



# THE IMPORTANCE OF ADAPTING TO CLIMATE CHANGE IN URBAN AREAS

Conference proceedings

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**Slovenian Association of Landscape Architects**

# COLD CITIES FOR A HOT PLANET

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ADAPTING TO CLIMATE CHANGE  
IN URBAN AREAS

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Slovenian Association of Landscape Architects

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# OPENING STATEMENT

## SLOVENIAN ASSOCIATION OF LANDSCAPE ARCHITECTS

**Barbara Kostanjšek**

*President of the Slovenian Association of Landscape Architects*

Each year, climate change is becoming a bigger challenge. Currently, we are paying particular attention to climate change in relation to damaging extreme weather events. Adapting to climate change, however, calls for preventive and strategic action. The effects of climate change are also becoming increasingly prominent, which is why we can expect their further intensification in the future, especially in urban areas that are, particularly in the event of heat waves, already bearing the brunt.

The publication before you summarises the contents of the digital conference Cold Cities for a Hot Planet: The Importance of Adapting to Climate Change in Urban Areas. It addresses the challenges we are currently facing in urban areas and, with the contributions of a wide range of experts, presents possible approaches to responsible spatial planning of climate-responsible urban areas.

The challenges posed by climate change have introduced a new dimension into spatial planning, which requires integrated and long-term considerations. In the following, we thematically present and discuss various planning approaches that have already been established or are still being implemented at various levels in theory and practice. Special attention is paid to planning and management of urban areas, especially in the case of the city of Ljubljana as a model of good practices and possible lines of action. A comprehensive consideration of the issue from various viewpoints addresses not only the technological and ecological aspects of spatial planning as a response to the challenges of urban warming, but also the social aspects of city development, the importance of awareness and of overcoming barriers in cooperation between professionals and other stakeholders.

With the conference and its contents presented in this publication, the Slovenian Association of Landscape Architects (SALA) wishes to inform the professional and general public that early and comprehensive action in the form of quality spatial planning contributes to improved living standards and comfort of urban residents, and builds the foundations of urban sustainability for the future. With the conference proceedings, we strive to help outline the future planning recommendations for climate-responsible urban areas, as well as to encourage the raising of social awareness and responsibility. By recognising that we are only at the start of integrating climate change into spatial planning, we believe that further joint meetings and coordination of knowledge and viewpoints will be needed to achieve desired results and effective cooperation.

You are kindly invited to continue reading!

# OPENING STATEMENT

## MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING

Mag. Lenča Humerca Šolar

*Head of the Strategic Spatial Development Division,  
Ministry of the Environment and Spatial Planning,  
Spatial Planning, Construction and Housing Directorate*

The awareness of the role of spatial planning in adapting to climate change was recognised at the beginning of this millennium, when the first Spatial Development Strategy of Slovenia was adopted. Even back then, the document was founded on the realisation that sustainable development in cities is conditioned by the adaptation to climate change. The strategy clearly defined the guidelines that are still relevant today, while also remaining, unfortunately, largely unfulfilled. Climate change has a long-term impact not only in terms of water, food, energy, and other supplies, but also in terms of prospects for future development, quality of life in cities, and security.

The new Spatial Development Strategy of Slovenia, which is currently in the phase before being submitted to the Government and the National Assembly, also implements the climate goals set out in the Paris Agreement on climate change, which represent an integral part of the spatial development guidelines: the optimal mitigation of and adaptation to climate change.

The Strategy identifies climate change as a fundamental challenge for future spatial development, because Slovenia lies in an area that will experience significant effects of climate change in the future due to its geographical position in the southern part of the Alps and its mountainous terrain.

Today, we cannot talk about spatial development other than in connection with the mitigation of and adaptation to climate change, which is why the Strategy does not provide specific guidelines for adapting to climate change. They are namely an integral part of its entire content: the vision, the goals, and the concept of spatial development, as well as of the guidelines for its implementation.

The Strategy addresses climate change through several related spatial topics:

- rational use of resources (orientation towards a rational and economical use when coordinating the needs for land and other resources),
- sensible organisation of activities (polycentric urban system as a supporting framework, consisting of cities and urban settlements acting as centres providing services, jobs, and supply for their gravity areas),
- green infrastructure and green systems,
- sustainable mobility (improvement of infrastructure, especially railway infrastructure for efficient connectivity, and hubs for sustainable mobility),
- strengthening resilience (withdrawal of settlements and infrastructure from floodplains).

The consequences of climate change in Slovenian cities and urban settlements do not seem as dramatic as elsewhere in the world due to their relatively small size and spatial interconnection with rural areas. They are nevertheless facing challenges that are reflected in increasing exposure to the impacts of higher temperatures and floods.

Our Vision of Spatial Development states that in the future residents will live in close contact with nature. Settlements will be intertwined with natural elements, with residents using technological and organisational solutions based on natural processes. Urban settlements will be distinguished for recognisable architecture and energy-efficient buildings. Sustainable mobility and regulated spaces will prevail in public areas. With the growing proximity of residential areas and services, digitalisation, the convergence of employment centres, and the introduction of new forms of work, the need for mobility and daily migration will be reduced, thus supporting the transition to a carbon-neutral society.

In addition to the urgent need to achieve the set climate goals, the adaptation to climate change offers itself primarily as an opportunity to reduce pollution, green cities, improve infrastructure, sustainably renovate neighbourhoods and buildings, and implement innovative solutions in the field of sustainable mobility and energy supply. It is hence an opportunity that can be used to make our cities and other settlements more pleasant to live in and more attractive for economic activities.

In conclusion, I believe that we do not have to wait for global agreements and strategies to improve the current situation. We can act on our own and we can act now!

# OPENING STATEMENT

## CITY OF LJUBLJANA

Ivan Stanič

*Head of the Department for Administrative Tasks and General Affairs,  
City of Ljubljana, Department of Urban Planning*

The topic of this year's meeting is timely and pressing.

The world's lockdown from March to June showed that the world can be different, at least in relation to nature and the environment, as well as in interpersonal relationships. The economy, in particular tourism and in parallel also culture have suffered, but other subsystems have been shown to flourish. Social networks have been flooded with appeals to get back to normal, saying this should be over soon so that everything will be the way it was or the way it usually is. Others rejected such an appeal. Why shouldn't it be different? Really, why shouldn't it be different?

It can be seen that it might truly be different, but without persistence it will not be different in the way it could be. Persistence requires significantly more effort, as it involves transdisciplinary innovation rather than traditionalism trapped in academic exclusivity or established production systems. Increasingly complex questions require increasingly complex answers.

For the optimistic stance, i.e. a different world, the basic global value assumptions have already been written. They can be found in the Millennium Development Goals and the Sustainable Development Goals, most recently set out at the Habitat III Conference of the Quito Declaration.

How is it possible then that ideas of giving priority only to certain public interests are arising? For example, energy interests over environmental ones or economic interests over social justice interests. I wonder if the prioritising of one benefit over the other is the consequence of a mistaken approach? Why not rather change the answer to a specific strategic question, so as to derive a concrete goal from the

projects, which would allow us to achieve as many comprehensive value effects as possible instead of sacrificing one at the expense of the other?

Past positive shifts in society can be quickly stopped or significantly changed in direction by political vanity. The excellent, decades-long efforts conducted in the domestic environment have been noticed. For example, the European Union awarded the City of Ljubljana the title of the European Green Capital in 2016. The title has been awarded for past successes and planned activities. This is precisely where the greatest social responsibility of the representatives of various professions, who are directly involved in spatial planning and management, lies.

Let us not give in dear colleagues, dear individuals! Let us not give in!

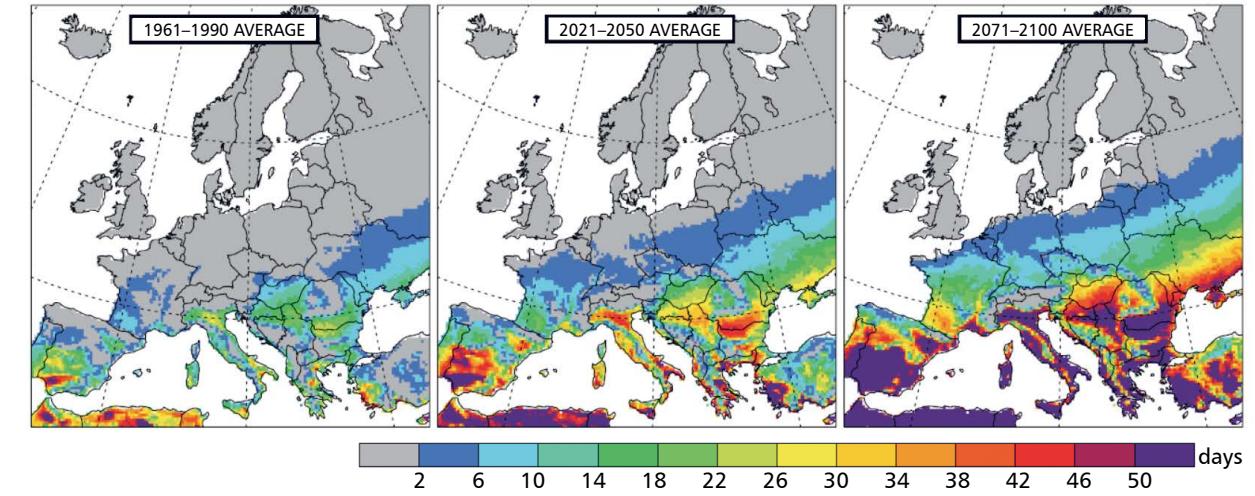
# What Are the Dangers and Opportunities Climate Change Poses to Cities in Slovenia?

Prof. Dr. Lučka Kajfež Bogataj

*University of Ljubljana, Biotechnical Faculty, Department of Agronomy,  
Chair of Agrometeorology, Agricultural Land Management, Economics  
and Rural Development*

Climate change is already having a significant impact on people's quality of life. Higher air temperatures, an altered precipitation regime, and a higher frequency of extreme weather events have a strong impact not only on the well-being but also on the health and productivity of the population. In Europe and Slovenia, air, soil, and water temperatures are rising much faster than in other areas. Among the natural disasters of recent decades, heat waves have caused the most human casualties, therefore making the emergence of extreme heat an increasing challenge for cities. Millions of Europeans experience problems due to heat waves in the summer months, especially in specific occupations exposed to direct or indirect weather influences. Most vulnerable are residents of larger cities over the age of 65, who currently make up 17% of the European population, but whose share will increase to 30% by 2060. In Slovenia, up to 20% of people over the age of 65 live in the largest cities. Particularly vulnerable in cities are those on low incomes, ethnic minorities, the disabled, and the chronically ill.

All projections of future climate conditions indicate that very hot days will occur even more frequently and with more extreme maximum daily air temperatures. The negative effects of heat stress on the health and productivity of workers are already noticeable in workplaces across Slovenia, and will only intensify with rising temperatures, especially so in construction, manufacturing, transport, tourism, and agriculture. In the absence of serious global action and with a further increase in the levels of the greenhouse gas in the atmosphere, at the end of the century, many areas in Slovenia will be so hot in the summer that normal activities such as food production and outdoor work will no longer be possible due to heat stress.



The measures to reduce the vulnerability of cities are divided into grey, green, and soft measures. Grey measures mostly relate to buildings: good insulation, blinds, passive cooling of buildings, urban plans providing shade and ventilation, and reduced emissions of air pollutants. Green measures include, for example, green urban areas, green walls and roofs, and trees that have the added advantage of being able to store carbon and provide habitats for wildlife. Examples of soft measures include raising awareness, mapping heat islands and cold areas, identifying vulnerable groups and their distribution in the city, warning systems, recommendations on behaviour during heat waves, etc.

We can conclude that climate change is increasing the demands on the resilience of cities to new risks. Therefore, climate-safe construction of buildings and infrastructure, provision of safe water and food supply even in extreme situations, and sustainable operation of public systems (transport, electricity supply, telecommunications, education, health, rescue services, etc.) are necessary. Climate change also presents us with the opportunity to eliminate past mistakes in the fields of construction, utilities, urban planning, and space management in general, and to transition to a more sustainable lifestyle.

# Utilising Blue-Green Infrastructure for a Wise Urban Water Management

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Urban water infrastructure is a fundamental requirement for the existence and further development of cities, which have today become home to the majority of the world's population. As a result, cities represent one of the main sinks of natural resources and sources of waste. Due to the effects of climate change, which manifests itself in more extreme weather events (either severe rainfall and floods, long droughts or heat waves), the pressures on the existing water infrastructure have been increasing. Against this background, it is clear that today's linear management of water and other resources is not up to the challenge. Changes in cities' water management systems can play a key role in mitigating the adverse effects of climate change. The global professional public and others have therefore developed and are trying to implement concepts such as "water-wise cities", "blue-green infrastructure", and "circular economy".

Blue-green infrastructure (hereinafter BGI) are natural and semi-natural (hence green) decentralised systems intended for rainwater management (hence blue) in cities that simultaneously provide a wide range of ecosystem services. They typically utilise processes such as infiltration, filtration, rainwater harvesting for reuse, and surface water retention. The basic principle, however, is the retention and percolation of precipitation at the location where it falls, and the consequent reduction of the amount and peak of surface water runoff.

The key challenge for the implementation of the BGI is to overcome the sectoral approach to urban water management, i.e., water supply, urban drainage and floods. This largely requires going beyond operating in the "silo" mentality within the water sector itself as well as beyond, toward horizontal and vertical integration of related disciplines involved in the urban (civil engineers, urban planners,

landscape architects, spatial planners) as well as suburban design and planning (agriculture and forestry engineers).

In many cities, the systematic introduction of BGI is already an established and no longer considered an alternative approach to urban planning. In Slovenia, strategies at the local or national level that would address water management in the light of emerging climate changes and the general crisis of handling and managing natural resources are still missing. All major national strategies, including the draft Law on the Climate Policy of Slovenia, have systematically neglected water.

For the successful implementation of more sustainable water management in cities it is necessary to: 1) reach a socio-political agreement to manage cities and the natural resources sustainably, comprehensively, and in accordance with the principles of circular economy; 2) include measures for adapting to climate change and managing water according to the principles of circular economy into urban planning procedures; 3) form interdisciplinary groups and cross-sectoral cooperation at the planning and operational levels; 4) develop guidelines and technical regulations for BGI planning; 5) develop and adopt an appropriate methodology for the evaluation of BGI measures (models), which includes the use of hydrological and hydraulic modelling and multi-criteria analysis.



Pond and reservoir of treated wastewater at the Nova Gorica sewage treatment plant  
Photo: Dr. Darja Istenič

# What Is an Urban Heat Island? How Do Landscape Structure and Actual Land Use Affect Its Occurrence?

Anica Simčič

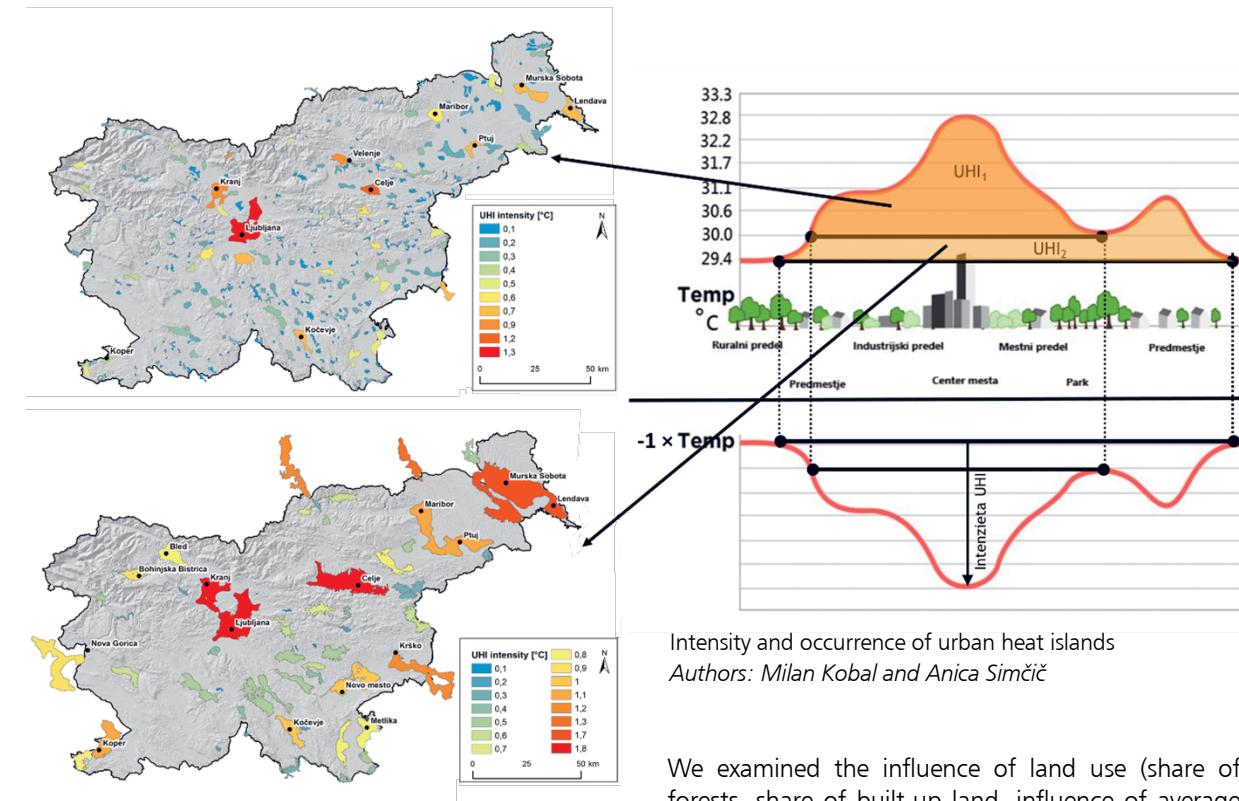
Slovenian Forestry Institute, Department of Forest Ecology

Assist. Prof. Milan Kobal

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Department of Forestry and Renewable Forest Resources

Urban heat islands are a common climatic phenomenon and represent the temperature difference between urban and rural landscapes. They appear due to various anthropogenic influences, such as the reduction of green areas in cities, the covering of natural soils with hard and impermeable coating, the installation of various construction materials that absorb solar radiation, and heat emissions (air conditioning, industry, transport). They are problematic mainly due to their impacts on the quality of life and health of people, as they slow down the cooling of the air in cities. They pose a risk to chronic patients, especially during prolonged heatwaves, which have been quite common in recent years.

In this study, we identified urban heat islands as areas within which the surface temperature is at least  $0,1^{\circ}\text{C}$  higher than the surrounding temperature. We used a raster map of the mean temperature in the warmest quarter of the year (June, July, August), which was derived from the images from the MODIS satellite (Metz et al., 2014) and the CORINE LAND COVER data on land use. Urban heat islands were determined by using the idea of eliminating karst sinkholes (Doctor and Young, 2013; Kobal et al., 2015), but instead of the relief we used as input data the value of the temperature raster map multiplied by the constant  $-1$ . Thus, higher temperatures were changed into lower values, and lower ones into higher, thereby producing "temperature depressions" that represent local rises in temperature or heat islands. The increase in temperature above the surroundings (or the "depth of the temperature depression") represents the intensity of the urban heat island.



Intensity and occurrence of urban heat islands  
Authors: Milan Kobal and Anica Simčič

We examined the influence of land use (share of forests, share of built-up land, influence of average forest patch size, and density of forest edges) on the intensity of urban heat islands. We found that the intensity of the urban heat island decreases with the increased share of forests and increases with the increased share of built-up land in the area of the urban heat island. The intensity of urban heat islands, however, decreases with increasing forest edge density and increasing forest patch size within the urban heat island area.

In the future, urban planners will have to pay more attention to the largest and most intensive heat islands in Slovenia (Ljubljana, Kranj, Murska Sobota, Celje, Maribor). In the area of urban sprawl, all green and forest areas will have to be preserved and green corridors established. Materials with higher albedo values, green roofs, and more street trees will have to be planned and used in construction.

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# How Does the City of Ljubljana Municipal Spatial Plan Take Climate Change into Account?

**Katja Fak**

*City of Ljubljana, Department of Urban Planning*

In 2010, the City of Ljubljana (COL) adopted the strategic and the implementation parts of the City of Ljubljana Municipal Spatial Plan (COL MSP). The documents were created in cooperation with the Urban Planning Institute of the Republic of Slovenia, Urbi d. o. o., and the Urban Institute of Ljubljana d. d. To date, the spatial acts have been amended several times, most recently in 2018.

In its strategy, COL sets out specific goals in the field of environmental quality in connection to climate change, in the field of settlement design from the point of view of environmental protection and spatial constraints, and in the field of green space design. Among other things, it thereby strives to:

- reduce the impact of urbanisation on climate change and adapt to it,
- preserve biodiversity and habitats,
- protect agricultural land and soil quality,
- protect urban forests by preserving the extent, coherence, integrity, and quality of forests that have ecological, hydrological, protective, and social functions,
- protect the soil production potential and promote various forms of food production for local self-sufficiency, including the production on roofs and terraces.

Further objectives of the settlement planning are also to maintain open areas in the direction of predominant ventilation corridors, to preserve the extent and integrity of larger natural areas, to avoid the placement of facilities and infrastructure within these areas or the "eating away" of their edges by providing different sizes and types of green areas, as well as to maintain and establish interconnecting corridors (riverbanks, tree-lined streets).

The basic design principle of the green areas of COL is the preservation or restoration of five green wedges, which enter the city centre from the hinterland. It is aimed primarily at restoring adequate green space in degraded or overbuilt areas.



The aim is to limit land development of the edges of larger green areas, to connect individual regulated areas, and to ensure good accessibility and an even distribution of green areas.

The goals and commitments of the COL MSP strategy are executed by COL in accordance with the implementation part. The strategy of preserving as many green areas as possible and establishing new ones is manifested both in determining various intended uses of land and in determining the level of utilisation of plots intended for construction in settlement areas.

The key factors in maintaining as many green areas as possible and establishing new ones are the factor of open living space (FLS) and the factor of open green surfaces (FGS)—the establishment of open living space attached to residential buildings and green areas connected to non-residential buildings on overgrown terrain.

The implementation part of the COL MSP tries to achieve the goals set in the strategy by determining concrete requirements for the placement of buildings and projects into space. Among other things, it determines: the minimum requirements for the provision of open living space or green areas in all urban zones; the minimum requirements for the design of children's playgrounds as well as recreational and socialising grounds for residents in multi-apartment areas; the arrangement of green roofs on all buildings (except parking lots or technological process facilities) with a flat roof net area exceeding 600 m<sup>2</sup>; the greening of new parking areas that include more than 10 parking spaces; the minimum requirements for the preservation and planting of trees.

In the so-called green wedges, which establish ecological, climate, and functional connections of the urban part of the city with its natural hinterland, the implementation part of COL MSP stipulates the increase of FLS and FGS on overgrown terrain. It also determines a higher number of mandatory trees on plots intended for construction, and a reduction in the size of flat roofs that need to be designed as green roofs from 600 m<sup>2</sup> to 400 m<sup>2</sup>.

In the COL MSP strategy, the City of Ljubljana has committed itself to building a resilient city, promoting sustainable land use and preserving green areas, implementing sustainable solutions and promoting local self-sufficiency through measures to mitigate and adapt to climate change. In accordance with the provisions set out in the implementation part, it is already turning the set goals into reality.

.....  
View of the north-western part of Ljubljana / Photo: Luka Vidic

# How Can We Use Spatial Planning and Design to Contribute to Spatial Arrangements that Are Less Vulnerable to Climate Change-Related Events?

**Mag. Rok Fazarinc**

*IZVO-R, projektiranje in inženiring (d. o. o.)*

Climate change directly affects precipitation, which in turn affects water runoff. Heavy rainstorms have become more common. Droughts also occur more frequently and in longer periods. These changes affect hydrological values, which provide the key data for introducing new interventions and activities to the space and for ensuring safety against the harmful effects of water.

Basic hydrological data on high, medium, and low waters and on the duration of individual phenomena are determined with the help of hydrological models of river basins or parts of river basins and with the statistical analysis of the recorded data (precipitation, outflows–discharges). The data on precipitation and discharge at measuring points is collected by the Slovenian Environment Agency ARSO.

The calculations performed by the hydrological models change over time. High waters are rising, while droughts are further decreasing low discharges. The observation periods are longer and the measurements more accurate. The models used for the analyses are also being improved.

An assessment of discharge trends with a 100-year return period for engineering practice is done by ARSO. The assessment of the increase of discharge is taken into account when calculating the results of hydrological models. Usually, the medium-term forecast period (the period between 2041 and 2070) is selected when assessing the resilience to climate change. The assessed increase in discharge is built into hydraulic models, which determine the range of high water levels, velocity fields, and water flow forces. The results of the hydraulic calculations are then used to check the resilience of the planned regulations and to propose appropriate measures.

The measures to reduce the impact of climate change are divided into comprehensive and local ones. With comprehensive measures, we aim to mitigate hydrological extremes. The key comprehensive measures are the promotion of water conservation in the natural environment (karst fields, karst subsoil, alluvial surfaces, land cover change) or in artificial structures (multi-purpose retention basins). Local measures, including the alteration (expansion) of riverbeds, the increase of water surfaces, the effects on the diversification of the river morphology during dry periods, shading, and the like, have a limited impact.

On the basis of practical examples, we have presented some problems and different approaches in adapting to climate change. We have introduced the issue of the Savinja river in the Lower Savinja Valley, the impact of the Ljubljanica dam, the assessment of the impact of climate change on the Gradaščica project (National Spatial Plan for ensuring flood safety in the SW part of Ljubljana), local regulation in the areas of Luče in the Upper Savinja Valley and Poljane above Škofja Loka, and the renaturation of the Lake Cerknica area.

The Drtiščica Reservoir or Gradiška Lake near Lukovica was built along the Ljubljana – Celje motorway section as a mitigation measure to reduce the flood risk for the settlements Krtina, Dob, Vir, and partly Domžale. It was initially planned without the permanent lake formation on the lower part of the retention area, but at the request of the local community, the permanent lake formation was implemented (already in the design phase). The rest of the available volume is intended for the retention of high, i.e. flood waters. / Photo: [www.falajfl.si](http://www.falajfl.si)



# Cool Cities by Responsible Planning. How Does the Preparation of Planning Documents Take Climate Change into Account

**Nuša Britovšek**

*LOCUS Spatial Information Solutions (LOCUS, d. o. o.)*

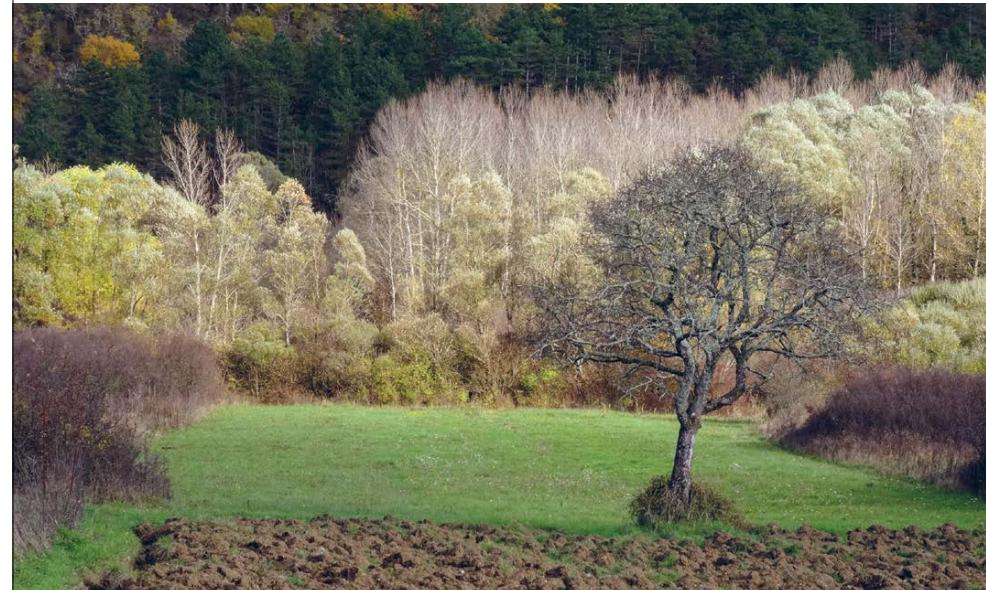
Climate change is the key challenge facing society today that runs through all its pores and encompasses social, cultural, political, economic, spatial, and environmental issues, and requires a comprehensive approach for finding solutions to mitigate and adapt to its effects.

The answer to the question of how the preparation of planning documents takes climate change into account is multifaceted and complex. It refers to a variety of policies and measures that adapt to specific spatial characteristics, needs, and challenges. They permeate all levels of spatial planning, ranging from strategic to implementing acts, state, regional, and local planning documents, etc.

Strategic planning in the context of landscape design for the Municipality of Koper, including the concept of emphasized protection areas and development-oriented areas; creating scenarios for the preservation and development of Velika planina by emphasizing the cooperation with stakeholders and the guidelines for visitor management, traffic regulation, and waste water discharge; ecological connectivity in the case of landscape design for the Municipality of Ankaran, including the evaluation and guidelines for improving ecological corridors and increasing the stability of ecosystems; defining a special locality with a proposal for the integrated planning of the water corridor of the river Vipava in the Municipality of Nova Gorica; a proposal for defining the use of green areas along watercourses in the settlements in the Municipality of Ravne na Koroškem; or the creation of a multi-purpose green system with an emphasis on the restoration of mill streams, floodplains, drainage and percolation of hinterland waters in the case of regulating the area of the gunpowder plant in Kamnik, are only a few examples that address and seek solutions to the issues related to climate change.

The key challenges to tackling climate change and other environmental concerns are:

- The need to promote awareness that caring for the environment is our shared, social, and personal responsibility.
- Tackling climate change is a matter of society's maturity. In the light of the growing number of events around the world related to restriction and discrediting of civil society, the lack of dialogue and autocracy, all of us are at a disadvantage.
- The unification of society and coherence between different sectors is crucial, as disunity and sectoral and lobbying control cause distrust among people and thereby the disregard of good practices.
- The profession must offer clear as well as alternative solutions on a global level. Commitments and certain actions have been defined, but we need to respond more effectively, comprehensively, and rapidly.
- The spatial planning profession can offer part of the solution, in which case the key challenge is the implementation of planning documents and spatial management.
- We need to incorporate environmental ethics into our daily lives, culture, and perception. We need to change the attitude towards the environment, space, fellow humans, and all living beings. We must begin to recognise nature as our common good, the good for all living beings.



"In response to people saying 'You can't go back,' I say, 'Well, what happens if you get to the cliff and you take one step forward? Or, do you do a 180° turn and take one step forward?' Which way are you going? Which way is progress?"—a quote from the documentary *180° South* directed by Chris Malloy.

Movraška vala, Municipality of Koper  
Photo: Nuša Britovšek

# How Does Spatial Planning Affect the Adaptation to Climate Change?

**Dr. Petra Vertelj Nared**

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Climate change is a fact of life. Various agreements that emphasize the importance of spatial planning are responding to it on international, European, and national levels. In this article, we outline only a few emphases of how spatial planning contributes to climate change response through the work of the company LUZ, d. d.

At all levels, all of us carry the responsibility for change. The system can only work well if all participants are aware of their responsibilities. Our actions need to be regarded as connected and interdependent. While a strong emphasis is placed on strategic decisions, these also have to be put into practice. The more negative consequences we can prevent (also by means of spatial planning), the less we will have to adapt to climate change.

Space is limited but most interventions into space are permanent; therefore, long-term planning is important. The General Urban Regulation Plan from 1966 provided the basis for the long-term planning of Ljubljana, including green areas and residential neighbourhoods. Its far-sighted planning enabled people of Ljubljana to spend time in the green areas of their neighbourhoods during this year's epidemic lockdown.

Strategies are the basis for planning. We use them to direct the development. Such is, for example, the green system in the City of Ljubljana Municipal Spatial Plan (COL MSP). Urban indicators, such as the building factor and the green areas factor, are important for the development of green areas at the implementation level. When preparing the new COL MSP in 2010, we introduced the regulation on overgrown terrain as a novelty. It ensures the share of unbuilt land connected to the parent soil, which enables water retention and percolation as well as the



growth of tall trees. In this way, it also contributes to the reduction of heat islands and to a healthier and higher living quality in the city.

Spatial planning can be an effective tool in responding to climate change, as it is a profession that results in the placement of activities into space and the assignment of land use with a direct impact on space. In order to find appropriate solutions in space, interdisciplinary work, i.e. the cooperation of several disciplines, is necessary. Those solutions that are sustainable in the long-term and multi-purpose have proved to be good. It is also necessary to plan in time and find the most appropriate of the possible solutions, especially when planning large, infrastructural systems.

The interconnection of systems must be ensured. Due to the higher density of built-up areas we are noticing a reduction of green areas alongside new residential buildings. As a result, the connectivity between them is vanishing, the quality of living is deteriorating, the heterogeneity at the city level is fading, and biodiversity is being reduced. Excuses referring to the proximity of other green spaces, parks, or urban forests will not be viable in the long run.

It is no longer a question of whether global warming is a problem. The question is how we will tackle the challenges ahead. With spatial planning we set up a framework, but the system needs to work at all levels. Some things cannot be left to individuals, because systemic strategic decisions are required. In order for Europe to truly become the first climate-neutral continent, which it is striving to achieve, we all need to take responsibility. First, of course, comes the responsibility at the highest, decision-making levels; the profession can support them with its knowledge, while action plans and implementations need to follow strategic decisions. This requires the awareness of everyone—politicians, experts, and also users. We are all responsible for the health of our planet and people.



Residential neighbourhood Šiška, Ljubljana / Photo: Luka Vidic (for LUZ)

# Tivoli, Rožnik and Šiška Hill Landscape Park in the Light of Climate Change

Dr. Andrej Verlič

Head of the Tivoli, Rožnik and Šiška Hill Landscape Park Management,

JP VOKA SNAGA d. o. o.

Protected nature areas can greatly contribute to climate change mitigation and adaptation. Sustainable forest management, wetlands, preserved and restored habitats, ecological corridors, preservation of biotic and landscape diversity are in this context some of the most influential nature conservation measures. Below, I present some highlights from the Park, intertwined with management challenges and opportunities this space can contribute in terms of climate change.

Around 30 tree species grow in the forest of the Landscape Park, among which spruce, red pine, English (pedunculate) oak and sessile oak, sweet chestnut, and beech predominate.<sup>1</sup> With the species and among them, the forest adapts to changes in the environment. For example, beech has been found not to lose its genetic diversity in old-growth forests and sustainably managed forests when transitioning from mature trees to their offspring, which shows a great potential for adapting to environmental changes.<sup>2</sup> Recent research suggests that spruce could be replaced by fir, as the latter adapts easier to warmer and dryer conditions.<sup>3</sup> The forest is a natural carbon sink; it locally alleviates temperature extremes and, in the face of increasingly frequent exceptional rainfall, retains surface water runoff. It is home to many organisms, including rare and endangered species. Several of the latter can be found in two transition mires that are protected as nature reserves Mali Rožnik and Mostec.

For more than two hundred years, the Tivoli City Park has been a maintained, public, and accessible space for leisure and recreation. Open views and a well-kept horticultural design with numerous mature trees help us restore our vital energy. Since 1958, Tivoli has included a phenological park, which today houses 33 trees of indigenous European tree species. Changes in the phenological phenomena are among the most obvious responses of the environment to climate change<sup>4</sup>, and therefore phenology has become an important bioindicator of climate change<sup>5</sup>.



Tivoli Park / Photo: ArtInFoto.si

The location of the Landscape Park enables the passage and exchange of genetic material for species that can migrate between forests in SE Ljubljana and the Polhov Gradec Dolomites in its NW part. Simultaneously, the same location that is practically in the centre of the city exposes this area to the introduction of invasive alien species, which can be brought in by the visitors or which, for example, "escape" from gardens. Invasive alien species are especially efficient in occupying space where the effects of extreme weather events have weakened the ecosystems. This threatens biodiversity, which is one of the most important assets for adapting to climate change, as it increases the resilience of ecosystems to changed environmental factors.

In the light of extreme amounts of storm water, the Tivoli Pond and the Koseze Pond act as important reservoirs, while at the same time providing home to many organisms. Every day, they offer a unique experience to the park users. In the first wave of the COVID-19 epidemic, the park became an "outdoor sanatorium" and visits more than doubled.<sup>6</sup> Thus, the awareness of the importance of quality, well-kept, and publicly accessible green areas in our immediate vicinity has been refreshed.<sup>7</sup> We remember them several times every year during heat waves, when the built-up parts of our settlements become heavily overheated. It is the combination of shading trees and the proximity of water surfaces in landscaped green areas that has proven to be the most attractive place to escape the heat, especially for more vulnerable groups, such as the elderly<sup>8</sup>.

The park management wants to stimulate the public with its contents that are either experienced live in the park or, in more numerous variants, published online. The management must be based on the trust between diverse landowners, other managers, planners, services, and contractors of various activities in the park. Only coordinated, planned, and highly professional work can keep this exceptional space in proper condition.

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2 WESTERGREN, M., BOŽIČ, G., FERREIRA, A., KRAIGHER, H. Insignificant Effect of Management Using Irregular Shelterwood System on the Genetic Diversity of European Beech (*Fagus sylvatica* L.): A Case Study of Managed Stand and Old Growth Forest in Slovenia. *Forest Ecology and Management*. [Print ed.]. 2015, vol. 335, pp. 51–59.

3 MOSCA, E., CRUZ, F., GÓMEZ-GARRIDO, J., BIANCO, L., RELLSTAB, C., BRODBECK, S., CSILLÉRY, K., FADY, B., FLADUNG, M., WESTERGREN, M., et al. A Reference Genome Sequence for the European Silver Fir (*Abies alba* Mill.): A Community Generated Genomic Resource. *G3*. 2019, vol. 9, ed. 7, pp. 2039–2049, illustrated.

4 Fenologija v Sloveniji. Priročnik za fenološka opazovanja. 2015. <https://meteo.arso.gov.si/uploads/probase/www/agromet/product/document/sl/Brosura0515.pdf>

5 Impacts of Europe's Changing Climate. An Indicator-Based Assessment. Plant Phenology and Growing Season. 2004, EEA Report No. 2/2004. 6 In the spring period of the epidemic on the routes where the number of crossings is measured.

7 UGOLINI, F., MASSETTI, L., CALAZA-MARTÍNEZ, P., CARIÑANOS, P., DOBBS, C., KRAITER OSTOIČ, S., MARIN, A. M., PEARLMUTTER, D., SAARONI, H., ŠAULIENĖ, I., SIMONETI, M., VERLIČ, A., VULETIČ, D., SANESI, G. Effects of the COVID-19 Pandemic on the Use and Perceptions of Urban Green Space: An International Exploratory Study. 2020, *Urban Forestry & Urban Greening* 56.

8 ARNBERGER, A. et al. Elderly Resident's Uses of and Preferences for Urban Green Spaces during Heat Periods. 2016, *Urban Forestry & Urban Greening* 21.

# Who Can Tell Where It's Hot in Ljubljana? An Overview of the Vroče točke Project

Zala Velkavrh

prostoRož

The overheating of urban centres is one of the first consequences of climate change that is already being noticed and experienced by urban residents. Slovenian cities are by now significantly warmer than in the 20<sup>th</sup> century, and the warming of cities is only expected to continue. As regular users of public urban areas, pedestrians and cyclists have the best insight into which parts of the city are the hottest. In the Vroče točke (Hotspots) project, they participated as informal experts in detecting the critical locations in the city. We invited the residents of Ljubljana to vote for the locations that they perceive as "hotspots" in the summer. Locations were collected via the Vroče točke web app in the period between the 7 and 25 of August 2020. During this time, the users marked 699 locations.

## Which locations were highlighted by the users?

The locations were segmented according to meaningful spatial units (intersections, streets and roads, neighbourhoods, Ljubljana public transport [LPP] bus stops). Votes for smaller spatial units were also taken into account when counting votes for larger spatial units (e.g. votes for the Celovška-Tivoli intersection were counted separately for the intersection as well as the total count for Celovška street). The locations that were most often marked as hotspots are the Slovenska-Dalmatinova-Gospovshtska crossroad (Ajdovščina), the Vilharjeva-Železna crossroad, Slovenska street and Celovška street, the Župančičeva jama neighbourhood, and the Klinični center (University Medical Centre) bus stop. Locations marked via Vroče točke app and the locations of heat islands measured by satellite thermal imaging in the *Urban Heat Island – UHI Ljubljana* survey (Komac et al., 2016)<sup>1</sup> overlap in the city centre, more specifically in the area of the central railway and bus station, the University Medical Centre, the vicinity of Pivovarna Union brewery, and in the area between Ajdovščina and Nazorjeva street. In general, more locations were marked in areas with good cycling and walking connections, and less in shopping mall areas. Although the largest measured heat island is the BTC shopping centre, most people visit it by car and are therefore less exposed to heat.

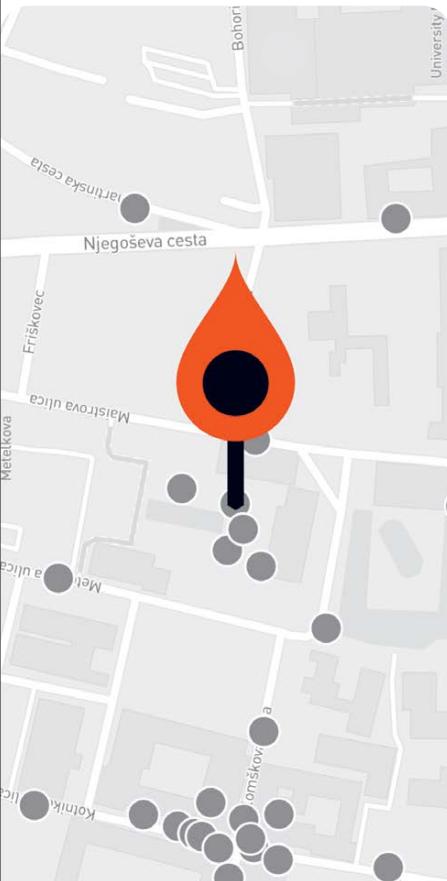
## How do residents avoid the heat?

The analysis of the user responses in the Vroče točke app showed that the residents are well aware of the heat issue in Ljubljana. As problematic locations, users often described crossroads, bus stops, platforms—in short, locations where they have to stop and wait. The users paid attention to the specifics of individual locations and microlocations and have developed strategies to avoid heat. It is worrying to note that due to heat, people actively avoid certain locations in the city. Many users tend to use different, even longer routes in the summer to avoid heat. In addition, some users prefer to use a car instead of cycling or walking in the summer. Not surprisingly, people are actively looking for shade in the summer. For this reason, many users called attention to certain trees in the urban environment that are too small to provide shade. Requests for more trees providing shade were numerous.

## Conclusion

ProstoRož prepared a set of measures for the voted locations and presented them to the City of Ljubljana, which positively received the project. The public is increasingly supportive of concrete measures designed to fight climate change. With simple and accessible actions, such as voting for overheated locations, the city's response to climate change has become a matter of community planning. By involving residents in marking locations, the project has generated support of the general public from the very beginning. These people will have the motivation and interest to support the city administration in implementing measures to cool the city and carry out a long-term climate strategy.

<sup>1</sup> KOMAC, B., LOOSE, A., PAVŠEK, M., ČERMELJ, S., OŠTIR, K., KOKAL, Ž., and TOPOLE, M. *Urban Heat Island in the Ljubljana City*. In: *Counteracting Urban Heat Island Effects in a Global Climate Change Scenario*, Springer, Cham, 2016, pp. 323–344.



Left: With a simple campaign like the online voting for hotspots, the city's response to climate change can become a matter of community planning.

Right: The citizens of Ljubljana marked 700 hotspots in two weeks. Strategies to avoid the heat include driving in the wrong direction and hiding under the shadows of buildings.

# Student Visions of Future Cities

Assist. Prof. Darja Matjašec

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Assist. Nejc Florjanc

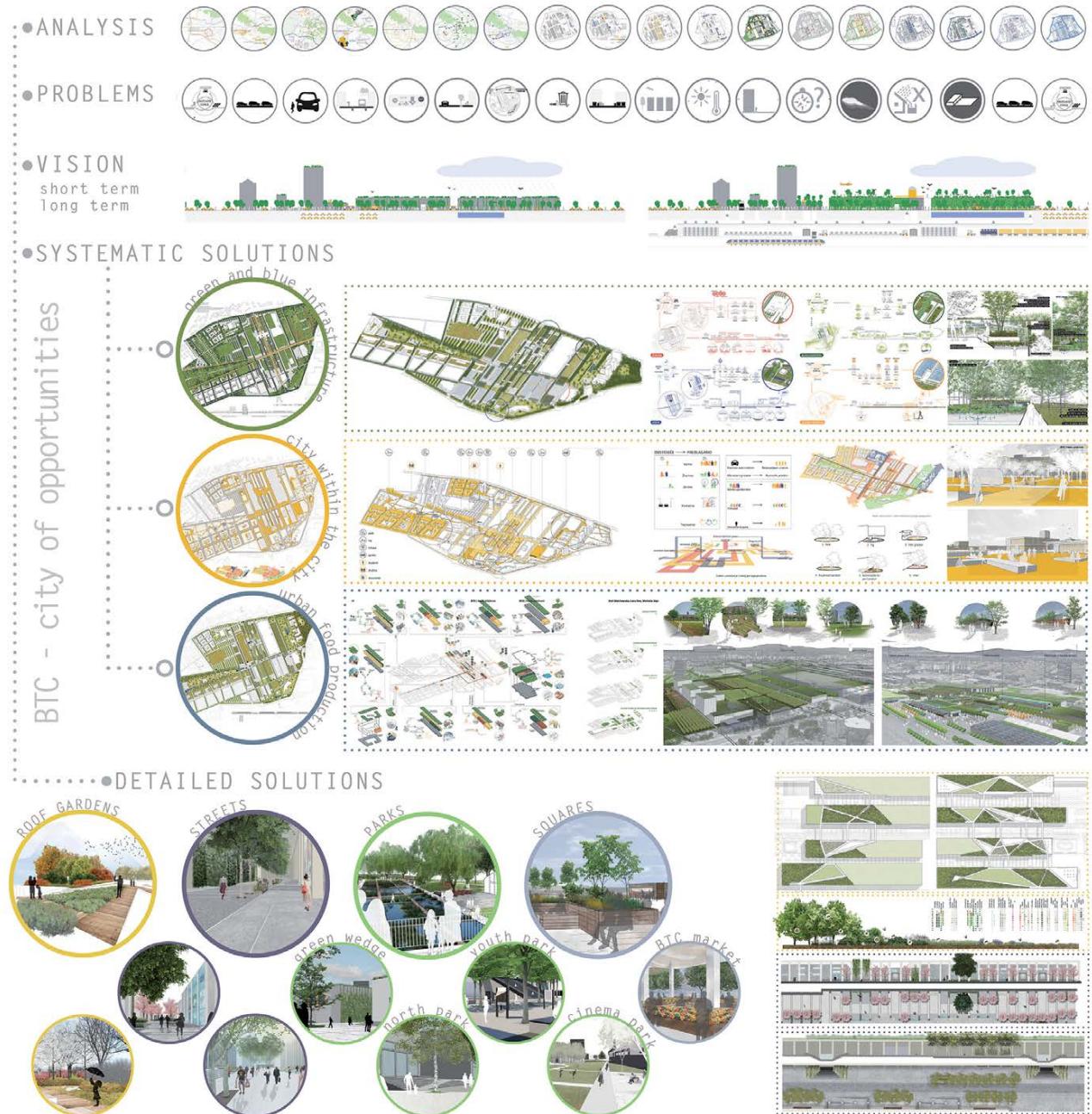
University of Ljubljana, Biotechnical Faculty, Department of Landscape Architecture

Student projects are carried out as part of regular teaching assignments at the undergraduate level in the course Landscape Design 2 in the 3<sup>rd</sup> year, and in the 2<sup>nd</sup> year of the postgraduate studies in the course Studio 2. In the framework of Studio 2, we usually participate in international competitions taking place in major urban environments on all continents, including multimillion, fast-growing metropolises, where we regularly rank among the award-winning competitors, while Landscape Design 2 deals with themes like public green space and built open space. We have also won prizes for student projects at biennials, salons, and in associations both at home and abroad. In addition to some places in Slovenia, where we indirectly also raise awareness of local communities, we have successfully participated in competitions in China, Croatia, Slovakia, Brazil, and France, and are currently participating in the *Le:Notre* competition in Gdansk, Poland.

The challenges of the urban environment that we are solving with students are urban sprawl, environmental problems, growing social inequality and dependence on energy sources, cities adapted to car transport, food production issues, and distinct local problems, which differ according to particular social arrangements around the world. Urban sprawl threatens the sustainability and consequently the quality of life in cities. Increasing urbanisation can lead to social instability and weaken the ability of cities to be sustainable and economically viable. Cities of the future thus comprise solutions to the above-mentioned challenges by utilising urbanism, the introduction of green infrastructure, sustainable mobility, urban food production, etc., which increase the level of well-being of the population. Cities of the future should be socially diverse environments where economic and social ac-

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Page 29: City of Opportunities. Vision for the renovation of the BTC area in Ljubljana, prepared in the 2017/18 academic year by 2<sup>nd</sup> year MSc and 3<sup>rd</sup> year BSc students of the courses Studio 2 and Landscape Design 2.



tivities overlap, and where communities live and operate in spatially defined areas without being dependent on major daily migrations. Spatially defined areas need to be planned and developed to adapt to the population in a way that allows it to be socio-economically creative and productive.

The students' solutions give hope that such challenges can be handled. They proved this, for example, in a competition in São Paulo, Brazil, and Shenzhen, China, both with a population over 12 million, where in several groups they developed concepts for certain parts of the cities that answer such issues and continually question the meaning of open public space as a synonym for social equality and a platform for the introduction of green infrastructure and sustainable mobility. The importance of open public space is inevitable for the future of cities and society. In this regard, we must keep aware of the close connection between the spatial and the social aspects of open public space, because the advantages and disadvantages of the spatial features affect social considerations. The accumulation of problems in open public space, due to its multifaceted nature, also has a strong impact on other systems in the city and on the city as a whole. The functional dynamics of an open public space promotes the flow of information, knowledge, experience, and creates social values through the users' social interaction. The lack of social interaction between different social groups leads to individual and collective isolation, resulting in the escalation of cultural differentiation that allows for more deviant behaviour as the connection between the population and its city fades.

While in urban areas around the world they mainly have to deal with reducing social stratification, food production, sustainable mobility, and reducing energy consumption by means of public transport, green areas, and urban trees, Slovenian cities primarily have to take care of the development of green and blue infrastructure, the inclusiveness of green areas and open public space, the integration of open public space and traffic, as well as the development of public transport. It is necessary to raise standards in the fields of urban management and development, as well as in maintaining urban trees and green areas.

Landscape architecture students with successful international experiences enter the labour market well equipped with the knowledge of how to design sustainable cities that will defy the above listed challenges in the future.



Collage on the topic Cold Cities for a Hot Planet / Author: Ana Štern  
Created at the course Drawing and Sculptural Design in the 2<sup>nd</sup> year Landscape Architecture study programme, mentor Assist. Prof. Mag. Mateja Kregar Tršar

# Climate Change and the Urban Environment. What Lies Ahead?

Dr. Maja Simoneti  
*IPoP – Institute for Spatial Policies*

Climate change among others raises the importance of nature conservation, environmental protection, and of ensuring social equality in the urban environment. Cities can no longer avoid the transition to a more sustainable concept of development. They are already experiencing climate change and are also leading the way in responding to it.

Appeals to reduce the carbon footprint, to maintain active mobility, shorten supply chains, increase energy efficiency and social equity, which are all part of sustainable development goals, are gaining new significance under the impact of climate change. This impact is especially strong in cities lying on the shores of seas, oceans, and rivers, which, due to more frequent high tides, storms, and heavy rains, cannot afford any delays in implementing the necessary measures. As we all could have observed this year during the epidemic of the COVID-19 virus, disasters can present a very powerful incentive for carrying out urgent but not necessarily always the most popular changes. In urban planning, we will probably all remember 2020 for the shutting down of whole cities and countries and for radical restrictions of people's freedom of movement, as well as for the side effects that this contagious disease has had on the implementation of sustainable mobility goals in cities around the world. It has only taken one spring season of the pandemic that a city like Paris has changed the modal split in the city centre in favour of pedestrians and cyclists.

Climate change also requires swift action, especially from coastal and flood-prone cities. The answer to its challenges consists of proper strategic planning and effective action in practice. In the long run, cities must in all areas ensure as coherent operation as possible and simultaneously involve new protagonists such as the private sector and citizens in the same course of action. Most cities that have already initiated climate change related programmes have chosen to act strategically, preventively, and practically, i.e. concretely, at the same time. Public administration and government strengthen their ability of cooperation and expand the



circle of participants. Rather than new regulations and documents, the integration of knowledge and proper understanding between protagonists become crucial.

Cities are experiencing the effects of climate change directly and concretely, so they are responding faster and more operationally than countries. This puts countries and cities in a new position. The importance of strategic spatial planning and practical action are equated. Tactical urbanism and placemaking are gaining a new position in urban planning due to the influence of climate change. This does not mean, however, that the significance of spatial planning is diminishing or that the national level of operation is less important. On the contrary, both climate change and the current epidemic are increasing the number of warnings about the importance of spatial planning and national guidance.

The biggest challenge for the Slovenian spatial planners and urban designers, architects, landscape architects, and other professionals in the fields of planning, construction, and management, as well as for cities, municipalities, and the state, will be to establish a new, more comprehensive and inclusive planning and man-



Active travel to school connects the operation of public schools with children, parents, and local municipalities. Organising travel to school with the Walking Bus or Bike Train and planning the school routes with the participation of the four groups of actors is a cooperative activity that enables children to walk and bike to the local school, while also leading to many improvements in local walkability. These activities are part of the programme Active Travel to School and Healthy City lead by the IPoP and supported by the Ministry of Health.  
Photo: Luka Vidic (for IPoP)

agement practice. After the decades of dividing competencies and isolating sectoral, legal, and administrative frameworks have almost eliminated the importance of spatial planning and have scattered land-use management to an almost uncontrollable level of discord among fields, professions, owners, and various managers must learn from scratch the common language of cooperation in spatial planning and urban management.

Spatial planning will have to assume the role of ensuring the efficiency of management and the resilience of cities to the challenges of the future, while creating quality residential environments and adding value to real estate and the environment. At the same time, professional circles and politicians will have to be trained in cooperation and in showing respect to the new protagonists entering the practice. The inclusion of the new protagonists like residents, estate owners, and the private sector, namely has a crucial impact on the efficiency, scope, and the quality of the response to climate change and other challenges, as well as on the responsibility in the processes of goal realisation. For all those who have already expanded the participation of the general public and civil society in spatial planning and management beyond the narrow legal obligations, this will also pay off in the future in strategic spatial planning and in the implementation of climate policy measures in practice.



Collage on the topic Cold Cities for a Hot Planet / Author: Julija Ferenc  
Created at the course Drawing and Sculptural Design in the 2<sup>nd</sup> year Landscape Architecture study programme, mentor Assist. Prof. Mag. Mateja Kregar Tršar

## About the Authors



**Lučka Kajfež Bogataj** has been a Full Professor at the Biotechnical Faculty of the University of Ljubljana since 1997. In addition to her pedagogical work, she is dedicated to research in the field of applied meteorology and climatology, with a particular focus on climate change. She has been a member of the IPCC (UN Intergovernmental Panel on Climate Change), a member of the GWP (Global Water Partnership) Steering Committee in Stockholm, and a member of the UNESCO Group on Ethics and Climate Change.



**Nataša Atanasova** is the Deputy Head of the Department of Environmental Civil Engineering at the Faculty of Civil and Geodetic Engineering of the University of Ljubljana (UL FGG). After completing her doctorate in 2005, she was employed at the UL FGG before continuing her career in Portugal in 2009, where she worked for three years as a researcher at the University of Algarve (Faro, Portugal) and the UNESCO centre for eco-hydrology. From 2013 to 2015, she transferred to the Imperial College London, where she worked as a consultant for the Blue Green Dream project, which dealt with the introduction of sustainable water use in cities. Between 2015 and 2017, she was a Marie Curie researcher at the University of Girona (Spain). She was the PI of the REUCITY (Innovative Technologies for Resource Efficient Cities) project, which dealt with circular management of resources (water, food, energy) in cities. Since 2017, she is an Associate Professor at the UL FGG in the field of environmental engineering. She is the leader of the UL team in the H2020 EdiCitNet project and the co-chair of the COST Action Circular Cities.



**Matej Radinja** received his master's degree from the Water Science and Environmental Engineering programme at the Faculty of Civil and Geodetic Engineering of the University of Ljubljana (UL FGG) in 2017. As part of his master's thesis, he modelled and assessed the impact of decentralised stormwater control measures in the case of the city of Girona in Spain. In the same year, he was employed as a young researcher at the Institute of Sanitary Engineering at the Department of Environmental Civil Engineering, UL FGG. His research work to date includes the implementation of multi-purpose green-blue infrastructure in urban drainage systems, its modelling, and planning. As part of his doctoral dissertation, he is researching advanced methods of urban drainage modelling and multi-criteria assessment of stormwater control measures.



**Anica Simčič** received her master's degree in 2018 on the topic *The Impact of Land Use on the Occurrence of Urban Heat Islands in Slovenia* from the Department of Forestry at the Biotechnical Faculty of the University of Ljubljana under the mentorship of Assist. Prof. Dr. Milan Kobal. She works at the Department of Forest Ecology at the Slovenian Forestry Institute, where she is engaged in various projects dealing with the promotion of measures for reducing greenhouse gas emissions in forestry and land use (LIFE-IP CARE4CLIMATE), the enhancement of the management of Natura 2000 in Slovenia (LIFE-IP NATURA.SI), and with the responsible management of non-native tree species in the Alpine region (ALPTREES).



**Katja Fak** is a landscape architect employed at the Department of Urban Planning of the City of Ljubljana. She began her career at the Urban Institute of Ljubljana, where she participated in various projects. Later, she also gained professional experience in two smaller municipalities. Since December 2017, she has been working in the Locational Information Office of the City of Ljubljana, preparing location information and various certificates as well as advising clients on the placement of buildings and projects into space in the City of Ljubljana area.



**Rok Fazarinc** received his master's degree in 2002 in the field of computational modelling of debris flows. In his work, he is engaged in the study and planning activities in the fields of water management, flood safety, renaturation, and rehabilitation of large landslides in the Republic of Slovenia. He has participated in the analysis of most flood events from 1989 to the present and prepared concepts and projects for rehabilitation after the floods of 1990 and 1998. He led the preparation of scientific documents on flood safety for the National Spatial Plan for several areas in Slovenia. He participated in the development of the motorway network of Slovenia and prepared water management projects for its individual sections. He is involved with the placement and preparation of scientific documents on water management and flood safety for some major infrastructure facilities in the country. In the field of watercourse renaturation, he is preparing project documentation for the renaturation of the Lake Cerknica tributaries. He participates in or is in charge of the making of flood risk maps for several areas in Slovenia. Since the founding of the company IZVO-R d. o. o. in 2001, he has been its employee and co-owner.



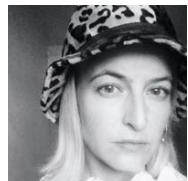
**Nuša Britovšek** is a landscape architect who is employed as a spatial planner in the company LOCUS prostorske informacijske rešitve (Spatial Information Solutions), d. o. o. The areas of her professional activity are diverse and include different levels of spatial, landscape, and urban planning. While the prevalent segment of her work is related to landscape planning and management, especially landscape design, she is also engaged in spatial development strategies of various areas, master plans, mobility plans, urban designs, etc., and in research projects in other areas of spatial planning. She is a member of the Slovenian Association of Landscape Architects and the Chamber of Architecture and Spatial Planning of Slovenia.



**Petra Vertelj Nared** works as a landscape architect at the Urban Institute of Ljubljana (LUZ, d. d.), where she is involved with spatial planning, the preparation of municipal spatial plans and various expertise on spatial and urban planning. She participates in preparing various documents, i.e. green systems, green infrastructure strategies, sustainable urban mobility plans, and in research and methodological studies in the field of spatial planning. She is interested in the issue of public space in cities as one of the key factors in raising the quality of living. She is a member of the Slovenian Association of Landscape Architects and the Chamber of Architecture and Spatial Planning of Slovenia.



**Andrej Verlič** is a forester, researcher, and head of the nature protection service at JP VOKA SNAGA d. o. o., which manages the Tivoli, Rožnik and Šiška Hill Landscape Park. His field of work includes conservational, professional, supervisory, and management tasks in the Landscape Park area. He participates in the fields of urban forestry and forest recreation at the international level.



**Zala Velkavrh** has been working as a project manager and communications manager at the non-profit urban planning studio prostoRož since 2012, where she actively co-creates flexible and democratic public spaces that enable change and spontaneous use. ProstoRož is the first association that has received the status of operating in the public interest in the field of urban space.



**Darja Matjašec** graduated from the Department of Landscape Architecture at the Biotechnical Faculty in Ljubljana in 1999. After working fifteen years at the Urban Institute of Ljubljana, she was employed as an Assistant Professor of Landscape Design at the Department of Landscape Architecture at the Biotechnical Faculty in 2012. For over ten years she actively participated in the Chamber of Architecture and Spatial Planning of Slovenia and in the Slovenian Association of Landscape Architects. She has received several awards in landscape architecture, urban planning, and architectural competitions at home and abroad.



**Nejc Florjanc** graduated from the Department of Landscape Architecture at the Biotechnical Faculty in Ljubljana in 2010, where he has been employed as an assistant in landscape design in 2012 after working at and cooperating with several design offices. He assists with the design courses at the undergraduate and master's level of the Landscape Architecture study programme. In recent years, he has participated in several project planning groups that have been awarded in architectural, landscape architecture, and urban planning competitions organised by the Chamber of Architecture and Spatial Planning of Slovenia.



**Maja Simoneti** Maja Simoneti is a landscape architect and spatial planner. For a long time, she has been closely monitoring climate change in connection with spatial planning and green space management. She is employed at IPoP – Institute for Spatial Policies, where she manages projects and acts in the public interest with regards to environmental protection and spatial planning. She is active in advocating for sustainable development, walking, participation, and health in spatial planning.



Collage on the topic *Cold Cities for a Hot Planet* / Author: Katja Založnik  
Created at the course Drawing and Sculptural Design in the 2nd year Landscape Architecture study programme, mentor Assist. Prof. Mag. Mateja Kregar Tršar