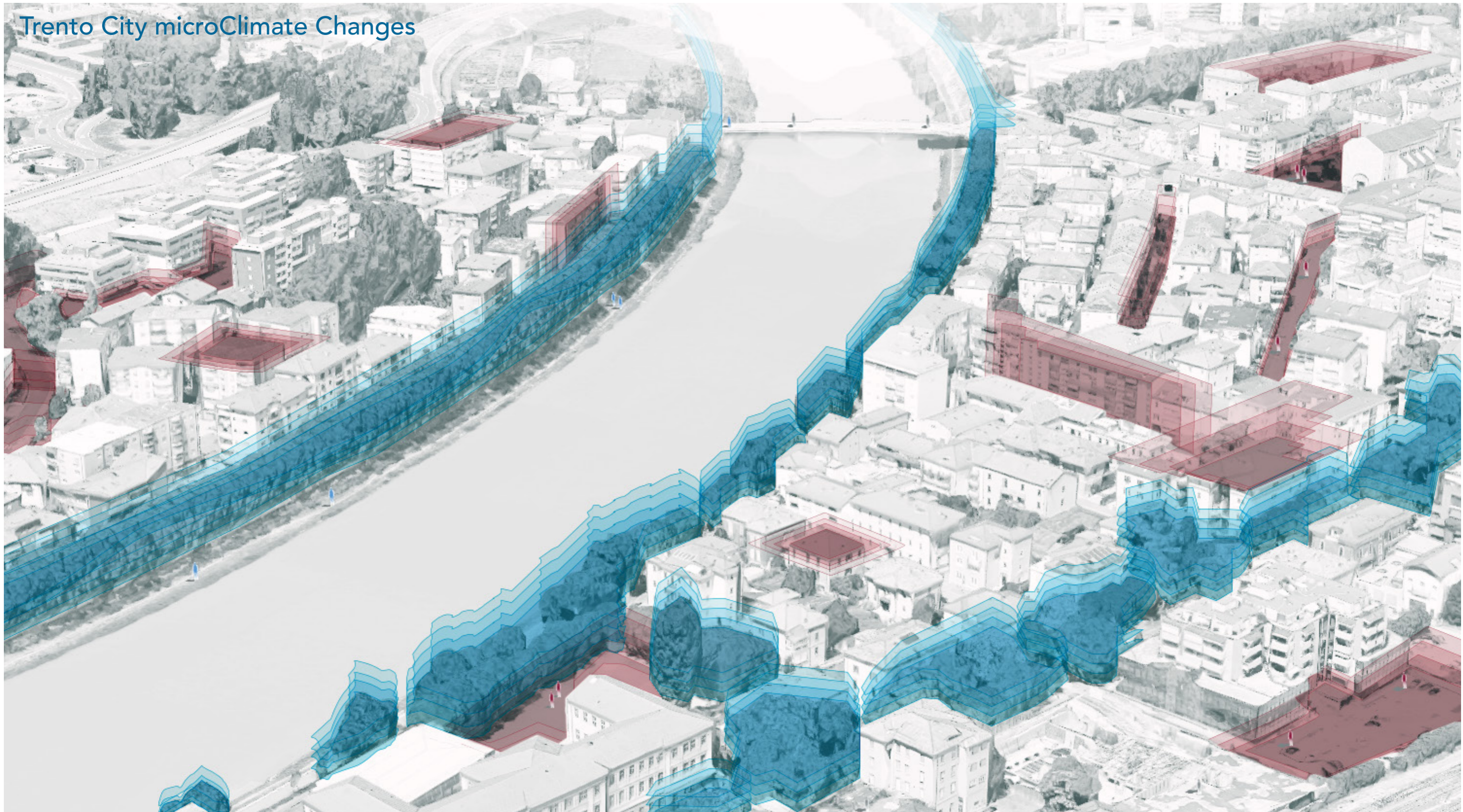


Trento City microClimate Changes



Country / City	Italy / Trento
University / School	University of Trento / School of Architecture and Building Engineering
Academic year	2016-2017
Title of the project	Trento City microClimate Changes
Authors	Anna Codemo

TECHNICAL DOSSIER

Title of the project	Trento City microClimate Changes
Authors	Anna Codemo
Title of the course	Master Thesis
Academic year	2016/2017
Teaching Staff	Prof. Arch. Mosè Ricci, Prof. Dino Zardi, Prof. Arch. Chiara Rizzi, Prof. Lorenzo Giovannini
Department/Section/Program of belonging	School of Architecture and Building Engineering, Department of Civil, Environmental and Mechanical Engineering
University/School	University of Trento



Written statement, short description of the project in English, no more than 250 words

Trento City microClimate Changes is a master thesis dissertation that aims to investigate the challenges related to extreme weather events in urban areas and to propose strategies to mitigate the Urban Heat Island (UHI) effect.

The project is carried out in Trento (IT), a town of 117'000 inhabitants located in the Adige Valley, and it seeks to define the vulnerabilities related to higher temperatures and to enhance the opportunities of making the town more climate resilient and energy performative.

The study identifies the microclimates of the urban environment of Trento, and it defines the heat-related risk to set different priorities of intervention. Moreover, it proposes a framework of intervention aiming at reusing existing spaces and surfaces to regenerate them and make them more liveable, by creating a sequence of multifunctional public spaces.

The project proposes a guideline to implement mitigation strategies at the urban scale, providing devices and actors involved, based on an approach of integration of the urban components with elements of Green and Blue Infrastructure. A pilot area is defined to experiment a series of design practices to make the neighbourhood climate proof: pervious open spaces, eco-boulevard with canyon of trees, performative buildings extensions, that increase evapotranspiration and shading, to increase microclimate comfort.

The guidelines aim to promote replicable solutions, based on the opportunities already present in the environment, to both adapt and mitigate climate changes and to make the town more liveable.

For further information
Máster d'Arquitectura de Paisatge -DUOT - UPC

T: + 34 93 401 64 11 / +34 93 552 0842
Contact via email at: biennal.paisatge@upc.edu

Máster d'Arquitectura de Paisatge -DUOT - UPC
ETSAB - Escola Tècnica Superior
d'Arquitectura de Barcelona
Avenida Diagonal, 649 piso 5
08028 Barcelona-Spain



CLIMATE CHANGE AGAIN

11th International Biennial Landscape Barcelona

Barcelona September 2020

SCHOOL PRIZE

Urban microclimates

Understanding the dynamics of urban climatology and the policies of Adaptation Plans is the basis to propose landscape architecture solutions, in which the adaptive and transformative devices are also capable of increasing the attractiveness of the places.

The main phenomenon occurring in Trento is the Urban Heat Island effect, a microclimatic phenomenon consisting of higher values of surface air temperature in the urban areas as compared to the surrounding rural ones.

The project proposes Nature-based Solutions, that enhance perviousness of surfaces, shading and efficiency of buildings and at the same time offers multifunctional areas, combining recreation, water management, nature, culture, mobility.



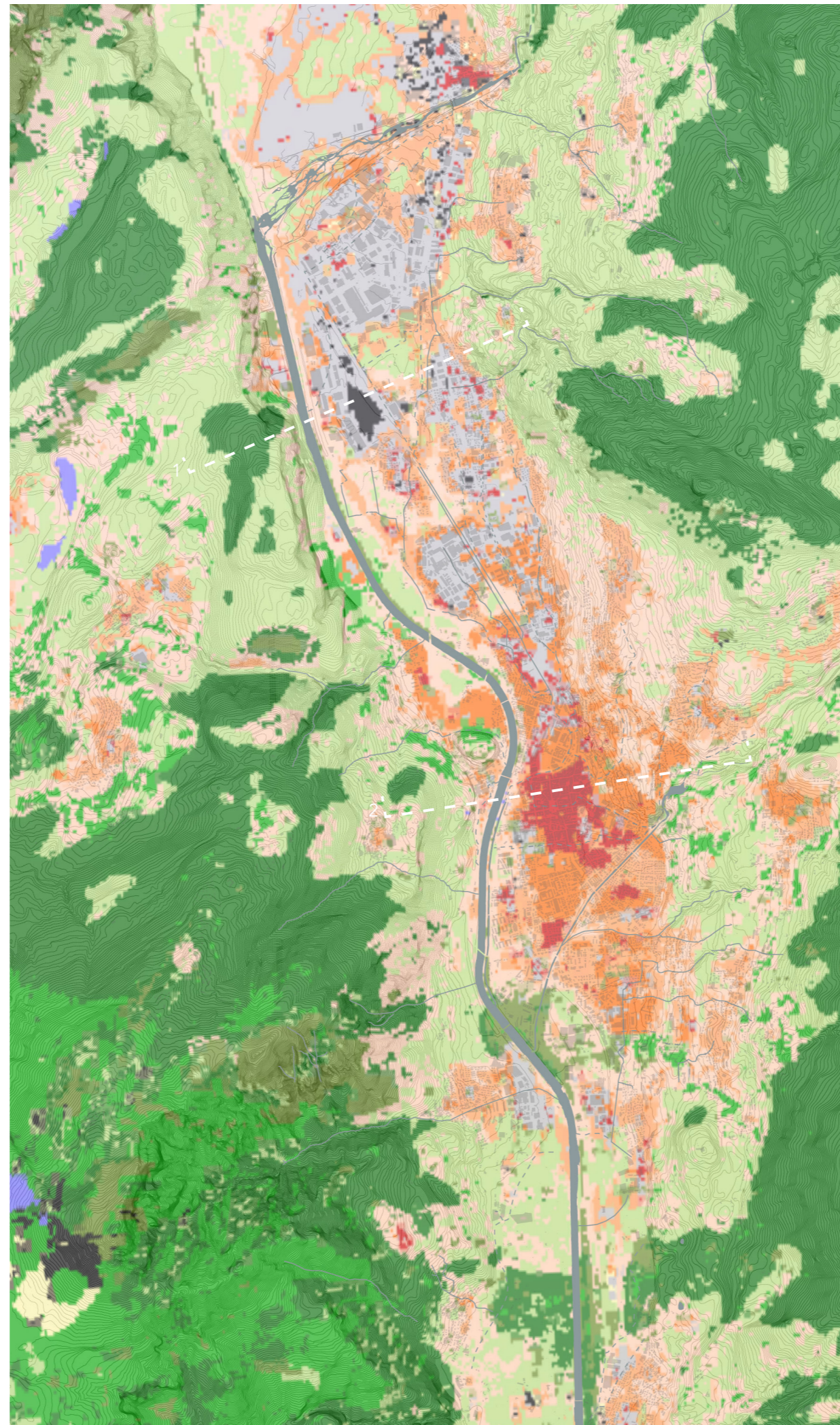
1 | Section of the north part of the town, industrial area



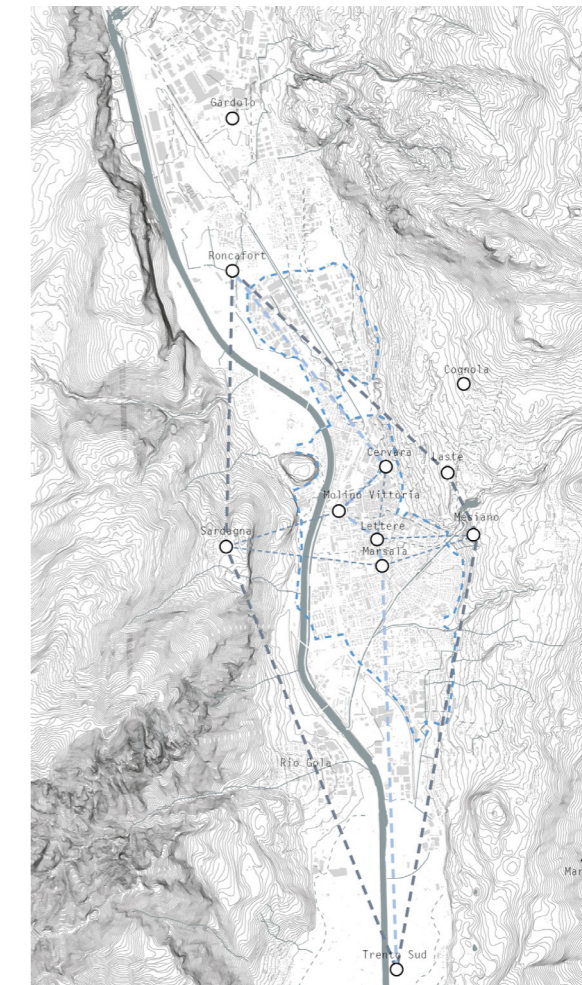
2 | Section of the historical center

Local Climate Zones

- | | |
|---|--|
| ■ Compact midrise | ■ Dense trees |
| ■ Compact low-rise | ■ Scattered trees |
| ■ Open midrise | ■ Bush, scrub |
| ■ Open low-rise | ■ Low plants |
| ■ Large low-rise | ■ Bare rock or paved |
| ■ Sparsely built | ■ Bare soil or sand |
| | ■ Water |



Temperature data - Urban Heat Island effect



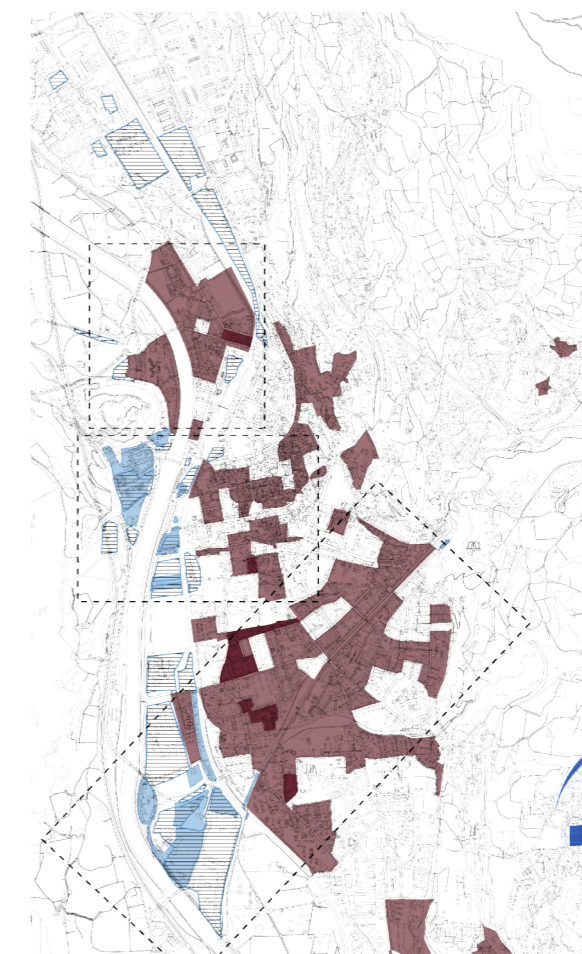
Measurements

- Weather stations
- Transversal direction
- Longitudinal direction
- Urban Heat Island

Measurements UHI

- ⋯ +0,6-0,8°C day temperature difference
- ⋯ +0,8°C-2,4°C night temperature difference

Heat-related risk and priorities

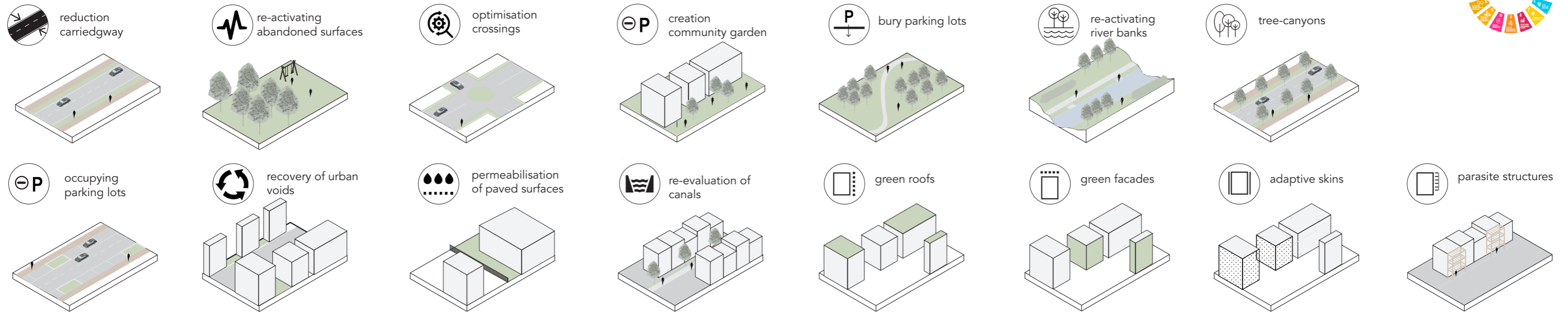


Heat-related risk

- 0,6-0,8 high
- 0,8-1 very high
- unused areas
- ▨ flood-risk areas



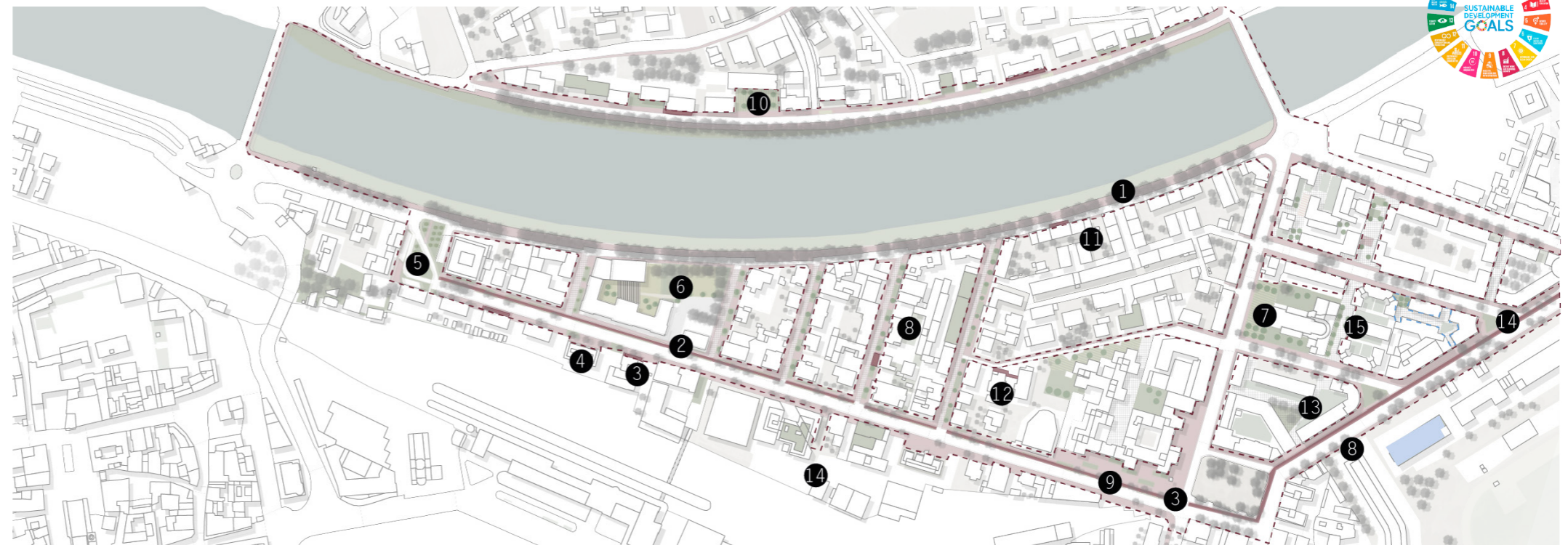
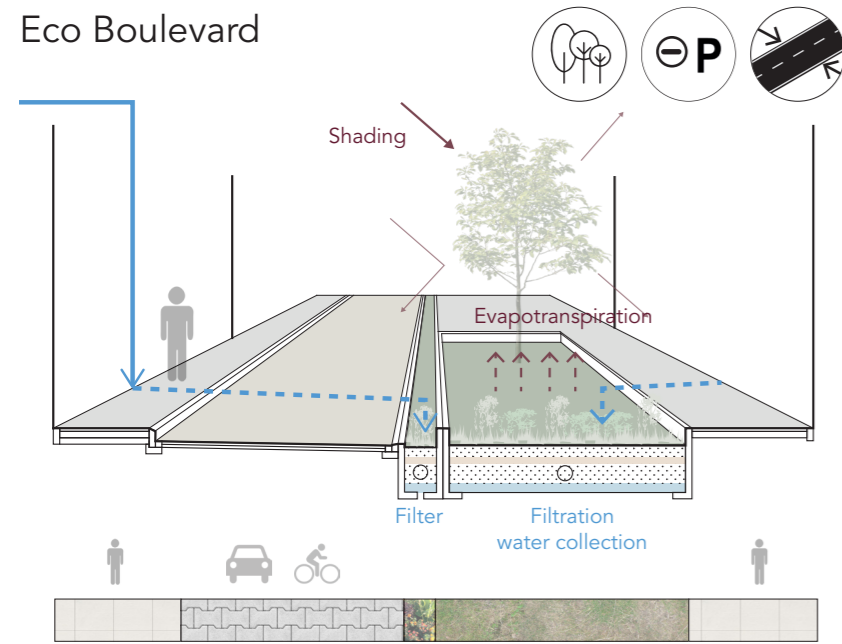
Blue and Green Infrastructures as mitigation strategies



Cristo Re climate proof neighbourhood



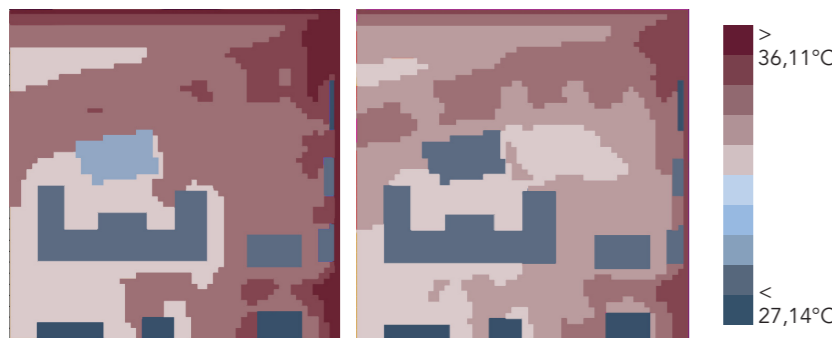
Eco Boulevard



Permeable Open Spaces



Energy efficient buildings



Current scenario

Proposed scenario

Difference of temperature between current and proposed scenarios