

Portfolio

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Introduction

This portfolio is a collection of work for an urban planning project for Birštonas. Every phase from primary empirical research and analysis to strategies and design proposals is presented in detail. Birštonas is a small resort city located in Lithuania, 39 km south from Kaunas. It is surrounded by Nemunas river and lush wild forests. The main characteristic feature of the city is that it is a balneological (practicing traditional spa medicine techniques) resort that extracts mineral water.

These distinct features of Birštonas are the main contributors to its economy. The main analyzed aspect of the city in this portfolio is recreational systems and links. Health tourism and recreation is a part of the city's character, lifestyle and identity, so it is crucial to create strategies for the future that would preserve and highlight these characteristic features and make use of existing resources to make the recreational experience as positive as possible for locals and city visitors alike.



Illustration of monument for Martynas Mažvydas in Birštonas

Analysis Phase

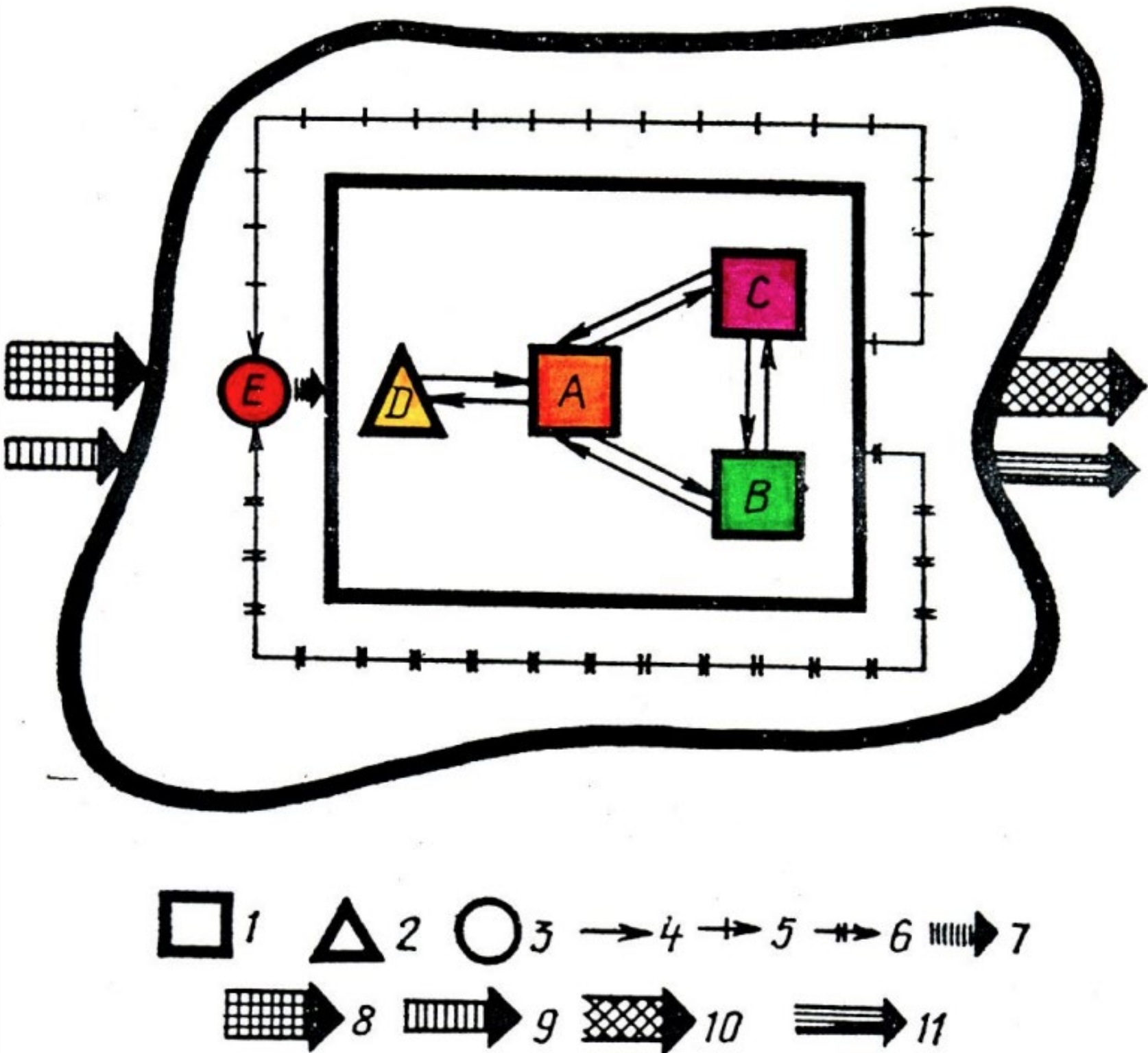
Intro to System of Recreational Spaces and Links

Recreation is a part of life for any human – its purpose being to replenish physical and spiritual strength. It is a part of biological and social needs of people. Defined as any activity undertaken for enjoyment, relaxation, or pleasure, recreation plays a role in enhancing physical, mental, and emotional well-being and quality of life. Its significance lies not only in its ability to alleviate stress and promote relaxation but also in its capacity to foster social connections, stimulate creativity, and promote a sense of purpose

Recreational activities are analyzed in a complex series of factors called a territorial recreational system (TRS). The system consists of tourists and holidaymakers, recreational resources and spaces, recreational infrastructure and roads or paths that act as connection links (Kavaliauskas, 1980). Each part has its own meaning and significance which are interconnected and dependent on one another and they are important to address especially in urban planning strategies and land management plan creation.

Components of the structural model of TRS:

- A – Tourists, holidaymakers;
- B – Recreational resources;
- C – Recreational infrastructure;
- D – Residential places;
- E – Regulation centre of recreational activity;
- 4 – Recreational flow;
- 5,6 – Informational relations;
- 7 – Means of regulation;
- 8,10 – Social recreational needs and their fulfillment;
- 9,11 – non-recreational use of the territory and its changes



Structural model of TRS according to P. Kavaliauskas

Meaning of Recreation

The definition of recreation dates back to ancient times and was described in forms like Ayurveda, a natural system of medicine from India or other well-known practices like China's Feng Shui. These and many other recreational systems have evolved to our times and are used in modern medical centers, spas, etc. Talking about Lithuania, in older times, Lithuanians had their own preferred type of recreation - villagers built saunas near their farmsteads while the rich created residencies along with gardens

and parks. The word "recreation" derives from latin: Re-Creatio, and its meaning is to restore. The goal of recreation is to restore a person's physical and psychological powers, all while promoting health and well-being. This topic has become more important with the changing needs of modern humans, which have many responsibilities, hard work that involves engagement with the virtual world and less physical movement. The surrounding pollution also contributes to depriving health (Staniūnas & Stauskis, 2011).



Illustration of Birštonas Kurhaus

Recreational System

Social Function

There are three interpretations of recreation (as outlined by Pridotkienė et al., 2006, and Vitkienė, 2008):

- **Personal activity** aimed at restoring physical and spiritual vigor.
- **Activity of group of people** aimed at rejuvenating physical and spiritual well-being.
- **Activity of many people** aimed at revitalizing physical and spiritual aspects (bio-psychological aspect of recreation), encompassing entertainment, environmental awareness, and personality development (humanitarian aspect of recreation), with implications for the economy (economic aspect of recreation), which requires urban and rural space as well as special infrastructure.

Recreation may become a social problem, which has to be solved by preparing urban planning strategies and plans. Reasons to foster recreational activities and possibilities to develop them must be addressed before preparing land management plans.

There are 2 groups of reasons to engage in recreational activities (Pridotkienė et al., 2006; Vitkienė, 2008):

1. Inner:

- desires of human nature for novel experiences, adventure, imaginative play, and participation in enjoyable pursuits.
- human needs for emotional relaxation and a sense of belonging within society.

2. Outer:

- Influences such as commerce, advertising, fashion, and advancements in technology.
- Education and wellness initiatives within social welfare programs.



J. Basanavičius square in Birštonas

Recreational System

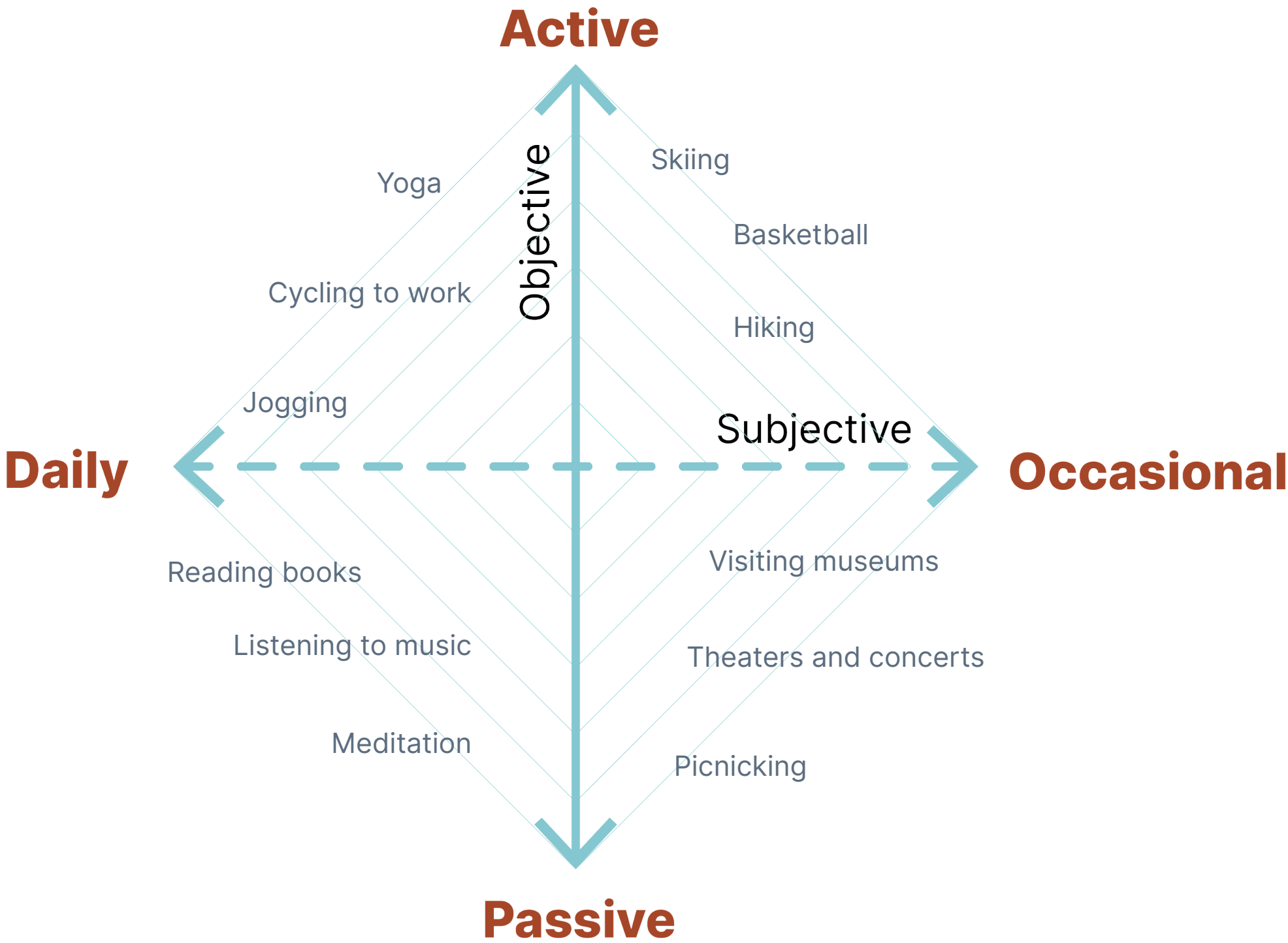
Recreational Activities

Recreation can be defined in forms of activities, that are engaged during leisure time for pleasure, personal development, hobbies, spiritual rejuvenation and so on. Recreation, according to E. Vitkienė (2008), can also be understood as one of state governance functions, namely, the function of societal development. The improvement of physical and psychological health of people leads to improvement of society and creates social stability and brings various economic benefits.

Recreational activities are conscious, which means a person chooses to do them intentionally. The scheme shows objective factors, active and passive, to describe recreational activities. These activities can also be understood subjectively in terms of frequency – whether an activity is done daily or occasionally is decided by each individual. For instance, cycling can be a weekend family activity, but for others, this may be a daily lifestyle as a main means of transport

7 categories of recreational activities (Pridotkienė et al., 2006; Vitkienė, 2008):

- **Health care;**
- **Intellectual;**
- **Hobby;**
- **Sports;**
- **Travelling;**
- **Social activities;**
- **Entertainment.**



Alternative scheme to categorize recreational activities

Recreational System

Recreational Resources and Spaces

Recreational resources are the elements and objects that support recreational activities within them. These include natural elements like forests, water bodies and fields, cultural heritage objects or landscapes – places that can facilitate the act of recreational activities and help people experience them (Kavaliauskas, 1980, Daniulaitis, 1997). Recreational resources are meant to be used in moderation – problem arises from people excessively overusing and depleting these resources and their ability to regenerate.

Today's model of economics and business is a big contributor to this issue. People are attracted to nature not only for fresh air and views, but also because individuals want to change their surroundings or have some time alone. Most traffic is unleashed upon water bodies, sea, rivers, for recreation. To avoid depletion and degradation of resources, many legal measures are taken to prevent natural landscapes from being anthropogenized and destroyed of their natural properties (Staniūnas & Stauskis, 2011).

Types of landscape zones:

- **Zone of the natural environment;**
- **Zone of the natural environment in which anthropogenic visual and acoustic impacts are weak;**
- **Environment in which natural and anthropogenic elements are in balance;**
- **Environment, dominated by anthropogenic elements, but with enough fragments of nature that allow people to contact with nature in small spaces;**
- **Anthropogenized environment in which nature is completely overshadowed by the buildings and facilities**



Natural landscape of the forest and river from a mound hill in Birštonas

Recreational System

Recreational Infrastructure

Recreational infrastructure includes physical facilities for recreation and entertainment. These structures, installations and systems are designed to support recreational activities and promote engagement. Recreational infrastructure also includes elements such as parking areas, restroom facilities, maintenance services etc. that ensure proper functioning and accessibility of recreational spaces. The infrastructure is adapted for temporary use, ensures comfortable conditions for visitors and tourists

to enjoy recreational activities. Recreational infrastructure also has a common function of recreational flow – the circulation of people within the facilities and its surrounding elements (Kavaliauskas, 1980, Daniulaitis, 1997). To ensure that a recreational infrastructure is working properly, managers and planners need to constantly analyze patterns of the flow and identify potential problematic areas that could be improved. Strategic planning of recreational infrastructure is crucial for positive user experience.

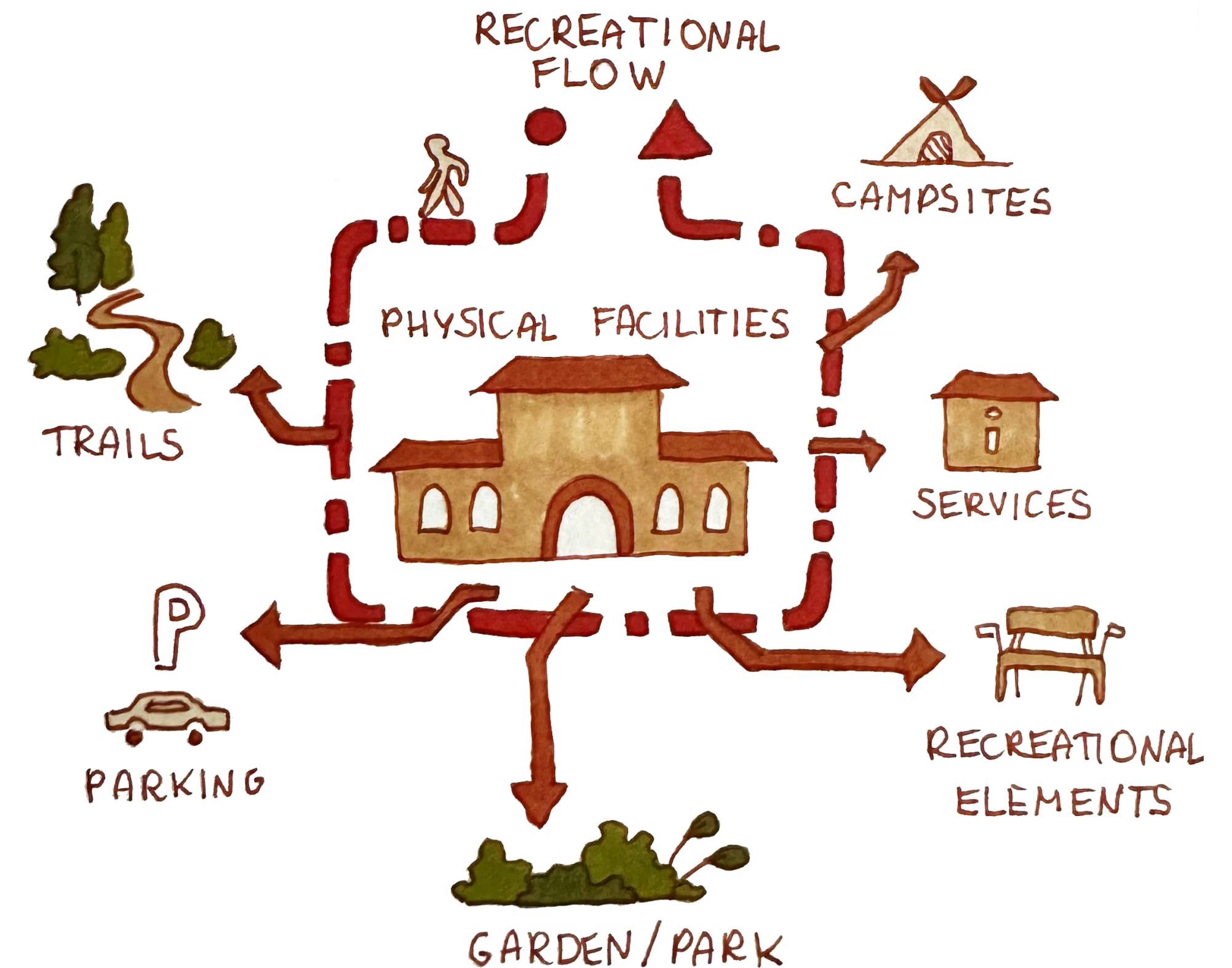


Illustration of recreational infrastructure components

Recreational System

Road and Path Connections

Recreational infrastructure cannot be reached without the help of transport roads and pathways for cyclists and pedestrians. Roads and paths act as connecting links between the tourist and its place of residence and the recreational site (Kavaliauskas, 1980, Daniulaitis, 1997). Roads are not limited to land transport, recreational infrastructure can also be reached by water that can incorporate as a part of recreation itself. The road and path network expands to multi-scale significance – the connections

can be local, regional, national, or even international. Local and regional roads and trails connect communities, while national and international levels bring people of many different backgrounds to recreational destinations and greatly enhance tourism and cultural exchange possibilities for recreational areas. Without road and pathway connections, recreational system would lack the most important component – visitors, tourists, holidaymakers. Recreational experience depends on the quality of these links.



Pedestrian pathways in Birštonas

Economical Factors and Tourism

Recreation can be a large contributor to a country's economy, however, Lithuania is not very dependent on this source of income. Because of this, the contribution of the recreation and tourism sector to the development of Lithuania's economy is significantly smaller than it could and should be. For the development of the national economy, it is important that the recreational services can be provided not only by large businesses, but even so more by medium and small-sized local ones. Such business

expansions are funded by EU investment programs. Recreational systems provide jobs for people, while recreation businesses developed in rural areas where traditional agriculture yields only modest income, provide significant opportunities. This branch of economy does not require to build huge polluting factories or natural resources and raw materials. Recreational and tourism sector needs qualified territory planning, investment knowledge and management specifics (Staniūnas & Stauskis, 2011).

Main tourism and recreation development types:

- **Active tourism;**
- **Health tourism;**
- **Cultural tourism;**
- **Conference and event tourism.**



“Birutės vila” – mineral water pavilion in Birštonas

Psychological Capacity

Attracting people to recreational spaces and ensuring economical benefits is an obvious ambition of territory planners, investors. However, there is a limit of tourist flow called psychological location capacity by recreation organizing specialists. An excessive concentration of vacationers in an area reduces its attractiveness because upon arrival, people once again find themselves in a crowd (Staniūnas & Stauskis, 2011). Controlling and solving this traffic of people is a crucial task for recreational planners.

Psychological capacity can also be understood from a person's perspective – the individual's mental ability to engage in recreational activities. There are many factors that contribute to this emotional capacity, such as motivation, stress levels, interest, coping mechanisms and overall well-being. The aforementioned psychological location capacity also corresponds with the individual's mental ability to stay and interact with a group of other people in a confined boundary of a recreational space.



Illustration of psychological capacity of a recreational space

Planning of Recreational Landscape

Stages of Landscape Planning

Landscape planning for recreational purposes is important while taking several factors into consideration – the environmental aspect of protecting natural resources from urbanization, the social satisfaction of human recreational needs, promotion of national culture with the help of tourism and recreational links and the economic factors of making income and profits with the help of recreational systems and using tourism as the main business and economy driver.

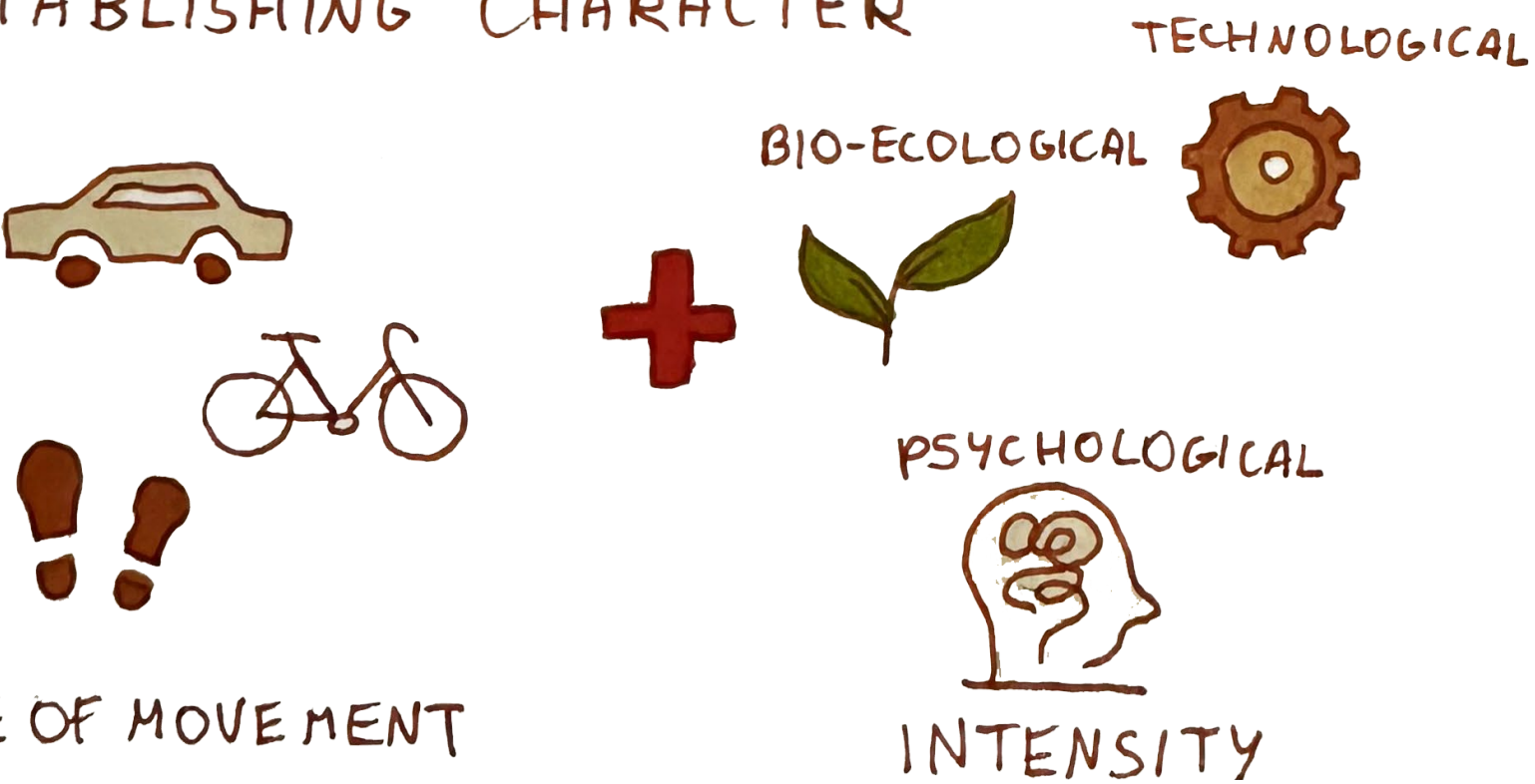
According to S. Bell, 2008, Functional zoning of the territory for recreational purposes should be determined by finding the balance of recreational experience and landscape character. Recreational activities need to complement the landscape character in order to enhance the overall recreational experience to its fullest potential.

- Main stages of landscape planning for recreational purposes (Kavaliauskas, 1980, Daniulaitis, 1997):
- **Measurement of landscape changes degree;**
 - **Establishment of the character and intensity of landscape recreational use;**
 - **Selection of means for landscape protection, management and rehabilitation;**

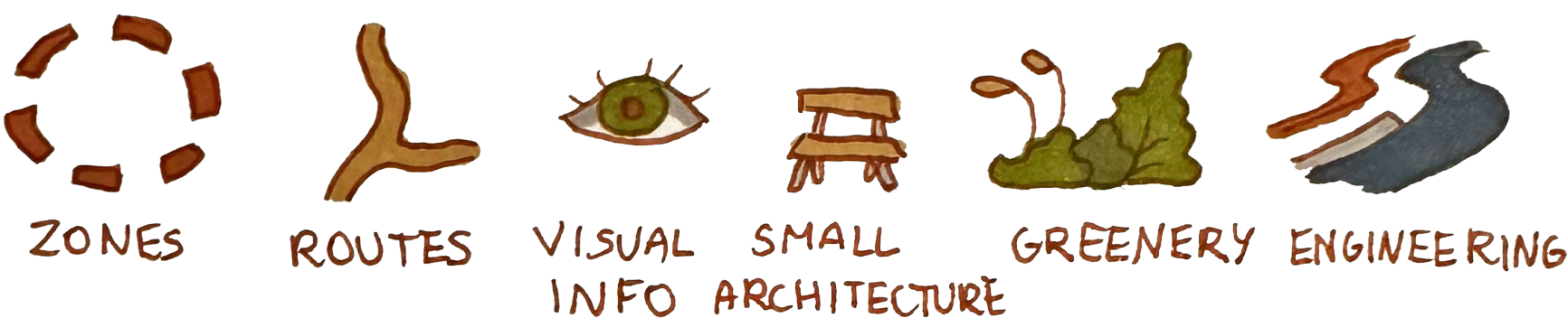
1. MEASURING CHANGES OF LANDSCAPE



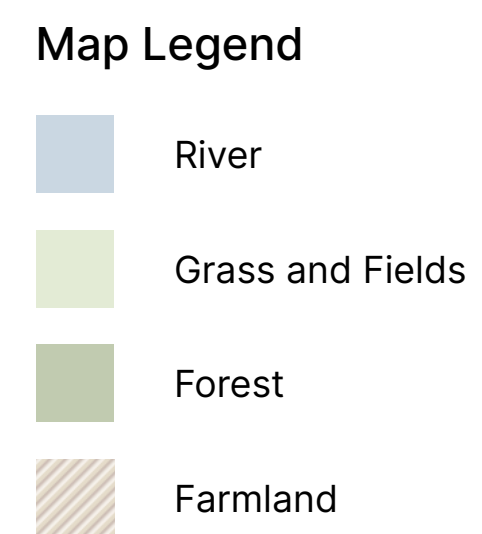
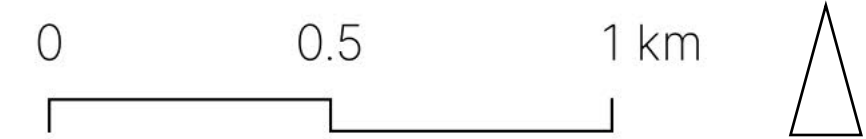
2. ESTABLISHING CHARACTER



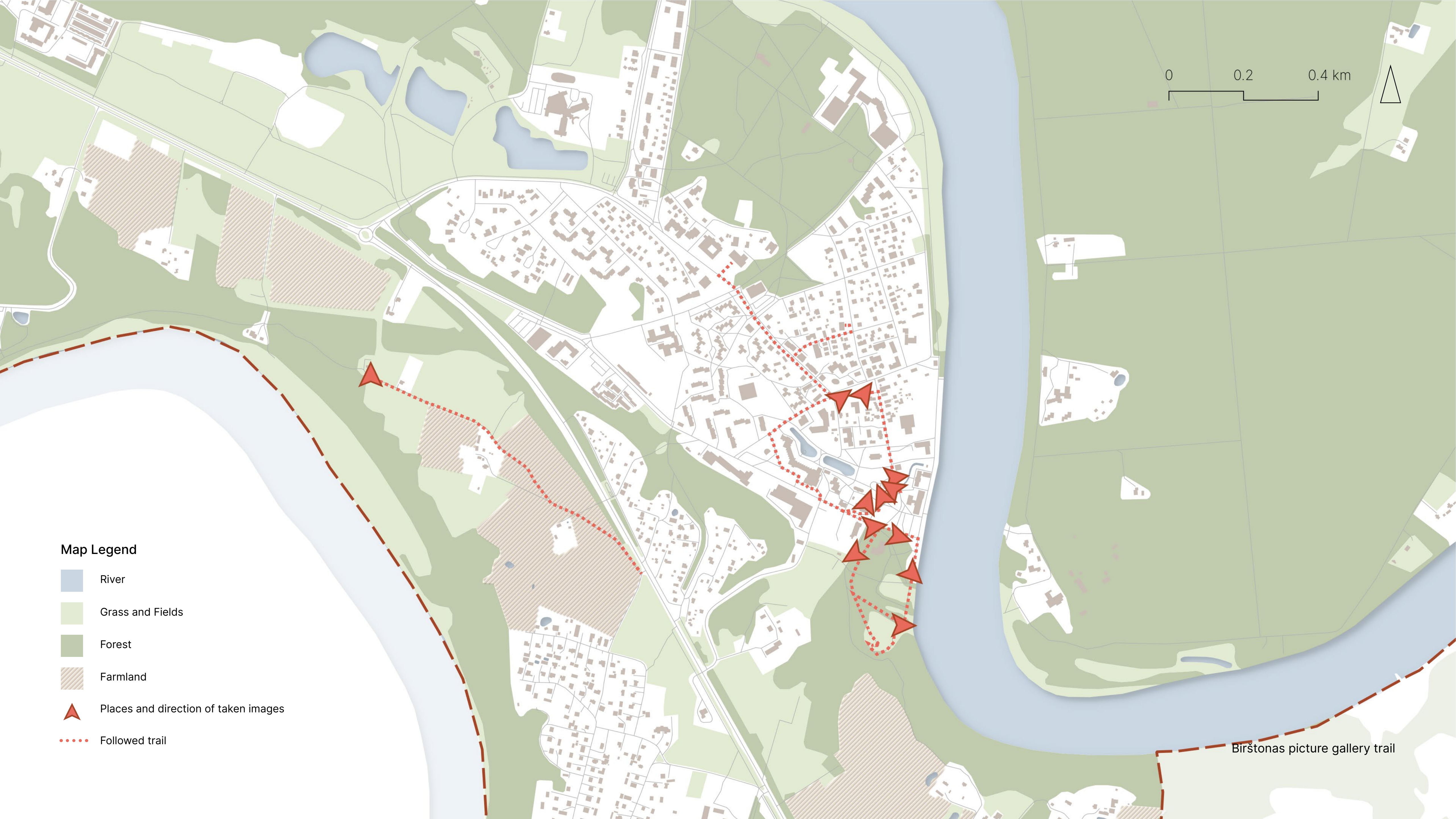
3. SELECTION OF LANDSCAPE MANAGEMENT



Sketch schemes for landscape planning stages



Map of Birštonas city and its administrative boundaries



Map Legend

-  River
-  Grass and Fields
-  Forest
-  Farmland
-  Places and direction of taken images
-  Followed trail

Birštonas picture gallery trail

Recreational System in Birštonas

Historical and Cultural Link

Birštonas is a resort that is famous for its all year round mineral water, mud and climate therapy. People went to Birštonas for the mineral waters' healing properties even back in Medieval times, when Birštonas was mentioned as the hunting manor of the Grand Dukes of Lithuania. The water springs in the area were the main contributors to the health tourism driven resort status of Birštonas that it has today. Officially, Birštonas became a resort in 1854. Health tourism is an old and developed branch

of business. Clients of the branch aim to improve their deteriorating health conditions or seek prophylactic nourishment of physical and spiritual well-being. While recreational infrastructure is important, the crucial element in health tourism resorts is accessible and abundant nature – Birštonas is surrounded by lush pine forests and is embraced by looping Nemunas river. The natural landscape remains relatively undamaged by urbanization, explaining its popularity (Staniūnas & Stauskis, 2011).



“Tulpė” sanatorium (Medical SPA) in Birštonas

Recreational System in Birštonas

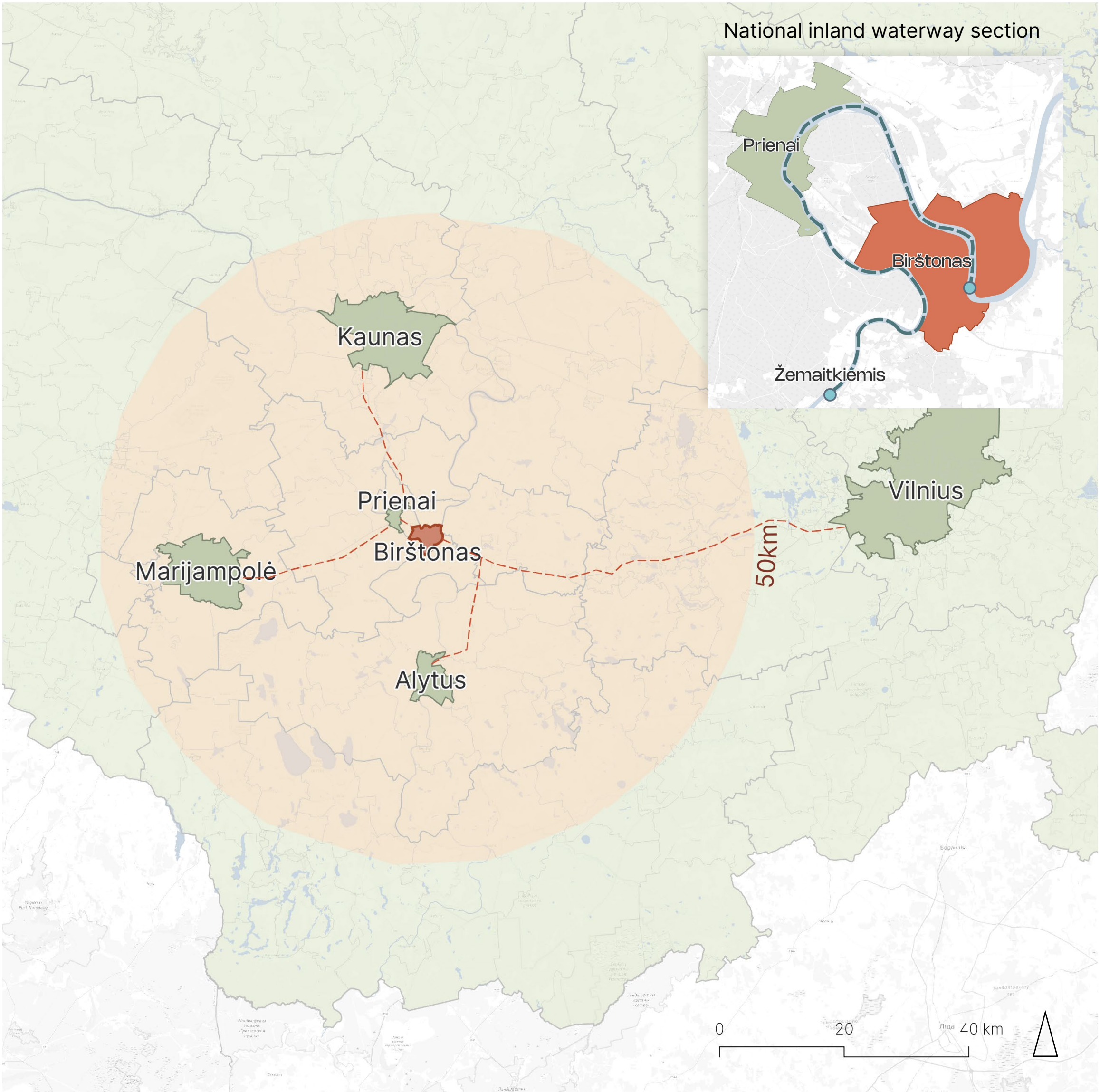
Recreational Territorial Links – National and International Scale

Looking at the international scale, Birštonas is situated equally close from the borders of Russia (Kaliningrad Oblast), Poland and Belarus. The city is farthest away from Latvia, But the straight Via Baltica road from capital Riga still makes the journey pretty easily reachable. Kaunas and Vilnius being very close opens up the international gates to broader spectrum of countries with the help of airports. From a national perspective, Birštonas is situated in the

southern part of Lithuania and is accessed with-in an hour-long ride from main large cities like Kaunas, Vilnius, Alytus. The main road routes for land transport are the most convenient way to reach the city by cars or buses. Rail transport, however, is not available. A section of Operated Inland Waterways of National Importance of The Republic of Lithuania exists in route Žemaitkiemis-Birštonas. It is 20km in length and 20m wide (Vidaus Vandens Kelių Direkcija, 2023).



Map of international links with Birštonas



Map of national links with Birštonas

Recreational System in Birštonas

Recreational Territorial Links – Regional Scale

In the whole area’s regional context, Birštonas has a neighboring city just about 4km away – city of Prienai. According to locals, the relationship between these two cities is not very close. Both cities function independently from each other and do not share any significant cultural or spiritual link, mainly due to Birštonas having a resort city status and having a larger tourist flow. The main highway, splitting Birštonas in two parts could be considered a regional road link connection of the area.

The main issue of the area is the lacking connectivity between the city parts that are separated by the river. To get to the other side of the river, a big 15km loop car ride around Prienai must be made, which is both time consuming and impractical for both residents and visitors. Also, the lower part of the city, the residential area, feels very disconnected from the rest of the city, with very little infrastructure to access it by foot. It was, in fact, a separate village once, that was joined to Birštonas later on.



Map of regional links

Recreational System in Birštonas

Existing Recreational Spaces

As a heath tourism focused resort, Birštonas has an abundance of recreational infrastructure, especially SPA facilities and hotels. Many natural resources in Birštonas are turned into recreational spaces – parks, gardens, hiking and educational trails. Most of them are well integrated into the city infrastructure by having easy access, roads, pathways, connections with city center. The selection of places to engage in recreational activities is broad, but there are still seasonal overcrowding issues.

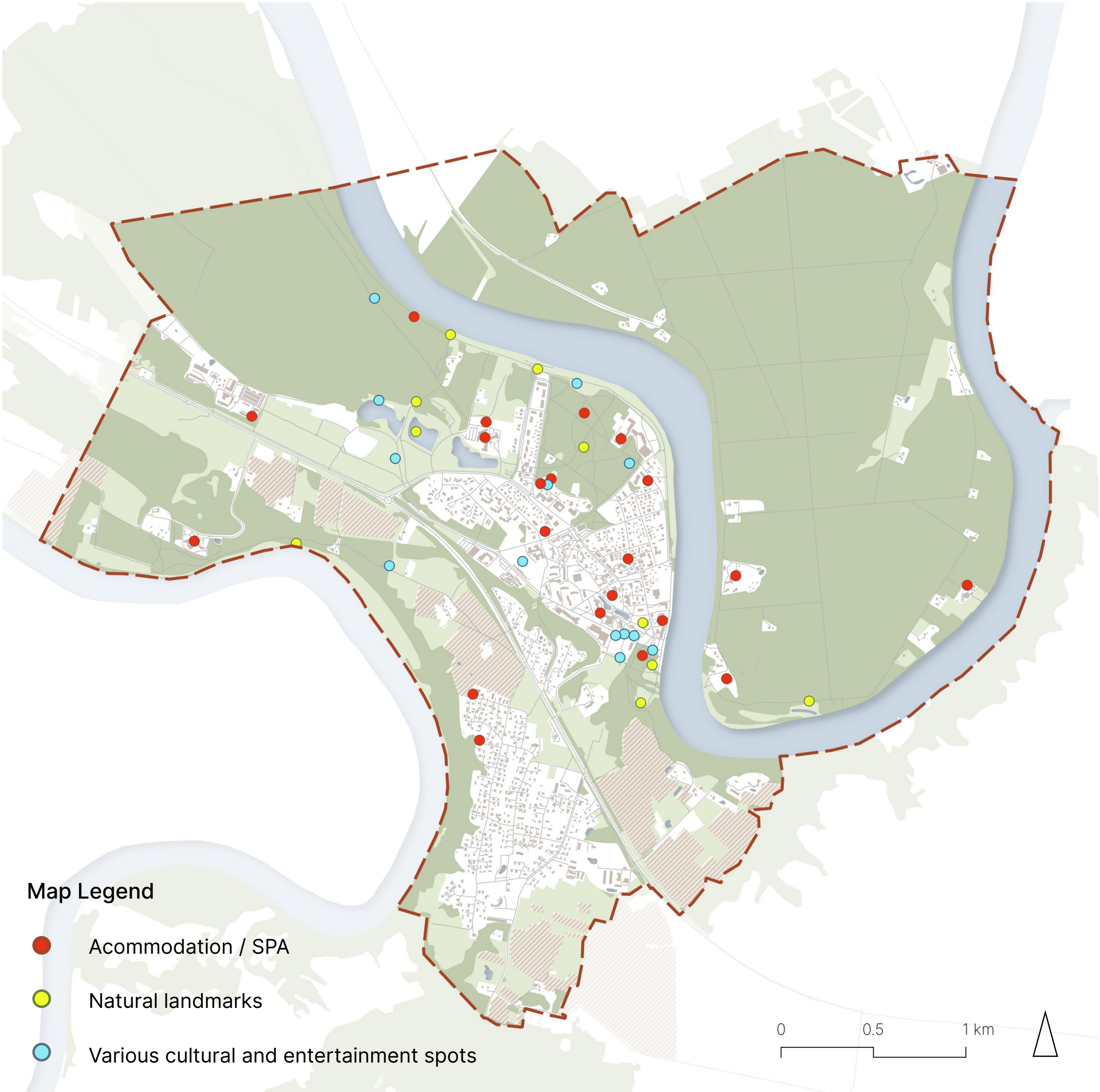
River access is open, however, it is not thoroughly developed for recreational use. During warmer seasons, the river provides a gateway for water tourism, but there is almost no marine dock infrastructure, just basic decks for boat access. The river bank is also not developed for direct access in some parts – a line of concrete enbankments for flood prevention block the way to water. There is still plenty of natural resources that are not adapted to be used as recreational spaces.



Birštonas kurhaus and its surroundings



Pathway along the river Nemunas



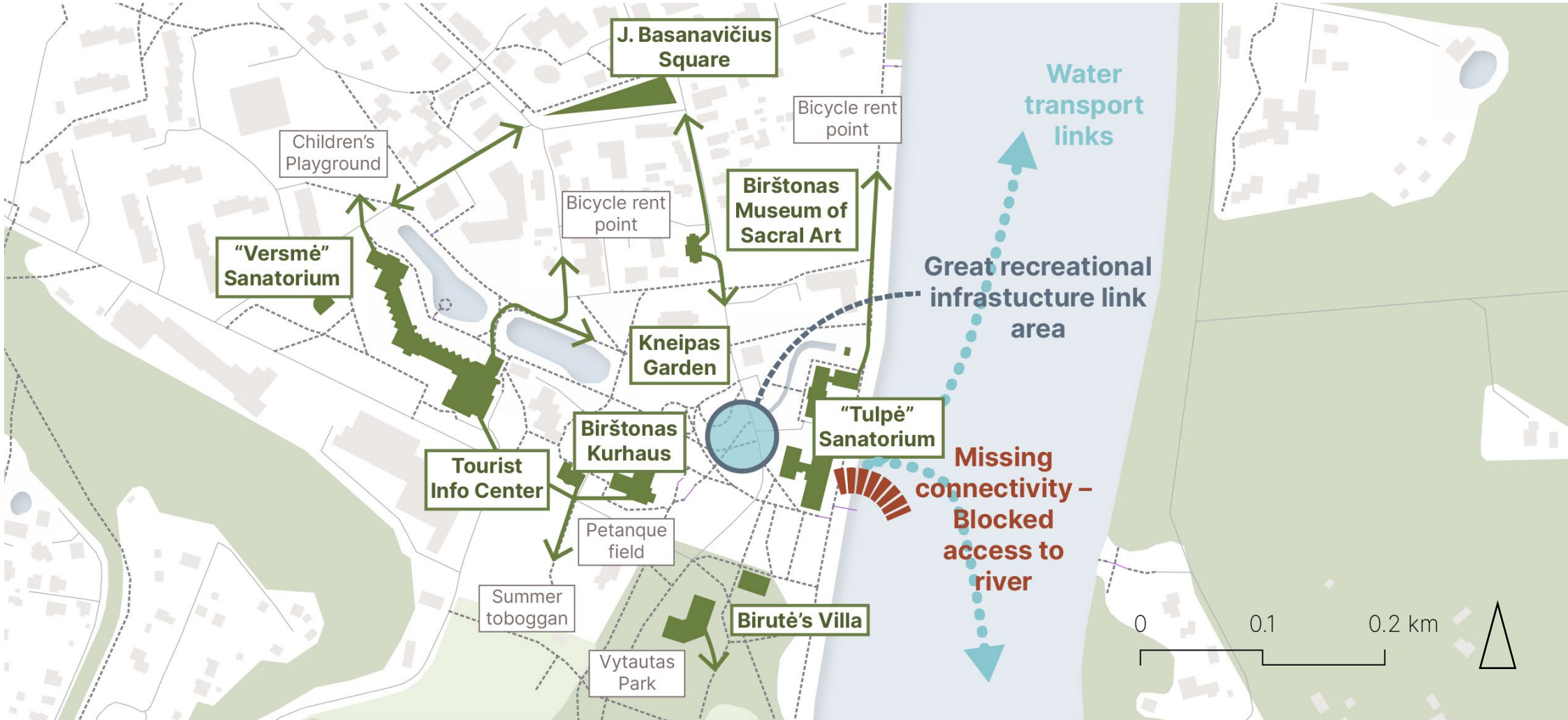
Map of Birštonas and its existing recreational infrastructure and spaces

Recreational System in Birštonas

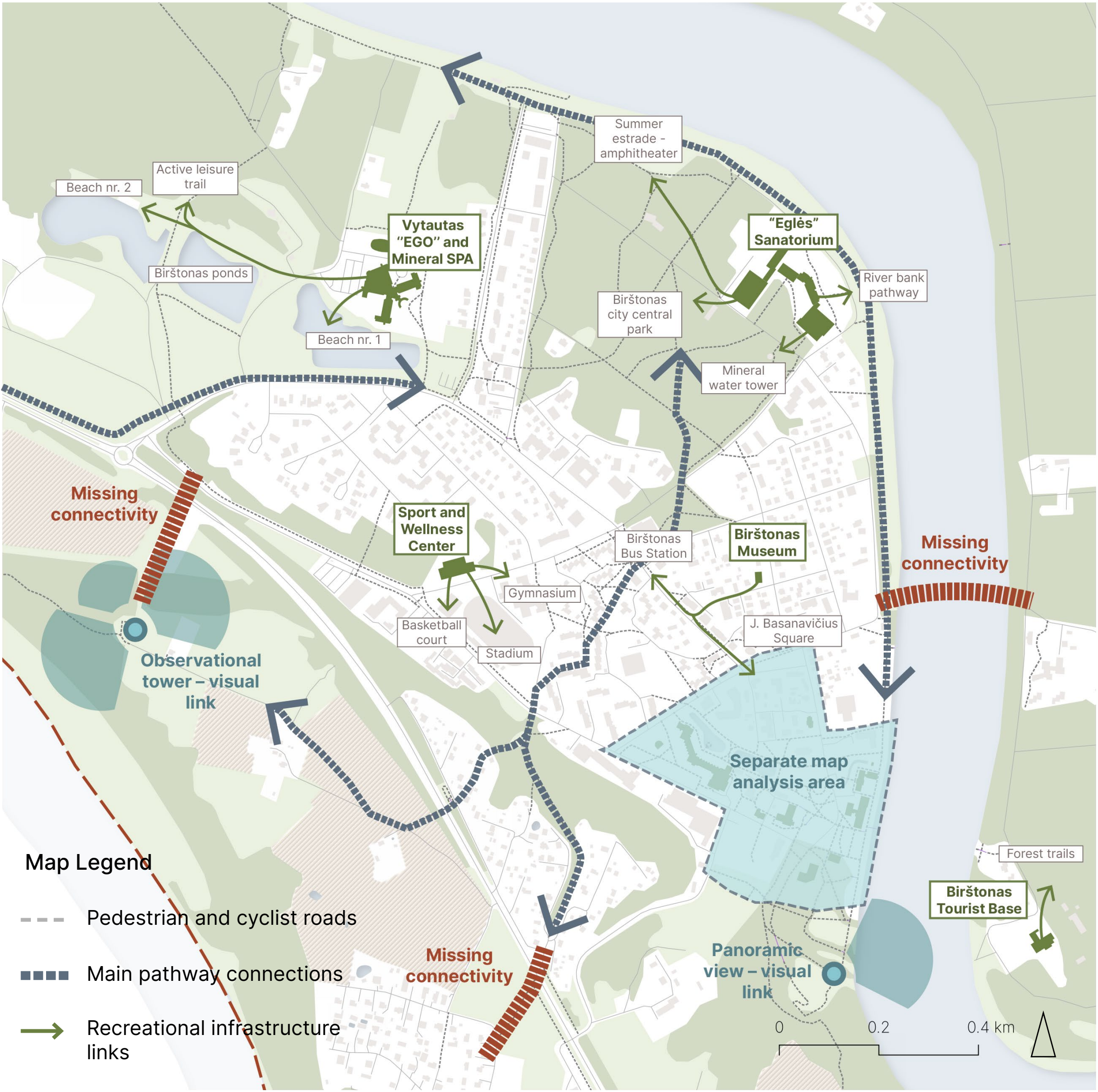
Recreational Territorial Links – Local Scale

Locally, Birštonas has many pathway and other territorial links within its recreational infrastructure. The overall access around the city and the recreational infrastructure elements is pretty well balanced – each of facility has accessible nature and entertainment points. The main issue is the lacking connectivity between the city parts that are separated by the river. To get to the other side of the river, a big 15km loop car ride around Prienai must be made, which is both time consuming and impractical for both

residents and visitors. The central area of the city has a very dense network of recreational infrastructure. The main issue is the lack of direct access to the river bank, especially near the Medical SPA “Tulpės sanatorija”. It is blocked by flood embankments – it is possible to walk over the concrete walls, but it does not seem right and inviting to step over the unpaved lawn. The rest of the center’s infrastructure is well-planned and many recreational elements and landmarks can be accessed within a small radius.



Map of local links (central area)



Map of local links

Recreational System in Birštonas

Impact to Community and Significance to Tourists

In 2023 summer season, Birštonas experienced a lower tourist flow than usual, specifically, 40% less internationals coming to visit the city. However, the medical rehabilitation sector did not suffer and was even overcrowded, but the local commercial businesses had a difficult time getting enough income from visitors (Delfi. Verslas, 2023). Entertainment services and events were also thriving due to the changing habits of tourists – people opt for short visits, often one-day, rather than staying longer.

Overall, Birštonas has a wide variety of recreational activities of various types and each age group can find activities of interest. Main factor of the city’s popularity remains the calm, quiet and abundant natural resources of the resort and the health-enhancing benefits that they offer. The city’s authorities are expanding the touristic opportunities by investing in new apartments and accommodation, but this only creates more infrastructure problems and damages the environment.



Gallery of Birštonas recreational spaces and landmarks

SWOT Analysis

Strengths

- Lots of wild non-anthropogenized natural resources;
- Good road network accessibility in national and international scale;
- The existing medical SPAs are popular and in high demand;
- Relatively wide variety of available recreational activities;
- The resort is mostly quiet and calm.

Weaknesses

- Fragmentation of city parts;
- No bridge through Nemunas to other side of the city;
- Underdeveloped river bank;
- Birštonas observational tower is a great tourist attraction but has bad connectivity with the rest of the city;
- Overused car transportation especially during warmer season;

Opportunities

- Development of Nemunas islands and other side of city through the river;
- Incorporating the other loop of the river near Birštonas observational tower for recreation;
- Vytautas Park and Vytautas mound could be interconnected better as one educational trail;
- The excluded residential part of the city could be connected;
- Birštonas beach near the ponds could use better infrastructure development.

Threats

- A large portion of the area is protected – Škėvoniai geomorphological reserve zone, Birštonas technical reserve zone and Nemuno Kllpos hydrographical reserve;
- Historical city center is also a part of Cultural Heritage Register;
- Larger recreational flow might overwhelm the permanent residents of the city;
- Any recreational system solution has to be very carefully planned because of the wild natural landscape that is sensitive to changes and may be damaged;
- Increasing tourist numbers causes pressure of overbooking to existing accommodation and service facilities.

Manifesto Ideas

The recreational system in Birštonas is in fact very satisfactory for such a small city without major urban planning strategies. The nature is abundant and accessible, while the recreational infrastructure objects around it fit perfectly into the health enhancing or mental and physical replenishment concept. The recreational system functions like a tube – a substance flows through while collecting any elements left behind it. The substance, in this case, being the recreational flow of people. During this journey,

people get to experience each element of the recreational infrastructure – anything from nature landmarks to pathways or facilities for rehabilitation or accommodation. All this whirlpool spiral is interconnected and each element is dependent on one another, thus forming recreational links (white space on the manifesto drawing). The recreational system of Birštonas can mostly be improved not by introducing new elements, buildings of facilities, but by improving the recreational links of the existing system.



Strategy Phase

Recreational System Development Strategies for Birštonas

During the strategy phase, a hypothesis for research is proposed and used as a base for the development strategies for Birštonas. The hypothesis needs to be proved with argumentative strategies and explanations of keywords. Each keyword hides away a deeper meaning and an aspect to base the strategies on. The main focus of the strategy phase is to find balance between three key factors – economic, natural and social. By balancing these factors, the needs of people living in the city are satisfied on higher

terms and quality. Besides these three factors, it is important to address the uniqueness of the location and its authentic features. Every component, whether it's a landscape, cultural heritage object or the people in general, is part of the city's identity and should be respected and preserved in every possible way. With the help of urban planning and well defined strategies, the identity of the city can in fact be enhanced and expressed even more, ensuring that Birštonas would be known for its exact individuality.

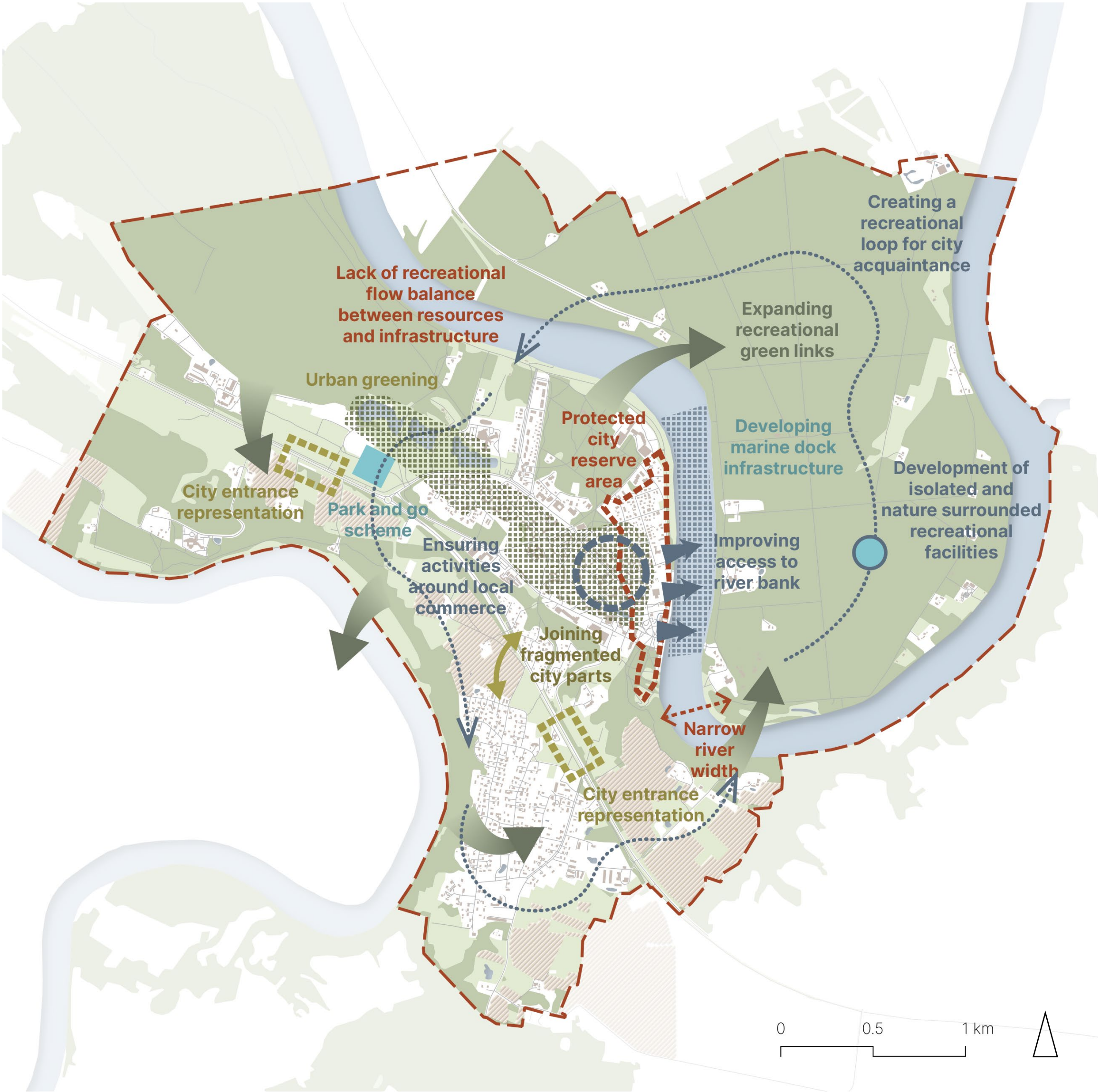


Illustration of wooden statue of Vytautas the Great in Birštonas

Opportunities and Constraints

Birštonas has many strategic paths for developing recreational systems. Land development strategies can include expansion of green recreational links with minimal damage to the natural environment and adapting urban greening alongside it. Establishing a park and go scheme (at least seasonally) would encourage city visitors to walk and explore the city without being dependent on car travel and finding local spots to spend their visit time. Improving access to the river bank should be one of the priorities,

since Nemunas river is a big part of the city's identity and correlates with the health-restoring characteristic. Activities should be located around the local commerce to address the problem of low visitor numbers during high season. The lush forest on the other side of the river could be used for creating a completely excluded and nature surrounded recreational facility, especially for people with mobility or intellectual disabilities. Main constraint of the area is the reserve and cultural heritage protection zones.



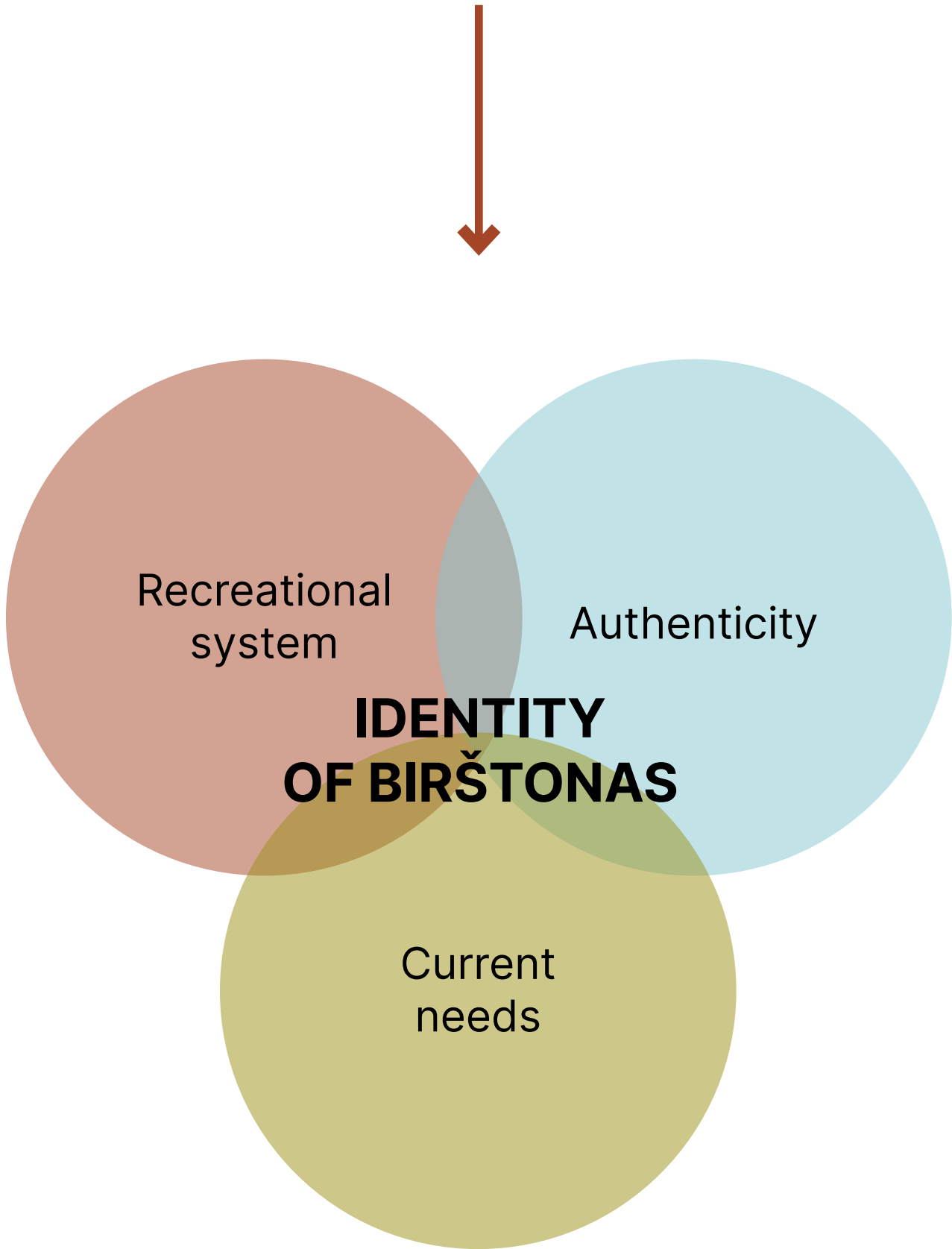
Map of opportunities and constraints of the area

Research Hypothesis

The identity of the city can be defined by many different factors which could even be subjective and depend on the unique viewpoints of people. However, some features inevitably shape the authentic atmosphere of a city and help to identify it from other cities. In Birštonas case, two factors play an important role in forming the city's character: recreational system and authenticity – the unique geographical, environmental and cultural heritage aspects of the area. To form a defined and strong identity of the city,

social factors must be added into the equation to reach balance between social, economic and natural elements. Recreational system is the only component that can be physically developed to support the other two and acts as the main driving aspect of the proposed research hypothesis. This hypothesis of further research of Birštonas and the idea of three overlapping factors in creating identity needs to be explained and proved to be functional and adaptable to the needs of Birštonas city residents and tourists.

“Development of recreational system based on current needs and authenticity in Birštonas would enhance the city's identity.”



Identification of Authentic Features

Landscape Patterns

One of ecologic planning methods proposed by P. Lewis states that complex patterns and textures of the landscape should be treated as a work of art. Such landscape patterns also need to be preserved and respected because the landscape patterns are linked to larger patches within which they are embedded and to the smaller patterns that are embedded in it thus forming an overlapping network of unique features and shapes that fill up, enhance and depend each other.

The primary landscape patterns of Birštonas are the naturally formed features of geology, ecology (complex ecosystems) and hydrology of the area. The large loops of the river form the unique shape of the natural landscape and acts one of the main patterns for the formation of secondary, tertiary and quaternary layers. Landscape elements are an important part of the recreational system, thus respecting these patterns of the area is crucial and preserving and showcasing them is part of Birštonas' identity.

PRIMARY:



Geology



Ecology



Hydrology

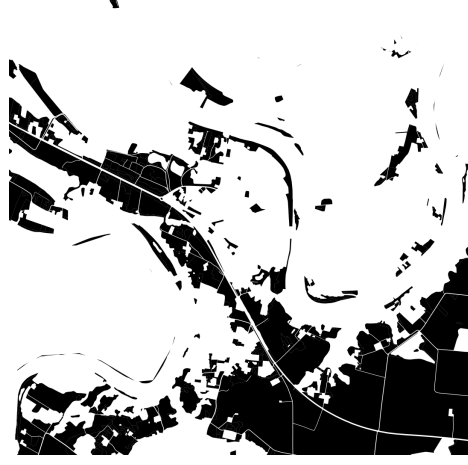
SECONDARY:



Buildings

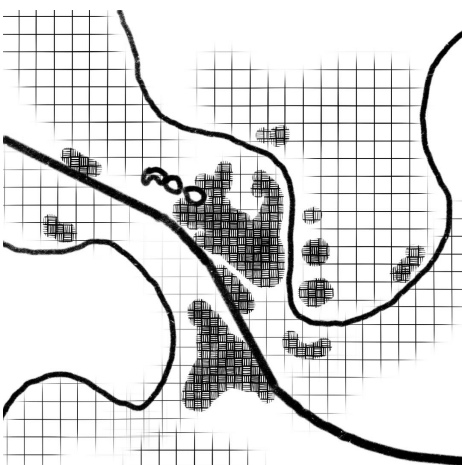


Roads

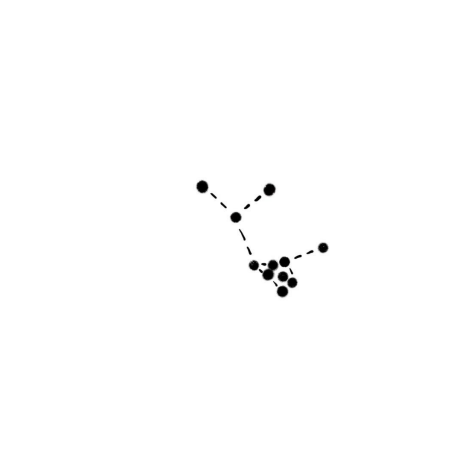


Fields

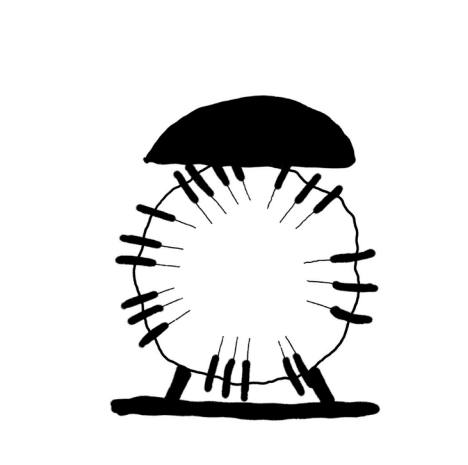
TERTIARY:



Art

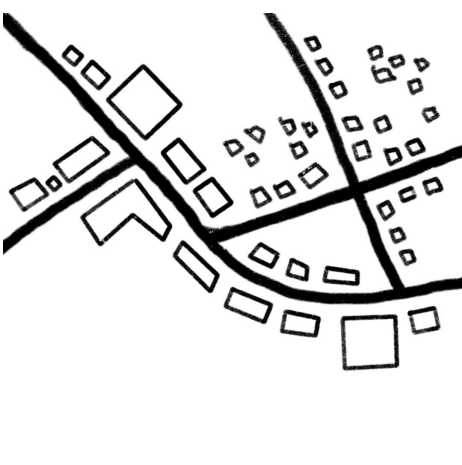


Stories

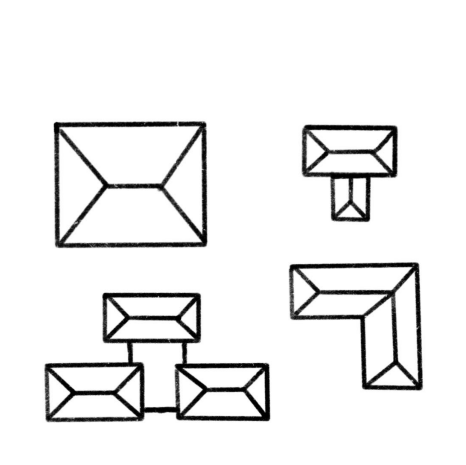


Music

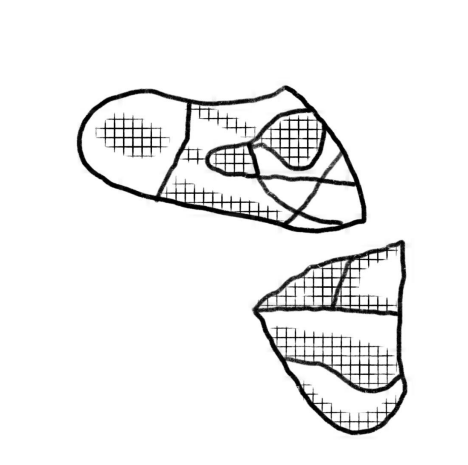
QUATERNARY:



Settlement archetypes



Building archetypes



Garden archetypes

Identification of Authentic Features

Health-promoting Environment

According to the official page of Birštonas Tourism Information Center, the region of Birštonas has 13 operational water boreholes of two categories – without specific components (sodium chloride) and bromine. Important aspect of mineral water is the level of mineralization, which can vary from low to medium and high. Each mineral type and content water has different healing properties. Birštonas has several places where drinking water of low to medium mineralization content is provided for public use.

The mineral waters are also used for external procedures in rehabilitation centers. The other important aspect of the health-promoting environment of Birštonas, is the natural surroundings of the area, an abundance of accessible parks, green public spaces and the beautiful natural landscape of the looping river. Along with an extensive recreational infrastructure, the natural environment and geological feature of concentrated mineral water springs create a unique health-tourism driven resort identity.



Illustration of drinking water fountain in Birštonas

Identification of Authentic Features

History and Heritage

The authentic townscape identity of a city is formed by historical and socio-cultural aspects of the defined area. The iconic and conventional symbols defined in the map are based on M.Cole's theories of cultural-historical artifacts and semiotics. As observed by A. Raižytė, according to the theory, objects used and created by humans, due to the cultural associations become symbols - a kind of external form of collective memory of the community, transmitting information from one generation, to another.

Iconic symbols are defined as whose form is related to culturally or city-specific iconic signs signifying certain content and are understood practically by all representatives of a particular culture. And lastly, conventional symbols are formed based on social agreement. Both of these types of symbolic landmarks of a city show the truly authentic places, buildings or cultural heritage objects that define a part of the city's unique identity. Respecting this history is an important part of enhancing the identity.

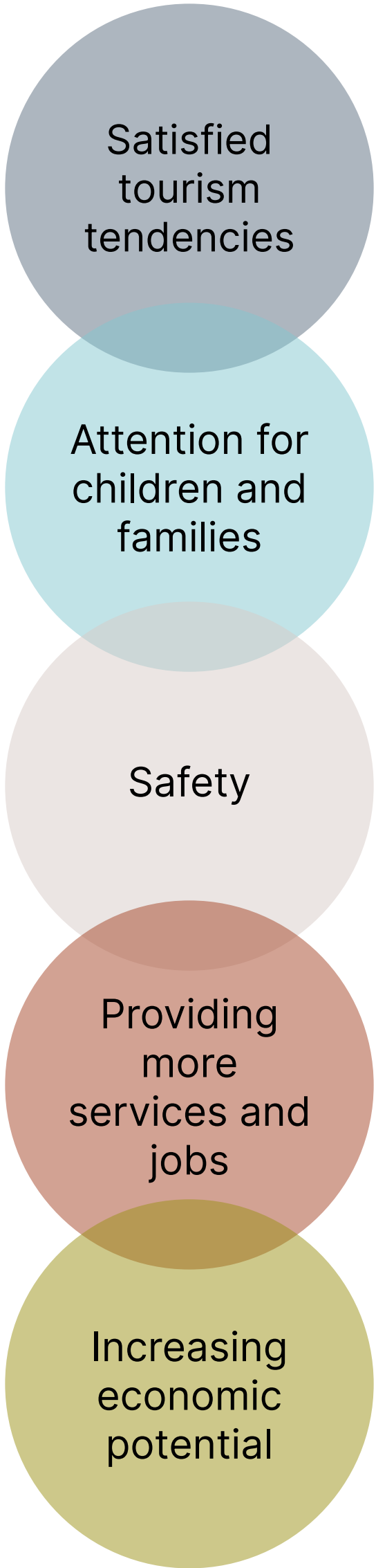


A part of Birštonas identity map analysis using M. Cole theory made by A. Raižytė

Analysis of Current Day Needs

According to the data of Birštonas Tourism Information Center that was published in the “Strategic Development Plan of the Municipality of Birštonas until 2030”, a very important aspect for resort city needs is noticeable tourism tendencies, such as increasing children and family visitors, workshop and conference event organization, safe tourism and winter activities. These are especially impactful for attracting international visitors. Main defined problems of the resort are the lack of interesting events, services,

objects and underdeveloped water tourism, this greatly impacts the international visitor numbers. On the regional and local level, primary issue is limited supply of services and jobs and decreasing attractiveness of the economic environment of the area, thus deterring young people from the city and leaving an aging population behind. The strategic development plan focuses on improving quality of life especially for younger people and attracting innovative businesses to the area to increase economic potential.

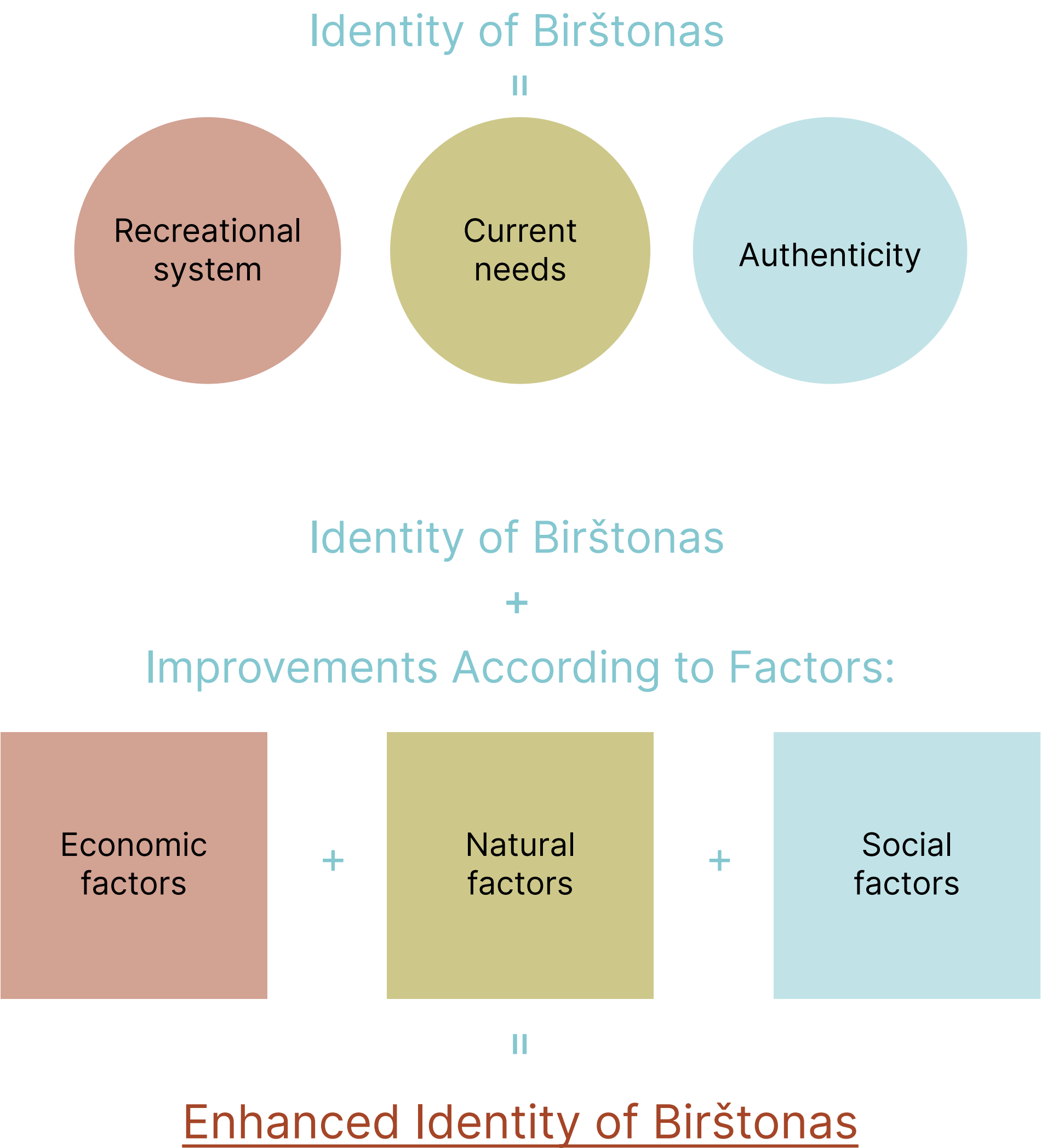


Birštonas city main needs and priorities

Key Objectives for Urban Planning in Birštonas

If the identity of Birštonas is formed by recreational system, current needs and authentic features, then strategies on enhancing it should involve not only the aforementioned components, but also look in into three important factors – economy, nature and social aspects. By proposing strategies that follow these three factors, a balanced outcome of urban planning solutions is created. Each factor represents each of the identity's components, for instance, recreational system is a major contributor to economy,

provides social and public spaces for people and uses natural recreational resources to achieve that. Any proposed strategy should answer the factors' needs in order to enhance the identity, otherwise, the current identity of the city will not be amplified or improved in any way and would stay as it is now. According to this logic, four strategies are proposed further on, all of which involve the aspects of the three main components of the city's identity and focus on the economic, natural and social factor problems.



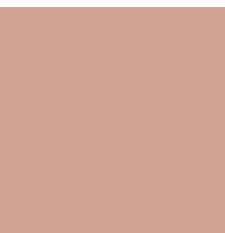
Scheme of strategy goals in Birštonas

Key Objectives for Urban Planning in Birštonas

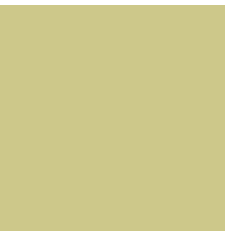
Preserve and Showcase the Authentic Features

Authentic features of history, landscape patterns and the health-promoting environment of the city can be further accentuated with the help of strategic educational trail placement, revitalization of the historic part, development of river infrastructure and establishment of new panoramic views for public access. Public art expositions that showcase the authenticity of Birštonas could also be implemented as a representative element in the entry points and transit streets, where it would be more noticeable.

Benefits and improvements to factors:



- Economic:**
- Attracting tourists;
 - More income;
 - Supporting local artists.



- Natural:**
- Respecting natural patterns;
 - Showcasing natural features;
 - Making use of natural resources.



- Social:**
- Education about history;
 - Spreading awareness about the importance of preservation.



Strategy map

Key Objectives for Urban Planning in Birštonas

Analogous Project Example

The Cheonggyecheon Stream Restoration is a project that revolutionized the cityscape of Seoul, South Korea. Concluded in 2005, the project centered on reviving a long-neglected waterway that had remained concealed beneath a highway for many years. This ambitious endeavor not only enhanced the visual allure of the region but also offered many social, environmental, and economic advantages for the city. The river's presence cools nearby areas by an average of 3 degrees, while its vegetation and

flowing water supports various wildlife, enhancing the appeal of this downtown Seoul oasis as a relaxing spot for leisure activities while improving connectivity in the downtown. The river was once an authentic landscape pattern of the area and concealing it within an artificial and highly polluting highway destroyed a part of the city's identity. Revitalizing and recreating this natural element and part of landscape brought back a sense of authentic connection with nature within a densely populated megapolis.



Highway before the restoration Project



Cheonggyecheon stream after the restoration Project (photo by F. Anzola)

Key Objectives for Urban Planning in Birštonas

Adopt Resilient Design Principles to Recreational System

Resilient design in urban areas consists not only of climate resilient aspects of adapting to nature, but also social and economic factors of equity and improved quality of life. Making use of the river resource in Birštonas is the most applicable and achievable strategy – creating new recreational spaces along the river that could adapt to climate changes and conserve biodiversity would improve all three strategic factors at once. Other solutions include rainwater management in the streets and accessible services.

Benefits and improvements to factors:

Economic:

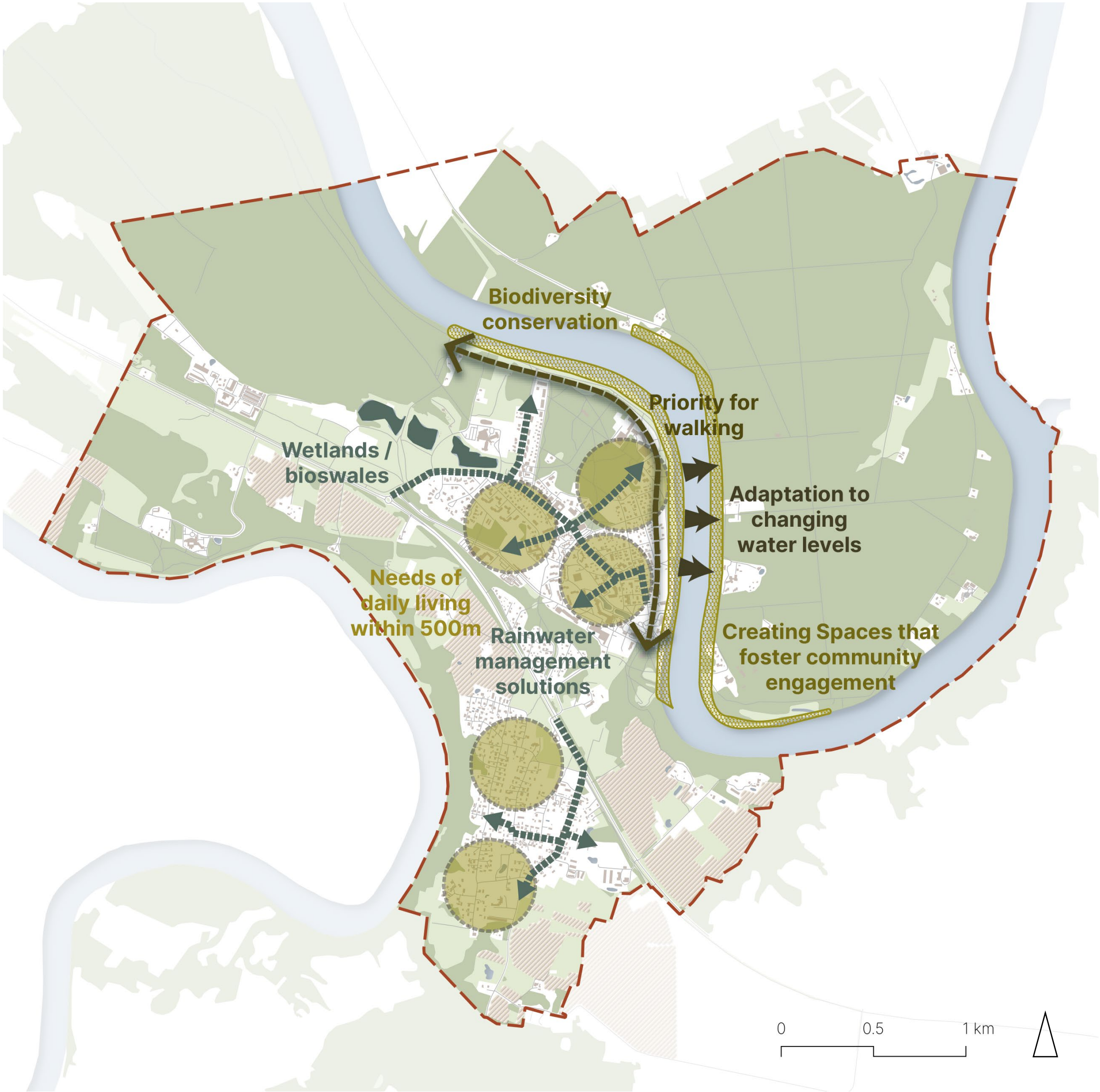
- Long-term cost savings;
- Enhanced property value;
- Improved tourism and recreation.

Natural:

- Ecosystem restoration;
- Climate adaptation;
- Green infrastructure.

Social:

- Public health and safety;
- Social interactions and community bonding;
- Social equity - equitable access to essential services.



Strategy map

Key Objectives for Urban Planning in Birštonas

Analogous Project Example

Jurong Lakeside Gardens in Singapore is a prime example of resilient design principles adapted to a real-life location. The area is a lush freshwater swamp forest that was turned into recreational spaces for the neighborhood. The main vision of the project is to create a biophilic garden where people, animals and plants can co-exist and bring mutual benefits. The freshwater swamp was extensively restored and the new recreational infrastructure is adapted to climate changes and water level fluctuations.

Biodiversity conservation and flood mitigation or proper drainage systems are one of the most important physical resilient design aspects of the project. The park was formed using local resources and mimics the natural movement patterns of swamp animals and other values of natural habitats. The Lakeside Gardens have also become a popular tourist destination and a place for communal activities and events. The area has many different spaces for each age group to enjoy and spend time alongside nature.

Before



After



Drainage improvements



Rasau Walk – swamp forest trail (photo by NParks)

Key Objectives for Urban Planning in Birštonas

Improve Economic Potential of the Area

Main current day needs of Birštonas according to the city's Strategic Development Plan is improvement of economic potential and providing more services and jobs to the community. Strategies to address this include improving the road infrastructure and developing tourist attractions (as proposed in detail in previous strategies). After this, promotion of mixed-use development and adaptive reuse could be adapted to the existing urban fabric, while targeted objects could turn into new places for services and jobs.

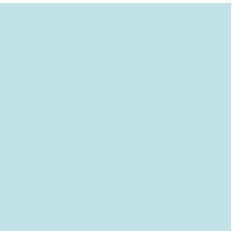
Benefits and improvements to factors:



- Economic:**
- Attracting and retaining businesses;
 - Ensuring local economy growth;



- Natural:**
- Investing in quality green solutions ensures support for environmental protection;
 - Promoting eco-tourism.



- Social:**
- Job creation and income growth;
 - Access to services and amenities;
 - Community development.



Strategy map

Key Objectives for Urban Planning in Birštonas

Analogous Project Example

Paupys district in Vilnius, Lithuania once used to be an abandoned industrial zone, until a major urban design project was proposed for the territory turning it into a contemporary mixed-use development neighborhood with business blocks for companies that appreciate the culture of the old town, as well as six characteristic residential blocks that hide away from the city noise. There is also an urban bazaar, food court, art galleries and venues and many different services, events and activities for the community.

The whole district received a complete make-over with the help of mixed-use development strategies, adaptive reuse methods and New Urbanism ideas that brought many new local businesses and jobs enhancing the economy of the city and also attracted residents to the area and improved the overall socio-economic potential of the surrounding area. The district now thrives as a safe, modern and opportunity-rich urban area that is open and functional for both local residents and visiting tourists alike.



Paupys district before the conversion



Bird's eye view of Paupys district (photo by E. Stakėnas)

Key Objectives for Urban Planning in Birštonas

Promote Social Cohesion and Safety

Birštonas is a small and rather quiet city that does not particularly suffer from high crime rates, however, the streets are more adapted for cars than people and this contributes to psychological safety issues due to the cars being too close to pedestrians. The safety of all public spaces could be enhanced by ensuring good lighting solutions. New residential development should be regulated to be inclusive for a wide variety of social backgrounds. Establishment of community hubs would foster participation.

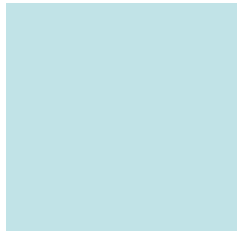
Benefits and improvements to factors:



- Economic:**
- Increased economic activity;
 - City becomes more attractive to well-educated and skilled people.



- Natural:**
- Environmental awareness of socially cohesive and active community;
 - Improvement to green spaces.



- Social:**
- Reduced crime and violence rates;
 - Enhanced social capital;
 - Improved public health.



Strategy map

Key Objectives for Urban Planning in Birštonas

Analogous Project Example

Gellerup New Nature Park is a nature-based model that transformed the social housing estates of the 1960s from deprived 'living machines' into socially and environmentally sustainable humane neighborhoods. The Gellerupparken district is the poorest neighborhood in Denmark, and has the highest density of immigrants in the country (88% of the residents). By focusing on the many existing qualities, Gellerup was transformed from a uniform residential area into a vibrant, climate-adapted,

and green neighborhood. Through an engagement process with the citizens, desires and requirements of all residents were listened to and incorporated into the design. Additionally, expert insights on safety, marginalized social groups, and strategies for improving socially and physically challenging neighborhoods were taken into consideration. Nowadays, numerous individuals can be seen outdoors, enjoying themselves and fostering connections with one another – a true success story of promoting social cohesion.



Gellerup district public spaces today



Gellerupparken project in Aarhus visual by SLA

Key Objectives for Urban Planning in Birštonas

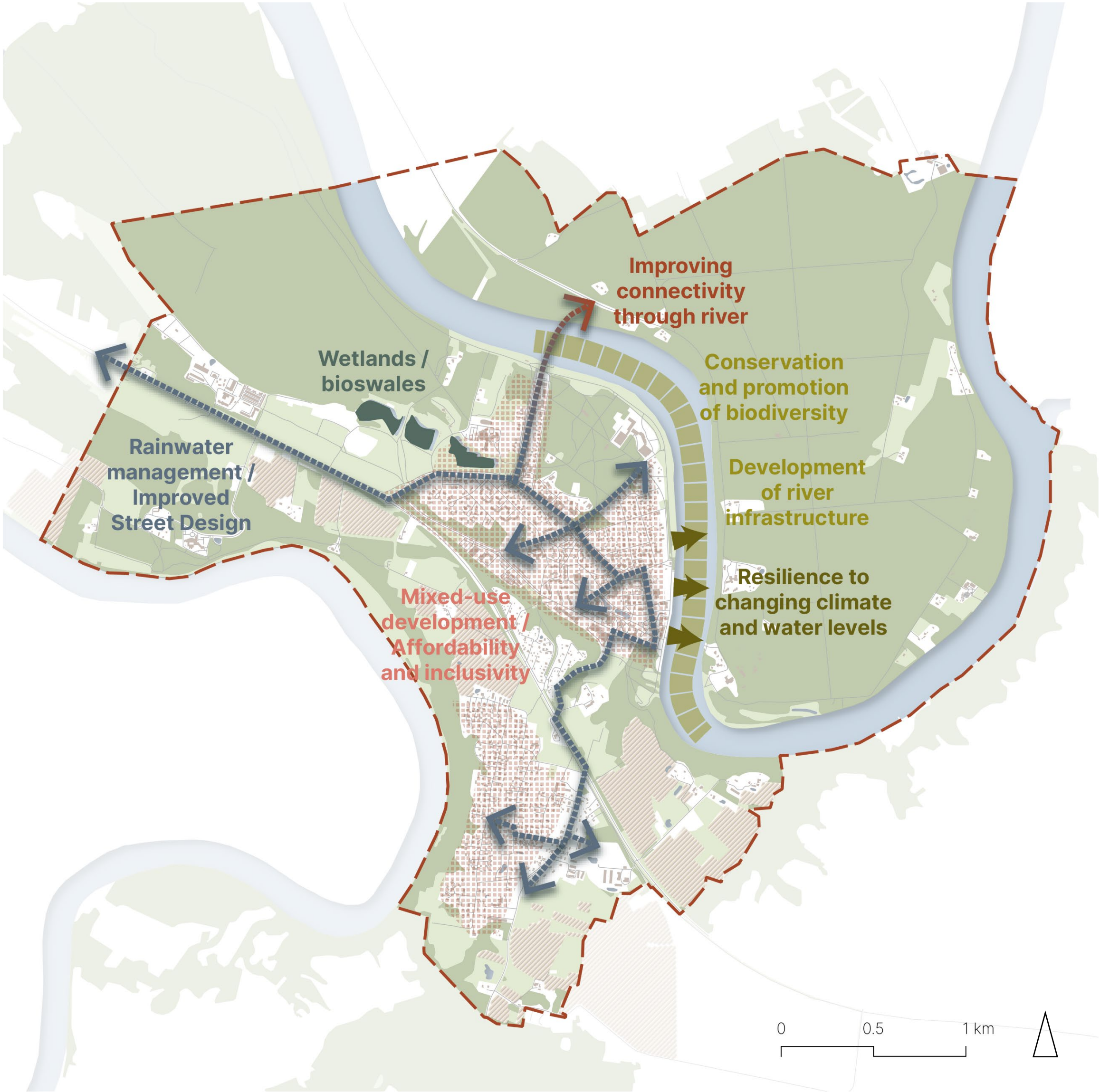
Combined Strategy

By combining and adding up similar strategy elements, a few key strategic approaches remain. Firstly, improvement of existing roads and streets by adding green infrastructure and adapting them more for people. Next key goal is to develop the most important and authentic natural resource of the area - Nemunas river, by adding infrastructure for water transportation, green solutions for promoting biodiversity and adding an aspect of resilient design – adaptations to changing water levels due to flooding.

The road and river strategies combine for the need to improve the connection between main-land Birštonas city and the other side of the river. After establishing the mostly natural factors, socio-economic improvements like mixed-use development strategies that ensure social cohesion by including affordable and inclusive options for everyone are implemented. This would increase the both the economic potential for future businesses and the attractiveness for high-quality urban life for residents and tourists.



- Improved economic potential for investors, businesses, tourism;
- Better quality of life in the city for both residents and visitors;
- Social cohesion and equity for accessible services, amenities, jobs, public spaces and safety;
- Respect for the unique natural resources and its landscape patterns.



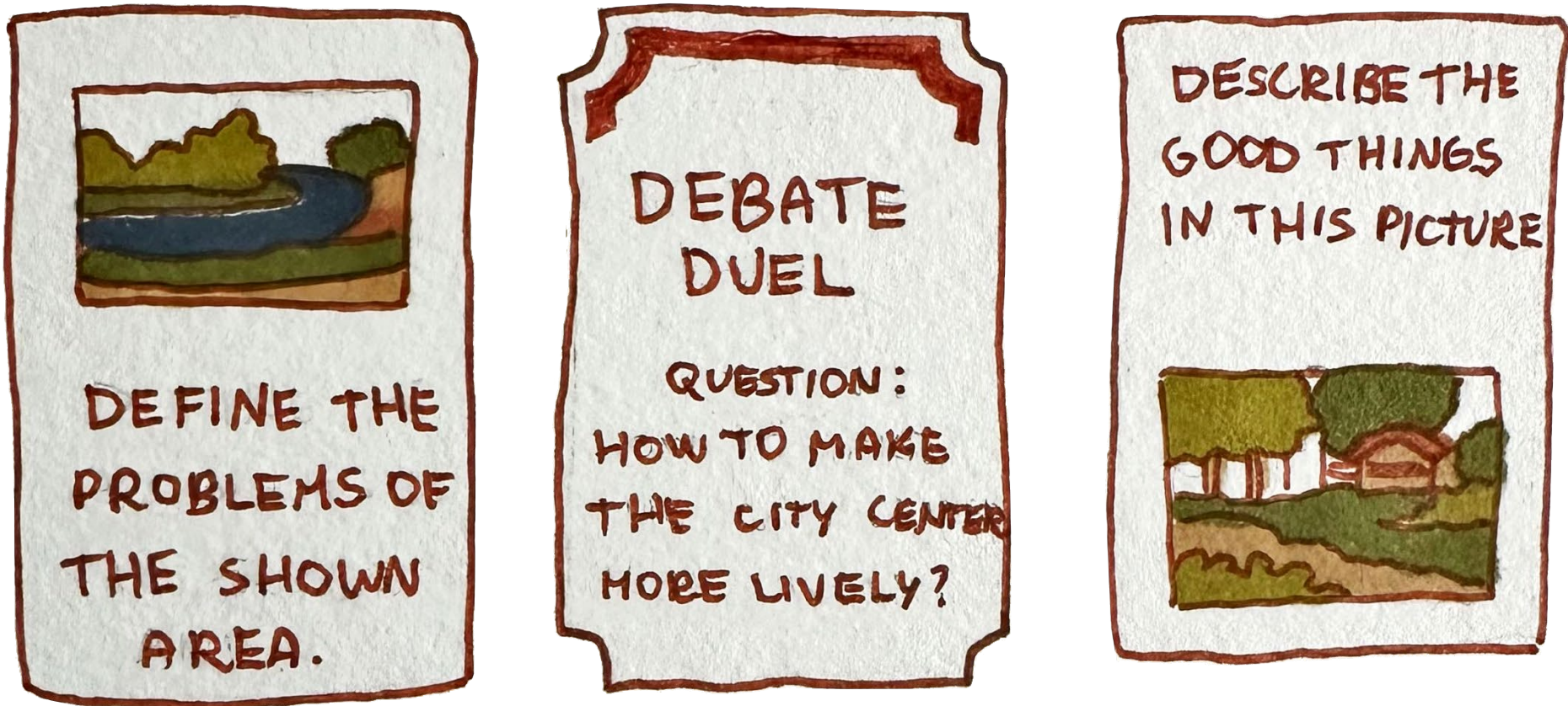
Combined strategy map

Community Participation in Urban Planning

Alias Party: Birštonas Edition

To encourage active participation in urban planning of Birštonas, an alternative version of a popular explanation game Alias Party is proposed. The game would work similarly as the familiar game rules, however, instead of explaining words within a limited time gap, players will get cards with pictures of places in Birštonas and would have to describe the area in a way the card tells to. For instance, a player could get a card that says to characterize the area in the image by defining its problems, all within a time

limit of the typical Alias game hourglass. If the location is guessed correctly, the explaining team may move the character on the board. The 'Party' element in the game would be the special tiles, which, if stepped on, could initiate debate duels between the teams. This way, fast on-the-spot critical thinking would play its role for the members of the community and these initial ideas of the mind could be used in urban planning to solve certain problems or find the good examples of the public spaces of a city.



Design Phase

Urban Planning Solutions for Birštonas According to Strategies

After extensive research and established strategies, a special plan of city scale and concrete solutions for a pilot area are proposed in this design phase. Starting from initial ideas for further masterplan development and building up some additional research and analysis according to strategy defined ideas for the area. The focus of the development is blue-green infrastructure and enhancement of the city's water-based identity. The benefits of implementing blue-green infrastructure are thoroughly analysed

and the correlation with recreational system is established. The special plan of the whole city defines management zones which provide a system of rules and recommendations according to specific features of each zone. A pilot area is selected for developing and detailing the masterplan of implemented solutions. The design solutions revolve around the one of the main problems of Birštonas – lack of water infrastructure and activities, which had proved to have a lot of potential to be developed in many ways.



Illustration of an artistic bench near Birštonas museum

Masterplan Development Ideas

Enhanced Identity Through Water Aspect

The analysis and research of the area showed that the river is a very underdeveloped part of Birštonas even though it is one of the most important landscape patterns shaping the frame of the city. The hypothesis of the project states that development of recreational system would enhance the identity of the city, so in order to specify the concept for the city to a narrower topic, the aspect of water is taken for the masterplan development sketches and ideas. Water is an important feature of Birštonas, not only as

a part of the authentic natural resource river, but also part of the health-enhancing environment and mineral water springs of the area. Incorporating elements of green and blue infrastructure and manipulating the water cycle of urban and natural environments would amplify the water aspect and enhance the essential part of the city's identity. Besides this, accentuation of water would create new types recreational spaces and infrastructure which would benefit the residents and attract more tourists.

Enhanced Identity + Water



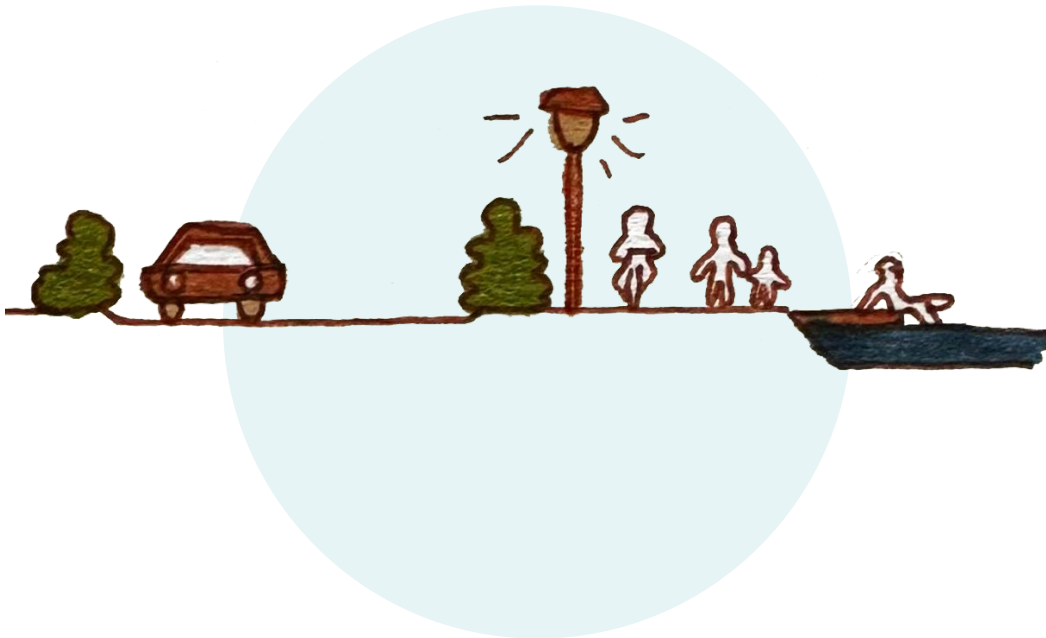
Preserve and Showcase the Authentic Features



Adopt Resilient Design Principles to Recreational System



Promote Social Cohesion and Safety



Improve Economic Potential of the Area



Masterplan Development Ideas

Blue and Green Infrastructure

Blue infrastructure refers to natural or semi-natural elements that provide various ecosystem services related to water management and conservation. These elements are usually water bodies like rivers, lakes, ponds or wetland areas. Green infrastructure are functional elements that mimic natural processes and can manage stormwater, reduce urban heat island effects, improve air and water quality, enhance biodiversity and provide recreational and aesthetic features by integrating nature into urban

environments. Engineered features like green roofs or permeable pavements are the most common examples of green infrastructure, however, it is sometimes referred to as blue-green infrastructure, due to it containing aspects of both. Integration of this infrastructure in cities makes the urban spaces more resilient and healthy places to work and live in and improves the overall quality of life in urban environments by mitigating the damage and bringing back the relationship between man and nature.



Map of existing blue infrastructure in Birštonas

Key Aspects of Blue-Green Infrastructure



Evapotranspiration

Process of both evaporation and transpiration – water movement from Earth’s surface into the atmosphere. A mature tree can use up to 200 litres per day, cleaning and cooling the air of the surrounding environment.



Filtration

Sustainable drainage systems (SuDS) provide an alternative to direct channelling of surface water through pipes and sewers and effectively filter up to 95% of pollutants, such as microplastics, hydrocarbons and metals.



Water and Carbon Storage

Trees are capable of holding huge amounts of water – up to 70% of the first hour of a rain event. Also, biodiverse multi-layered plant groups and landscape elements store higher levels of both water and carbon.

Masterplan Development Ideas

Blue Infrastructure and Recreational System

Birštonas has a large area of usable blue infrastructure, however, it is completely underdeveloped and underused. There are two particular areas in Birštonas – the city center and the SPA complex near Birštonas ponds that have many elements of recreational infrastructure, but no significant connection with the surrounding water bodies. These areas have the most potential for blue infrastructure development due to higher number of visitors and quality improvement for the existing recreational spaces.

Encouraging blue infrastructure development would introduce a new types of recreational activities to Birštonas – water-based recreation. These solutions would be multi-functional and could serve as new social gathering spaces and spread public awareness about blue-green infrastructure and their importance. Creation of new recreational spaces and improvement of existing ones would bring health and well-being benefits for residents and attract more tourists, thus enhancing the economic potential of the city.



Map of existing blue and recreational infrastructure in Birštonas

Masterplan Development Ideas

Analogous Project Examples

When it comes to blue-green infrastructure, the most common problem-solving topics about this are stormwater management and restoration of biodiversity around water bodies and making use of their provided ecosystem services. Blue-green solutions like rain gardens together with the function of water absorption and filtering, can have secondary effects as well, like acting as a green buffer between cars and pedestrians thus improving safety and overall aesthetics of the streets. Blue infrastructure itself can be

improved by creating direct access to water and building recreational decks around for walking and observing the surroundings. Existing underused water bodies can be turned into wetlands that not only act as a sponge for water collection and trap pollutants, but also vastly improve the biodiversity of flora and fauna and could also be turned into recreational and educational spaces. Each green and blue infrastructure element brings different natural and social benefits to urban environments.



Special Plan

Blue-Green Recreational Infrastructure

Map legend

- City boundary
- Changed management zones and regimes
- Connection through the river

Management zones

1. Conservational Purpose Land Landscape

- KOr – regulated protections of natural and cultural heritage objects

2. Forestry Land Landscape

- MAb – protective forest landscape general protective forest farming
- MAs – protective forest landscape specialized protective forest farming
- MEk – ecosystem protection forest landscape conservational forest farming
- MRe – recreational forest landscape extensive adaptation
- MRi – recreational forest landscape intensive adaptation

3. Agricultural Land Landscape

- ŽAb – protective agricultural landscape general conservational farming
- ŽAs – protective agricultural landscape specialized conservational farming

4. Other Land Landscape

- GAe – protected territories of cities, towns or villages stricter geoeological regulation
- GAi – protected territories of cities, towns or villages stricter visual regulation
- GEk – landscape conservation in cities, towns or villages valuable in cultural heritage

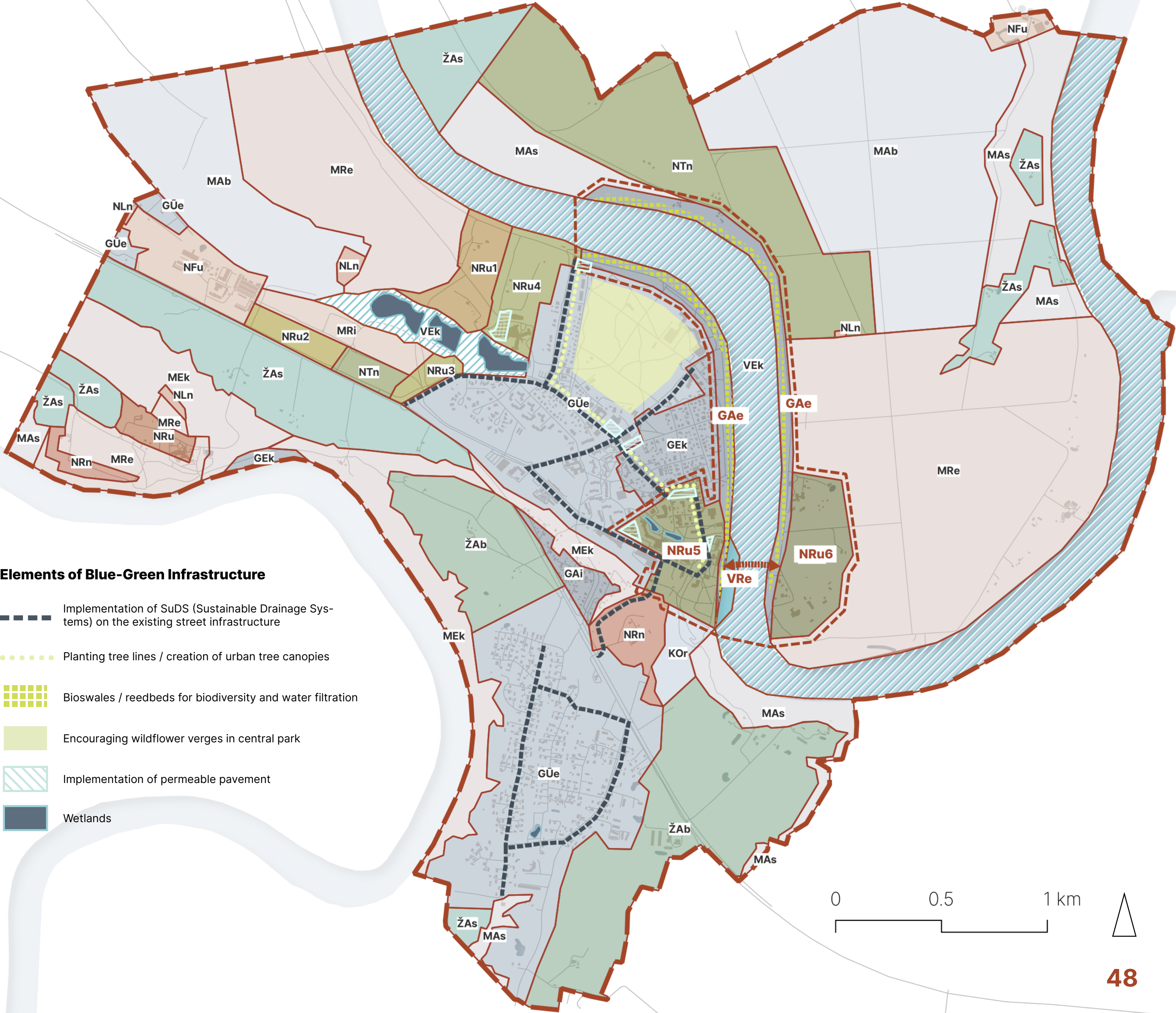
- GŪe – general extensive management of cities, towns, villages
- NFu – extensively technogenic environment in industrial-communal land
- NLn – subnatural (non-urbanized) environments of operational (extractive) land
- NRn – (non-urbanized) recreational environments of Birštonas hill skiing area
- NRu – Druskupis recreational development zone urbanized recreational environments
- NRu1 – intended for construction of one- or two-family residential houses, children's sanatoriums, buildings of boarding houses and other specialized health facilities for people of retirement age
- NRu2 – isolated between the technogenic zone of Vilnius–Priėnai road and Druskupis where activities are carried out according to the mineral water well
- NRu3 – territory intended for the construction of commercial objects
- NRu4 – the territory of intensive construction intended for recreational, entertainment, for the construction of commercial objects, as well as one- and two-family houses
- NRu5 – territory of intensive recreation around green and blue infrastructure elements
- NRu6 – territory intended for recreational revival of Birštonas on the other side of Nemunas river
- NTn – communication-engineering land landscape extensively technogenic environments

5. Water Farming Landscape

- VEk – water ecosystem protective landscape conservational farming
- VRe – recreational water landscape extensive recreational use

Elements of Blue-Green Infrastructure

- Implementation of SuDS (Sustainable Drainage Systems) on the existing street infrastructure
- Planting tree lines / creation of urban tree canopies
- Bioswales / reedbeds for biodiversity and water filtration
- Encouraging wildflower verges in central park
- Implementation of permeable pavement
- Wetlands



Special Plan

Management Zone Regimes and Regulations

Management zone regimes and regulations:

Name of Management Zone	Count of Zones	Regimes and Regulations
1. Conservational Purpose Land Landscape Management Zones		
KOr – regulated protections of natural and cultural heritage objects	1	Zone is established in cultural heritage sites and natural heritage sites (protected natural landscape objects), primarily in hydrographic or geomorphological objects, where it is appropriate to maintain traditional (customary) forms of use ensuring the preservation of the designated value and improve the conditions for displaying these values
2. Forestry Land Landscape Management Zones		
MAB – protective forest landscape general forest farming	2	It is established in forests located in the areas of water sources, resorts, intensive karst protection, buffer protection, and visual protection zones, geological, geomorphological, hydrographic, cultural reserves, biosphere monitoring areas, as well as in parts of landscape reserves where there are no biological values. In this zone, forestry is practiced aiming to maintain productive stands corresponding to site conditions. In this zone: - selective and small-scale clear-cuttings (up to 5 hectares), improvement, and sanitation cuttings are allowed; - main cuttings are carried out in autumn and winter, while other cuttings can be performed throughout the year, except during the bird migration period (from March 1 to July 1); - when preparing special plans (management plans, forest management projects, etc.), region-forming cuttings may be envisaged; - forest regeneration is carried out in accordance with the requirements of Forest Restoration and Reforestation Regulations; - combating forest pests is allowed using economic, biological, and limited chemical means; - non-timber forest resources may be harvested, hunting is permitted; - campsites may be established only in locations designated in planning documents for protected areas near water and cycling tourism routes.
MAs – protective forest landscape specialized forest farming	7	A specialized protective forestry management landscape zone is established in protective forests located in reserve protection zones, water reservoirs, fields, and forest massif protection zones, as well as in geological, geomorphological, hydrographic, cultural, and landscape reserve areas. In this zone: - depending on local conditions and protection objectives, clear-cutting may be prohibited; - the use of fertilizers is prohibited; - forest regeneration is carried out in accordance with the requirements of Forest Restoration and Reforestation Regulations.
MEk – ecosystem protection forest landscape conservational forest farming	3	The regulation is most commonly applied in the territories of natural and complex reserves. In these areas: - clear-cutting is prohibited; - mature forests can be harvested through selective clear-cutting;

		- special environment-forming cuttings are allowed if necessary to create suitable conditions for the existence and display of protected biota or other landscape elements; - forests affected by natural or biological factors, in poor sanitary condition, are harvested through selective or clear-cut sanitation cuttings; - sanitation, improvement, and other cuttings are carried out in autumn and winter (from September 1 to March 1). Sanitation cuttings, in case of natural disasters and mass spread of pests, may also be carried out at other times of the year; - forest regeneration is carried out following the Forest Restoration and Reforestation Regulations, approved by the Minister of Environment; - non-timber forest resources may be harvested, hunting is allowed, taking into account ecosystem protection requirements; - the use of pesticides and fertilizers is discouraged; - construction of buildings and development of engineering infrastructure, conversion of forest land for other uses, as well as exploitation of mineral resources, are prohibited; - peatlands within forests that protect ecosystems are not included in the balance of the state's useful mineral resources.
MRe – recreational forest landscape extensive adaptation	4	- Maintained is the close-to-natural species composition and structure of the forest; - measures are implemented to shape the environment, improve sanitary-hygienic and aesthetic properties, shape regions, and increase forest resilience; - recreational features are enhanced, regions are opened, attractive and visited objects are created, with minimal recreational infrastructure development; - mature forests can be harvested through selective clear-cutting. All types of improvement, sanitation, and environment-forming cuttings are allowed; - cutting is not done during the resting season, except for forests affected by natural or biological factors. Forests in poor sanitary condition, affected by natural or biological factors, are harvested through selective or clear-cut sanitation cuttings; - the use of pesticides is prohibited. In case of mass spread of pests, the use of bio-preparations and selective-action insecticides is allowed; - non-timber forest resources may be harvested; - construction of structures (except for recreational equipment and infrastructure) and conversion of forest land for other purposes are prohibited; - campsites may be established only in locations designated in planning documents for protected areas near water and cycling tourism routes; - hunting is restricted, prohibited during the summer season; - It is allowed to shape the species composition and structure characteristic of a relaxation park adapted for intensive recreation, to open up areas;
MRI – recreational forest landscape intensive adaptation	1	

		- The recreational environment may be shaped through selective (group-random and selective) cuttings, planting with large seedlings; - It is allowed to establish a dense network of recreational infrastructure; - Mature forests can be harvested through selective clear-cutting. All types of improvement, sanitation, and landscape-forming cuttings are allowed; - Cutting is not done during the resting season, except for forests affected by natural or biological factors. Forests in poor sanitary condition, affected by natural or biological factors, are harvested through selective or clear-cut sanitation cuttings; - The use of pesticides is prohibited. In case of mass spread of pests, the use of bio-preparations and selective-action insecticides is allowed; - Hunting is restricted, prohibited during the summer season.
3. Agricultural Land Landscape Management Zones		
ZAb – protective agricultural landscape general conservational farming	2	It is distinguished from larger water bodies in agricultural areas performing protective (especially buffer) functions, usually located in buffer zones, where farming is carried out without violating the overall goals of protecting natural frameworks, as well as in intensive karst protection and visual protection zones. The main direction of management is to create and maintain productive agroecosystems, ensuring the stability of the natural landscape and opportunities for ecological compensation. In this area: - destruction of tree groups, conversion to agricultural land of forest land inventoried areas and shrubs on former agricultural lands is prohibited, except for management measures aimed at protecting biodiversity; - drying out and conversion to other uses of peatlands larger than 0.5 hectares, and their surroundings, destruction or alteration of peat flora, peat digging, cultivation, and conversion to other uses of natural meadows is prohibited; - it is recommended and encouraged to increase the area of forest stands, local elements of the natural framework network are planned in land management projects; - repair of existing and installation of new drainage systems is allowed, except for cases specified in Regulation 21.1.2; - if this zone is distinguished in polders, additionally, it is prohibited to plow meadows, however, overseeding with grass is allowed, setting up summer pastures for cattle is prohibited without arranging sewage collection and pollution removal facilities, meadows are mowed and grazed continuously, the use of pesticides and other chemicals is discouraged.
ZAs – protective agricultural landscape specialized conservational farming	7	It is distinguished in agricultural areas where additional special requirements for general water bodies, soil, ecological protection, as well as sanitary and physical protection are provided, when it is appropriate to develop traditional agriculture, technologically consistent with water and soil protection or the respective protection and land use regime of the reserves (landscape, geomorphological, and others). In this area: - promoting the non-fertilization of natural meadows and pastures; - ecological or anti-erosion farming is recommended and encouraged.
4. Other Land Landscape Management Zones		

Based on Lithuanian Typical Protection Regulations for Protected Areas (Saugomų teritorijų tipinis apsaugos reglamentas) (2004)

Special Plan

Management Zone Regimes and Regulations

GAe – protected territories of cities, towns or villages stricter geoecological regulation	3	- Measures are taken to ensure the ecological quality of residential environments and their improvement, as well as the preservation and maintenance of overall environmental geoecological stability; - Trees in residential areas and their immediate surroundings are protected and expanded, and their species composition is improved to meet recreational needs.
GAi – protected territories of cities, towns or villages stricter visual regulation	1	Established in settlements or their parts located in geological, geomorphological, hydrographic, and landscape reserves, visual (observable), buffer, ecological protection, recreational, and other (residential) functional priority zones. In this area: - The existing visual character of residential areas is maintained, and trees that could obscure or hinder the view of protected objects or complexes are not planted. - The expressiveness of the landscape spatial structure is increased, especially in visually protected areas significant from this perspective; - The natural expression and character of the relief are preserved.
GEk – landscape conservation in cities towns or villages valuable in cultural heritage	2	Designated in cities, towns, villages, or their parts with monumental value, managed by conservation, restoration, and reconstruction measures based on the principles of conservation, restoration, and reconstruction established in the Law on Immovable Cultural Heritage Protection. In this area: - conservation, restoration, and reconstruction works are carried out to ensure the preservation of ethno-architectural values; - construction that would compromise the integrity of the city, town, or village as a unified architectural complex and its traditional connections with the natural environment is prohibited; - in cases established by legislation, management works may be carried out following the principle of limited imitation; - works are carried out according to projects specifying specific architectural and environmental shaping measures.
GŪe – general extensive management of cities, towns, villages	4	- The overall established character of development and urban structure is maintained; - During construction, the environment is not radically restructured, primarily limited to renovation measures; - Intensive landscape management zone, established in agricultural settlements with greater development potential. In this area: - Essentially changing the nature of development is allowed; - During construction, the urban environment may be altered.
NFu – extensively technogenic environment in industrial-communal land	2	-
NLn – subnatural (non-urbanized) environments of operational (extractive) land	4	-
NRn – (non-urbanized) recreational environments of Birštonas hill skiing area	2	- Building leisure structures is prohibited; - Setting up recreational areas, rest areas, and bathing spots is allowed; - Only minimal recreational infrastructure may be formed, while preserving the natural environment and the natural landscape;

		Damaging or destroying recreational facilities, or disrupting relaxation, is prohibited.
NRu – Druskupis recreational development zone urbanized recreational environments	1	- Campsites, campgrounds, tourism centers, holiday homes, or other stationary recreational building complexes are constructed; - An environment adapted for intensive visitation is created, along with recreational engineering infrastructure; - The nature of the natural environment may be altered for recreational purposes.
NRu1 – intended for construction of one- or two- family residential houses, children's sanatoriums, buildings of boarding houses and other specialized health facilities for people of retirement age	1	- The buildings must have varying heights, with the predominant building height being 9 meters, and for architectural landmarks, up to 15 meters. - The possible building density in the area can be up to 30 percent.
NRu2 – isolated between the technogenic zone of Vilnius-Prienai road and Druskupis where activities are carried out according to the mineral water well	1	Activity in this area is conducted in accordance with the requirements of the sanitary protection zone of mineral water springs. It is proposed to construct an entertainment and wellness center. Only the construction of recreational buildings with commercial services is permitted (building height - up to 9 meters). The building density in the area can be up to 50 percent. Engineering infrastructure objects must be landscaped with protective vegetation groups.
NRu3 – territory intended for the construction of commercial objects	1	- Building height - no more than 9 meters. - The building density in the area can be up to 50 percent.
NRu4 – the territory of intensive construction intended for recreational, entertainment, for the construction of commercial houses, as well as one- and two- family houses	1	- The buildings must have varying heights, with the predominant building height being 9 meters, and for architectural landmarks, up to 15 meters. - The possible building density in the area can be up to 30 percent.
NRu5 – territory of intensive recreation around green and blue infrastructure elements	1	- Measures are taken to ensure the ecological quality of residential environments and their improvement, as well as the preservation and maintenance of overall environmental geoecological stability; - Elements of technologically advanced and sustainable green-blue infrastructure are implemented in the area and adapted to existing infrastructure; - Setting up recreational areas, rest areas, and bathing spots is allowed; - Damaging or destroying recreational facilities, or disrupting relaxation, is prohibited.
NRu6 – territory intended for recreational revival of Birštonas on the other side of Nemunas river	1	- Restore and renovate abandoned buildings or complexes and use principles of adaptive reuse; - An environment adapted for intensive visitation is created, along with recreational engineering infrastructure; - Campsites, campgrounds, tourism centers, holiday homes, or other stationary recreational building complexes are constructed; - Incorporate amenities such as walking trails, bike paths, and seating areas to encourage outdoor recreation.
NTn – communication-engineering land landscape extensively technogenic environments	2	-
5. Water Farming Landscape		
VEk – water ecosystem protective landscape conservational farming	2	Activities that could harm the stability of hydroecosystems are prohibited.

		- Destruction of protected aquatic biota objects is prohibited. - Fishing intensity is restricted, and recreation activities negatively impacting the condition and resilience of protected objects and complexes may be regulated. - Measures to maintain the stability of aquatic ecosystem are implemented and promoted.
VRe – recreational water landscape extensive recreational use	1	- Creating a comfortable water recreation environment for designated species is being developed. - Aquatic areas are adapted for particularly intensive use. - Intensive recreational engineering infrastructure may be developed along the shores.

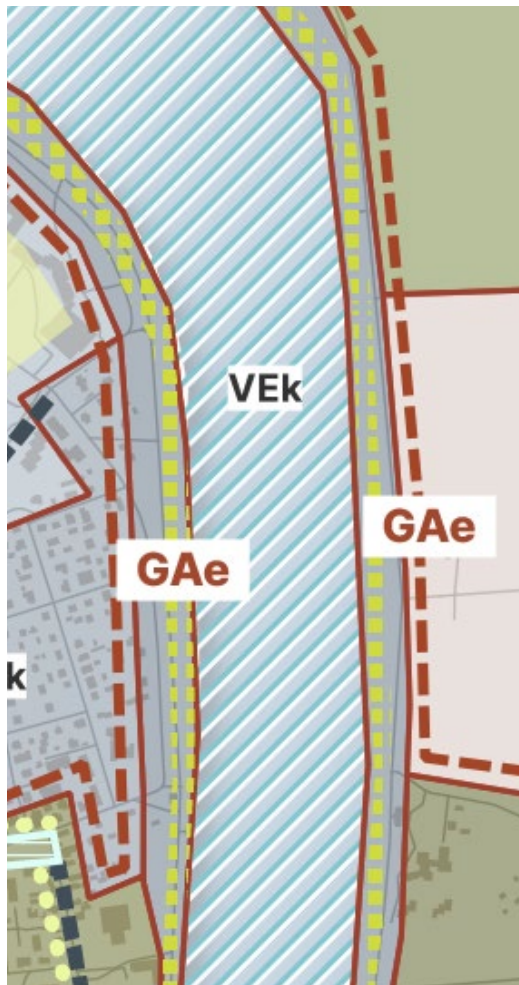
Based on Lithuanian Typical Protection Regulations for Protected Areas (Saugomų teritorijų tipinis apsaugos reglamentas) (2004)

Special Plan

Changed Management Zone Regimes and Regulations

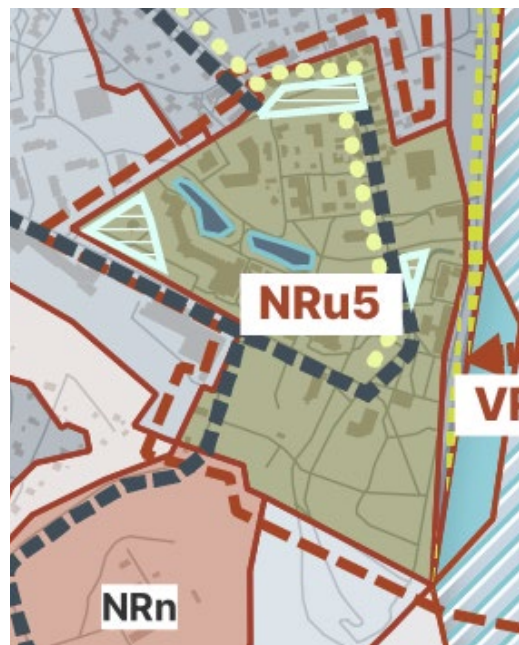
GAe – protected territories of cities, towns or villages stricter geoecological regulation

- Measures are taken to ensure the ecological quality of residential environments and their improvement, as well as the preservation and maintenance of overall environmental geoecological stability;
- Trees in residential areas and their immediate surroundings are protected and expanded, and their species composition is improved to meet recreational needs.



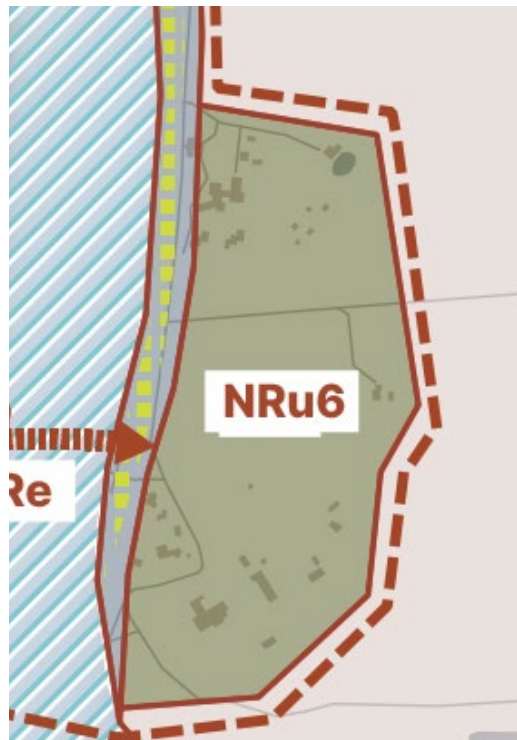
NRu5 – territory of intensive recreation around green and blue infrastructure elements

- Measures are taken to ensure the ecological quality of residential environments and their improvement, as well as the preservation and maintenance of overall environmental geoecological stability;
- Elements of technologically advanced and sustainable green-blue infrastructure are implemented in the area and adapted to existing infrastructure;
- Setting up recreational areas, rest areas, and bathing spots is allowed;
- Damaging or destroying recreational facilities, or disrupting relaxation, is prohibited.



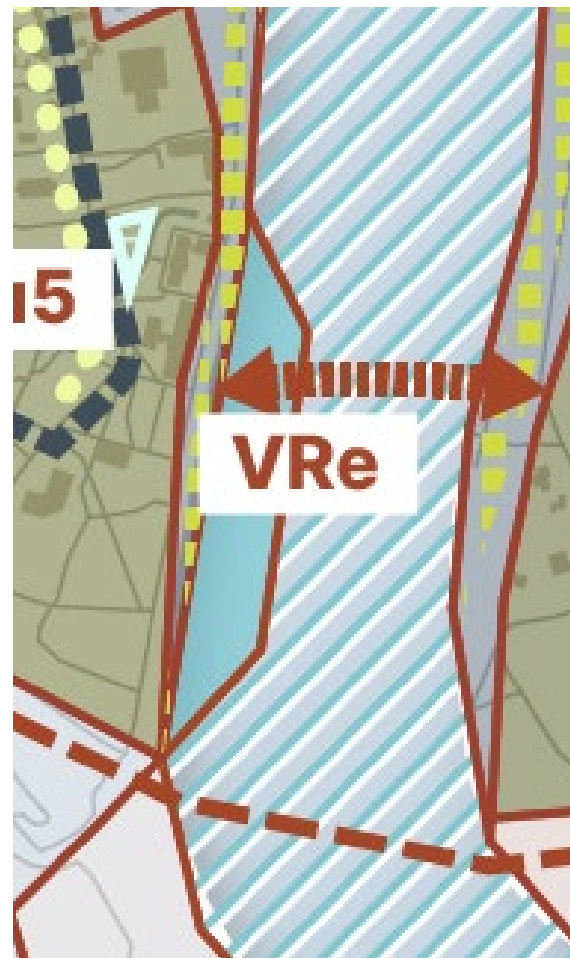
NRu6 – territory intended for recreational revival of Birštonas on the other side of Nemunas river

- Restore and renovate abandoned buildings or complexes and use principles of adaptive re-use;
- An environment adapted for intensive visitation is created, along with recreational engineering infrastructure;
- Campsites, campgrounds, tourism centers, holiday homes, or other stationary recreational building complexes are constructed;
- Incorporate amenities such as walking trails, bike paths, and seating areas to encourage outdoor recreation.



VRe – recreational water landscape extensive recreational use

- Creating a comfortable water recreation environment for designated species is being developed.
- Aquatic areas are adapted for particularly intensive use.
- Intensive recreational engineering infrastructure may be developed along the shores.

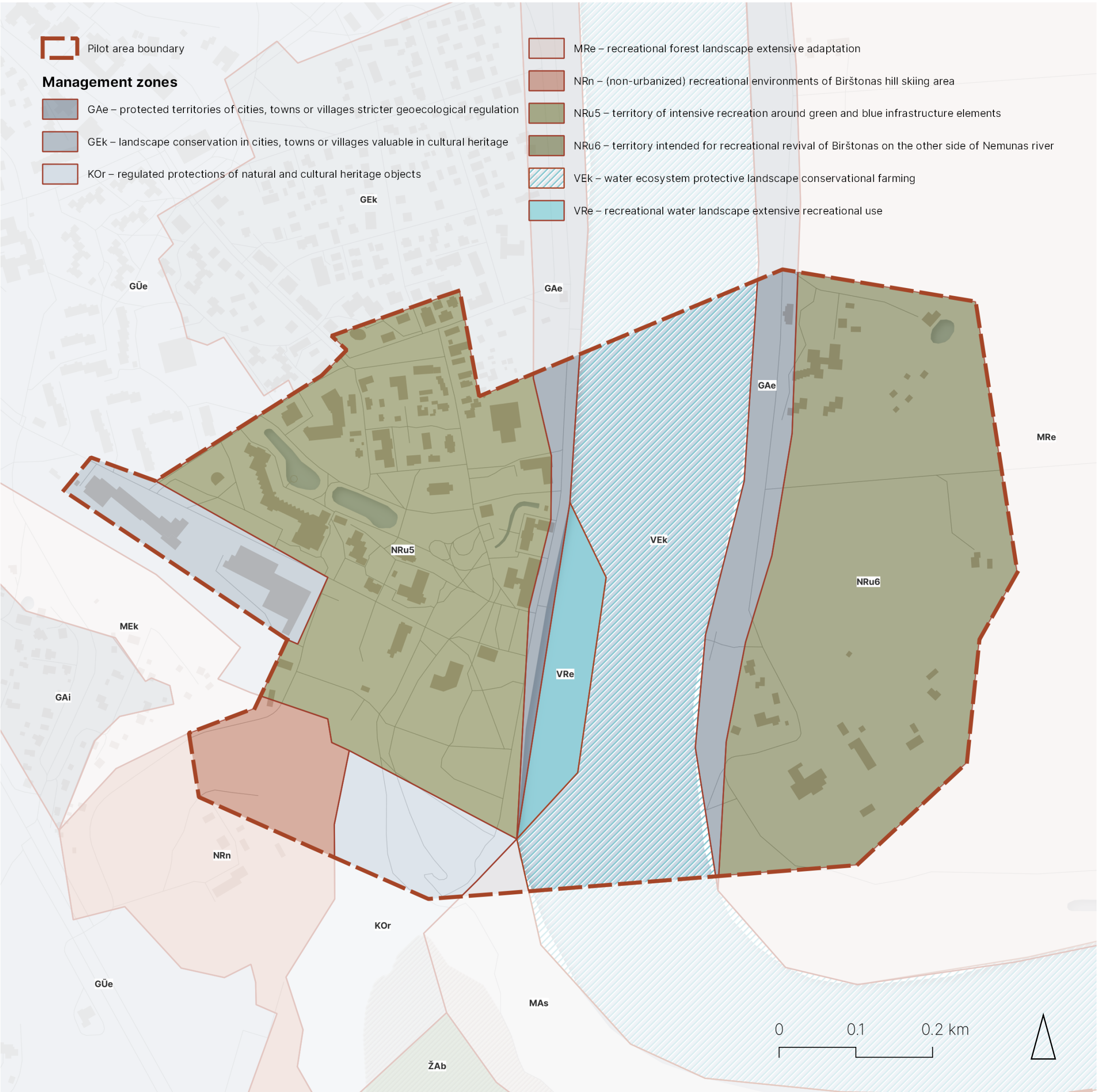


Based on Lithuanian Typical Protection Regulations for Protected Areas (Saugomų teritorijų tipinis apsaugos reglamentas) (2004)

Selected Pilot Area

The pilot area for masterplan development takes a large part of the city center and territory on the other side of the river. The city center is the most lively area in Birštonas in terms of recreation, especially during warmer seasons. The existing recreational infrastructure in the area is actually pretty satisfactory as it has diverse recreational activity options. However, it could be improved in terms of aesthetics and sustainability. Also, as concluded in the research, the river bank is underdeveloped and lacks direct access

to water, and thus has many development options. One of the main strategic goals is to create a connection between two river-separated parts of Birštonas and to revitalize the abandoned building complexes on the other side of the river and create a new functional recreational infrastructure system in the area. The management zones of the special plan have regimes for particular zones of the territory which helps to establish rules of development and prevent damage to local nature and cultural heritage.



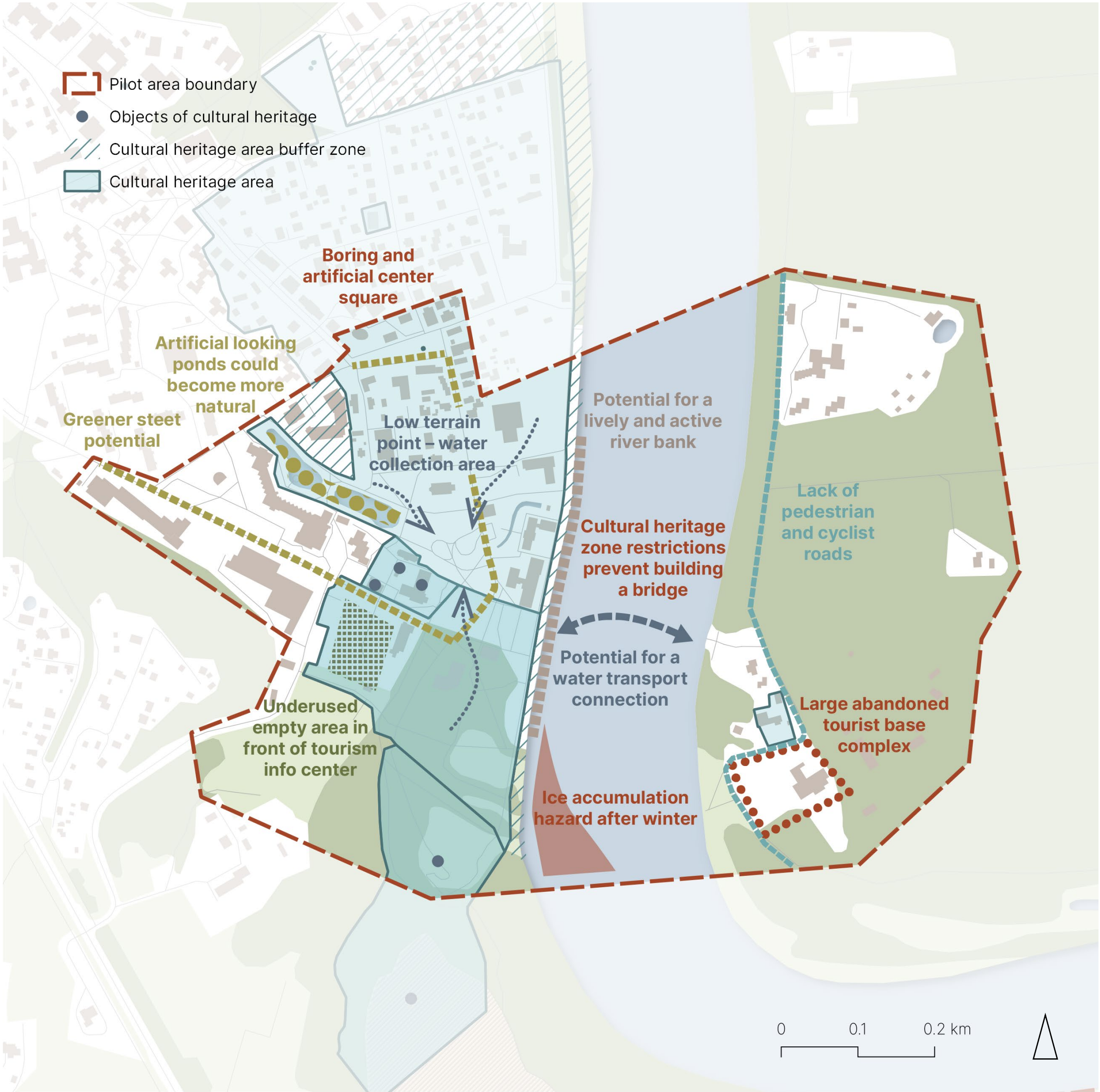
Map of selected pilot area and management zones

Selected Pilot Area

Opportunities and Constraints

The area being the city center presents with many possibilities for introducing new recreational activities or improving existing recreational infrastructure. First and foremost, a large part of the territory is a part of cultural heritage register, with each of the zones having different cultural values that need to be preserved. This is one of the reasons why a connection between river-separated land parts could not be a bridge in this area. However, a seasonal boat cross is entirely possible, but needs better dock

infrastructure. The dock infrastructure, however, also needs solutions to combat accumulating and drifting ice near the river loop. Another interesting aspect of the pilot area that could be used to an advantage is a low terrain area of Kneipas garden – which could become a great rain garden for stormwater absorption. The nearby man-made ponds could be naturalized and become an extension of the lush rain gardens. Other high development potential areas include an abandoned tourist base complex.



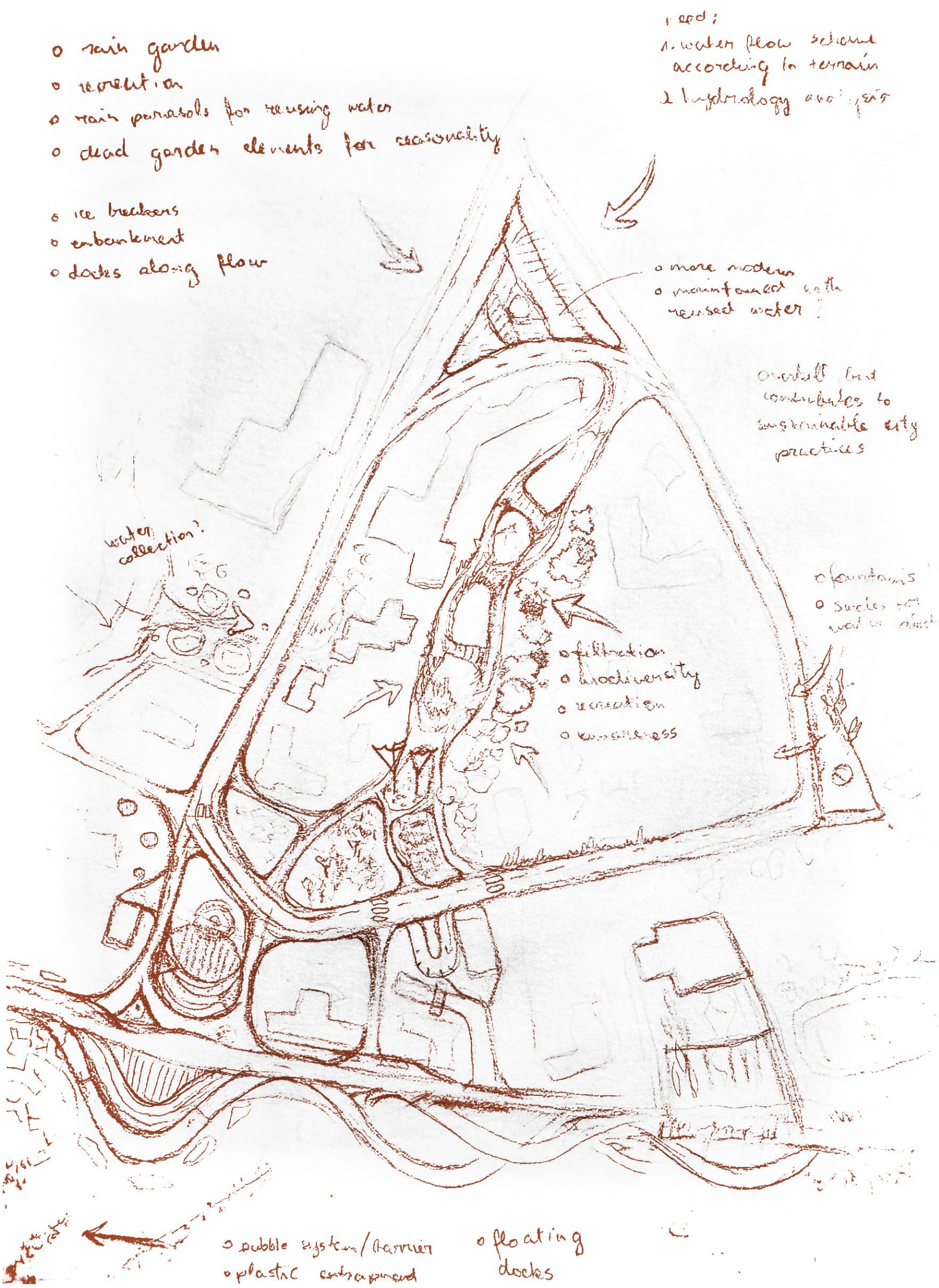
Map of protected cultural heritage zones and opportunities and constraints of the pilot area

Selected Pilot Area

Masterplan Sketch and Ideas

The selected pilot area had a lot of potential for implementation of green-blue infrastructure, particularly rain garden or bioswale systems for water drainage and natural stormwater treatment. Kneipas Garden area was identified as a lower terrain area where water would naturally run to and collect, so this area got the first sketched idea of rainforest-based plant verges with different absorption level plant species that would respond to the terrain. As seen in researched analogous projects, rain parasols

could be a great addition to the park as a water collection unit where the water could be used for various purposes in the city and could also act as a shade for sitting areas. Due to the nature of the river and its looping landscape pattern, it seemed to be appropriate to develop the river bank area in organic curved forms of the docks and trails. The twin ponds near “Versmé” rehabilitation center had a very artificial look, so in order to respond to the natural rain gardens, a rocky step trail and wetland plants are proposed.



Masterplan development sketch of selected pilot area

Selected Pilot Area

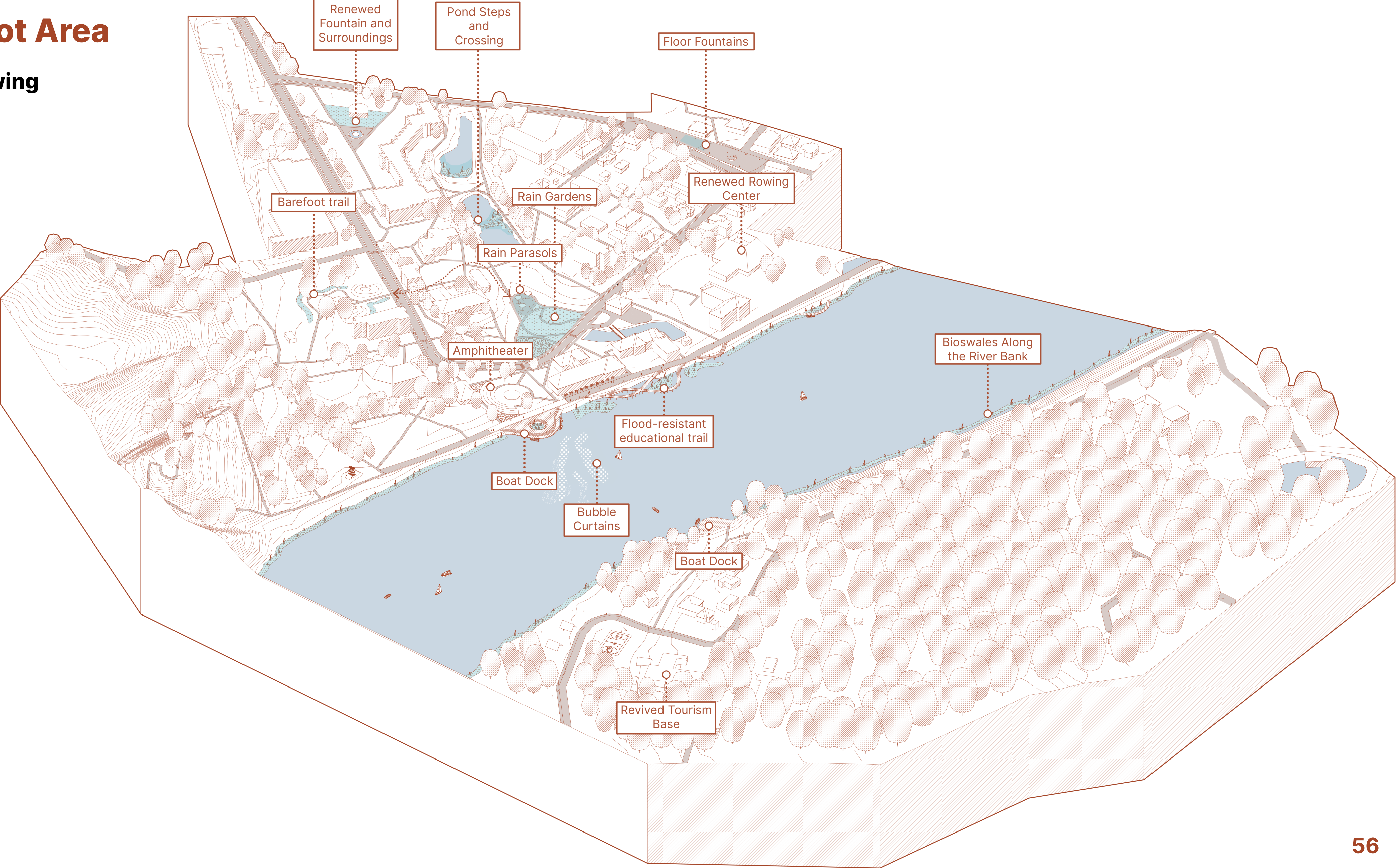
Masterplan

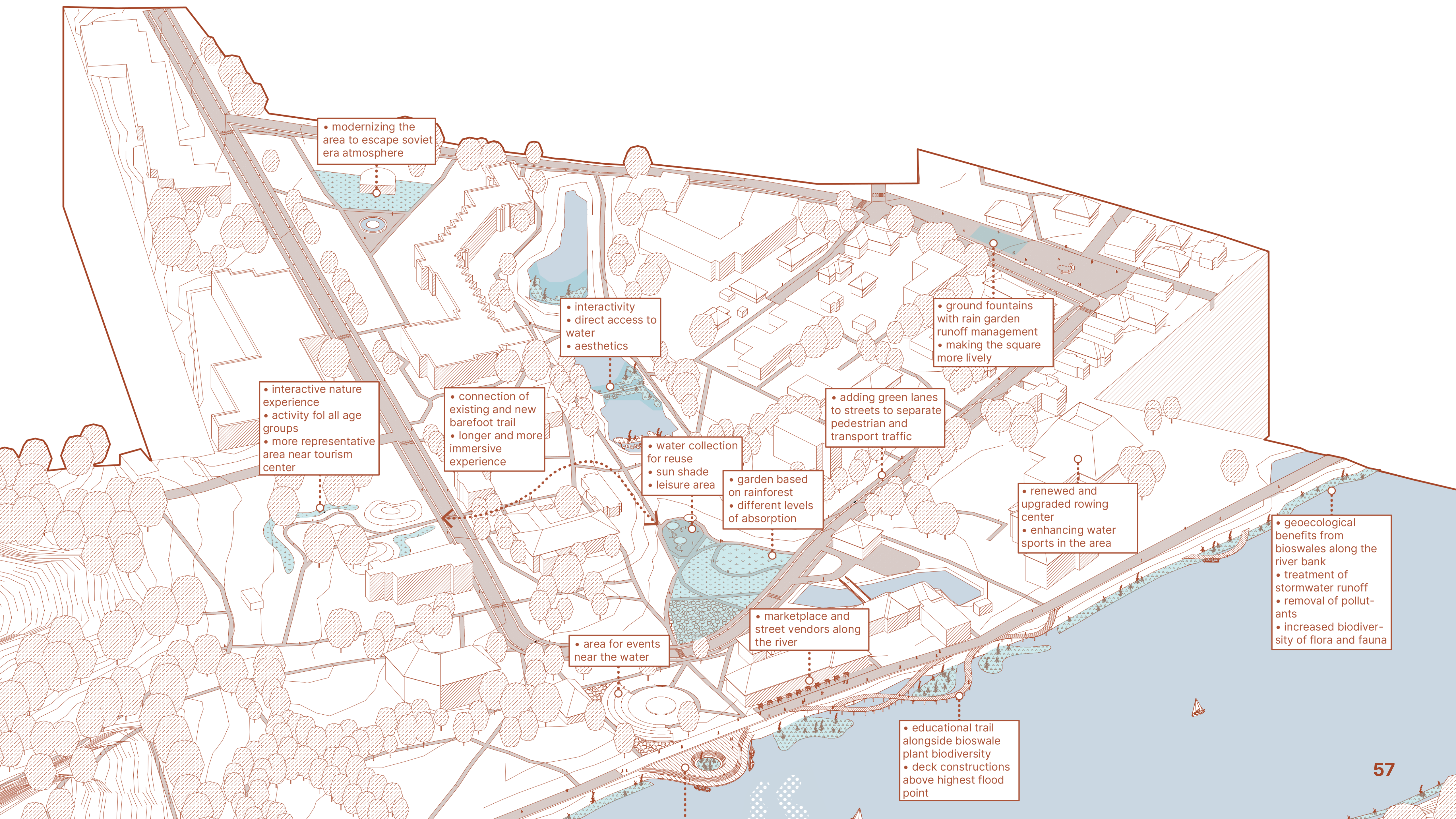
- 1 Ground fountains and bioswales of J. Basanavičius square
- 2 Pond steps and trail
- 3 Renewed drinking water fountain area
- 4 Rain gardens
- 5 Continuation of exiting barefoot trail
- 6 Outdoor amphitheater near the river
- 7 Boat docks
- 8 Educational trail over the river
- 9 Renewed Birštonas rowing school
- 10 Bubble curtains
- 11 Boat docks of the other side of Birštonas
- 12 Revived Birštonas tourist base



Selected Pilot Area

Axonometric Drawing





- modernizing the area to escape soviet era atmosphere

- interactivity
- direct access to water
- aesthetics

- ground fountains with rain garden runoff management
- making the square more lively

- interactive nature experience
- activity for all age groups
- more representative area near tourism center

- connection of existing and new barefoot trail
- longer and more immersive experience

- water collection for reuse
- sun shade
- leisure area

- garden based on rainforest
- different levels of absorption

- adding green lanes to streets to separate pedestrian and transport traffic

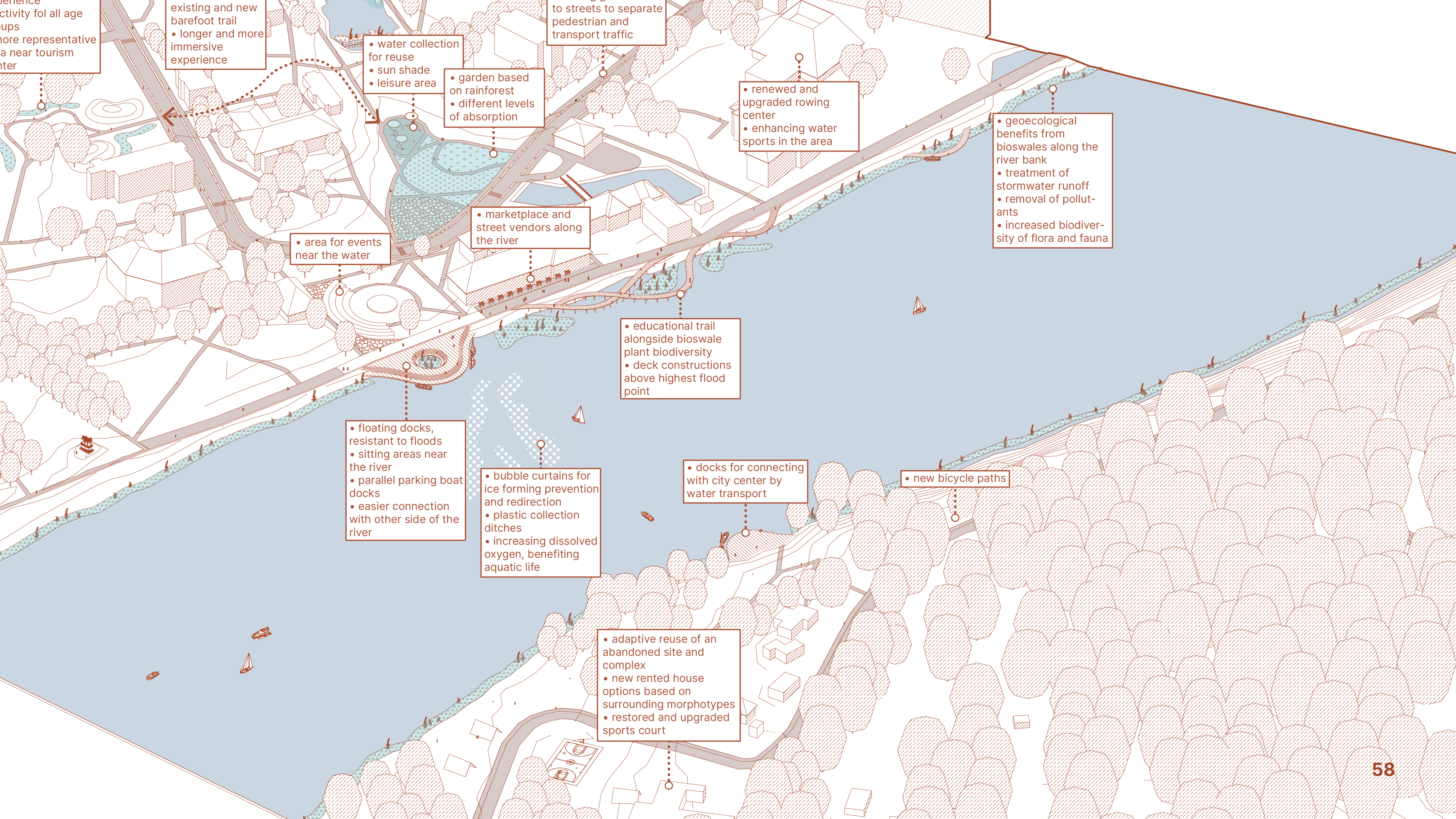
- renewed and upgraded rowing center
- enhancing water sports in the area

- geocological benefits from bioswales along the river bank
- treatment of stormwater runoff
- removal of pollutants
- increased biodiversity of flora and fauna

- area for events near the water

- marketplace and street vendors along the river

- educational trail alongside bioswale
- plant biodiversity
- deck constructions above highest flood point



• activity for all age groups
• more representative of a near tourism center

existing and new barefoot trail
• longer and more immersive experience

• water collection for reuse
• sun shade
• leisure area

• garden based on rainforest
• different levels of absorption

to streets to separate pedestrian and transport traffic

• renewed and upgraded rowing center
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• geocological benefits from bioswales along the river bank
• treatment of stormwater runoff
• removal of pollutants
• increased biodiversity of flora and fauna

• area for events near the water

• marketplace and street vendors along the river

• educational trail alongside bioswale
• plant biodiversity
• deck constructions above highest flood point

• floating docks, resistant to floods
• sitting areas near the river
• parallel parking boat docks
• easier connection with other side of the river

• bubble curtains for ice forming prevention and redirection
• plastic collection ditches
• increasing dissolved oxygen, benefiting aquatic life

• docks for connecting with city center by water transport

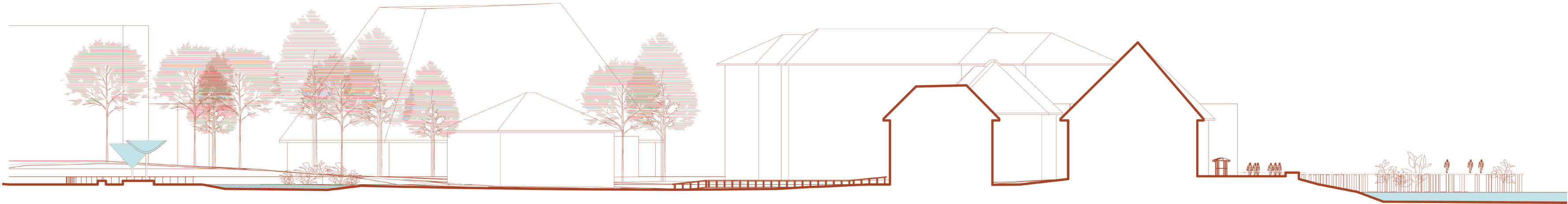
• new bicycle paths

• adaptive reuse of an abandoned site and complex
• new rented house options based on surrounding morphotypes
• restored and upgraded sports court

Selected Pilot Area

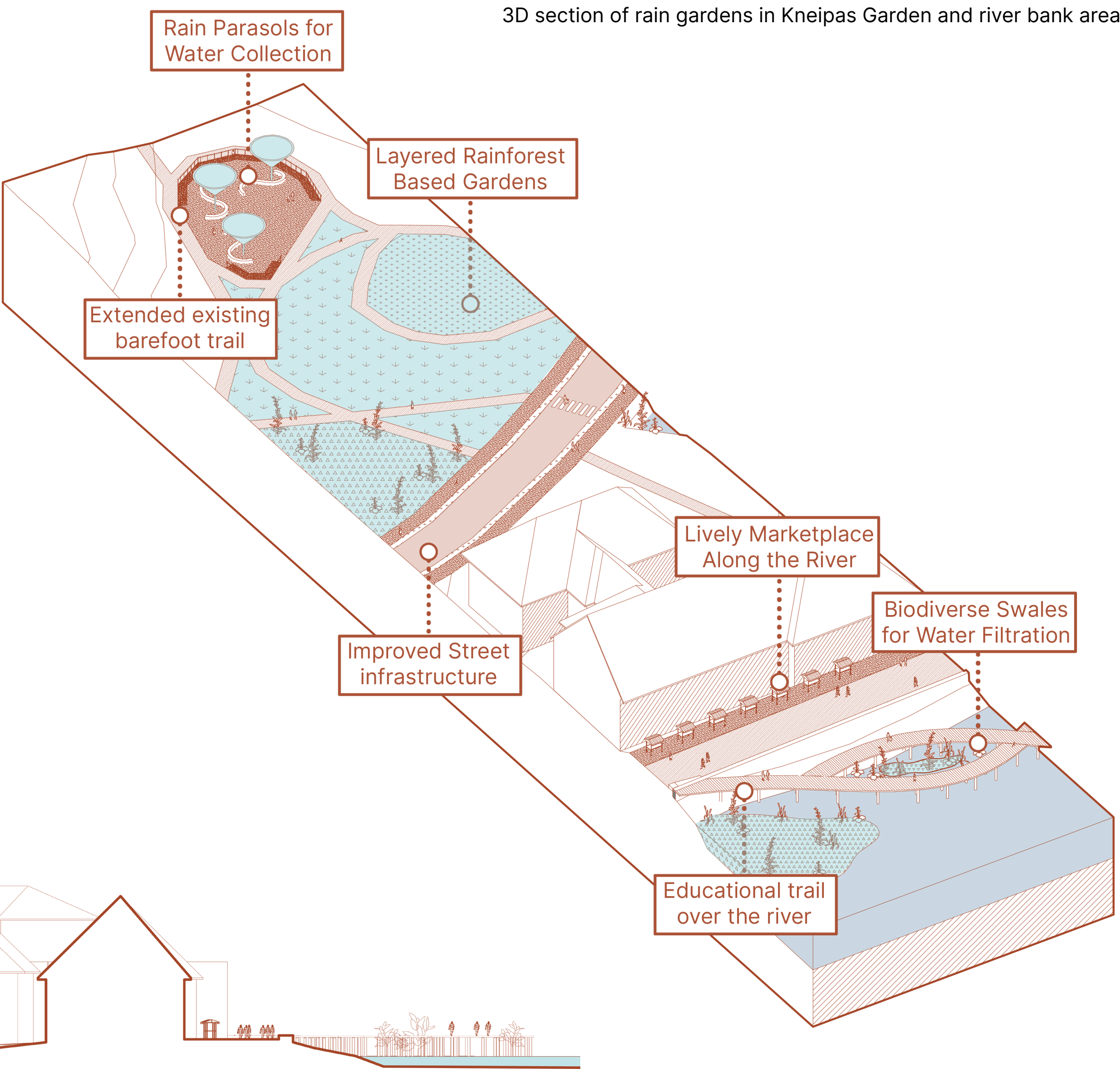
Section Drawings

The 3D section of the rain gardens gives a closer look at how the gardens have different plant layers according to needed water absorption levels. The purpose of the gardens and swales along the river is not only to capture and store water runoff, but also to trap and filter contaminants, provide recreational aesthetic values and to expand local biodiversity. A practical example of this is that the runoff of the proposed ground fountains in J. Basanavičius square gets collected in the bioswales along the street.



2D section of rain gardens and educational trail along the swales

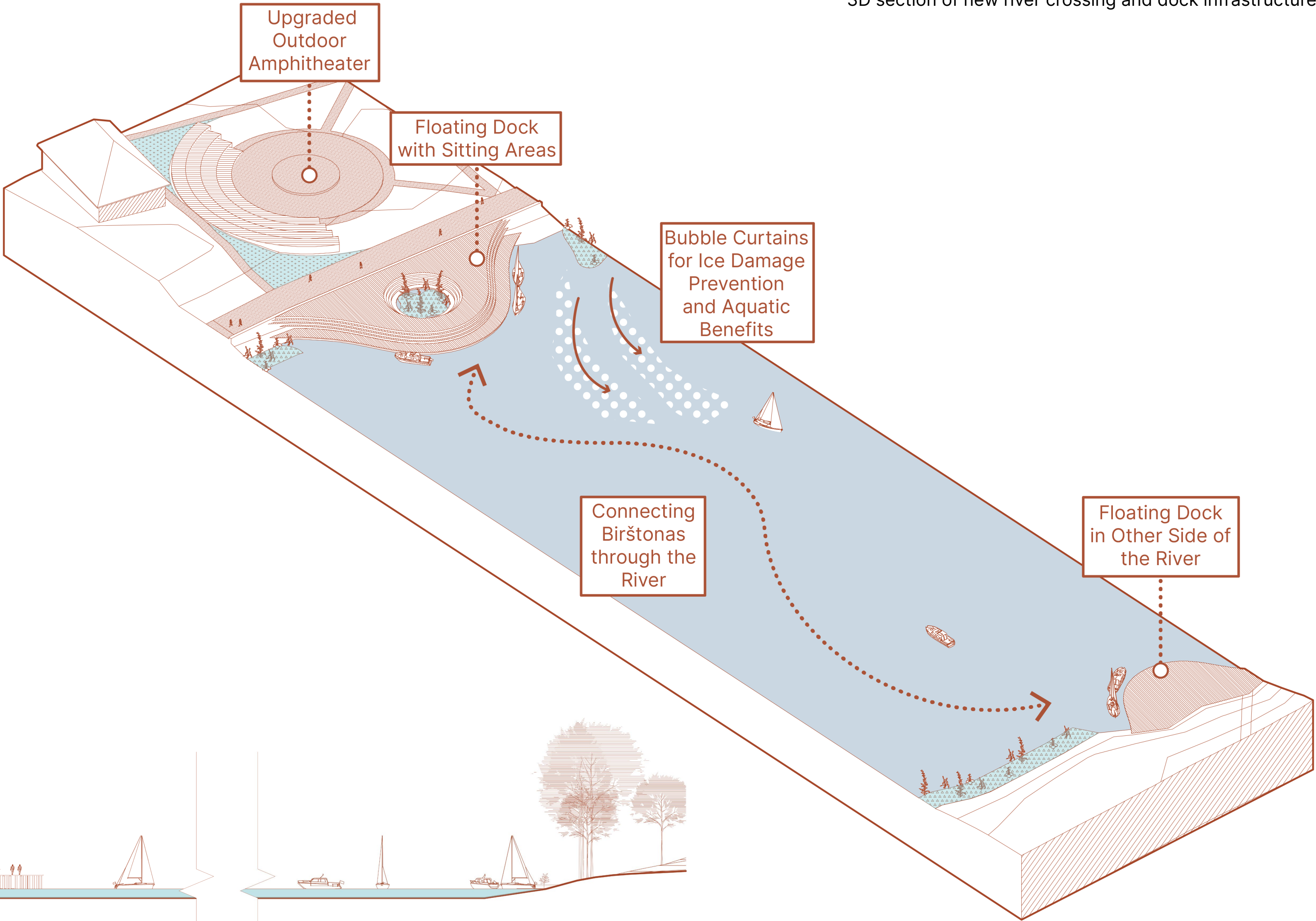
3D section of rain gardens in Kneipas Garden and river bank area



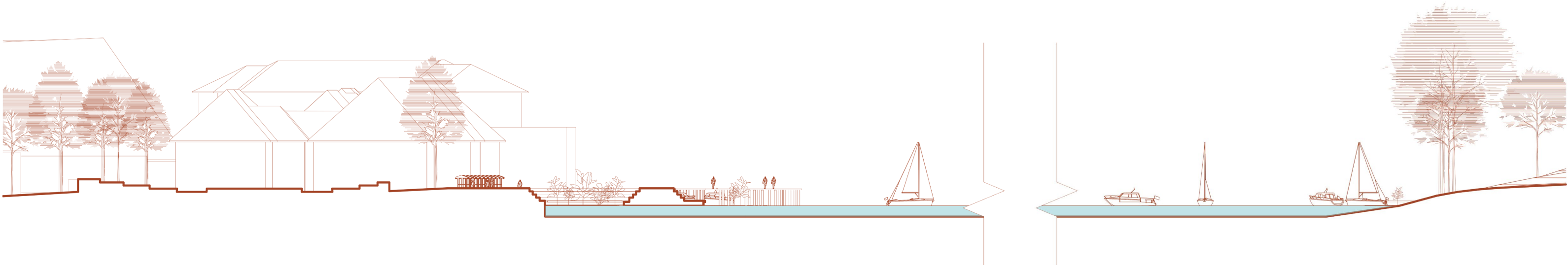
Selected Pilot Area

Section Drawings

The existing amphitheater is expanded and rotated perpendicularly to the river. Floating river docks are proposed nearby to provide a boat parking infrastructure and direct access to the river. Due to river loops, ice tends to accumulate along the bank during winter, thus a smart solution of bubble curtains is proposed in order to redirect or prevent the formation of ice blocks, while also providing dissolved oxygen, beneficial to aquatic life. The parallel river docks provide a much needed water transport connection.



3D section of new river crossing and dock infrastructure

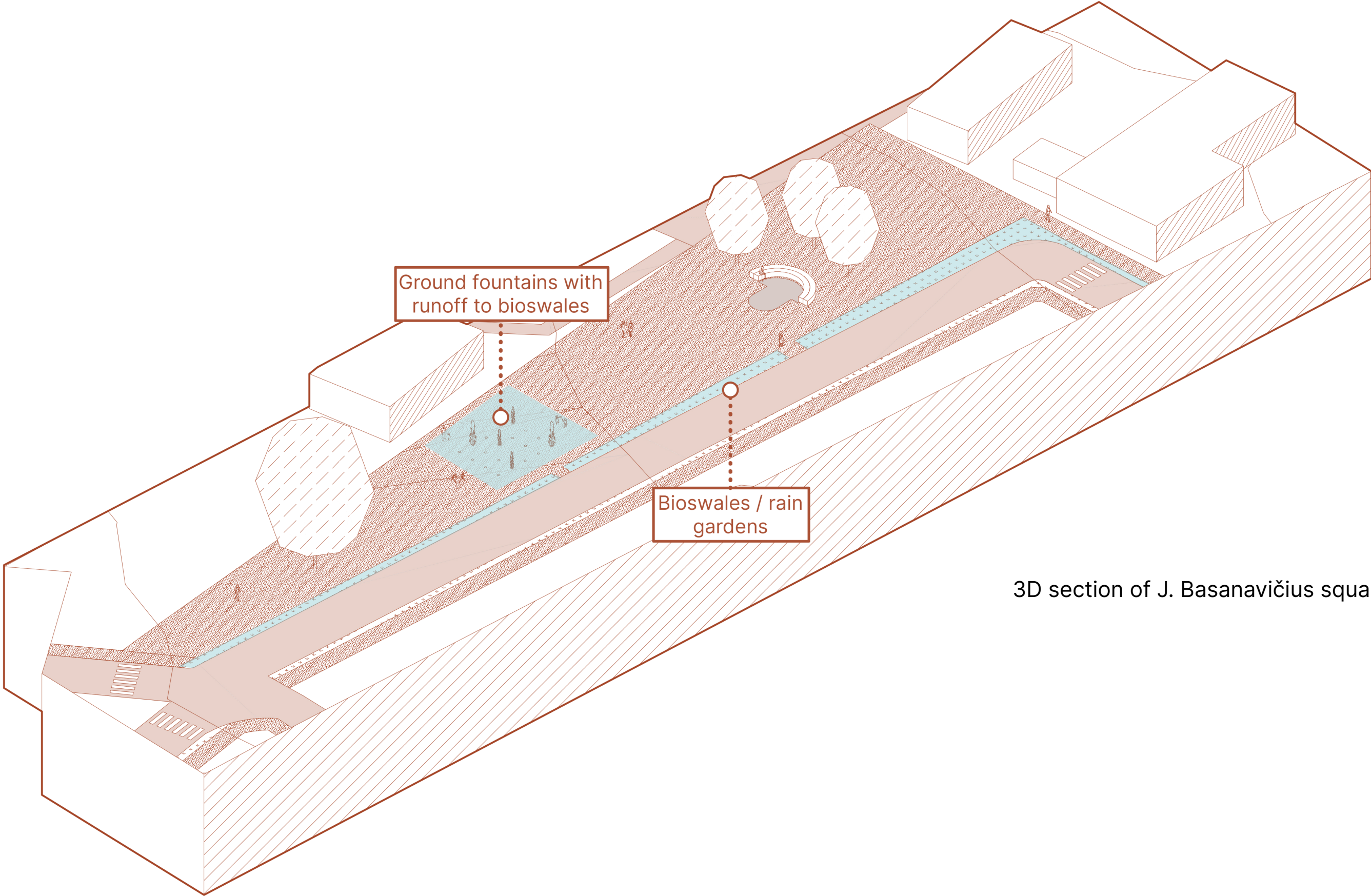


2D section of the river and docks

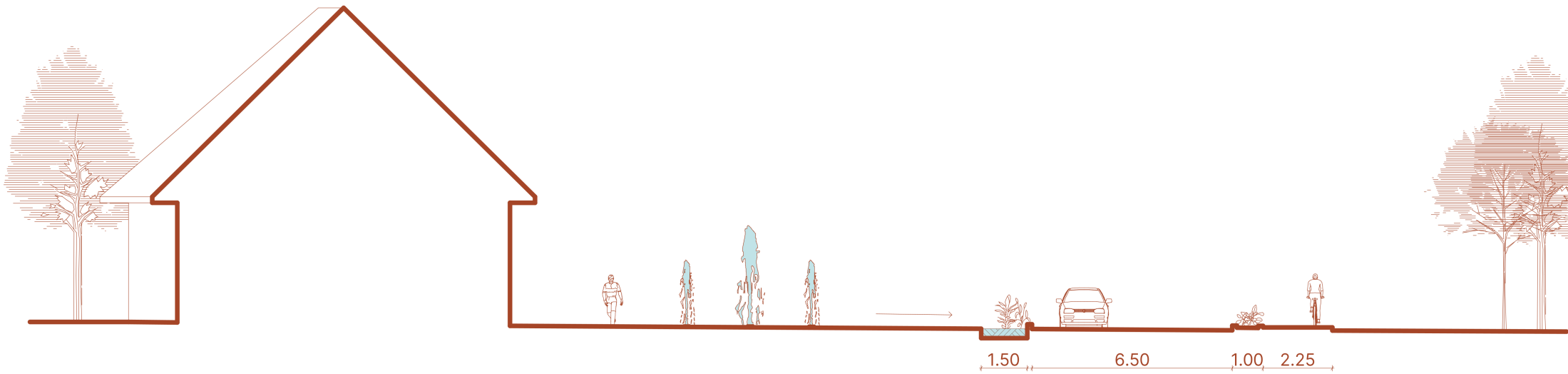
Selected Pilot Area

Section Drawings

J. Basanavičius square is a large paved area with a memorial for a famous Lithuanian activist. Currently, the square feels very artificial, has little vegetation and is not actively used by people. In order to contribute to the blue-green infrastructure improvements of the city, a ground fountain is proposed for the square with engineered water runoff straight to bioswales along the street, which not only absorb the water, but also separate traffic and pedestrians, which is also an unpleasant aspect of the square.



3D section of J. Basanavičius square



2D section of J. Basanavičius square

Selected Pilot Area

Perspectives



Perspective of river bank pathway and docks



Perspective of rain gardens (Kneipas garden)



Perspective of pond steps and crossing



Perspective of J.Basanavičius square



Perspective of river crossing and docks

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