



healthy and connected **built environment**

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Healthy City

- / Impact of **built environment** on human **health** and **wellbeing**
- / **Environmental factors** affecting health and wellbeing
- / **Tools** for integrating and **evaluating health and well-being** when designing and managing the built environment

Environmental analysis

- / Procedures and tools for **assessing, monitoring** and **communicating** environmental conditions related to **microclimate, air quality, sound** and **light**
- / Opportunities and challenges of digital **technologies, simulation** and **modelling** for environmental analysis

Case studies

- / Critical analysis of **case studies**
- / Focus on architectural and urban **design strategies** for **healthy cities**, and social quality in buildings and communities

A healthy city is one that continually creates and improves its physical and social environments and expands the community resources that enable people to mutually support each other in performing all the functions of life and developing to their maximum potential (WHO_ World Health Organization)

The course organization in three modules



Building physics: *"Building physics is the application of the principles of physics to the built environment. Building physicists bring a fundamental understanding of physics to improving the design of building fabrics and surrounding spaces"*

(<https://www.arup.com/expertise/services/buildings/building-physics>)

Physics domains: heat, moisture, air, **light, sound**, energy,.....

TOPIC 1: Healthy City

Factors that affect human health, wellbeing and performance

Focus on **light and sound** (soundscape and lightscape approach)

How to promote healthy environments

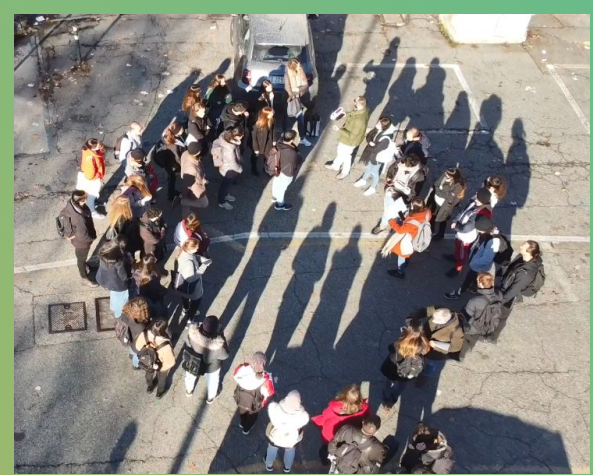
TOPIC 2: Environmental analysis

Assessing, monitoring and managing the lightscape and soundscape

TOPIC 3: Case studies

Examples and best practices for healthy and smart built environments

The approach:
building physics



Environmental design is "... the **process of addressing surrounding environmental parameters** when devising **plans, programs, policies, buildings, or products**. It seeks to create spaces that will enhance the natural, social, cultural and physical environment of particular areas. (Caves, Encyclopedia of the City, 2004)



TOPIC 1: Healthy City

Factors of the built environment determining the **urban quality**,
Strategies for a "**Preventative Architecture**"
Human **health** and **microclimate: Urban Heat Island (UHI)** mitigation

TOPIC 2: Environmental analysis

Use of simulation software **ENVI-met** to assess the microclimate conditions of the case study
Highlighting the **criticalities**
Promoting ecosystem and NBS solutions to solve them

TOPIC 3: Case studies

Examples and best practices for healthy and smart built environments



The approach

architectural technology/environmental design

Flipped classrooms



/ All groups will be assigned a **topic**

/ All groups will be assigned **documents about the topic** (scientific papers/report, case study, documentary...) to analyze

/ The lesson will start with your presentation, **briefly introducing** the contents of the documents. It must be very concise and direct (9 min).

/ We will discuss on topic and continue with a **frontal lecture**

/ The presentations (as **reports**) will be collected in a **final report** for the exam

The course and exam

Expected results

A4 report

collection of previous presentations



written test
(multiple choice questions)
/ building physics
/ environmental design



A1 posters given format

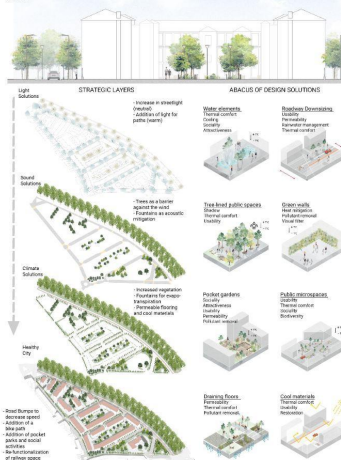
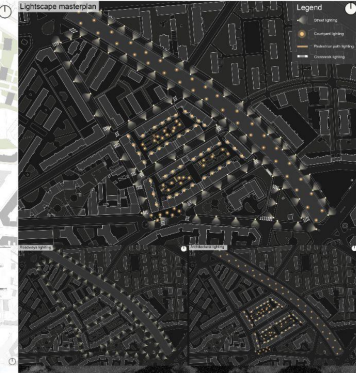
/ the design proposal
/ your guidelines for the healthy and connected built environment

GREENNECTION

CONCEPT: **Sound** **Light** **Environment** **Health**

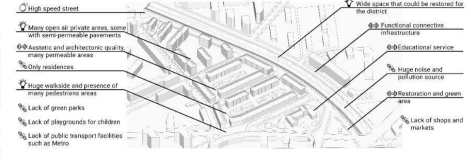


GreenConnection has one goal: to create the best environment for citizens. In order to do so, our project is based on many key points that are the decrease of the heat island effect, the control of the car usage, the increase of safety, wellness, health and well-being. This targets are reached with a prior planning phase that takes into account the historic, sociological, environmental and climatic. Reforestation is the main solution that involves all the aspects, with a view to sustainable development. In using trees and vegetation, the production chain is shortened. The consumption of raw materials, production costs and, therefore, the ecological footprint are decreased. Built-up solutions are the most effective ones and could be conceived in details with the involvement of the stakeholders that might contribute with their knowledge of the district that only a local point of view can provide.

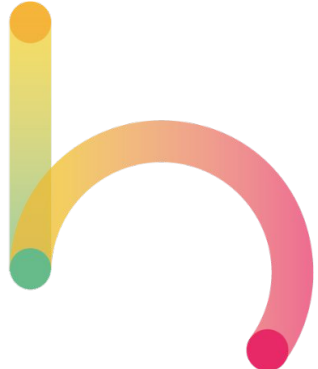
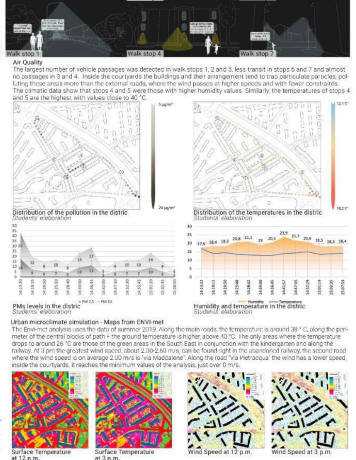
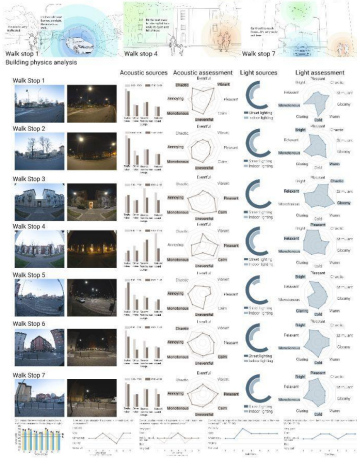
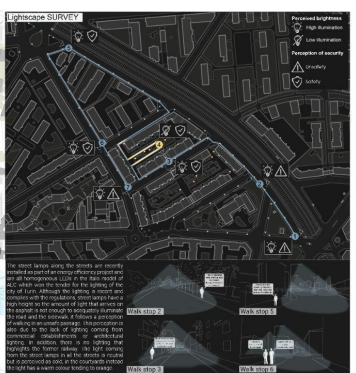
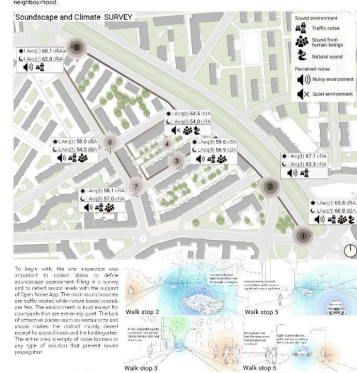


GREENNECTION

SWOT: **Strengths** **Weaknesses** **Opportunities** **Threats**



The area under analysis is located in the north-east of Turin, in particular path F is bordered by the streets of Via Settemio, Via Petrucciolo and Via Medadone. Inside we find a heterogeneous residential building and a small truck bar that is the only catering service in the area. No shops are available. Residences are predominant in the district. There are buildings in fire-damaged areas. The northern block is dated around 1946 (D.C. with an average height of 20 metres, the following two are dated 1919-43 (D.C. with an average height of 13 metres. Only one of the blocks has parking spaces inside the courtyard, other parking lots are located along the roadside. Path F is only served by a bus stop. The sidewalks are quite wide and have the road lighting system. Enclosed between Via Settemio and Via Goffarino there is the former abandoned railway, dating back to the twentieth century, currently used as an illegal open-air landfill but which could become an interesting element of the neighbourhood.

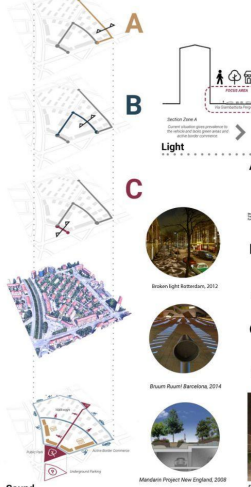


"Shaping the surroundings that shape us".

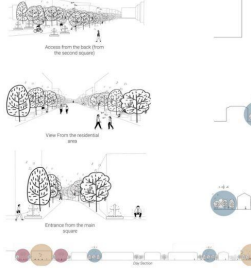
Neighborhood inside the Regio Parco district, consisting of four mixed use blocks, predominantly residential, and one block dedicated solely for ground parking. We were assigned this 5.3 ha for our analysis, which consists of seven stops at different parts of the neighborhood, where we collected and processed raw data for sound, light and climate in order to perform both quantitative and qualitative analysis on these as indicators for the further design proposal.

We are focusing on a 5.3 hectare neighborhood.

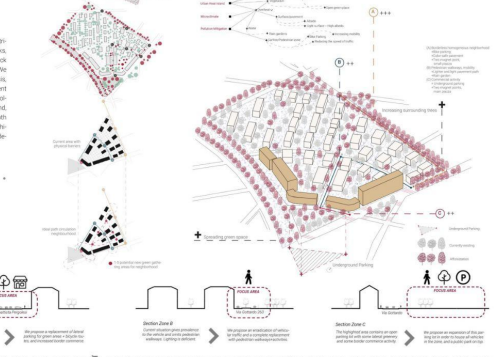
Meta-design vision



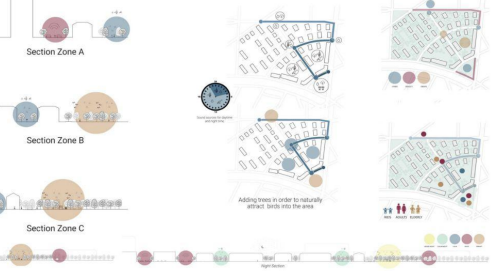
Sound



Design strategies UHI, microclimate



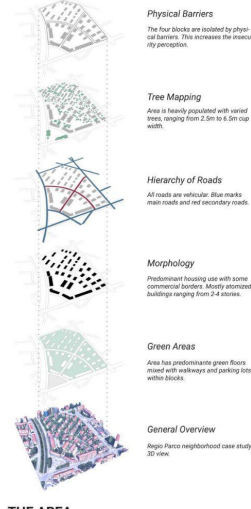
Light



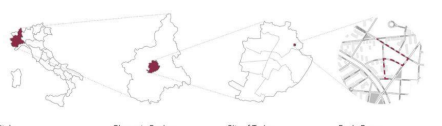
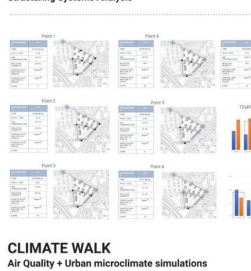
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THE AREA Structuring Systems Analysis

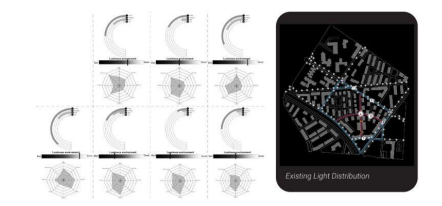


Italy
At a wider scale we are observing the northern part of the country, a region and latitude of 45.5227° N, 7.5181° E.

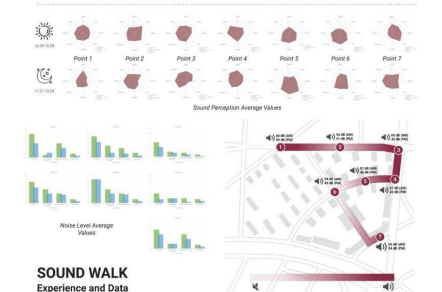
Piemonte Region
In the heart of the Piemonte Region is the smaller Torino, where the study area is located.

City of Torino
The Case Study neighborhood is located in the north of the city, specifically in the 6th Circoscrizione.

Regio Parco
Inside the Regio Parco neighborhood we were assigned this 5.3 ha for a meta design proposal.



LIGHT WALK Experience and Data



SOUND WALK Experience and Data

