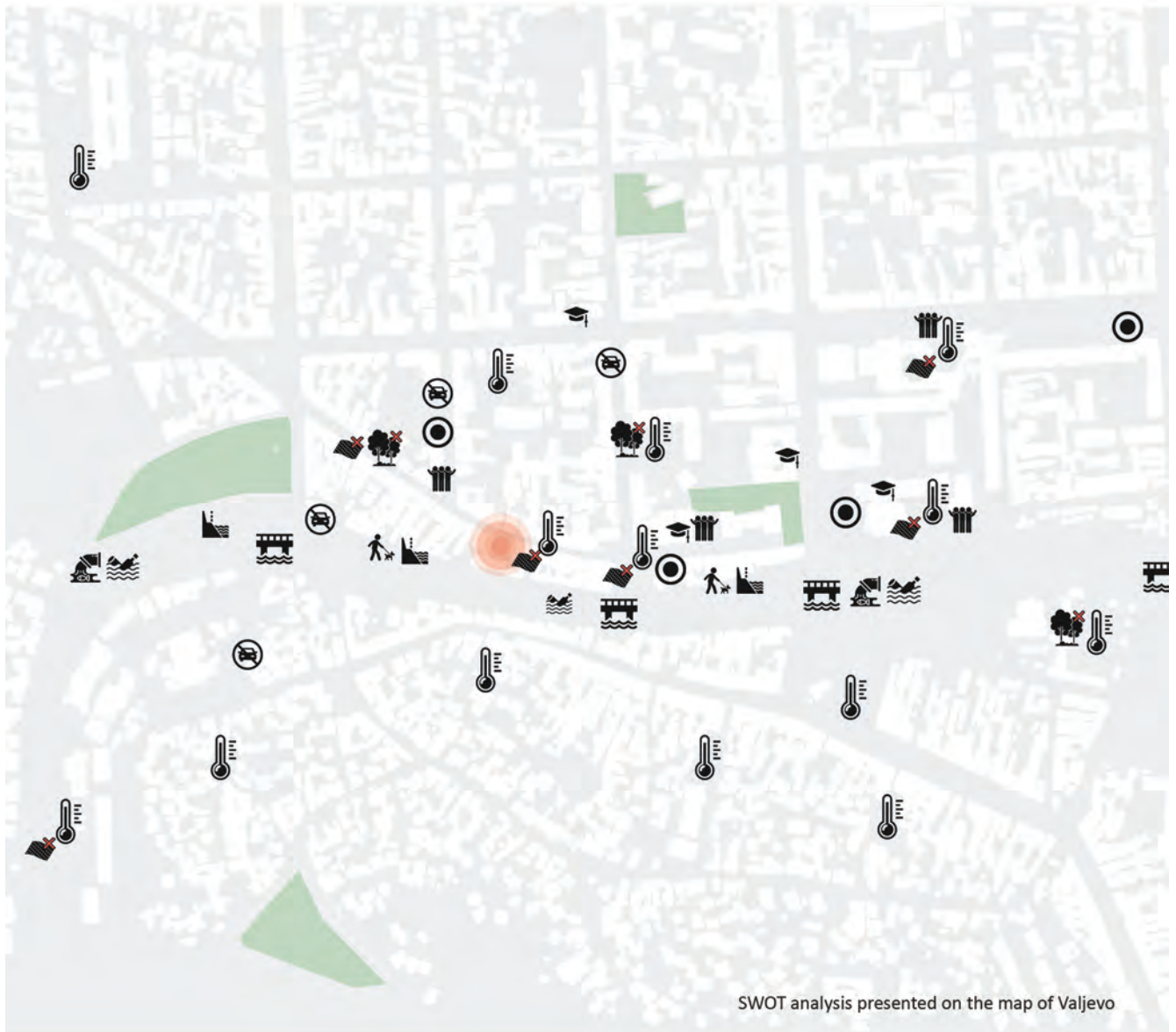
ORGANIZING SEASONAL EVENTS

T

HEAT ISLANDS 

RIVER POLLUTION 

DISAPPEARING GREENERY 

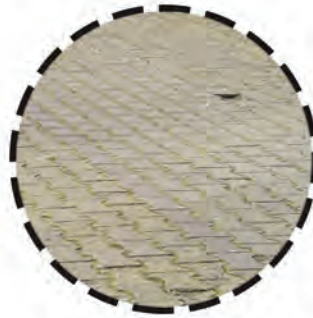


SWOT analysis presented on the map of Valjevo

What problems do we solve?



FLOODS



NON-POROUS CURTAINS
LACK OF GREEN AREAS



SPACE ACTIVATION
INTRODUCTION OF NEW CONTENT

What potentials do we use?



GATHERING PLACE



PEDESTRIAN ZONE



GOOD CONNECTION WITH THE
REST OF THE CITY

Conclusion

Management of atmospheric waters, in addition to its primary function of regulating the impact of atmospheric rainfall in urban areas, also contributes to the prevention of heat islands and cools the environment. Its design can make spaces more attractive, and it can be easily applied in other locations in the city that also have similar issues.

EXPECTED GOALS/RESULTS



NATURAL WATER CYCLE



**CLIMATE ADAPTATION MEASURES AND
URBAN QUALITY**



**RESILIENCE TO FUTURE
CLIMATE CHANGE**



**MORE POROUS SURFACES
IN URBAN FABRIC**



**FILTERS FOR PURIFYING
ATMOSPHERIC WATER**



MORE ATTRACTIVE SPACE

Climateproof ZOHO (Rotterdam)

Rotterdam is the second largest city in the Netherlands. The city is known worldwide for its seaport, which is the largest in Europe. 40% of the Netherlands is below sea level, and even 80% of Rotterdam is below sea level. That being said, the state is known worldwide for its ability to defend itself against extreme floods. The main goals of this project are to provide the citizens of Rotterdam with clean water, to increase the city's attractiveness, as well as to create a high-quality stormwater drainage system.

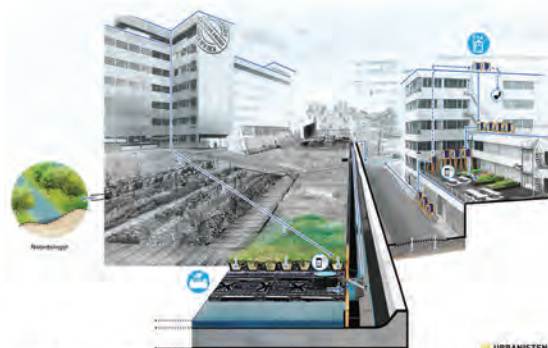
Permeability

The need to increase permeable surfaces in urban areas is one of the biggest challenges for cities that want to face a changing climate and reduce the consequences of extreme precipitation and the creation of torrential flows.

ZoHo projects aim to increase porous surfaces in the dense urban fabric, which is mostly covered with solid and poorly permeable materials due to the high percentage of population. It is necessary to reduce the pressure suffered by the sewage system during rainfall and floods, by introducing new, more porous surfaces that will absorb part of the water, retain it for a certain time or carry it on. It is important to maintain the natural cycle of water movement.



render - location during dry and rainy periods



WSUD system - section

source: <https://www.urbanisten.nl/work/climate-proof-zomerhofkwartier>

Some of the WSUD (Water sensitive urban design) tools are: bioretentions (e.g. rain gardens), greened shallow depressions (swales), porous or permeable paving, sand filters, canals/trenches, lakes and pools (retention or detention), containers/ rainwater collection tanks, power plants, landscape structure elements.

proven to be very useful in channeling rain runoff and are very often applied in this area.

It is an interesting fact that green roofs are not a mandatory technical element, but they have

source: Water Sensitive Urban Design (WSUD) as a climate adaptation strategy
ANDREA FUMERO

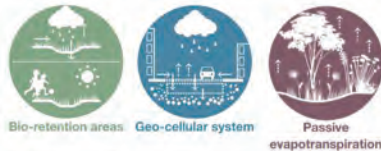
1. Water square Benthemplein



2. Polder roof



3. Rain(A)way garden



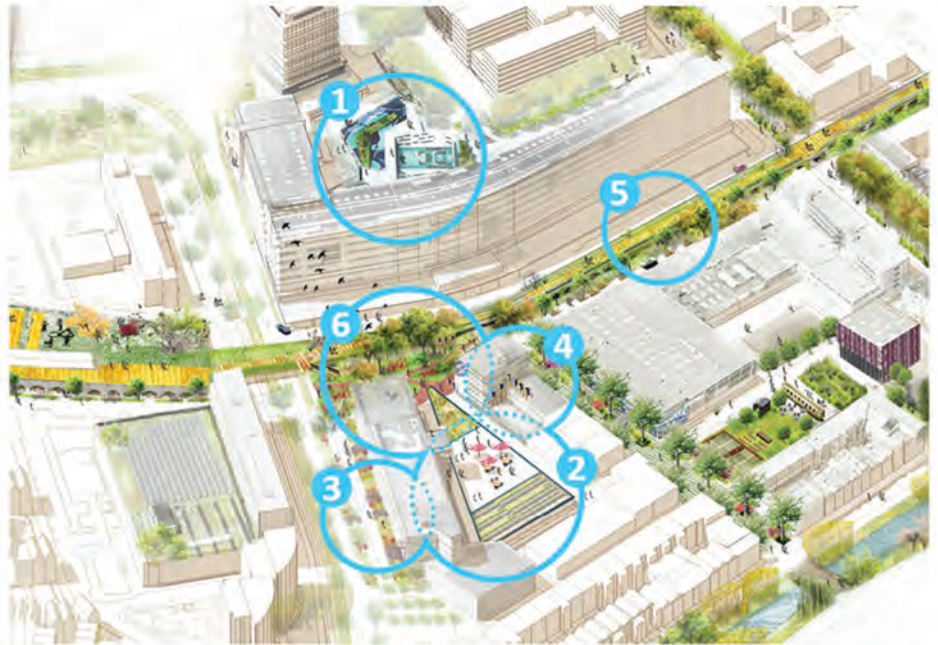
4. ZoHo Rainbareil



5. ZoHo Raingarden



6. Greening Hofbogen



WSUD tools

Climateproof ZOHO (Rotterdam)



ZoHo Rotterdam - montage



ZoHo Rotterdam - montage



Porous paving



Green facade



Rainwater harvesting



Passive evaporation



Main directions



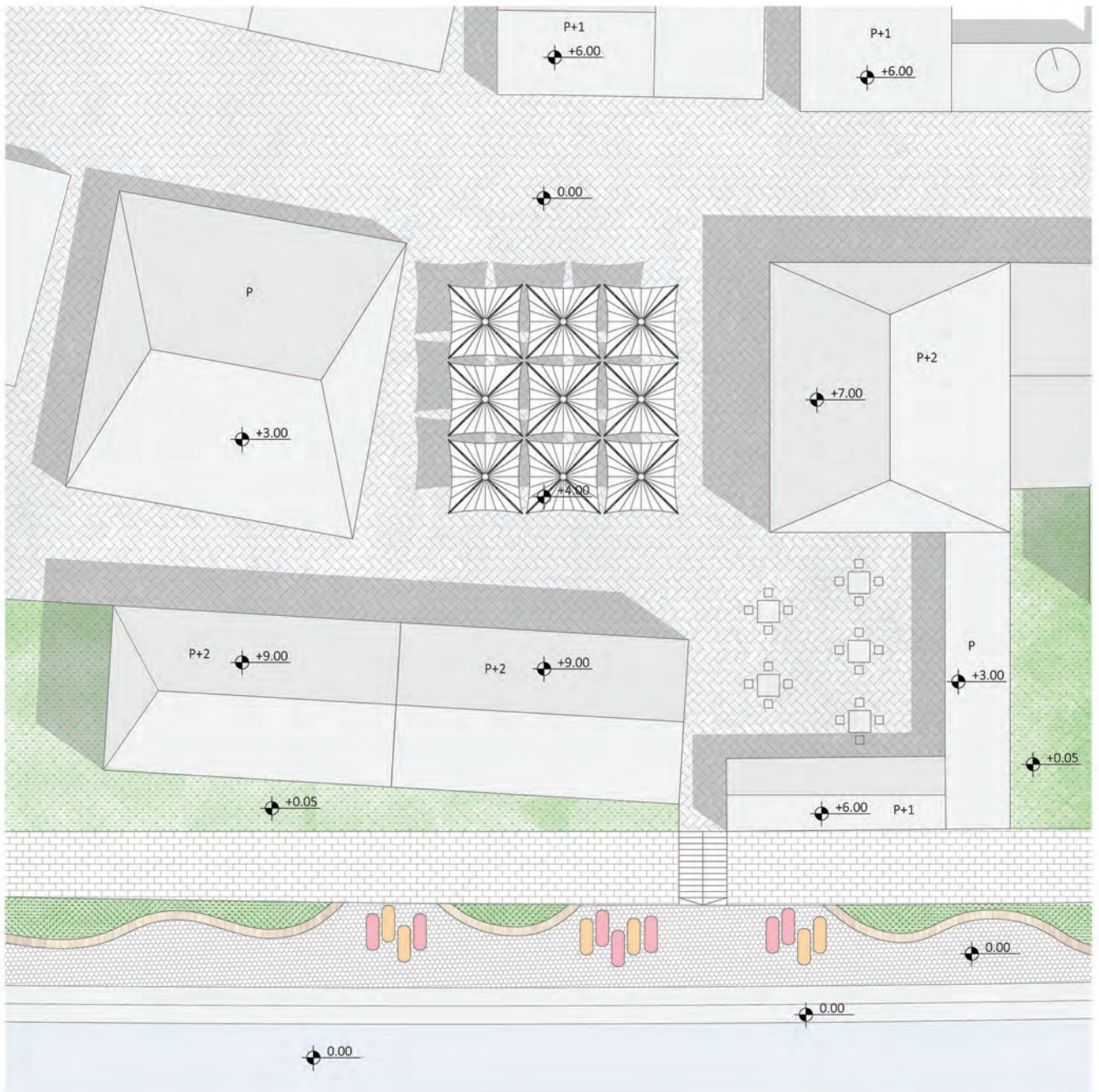
Vehicular traffic



Pedestrian traffic

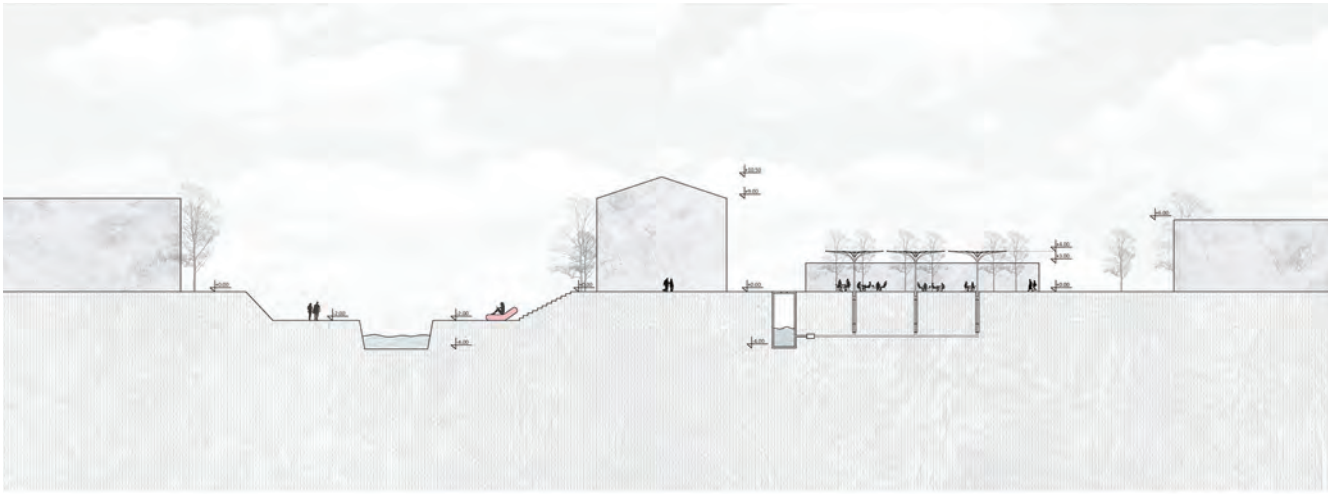


River Kolubara

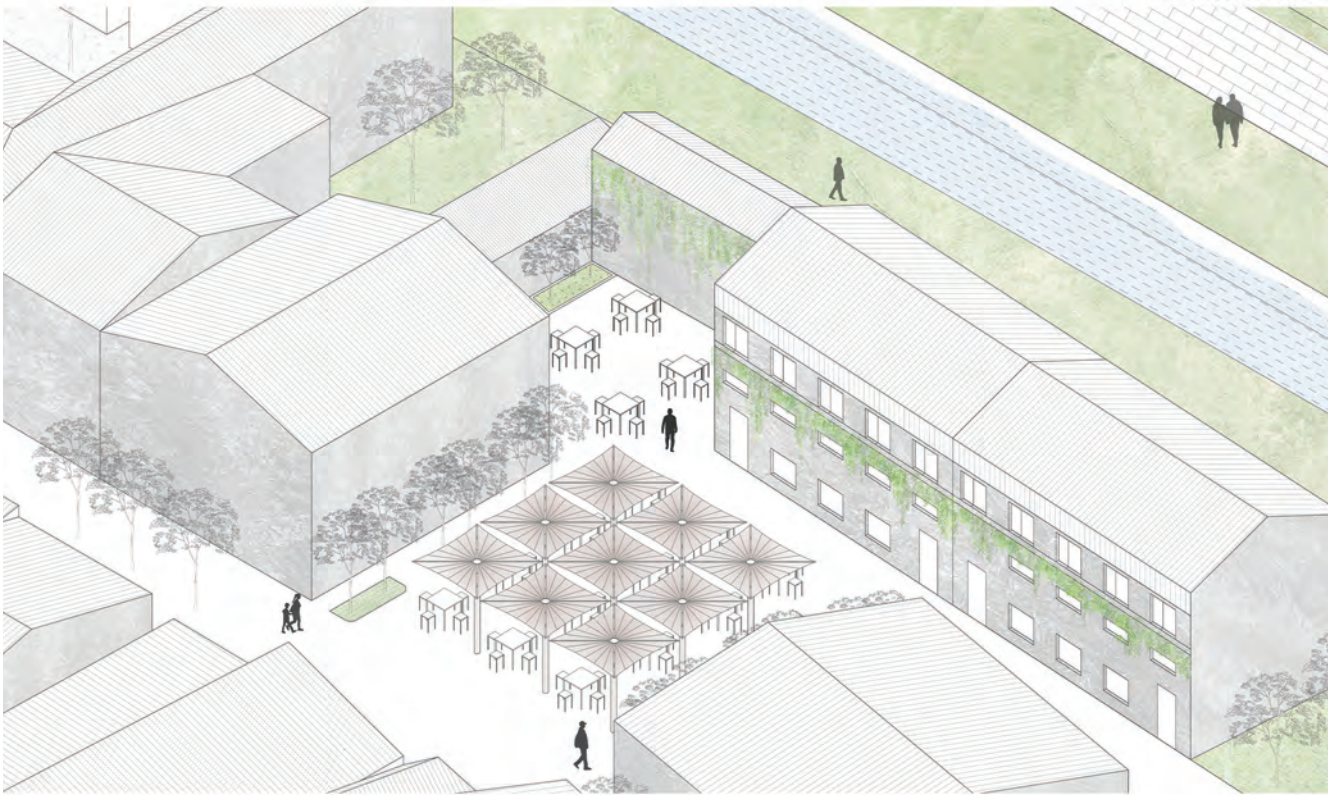


Compositional solution R 1:200

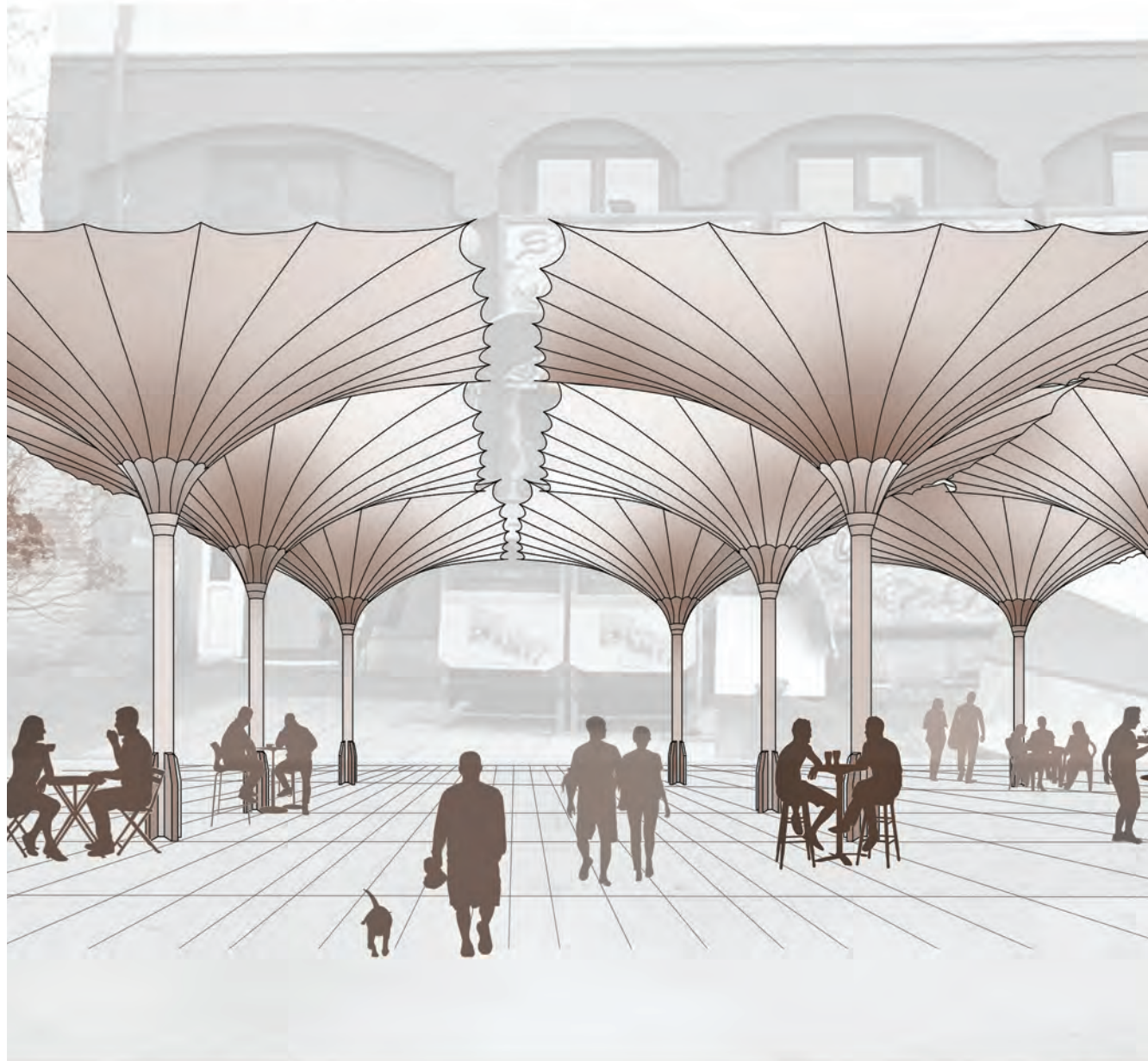


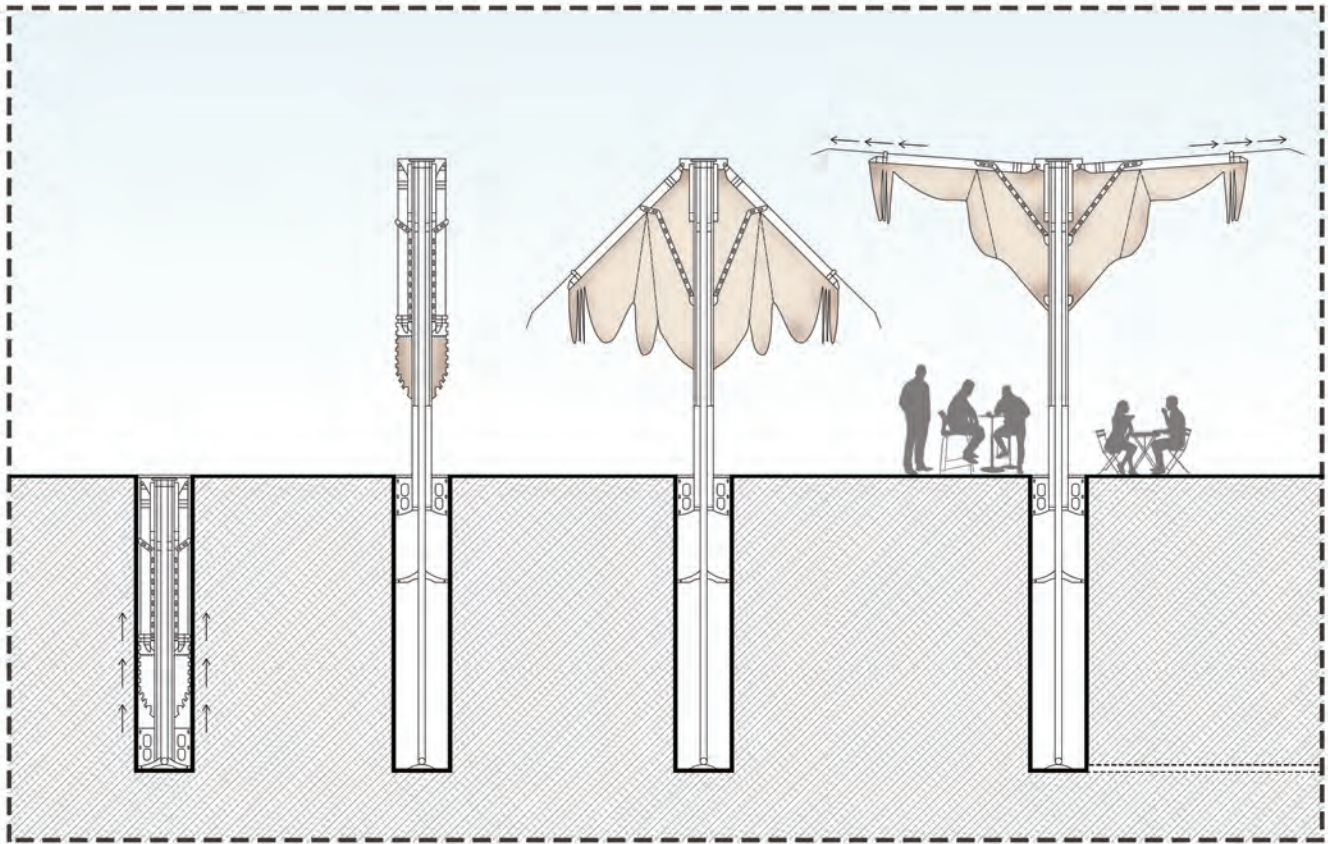


Section R 1:200



Axonometric view





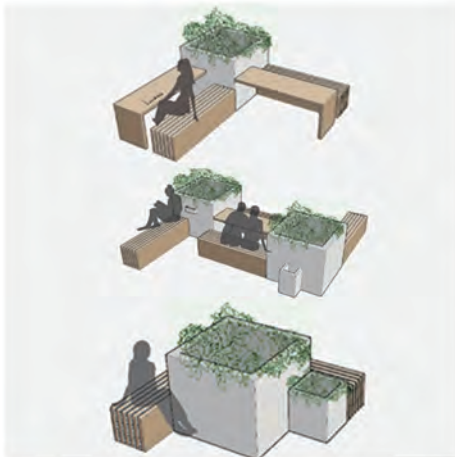
Teodora Živković - HEALING CORNERS, Sustainable urban pockets

Teodora had a concept project for Valjevo, on top of her previously mentioned Ladybug Climate analysis for Valjevo.

“The Climate Tile is a pilot project designed to catch and redirect 30% of the projected extra rainwater coming due to climate change. The Climate Tile reintroduces the natural water circuit in existing cities through a simple process that manages the rainwater from the roof and sidewalks.

Bioreceptive cement

“Respyre has developed an innovative –patent pending– bioreceptive concrete solution. Several unique characteristics of our concrete make it bio-receptive which include its porosity and water retainment, micropore texture, acidity and nutrients that are included in the mixture.





Public greenery in city centre

Valjevo is a pretty green city, as in content of greenery outside of the city core. In the centre of the city as we can see there are only a few green public places. Since there are a lot of single houses, people have greenery in their yards but we cannot say the same for the open public spaces. The lack of greenery is one of the more dominant causes of heat islands. Greenery in public open spaces can help mitigate the urban heat island effect, which refers to the higher temperatures in urban areas compared to surrounding rural areas due to the heat-absorbing properties of built-up surfaces. Lack of greenery can exacerbate the heat island effect, leading to higher temperatures in urban areas.



Public greenery



Mapping of public greenery

Streets and traffic

The design and layout of transportation infrastructure, such as roads, streets, highways, and intersections, can greatly impact traffic flow and efficiency. Well-designed transportation infrastructure can facilitate smooth traffic movement, while poorly designed infrastructure can result in congestion, bottlenecks, and delays.

In the south of Valjevo which is the old city "Tešnja", has a so called self-appointed traffic network which was made as the city grew. It is made from long-lasting quality materials, but not really planned as it should be. The north of the river Kolubara we can see orthogonal array of streets which is clearly the new and planned part of the city.



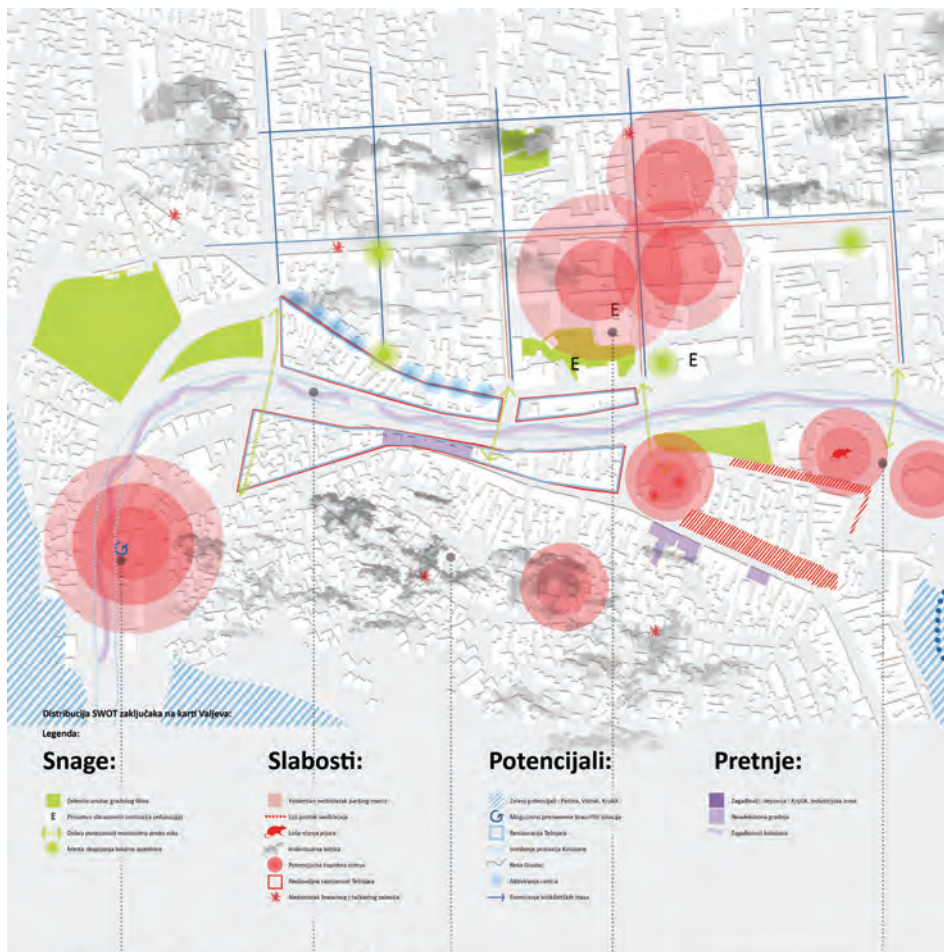
City streets



Tamara Mladenović - Cliche and studio process tracking

Tamara had the task of monitoring the process of the Cliche workshop and studio projects during the semester. The product of the work during the semester is this book. The process is shown on the exam in the form of a poster in the picture on the next pages. In addition to this, a total analysis of the entire city of Valjevo was prepared for the exam as a final element, serving as the beginning of all individual projects.





SWOT ZAKLJUČAK

Student: Tamara Mladenović 2022_21002

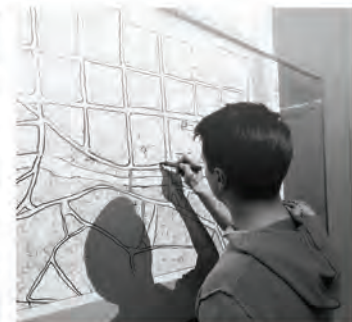
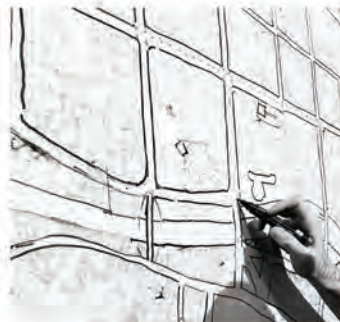
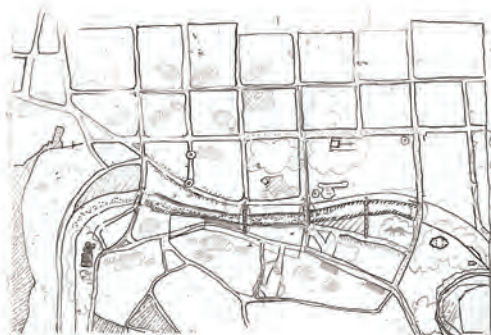
FOTOGRAFIJE KARAKTERISTIČNIH MESTA VALJEVA <https://www.google.com/maps/@44.2084071,18.8890012,83.9428006a,348.9419488,63.9105.3776111,0,0,0>

Univerzitet u Beogradu - Arhitektonski fakultet
 Projekat završen 2022/2023
 Studija M203 - Partecipativni urbanistički dizajn - Projekat
 Nastavnik: dr Zoran Đukićević, redovni profesor / dr Jelena Zakonić, vanredni profesor
 Saradnik: dr Predrag Ivanović, asistent
 Učesnik u nastavi: Stefan Stanić, in. arh.



	FIZIČKA STRUKTURA	SOCIO-KULTURNI ASPEKT	FUNKCIONALNA STRUKTURA	KLIMATSKI ASPEKT	ZDRAVSTVENI ASPEKT
S	<ul style="list-style-type: none"> - Postojanje urbanističkih planova za grad Valjevo (ortela, podloga, informacija o fizičkoj strukturi) - Veliki procenat zelenih površina, kako u centru grada tako i u njegovom bliskom okruženju (Višnjič, Krušik, Pečina) 	<ul style="list-style-type: none"> - Aktivno učesnik lokalnog stanovništva u rešavanju problema grada - Prisustvo brojnih nevladinih organizacija koje se bave različitim životne sredine, klimatskim promenama i zdravstvenim pitanjima, obrazovanjem ljudi putem lokalnih medija i radionica - Rastući broj obrazovanih stanovnika, što dovodi do veće svesti o klimatskim promenama, zagađenju i zdravstvenim problemima 	<ul style="list-style-type: none"> - Dobra povezanost dve obale Kolubare brojnim mostovima - Čitljiva ortogonalna matrica u severnoj zoni Valjeva olakšava transport i kretanje 	<ul style="list-style-type: none"> - Postojanje jakle lokalne zajednice i NGO koje se bave pitanjem klimatskih promena - Inicijative gradskih organa u podršci programima zaštite životne sredine (Program zaštite životne sredine 2016-2025) - Program "Boja energije" koji se bavi poboljšanjem energetske efikasnosti stambenih objekata - Reka Gradac kao jedna od najčistijih u Srbiji 	<ul style="list-style-type: none"> - Slobodni prostori pored reka - Dobra opremljenost zdravstvenih ustanova
W	<ul style="list-style-type: none"> - Loše stanje infrastrukture u određenim delovima grada - Blizina deponije, braunfilid lokacija i Krušik fabrike stambenim objektima - Loša integracija vodenih tokova - Nedostatak parking mesta - Slaba održavana gradska pijaca 	<ul style="list-style-type: none"> - Visok nivo zagađenosti vazduha u gradu, posebno utiče na ljude stariji od 50 do 59 godina tokom zimskog perioda - Većina zaposlenog stanovništva se nalazi u sekundarnom sektoru, izložena je radu na otvorenom i zagađenju - Veliki procenat stanovništva koristi igalj u individualnim kućima i time doprinosi zagađenju vazduha 	<ul style="list-style-type: none"> - Nedostatak parking mesta u centru grada - Nedostatak zelene infrastrukture u centru grada, Bliz puteva i ulica 	<ul style="list-style-type: none"> - Veliki broj individualnih ložišta na ugaj i drvo - Odsustvo kanalizacione mreže ima negativan uticaj na zemljište i vode Valjeva - Postojanje industrije kao što je Krušik ima loše uticaje na čistoću vazduha, kao i zdravlje zemljišta i vode 	<ul style="list-style-type: none"> - Zagađenost Kolubare - Problem sa kanalizacijom - Otpor ljudi ka rešenju ovih problema
O	<ul style="list-style-type: none"> - Zainteresovanost nacionalnih i evropskih institucija za unapređenje fizičke strukture grada - Restoracija Tešnjara u cilju održavanja kulture i povećanja turizma - Aktivacija obale reke Kolubare - Dodatna aktivacija zelenih površina oko reke Gradac kao omiljenog mesta za razonodu stanovnika - Potencijal obnove braunfilid lokacija kao što su Šilov 	<ul style="list-style-type: none"> - Edukacija lokalnog stanovništva putem medija i događaja - Povezivanje sa lokalnom radi smanjenja broja individualnih ložišta 	<ul style="list-style-type: none"> - Moguće formiranje biciklističkih staza, naročito u severnom delu grada čiji je teren prilično ravan - Moguće dodatna aktivacija starog centra 	<ul style="list-style-type: none"> - Klimatski potencijal je neverovatno prirodni položaj grada na 3 reke : Kolubare, Gradac i Ljubostinja - Okolina Valjeva je šumovita - Moguće formiranje povezane zelene infrastrukture zelenih površina grada i obala reka, koje bi značajno uticalo na klimatsko stanje grada, a ujedno i na njegov identitet 	<ul style="list-style-type: none"> - Mogućnost povezivanja sa sistemom daljinskog grejanja (smanjenje broja individualnih ložišta) - Postojanje organizacija koje se bave problemima zagađenja
T	<ul style="list-style-type: none"> - Neregularna gradnja u gradu - Neregularna gradnja u okruženju Valjeva - Divčibare - Građevinski radovi u blizini brane na Tešnjari i oštećena opasnost koju to predstavlja za sam grad - interes investitora za građevinske projekte (takođe i prilika) - Veliki broj toplinskih ostrva u centru grada - nedostatak porozičnih površina 	<ul style="list-style-type: none"> - Smanjenje broja stambenih i povećanje prosečne starosti čiji okruženje manje pogodljivim na klimatske promene i porozičnih bolestima - Smanjeni broj zelenih površina u centru grada dovodi do visokih temperature i toplinskih talasa koji utiču na ranjive grupe kao što su starije osobe i deca 	<ul style="list-style-type: none"> - Preveliko zagrevanje centra grada zbog nepromišljenog položaja "trgova", ulica, i njihovih veza. Oveone doprinose i parkirani automobili po trotuarima 	<ul style="list-style-type: none"> - Zagađenje vazduha predstavlja značajnu pretnju za ljudsko zdravlje - Neadekvatno upravljanje rekama može rezultirati ozbiljnim posledicama, kao što su poplave koje je Valjevo doživelo 2014. godine - Primećen porast građevinskih aktivnosti u svim sektorima može pogoršati već loše stanje ovih aspekata ukoliko nije pravilno regulisano 	<ul style="list-style-type: none"> - Toplana, Krušik, individualna ložišta (izvor zagađenja vazduha) - Blizina deponije gradu - Čestice PM 10 (čija koncentracija nije kontrolisana na Valjevskom institutu)

FOTOGRAFIJE SA FAKULTETA TOKOM ČASA - ZAJEDNIČKE SWOT ANALIZE





CLICHE

**participativni
urbani dizajn**

Valjevo, 2023.

Climate Change, Cities,
Communities and
Equity in Health



PROCES PUD + CLICHE

Student: Tamara Mladenović 2022_21002

Univerzitet u Beogradu - Arhitektonski fakultet
Prolećni semestar 2022/2023
Studio MOZU - Participativni urbani dizajn - Projekat
Nastavnici: dr Zoran Đukanović, redovni profesor / dr Jelena Živković, vanredni profesor
Saradnik: dr Predrag Jovanović, asistent
Učesnik u nastavi: Stefan Slavnić, m.arh.



PAPS: Public Art and Public Space 09



09.1. PUBLIC ART AND

PUBLIC SPACE

Public art and public space project and organization participated in CLICCHE as well. Students had an opportunity to create public art, installations and performances regarding climate change and equity in health.

Objectives of Public art and Public space project in general are:

- “Integration of art into process of urban planning and urban design with a purpose to establish new framework for evaluation and improvement of public spaces in Belgrade and Serbia
- Public participation: activation and involvement of local community, different institutions and City government into urban design process
- Identification, evaluation and improvement of public spaces in Belgrade.
- Creation of a search-able database of public spaces in Belgrade (input for future action).
- Activation of spaces with cultural, historical and representative potentials
- Education of new generation of professionals in the field of public art
- collaboration between Faculties of architecture, fine arts, applied arts, landscape design, performing arts, etc. in education of new generation of professionals that can collaborate in overall design process in context of Bologna declaration

PAPS project explores possibilities for redefinition of public spaces use and design in Serbian context.

From : <https://www.publicart-publicspace.org/about/walkthrough-paps-project>





CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

711.4.012(497.11)(082)

CLICCHE Participatory Urban Design / [editors Zoran Đukanović ... [et al.]].
- Beograd : University of Belgrade, Faculty of Architecture, 2023 (Beograd
: Službeni glasnik). - 380 str. : ilustr. ; 21 x 21 cm

“The book is published as an integral part of the project: Climate Change, Cities,
Communities and Equity in Health Erasmus+ cooperation partnerships in higher
education ...” --> kolofon. - Tiraž 300. - Str. 4-12: Introduction / Editors.

ISBN 978-86-7924-348-5

а) Урбани дизајн - Зборници б) Урбанистичко планирање - Зборници в) Ваљево
- Урбанизам - Зборници

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