

Confluence



**INFRASTRUCTURE
FOR URBAN RESILIENCE**

ASSANBAYEVA TOMIRIS

POLITECNICO DI TORINO

LAUREA MAGISTRALE IN ARCHITETTURA COSTRUZIONE CITTÀ
MASTER DEGREE IN ARCHITECTURE CONSTRUCTION AND CITY

A.Y. 2021/2022

CONFLUENCE:

**INFRASTRUCTURE
FOR URBAN RESILIENCE**

ASSANBAYEVA TOMIRIS

SUPERVISOR:
ELENA VIGLIOCCO

ABSTRACT

With the ongoing climate urgency, it's necessary to transform society towards a more sustainable way of living, drastically lowering GHG emissions, which is known as a process of climate mitigation. At the same time, in light of the growing number of extreme climate-related events, there is a need to adjust the urban environments for the risks that come ahead, which is defined as the process of adaptation. Urban resilience is a term that unites those two processes, which has lately been used more often to describe the ability of a city to withstand stresses and shocks of different natures and help society to move towards a greener future.

The disused area of Pavia, Confluence, represents an urban margin, a man-made "island" created by the final stretch of Naviglio Pavese. The portion of land between the historic city and the canal was formed as the result of its confluence with the Ticino river. Morphologically, the area is a place of convergence of different landscapes: the transition zone between the city, river, natural surroundings and Naviglio. Located in-between those main actors and at the node of numerous historical and contemporary routes, such as Via Francigena and VENTO, the area has the potential of playing a role of an urban regeneration catalyst and becoming a welcome point for incoming slow tourism fluxes. Thus, Confluence can serve as a tool for the transformation of the image of the city as a whole, underlining its role of a "Crossroad of routes".

The thesis is based on the research of different fields that together represent the *genius loci* of Confluence and explore the potential of its regeneration. The different perspectives on Infrastructure run central to the thesis: from Slow Tourism Infrastructure to the system of Navigli and adaptive reuse of disused infrastructures. As the final result, inspired by the concept of Landscape Infrastructure, the Masterplan aims to revitalise the area by giving it a role of Urban Resilience Infrastructure with the main focus centred around water and leisure, for residents and visitors alike.

Contents:



Pavia: view from Borgo Ticino on the river and Duomo of Pavia.

+ INTRODUCTION

+ PART ONE: SLOW TOURISM, ANTITHESIS FOR “FAST LIFE”

+ PART TWO: CROSSROAD OF ROUTES

+ PART THREE: CONFLUENCE

+ PART FOUR: NAVGILIO - INFRASTRUCTURE

+ PART FIVE: MASTERPLAN

+ BIBLIOGRAPHY

PART ONE: SLOW TRAVEL, ANTITHESIS FOR "FAST LIFE"

1. TRAVEL VS. TOURISM

18-21

*ANTECEDENTS OF TOURISM
DEMOCRATISATION OF TRAVEL & EMERGENCE OF MASS TOURISM*

2. THE IMPACT OF TOURISM

22-25

*ECONOMIC EFFECTS
SOCIAL- CULTURAL EFFECTS
ENVIRONMENTAL EFFECTS*

3. SUSTAINABLE TOURISM

26-27

4. SLOW TRAVEL

28-31

*EXPERIENCE OF SLOW TRAVEL
GROWTH OF SLOW TRAVEL
BENEFITS FOR LOCAL COMMUNITIES*

5. SLOW TOURISM INFRASTRUCTURE

32-34

6. ITALIAN CONTEXT

35-43

*SLOW TOURISM INFRASTRUCTURE IN ITALY
BICI ITALIA
VENTO
VIA FRANCIGENA AS CULTURAL TOURIST PRODUCT*

PART TWO: CROSSROAD OF ROUTES

I. ANALYSIS OF THE TERRITORY

47-71

*SLOW TOURISM IN LOMBARDY
PAVIA - CROSSROAD OF ROUTES
LOCATION
-SCAPE/-SCAPES*

II. ANALYSIS OF PAVIA

72-91

*HISTORICAL CROSSROAD
PRESENT-DAY SITUATION
OPPORTUNITIES FOR THE CITY
ANALYSIS OF VECTORS CROSSING PAVIA
AREA OF TRANSFORMATION*

PART THREE: CONFLUENCE

I. HISTORICAL ANALYSIS OF THE AREA

96-135

*THE AREA
URBAN EVOLUTION OF THE AREA
ELEMENTS OF THE AREA
TIMELINE
NEIGHBOURING CONTEXT*

II. URBAN ANALYSIS OF THE AREA

136-153

PART FOUR: NAVIGLIO - INFRASTRUCTURE

1. SYSTEM OF NAVIGLI

156-159

*EVOLUTION OF THE NAVIGLI SYSTEM
PTRA "NAVIGLI LOMBARDI"*

2. NAVIGLIO PAVESE

160-171

*HISTORY
COURSE OF NAVIGLIO PAVESE
CURRENT SITUATION*

3. INFRASTRUCTURE REUSE

172-183

*POST-INDUSTRIAL HERITAGE
ADAPTIVE REUSE OF INFRASTRUCTURE
CASE STUDIES*

4. INFRASTRUCTURE FOR RESILIENCE

184-189

*CLIMATE EMERGENCY
URBAN RESILIENCE
ROLE OF INFRASTRUCTURE
LANDSCAPE URBANISM AND INFRASTRUCTURE*

PART FIVE: MASTERPLAN

1. CONFLUENCE AS INFRASTRUCTURE

192-197

*URBAN RESILIENCE INFRASTRUCTURE
LOCAL CLIMAT RISKS
RECREATION AND SLOW TOURISM INFRASTRUCTURE*

2. MASTERPLAN FOR CONFLUENCE

198-238

*GOALS
CONCEPT
STRATEGY (MOBILITY/RESILIENCE/ACTIVITY)
RESULT*

BIBLIOGRAPHY

Introduction:

We live in challenging times, times of changes that come faster than our ability to change. During our lifetime, climate change already manifests itself on a global scale, making our existence as we know it less certain since the Earth's natural systems and cycles are getting more unpredictable and extreme. But humankind, as it has been done numerous times before, once again needs to show its ability to adapt and change itself accordingly to the threats. Today, the term 'resilience' became increasingly popular to talk about the ability of a system to absorb the change and recover without major disruptions. Reflecting the urbanised world we live in today, the specific concept of 'urban resilience' or 'resilient city' is used. Since the urban areas throughout the world represent the major concentration of people and capital, the stability of those systems is crucial for society as a whole, and globally inter-disciplinary discourse is established, bringing together governing, ecological sciences and urban design and planning. Cities are complex systems made by the physical environment, numerous actors that inhabit it and the interaction between them. The resilience of a city reflects this complexity and should take into account the different levels that those interactions take place: ecological, social, and economic.

Within the inter-disciplinary fields of urban and landscape design, in the last decade, a new trend appeared of creating infrastructures capable of withstanding the stresses and managing the risks - usually climate and water-related. By performing these functions, the infrastructure can offer the urban

environment a major resilience to extreme climate events, but also it doubles the function as a new green and public space, offering also habitats for biodiversity and recreative places for the communities. The common name applied to those types of areas in the professional practice is Landscape Infrastructure, the term coined within the Landscape Urbanism discourse. The concept of Landscape Infrastructure is applied to performative hybrid infrastructures, that can work to improve mass transit and mobility, enhance ecological performance and sustainability, create public and recreational space, and provide increased urban resilience.

Can a disused area of a middle-size city perform similar functions, becoming an Infrastructure for Urban resilience? The infrastructure that improves soft mobility transit, promotes flows, creates public recreational space for the city and at the same time provides an increased climate and urban resilience. In this thesis, this concept is applied to the disused area located in Pavia, named Confluence, characterised and created by a convergence of Naviglio Pavese and the Ticino river. In reality, the area doesn't transmit a common unifying identity in the perception of the visitor. This unifying characteristic is seen only from the map: the area has very strong physical limits performed by Naviglio, the Ticino and the moat Roggia Carona, reminiscent of the trace of the Spanish Wall - the city walls of Pavia built in the 16th century. It represents a sort of "island" and plays a role of an urban margin of Pavia's city centre.

To find a solution for the regeneration of the area, the thesis performs an analysis of both, territorial and urban scales, in order to understand the given attributes and find the potential of the Confluence and Pavia. During this process an interesting characteristic of Pavia came to the light - the city performs a role of a crossroad for numerous 'cammini' or 'vie' (pilgrimage routes) on a scale of Lombardy: Via Francigena, Via degli Abati to name a few. Those numerous routes serve as Infrastructure for Slow Travel, a concept of travelling slower, by foot or bike, and exploring local "experiences" during the journey. Pavia, due to its position within the network has the potential to become a Slow Travel Hub on a territorial scale. Moreover, the identity of "Crocevia d'Europa" (Crossroad of Europe) is claimed to be given to the city by the European Commission in 2012 for the richness of historic and religious paths and routes that cross the city. Considering the current interest in Slow Tourism in Italy, which is expected to grow further in the future, this identity of a Crossroad could bring a regeneration impulse to Pavia, which for many decades suffered from urban decay brought by the post-industrialisation process, today accounting to 83 ha of disused heritage.

Following the analysis of the vectors crossing Pavia, the position of the area gets a new meaning: the area includes in its territory two important nodes. At the north, the node of the routes is located, vectors that cross Pavia by land, which coincide with the old city gate, Porta Garibaldi, destroyed with the process of tearing down the city walls. In the southeast, there is Confluence,

the point of meeting of a man-made canal, Naviglio, with the Ticino river. This node once was used as a port, which seized its activity with the gradual decline of navigability of Naviglio. Both of these nodes represent the potential of the area, by positioning themselves within the larger territorial networks. The redevelopment can represent a physical manifestation of the identity of the Crossroad, providing crucial infrastructure for the fluxes of slow tourists in the future.

But what does actually the area represent and what it is made of? It is the residue space, left by the course of Naviglio, that was passing at a distance of around 150 meters from the trace of the city wall. The resulting space in-between had a peculiar status: it wasn't already the countryside, which now was fully starting after the canal, but neither it was considered a city, which was limited by the walls. This urban margin found its vocation in connection with the activity of Naviglio, by hosting the port-related functions. But with the decline of navigation of the canal, induced by the arrival of the railroad, and later its complete stop in the 1960s, the area was in the full process of transformation, characterised by the construction of Palazzo delle Esposizioni and the Swimming pool. But this process succeeded only for a period of time, followed by a steep decline in activity that was already evident from the end of the 19th century. This resulted in the state of the art of today: three abandoned complexes, an exhibition hall used on occasions but deserted the majority of the time, residential houses along Naviglio and the semi-informal

settlement of the Sinti population, that in the 1980s displaced by the conflicts, were forced to search for a new home, encountering the disused area at the waterfront of the Ticino.

But the protagonist of the area is, without doubt, Naviglio Pavese, stretching for 33 km from Milan to Pavia, It is a disused infrastructure that once was a manifestation of the great hydraulic achievement of Lombardy: the last canal built that completed the long-awaited system of Navigli by closing the loop Ticino - Naviglio Grande - Naviglio Pavese - Ticino. Today the infrastructure is characterised by the state of abandonment, for more than 60 years it doesn't perform the role of a navigation channel, but is used only for irrigation purposes. The urban stretch of Naviglio in Pavia especially reflects the long-lasting neglect: it has no public functions along the course and is generally characterised by a lack of activities, except few fishermen here and there.

A comparable process of disuse affected many other obsolete transport infrastructures in post-industrial societies, and with the turn of this century, the topic of infrastructure reuse started to appear in the fields of architecture, landscape and urban design. Envisaged by Promenade Plantée in Paris and then made popular by the High Line in New York, the viaducts, railways, airfields and canals around the world are seen today as valuable urban assets that can kickstart the regeneration processes and offer attractive green public space to the communities. On the territorial scale,

this process is ongoing too: thousands of kilometres of disused railways around Europe are turned into greenways, promoting sustainable travel and mobility. Could similar processes happen to Pavia and Naviglio? Could an urban regeneration of Confluence kickstart the regeneration of Naviglio heritage and vice versa?

The inquiries discussed up to this moment created the base for the Masterplan of Confluence, which seeks to include various aspects that create the *genius loci* of the place, perceive the potentialities found and as a final result answer different needs, consolidated in one project. Inspired by the concept of Landscape Infrastructure discussed at the beginning of this introduction, the area in its integrity is seen as a type of hybrid multifunctional Infrastructure. From one point of view, it includes different types of uses and functions to provide a space for the city with strong recreational and tourism connotations, that can help Pavia to reemerge from the process of stagnation, become more livable and energetic and reintegrate itself through the means of territorial marketing as the "Crossroad of Europe". From another point of view, the Masterplan increases the urban resilience of Pavia in a range of aspects: economy, climate, health and well-being, improving as the result not only the degree of adaptation of society as a whole but also the well-being of the residents. To better reflect this multi-dimensional extent, the Masterplan consists of three levels of strategy: Mobility, Resilience and Activity.

Part one: Slow travel, antithesis for “fast life”



Travellers approaching Ponte Coperto, Pavia.

Source: <http://www.lombardia.viefrancigene.org/static/photologue/photos/2018/2/VF-Lombardia.jpg>

Traveling slowly, this rootedness is given in a horizontal way - through the relationship of the tourists with the visited spaces. In the tourist experience, slow travel becomes both a means and an end, as it is a kind of reward and the way to achieve it.¹

1. Felipe Koch, “Slow Travel: de l’individu-sédentaire à la personne-nomade” in *Sociétés* 142, no 4 (2018): 121-127
<https://doi.org/10.3917/soc.142.0121>

1. TRAVEL VS. TOURISM

“All tourism involves travel, yet not all travel is tourism”

Robert Christie Mill, and Alastair M. Morrison. “The Tourism System” (2002).

Tourism is the process of spending time away from home, usually in search of recreation and pleasure. However, the motivation can range widely and goes beyond leisure or holiday pursuits. The United Nations World Tourism Organization (UNWTO) defines tourism as a social, cultural and economic activity which entails the movement of people to countries or places outside their usual environment for personal or professional purposes¹.

It will be also useful to note the differences between the words “travel” and “tourism”. While the two worlds are often used together and sometimes interchangeably, each of these words has its own specific meaning. “Travel” refers to the act of movement and relocation, or the activity of going on a journey². “Tourism”, derived from the word “tour”, while also refers to as the act of travelling, it has also an added specific purpose to a journey and refers to touring a place for pleasure or leisure.

Another useful observation would be that the majority of the cultural and historical background here relates to the region of western Europe. The history of other developments in other geographic zones can differ a lot.

ANTECEDENTS OF TOURISM

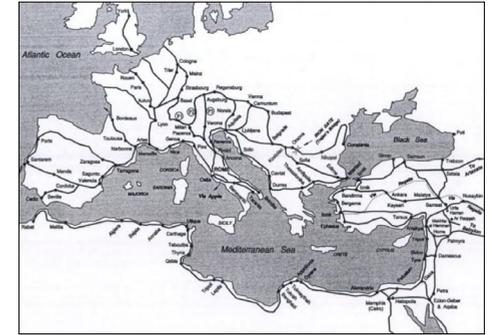
The history of travel and tourism is closely linked to the development of roads, and subsequently to the progress of other types of transport infrastructure or modes of transport, all being a basis for the movement of humans from one location to another. The evolution of a network of roads, firstly, allowed the movement of military and transport of commerce, then the same infrastructure started to be used for translocating people for all different reasons, among it travelling for leisure.

In **Ancient Rome**, a vast system of road infrastructure had been developed starting from 300 BC, known as *viae Romanae*, which was vital for the expansion and maintenance of the Empire. The same roads allowed people to travel for leisure, marking one of the earliest forms and remote antecedents of both cultural and resort tourism. People could travel for leisure and education, discovering cultures different to theirs, like those of Greece or Egypt. While a resort-type recreation at the epoch was to retreat from city life at rural or coastal villas, like those found in the Gulf of Naples or near Trieste at Barcola.

Later, in the **Middle Ages**, a different type of tourism became deeply important - the religious pilgrimage. In Christian tradition, the main destinations were Jerusalem, Rome and Santiago de Compostela, as a result, an elaborate network of routes was formed to reach those sites (frequently reusing the road system built by Romans) equipped with the hospices along the way for the accommodation of the pilgrims.

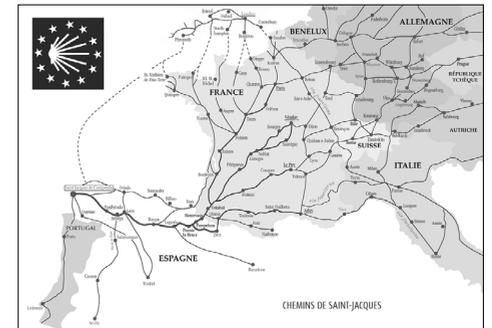
Over time, the religious motivation for travel diminished in its primacy and the educational reasons took over, in the form of a popular practice of the 18th century named the **Grand Tour**. This type of educational journey through Europe was a form of aristocratic rite de passage undertaken usually by young noblemen for several months or even years, offering the traveller a sense of accomplishment and prestige upon return. While the itinerary could vary, Italy and France were the usual destinations on the journey, since they were the ones offering the rich cultural heritage that many aspired to contemplate.

As it can be seen from the early history of tourism, it was usually accessible only to wealthy travellers, and to a much smaller degree to the lower classes. The reasons behind it were the lack of free time for the labouring class, paired with the lack of resources. Wealthier classes could allow a greater amount of repose and resources to financially sustain all the amenities necessary during the travel. The process of democratisation of travel gradually started to progress with the advances in industrialisation.



Major Roman Roads.

Maxwell G Lay, *Ways of the World : a History of the World' s Roads and of the Vehicles that Used Them*, (New Brunswick : Rutgers University Press, 1992)



Map of the Camino de Santiago (Way of St James) in Europe.

Source: https://commons.wikimedia.org/wiki/File:Ways_of_St._James_in_Europe.png

1. “Glossary of Tourism terms”, United Nations World Tourism Organization, accessed on January 15, 2022,

<https://www.unwto.org/glossary-tourism-terms>

2. Merriam - Webster online dictionary, s.v. “travel”, accessed on January 15, 2022,

<https://www.merriam-webster.com/dictionary/travel>

DEMOCRATISATION OF TRAVEL AND THE EMERGENCE OF MASS TOURISM

In the way it exists today, tourism is a product of the **Industrial Revolution**. With the development of industry, workers started having more free time and with the emergence of paid holidays, the people started to have the possibility of travelling for leisure. At the same time, international **transport infrastructure** was evolving, allowing faster and easier access to different places on Earth. First with trains, then with automobiles and planes, the world became more interconnected. This process of **globalisation** made it possible to travel to different faraway places for holidays worldwide.

Starting from the 19th century, tour packages appeared on the market. Organised tourist trips were created and sold to the customer by specialized enterprises, such as tour operators and travel agencies. The convenience was in the price and pre-planned schedule: tourists could embark on a journey with ease, not worrying about the organisation side of a trip. With the rapid development of the tourism industry in the second half of the 20th century, tourism operators became working on a big scale, producing the effect of **mass tourism**, defined as the movement of a large number of organized tourists to popular holiday destinations. Leisure activities and products for mass tourism are often standardized. ³

3. Auliana Poon, *Tourism, Technology, and Competitive Strategies* (Wallingford: CAB International, 1993).

4. Carles Manera, and Antonia Morey, "The Growth of Mass Tourism in the Mediterranean: 1950-2010", *Journal of Economics and Finance* 7, no.4 (2016): 84-91.

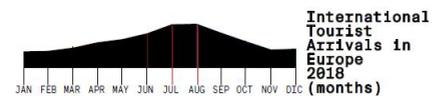
5. World Tourism Organization (UNWTO) et al., 'Overtourism'? – *Understanding and Managing Urban Tourism Growth beyond Perceptions, Executive Summary* (2018). DOI: <https://doi.org/10.18111/9789284420070>

Tourism grew into an even bigger business during the second half of the 20th century. Air travel was progressively deregulated, opened for a free market and decoupled from national airlines. A new type of product appeared for the tourists: the flight tours to sunny coastal destinations. One of the main destinations became the **Mediterranean Sea**, which started also attracting more and more international visitors. Up to today, all the Mediterranean countries together constitute one of the world's main tourist destinations, representing around a third of the total international tourist arrivals globally, with France, Spain and Italy being the most visited countries in Europe and worldwide. ⁴

Starting from the 1990s there was the development of flexible international travel, thanks to the rise of **low-cost airlines**, such as EasyJet and Ryanair, which opened new destinations to a larger public. The interest in the product was growing exponentially, and the low fares of the low-cost airlines have made it easier for more people to travel more often, leading to the problem of overtourism in some locations. UNWTO defines **overtourism** as "the impact of tourism on a destination, or parts thereof, that excessively influences perceived quality of life of citizens and/or quality of visitor experiences in a negative way." ⁵

Mediterranean Sea

3 750 000 km³ water
2,51 million surface
46.000 km coastline
23 states
3 continents
500.000.000 inhabitants
2.000.000 tons of goods
122.000.000 passenger



International Tourist Arrivals 2018



Global market



Naval traffic



Transport mode



SOURCES:
 UNWTO, EUROPEAN AGENCY OF TOURISM ISTAT, GOOGLE TRENDS, EUROSTAT, ESPON, ESATdor, EuroMED, Study of Maritime traffic flows in the Mediterranean sea 2008, APPE.

Infographics on Mediterranean Sea tourism.

Silvana De Bari, Valerio Di Festa, and Stefania Iraci Sareri, "Through the Rooms into a Diorama: an Alternative Domestic Model to Inhabit the Territory", (Master thesis, Politecnico di Torino, 2020), 46, <https://webthesis.biblio.polito.it/14120/1/tesi.pdf>



Firenze, Piazza Duomo. OverTourism photographic project.

Alessandro Toscano, *Firenze, Piazza Duomo*, digital image, 2019.

<https://www.alessandro Toscano.com/overtourism-in-progress#10>

2. IMPACT OF TOURISM

The fast-developing tourism industry showed the potential for both positive and negative impacts. Depending on its effect, it is commonly divided into three domains: economic, socio-cultural, and environmental impacts. It is widely acknowledged that tourism can have numerous benefits, particularly in rural areas and in developing countries. However, it can also have serious negative effects on host communities and the climate. Generally, mass tourism and overtourism aggravate existing and lead to more serious negative impacts. International tourism is expected to grow, but at varying rates based on location. This continuous growth in one of the world's largest and fastest-growing industries will place significant stress on remaining biologically diverse habitats and indigenous cultures. In the long term, tourism can be sustainable if it is managed in such a way, that potential negative effects on the society and the environment don't outweigh the financial benefits.

ECONOMIC+

- +creation of jobs
- +stimulus for the local economy
- +increased trade for local businesses
- +tax revenue
- +increase in a wealth of an area
- +goods manufactured more locally
- +diversification of the employment and income

ECONOMIC EFFECTS

The tourism industry contributes almost ten per cent to the **global GDP** and is one of the principal generators of business. Today many societies depend on the income derived from the tourist economy, so the abruptness of travel, as we saw during the **Covid-19 pandemic**, severely affect the economies of many countries. But despite the slow down of the industry during the beginning of the 2020s, the tourism sector is still expected to grow. Today it became one of the dominant leisure activities of our time and one can notice the rise of tourism with the growth of the **Experience Economy**, which is interested in the sale of memorable experiences to a customer.

The economy of the community can be affected both positively and negatively by tourism. The positive effects can guide the **economic stimulus** of the local economy and increase job opportunities, diversification of employment and income potential. Local communities can also benefit from the creation of local products, and the opening of businesses serving the expanded tourism market. Tourism plays an important role in the creation of direct and indirect jobs (around 10.7% of the total available worldwide).⁶

ECONOMIC-

- jobs are often seasonal
- increase in the price for locals
- negative effects of mass tourism on a city's infrastructure
- arrival of big businesses
- locals being pushed out of the economy

The negative effects from the employment side could be that often the jobs are **seasonal and low-paying**. In the case of mass tourism, detrimental impacts tend to grow for the local community: **increase in prices** of services and property, gentrification, and exhaustion of local resources. When the location is very lucrative, the international business takes a part of the market, creating the leakage of revenue abroad.

SOCIAL-CULTURAL+

- +employment
- +improved infrastructure and services
- +higher quality of life for locals
- +better public services
- +restoration and preservation of historic sites
- +encouraging the revitalization of cultures
- +community participation
- +intercultural interaction
- +increase in local pride
- +preservation of historical sites and heritage
- +opportunities for education

SOCIAL-CULTURAL-

- locals being pushed out of the economy
- the commodification of culture
- the destruction of pre-tourist culture
- acculturation
- depletion of the public services
- conflict between visitors and residents
- increase in crime
- overcrowding
- aesthetic pollution

SOCIAL-CULTURAL EFFECTS

The socio-cultural impacts of tourism refer to how tourism affects the communities in which it operates, such as how it can change values, living styles, behaviours, community structures, cultures, lifestyles or overall quality of life. Both positive and negative socio-cultural impacts can occur, and these impacts can affect residents of the area as well as tourists. Some examples of these positive and negative impacts include:

6. Tim Tyrrell, and Robert Johnston, "The Economic Impacts of Tourism: A Special Issue" *Journal of Travel Research* 45, no.1 (2006): 3-7, <https://doi.org/10.1177/0047287506288876>

ENVIRONMENTAL EFFECTS

The effects on the environment can be produced by the activities directly involved with tourism, like the waste produced by tourists, and also indirectly, during the production of goods and services for this market. While the quality of the environment of a given place is essential to tourism, and it can serve as a tool for the protection of natural environments, the same activity can have serious adverse effects on climate and habitats.

Like most activities of the anthropogenic era, tourism employs natural resources and releases greenhouse gasses (GHGs). Currently, the greatest contributor to tourism emissions are travel-related and account for 50-97.5% of the general impact of a touristic trip on the environment.⁷ The range can vary greatly according to the distance, the mode of travel, the length of stay and the energy intensity of the accommodation and activities at the destination. Globally, the transport sector is the primary oil consumer, amounting to more than the half of world's final consumption, with road transport constituting nearly 50% in 2018.⁸

When the passenger travels by air transport, the **environmental costs** of a single trip are extremely high, followed by those of personal automobiles. Aviation emissions can vary based on the length of flight: the **highest impact** is for short-range flights and it tends to decrease for longer flights (Fig.1). But the worsening factor of air travel is that GHGs other than

CO₂ (e.g. methane, nitrogen oxides) happen at a stratospheric altitude, contributing to greater radiative forcing, meaning Earth receives more incoming energy from the sunlight.

Other than the negative impacts of air pollution by transport, there is a range of other forms of **pollution**, that can be produced by the tourism industry: noise pollution, waste and discharges production, visual/aesthetical pollution, etc...

Tourism can also have direct physical negative effects created by visitors to the natural settings, which are usually multiplied in the case of overtourism, or when the level of visitors exceeds the environmental ability to cope with it. First of all, the activity can lead to the **depletion of natural resources**, by increasing the consumption in areas where resources are already scarce, such as water, energy and other raw materials.

Often, attractive landscape sites, such as mountains, sea shores and riversides, are transitional zones characterized by species-rich ecosystems and can be extremely susceptible to degradation. In the case of natural sites, tourism can bring interference with **local flora and fauna**: the negative consequences can lead to the loss of biodiversity or its change towards different non-local species. Deforestation, intensified use of land, erosions, and **destruction of habitats** - are all possible negative effects of tourism if managed unsustainably.

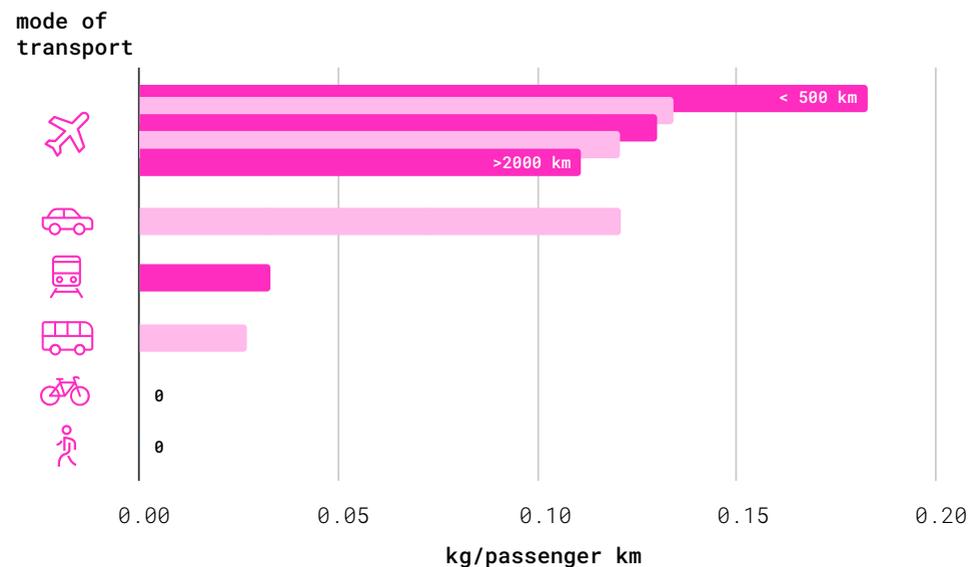


Fig 1. Mode specific CO₂ emission factors for transport.

Source: Janet E. Dickinson, Derek Robbins, and Les M. Lemsdon, "Holiday Travel Discourses and Climate Change", *Journal of Transport Geography* 18 (2010): 482-489.

ENVIRONMENTAL+	ENVIRONMENTAL-
+preservation of the natural environments	-depletion of natural resources
+increased environmental awareness	-increased pollution, general waste.
+promotion of conservation of wildlife	-air pollution
	-noise pollution
	-aesthetic pollution of the environment
	-loss of biodiversity
	-erosion and loss of natural features
	-harmful changes to the local environment

7. Janet E. Dickinson, Les M. Lemsdon and Derek Robbins, "Slow Travel: Issues for Tourism and Climate Change", *Journal of Sustainable Tourism* 19, no.3 (2011): 281-300.

8. IEA, Key World Energy Statistics: Final Consumption (2020), <https://www.iea.org/reports/key-world-energy-statistics-2020/final-consumption#abstract>

3. SUSTAINABLE TOURISM

According to the UN World Tourism Organisation (UNWTO) definition, “Sustainable Tourism takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities.”⁹

Tourism should be sustainable, which is now a widely held consensus. When planned, developed, and managed properly, all forms of tourism could be sustainable. As was stated in the previous chapter, the impact of tourism can be both positive and negative on economic, social and environmental dimensions. The overall magnitude of impact is affected by many diverse factors: from a mode of transport to the choices made during the stay, but also an election of a destination in itself. Sustainable tourism should address the concerns of the economic, social and environmental issues. The social-cultural concerns relate to the creation of social equity, quality of life and cultural diversity; while economic benefits could result in a dynamic economy and new jobs creation and prosperity for all. In such a way, Sustainable Tourism tries to enhance tourism’s **beneficial impact**, while reducing the negative effects. In these cases, the travellers consider themselves responsible for their choices and prefer **sustainable solutions** when possible for all the choices made during

a trip, **supporting local communities** and economies, as well as the environment. The expansion of sustainable tourism is considered a part of the wider **2030 Agenda for Sustainable Development**, adopted by all members of UN in 2015. The Agenda creates a shared model for current and future prosperity and peace for people and the planet. At the core, there are 17 Sustainable Development Goals. Sustainable tourism development is included in **goal 8**, which states its aspiration to: “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.”¹⁰ A key element of the target is promoting sustainable tourism through implementing policies that lead to the subsequent creation of jobs and encouragement of local culture and products.

Rather than referring to one specific form of tourism, sustainable tourism is an aspiration to make the impacts of all forms of tourism sustainable for generations to come. Some of the different segments of tourism have their motivation in a line with the similar **concepts and values**. During the last decades, a new tourism movement emerged, named slow tourism, which had its aspiration closely connected with social, ecological and economic sustainability.

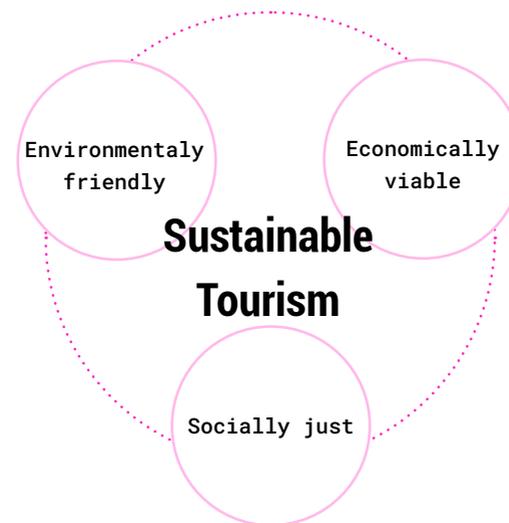


Fig2. Constituents of Sustainable Tourism.

Produced by author.

Sustainable tourism

130. We emphasize that well-designed and managed tourism can make a significant contribution to the three dimensions of sustainable development, has close linkages to other sectors, and can create decent jobs and generate trade opportunities. We recognize the need to support sustainable tourism activities and relevant capacity-building that promote environmental awareness, conserve and protect the environment, respect wildlife, flora, biodiversity, ecosystems and cultural diversity, and improve the welfare and livelihoods of local communities by supporting their local economies and the human and natural environment as a whole. We call for enhanced support for sustainable tourism activities and relevant capacity-building in developing countries in order to contribute to the achievement of sustainable development.

131. We encourage the promotion of investment in sustainable tourism, including eco-tourism and cultural tourism, which may include creating small and medium-sized enterprises and facilitating access to finance, including through microcredit initiatives for the poor, indigenous peoples and local communities in areas with high eco-tourism potential. In this regard, we underline the importance of establishing, where necessary, appropriate guidelines and regulations in accordance with national priorities and legislation for promoting and supporting sustainable tourism.

Extract from the Rio+20 summit final document.

United Nations, *The Future We Want*, Rio+20 outcome report (Rio de Janeiro: 20-22 June, 2012): 25, <https://wedocs.unep.org/bitstream/handle/20.500.11822/13662/N1238164.pdf?sequence=1&%3BisAllowed=>

9. UNWTO, “Sustainable development”, accessed on March 28, 2022, <https://www.unwto.org/sustainable-development>

10. United Nations, “Goal 8”, accessed on March 28, 2022, <https://sdgs.un.org/goals/goal8>

4. SLOW TRAVEL

With slow travel, we experience the possibility of breaking the narrative of our life stories. We want to dismember this narrative and reconstitute it with several heterogeneous pieces of different experiences, coming from elsewhere. Nostalgia, moreover, makes the present moment impossible. And how to make this moment possible? By cutting the daily scenario and restoring it elsewhere. At this moment, one becomes a person composed of different changing facets, adapting to each new moment of now nomadic life.

- Koch, Felipe. "Slow travel. De l'individu-sédentaire à la personne-nomade", *Sociétés* 142, no. 4, (2018): 121-127.

'Slow Travel' refers to a movement that encourages to travel locally, visit less, but stay longer, or/and reject motorised transportation, like air and automobile travel, in favour of walking and cycling. It is characterized by the concept of reducing speed and the mobility, with which one travels, and taking more time to explore local history and culture while being attentive to the impacts on the environment. With its principles of slowness and locality at its core, slow tourism represents a type of sustainable and ethical tourism, that has the potential of creating benefits for local communities and of being the solution to climate change mitigation.

The term "Slow Tourism" is often associated with the Slow Food movement, which was started in the 1980s by Carlo Petrini and a group of activists to resist the expanding market of fast food in Italy. The initial aspirations began with defending regional traditions of local food and food production but with time the concept and denomination

'slow' grew to a lifestyle philosophy that touches every aspect of one's life: from the Slow City movement, which builds on the ideas of Slow Food extending its philosophy to cities and destinations, to Slow Living that advocates for a slower-paced, but enriching life. Slow Tourism represents an alternative form of tourism and an eclectic counter-movement to mass tourism.

For Slow Travel, the fundamental shift appears to be in attention: from obtaining a quantity of activities while on vacation to reaching the quality of fewer but more significant experiences.¹¹ It inspires people to embark on a journey of experiencing deeper connections with local people and places. Participating in everyday interactions, learning about tradition and culture, and eating local food - Slow Travel encourages a more detailed exploration of the cultural environment in which the holiday is taking place and results in a more rewarding and memorable experience for the participants.

¹¹. Peter Robinson, Sine Heitmann, and Peter Dieke, *Research Themes for Tourism*, (CABI:2011).

Current analysis of tourism points to the relatively high contribution of holiday travel to greenhouse gas (GHG) emissions. Overall, calculations suggest that the tourism industry contributes between 5% and 14% of world GHG emissions, however, the travel component of tourism is responsible for a large share of these emissions and this share is set to grow. The problem is particularly exacerbated by the forecast for the growth of tourism, as only one-tenth of the world population currently travels overseas. The second issue is the strong growth in long haul tourism in recent decades. Given that the international agenda is one of reducing emissions, this poses a problem for the tourism industry. The reliance on air and car transport presents a significant problem in moving to a lower-carbon future.

One response has been 'slow travel'. Slow travel is an idea that has emerged in web communities, the media and academic circles where people are choosing to avoid air and car transport to travel to destinations more slowly overland, stay longer and generally travel less. It symbolises the "rediscovery of the pleasure of the journey as an important dimension of slow travel in an era of commoditised air travel". While reduced GHG emissions are an optimal outcome of slow travel this is not necessarily the main concern; many discussions focus on the quality of experience. However, given the imperative for the tourism sector to address climate change concerns it is the mitigation and adaptation potential that is the focus here. While not applicable to every tourism context, slow travel has considerable potential in Europe where most holiday travel is domestic or short-haul. Euromonitor International forecasts that slow travel will be a key growth area in the European market. This is particularly significant as a high proportion of global tourism trips take place in Europe.¹²

¹². Janet E. Dickinson, Derek Robbins, and Les Lumsdon, "Holiday travel discourses and climate change", *Journal of Transport Geography* 18 (2010): 482-489.

EXPERIENCE OF SLOW TRAVEL

Slow Travel doesn't have a unique identity or characterising activity, the movement is quite eclectic and its philosophy manifests ranging widely. In this sense, Slow Travel is rather an umbrella term, that encompasses different alternative types of tourism.¹³ Typical aspects of slow travel include the mode of transportation, gaining an authentic experience, trying local cuisine and travelling less distance. With such characteristics, slow travel can incorporate a variety of tourism types, including eno-gastronomical, agro/ecotourism, cultural, religious, experience-based, motivated by specific means of transport or physical experience (hiking, cycling) and others. Hence, the "slow tourist" is a unifying term for a very diverse group, with different motivations, different activities and different needs.

What in many cases unite those groups are the same values and aspirations and in some cases same characteristics, like a choice of zero-carbon or low-carbon modes of transport, such as walking, cycling, horse riding, or canoeing. Slow tourists often partake in a sort of modern-day pilgrimage, which sometimes follows the traces of ancient pilgrimage routes, chosen for their sustainability, slowness of pace and experience-richness, such as Camino de Santago and Via Francigena, to name the most known. Those pilgrimage ways (commonly called in Italian *cammini*), and other sorts of trails or cycling paths, represent a network of long-distant routes and can be considered a slow tourism infrastructure, which will be studied in detail in the next chapter.

BENEFITS OF SLOW TOURISM

Slow tourism can bring with its development wide-ranging benefits, from reducing carbon footprint of tourism to social and economical benefits for resident communities, creating a more ethical environment. It has the capability of giving a strong push for economies, increasing trade and interest in local products, such as agricultural and artisanal production. It is often seen as a regeneration motor for a wide range of places: from abandoned villages' in rural settings to urban environments. As such, the development of Slow Tourism could become a priority tool for protection, enhancement and regeneration of the cultural landscape and urban spaces.

Concerning the current climate change issues, slow travel could be the potential solution for keeping its environmental impact low, by primarily choosing low-carbon travel solutions and travelling less distant. It can act as a part of climate change mitigation and adaptation strategy.¹⁴ For the tourism to evolve towards a lower carbon future, considerable changes in the status quo are needed. First of all, there should be incentives to promote **low-carbon** solutions, making them available to a broader public, and developing the infrastructure for its use. Secondly, there needs to be a structural change to transform the dependence of the population on high GHG's emitting option, such as cars and air-transport. Those environmentally harming solution should be discouraged systematically, while encouraging more sustainable options.



Landscape along the Via francigena

¹³. Polyxeni Moira, et al, "The Application of Slow Movement to Tourism: Is Slow Tourism a New Paradigm? *Journal of Tourism and Leisure Studies*, 2, no 2 (2017), 1-10, <https://doi.org/10.18848/2470-9336/cgp/v02i02/1-10>

¹⁴. Janet E. Dickinson, et al, "Slow travel: Issues for tourism and climate change", *Journal of Sustainable Tourism* 19, no.3 (April 2011): 281-300, <https://doi.org/10.1080/09669582.2010.524704>

5. SLOW TOURISM INFRASTRUCTURE

Tourism infrastructure includes all the different amenities and services that contribute to making travel a pleasant, reliable and sustainable experience.¹⁵ While it can be acknowledged, that is not limited to infrastructure in a physical form, the latter is the one of very high importance and is considered a base for the development of tourism, as it enables the visitors to travel, and stay in a place and have leisure activities there. Among its components are some basic services, such as road network, transportation, accommodation, gastronomy, as well as cultural and leisure services. Tourism development has the potential to be advanced by all of these elements primarily by enhancing a destination's attractiveness and competitiveness, therefore, it can be stated that tourism infrastructure aims at providing preconditions for the destination's future development.¹⁶

A destination's tourism infrastructure encompasses all those elements that enable and support tourism

development. It generally includes all those facilities that tourists use between leaving and returning back to their homes, although in reality, the majority of tourism infrastructure is constantly utilised by local residents. Physical amenities for tourism can be divided into four main groups: road and mobility system that allows the movement of people, accommodation facilities that host travellers, services, and recreational facilities of a very wide spectrum (from attractions to activities). The latter make up an important part of a place's tourist product, as they are often one of the main determinants of destination choice for visitors, and play a significant role in overall economic and tourism development.

In Slow Tourism, the infrastructural development also influences a destination's overall development, emphasising sustainability and implementation of low carbon solutions. Some of the main constituents of the structure are:

**SOFT MOBILITY INFRASTRUCTURE +SERVICES
+ RECREATION FACILITIES
= SLOW TOURISM INFRASTRUCTURE**

¹⁵. Ante Mandić, et al, "Tourism Infrastructure, Recreational Facilities and Tourism Development", *Tourism and Hospitality Management* 24, no.1 (2018): 41-62

¹⁶. Idem.

SOFT MOBILITY NETWORK

In the case of Slow Tourism, the movement toward the destination becomes an integral part of the experience and not solely a means to reach a destination. The network of routes adapted for walking and cycling for long or short distances, also known as Soft Infrastructure, establishes an important part of tourism infrastructure, its backbone. The term "Soft Mobility Infrastructure" is defined as the physical support of "soft mobility" and can be seen as a foundation of sustainable mobility.¹⁷ As a concept, it is non-motorised mobility based on human physical activity, with the two most common means being walking and cycling, though other modes may comprise running, rowing and sometimes with the use of animals, like horseriding. Soft mobility, also sometimes known as active mobility, brings important benefits to human health and a significant reduction in fossil fuel dependence and air pollution.¹⁸ There are different denominations used for calling this type of infrastructure (some can be used interchangeably as synonyms), others are more specific to a type of activity. Some of the examples are:

Paths: Footpaths, Canal towpaths.
Routes: Pedestrian, Cultural, Pilgrim, Cycling routes.
Trails: Hiking, Walking, Mountain, Coastal, Cross-country, Horse trails.
Ways: Greenways.

¹⁷. Andrea Conti, Deni Ruggeri, and Luigi Bartolomei, "Soft Infrastructure as Landscape – a Methodology for the Assessment and Improvement of the User Experience of Soft Mobility", *Transportation Research Procedia* 14 (2016): 2314 – 2323.

¹⁸. Idem.

¹⁹. European Ramblers Association, "E-paths", accessed on March 15, 2022, <https://www.era-ewv-ferp.org/e-paths/>

In the European context, there are several organised networks, that form a foundation of the Soft Mobility Infrastructure over long distances. Two of the main existing long-distance networks are:

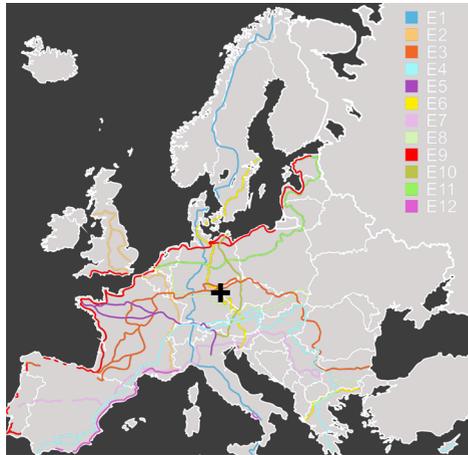
European Long-distance paths

European walking trails, known as E-paths, designated by the European Ramblers Association (ERA) are long-distance trails that link different national and regional walking trails into a transnational walking network. The paths interweave European Continent, from North Cape to Crete and from the Atlantic Ocean to the Black Sea. The purpose behind the network is aptly described by a statement of the association: "E-paths connect people and are the paths for peace, understanding and unity."¹⁹ Today the network consists of 12 long-distance trails, stretching for more than 70 000 km across the continent.

EuroVelo

European Cycle Route Network, EuroVelo, consists of 17 long-distance cycle itineraries crisscrossing the whole European continent and spanning over 90,000km. It is a project of the European Cyclists' Federation (ECF) started in 1995, with the ambition of creating a sustainable Trans-European Transport Network with high-quality routes, promoting cycling and making it safer. The routes are thought to be used both for cycling tourism and for daily use by local people.

6. ITALIAN CONTEXT



Cultural Routes of the Council of Europe

A European Cultural Route is a certification presented to networks promoting the common culture, history and memory of Europe. The programme was launched in 1987, constituting today out of 48 routes with the thematics can vary a lot, and not necessarily represented by physical paths. After the first Cultural Route of Europe assignment to Santiago de Compostela, gradually, the Council of Europe began certifying other routes with cultural, social, or historical significance as a way to bring cultures closer together. Being named a Cultural Route by the Council of Europe means the opportunity for larger visibility and funding for the development of the itinerary.

The E-paths network

Source: <https://usercontent.one/wp/www.era-ewv-ferp.org/wp-content/uploads/2022/05/Europe-Map-2022-E-Paths-v4-2-2048x2048.png>



EuroVelo cycling network

Source: https://en.wikivoyage.org/wiki/File:EuroVelo_Routes_2020.svg

Before the Covid-19 Pandemic, Italy was one of the most visited countries in the world: in 2018, it was in the fifth position after France, Spain, the United States and China.²⁰ The Pandemic greatly affected the tourism sector, completely stopping international travel, while many businesses were depending on tourism, and were left almost with no market. These difficulties further will be aggravated by climate change, which can disrupt different important economic sectors such as tourism.

In chapter 2 "Impact of Tourism," the repercussions were mentioned that tourism has on the climate: the whole industry is highly dependent on fossil fuels and has a high carbon footprint, emitting a considerable amount of GHGs in the atmosphere. But the influence is mutual, the changing climate also deeply influences the global tourism sector. In the case of Italy, the influence of the rising temperatures can severely affect the industry, resulting in economic losses for the country, since it represents one of the biggest economic sectors of the country constituting around 10% of the total GDP in 2019.²¹

The predicted increase in temperature over the coming decades will cause a progressive decrease in the snow thickness and snowfall duration. In winter, it magnifies the vulnerability of ski resorts, increasing the need for artificial snowmaking, consuming large amounts of water and energy, and as a consequence resulting in negative economic impact as well as worsening the environmental one. Summer tourism can also be affected by rising temperatures, aggravated by heat waves and wildfires, but also by altered ecosystems. For example, the growing temperature of the sea provokes increased growth of algae, which excess presence can repel the tourists. As for the adaptation strategy for those negative effects, it includes the diversification of the tourist offer of the country and enhancing alternative tourism proposals. Almost for a decade, the Ministry of Tourism started to pay attention to Slow Tourism considered to be a promising prospect as well as a greener version of conventional tourism practices.

²⁰. World Economic Forum, "Chart of the day: These countries normally have the highest international tourist numbers." (2020) <https://www.weforum.org/agenda/2020/06/most-visited-countries-world-tourism-organization/>

²¹. Statista, "Share of travel and tourism's total contribution to GDP in Italy from 2019 to 2021" (April 2022) <https://www.statista.com/statistics/628849/tourism-total-contribution-to-gdp-italy-share/>

SLOW TOURISM INFRASTRUCTURE IN ITALY

Italy is the country par excellence for slow tourism development potential. It's a country rich in human-natural landscape, picturesque agricultural lands, rich historical and cultural heritage, and diverse eno-agricultural production. Travellers, both foreign and local, can experience the many cultural highlights of Italy through slow tourism. Italy is rich in quantity of historical routes (or *cammini*) passing through its territory from north to south and from west to east, used for trade, circulation and religious reasons. Today the same roads allow to discover the heritage and enjoy the landscape of Belpaese, passing through small villages, churches, and castles. This type of tourism, not only allows the contemplation of landscape at a slower speed but can go hand in hand with the discovery of enogastronomical tradition of the single regions.

In the last decade, Italy is pointing to this market, developing a slow tourism sector, and promoting it with various governmental plans. Italian Ministry of Cultural Heritage and Tourism (MiBACT) declared 2016 the Year of the Routes in order to raise awareness of the historic, naturalistic, cultural, and religious paths that cross the country from north to south representing a little-known but fundamental part to slow tourism in Italy. The Ministry aimed to connect the existing *cammini* into an intermodal network for slow mobility - a network of greenways 15,400 km long that criss-cross the whole Peninsula and traverse 1,435 municipalities. It was followed by Strategic Tourism Plan 2017-2022, focusing on the environment and landscape integration, with agricultural,

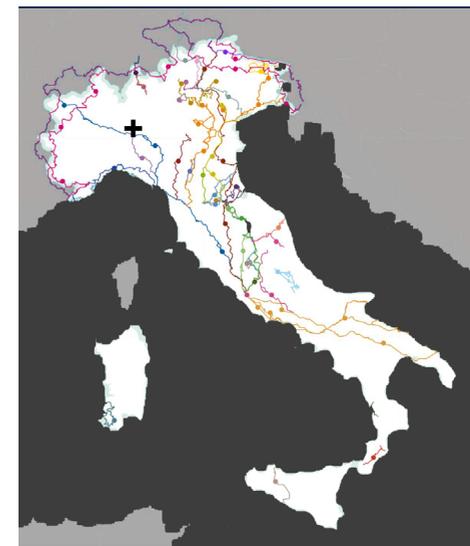
craft and tourist-cultural activities of the country system. In 2018, by creating a website named "Cammini d'Italia", that was containing more than 40 routes, the government was aiming at promoting the discovery of Italy on foot and slow tourism. It culminated in 2019 by declaring it the year of Slow tourism. All those actions allowed for the first time the creation of a new outline of the current situation of this type, identifying the opportunities available throughout the country to better understand the connections between the routes and practice the territories traversed.

Another project of MiBACT started in 2016 is the **National System of Touristic Cycle Routes**, or Sistema Nazionale Ciclovie Turistiche. The initial idea, inspired by the EuroVelo project, concerns building ten different cycle routes across the country. Expanding for more than 6000 km of quality routes, respectful of the environment and the landscape, made for bike-friendly and non-motorised travel. Five of the ten routes intersect with the routes of Cammini d'Italia - creating a Point of Intersection (POI). Those hubs play a role as gateways to slow tourism, among them great cities of art and hundreds of historic villages.

With the pandemic of Covid-19, the tourist industry was one that felt the most decline due to the extent the industry depends on the connectivity of the globalised world. Nevertheless, it allowed further growth of interest in slow tourism in the form of pilgrimage routes or other types of trails: according to the survey made by Terre de Mezzo, 13% had their first experience in one of the routes in the

With the pandemic of Covid-19, the tourist industry was one that felt the most decline due to the extent the industry depends on the connectivity of the globalised world. Nevertheless, it allowed further growth of interest in slow tourism in the form of pilgrimage routes or other types of trails: according to the survey made by Terre de Mezzo, 13% had their first experience in one of the routes in the summer months of 2020.²²

In the next chapters, some national soft mobility networks and routes are mentioned: Bicitalia, Ciclovía Vento and the Via Francigena, which is then studied in more detail, being the most well-known Italian Cultural Route that has the potential of becoming a national tourist product, similar to what happened with Camino de Santiago in Spain.



Long-distance routes of Italy on "Cammini d'Italia" website

Source: <https://camminiditalia.cultura.gov.it/cammini/page/2/>

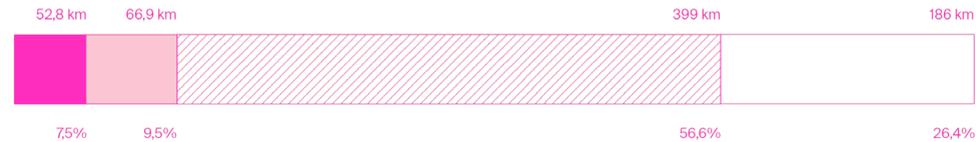
SLOW TOURISM IN ITALY: TIMELINE OF MIBACT ACTIONS



22. Terre di Mezzo, "Italia, paese de Cammini", published November 23, 2020, <https://www.terre.it/cammini-percorsi/i-dati-dei-cammini/italia-paese-di-cammini-ecco-tutti-i-numeri-del-2020/>

BICITALIA

BICITALIA is a national cycling network, promoting and creating safe cycling connections throughout Italy. The network considers only the routes from long to mid distance that allow inter-regional or international connections. The project takes its origins from the late 1990's thanks to FIAB - Italian Federation for Environment and Cycling, but for many years was left without much necessary governmental attention. In 2018, with the national law on bicycle mobility, which promotes use of bicycles and the creation of the national cycling network, Bicalitalia received the normative and financial support for its realisation.²³ With the motto "20 cycle routes for 20 regions" the project highlights its interest in creation of extensive network crossing every Italian region and making the territory interconnected in a sustainable manner.



- sections rideable safely
- adapted sections, if changing the road signs
- modest interventions needed
- big interventions needed

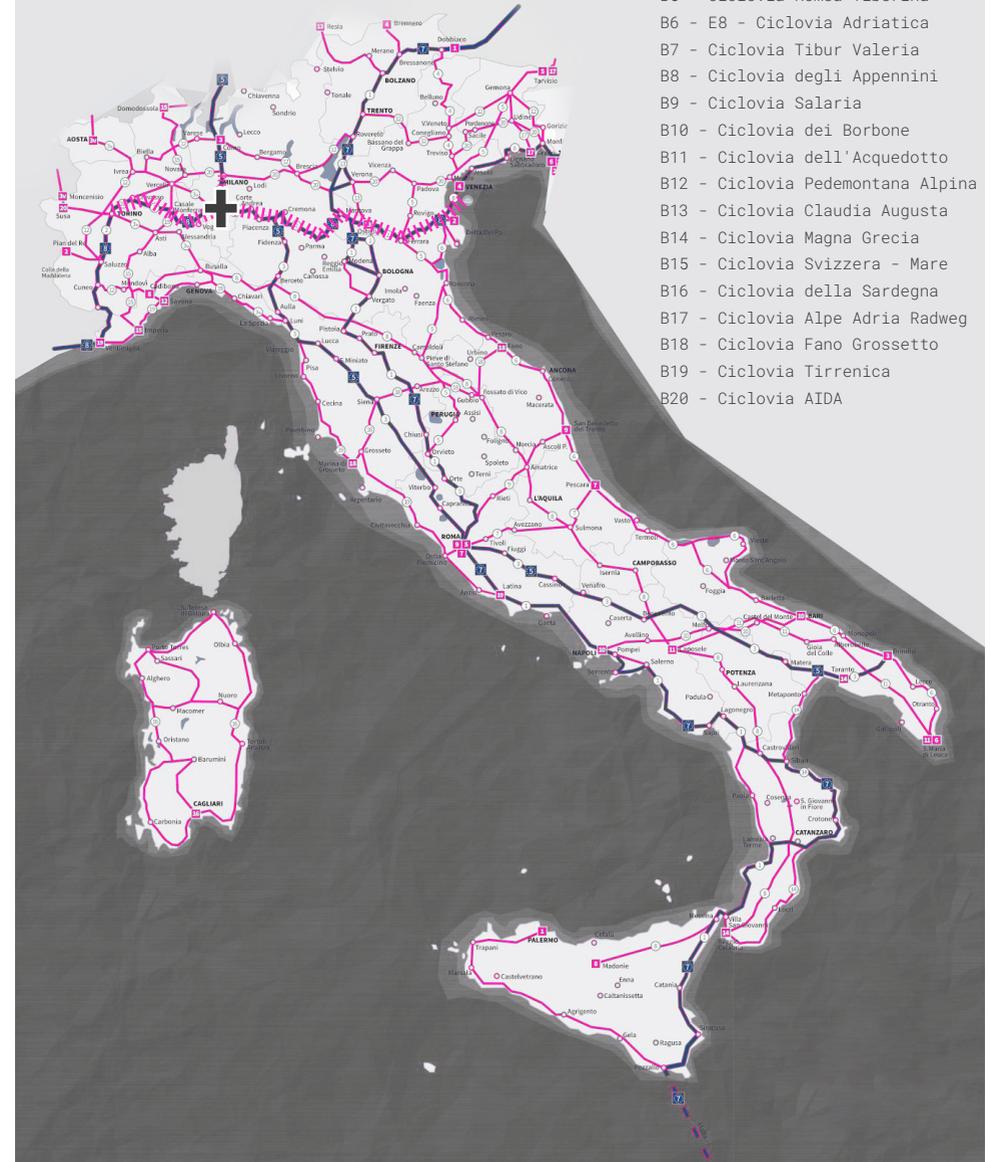
State of the art of the VENTO cycle route.

Source: <https://www.cicloviavento.it/progetto/stato-di-fatto/>

VENTO

Ciclovia VENTO - is a part of the National Cycling Route, and coincides with the course of Bicalitalia 2 - Ciclovia del Po. A project initially conceived by Politecnico di Milano with the aim of connecting the EXPO2015 area to the river Po and the agricultural territories of the valley. The project was not carried out for the World's exposition but remained (and still is) under execution. Cycling road, for a moment unique in its kind in Italy, will stretch for 680 km from Venice to Turin, along the river Po, creating a real cycling highway that would be safe for users of any level of preparation. The route will partly reuse the existing paths, or run along routes yet to be equipped. The trace will be fitting into the Eurovelo 8 route in connection with Eurovelo 5 and Eurovelo 7.

BICITALIA & VENTO



²³. Camera dei deputati ed il Senato della Repubblica, Legge 11 gennaio 2018, n.2, <https://www.gazzettaufficiale.it/eli/id/2018/1/31/18G0013/sq>

National Cycling Network - Bicalitalia

Source: <http://www.bicalitalia.org/it/bicalitalia/la-rete-ciclabile-nazionale-bicalitalia>

VIA FRANCIGENA AS CULTURAL TOURIST PRODUCT

Via Francigena is a medieval pilgrimage trail that stretches for more than 3000 km, from Canterbury in England to Rome, and is one of the most well-known historical routes in Italy. Certified as a “Cultural Route of the Council of Europe” in 1994, “Via Francigena” - means road coming from France, but in Pianura Padana the same road system often was called “Vie Romee”, as roads that were leading pilgrims to Rome. The route crosses England, France, Switzerland and Italy, where the route passes mainly rural environments and small and middle-scale cities on the way to Rome. Later it was expanded by the name of The Francigena nel Sud (Via Francigena in South) with the stretch that expands the way down to Apulia’s and then allows the connection further toward Jerusalem. The Southern part was certified in April 2016 as a Cultural Route of the Council of Europe, prolonging the Via for another 930 km till the most south point of Apulia - Santa Maria di Leuca.

During the Middle Ages, the pilgrimage to Rome was one of the majors, along with the one to the Holy Land and Santiago de Compostela. At the end of the 10th century the Archbishop of Canterbury, Sigeric, followed the Via Francigena, recording the 79 stages of his journey, to be consecrated by the Pope in Rome. Much later, in 1985, his

diary established the basis for retracing the route on basis of the Sigeric’s diary, serving as an interpretation or one of the variants of Via Francigena that was more like a road system, than a single road. In anticipation of the 2000 Jubilee Year, the MiBACT started promoting and developing a suitable pilgrim infrastructure in collaboration with local governments along the route.

The Via Francigena was defined as a ‘bridge of cultures’ by the french historian Jacques Le Goff. The route is considered an important vehicle for transmitting cultural heritage, especially between Anglo-Saxon and Latin Europe.²⁴ This “cultural corridor” had put different values and traditions in contact from one part of Europe to another creating the cultural unity that characterized the territory in the Middle Ages. With its development, the road started to acquire commercial importance, and be used more for the transfer of goods. In the case of Via Francigena the interest, at first limited to scholars, then extended to many who, after having walked the Pilgrim’s Way to Santiago, wished to reach Rome on foot and then Jerusalem (using the Apulian naval routes), gave rise to a network of ‘Amanti della Francigena’ (Francigena lovers) who began to mark paths and routes, recovering the original route, but sometimes choosing to deviate from the historic route in favour of paths and roads with less traffic.

24. Guya Bertelli, et all, *Sulle tracce della via Francigena: Punti di vista sullo spazio pubblico* (Santarcangelo di Romagna: Maggioli, 2014).

25. Patrizia Gazzola, et al, “Il Turismo Religioso: la Via Francigena, un’Opportunità per l’Italia”, *Economia Aziendale Online* 11, no.3 (2020), <http://dx.doi.org/10.13132/2038-5498/11.3.341-358>

The process of revitalisation of Via Francigena started at the end of the XX century, when there was growing interest in the Christian routes, leading to the renaissance of medieval pilgrimage routes, as in the case of the famous El Camino de Santiago that could revive a whole region of Spain, bringing a major flux of tourists, relaunching the economic system of the territory and becoming an important cultural tourist product.²⁵

Among the many regions along the route, Tuscany is considered an example of good practice for its ability to create a cross-region network. With the creation of the ‘Via Francigena’ Masterplan in 2009, with the declared purpose to give visibility to the ancient route and foster sustainable development in less exploited tourist areas, through the promotion of a multiplicity of activities (historical, cultural, religious, nature and sports tourism, and enhancement of food and wine products).²⁶ The development brought considerable results: the study performed by IRPET shows that the positive impact on tourist flows was achieved after the restructuring, enhancement and promotion interventions on the Via Francigena, conducted by the Region and concerned Municipalities. The benefit is particularly fruitful for small hill and mountain towns, especially the ones characterized by landscape value, where tourism represents an important option for development and contrasting marginalization. With the rise of experiential and slow tourism models, restoring historic pilgrimage routes can offer new opportunities to these regions.²⁷

26. Enrico Conti, et al, “Effetti del ripristino del tratto toscano della Via Francigena sulle presenze turistiche nei comuni attraversati e dintorni,” *Working Papers* (IRPET: May 2022).

27. Idem.

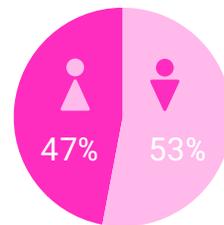


Via Francigena's trace from Canterbury to Rome

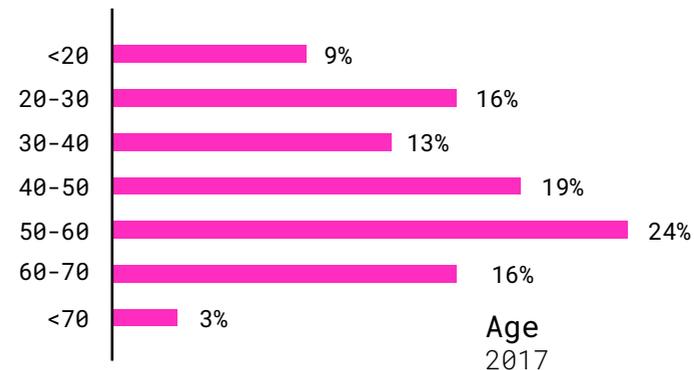
Nowadays, Via Francigena is chosen by different types of users, and the number of travellers taking the pilgrimage routes is constantly increasing: many travellers and hikers take the route for non-religious reasons, such as travel experience or sport; for many modern 'pilgrims' it serves as a retreat and cultural experience. But more than anything it allows sustainable travel and tourism, creating meanwhile a big support for local communities. The Via Francigena gives small villages and municipalities the opportunity to get known and appreciated on a European scale: it is an opportunity for the development of a sustainable economy and the enhancement of environmental policies based on the 'slow' tourism approach. In order for the Via to continue expanding, it needs a plan for the management of the territory and investment in the improvement of the route and services along the way for pilgrims.



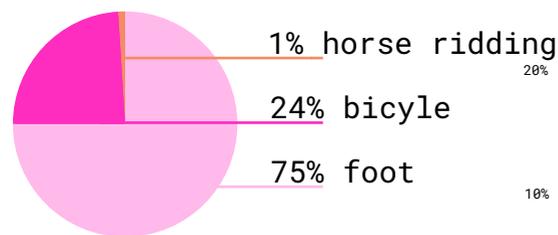
PROFILE OF THE PILGRIM



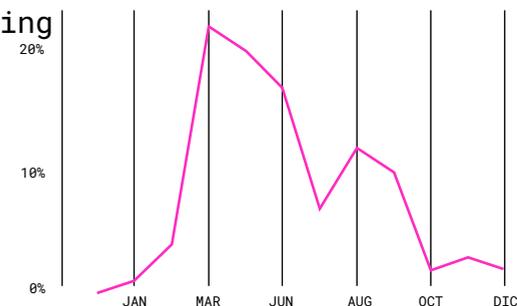
Gender 2017



Age 2017



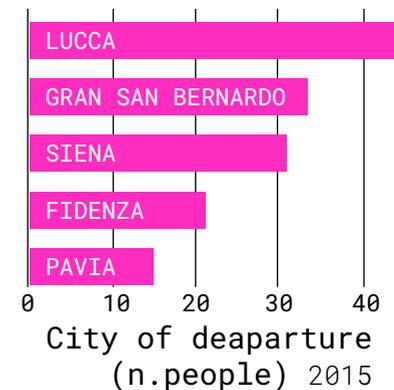
Mode of transport 2015



Distribution over the year 2017



MOTIVATIONS 2015



City of deaparture (n.people) 2015

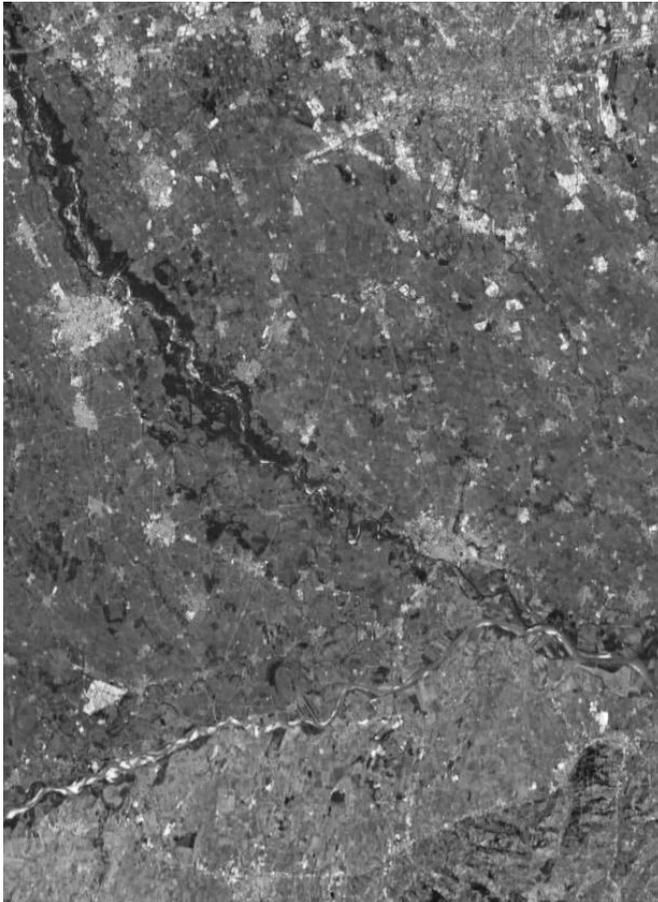
Part two: Crossroad of routes



Cycle path of Ticino and Ponte Coperto, Pavia

Source: <https://www.dueruotenevento.com/portale/modules/meta/tra/BICINDI/ITALIACEN/ITIFR3/1/10/via-francigena-pavia-lucca.html>

Pavia is a middle-sized North-Italian city, located in Lombardy, 33 km away from Milan. It is situated on the banks of the Ticino river, which was a favourable location for its development. In the Middle Ages, the city became a point of a stop for many pilgrims that usually were heading to Rome. To the present day, it is a point of intersection of numerous historical ways (*cammini*). With today's resurgence of those trails and routes for the network of slow travel, there is the potential of this type of sustainable tourism for restoring the communities and economies. While in many cases effect is evident the most in rural environments, slow tourism could promote the regeneration of urban context.



I. ANALYSIS OF THE TERRITORY

SLOW TOURISM IN LOMBARDY

LOCATION

PAVIA - CROSSROAD OF ROUTES

-SCAPE/-SCAPES

WATERSCAPE

URBANSCAPE

GREENSCAPE

AGROSCAPE

ROUTES

SYNTHESIS

1. SLOW TOURISM IN LOMBARDY

Lombardy is the most populated region of Italy, which occupies a central position on several national levels: geographically - it is a centre of Northern Italy; functionally - as a strong area of the national economic system; and infrastructurally - as the hub on which the Italian and European road systems are connected. At the same time, it is one of the most visited provinces by international visitors in Italy.¹ It is a region on the crossroads of the axes, connecting the Mediterranean to the rest of Europe. Lombardy is located in the middle Po River valley and from ancient times became a transit point for trade between the Mediterranean and the Trans-Alpine lands. Of the Italian regions, Lombardy is the most economically developed, and plays a leading role in the production, financial and communications sectors, as well as being a strong area in many sectors of society: services to citizens and businesses, transport, publishing, sport and fashion. Touristically, it is an important centre too, entering regularly the list of the most visited regions, with Milan being the third most visited city in Italy in 2019².

This important connecting role of the region is also reflected in the number of historical and religious routes that pass through Lombard territory, reinforced by the fact that it is one of the leading Italian regions in the development of the soft mobility network. At the top of the list of proposals for slow travellers are the numerous short, medium or long-distance routes that were experiencing

a boom in recent years. The potential of the region in this sector is considered to be high and can be a great resource for the development of the territory, as well as the enhancement of tangible and intangible cultural assets³. Slow tourism model allows wholly appreciate the diverse landscape of mountainous areas and the plains, plentiful beautiful lakes and borgos, diverse historical heritage and rich enogastronomical production. routes crossing Lombardy.

The development of slow tourism infrastructure and soft mobility networks can give the possibility of creating a new sustainable vocation of the tourism sector, which is already reflected in the current administration plans. In recent years, Lombardy poses increased attention to the development of slow tourism and its network. Already during the preparation for the Expo 2015, which was focusing on the topic of food and sustainability, there were promotional initiatives encouraging the development and requalification of the strategy for Lombardy's tourism. Along the main aims of the plan lays in systematising and enhancing existing paths in Lombardy, connecting them into a webbed network with the information widely available to the public through the website*. Today the website contains information on 16 routes crossing Lombardy.



The network of Cammini of Lombardy.

Source: <https://www.camminidilombardia.it/>

1. "Quali sono le province più visitate dai viaggiatori stranieri nel nostro paese?", *Il Sole 24 Ore*, March, 21, 2017
<https://www.infodata.ilsole24ore.com/2017/03/21/quali-le-province-piu-visitate-dai-viaggiatori-stranieri-nel-nostro-paese/>
 2. ISTAT, *Annuario Statistico Italiano 2020 (2020)*.
<https://www.istat.it/it/files//2020/12/C19.pdf>
 3. Associazione Wabi, Lombardia in cammino, and Regione Lombardia, "Indagine sui cammini di Lombardia" (2021),
<https://www.wa-bi.it/indagine-sui-cammini-della-lombardia-i-dati-scaricabili/>
 4. Daniele Grechi, et al, "EXPO 2015 and development of slow tourism: Are the tourism products clubs in the territory of Varese successful?", *18th Toulon - Verona International Conference Excellence in Services* (Palermo, 2015),
https://www.researchgate.net/publication/311510244_EXPO_2015_and_development_of_slow_tourism_Are_the_tourism_products_clubs_in_the_territory_of_Varese_successful
- * <https://www.camminidilombardia.it/>

SLOW TOURISM INFRASTRUCTURE IN LOMBARDY

PROJECTS:

Lombardia in Cammino (LinC)

16



Routes

Via Francigena, Via degli Abati,
Via Francisca del Lucomagno,
Via Postumia, Via Carolingia...

Regional Bicycle Mobility Plan (PRMC)

17



Routes

VENTO, Ciclopista del Sole, Navigli,
Ticino, Via del Sale - Via del Mare,
Greenway Pedemontana...

ROUTES in LOMBARDY:

E-Paths: E1, E7, E10

EuroVelo: EV5, EV8

Bicitalia: B1, B3, B7

B8, B12, B17

Another important development plan acts in a different direction of the regional importance - the cycling network. The purpose of the Regional Cycling Mobility Plan (PRMC) is to promote and encourage sustainable travel in daily and leisure settings. In the process of drawing up the Plan, the entire regional cycle system was identified with a view to integrating it with the municipal and provincial systems and encouraging intermodality. The plan was approved in April 2014. Based on an analysis of the geography and morphology of the territory, urban development, and the natural setting, particularly in relation to river and lake systems, regional parks, and major points of interest, the cycle system was developed. The Plan also provides a unified system for cyclists' signposting and specifies technical standards for local authorities to use in implementing the regional network of 17 cycle paths.

INTERSECTIONS

Looking at the map of the Soft mobility infrastructure of Lombardy, one can notice that the web creates points of intersection or nodes, that can become an important support of the soft tourism infrastructure. They can serve as an entry point or service and rest stops for the travellers on those networks. As already was noticed in the chapter on Slow Tourism, it can represent the possibility of encouraging the development of the local economies, becoming a motor for regeneration.

One point in particular, which has the major number of intersections in the Province, draws attention - is Pavia. It is the point of encounter of at least 4 cammini (out of the LinC list, but



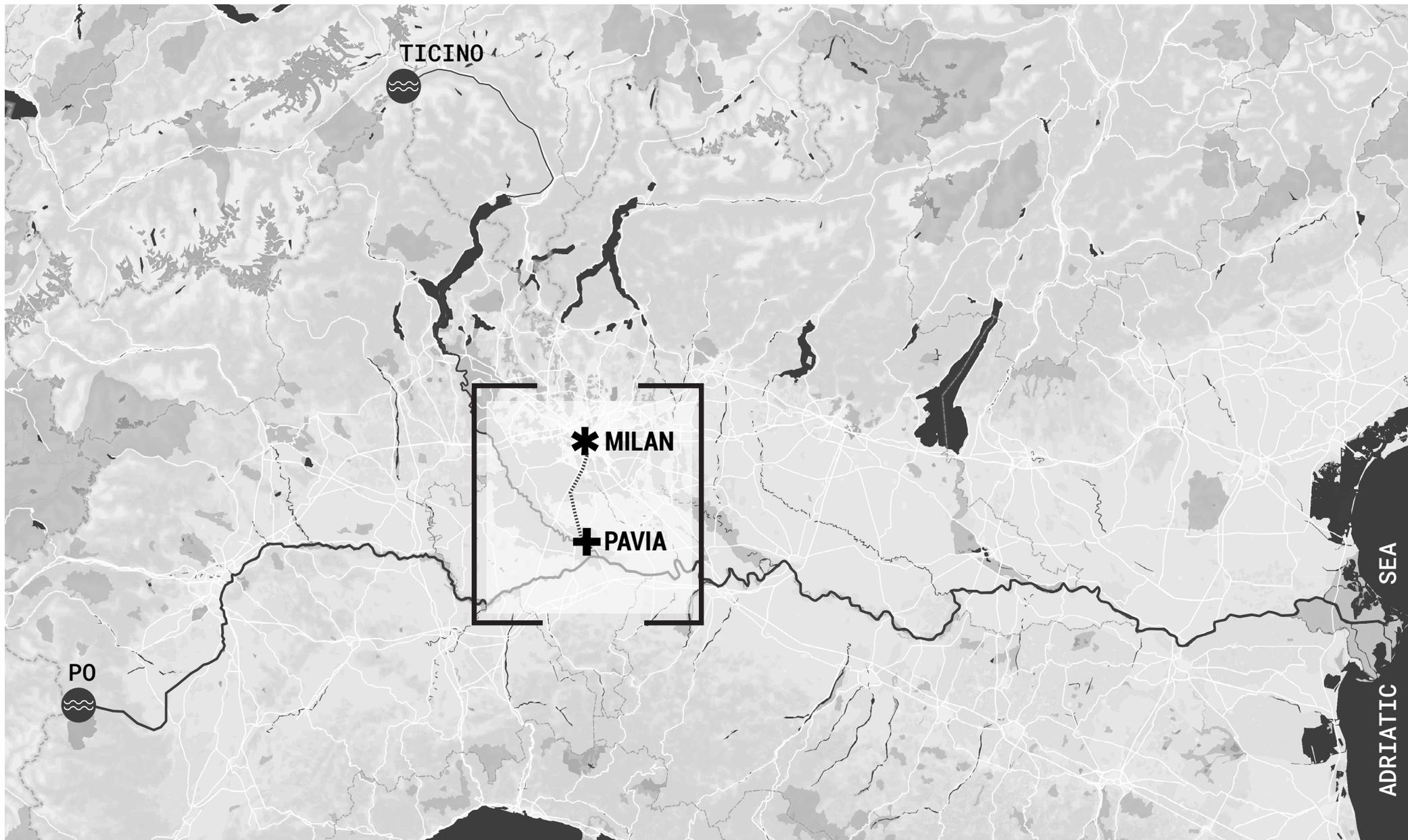
Lombardian Regional Bicycle Mobility Plan (PRMC)

Lombardy region, *Piano Regionale della Mobilità Ciclistica* (2014).

- Regional Cycle path
- Bicitalia path
- EuroVelo path

- | | |
|-----------------------------------|---------------------------------|
| 1. Ticino | 10. Via delle Risaie |
| 2. Pedemontana Alpina - B12 | 11. Valchiavenna - B17 |
| 3. Adda - B17 | 12. Oglio |
| 4. Brescia - Cremona | 13. Via del Sale - Via del Mare |
| 5. Via delle Pellegrini - B3 - E5 | 14. Greenway Pedemontana |
| 6. Villorresi | 15. Lambro |
| 7. Ciclopista del Sole - B1 - E7 | 16. Valle Olona |
| 8. Po - B2, E8 | 17. Tirrenica - B16 |
| 9. Navigli | |

there are more of them) and 4 cycle paths. The city from its earliest history gained significance due to its physical position near the confluence with the Po, representing a crucial junction of different roads for many centuries of its history. The same city that, in the 21st century, carries profound signs of the deindustrialisation process that started in the 1980s, affecting the economy and image of the city.



2. LOCATION Pavia, and its province of the same name, are located in the Lombardy region of northern Italy. Geographically it is known as Pianura Padana or a valley of the Po river, forming an agriculturally rich area.

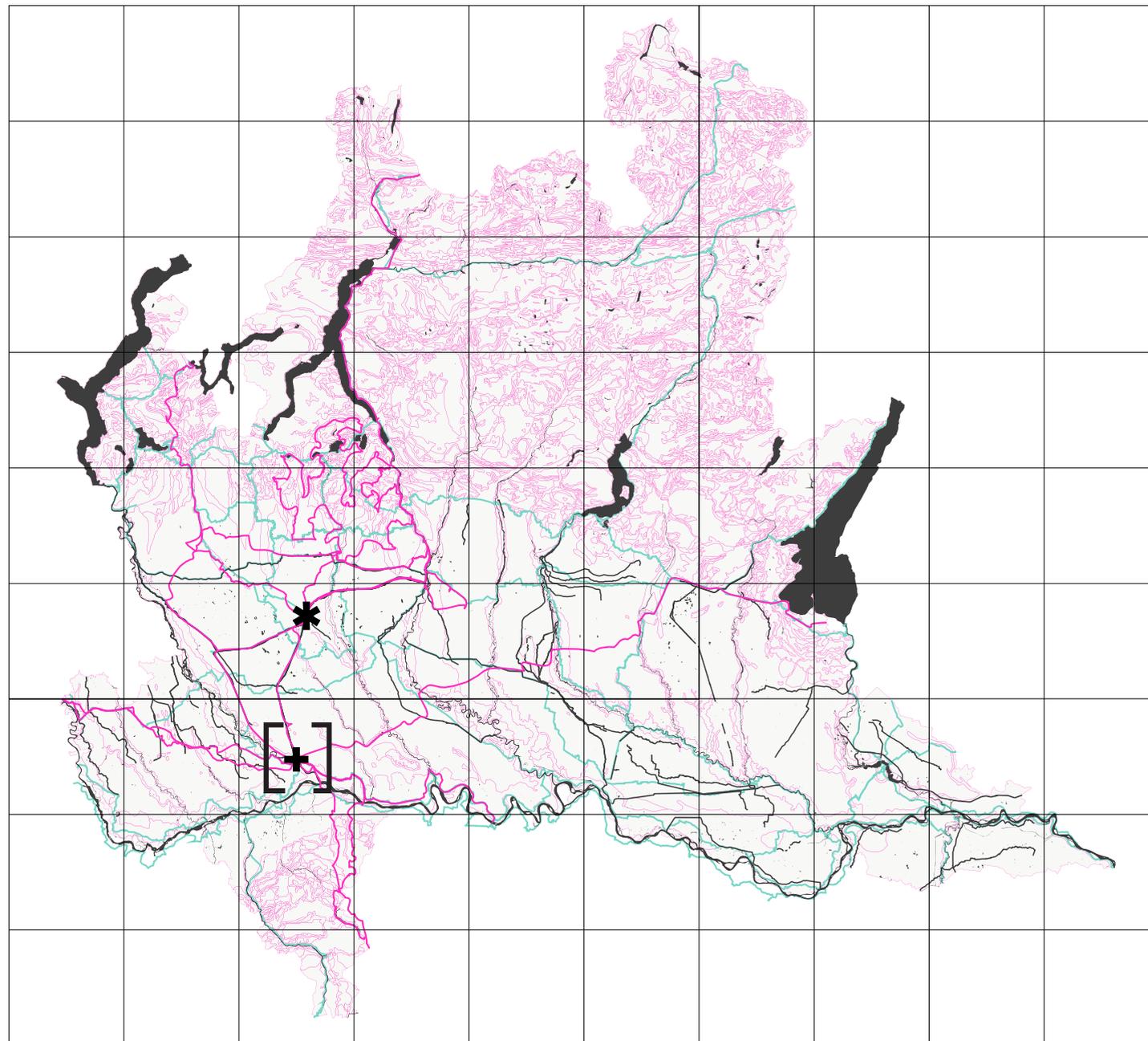
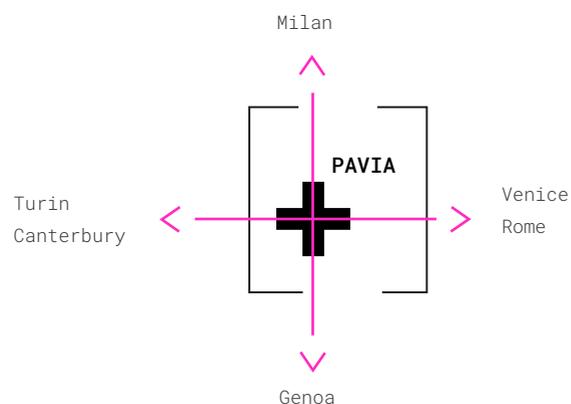
The city is located on the banks of the Ticino few kilometers away from its confluence with Po. The navigable connection was possible from Lake Maggiore, shared with Switzerland to the Adriatic Sea.



3. PAVIA - CROSSROAD OF ROUTES

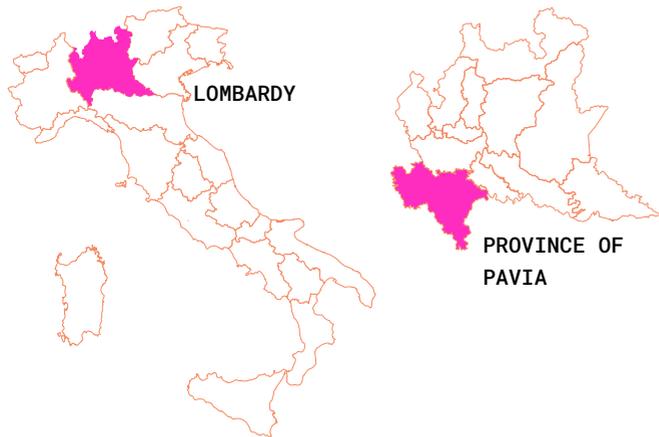
Looking at the map of the Soft mobility infrastructure of Lombardy, one can notice that the web creates points of intersection or nodes, that can become an important support of the soft tourism infrastructure. They can serve as an entry point or service and rest stops for the travellers on those networks. As already was noticed in the chapter on Slow Tourism, it can represent the possibility of encouraging the development of the local economies, becoming a motor for regeneration.

One point in particular, which has the major number of intersections in the Region, draws attention - is Pavia. It is the point of encounter of at least 4 cammini (out of the LinC list, but there are more of them) and 4 cycle paths. The city from its earliest history gained significance due to its physical position near the confluence with the Po, representing a crucial junction of different roads for many centuries of its history. The same city that, in the 21st century, carries profound signs of the deindustrialisation process that started in the 1970s, affecting the economy and image of the city



LOMBARDY REGION





LOMBARDY

PROVINCE OF
PAVIA

ROUTES CROSSING PAVIA

PILGRIMAGE ROUTES:

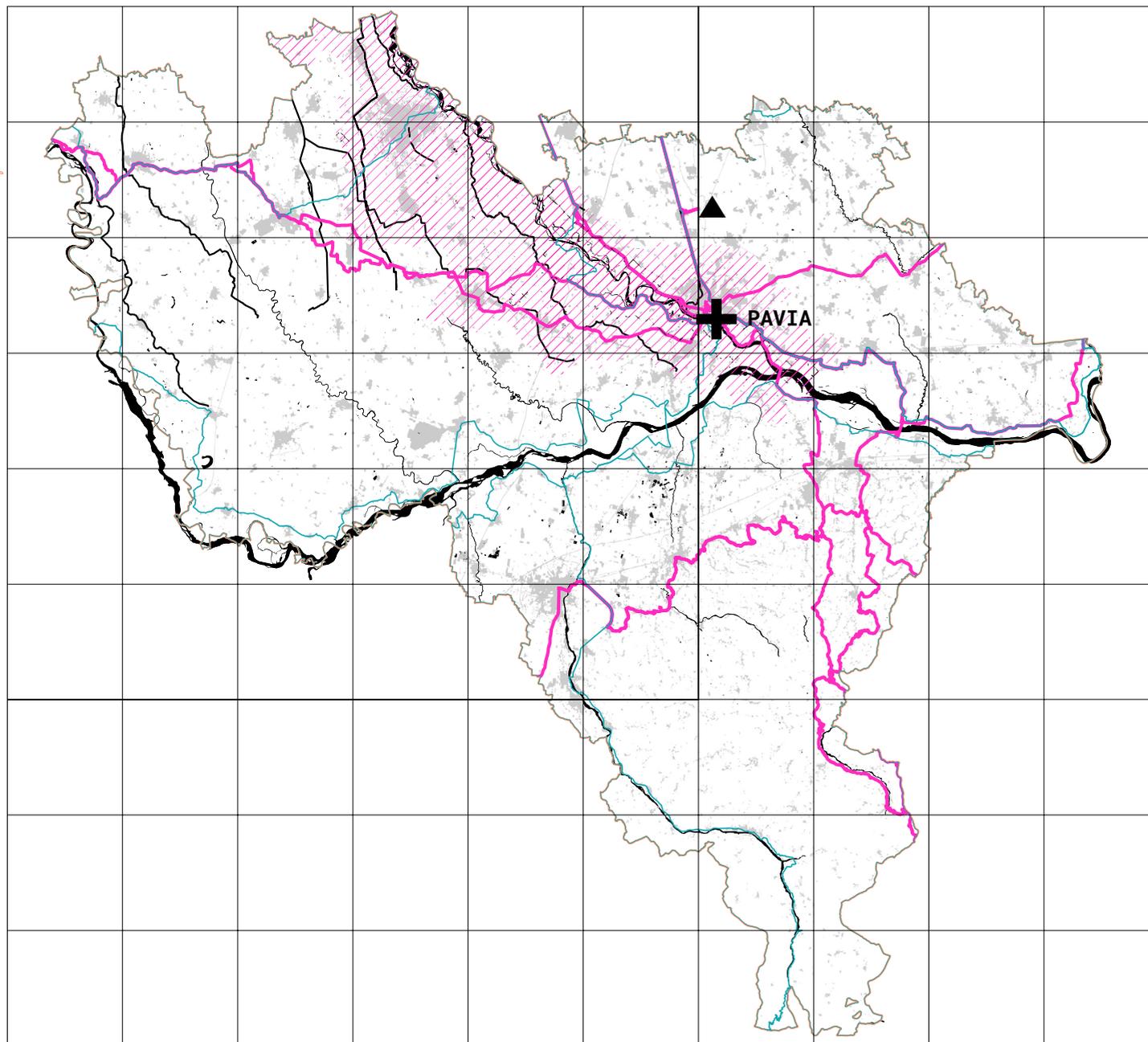
- Via Francigena
- Via degli Abati
- Cammino di Sant'Agostino
- Via Francisca del Lucomagno
- Via di San Martino di Tours
- Via San Colombano
- Via Postumia

CYCLE ROUTES:

- VENTO
- EV 5
- EV 8

OTHER ROUTES:

- E1
- Via Transromanica



cammini, routes

water system

Pavia

regional cycling routes

Ticino park

Certosa di Pavia

PROVINCE OF PAVIA

0 5 10 20km



4. -SCAPE/-SCAPES

MANY DIFFERENT -SCAPES:

LANDSCAPE

WATERSCAPE

GREENSCAPE

WALKSCAPE

FLOWSCAPE

URBANSCAPE

Suffix:	-scape
Meaning:	1. form, formation, shape 2. scene, picture, view 3. A specific type of space
Etymology	abstracted from land-scape. ⁵

In the common language, the landscape is usually defined as a piece of land with visible features of a territory and the way it integrates with natural or man-made elements. Since the end of the last century, in the social sciences, art and architecture, the interest in landscape was growing, accompanied by the development of different approaches to understanding it, and its interpretations. That led to various interpretations in different fields, with no common agreement on the topic.

In the case of the architectural field, the landscape is usually perceived as a system, whose parts are interrelated and exhibit inherent properties, integrating

different elements ranging from natural to man-made.⁶ Lately, in the field, often when there is a dominating element or feature, the world landscape is transformed by using the suffix -scape, and a name of the prominent component, e.g. urbanscape (an urban landscape), waterscape (an aquatic landscape) etc... From this point of view, the landscape can be considered as a different type of -scapes creating a mosaic of the territory.

In the next section, for the sake of analysing the territory of Pavia and Naviglio, there will be an analysis of different -scapes constituting the territory.

⁵. Wiktionary, s.v. "-scape", <https://en.wiktionary.org/wiki/-scape#English>
⁶. John L. Motloch, *Introduction to Landscape Design* (2000).

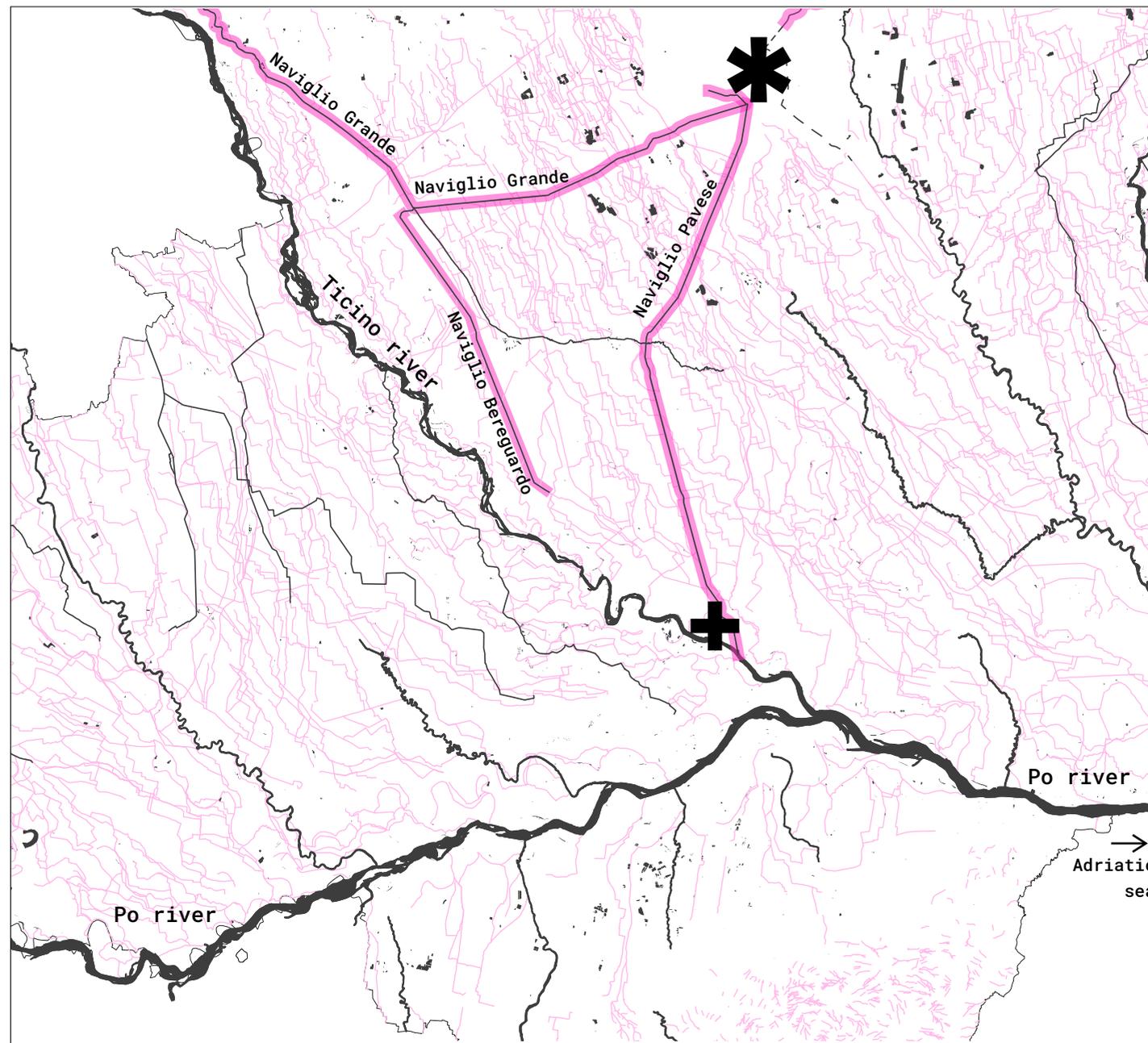
As the two largest Italian rivers by flow rate cross the territory, the Po and the Ticino, flowing into each other 7 km away from Pavia, one could argue that the province of Pavia is either divided or united by these rivers. What is certain is that looking at the hydrological situation of the territory, it is possible to make two main statements. Firstly, the territory is rich in natural water resources, being irrigated by two rivers. These waters are essential for anthropic activities, such as irrigation and hydroelectricity generation, but they are also vital for the biological communities in the valley and it is closely connected to the quality and quantity of its waters as well as the ecosystems upon which they depend.

Secondly, its waterscape is defined significantly by human activity transforming the valley during the ages. There are the canals of Navigli: Naviglio Grande, which starts from Ticino and after reaching Milan, it meets with Naviglio Pavese, bringing water back to the same river, while Naviglio Bereguardo connects only with Naviglio Grande at its corner, and goes towards the river but stops few kilometres before meeting it. But there are also smaller canals for irrigation of rice fields, and during spring with their flooding, the plain turns into a large waterscape in every direction.



Confluence of Po and Ticino

Source: <https://www.luoghidellininfinito.it/Pagine/acque-marzo-2013.aspx>



WATERSCAPE

- main rivers
- secondary streams
- Naviglio canals



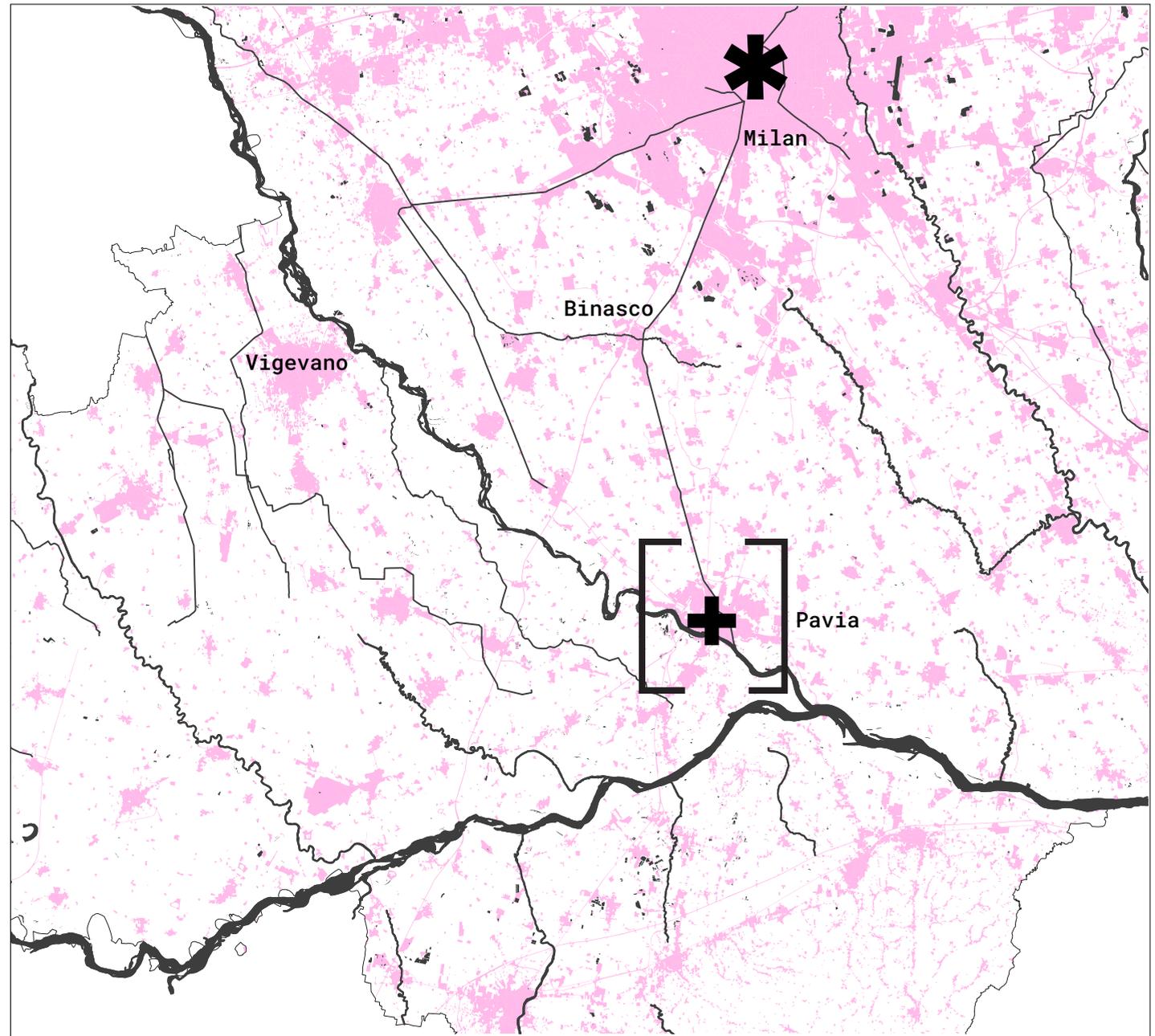
Looking at the traces of urban land, it becomes obvious the difference between the north and south of the territory. The north of the territory is largely defined by the urban landscape of Milan Metropolitan city, the second biggest, with a population of almost 3,3 million people (Istat 2021), and one of the most densely populated municipalities in Italy.

South of the metropolis towards the Pavia, the landscape becomes predominated by agricultural lands with a uniform distribution of small or medium-scale towns, the biggest one being Pavia with a population of around 71 000 people (Istat 2020), followed by Vigevano with around 62 000 people.



View of Pavia: Duomo dome and Ponte Coperto

<https://lorenzomainieri85.wixsite.com/ilmiosito/post/linea-verde-nel-pavese>



URBANSCAPE

urban land



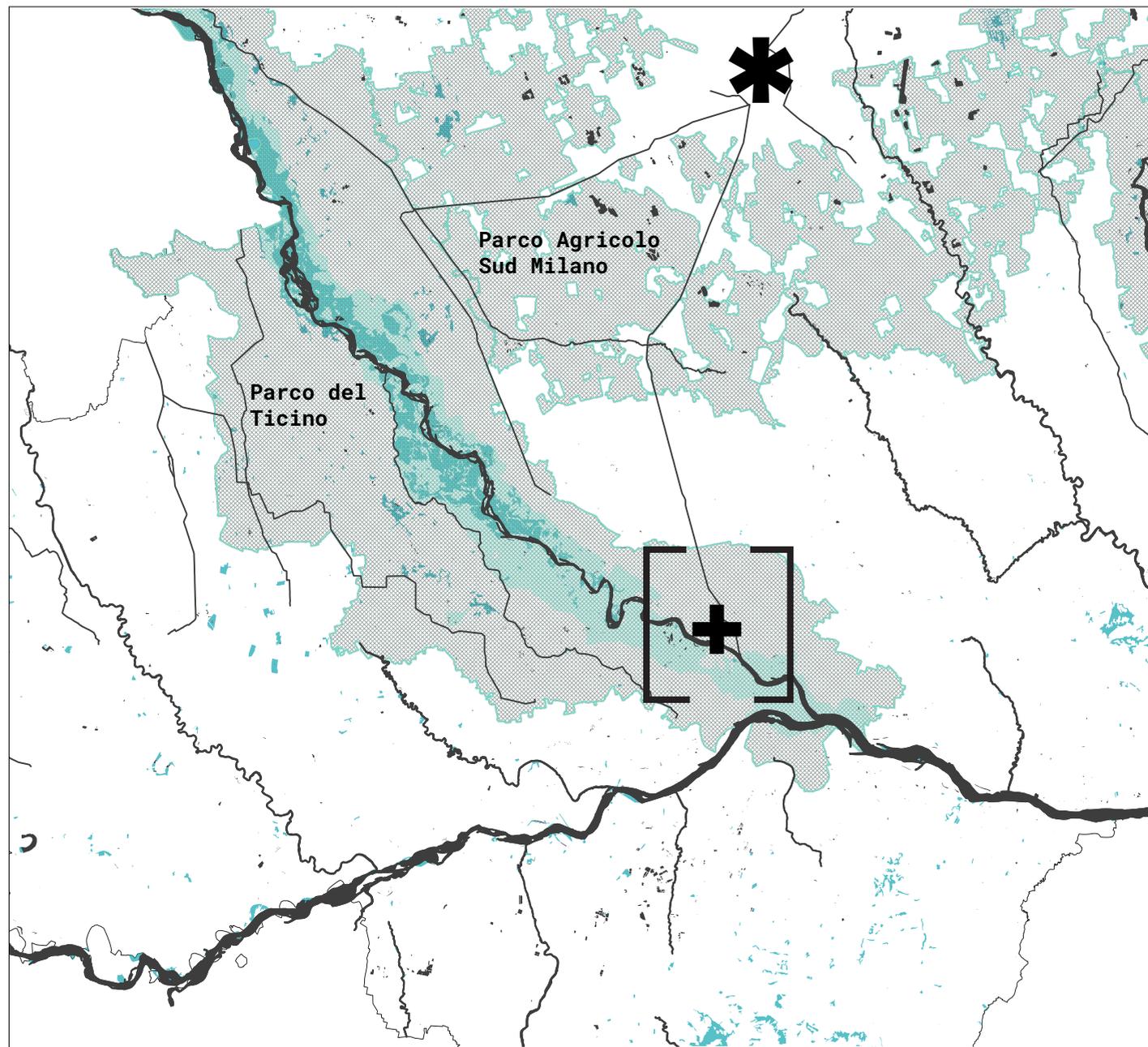
The Ticino river, in addition to its role as one of the main waterways of the Po Valley, is an important ecological corridor between the Alps and the Apennines, serving as an important connection between continental Europe and the Mediterranean basin.⁷ With aim of preserving its role as an ecological corridor, the Lombardy Park of the Ticino Valley was created in 1974 - the oldest regional park in Italy. It shares the same function with the regional park from the Piedmontese side named “Valle del Ticino”, of preserving the flora and fauna of the river and its vicinity. Going through Lombardy and covering an area of around 91.800 hectares,⁸ the park of Ticino entirely follows the Lombard course of the river, starting in Lake Maggiore and finishing in the Po, passing through cities of Varese and Pavia. The park hosts extraordinary biodiversity and has very diverse landscapes: woods, moors and wetlands, etc.

Another natural park presented in the territory is Parco Agricolo Sud Milano (Rural Park South of Milan), which was established as a green belt running south of the metropolis, representing the natural east-west ecological corridor between the Ticino and Adda catchment basins.⁹ The park's scenery represents a mix of rural and natural landscape systems, consisting of an extensive water network of Navigli, with the lands holding mainly agricultural vocation. Its fragmented organization highlights its peri-urbanity, serving as a filter between urban and rural or natural.

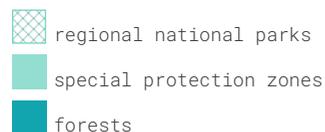
7. Bando Fondazione Cariplo 2013, *Il Fiume Ticino: Riqualificazione e Valorizzazione del Corridoio Ecologico*, report (2017).

8. Parco Ticino, “Il parco in cifre”, <https://ente.parcoticino.it/il-parco/il-parco-in-cifre/>

9. “Parco Agricolo Sud Milano”, https://parcosud.cittametropolitana.mi.it/parco_agricolo_sud_milano/index1.html



GREENSCAPE

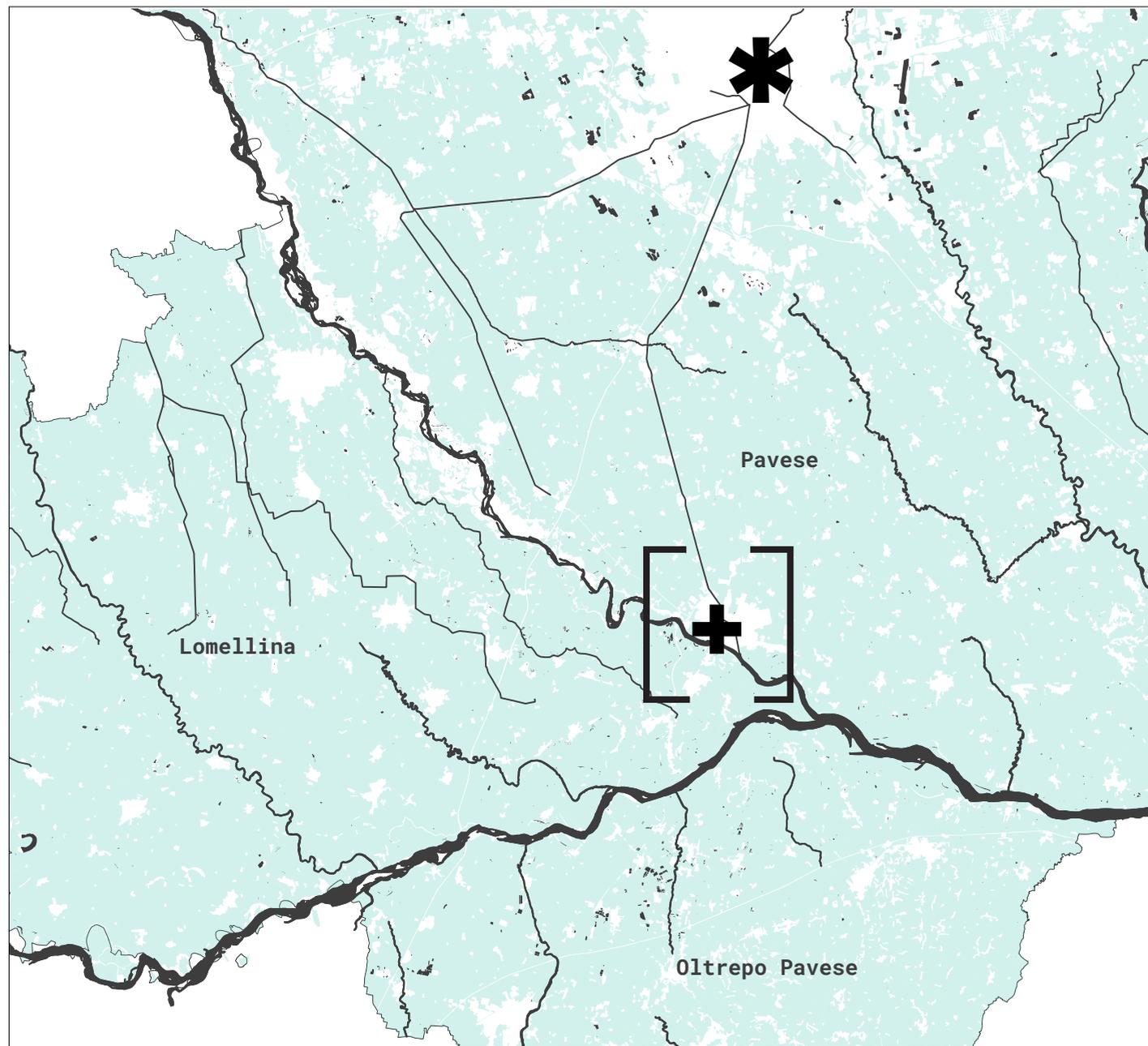


The region's highly productive agricultural landscape is centred on the irrigated plains of the Po River valley, also known as Pianura Padana (Padana plain), that have been used for agricultural purposes since Roman times. Thanks to its widely arable lands, and the almost completely flat topography, the territory neighbouring Pavia (Pavese and Lomellina) is highly suitable for agriculture and especially for rice cultivation, which is a very water-demanding crop. And indeed, the region of Pavia, with its 85 000 hectares of rice fields, is the province with the highest percentage of rice cultivation in Italy and the leading producer at the national and European levels. The rice field landscape changes a lot during the year with the seasons, especially in spring, when the fields are levelled and flooded with water, while later in the summer, they become green grasslands. In autumn yellow replaces green and announces the harvest, while winter is often accompanied by a foggy veil over the fields. Other than rice, the region produces cereal crops, like corn and wheat.

This territory can be characterised by a flat landscape, crossed by an elaborate network of canals, dotted with large brick farmhouses and noble castles. The situation changes towards the hilly territorial region called Oltrepo Pavese, located south of the Po, where the main activity is viticulture, producing principally pinot noir grape. This part of the region is highly appreciated for its scenery: a hilly landscape, marked by terraced vineyards interrupted by villages, *borgos* and castles.



Rice fields in the spring, during its flooding
<https://www.ricetteracconti.com/2017/05/28/riser-va-san-massimo-carnaroli-autentico/>



AGROSCAPE

agricultural zones



On this map are located the routes, representing the soft mobility network, and the railway infrastructure of the territory. It can be noticed how in some cases the routes follow some natural or man-made features of the territory, in this case, its rivers and canals. Particularly prominent is the system of Navigli, representing the significant backbone of the network, along which course there were established routes and paths for walking and cycling. Moreover, there are nodes created by this network and Pavia is one of those, located as the meeting point of Via Francigena, Naviglio Pavese, the routes along Ticino, and others.

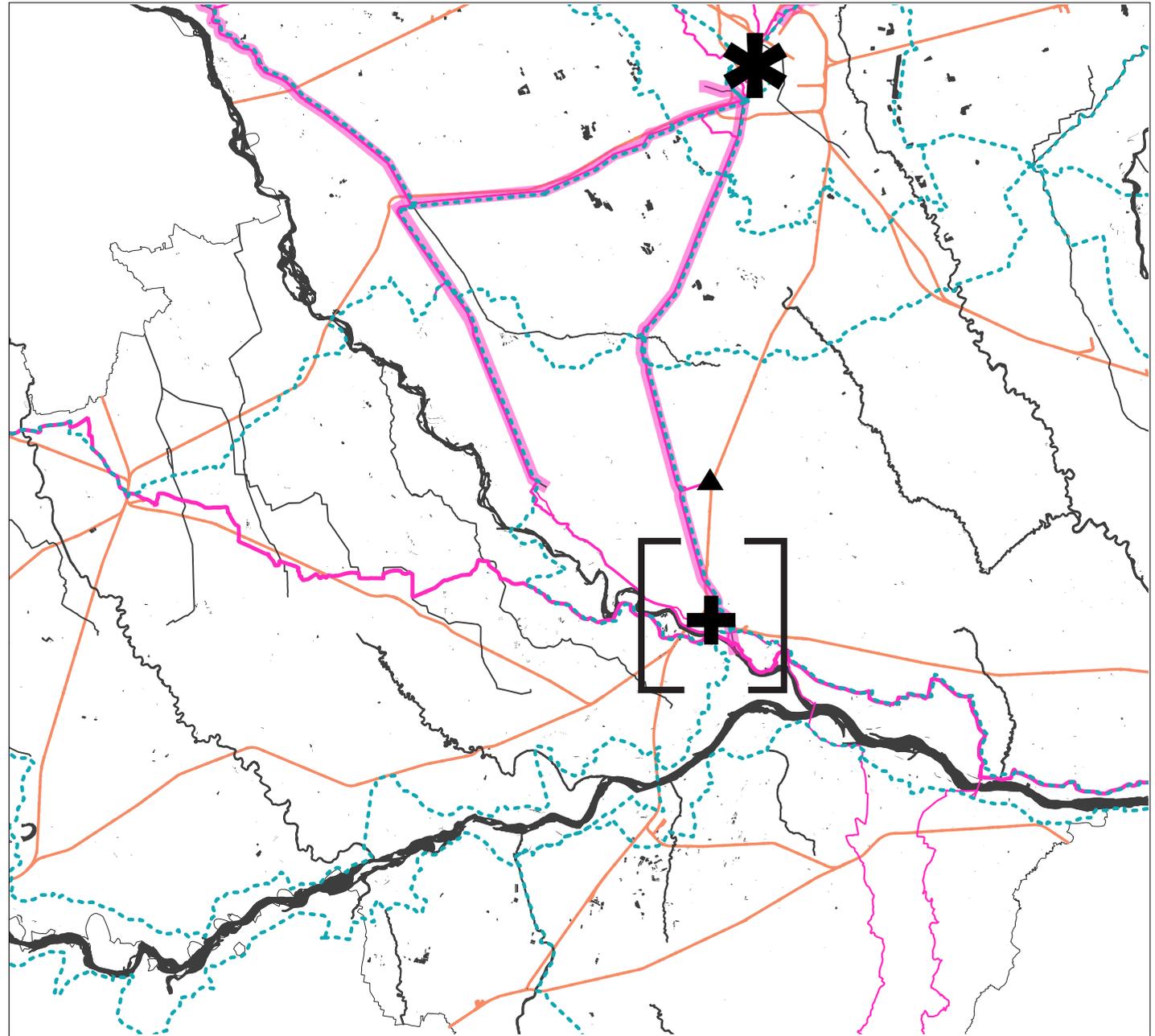
Tourism-wise, the main attractions of the region are the hills and the Oltrepo wine, the rice fields of Lomellina, the castles, the two cities of Pavia and Vigevano, and the Ticino Park. But more common are the cycle and pedestrian paths act as an attraction or reason for interest.¹⁰ The big majority of tourism is domestic, with short-range visitors from neighbouring provinces or regions, international arrivals are mainly from neighbouring European countries like France, Switzerland and Germany.

¹⁰. Iniziativa Ticino, *Piano di Riqualificazione del corridoio ecologico del fiume Ticino 2021-2031: The Ticino Landscape Restoration Plan* (February, 2021)



Cyclists in the Pavian countryside

<https://www.bikeitalia.it/2020/09/11/vento-bici-tour-edizione-2020-in-sella-per-la-ciclovia/>



ROUTES

- regional cycle path
- railway
- cammini

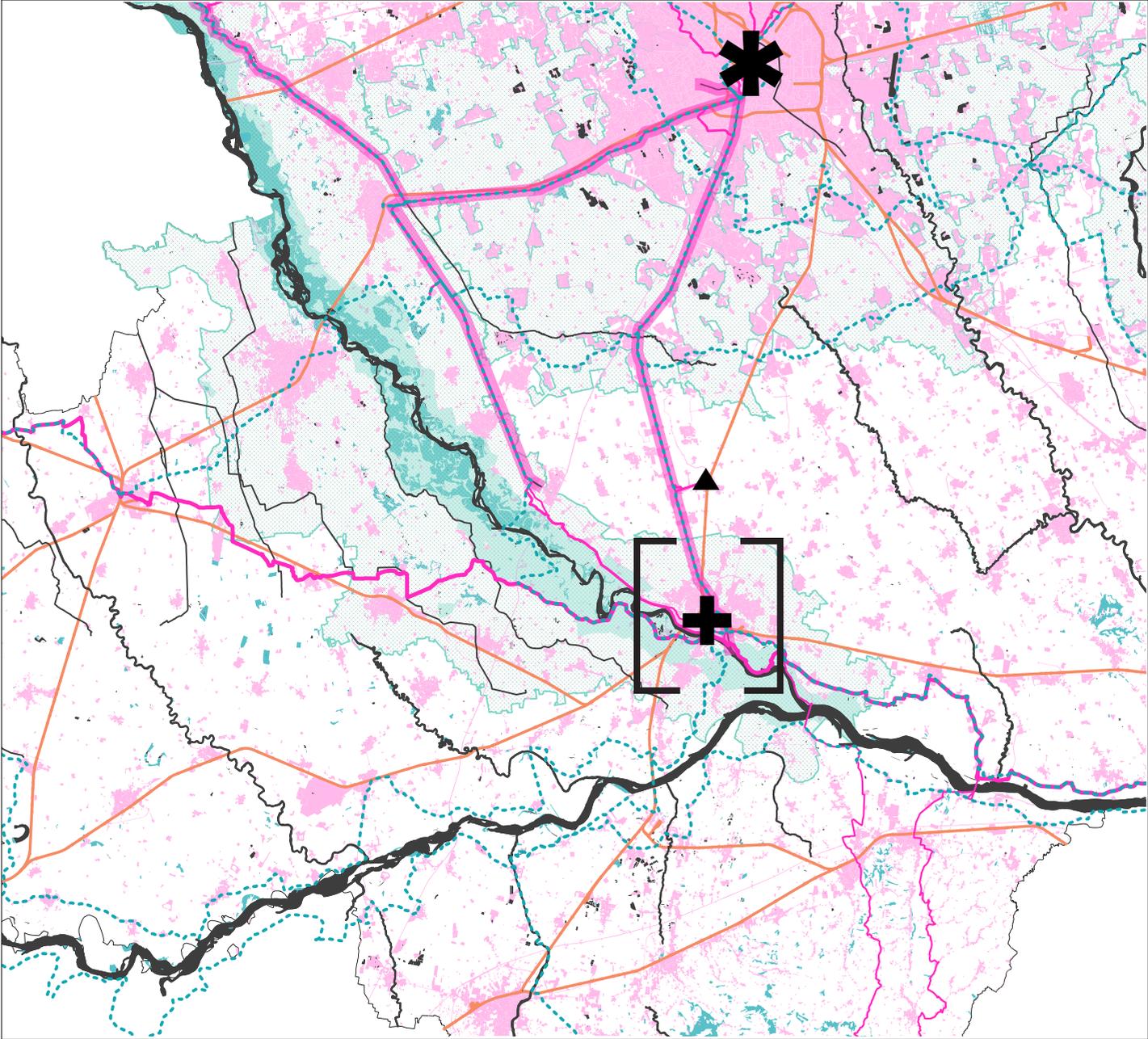


The territory makes up part of one of the richest and most productive regions of Italy: Lombardy, which can be defined by large urban areas, developed industries and intensive agriculture. Despite development, there are still significant ecosystems and biodiversity in the Ticino Landscape, as well as ecological processes and connectivity. In general, the area surrounding Pavia can be characterised, as a synthesis, of the following -scapes:

- the Ticino (and the Po) river landscape: natural park, rich flora and fauna
- the landscape of the Naviglio system, in particular, the one of Naviglio Pavese
- rural and agricultural landscape: rice cultivation fields, rich arable lands

Legend :

-  main rivers
-  Naviglio canals
-  regional cycle path
-  railway
-  cammini
-  urban lands
-  regional national parks
-  special protection zones
-  forests



SYNTHESIS





II. ANALYSIS OF PAVIA

HISTORICAL CROSSROAD

PRESENT DAY SITUATION

OPPORTUNITIES FOR THE CITY

ANALYSIS OF VECTORS OF PAVIA

AREA OF TRANSFORMATION

HISTORICAL CROSSROAD

Pavia's geographical location since ancient times determined its economic fortune and strategic and political importance. The strategic position of the city, at the confluence of Ticino and Po has characterized the function of Pavia over the centuries as fundamental political and commercial link on regional, national and international levels. As early as Roman times, Ticinum became a key water and road junction, and serving later as a major crossroads for trade during late antiquity.¹¹ The strategic location of Pavia and the Ostrogoth palaces located there made it the first capital of the Lombard Kingdom of Pavia, and it would become the main residence of the Lombard rulers during the 7th century.

ROMAN AGE - TICINUM

Pavia was founded by Romans, as a military *castrum*, located a few kilometres north of the confluence of the Ticino in the Po, both navigable rivers. Its Roman name - *Ticinum* was hence derived from the name of the river it was standing on. The remarkably favourable conditions of

the terrain, both in its conformation and typology, made this geographic position opportune for defence reasons and accessibility from the sea. This last aspect helped the city to establish itself as a node between the Ticino river and the surrounding territory, becoming a port and a **place of encounter of different vectors**. The same advantageous geographical location drove Pavia to gradually gain importance: Ticinum became one of the most forward Roman military outposts in the Po Valley and became a *municipium*. But not only because of the waterway connection: with the intensive development of the roads by Romans, the city was an important intersection between two of these systems. It was located on the extension of the *Via Aemilia*, which was going from Rimini to the Po River, which it crossed at Piacenza and there forked, one branch going to Milan and another to Ticinum. Then from there, it was going further to Lomello where it divided once more, one branch going to Vercelli - and thence to Ivrea and Aosta - and the other to Valenza - and thence to Turin.

There were two main vectors in which the role of Pavia as a crossroad was evident across the history: by land and by water.

ROADS .

Romans starting from 300 BC developed a vast system of road infrastructure, known as *viae Romanae*, that was vital for the progress and maintenance of the Empire. Built primarily to move armies and impose laws and taxes, they also helped to expand the trade and improve communication. Ticinum enjoyed excellent connections with the great western provinces of the Empire via the so-called *Via delle Gallie*, a road that passed through Pavia, Lomellina, Piedmont, and crossed the Alps. While the eastern connection was allowed by the extension of the *Via Aemilia*, running through Pianura Padana, from Rimini to Placentia, where it divided, one branch going to *Mediolanum* (Milan) and the other to Ticinum. Later both cities were connected by the road *Mediolanum-Ticinum*. The road was serving as an important axe for the urbanisation of the neighbouring areas.¹² The road was strengthening the economic and logistical role of Ticinum, serving mainly the needs of Mediolanum, which was a capital in the fourth century AC. Not a secondary sign of this gradual prestige acquired by Ticinum was the presence in the urban territory, from the age of Aureliano, of an imperial mint, which remained active until 326 AD.¹³

WATERWAYS .

Situated on the **Ticino River** and near its confluence with the Po, its position gave it a role of a fundamental junction towards the north of Italy, determined by the transits along two rivers and allowing navigable connection between **Lake Maggiore** and the **Adriatic Sea**. The position was of strategic importance for the control and exploitation of the Ticino river route.

During the Roman times, the Po River with its large hydrographic network was a fundamental artery, and a dense system of transactions developed through trading stations and river ports that guaranteed the supply of essential commodities in the hinterland, such as salt. Ticinum was one of those river ports, located on the riverbank of Ticinus, and was among the main ports of the Po basin, along with Piacenza (Placentia), Milan (Mediolanum) and Turin (Augusta Taurinorum).

¹¹.Filippo Brandolini, "Pavia: Vestigia di una Civitas Altomedievale", Master thesis, Università degli Studi Milano, (2010-2011).

¹². Mariavittoria Antico Gallina, La via Mediolanum-Ticinum nel quadro insediativo dell'agro mediolanense sud-occidentale, Civico museo archeologico di Milano, 2002.)

¹³. Filippo Brandolini, "Pavia: Vestigia di una Civitas Altomedievale", (2010-2011).

MIDDLE AGES - PAVIA.

In the Middle Ages, Ticinum had a substantial growth of its political and military importance, which started to be noticeable already since the late Roman times. Just like before, thanks to its position Ticinum was seen also in the middle ages as one of the main strategic points in Pianura Padana. With the arrival of Ostrogoths in the 5th century, Pavia was elected as one of the royal seats alongside Ravenna and Verona. Under the Lombard rule, the city was the **capital** of their kingdom too and acquired the new name of **Papia**. Altogether, Pavia remained the capital for more than 5 centuries, till 1024.

Together with becoming a political heart of that period, Pavia started growing **religious importance**. The city experienced profound changes in urban topography, mainly by the creation of new churches and monasteries, some of them containing Christian Relics, which started to attract **Christian pilgrims**. Thanks to those transformations, the centre of Pavia gradually lost its military connotation, becoming more of a cultural centre of the Po Valley, both by land and by water. The city experienced profound changes in urban topography, mainly by the creation of new Christian buildings of worship. Until the middle of the sixth century, only two Christian churches in the city are attested, while, between 569 and 774, at least 21 churches and monasteries were founded.



Medieval towers of Pavia

photo made by author

For long centuries later during the Middle Ages, there was a rivalry between Milan and Pavia for the title of the most important city of Lombardy. The title subsequently went to Milan when Pavia fell under **Visconti's rule**. In such a way Pavia was playing the role of the **second capital**, and Visconti greatly contributed to the architectural and cultural enrichment of the city, as it was one of the residences of the court. During this period, the Visconti castle was constructed, surrounded by a vast territory of the park. In 1361 the Pavian University was founded, one of the oldest in Italy, made it a destination for students and academics from all the Europe.

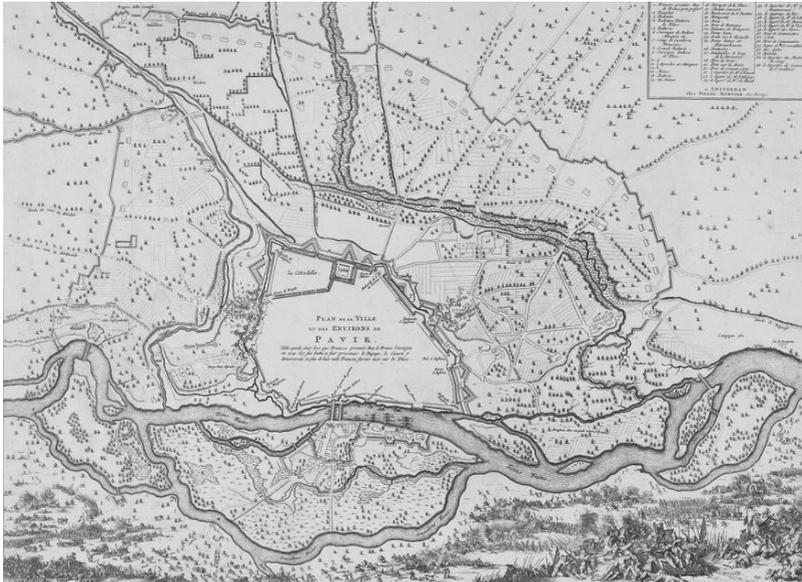
ROADS .

While the growing religious importance of Pavia, also the phenomenon of religious pilgrimage started to expand starting from 8th century. The historian Paolo Diacono, in his *Historia Langobardorum*, tells: "In those times men and women, noble and not, leaders and individuals, usually came from Britain to Rome"¹⁴ The itinerary to Rome described in the diaries of Archbishop of Canterbury, which became later a base for a Via Francigena, included Pavia as a 41th stage of the pilgrimage. But the ways of pilgrimages weren't in reality represented by single roads, but a network of various routes and trails, Considering the significant importance of Pavia in that period and all the different geographical reasons for being a place of communication of different regions, the city saw a significant flow of the pilgrims during its history. The increasingly intense flow of pilgrims, together with merchants, travellers and all those who moved for various reasons, encouraged the increase of the construction along the paths or routes of the accommodation facilities for people, horses and other animals in tow.

WATERWAYS .

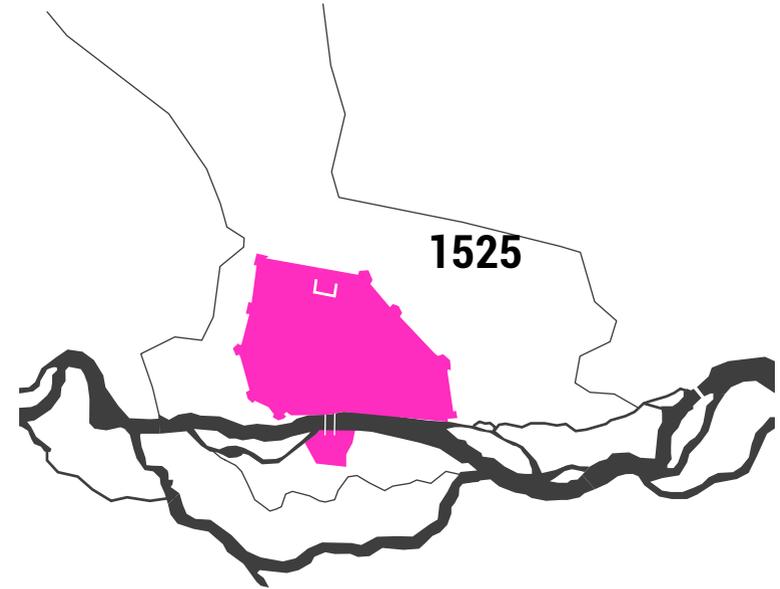
The waterway connection played a big role in the growing political importance of Pavia but also turned the city into an important hub for commercial activity. Starting from the eighth century, the Venetians and Comacchiesi began to sail the Via del Po: the first traded fabrics and stones, precious and oriental spices, while the latter had the monopoly of the salt which entered Pavia from the "Porta Salara". Pavia was a place for numerous markets, that attracted merchants and goods from neighbouring kingdoms. Its fleet, in the inland waters of upper Italy, was not afraid of rivals, it was considered the strongest and most aggressive, and the city became important and powerful. With the arrival of the Sforzesco, which understood the benefits of the canals' construction and use, were interested in establishing a navigable connection between Pavia and Milan. While they didn't reach success in completing the project, the long process of the construction of the Naviglio system got started.

¹⁴. Paulus Diaconus, *Historia Langobardorum*, (Grande Biblioteca Latina, 2020) https://books.google.it/books?id=vtrWDwAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

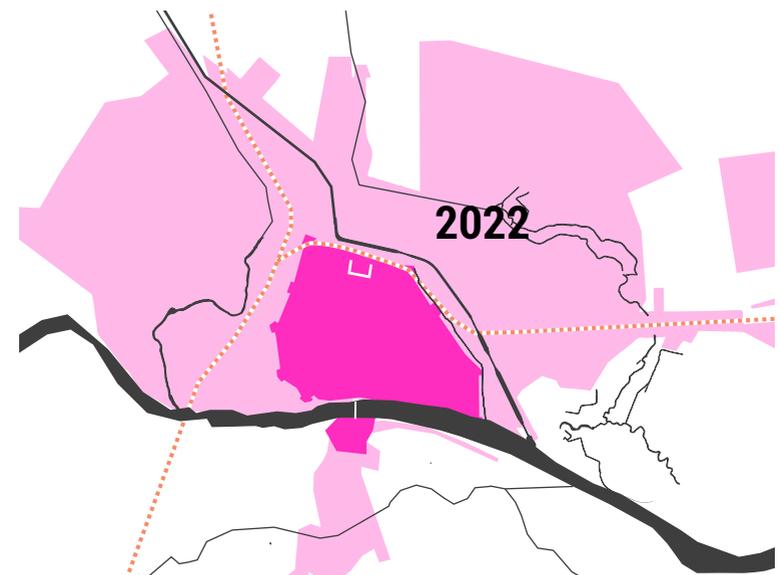


Map of Pavia after the siege and imprisonment of King Francis I of France in 1525. "Map of Pavia", 1655 - 1708?, 51x70cm, Rijksmuseum, Amsterdam, <https://jstor.org/stable/community.8584764>

Satellite image of Pavia in 2022:



Urban shape of Pavia in 1525 and 2022.



MODERN HISTORY

Pavia was occupied by Austrians, French, and Spaniards since the 16th century. Then, as one of the leading cities of Lombardy, it played an important role in the campaigns of the Risorgimento (movement for Italian political union) and joined the Kingdom of Italy in 1859. In the 1820s the work on the Naviglio Pavese was completed. The canal, designed as a waterway between Milan, Pavia and the Ticino and also as an irrigation canal, contributed to the development of the city and the territory, especially when there appeared the possibility to produce the energy using its waters. During the process of industrialisation of the region, which began towards the end of the 19th century, and accelerated at the beginning of the 20th century many new companies opened in Pavia with a diversified profile of production.¹⁵ The culmination of the industrialisation process happened in the 1950s and 1960s when there was significant economic and industrial development. But soon, deindustrialisation started, caused by the single-sector approach and by the lack of productive synergies.¹⁶



Idroscalo building - abandoned seaplane base.



The confluence of Naviglio Pavese and the Ticino.

photos made by author

ROADS.

The construction of the railway from Milan to Genoa permitted the goods to be transported via rail. This type of connection fastly became the most cost-efficient and preferred for its speed. In the afterwar period, There was an extensive automobile connection established in the country, making the road vehicles the most efficient transport for short, mid-distance journeys, to the point that the waterways stopped being used for the transport of goods and people.

AIR.

During the Fascist regime, there was a new link added, the one via air. The new connection became possible with the construction of Idroscalo, dedicated to the seaplane line Trieste-Torino, with the service stop in Pavia. The line didn't function for a long time, leaving the building in abandonment till nowadays.

WATERWAYS.

With the finalisation of Naviglio Pavese, Pavia once again proved its role as an important node. The zone of Confluence, a place to encounter the Ticino and the canal, became a small-scale port, and the canal itself became firstly an important way of commerce, later summing also the tourist functions: between 1854 and 1859 there was a regular line of steamships to Venice and Trieste, with the connection to Milan along the Naviglio. Then, with the growing industrialisation, the canal was used for the production of electricity and allowed huge industrial possibilities for the area. When the Milan-Genoa railway arrived in Pavia in 1862, allowing a faster connection with the Lombard capital and allowed a more efficient transport. Slowly the canal infrastructure became less used until the complete stop of its functioning only after WWII, with the development of automobile transport. The Naviglio Pavese became an obsolete infrastructure, used only as an irrigational channel.

¹⁵. Gianfranco Brusa, "L'industria pavese. Storia, economia, impatto ambientale", *Annali di Storia Pavese* (2000).

¹⁶. Idem.

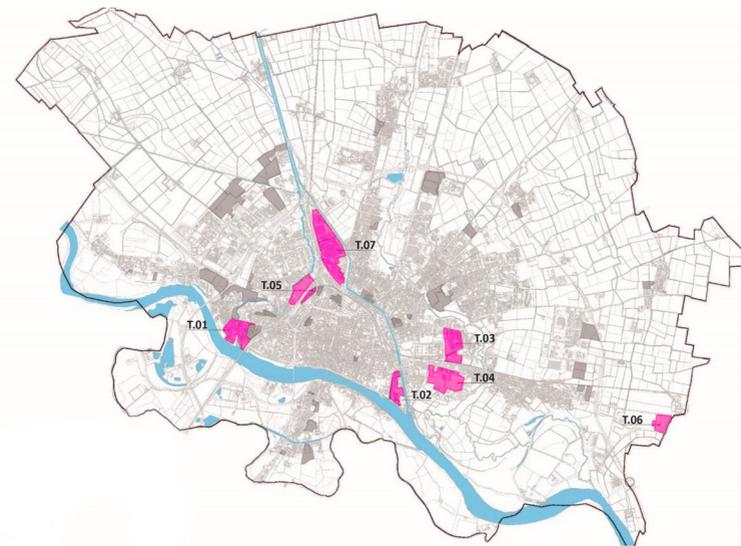
PRESENT-DAY SITUATION

With a population of around 73 000 people (2019), is a city of human scale, with a large historic centre defined by the trace of the former city walls. The centre is still can be characterised by the configuration of the Roman castrum, enriched then with the developments of different historical periods. Pavia's urban environment has vast heritage of high cultural value, especially regarding religious architecture. Today Pavia is also a University City, hosting one of the oldest universities in Italy and the world, creating an important educational pole.

But on the downside, there are signs of decay and deindustrialization, that have profoundly impacted the city: during the last century, the rapidly growing industry was expanding the city, and with the closure of the production, what was left were massive brownfields. Today those sites within the municipality occupy an area of more than 83 ha around the historic centre. Those abandoned areas are commonly thought to create a decline in the cities' environment, leaving "black holes" - urban voids - in the city's morphology marginalising the areas. But at the same time, these areas constitute significant resources in terms of size and location.¹⁷ For some time already the city's municipality acknowledged the need of reusing or transforming those dismissed places of Pavia. For this scope since the 2000s, in the local governance document, PGT (Territory Governance Plan), the municipality named those as areas of urban transformation and was aiming at their redevelopment; in total there were 12 abandoned zones, the majority industrial but not only. Unfortunately, in over twenty years very few actions were imple-

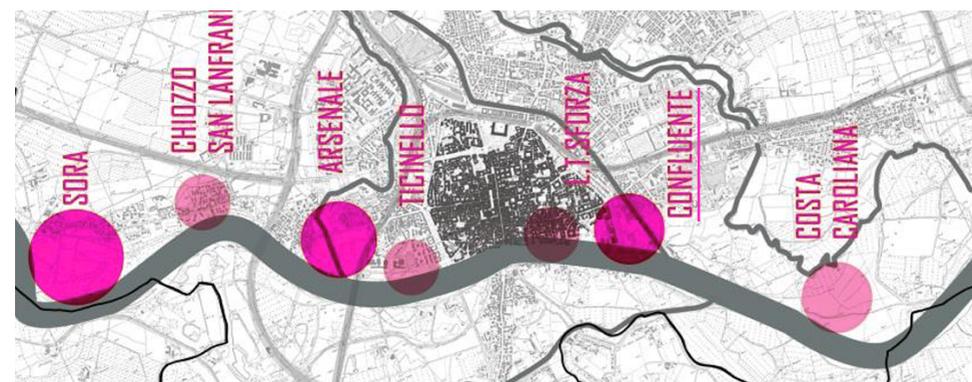
mented to reuse those areas, except for a few projects that were yet not realised. The change also happened in the relation between the residents and the river. Up until the 1980s, with equipped beaches along the entire course of the river, the navigable and swimmable Ticino was a place of recreation and an attraction for not only the local population but also for residents in Milan hinterland.¹⁸ For some reason, the degree to which the locals use the river for their leisure was drastically reduced, and today the uses are much more limited.

In recent years the focus of the government was directed on the regeneration of the riverside: in the guideline document for the new PGT 2030 of Pavia, it is mentioned that one of the main priorities for the new municipal plan will be the revaluation of Ticino and Naviglio, bringing them a role of infrastructures destined for leisure and enjoyment of the city. They are visioned as becoming the poles of attractiveness of the city, activating the urban regeneration process. The regeneration is envisaged to involve the waters of Pavia in recreational, tourist and environmental dimensions. In 2021 the interest resulted in the creation of the project "Pavia città d'acqua". The project is aiming at the regeneration of all the urban stretch of Ticino, in the strategy the river is seen as a reactivator of the local social, economic and environmental dimensions; it was already granted the regional funds for its implementation. The approach of the project is to divide the areas of the Ticino bank into zones, pointing out those that have the criticalities and need the most transformation.



Dismissed areas, defined as Areas of Transformation (AT or T) in Pavian Municipal city plan

Comune di Pavia, Pavia 2030 linee guida per il nuovo PGT (2020)



Areas defined as critical in the municipal plan "Pavia città d'acqua"

Source: Comune di Pavia, Pavia città d'Acqua, strategic plan (2020).

¹⁷. Comune di Pavia, Pavia 2030 linee guida per il nuovo PGT, guidelines document (2020).

¹⁸. Comune di Pavia, Pavia città d'Acqua, strategic plan (2020).

OPPORTUNITIES FOR THE CITY

Pavia has an identity of “Crossroad of Europe” claimed to be recognised by the European Commission in 2012 for the richness of historic and religious paths and routes that cross the city.¹⁹ This thesis proposes to revive and develop this identity and the vocation of the city as a node, which it once had, but with a new philosophy, closely tied to sustainability - slow travel. Today with this growing phenomenon, Pavia has again the possibility of becoming an important crossroad, a node of the meeting of different networks and vectors. A service point and a destination itself - those functions that the city with this type of tourism could now play simultaneously. The present tourism of Pavia mainly represents the cultural, religious and naturalistic orientation, which represents the characteristics similar and compatible with slow tourism.

In the past Pavia already was a passage point for medieval “tourists” - pilgrims on the way to Rome. Also nowadays religious tourism constitutes a noticeable part of the tourist offer of the city and territory around it. Pavia is one of the stops on the Via Francigena itinerary, while its province is crossed in 16 municipalities by the route. Pavia is also a major stop on other spiritual and historical routes, such as the routes of Saint Martin of Tours

and St. Augustine, the Transromanica and many others, some of which are certified by the Council of Europe as Cultural Routes. Other than being a crossroads of historical routes, Pavia is a territorial node that progressively was diminishing its relevance. In past, the city could advance and prosper thanks to its position close to its confluence with the Po, which was a convenient position for navigating, Today the majority of transportation of goods and people now happens by land, and the connection between the river, city and territory started to be loosened since the arrival of rail and automobile transport, to a complete stop of usage waterways as a transport.

But Pavia still represents an important node of a transportation network, a crossroad of different roads (now mainly by land). It is also a destination per se, thanks to its rich religious and cultural heritage. With this favourable position within the slow mobility network, there is a possibility to reinforce or revive the identity of a “crossroad of routes”, which the city already poses, and to reinvent its importance in this role, by focusing on the development of slow tourism infrastructure of the city. This would mean developing the slow mobility infrastructure and also recreational activities and services for the visitors and residents alike.

As reported in the document of guidelines for PGT 2030, the location and accessibility are considered the strong points of the Pavia, which could help it “attract valuable functions”²⁰ to the city in the future. In this aspect, the city is appreciated the most for its barycentric position and closeness and accessibility to Milan, by rail or along the Navigli canal. Located just 33 km away from the metropolis, Pavia was for a time in history was serving as a significant node for Milan. The connection to the waters of Ticino in the area of Pavia was seen as an essential link for the completion of the system of canals named Navigli, as it would allow faster access from Milan to the sea. With the construction of Naviglio Pavese, the connection of the two cities became physically present not only in the form of roads but also as a water channel, which was very long-awaited by Milan, as a faster connection to the sea, but not desired, and even opposed during its construction, by Pavians.²¹ The project was implemented but with a delay of some centuries, so the canal served its original function for only a few decades before the rapid process of industrialisation of the society completely changed the logistics of the region.

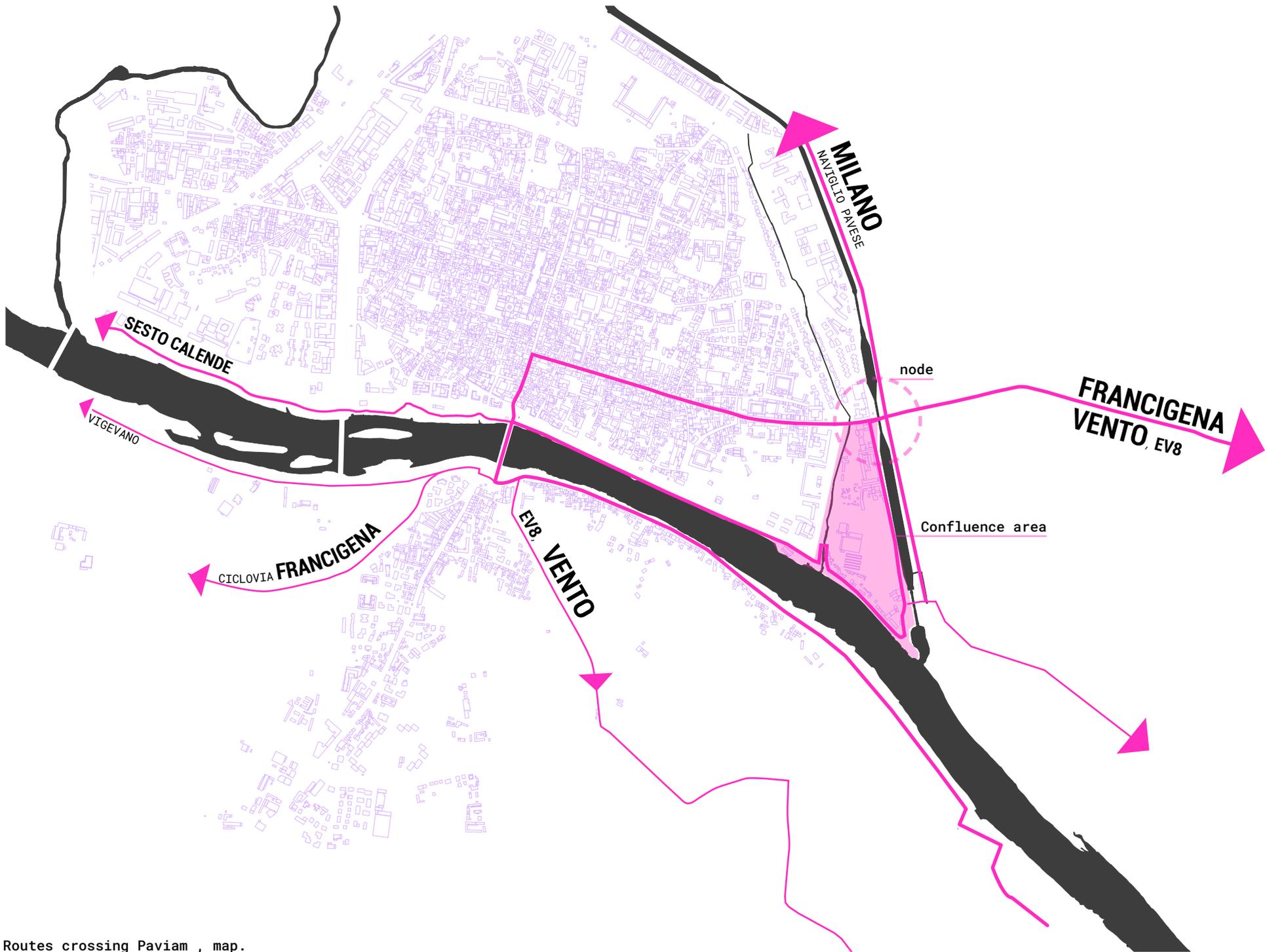
Analysing the vectors crossing Pavia too, it becomes evident the importance that Naviglio has in the soft mobility network, being the physical and functional manifestation of the direct link with Milan. Today along all its course runs the cycle path, which is planned to be improved for the occasion of building the Ciclovía VENTO, which in itself is thought to have a big potential for growth of the slow tourism in the city, bringing renewal and new possibilities for the growth or regeneration of communities.

From the point of view of its position, the area of Confluence, and in particular the meeting course of Naviglio and Viale Partigiani constitute an actual location of the main crossroad. This area would be described as problematic for many different reasons, but the reality is that it suffers from a lack of uses and activities, which results in low attractiveness of the place. Considering its favourable position in relation to the routes, here the developments intended for the slow tourism infrastructure would be the most suitable and could stimulate a major transformation to the area.

¹⁹. “Crocevia d’Europa”, accessed on March 5 2022, <https://croceviadeuropa.eu/>

²⁰. Comune di Pavia, Pavia 2030 linee guida per il nuovo PGT, guidelines document (2020).

²¹. Remi Veri, “Naviglio Pavese - Storia” accessed on April 16, 2022, <https://www.remiveri.it/il-naviglio-pavese-storia/>.

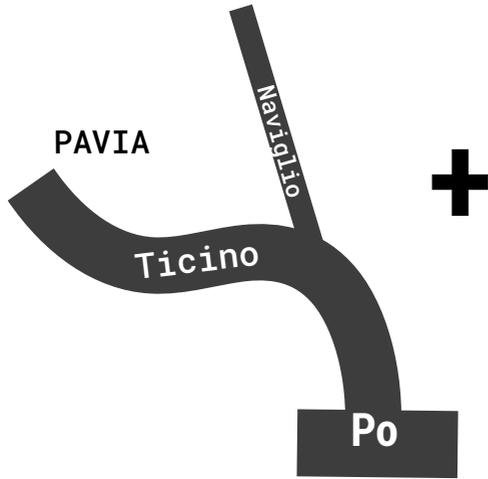


Routes crossing Paviam , map.

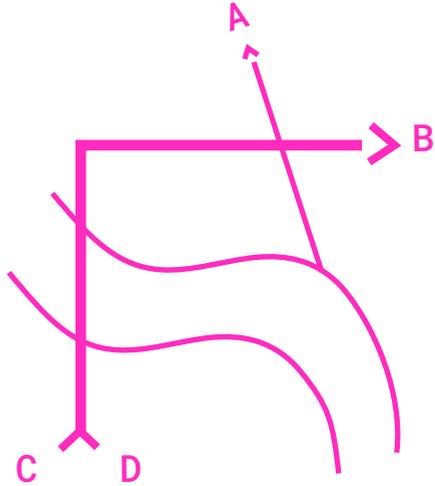
ANALYSIS OF VECTORS OF PAVIA

EXISTING SITUATION

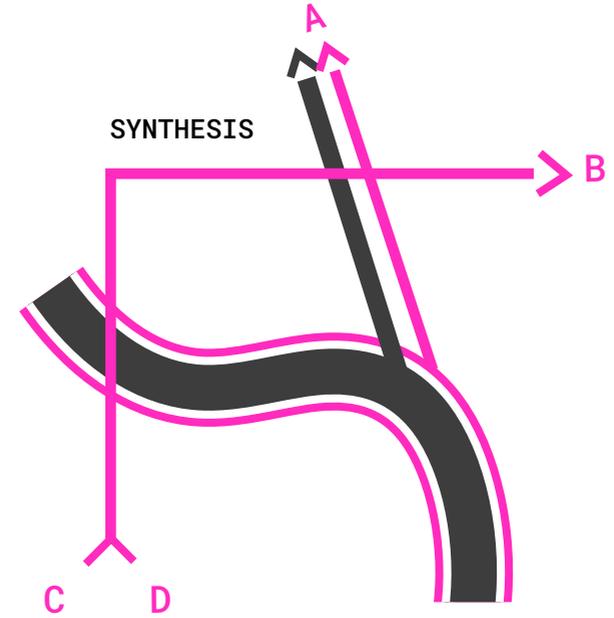
WATERWAY SYSTEM



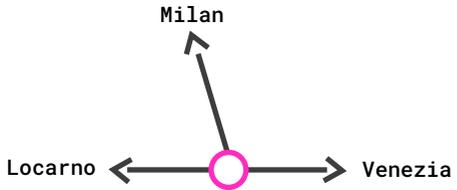
CYCLING SYSTEM



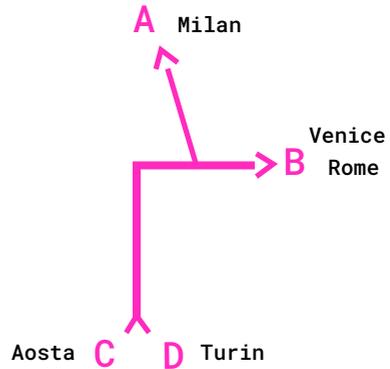
SYNTHESIS



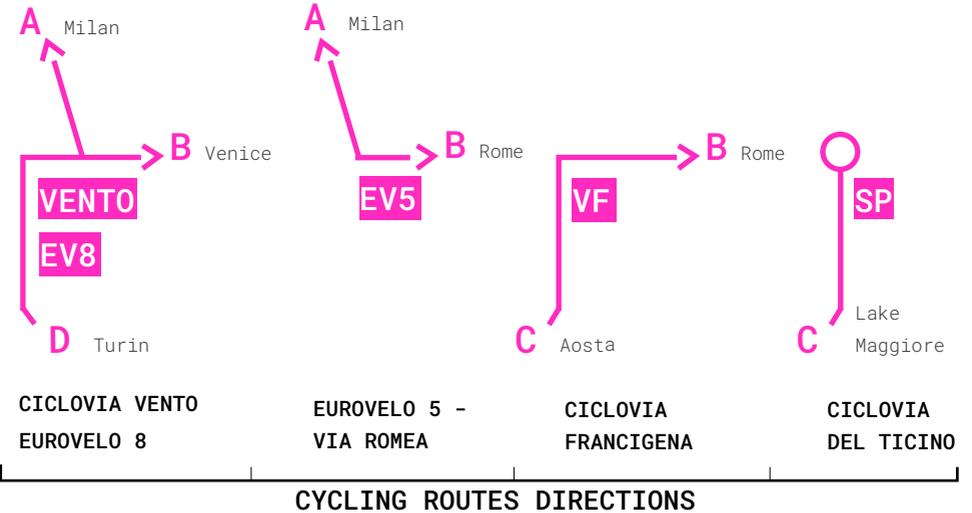
— cycle paths
— waterways



WATERWAY DIRECTIONS



ROUTES DIRECTIONS



CYCLING ROUTES DIRECTIONS

AREA OF TRANSFORMATION

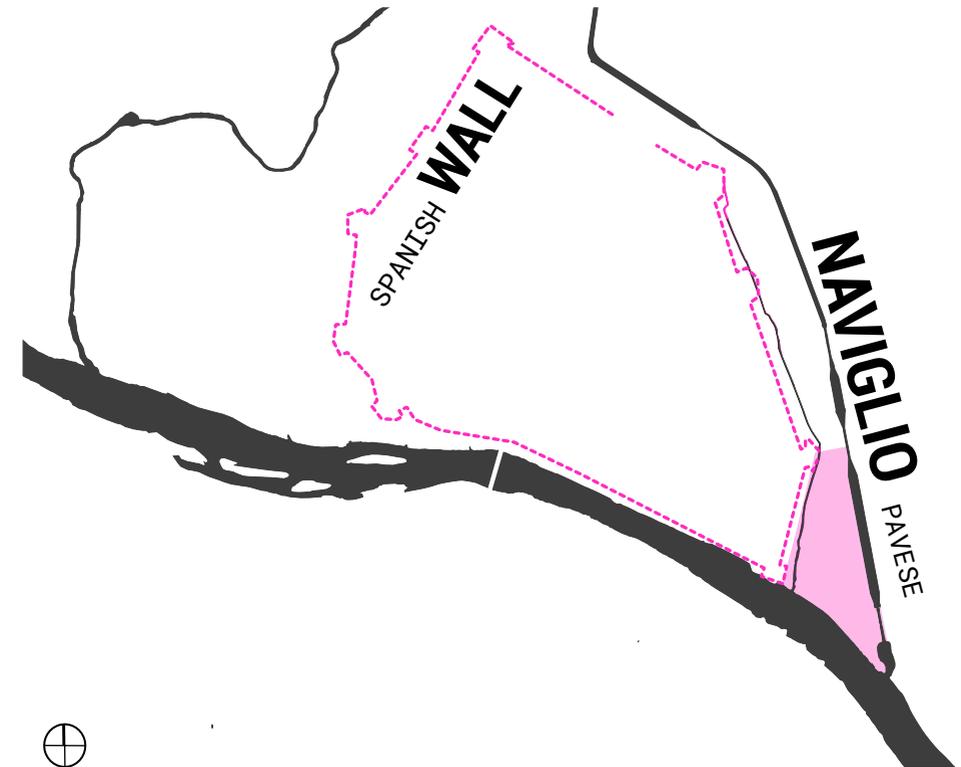
In recent years the focus of the local government was directed on the regeneration of the riverside: in the guideline document for the new PGT 2030 of Pavia, it is mentioned that one of the main priorities for the new municipal plan will be the revaluation of Ticino and Naviglio waterfronts, bringing them a role of infrastructures destined for leisure and enjoyment of the city. They are visioned to become the poles of attraction of the city, activating the urban regeneration processes. The regeneration is envisaged to involve the waters of Pavia in recreational, tourist and environmental dimensions. In 2021, this ambitions resulted in the creation of the project "Pavia città d'acqua", which is aiming at the regeneration of all the urban stretch of Ticino. In the strategic vision the river is seen as a reactivator of the city's social, economic and environmental well-being, and was already granted the regional funds for implementation. The transformation is approached by dividing the areas of the bank into zones, pointing out those that have the criticalities and need transformation the most.

One of those areas, referred to as Confluente (Confluence), is considered to be of the biggest criticalities in the urban environment of Pavia, but the one with big potential. The site represents a final stretch of Navigli Pavese before it meets with Po and is one of the Transformation zones of the PGT mentioned earlier.

As it was shown earlier, the area is also a place of encounter of different vectors and routes, some of them of big historical importance and potential (e.g. Via Francigena), others constituting the backbone for soft mobility network (e.g. European long-distance cycle routes).

The Area of Confluence is a 'left-over' space after the construction of Naviglio. The channel was passing outside the city walls around 150 meters away, leaving a strip of land in-between. So the west and east limits are represented by those two important urban-scale elements. To the north, the area was facing the old city gate, Porta Garibaldi, which was destroyed in the last century. To the south, it meets Ticino's waters, which creates a natural border.

The land was not much defined by industrial past, in comparison with the majority of Transformation Areas of Pavia, but rather represents a margin area, or a *terrain vague*²² consisting of different elements, that, at first, are hard to logically connect together: abandoned seaplane base, old gasworks, city's exhibition hall, and camps of Sinti population. The area is underused, marginalised and was for many years a topic of plans of transformation, but till today no defined project or plan exists. It is left for a long time in limbo where there are grandiose plans for change, but nothing actually happening.



Location of the Confluence Area, between former city walls and Naviglio.

²². Ignaci de Solà-Morales, "Terrain vague", Territorios, (Barcelona: 1995): 181-193.

Part three: Confluence



Men fishing with the view of Confluence of Naviglio Pavese and Ticino.

Giampietro Agostini , *Confluenza Naviglio di Pavia con fiume Ticino a Pavia: In primo piano coppia di pescatori*, Musei Civici di Pavia (1960), <https://www.lombardiabeniculturali.it/fotografie/schede/IMM-LOM60-0006548/>

The final stretch of Naviglio in Pavia is characterised by an area, a portion of land between the historic city and the canal, formed as the result of its Confluence with the Ticino river. Morphologically, the area is a place of convergence of different landscapes: the transition zone between the city, river, natural park and Naviglio. Yet, the area itself is in a state of long neglect, reflecting the state of the canal, and is a subject of the various transformation plans of the Municipality of Pavia, which for years went without realisation.





I. HISTORICAL ANALYSIS OF THE AREA

THE AREA

URBAN EVOLUTION

ELEMENTS OF THE AREA

TIMELINE

NEIGHBOURING CONTEXT

1. THE AREA

“A place in-between”, “unincorporated margin” are definitions that could describe a contemporary situation of the area. The place that doesn’t have a clear position in the experience of the inhabitants of Pavia: is a place of temporality and disuse. Created as a residue - outside the Spanish Wall and before the course of Naviglio - it appeared with the construction of the latter and became incorporated into the city during urban expansion in the XX century with the gradual demolition of the city walls.

The area can be characterised as *terrain vague*, which can be summarized by this citation of the creator of the term, Catalan Architect Ignacio de Solà Morales:

...spaces internal of the city yet external to its everyday use. In these forgotten places, the memory of the past seems to predominate over the present... unincorporated margins... void of activity... In short, they are foreign to the urban system, mentally exterior in the physical interior of the city, its negative image, as much as a possible alternative.¹

It is an underused area consisting of different elements, that don’t have a proper uniting identity and neither a collective name. It is usually referred to by some of

its constituting members: Ex-Gasometer, Piazzale Europa, Exposition Palace and various combinations of those depending on the context. Usually, in the municipal plans concerning the transformation of disused zones, it is called T4 or Area Transformazione 4 (meaning Transformation zone number four) and the name “Piazzale Europa/Gasometro”.

The reasons for the unintelligibility of the area as a whole may be explained by two conditions, playing a role simultaneously. The first reason has to do with the spatial perception of the place: while the unifying identity is visible from every map, represented by its prominent limits, it’s hardly possible to read the same characteristics from the human perspective. The second reason is the fragmented structure of the site, consisting of various incoherent sectors, without evident linking characteristics.

The area is located in the vicinity of the centre but acts as an apparently external element, while the fortification structure doesn’t exist anymore the city centre is still delimited by abstract walls represented today by the ring road. The integration into the city’s structure didn’t happen in the decades after the demolition of the walls, making the perceived physical and functional detachment one of the pronounced characteristics of the area.

The physical remoteness of the area is expressed by the topography and limits of the site, which are strongly marked and sometimes act as barriers to reaching the place. Looking from the city centre, the first frontier is expressed by the Carona moat, the historical remains of the defensive system of the city, a deep trench functioning today as a discharge channel of Naviglio. It also highlights the topographical distinction of the site, which has a slight inclination descending towards the river: there is a visible difference in height with respect to the “walled city”, further accentuated by the moat.

The functional detachment is symbolised by the general disuse and abandonment of the area and a few activities that are still performed there: it serves as an addition that can house the functions that couldn’t be integrated into the life of the city centre. Many of them have characteristics of temporality, like swimming pools during the summer months, expositions and funfairs, others from temporal with the time converted to permanent, like Nomad Camps. Already since the begging of 2000 the area is considered to be in a state of disuse or in need of transformation. Since the 2010s in the Territorial Governmental Plans (PGT) of Pavia the main emphasis was placed on the reuse of the industrial heritage of the city and some other areas called altogether as Area Transformazioni, between the others there were mainly abandoned manufacturing complexes.

¹ Iganci de Solà-Morales, “Terrain Vague”, in Territorios (Barcelona: Gustavo Gili, 1995), 181-193.

2. URBAN EVOLUTION OF THE AREA

The development of the area is closely related to two important urban elements: city walls and the Navigli canal. The land, laying outside the city walls, to which the moat is still a testimony, was agricultural and external to the city until the beginning of the 19th century. Only with the creation of Naviglio Pavese, the area gets its characteristic triangular shape and becomes “a place in-between”: outside the trace of the Spanish Wall and before the canal.

The subsequent evolution that gave the area its present attributes is a product of city expansion at the end of the 19th and the beginning of the 20th century, which followed after the demolition of the city walls.

19TH CENTURY

On the entrance of the city to the west, in the meeting point of Viale Resistenza and Corso Garibaldi, there was a Porta Garibaldi, one of the city's gates. It carried the name Porta San Giustina until the 1860s and existed till 1920 when was demolished for the transport commodity.

During the period of active navigation of Naviglio, the area hosted the port located at the Confluence, and different facilities serving its needs were located nearby, like naval workshops and houses of workers. In the second half of the 19th century, following the pace of the industrial revolution, there was a growing need for gas production and storage of the city gas for public illumination, which resulted in the construction of Gasworks.

20TH CENTURY

At the beginning of the 20th century, the rate of expansion of the city accelerated significantly extending towards the territory outside of the medieval city. The Walls were seen as an obstacle to growth and had been gradually torn down. In 1920 the same destiny reached Porta Garibaldi (previously Porta San Giustina), one of the main city gates located at the beginning of Viale Partigiani, which was demolished for better transport accessibility. With this process of gradual demolition of the city walls along all their length and simultaneous expansion of the city, the latter still remained divided into the inner and outer city.²

During Fascist rule in Pavia, the eastern edge of the city profoundly changed: starting with the construction of Idroscalo - a seaplane base on the Ticino river serving the Torino-Trieste line and later in the 1930s with the construction of a fascist ensemble on the location of dismissed shooting range facing Viale Resistenza consisting of 4 public buildings that were designated to education and influence of young fascists.

The next phase of the transformation of the area started around the 1960s, with the construction of Palazzo delle Esposizioni and the Municipal Swimming Pool: the area was chosen to house the activities that are necessary for the inner city, but the ones that it itself can't host. It was around that period that Naviglio completely stopped being used for navigation. Towards the end of the last century, the feeling of neglect and disuse became noticeable, the area moreover became to be marginalised because of the presence of so-called “nomad camps”, the semi-informal settlement of Sinti population.



². Claudio Baracca, “La qualità della città: la periferia nelle ipotesi urbanistiche e nella realtà fisica” in *Annali di Storia Pavese* no. 28, (Pavia: 2000).

The painting of the view of the Confluence and Pavia at the port.

Francesco Treccourt, *La darsena di Pavia alla confluenza del Naviglio Pavese nel Ticino con il piroscampo Contessa Clementina*, oil on canvas, 1859 circa, Pavia, Musei Civici.



The view on Porta Garibaldi around 1910 (Ex Porta Santa Giustina), the entrance gate to the inner city, demolished in 1920.

Source: http://www.paviaedintorni.it/temi/sguardo_nel_passato/ieri_oggi_file/Porta_Garibaldi.htm



The view on the port of the Confluence, around the 1850s.



The area of Porta Garibaldi towards Viale Partigiani in the 1960s, to the right - the entrance to the Gasometer complex.

Source: http://www.paviaedintorni.it/temi/sguardo_nel_passato/ieri_oggi_file/Porta_Garibaldi.htm



The view on the Confluence, 1960.

Giampietro Agostini , Confluenza Naviglio di Pavia con fiume Ticino
a Pavia: In primo piano coppia di pescatori, Musei Civici di Pavia (1960),
<https://www.lombardiabeniculturali.it/fotografie/schede/IMM-L0M60-0006548/>



The same area today.



Confluence today



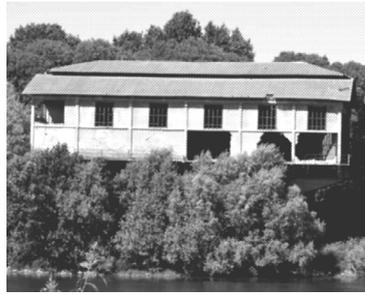
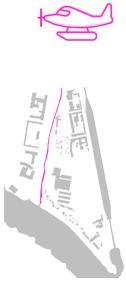
- disused ○
- in use ○
- canals ○

3. ELEMENTS OF THE AREA

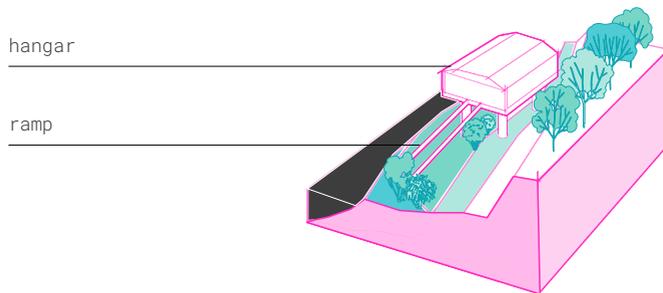
- A Idroscalo - abandoned seaplane base
- B Ex Gasometer - abandoned gasworks
- C Ex Swimming Pool - abandoned municipal pool
- D Sinti settlment - informal settlement
- E Palazzo delle Esposizioni - city's exhibition hall
- F Residential houses along Naviglio
- G Roggia Carona - moat of the Spanish Wall
- H Naviglio and Confluence - meeting point of the canal and the Ticino river

A. IDROSCALO

abandoned seplane base



Construction year: 1926
Architect: Giuseppe Pagano
Use: Seaplane base
Typology: Industrial
Status: disused since 1981



Idroscalo of Pavia was a seaplane base standing on the Ticino river - a local icon of industrial architecture designed by Arch. Giuseppe Pagano. In the period between the World Wars, in the 1920s-1930s, the seaplanes were becoming a popular means of transport, succeeding in some characteristics of traditional planes - they could land virtually on any large enough water surface, with no need of a specifically made runway. Earlier operated mainly for military purposes, in this period it broadens its use including commercial aviation and mail delivery. The first Italian civil Turin-Trieste line was started in 1926 by S.I.S.A. (Italian Air Service Society) and was a part of an ambitious infrastructure plan aimed at creating a network of "aquatic" airports throughout the country. The route was following the course of the Po river with the stops in Pavia and Venice for refuelling, and the Pavian hangar was also operated as a logistic hub for sorting goods and mail, serving the Milan area as well.

Constructed near the Confluence, on the elevated position from the river bed, Idroscalo was of the same typology as Turin's seaplane base, demolished in 1954. The typology was rather unique compared to the conventional type and was used in the case of the significant variation in water levels. It consists of two main elements: the hangar and the ramp. The hangar stands on a platform (34 x 22 meters) sustained by four reinforced concrete pillars, measuring around 8 meters. The ramp extends from the east elevation, which has a metal door for a total of its length, allowing the ascent and descent of the seaplanes.



Idroscalo (inside and outside) with the seaplanes.

1. Guglielmo Chiolini, *Pavia - Viale Lungo Ticino Sforza - Idroscalo - Idrovolante*, Musei Civici di Pavia, <https://www.lombardiabeniculturali.it/fotografie/schede/IMM-F0150-0000061/>

2. Guglielmo Chiolini, *Pavia - Viale Lungo Ticino Sforza - Idroscalo*, Musei Civici di Pavia, <https://www.lombardiabeniculturali.it/fotografie/schede/IMM-F0150-0000061/>

Almost all of the interior of the hangar is characterised by a large open space, which could host contemporary four vehicles. The only enclosed space is on the western side of the building and has two floors, which contained all the necessary service rooms: workshops for the maintenance and repair of the planes, a radio-telegraph station for the in-flight communication, an office and a warehouse.³ For the use of the passengers there were a waiting room and a bar, where they could pass some time and rest during the refuelling of the plane.

The original function as a seaplane airport wasn't long-lasting, the Turin - Trieste line was entirely suspended in 1933 as a result of the company's crisis. But the hangar continued to be used: already since 1929, it was hosting social and recreational events, like dances and parties.⁴ In 1938, the structure became a public property but was functioning as a private seaplane garage. In 1981 Idroscalo was entirely abandoned.

Nowadays Idroscalo rises above the water as a ruin of the 20th century in comprised condition, with severe decay, inaccessible and isolated (the small bridge serving as access was removed in 1995).⁵ It is the last remaining river airport of the route it was built for, and its architectonic value is publicly recognised - Idroscalo was assigned the status of cultural heritage by Lombardy Region. However, already for many years, its recovery is a topic full of questions and

no answers. In 1999, the structure was purchased by a private investor, in 2018, there was a project ready and approved by the municipality, but the beginning of construction works seems to be paused indefinitely.⁶

In 2021, TerraViva* launched an international competition with the name "Hangar Ticinum" with the brief of reusing Idroscalo as a community hub. The competition raised public awareness about the deterioration of the building and brought a lot of creative ideas for its reuse. While the competition is only hypothetical and doesn't imply the execution of the project, there is hope it could kickstart a long-awaited recovery of Idroscalo.

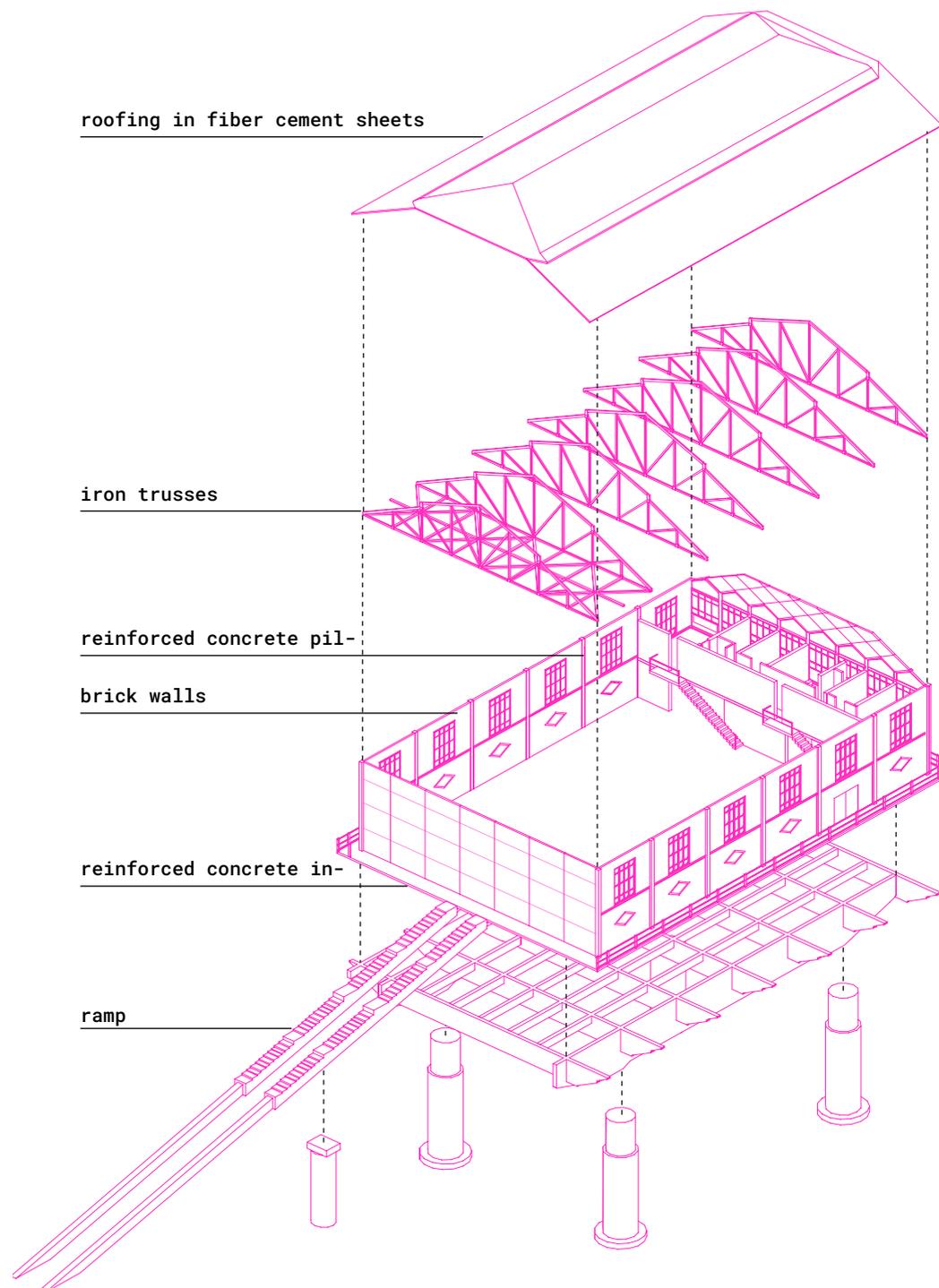
3. "Idroscalo", Lombardia Beni Culturali, 2009, <https://www.lombardiabeniculturali.it/architetture/schede/PV240-00948/>

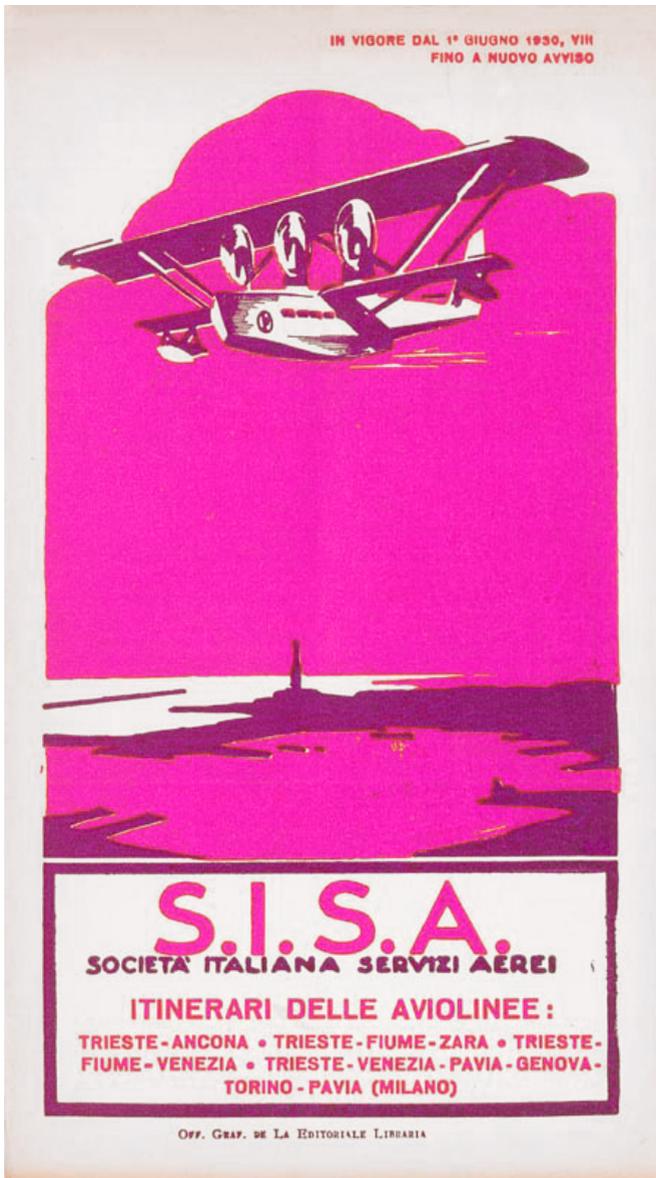
4. Idem.

5. Valentina Racis and Anna Tafi, "New natural scapes: l'Idroscalo di Pavia come macchina per dialogare con la natura," thesis, Politecnico di Milano, 2013.

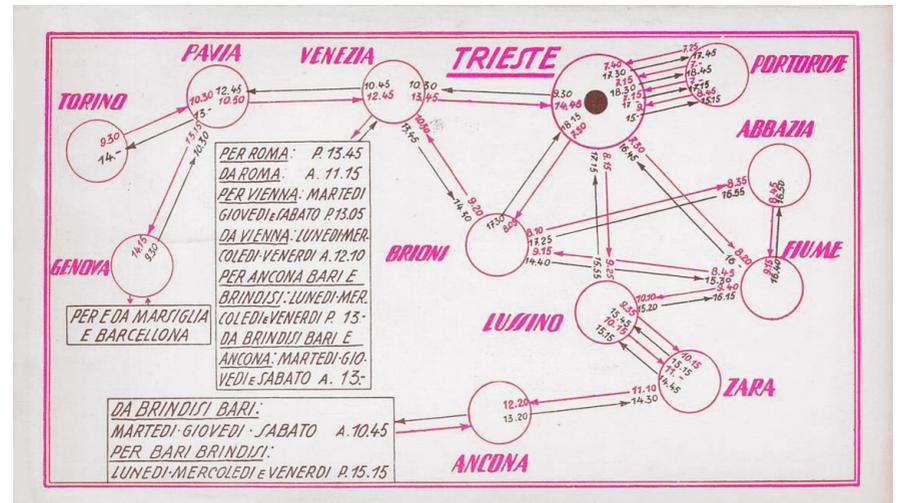
6. Maria Fiore, "I ritardi all'Idroscalo? È troppo comodo dare la colpa al Comune" La Provincia Pavese, September 25, 2018, <https://laprovinciapavese.gelocal.it/pavia/cronaca/2018/09/25/news/i-ritardi-all-idroscalo-e-troppo-comodo-dare-la-colpa-al-comune-1.17286818>

* <https://www.terravivacompetitions.com/hangar-ticinum-competition/>





Cover of a brochure with timetable of S.I.S.A. lines
<http://www.timetableimages.com/ttimages/sisa3006.htm>



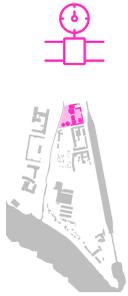
Timetable of routes and connections of S.I.S.A. operated from June 1, 1930.



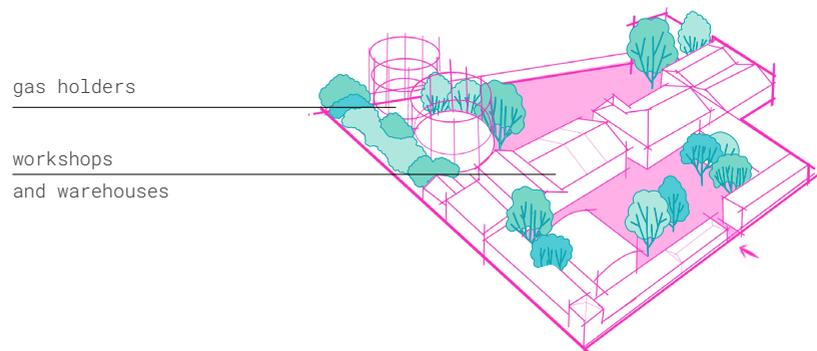
S.I.S.A. postcard of Torino - Trieste line diffused for the inauguration.

<https://web.archive.org/web/20060506231000/http://www.lanternafil.it/Public/Rubrica/Postaerea/idrovolanti.htm>

B. EX GASOMETER *abandoned gasworks*



Construction year: 1862
Typology: Industrial
Use: Gasworks
Status: disused since the 1960s



Located just outside the city centre at the very beginning of Viale Partigiani, the gasworks complex was built in 1862 for the production and storage of coal gas. The compound is formed of several structures: an oven for distillation, some warehouses for storing raw materials, workshops and two concrete gasometers of 1200 cubic meters volume. The gas produced was mainly used for public illumination of Pavia.

The gasometers, characterised by a system of iron trusses, were serving as regulation devices for production and short term gas storage, therefore enabling to serve the peak demands. The structure of the gasometer is composed of a concrete semi-underground pool containing water, hermetically sealing the gas and the iron truss structure, that was carrying the moving mechanisms.

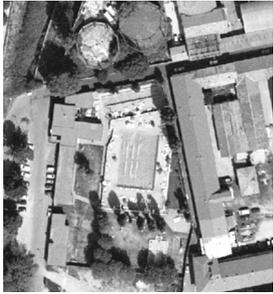
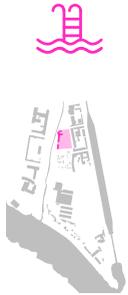
From the beginning of the 20th-century gas started to be used also for domestic and industrial use, and in 1926 one of the gasometers was replaced by a new gasometric concrete pool of a larger size. Its full activity lasted until the 1960s, when with the spread of methane gas the use of city gas started declining, leading to the gradual decommissioning of the plant. Nowadays, the complex is in a state of severe abandonment, with the two gasometers representing monuments of industrial archaeology.



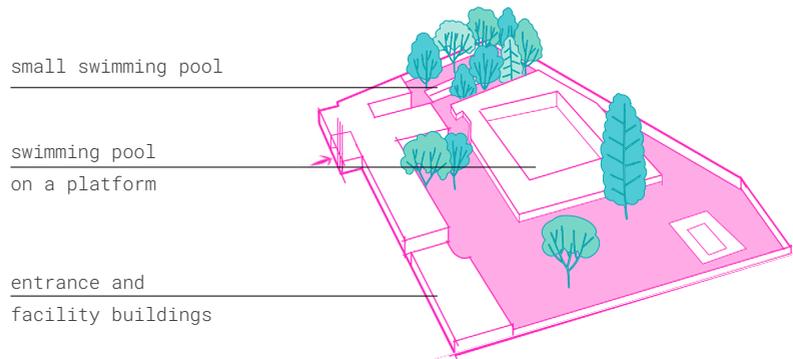
Ex Gasometer view on the workshops from Navigli and inner court.

Photos taken by the author.

C. EX SWIMMING POOL *abandoned Municipal pool*



Construction year: 1960
Typology: Recreational, Sports
Use: Swimming pool
Status: disused since 2009



The Municipal Swimming pool was built by CONI (Reginal Olympic Committee) in 1960 with an area of 3660 square meters. The territory enclosed by 2,3-meter walls included two one-story buildings, hosting the entrance with the ticket office and the facilities like lockers and technical rooms, two open-air pools, one measuring 25x18m and a smaller one of 25x4m, and a green area.

The Swimming Pool was managed by Municipality through the concession agreement, but with time the maintenance was requiring ever-higher costs for adaptation and compliance works due to outdated design specifications. It kept functioning during the summer months with the growing economic effort until 2009, when it was decided not to be economically viable to carry on and the Swimming pool was permanently closed. Despite the intention voiced by the Municipality already in 2003 to acquire the property in order to intervene and renovate it,⁷ the plan never came to life. The abandoned complex started rapidly showing signs of decay joining to the state of neglect of the other area.

⁷ Luca Simeone, "Il Comune compra l'ex piscina ma l'area cambia destinazione," *La Provincia Pavese*, December 28, 2011, <https://laprovinciapavese.gelocal.it/pavia/cronaca/2011/12/27/news/il-comune-compra-l-ex-piscina-ma-l-area-cambia-destinazione-1.2881985>

D. SINTI SETTLEMENTS

informal settlement



Formation year: 1984
Typology: Residential
Use: Nomad camp
Status: in use

A part of the area is characterised by the presence of so-called “Nomad camps”, formed in 1984, is a settlement of Sinti population estimated to the total of 265 people,⁸ divided into two zones: one between the Exhibition centre and the river, the other near the abandoned Swimming pool. The camp is considered to be informal but institutionalised.

One of the causes of the creation of camps was the regional legislation aiming at "safeguarding of cultural heritage and Roma identity", which in order to achieve the goal of protecting ‘nomadic culture’* were recommending and financing the construction of "nomad camps", which were organized solely on an ethnic basis for parking mobile homes and caravans, that with time became permanent.

The question of the relocation of the community has long been an administrative debate, but the solution usually proposed by the administration is to create a new camp for the Sinti population in a different place. As for March 2021, the city’s administration seems to be decisive in its decision. As claimed by Massimiliano Koch, Pavia’s city planning councillor, as of now, the new area suitable for hosting the families wasn’t identified, but they are planning to work in close collaboration with the Social Service in accompanying people towards the new settlement. Adding that: “the Sinti families cannot remain in Piazzale Europa, which is indicated as at risk of flooding in the PGT and constitutes a risk for the very people who live there.”⁹

The solutions of the ethnical encamping of the Sinti and Roma residents are considered discriminatory by the UN Committee on the Elimination of Racial

Discrimination, declaring that "the housing of Roma in such camps leads not only to a physical segregation of the Roma community from Italian society, but a political, economic and cultural isolation as well".¹⁰ The Italian Association 21 Luglio working for years with Roma and Sinti communities declares that the solution shouldn’t be based on ethnicity, but rather implementing ordinary social policies structured on the needs of individual families, advocating that the great majority of Sinti prefer a housing solution.¹¹

⁸. “Il Paese dei Campi: Mappa,” Associazione 21 Luglio, <https://www.ilpaesedeicampi.it/mappa/>

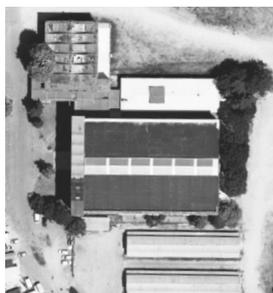
* The label ‘nomads’ is usually applied indifferently to the whole Roma and Sinti population, regardless of origin, nationality and nomadic or sedentary status.

⁹. Fabrizio Merli, “Il Campo Nomadi Andrà Spostato: La Giunta Fracassi Cerca Alternative,” *La Provincia Pavese*, March 23, 2021, <https://laprovinciapavese.gelocal.it/pavia/cronaca/2021/03/23/news/il-campo-nomadi-andra-spostato-la-giunta-fracassi-cerca-alternative-1.40064504>

¹⁰. United Nations CERD, Concluding Observations on Italy (Geneva, 1999)

¹¹. “Il Superamento degli Insediamenti,” Associazione 21 Luglio, <https://www.ilpaesedeicampi.it/il-superamento-degli-insediamenti-rom-sinti/>

E. PALAZZO DELLE ESPOSIZIONI *city's exhibition hall*

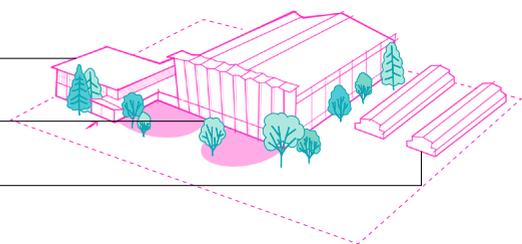


Construction year:	1958
Architects:	Carlo Alberto Sacchi, Chiandussi Duilio
Typology:	Cultural
Use:	Exhibition hall
Status:	in use, on occasions

entrance building

exhibition hall

barns



Palazzo delle Esposizioni was planned to be the result of a competition launched by the Chamber of Commerce of Pavia in 1953, the exposition center would give a permanent location to the trade fairs of the productive sectors of the city and province, showcasing industrial, agricultural, artisanal and artistic productions. The final assignment was given to engineers Sacchi and Chiandussi, with the task of reworking the projects selected by the jury, which didn't satisfy completely the requests of the call.¹² Carlo Alberto Sacchi, was one of the greatest local exponents of Italian rationalism and constructed Casa del Ballila in 1934, located just in front the Palace on the Viale della Resistenza.

The exhibition complex completed in 1958 consists of two bodies: an access pavilion of about 400 sqm was designed to host smaller meetings and conferences, nowadays it serves as an entrance hall and the storage space; a bigger volume with a facade made of rhythmic tall thin pillars hosts a spacious exhibition hall of about 2500sqm, characterised by a succession of concrete arcades. Neighbouring to the south, three elongated rectangular constructions (out of which only two remain) were housing the cattle during the agricultural fairs.

Till today the Palace from time to time hosts city events ranging from furniture and food fairs to art expositions, but outside of those times, the complex stands disregarded.



Palazzo delle Esposizioni exhibition hall during the PaviArt contemporary art event.

<https://www.paviart.it/foto-video>

¹²."Architettura in Lombardia dal 1945 ad oggi", Lombardia Beni Culturali, 2015, <https://www.lombardiabeniculturali.it/architetture900/schede/p3010-00276/>

F. RESIDENTIAL HOUSES *along Naviglio*



Construction year: around 1900-1950
Typology: Residential
Status: in use

The courtyard buildings along the canal were built as typical workers' houses: during the functioning of Naviglio, they served as the residents for the canal's staff. The buildings all face Naviglio and are two or three-storey-high. The circulation of some of them is defined by balcony access, named Case a Ballatoio, which was typical for North Italy at the beginning of the 1900s, following the need to create low-cost and standardised housing.

The houses located in immediate vicinity to the Confluence were hosting the function to the utility of the port: workshops and storages. Today the houses are converted to the small condominiums.

G. ROGGIA CARONA *moat outside the Spanish wall*



Typology:

moat / canal

Function:

discharge channel

Status:

neglected

The small canal, named Roggia Carona or Carona fuori le Mura, but also known by Pavians as *Taiòn* (meaning the cut in the local dialect), was a historical moat of the area, signing the presence of the Spanish Wall, the flow of the river Carona outside the city walls. Carona was a group of streams that historically were crossing Pavia already in the 13th century. It was of great use for the agriculture to the north of the city and for the everyday life of the city in general.

The main stream, Carona Magistrale, was arriving from the north and closer to Pavia was divided into several flows: Carona di Strada Nuova, Carona Ospedale S. Matteo and others. One of them was Carona fuori le Mura which was serving as a moat outside the city's walls and bringing its waters into the Ticino river. Originally it was a single stream passing inside the perimeter of the city's walls, but in the 15th century, it was divided by adding the outside ditch, which was taking water from the Castle's moat.

Later, with the construction of Naviglio, the Roggia Carona began serving as its discharge canal, helping manage the level of Naviglio in case of spillover of excess water, as in case of the intensive rains. Today the canal is in neglected conditions and appears to be entirely forgotten - it's covered by intensive vegetation and with various types of debris and waste scattered everywhere.

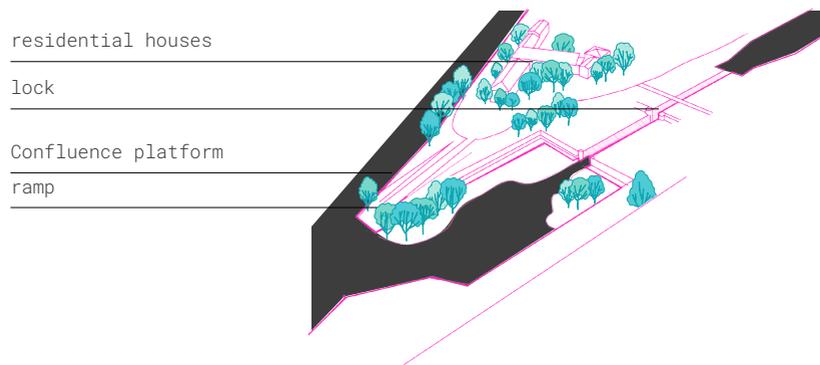
H. NAVIGLIO AND CONFLUENCE *meeting point of the canal and the Ticino river*



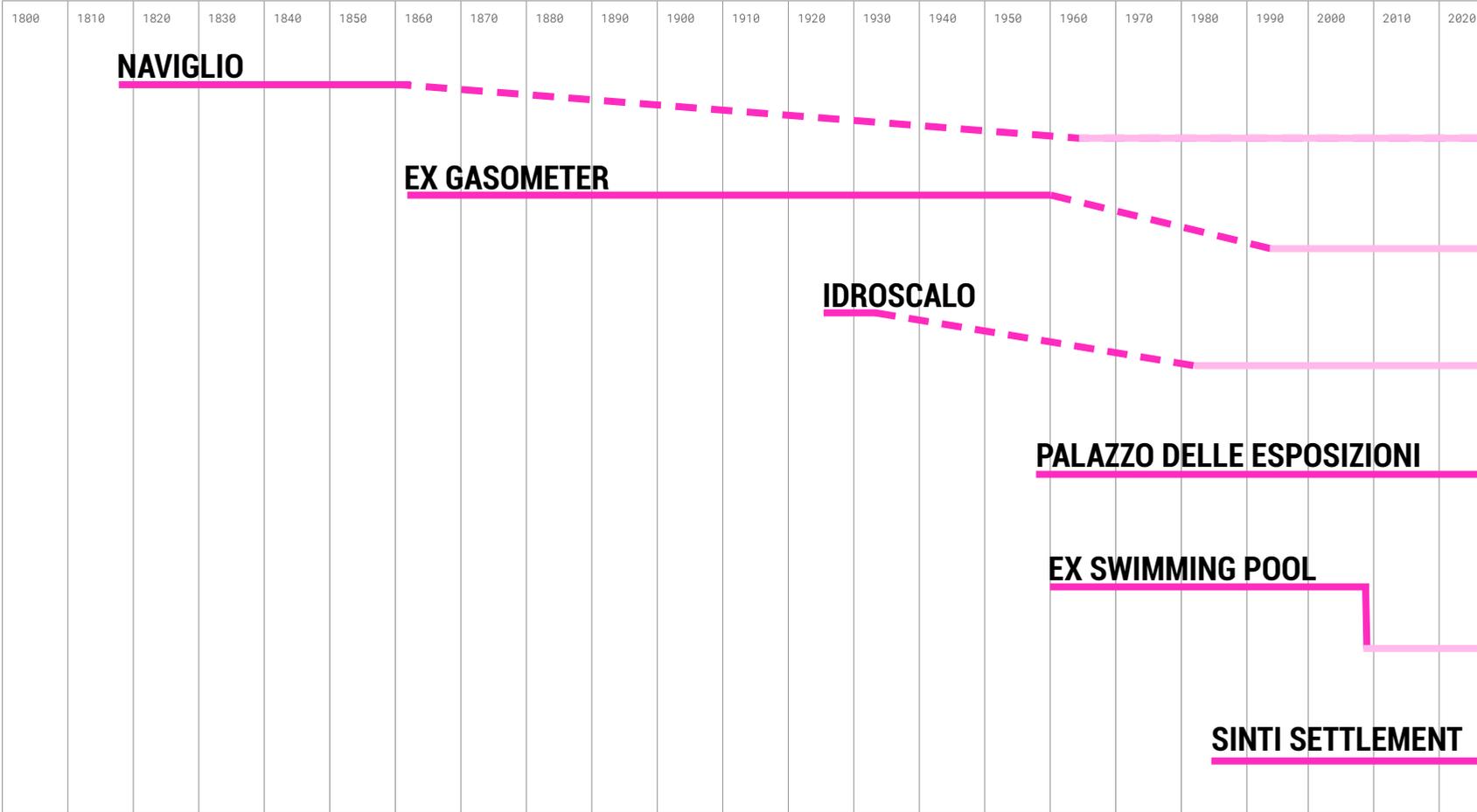
Construction year: 1819
Typology: canal
Function: irrigation channel

The last basin of Naviglio stretches for about 550 meters. The last lock, named Conca del Confluente, allows crossing the level difference of 3.30 metres, before reaching its terminal point, flowing into the Ticino. The lock represents a great hydraulic achievement of its time.

During the functioning of the canal, the area of the Confluence was functioning as a port area for Ticino and Naviglio. The closest buildings were hosting the warehouses and services for the maintenance of the boats.

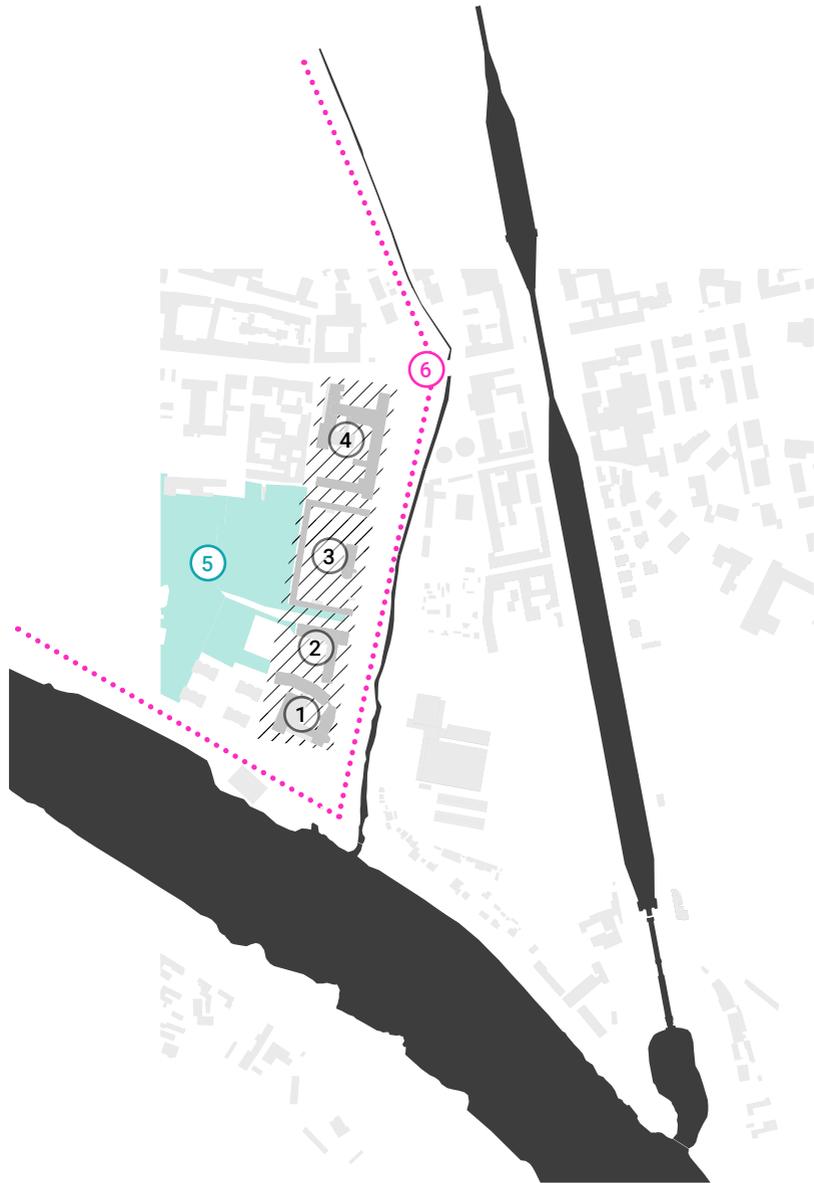


3. TIMELINE - LENGTH OF USE AND DISUSE



- USE
- PROCESS OF DISUSE - in case of gradual decrease in the uses until the full stop
- ABANDONMENT

4. NEIGHBOURING CONTEXT

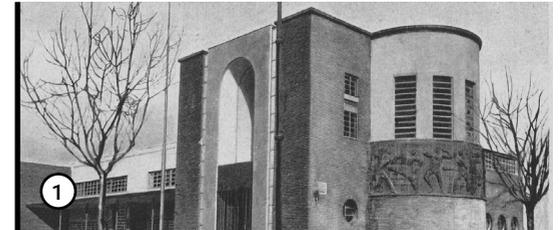


A. FASCIST ERA BUILDINGS

Casa del Balilla



Caserma della M.V.S.N.



Comando della G.I.L.



Bordini Institute

B. OTHER ELEMENTS

⑤

Borromeo Gardens

⑥

Trace of the Spanish Wall

A. FASCIST ERA BUILDINGS

The west front of the Viale Resistenza is characterized by the presence of Fascist buildings built during the 1930s. The large empty area formed by the dismantling of the Shooting Range to the east of the city centre gave space for the construction of the Fascist Ensemble, creating the "showcase" of the Regime. The buildings are representative of the Rationalist movement, that at that time was encouraged to express the messages and values of Fascist ideology. A large number of public works was completed in the course of the rule, intended to gain consensus among the society's lower classes, while also enforcing social control.¹³ The particularity of those buildings was reflected in the construction of new typologies characteristic to the Fascist Regime, such as Casa del Balilla and Comando della GIL, that had as its purpose to create and shape the youth according to the values of Mussolini's Italy.¹⁴ Nowadays, the ensemble create institutional and educational sector in the fabric of Pavia.

① Casa del Balilla

Built in 1934 by the engineers Carlo Alberto Sacchi and Carlo Felice Zanetti. Designed for the meeting, indoctrination and physical education of young fascists, the complex is equipped with large spaces, reception halls and a notable gym. Among the four buildings is the most prominent example of monumentalism. The facade is characterised by a semicircular body with an impressive litho-ceramic bas-relief that reproduces athletes in action made by sculptor Giuseppe Ursi, underlining its propagandistic message. Nowadays the structure houses the Le Vele Foundation, which implements guidance, training and work accompaniment services that aim at the professional development of the person.



② Comando della G.I.L

The last of four buildings completed in the 1940s, designed by Engineer Eliseo Mocchi as the headquarter of G.I.L command, standing for Gioventù Italiana del Littorio - Italian Youth of the Lictor, the unitary and totalitarian movement of the Fascist Party with the scope of increasing



spiritual, physical and military preparation of youth according to principles of the ideology. The building consists of two perpendicular solid volumes with an exposed brick facade and a monumental stone cladded entrance and was designed to connect with the Casa del Balilla, forming single architectural complex.¹⁵ It is currently the seat of the public Cardano College.

③ Caserma della M.V.S.N.

Inaugurated in 1935, the building was designed by engineer Giacomo Gara with various collaborators, adhering to rationalist forms with strong visual impact. The building consists of a two-storey U-shape body, creating a big courtyard and an entrance building accentuated by a 23-meter tower that resembles the prow of a ship. The complex was housing the headquarters of Voluntary Militias for National Security and anti-aircraft command, today it is the headquarter of the local police.



④ Bordoni Institute

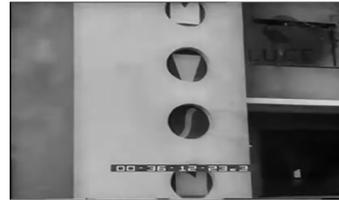
A functionalist building of the Institute was the project presented by Architect Mario Ridolfi with the collaboration of Wolfgang Frankl for the competition announced for the occasion. Built with specific attention to the didactic function, all rooms are arranged planimetrically with attention to the problems of lighting, exposure and practical distribution. It is still used today as a high school, intended for courses for accountants and tourist experts.



¹³. Vittoria Prina, *Pavia moderna. Architettura moderna in Pavia e Provincia 1928-1980* (Pavia: Cardano Libreria Ed., 2003)

¹⁴. N: Milena Vico, "Viale Città di Fiume e Viale Belgio Testimoni del Ventennio a Pavia", in *Guida Breve all'Esposizione Metafisica dello Spazio: Architettura e Scultura nella Pavia tra le Due Guerre* (Busto Arsizio: Nomos edizioni, 2022)

¹⁵. Davide Tolomelli, "Architettura a Pavia tra le Due Guerre", in *Guida Breve all'Esposizione Metafisica dello Spazio: Architettura e Scultura nella Pavia tra le due Guerre* (Busto Arsizio: Nomos edizioni, 2022)



B. OTHER ELEMENTS

5 Borromean Gardens

The gardens belong to the Collegio Borromeo, a private university, founded in the 16th century, and recognised as one of the oldest merit-based educational institutions in Italy still in operation. The palace built in mannerist style is surrounded by gardens, built on the land that was acquired as a result of the demolition of a church and on the areas that once belonged to convents. The gardens consist of three parts with distinct styles, reflecting the aesthetics of the eras in which they were built. The Italian one was, positioned to the east designed in the 16th-17th century, characterised by symmetrical configuration and central axe, lined with low hedges, culminated by a baroque fountain. The English garden completed in the 19th century has an irregular arrangement, reproducing the romantic aesthetic with a "natural" effect. The rest of the green area, known as *orti* (vegetable gardens), was conceived as a buffer area, isolating the gardens from the rest of the urban environment.

The gardens represent the largest green oasis in the centre of Pavia, stretching for three hectares and comprising meadows, centuries-old trees and an small artificial lake. But currently the green area isn't openly accessible to the wider public, the visits can be done only with guided tour to Italian garden. There are plans in place for opening the Borromean Gardens for the city's use, being part of the Horti project, which also proposes to host there the works of contemporary art and a diverse programme of activities.¹⁶



The view of the Italian style garden and the *orti* area

Source:

<http://www.collegioborromeo.it/it/almo-collegio-borromeo/visita-il-collegio/>

¹⁶ Almo Collegio Borromeo, "Horti," accessed on June 15, 2022. <http://www.collegioborromeo.it/it/en/horti/>

The visit of Benito Mussolini to Pavia. November 11, 1936.

1. Inaguration of Bordoni Technical Institute.
2. Caserma della M.V.S.N.
3. Casa del Ballila.

Arturo Gemmiti, "La visita di Mussolini a Pavia", November 11, 1936, video, 5:25, Archivio Luce. <https://patrimonio.archivioluca.com/luce-web/detail/IL5000026439/2/la-visita-mussolini-pavia>

5 Trace of the Spanish Wall

Pavia's urban structure and its identity till now are closely linked to its fortifications, although they are not existing nowadays, the traces are still visible or legible today. Those defensive constructions deeply shaped the urban grid, developing a deep system of interaction between city, population and history. The presence of a military defence system goes back to the foundation of the city by the Romans and evolves through the Middle Ages and the Spanish domination. This resulted in the alternate existence of three different layers of fortification around the historic centre during the city's development.

The origin of the first fortified wall system of Pavia dates back to its foundation as Ticinum, a Roman colony, in the 1st century BC. The traces of those walls, while not present physically anymore, today strongly characterise the morphology of the historic centre: the castrum has determined the development of city blocks, conforming their arrangement along the two main axes (cardo - decumanum) and with the connecting lines to the outside, one of which was the bridge over Ticino. The second walls, the "gothic", were

erected starting from the 10th century AD, it was characterized by a plan with crenellated defence towers and bridges for the passage over the ditches, developed on a polygonal path that deviates notably from the regular Roman layout to incorporate the medieval development of the urban blocks.¹⁷ The architectural and urban interventions applied since Middle Ages have implemented methods and choices of expansion of the city, sacrificing the conservation of the ancient roman traces with the construction of a new "Gothic" enclosure, which neither survived till nowadays - it only presents through some of its monumental gates remaining, the rest is retraceable only hypothetically.

The third and the last wall, commonly named the Spanish wall, was a bastion fortification. Its construction started in 1506 by the French, but the extensive defensive system with 12 bastions was done by The Spanish later in 1560. Today those walls are the ones that profoundly affect the city's organization: they are an essential element of urban structure, as a limit between the city and periphery.

Starting from the 18th century the Spanish walls had been losing their original military defensive function, but the active demolition started only in the 20th century and was justified by the need for expansion of the city and prioritising the transport circulation over wall preservation. Those urban development policies have created radical changes in the system of the historical centre. In 1905, during the construction of the external southeast ring road, large tracts of ramparts were destroyed, opening the city towards the river. The demolition soon spreads also to other parts of the wall, resulting in the deprivation of the historic centre of its architectural borders.

With this process of historical loss, some portion of the wall survived only punctually within the urban fabric, represented mainly by some of the gates and ramparts, heavily undermined by neglect and by the state of abandonment of these monumental sites.



The trace of Spanish wall (pink) and Roggia Carona moat (blue).

¹⁷. Raffaella De Marco, Sandro Parrinello, "Le Mura di Pavia: Sistemi Digitali di Modellazione Virtuale per la Valorizzazione Urbana dei Resti delle Cinte Fortificate" (conference paper for FORTMED, Alicante, 2017)



II. URBAN ANALYSIS OF THE AREA

LIMITS

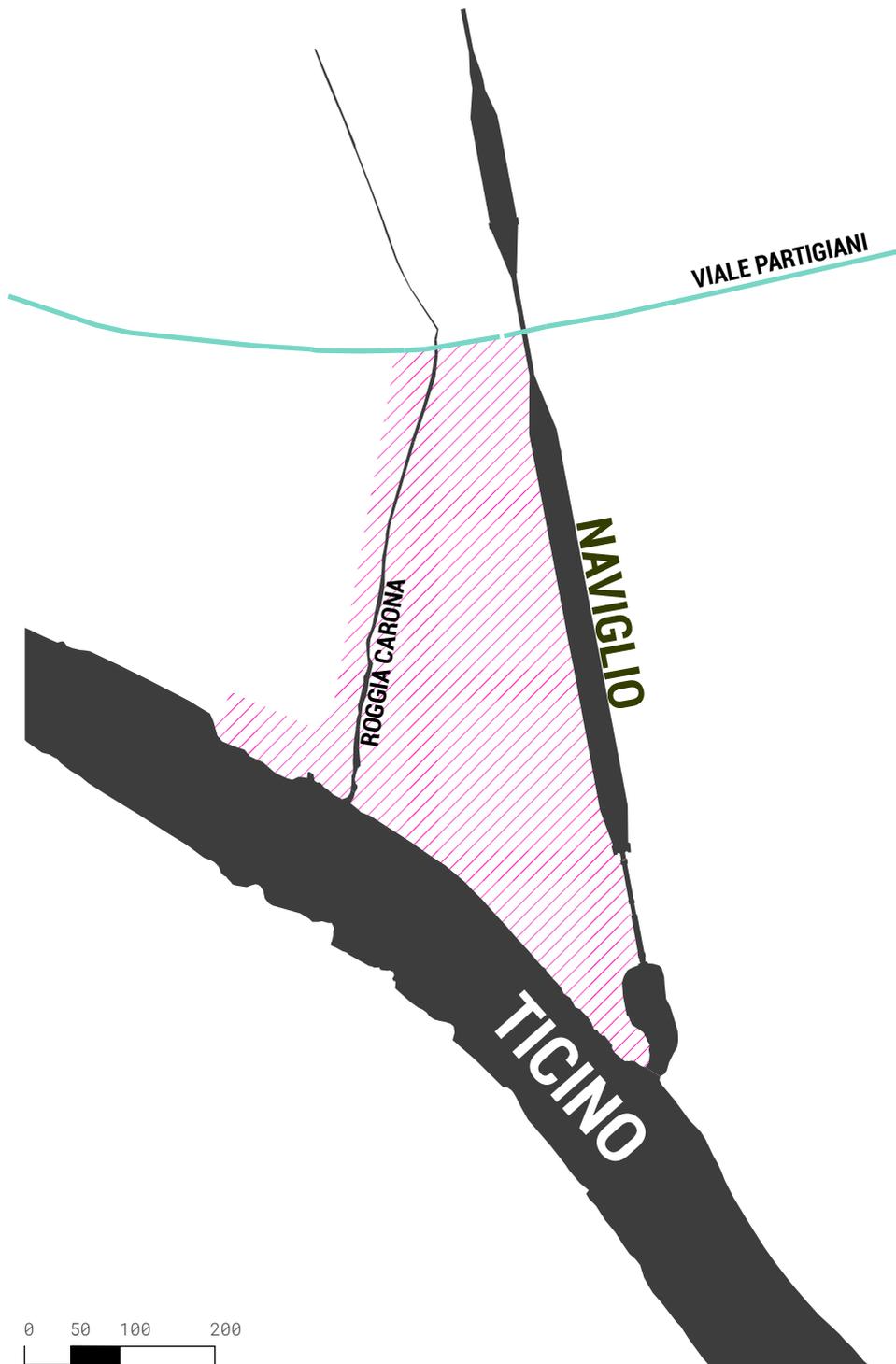
FIGURE-GROUND PLAN

HEIGHT DISTRIBUTION

SYSTEM OF GREEN

VIABILITY

SOFT MOBILITY NETWORK



1. LIMITS:

The area, morphologically similar to a peninsula, is delimited by water on three sides.

The south border is the most evident one and impenetrable, it's the Ticino river. On the east, the Navigli canal represents the limit, which is also perceived as almost pathless, because the points to pass to another site of the canal are few: two to the outermost edges of the area.

The layout of the Spanish wall delineates the Western limit - the old city wall that is not present today but still defines the city centre of Pavia. However, the outer ditch with a water stream is still present and reminiscent of another physical border that was existing.

To the north, the area is defined by Viale Partigiani, a busy road and the east entrance to the city centre, and the place where the city's door Porta Garibaldi stood, till the 19th century.



Area



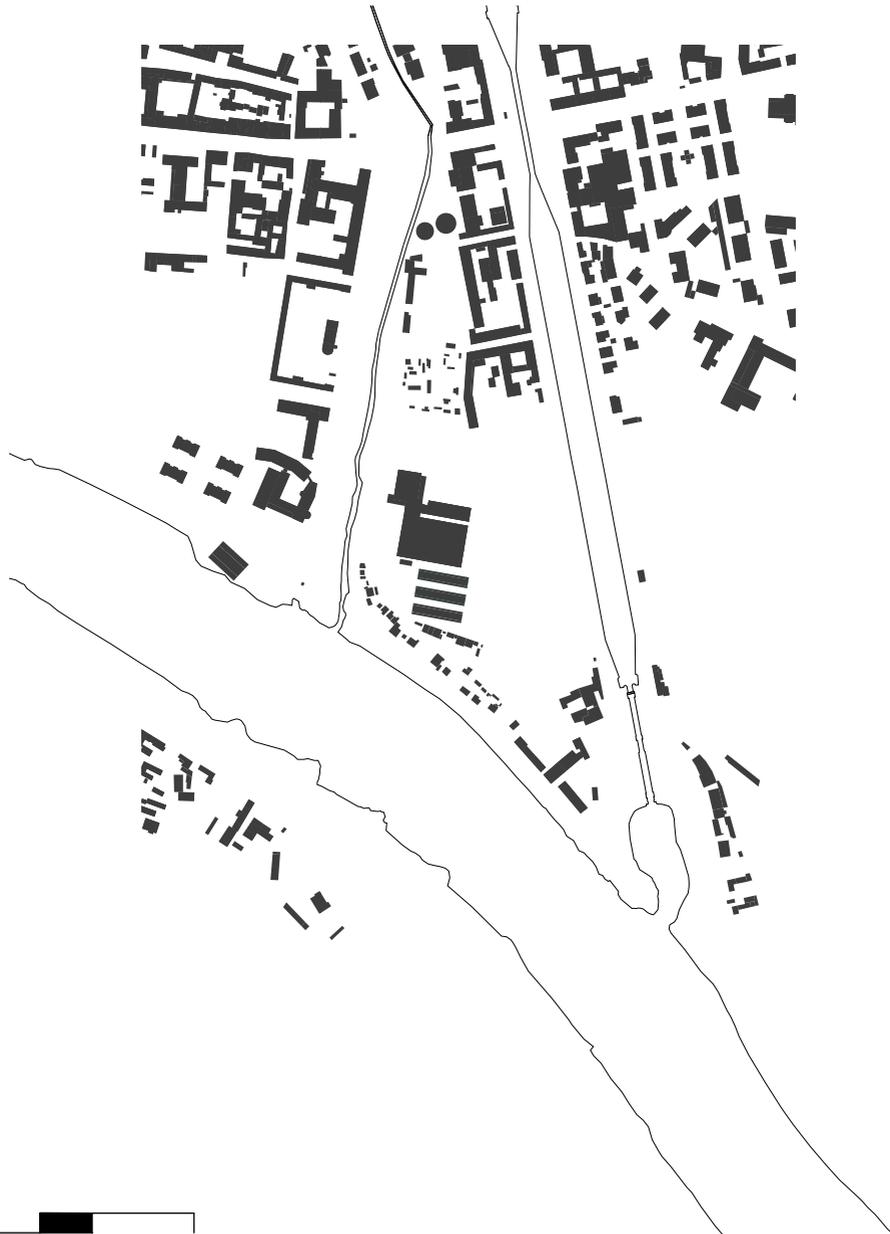
Street



Water

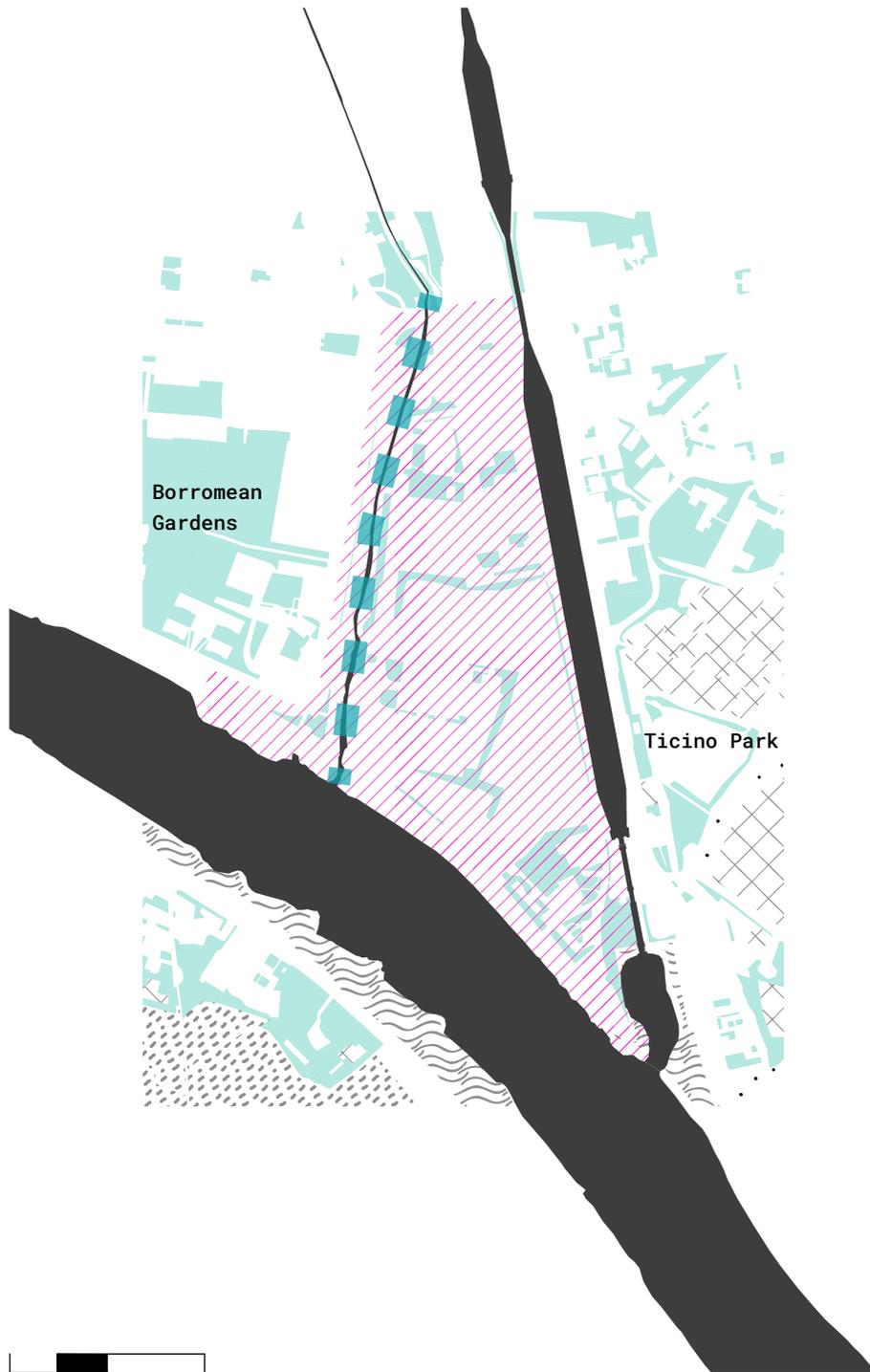


2. FIGURE-GROUND PLAN:



3. HEIGHT DISTRIBUTION:





4. SYSTEM OF GREEN:

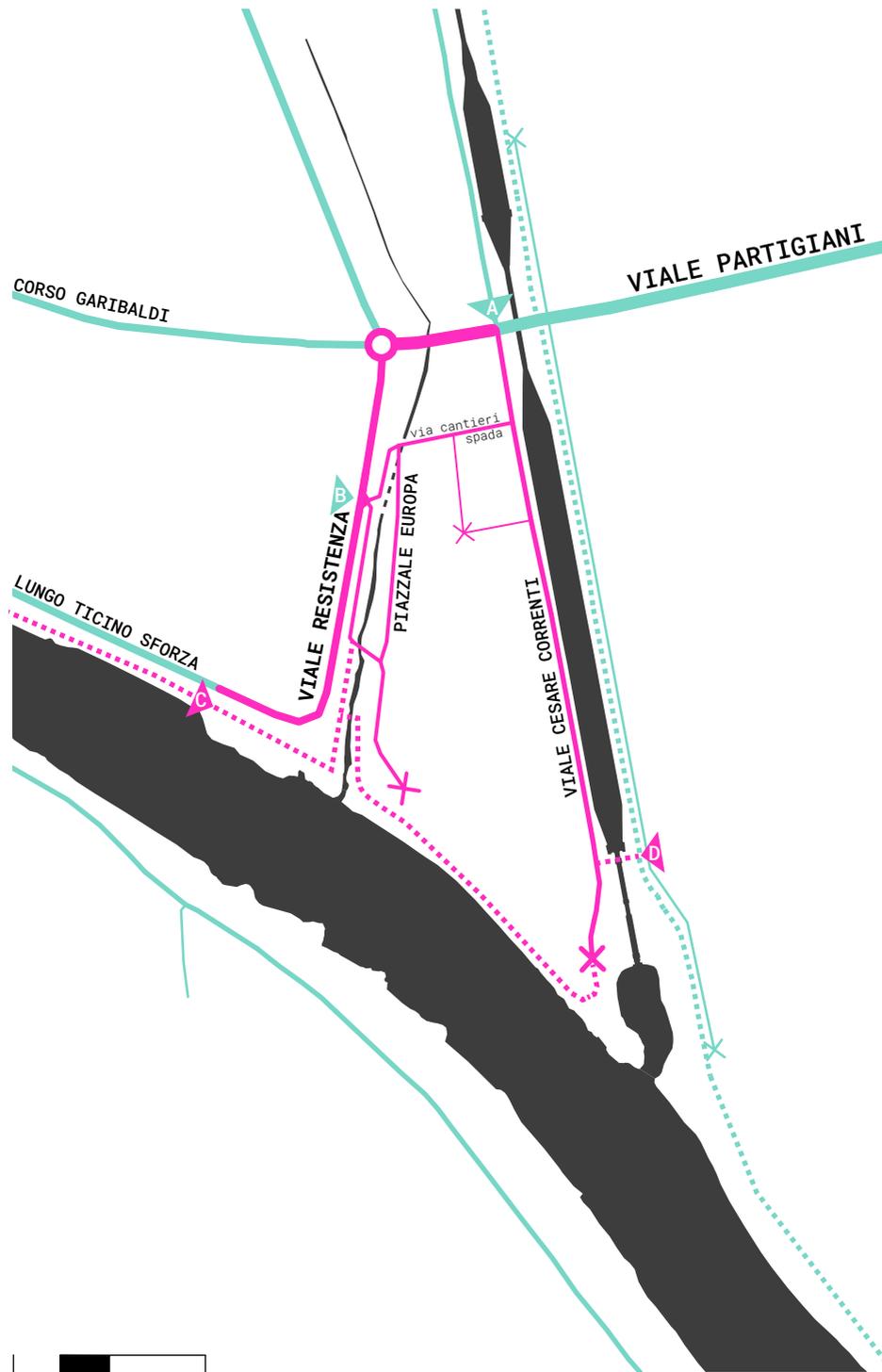
Even if the area seems to be abounded with greenery from the aerial view, most of those urban green spaces are private and aren't openly accessible. Like Borromeian Gardens, which is the biggest park inside the perimeter of the Spanish Wall, up to today this garden is not accessible to the broad public, but there are plans in place of opening it to the city in the future.

On the other side of the Navigli one can strongly feel the limit of the urban and the beginning of the rural environment: from now onwards continue the vast agricultural fields, the area of Ticino Park.

The area itself has a green corridor represented by Roggia Carona - the remnant of the city's wall moat, but which today results in being disused and inaccessible. A sort of "terzo paesaggio", as defined by Gilles Clément " - an undecided fragment of the Planetary Garden - designates the sum of the spaces where man abandons the evolution of the landscape to nature alone",¹⁸ which includes also neglected and abandoned zones.

¹⁸. Gilles Clément, *Manifesto di Terzo Paesaggio* (Macerata: Quodlibet, 2018).

- urban greenery
- agricultural forests
- agricultural lands
- riparian formation
- green corridor



5. VIABILITY:

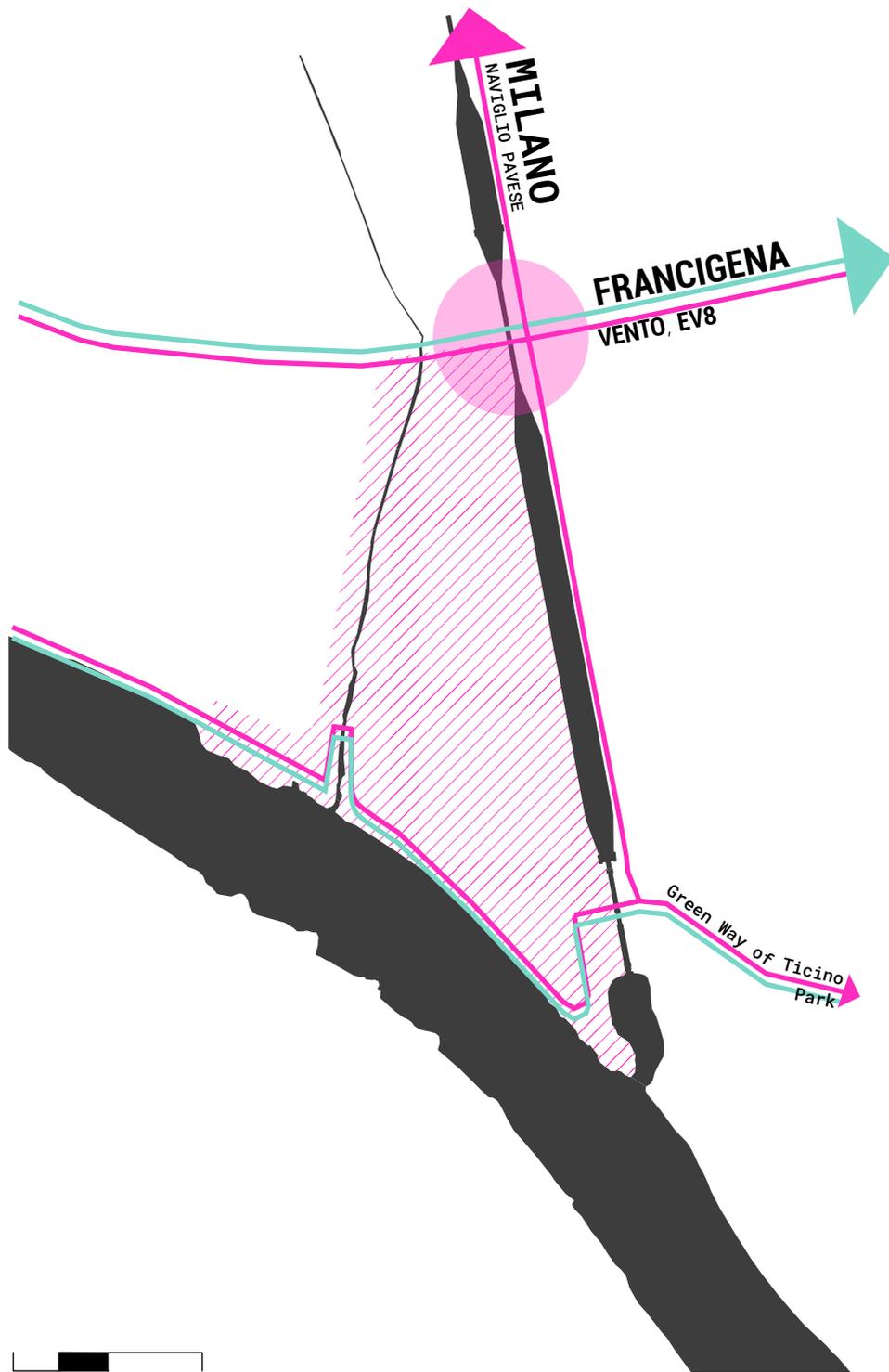
The viability of the area is mainly defined by two axes: Viale Partigiani and Viale Resistenza, both are busy and important roads for the circulation system of Pavia. Viale Partigiani is one of the main axes to and out of the city, serving as a link with the east. Here access to area (A) is allowed by a street laying parallel to Navigli named Viale Cesare Correnti.

While Viale Resistenza is one of the streets, that connecting together with Lungo Ticino Sforza and Viale della Libertà, creates the ring road around the city centre, reminiscent of the City Walls. From the western side, vehicle access is allowed at one point in the middle of Viale Resistenza (B), which then splits towards the north and the south, creating ramps necessary to reach the area, because of the topographic differences. The section going in the north direction (1) descends rapidly towards Ex Gasometers. The one going south (2) creates a sort of “controviale” that bridging Carona ditch reaches the entrance of Palazzo delle Esposizioni.

The third entry (C) is from along the Ticino river and it is accessible only to pedestrians and cyclers.

The internal circulation of the plot results is quite limited. Besides the Viale Cesare Correnti allowing circulation along Navigli to the east side of the area, and Piazzale Europa to the west, there is only a small street Via Cantieri Spada connecting the two.

- Streets
- Streets in the area
- Pedestrian/bicycle path
- Vehicle access
- Pedestrian/bicycle access
- Stairs

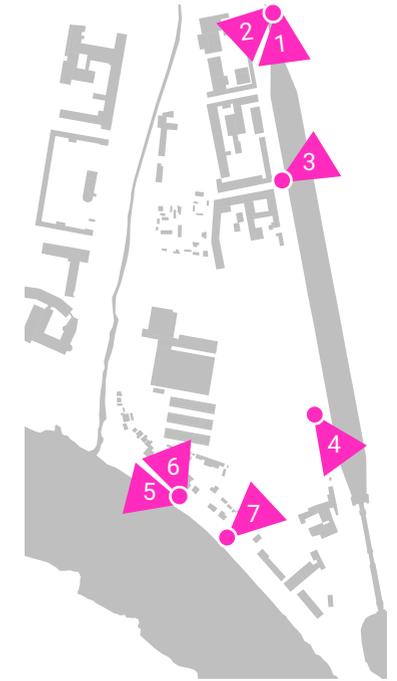
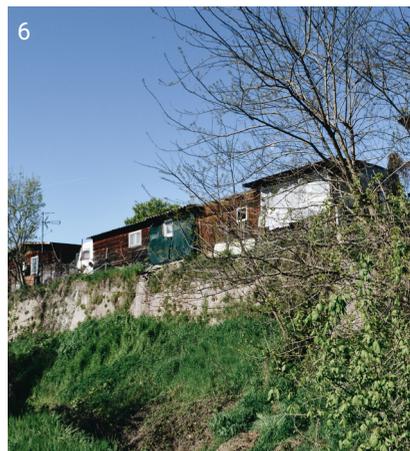


6. SOFT MOBILITY NETWORK:

The area of ex Porta Garibaldi, which once was the main eastern gateway to the walled city, today continues to perform the role of an entry point to the urban centre. The same is also true for the territorial soft mobility network, which consists of long and medium-distance pedestrian and cycle routes. As seen in the analysis of vectors of Pavia, the node here creates an intersection between Naviglio cycle paths, that is destined to become soon a part of VENTO, and the routes that continue their way towards the east and the south of Italy (Via Francigena, VENTO). Along the course of the river, the routes are characterised as greenways of Ticino park, exploring the local landscape and biodiversity.

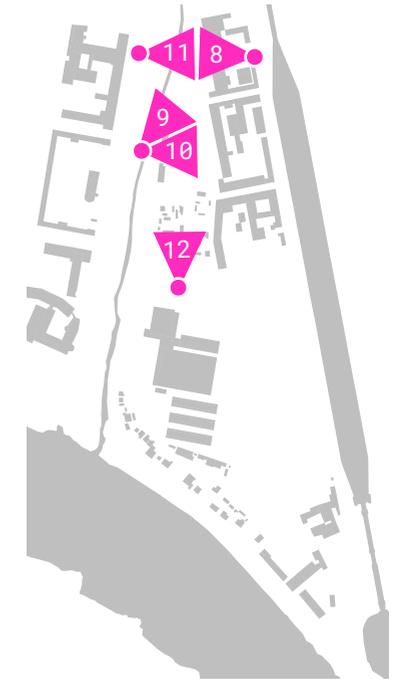
— Pedestrian route

— Cycling route

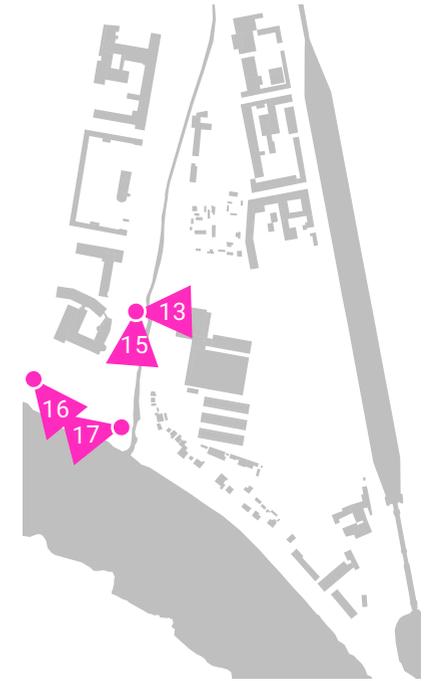


7. PHOTOGRAPHIC RECORD

1. The final basin of Navigli
2. Ex Gasworks complex
3. Residential houses to the other side of Naviglio
4. The stretch before the final locks and the Confluence
5. The cycling path along the Ticino
- 6 & 7. Informal houses of the "nomad camp" overlooking the river



- 8. The courtyard of the Gasworks
- 9. Ex Swimming Pool and Gasholders
- 10. The entrance of the Swimming Pool
- 11. Gasholders and the gas workshops
- 12. The Sinti settlement near the Swimming



13. Entrance to the Palazzo delle Esposizioni

14. The Exhibition Hall

15. The rests of the Spanish Wall along the Roggia Carona moat

16. Idroscalo's East facade

17. Idroscalo's West and North facades

Part four: Naviglio - Infrastructure



The lock of Naviglio Pavese

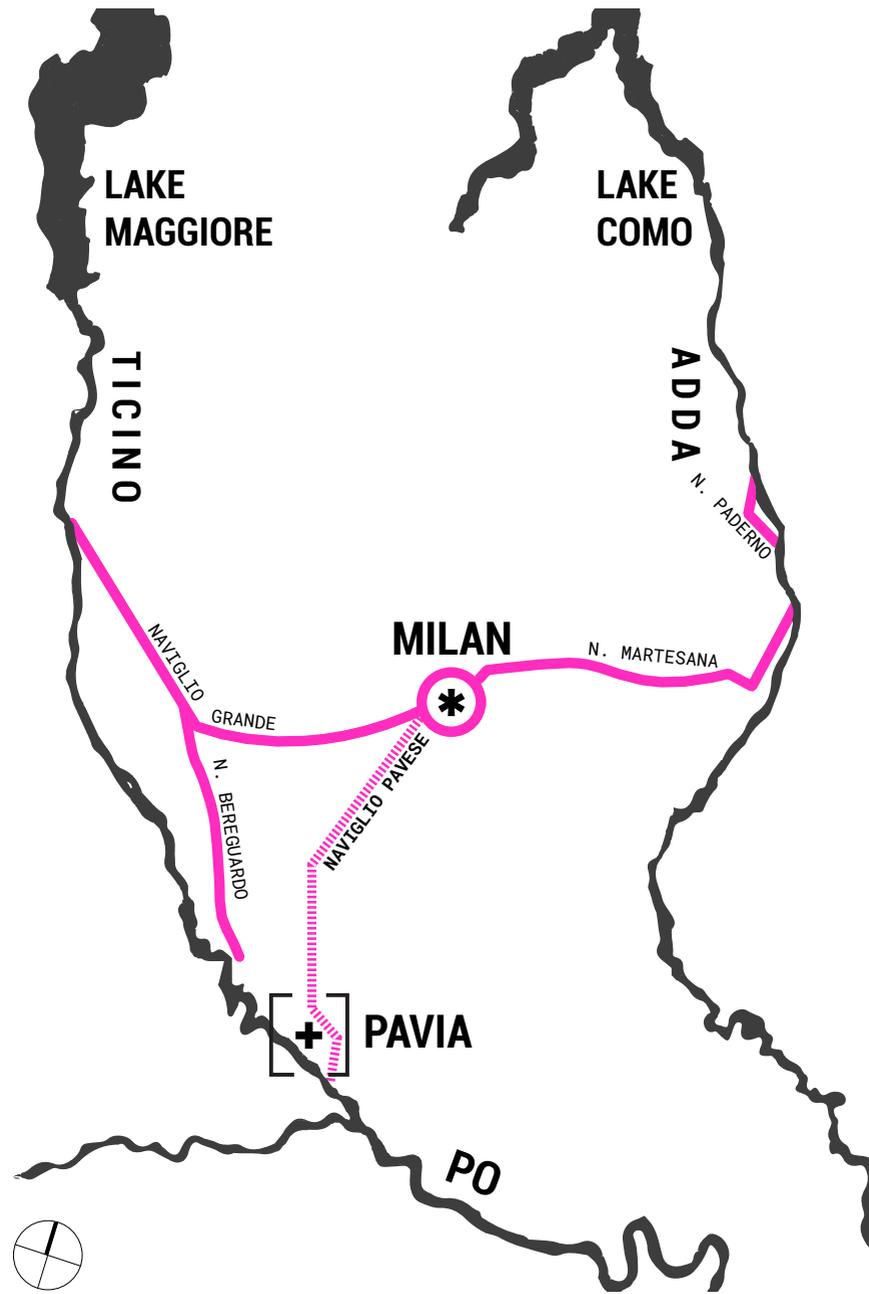
Giampietro Agostini , *Naviglio di Pavia: Pulizia del canale in Pavia*,
Musei Civici di Pavia (1960),

<https://www.lombardiabeniculturali.it/fotografie/schede/IMM-LOM60-0006545/>

Naviglio (from lat. *navigium*) - Artificial canal with a fairly high flow rate, capable of being navigated and also used for irrigation, which usually originates from a river and runs out in a dock or discharges into the sea. The name is a northern usage voice, which can be found in particular denominations as a proper name.

Treccani, s.v. "naviglio2"

<https://www.treccani.it/vocabolario/naviglio2>



System of Navigli in the XIX century

source: [https://it.wikipedia.org/wiki/Navigli_\(Milano\)#/media/File:Navigli_XX_secolo.png](https://it.wikipedia.org/wiki/Navigli_(Milano)#/media/File:Navigli_XX_secolo.png)

1. SYSTEM OF NAVIGLI

The system of Navigli is a remarkable hydraulic infrastructure which began to be formed in the 12th century in Lombardy and its construction spanned over 5 centuries. The system, which resulted in the construction of 5 canals, shaped the territory, permitting inland water connection to the city of Milan and playing an important role in the regional development in general. It represents the heritage of Lombardy and creates a cultural landscape: these hydraulic works of great technique and ingenuity have historically structured the settlements and countryside, playing a decisive role in the economic and social development of Lombardy. These signs of territorial history together with the valuable naturalistic environmental contexts, constitute valuable elements to be safeguarded and enhanced.

Started as an infrastructure for irrigation and defensive or military purposes, later it was made navigable and acquired **commercial function**, using the canal to take salt, grain, wine, and manufactured goods upriver to Lake Maggiore. While in the other direction, during the construction of the Duomo of Milan, the boats were bringing the marble from Candoglia to Lake Maggiore. The canal was from those times of fundamental importance for the development of the economic and military power of Milan, and Lombardy in general.

Over the centuries, the channel system expanded, creating a network of different *navigli* that allowed Milan to have a better and more efficient connection to the water system of Italy and Europe. But it has had other several crucial functions: irrigation, defence, and it was used for supplying mills and transporting people and goods. In total there were 5 *navigli* built, out of them three were reaching the city, so that the urban environment of Milan became strongly characterised by the canals, constituting the network connected around the historic centre by a circular moat, the so-called Cerchia dei Navigli.

EVOLUTION OF THE NAVIGLI SYSTEM

The development of the artificial canals of Milan started in the 12th century with the construction of *Navigium* (now became Naviglio Grande), a 50km long canal connected with the waters of Ticino - one of the oldest artificial canals in Europe.

	Naviglio Grande	Naviglio di Bereguardo	Naviglio Pavese	Naviglio della Martesana	Naviglio di Paderno
year of start and finish of works	1177-1272	1460-1470	1359-1819	1457-1497	1518-1777
length of the canal	50 m	19 m	33,3 m	39 m	2,7 m
min and max width	12/50 m	10/13 m	11/29 m	9,60/18m	11/12,7 m
average width	20 m	11 m	12 m	12 m	11 m
total gradient	34 m	24 m	56,5 m	18 m	27,5 m
number of locks	-	11	12	1	6

Source: Direzione Generale Territorio, Urbanistica, et al, *Piano Territoriale Regionale d'Area Navigli Lombardi*, (document of the plan, 2020).

At the end of the 1920s started the process of their covering: channels were seen as unhygienic and as an impediment to the city's viability. As a result, several canals were closed, with only the Naviglio Grande and Naviglio Pavese, located in the South of the city, being left open. Time changed, and now there is a popular opinion about canals as a benefit for the urban environment, as in the case of the two remaining Navigli in Milan, which together create an enjoyable neighbourhood loved by people for its lively environment. There is a project for the restoration of the water network led by the Association "Riaprire i Navigli", which even made a "referendum" of the local population, receiving strong support to the idea of reopening the system. The preliminary studies showed that the recreating of Cerchia dei Navigli is possible from a technical point of view, and it could benefit greatly the city of Milan, bringing back its identity of "The City of Water", environmentally, economically and socially.¹ With the local public support the project made its way to the Municipality's tables and then it in the Municipality City's Plan. The project is acknowledged to have several strengths, such as urban quality improvement, increase in soft mobility, and attractivity for new commercial and recreational activities.²

The rehabilitation of the Navigli in the eyes of the population of Milan is very prominent. As was mentioned before the

main problems of channels were their hygiene concerns and vehicle viability problems. But since then there were drastic changes in the conditions of the urban waters and urban environment: when in the last centuries there were happening unregulated discharges of wastewater, making the environment not pleasant and hygienically unsafe, today's city water, especially in the case of specific treatments, are usually cleaner. The viability too started to be seen from a different perspective: while the access of vehicle transport before was often privileged, nowadays the development of soft mobility becomes a priority topic for the communities.

For the participation of Milan in the EXPO2015, there was a renewed attention given to the regeneration of the Navigli system, since the area of the Expo itself had been planned to be connected to it by re-establishing historical channels. The document that embodied the aspirations for regeneration of Navigli was the regional plan PTRA "Navigli Lombardi", which was aiming not only on restoring the navigability of the channels but also on developing a soft mobility system and conserving the cultural landscape created by the canals in Lombardy. The cultural legacy of Navigli today is acknowledged more than ever: in 2019, the Region announced it would submit the application for the inclusion of the System of Navigli on the UNESCO World Heritage List.³

1. Navigli reloading, "Riaprire i Navigli: il progetto", accessed on May 16, 2022, <https://naviglireloading.eu/riaprire-i-navigli-a-milano/>
 2. Ilenia Mariotti, and Patrizia Riganti, "Valuing urban regeneration projects: The case of the Navigli, Milan", City, Culture and Society 26,(2021).
 3. Giambattista Anastasio, "I Navigli come patrimonio Unesco", Il Giorno, February 26, 2019, <https://www.ilgiorno.it/milano/cronaca/navigli-patrimonio-unesco-1.4462583>

PTRA 'NAVIGLI LOMBARDI'

"Navigli Lombardi" - Regional Territorial Area Plan (PTRA) of the Lombardy region was first approved in 2010 and since then was selected by the Directorate-General for Regional and Urban Policy of the EU Commission as one of the eight best practices of multi-level governance. Described as an innovative instrument with an active participatory process at various levels and dealing with topics of different types and scales, able to create important territorial synergies regulated through a systemic approach. The original document was created on the occasion of EXPO 2015 and many of the plan's aims are directly tied to the universal exhibition's theme. One of the plan's key objectives is dedicated to the project contained in the EXPO candidacy dossier for the development of waterways that work in conjunction with the canal system, connecting the site of exposition with the Darsena of Milan and creating a "sustainable corridor of waterways and land routes".⁴

The document underlines the historical importance of the Navigli and declares that the five canals should be considered an important element forming the Lombardy regional identity, playing an important role in qualifying the infrastructure of the landscape and economy of the region, used as irrigation channels and as important routes of communication and transport of goods. The plan also pays considerable attention to the slow mobility network, which constitutes a core of the whole PTRA, with the aim of developing new routes and improving the existing ones.

4. Direzione Generale Territorio, Urbanistica, Difesa del Suolo e Città Metropolitana, Piano Territoriale Regionale d'Area Navigli Lombardi, (document of the plan, 2020).



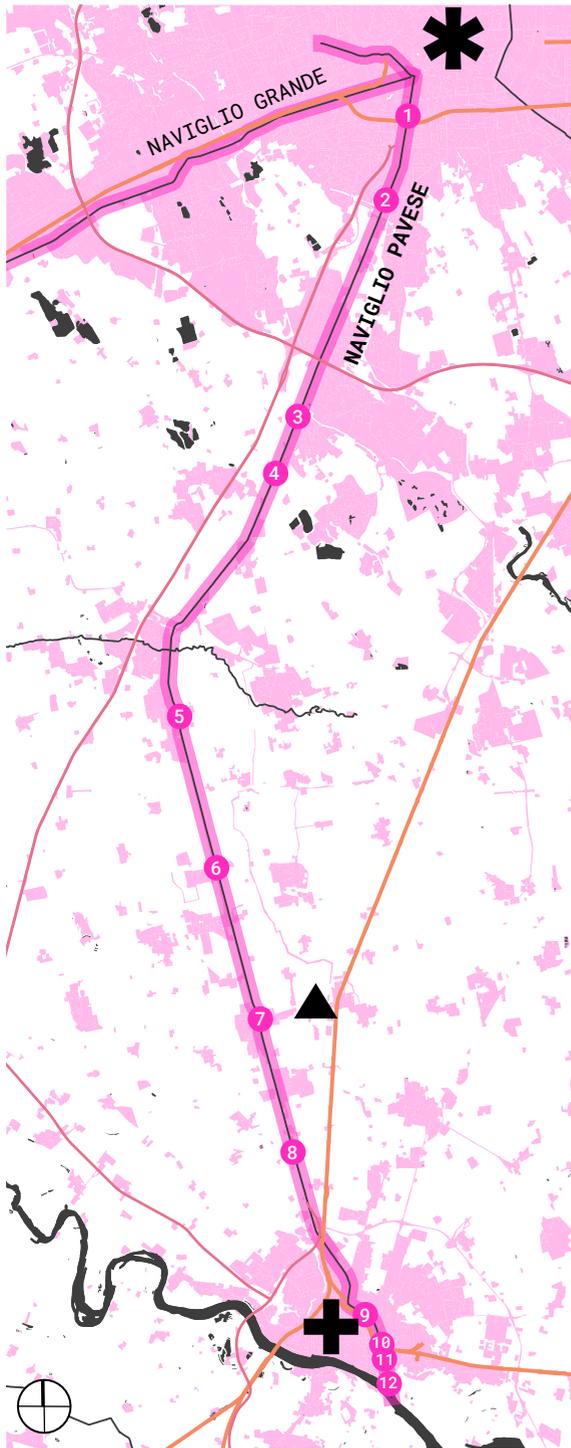
The inauguration of Naviglio Pavese in 1819.

Alessandro Sanquirico, *Veduta della solenne festa ch'ebbe luogo il 16 Agosto...*, (1819).



Layout of the project of recreation of Cerchia dei Navigli.

Ilenia Mariotti, and Patrizia Riganti, "Valuing urban regeneration projects: The case of the Navigli, Milan", City, Culture and Society 26,(2021).



2. NAVIGLIO PAVESE

Construction: 1819
 Length: 33.3 km
 Difference in level: 56 m
 Number of locks: 12

Milan - Pavia travel time



33m



2h



7h

THE LOCKS:

1. Conchetta
2. Conca Falata
3. Conca di Rozzano
4. Conca di Moraiga
5. Conca di Casarile
6. Conca di Nivolto
7. Conca di Certosa
8. Conca di Cassinino
9. Conca di Porto Cairoli
10. Conca di Poligono
11. Biconca di Porta Garibaldi
12. Biconca di Confluente

LEGEND:

-  lock
-  urbanized area
-  railway
-  Milan
-  Certosa di Pavia
-  Pavia



Naviglio Pavese is a regional heritage, but also a disused infrastructure. Its way is an essential physical link between two historically important Lombardian cities: Milan and Pavia. The construction of the canal took many centuries and the completion of the connection was long-awaited, finished in 1819. The current state of the canal and its engineering is decaying over time and is in certain need of action for its preservation.

HISTORY

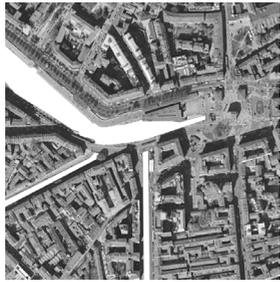
The construction of Naviglio of Pavia, which was supposed to grant the city of Milan faster sea access through the river Po, spanned over many centuries. In the 14th century, the Visconti family had a canal connected to Ticinello serving for irrigation of their vast park near Pavia, intended for hunting and entertainment of the court. The canal, that ran between Pavia and Binasco, couldn't be extended to Milan due to the level difference. Later known as Navigliaccio, it was reused a century later, under the duchy of Sforza, becoming a navigable connection to Ticino. But in a short time, the subsequent neglect and the excessive withdrawals of water made it no longer traversable to the point of no return. But the need for the water connection persisted: in the 17th century during the Spanish reign, there were several attempts to create a new connection with the Ticino river, but despite several attempts, the project had been resulting not finished.

After the arrival of Napoleon, in 1805 he prepared a decree to complete a navigable extension towards the Po and the sea through the Pavese canal. Already under the reign of the Lombard-Veneto kingdom, the waterway was inaugurated in 1819, finally connecting Milan to the sea through Naviglio Pavese and Po. The difference in water levels of around 57m was overcome with the system of locks, named 'le conche', used for raising and lowering boats between stretches of water of different levels on canal waterways.

After completion, Naviglio Pavese, extending over 33 km, temporarily achieved its maximum functionality: the sea was reached via the canal and the Po, while Lake Maggiore via the Naviglio Grande and the Ticino. From 1854 to 1859 there was a regular navigational line Locarno - Trieste, via Milan, Pavia and Venice.⁵ Another aftereffect of the canal, was the accelerated development of the industries along the canal, from Certosa to Ticino. It was favoured by the progress of hydraulics, like mills, capable to produce energy by exploiting the power of water, and as result growing the economy of the province. The arrival of the railway in 1862 led to a significant decrease in goods transported by water. The decline accelerated in the 20th century affected by the progressive increase in the importance of road transport after the Second World War, concluding with the ceasing of navigation on Naviglio Pavese in 1965.⁶

5. "Il Naviglio Pavese" *Navigli Live*, accessed on April,16, 2022, <https://www.naviglilive.it/il-naviglio-pavese/>

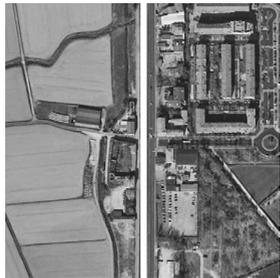
6. Navigli reloading, "Naviglio Pavese", accessed on April,16, 2022, <https://naviglireloading.eu/navigli-lombardi/il-naviglio-pavese/>



Milan, Darsena
0.0 km



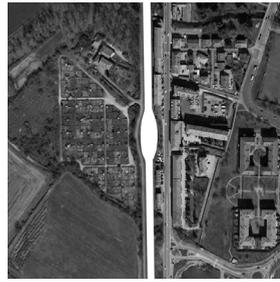
0.53 km



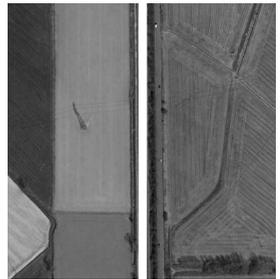
4.43 km



6.67 km



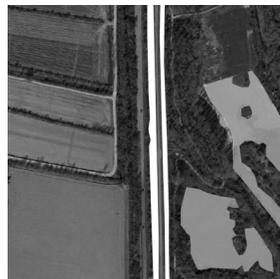
9.29 km



12.64 km



14 km



18.95 km



22.40 km



Certosa di Pavia
23.80 km



25.35 km



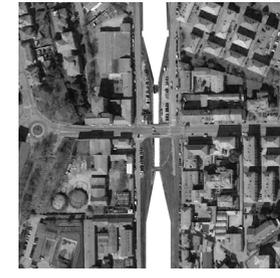
28.86 km



30.20 km



Castello Visconteo
31.15 km



Ex Gasometer
25.35 km



Pavia, Confluence.
33.30 km





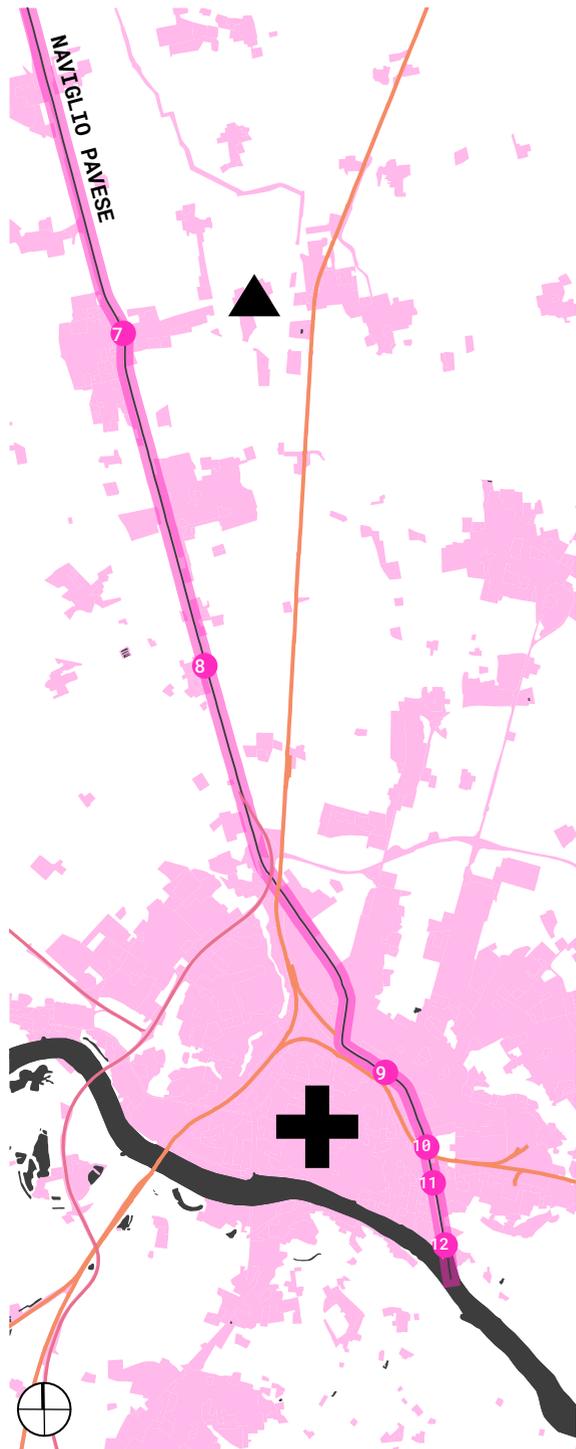
COURSE OF NAVIGLIO PAVESE

The Naviglio Pavese connects Milan and Pavia in just over 33 kilometres, by two almost straight sections, which converge in the town of Binasco. Along its course, the canal passes through a variety of scenery and environments that range from the dense urban fabric and peri-urban areas to rural landscapes and vast agricultural lands with the occasional industries. Parallel to the canal's course, two roads are running on both sides: SS35 dei Giovi and Via Alzaia. The first one is an Italian state road connecting Genoa with Como, while the second is a smaller road shared with a cycle route with lighter traffic.

DEPARTING FROM MILAN

The course of Naviglio Pavese starts near Porta Ticinese at Darsena, a point of its convergence with Naviglio Grande. The area between the two canals, named Navigli, is a lively neighbourhood particularly vibrant in the evenings, full of restaurants, bars and boutiques. Following towards southwest, the canal passes the predominately residential districts, witnessing decreasing density towards the city's outskirts. There the environment becomes peri-urban, defined by fragmented fabric, with the increasing presence of agricultural lands in between the residential, commercial or industrial uses. Crossing over Milan's ring road, the agricultural landscape gradually takes over, interrupted occasionally by little villages.

When reached the small village of Binasco (which marks the border of the Metropolitan City of Milan), Naviglio takes a turn towards the direction of Pavia. Here it meets its antecedent - the canal Navigliaccio, which was built in 1359 for irrigation of Visconti park. The two run parallelly to each other onwards till the north of Pavia, where it curves towards the west of the medieval core of the city, flowing into the Ticino.



FROM CERTOSA - TO PAVIA

LEGEND:

- lock
- urbanized area
- railway
- Certosa di Pavia
- + Pavia



FROM CERTOSA TO PAVIA

The stretch of Naviglio before the arrival to Pavia is characterized by the agricultural and rural landscape and has an important 15th-century national monument that particularly stands out along its course.

Certosa di Pavia is a splendid Lombardian monument, one of the largest monastery complexes in Italy, located 8 km north of Pavia. It was built by the will of the Visconties and included a family chapel, aiming to represent their authority and prestige, competing with other Italian courts of the time.

The Certosa is notable for the richness of its architecture, representative of Gothic and Renaissance styles, as well as its collection of significant artworks. In 1866 declared a national monument, today the complex is one of the most visited monuments of Lombardy.

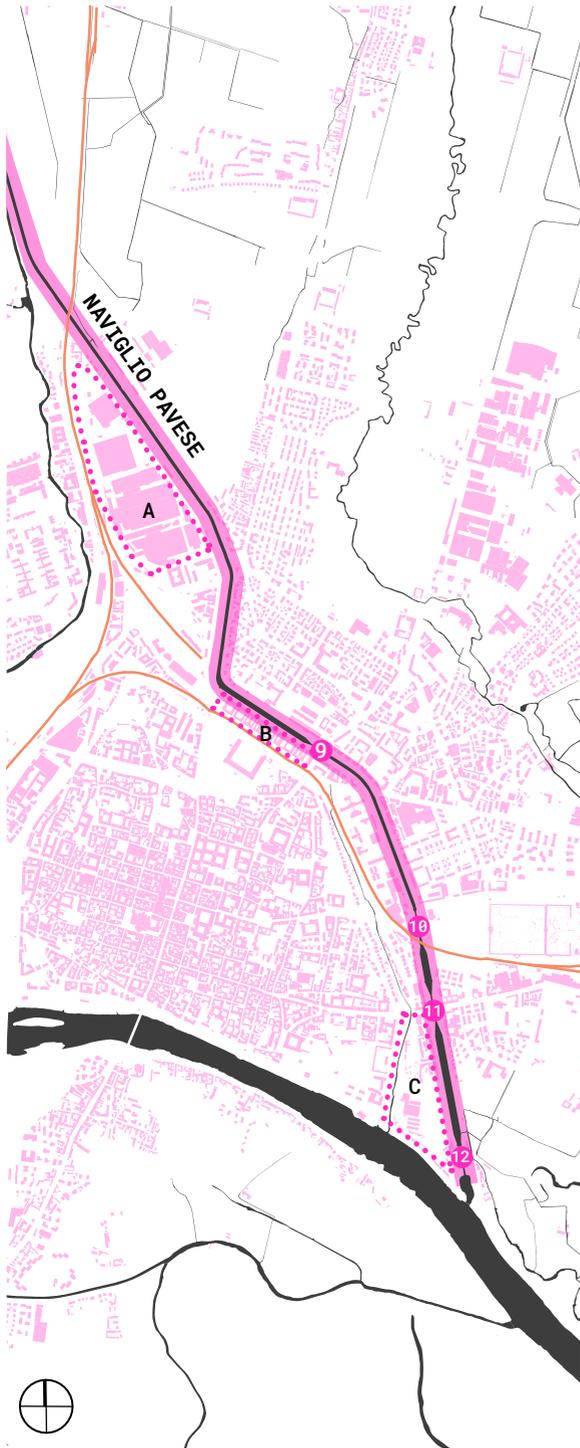
The location chosen for the construction of Certosa was chosen in between Milan, the capital of the duchy, and Pavia, the second most important city at the time, and the base of the court in the Visconti Castle. The fertile lands in between the Monastery and the castle were once a territory of Parco Visconteo - a large 14th-century hunting park, the largest in Europe at the time. It was a property of the Visconti family, intended for the recreation of the court. Extending linearly for 22 square km. Progressively the park became abandoned, conserving till today only few of the original features. The majority of the territory is occupied by agricultural lands, but there are few smaller natural areas left reminiscent of the medieval park, one of them being Vernavola Park - the biggest green area of Pavia.



Certosa di Pavia, aerial view and view from the small cloister.

1. Google satellite photo, 2021

2. Bernardo da Venezia, *Certosa di Pavia Towards northeast*, photograph, Hartill Art Associates Inc, <https://www.jstor.org/stable/community.14665675>



URBAN STRETCH IN PAVIA

LEGEND:

-  lock
-  buildings
-  railway

- A** - Ex Necchi
- B** - Borgo Calvenzano
- C** - Confluence



PAVIAN STRETCH AND CONFLUENCE

Entering Pavia, the course of Naviglio crosses a dull landscape of urban fringe: near the ring road and railroad bridge one encounters residual lands and large parking areas along the city's stadium. The land to the west, between the railroad and the canal, is characterised by a formerly significant manufacturing zone (A), abandoned in 2010. The industrial area was a property of Necchi, the company known for producing sewing machines, which closure was a culmination of the deindustrialisation of Pavia that started in the 1970s. Opposite to Necchi, to the east of the canal, starts the residential fabric of Pavia.

Coming closer to the city centre, the watercourse bends over, following the traces of the medieval city walls at a slight distance, thus creating a space in between those two urban elements. In this gap near the Visconti Castle, stands the Borgo Calvenzano complex (B), a long and continuous row of courtyard buildings with porticos facing the canal. It was built as a commercial infrastructure that was serving the navigation of Naviglio and hosted warehouses, stables and shops.

The next section is represented from the east side by educational institutions, which stand almost entirely detached from the canal: the side facing viale Sardegna is fenced and lined with impenetrable greenery. The opposite bank is the only part of the urban course of Naviglio that is adapted for a promenade along the edge of the canal. Further, around the place where the railway bridge crosses over the channel, interrupting on one side the continuity of the towpath, there are very few things going on in the urban environment: there are



semi-abandoned zones facing the cemetery, workshops and warehouses. The final stretch is lined mainly with the residential buildings, arriving at the area of Exhibition Palace, the environment is defined by the presence of wasteland on the western side and agricultural lands that start on another side of the canal. The lands, where starts the Ticino Park.



USES AND ACTIVITIES

ALONG THE URBAN COURSE OF NAVIGLIO PAVESE

LEGEND:

- disused
- residential
- institutional
- warehouse/workshop
- entertainment
- agricultural
- wasteland
- railway

The course of the Naviglio is one of the elements that characterize the urban landscape of Pavia. Currently, many of its urban features are not very much appreciated, almost as if it was an uncomfortable impediment to circulation. Instead, it represents one important testimony of an era in the history of the city and a notable work by hydraulic engineering. It is, therefore, an element that must be valued, above all in its most urban stretch.

-Gregotti Associati Studio (A.Cagnardi, V.Gregotti), Piano regolatore generale: Relazione illustrativa, Pavia: 2002.

CURRENT SITUATION

As stated in the document of “PTRA Navigli”, “In the system of the Navigli in Lombardy, the Naviglio Pavese is the one with the greatest criticalities, above all due to a general condition of the poor quality of the territorial context”.⁷

The plan underlines five areas needing the improvements the most, where mentions the urban stretch of Pavia. Nowadays the conditions and the urban role of Naviglio differ very sharply between Milan and Pavia: while Milan’s Darsena (from Italian, dock) is one of the most vibrant places in the metropolis, Pavia’s course of Naviglio is a place of neglect where there is no much activity happening, except the people jogging and witnessing some silent fishermen along the canal. So one of the biggest criticalities of the stretch is the very limited number of activities. While with the regional plans such as VENTO, “PTRA

Navigli Lombardi” and international ones such as “Idrovia Locarno-Venezia” there is an interest in the reuse of the canal, its regeneration to the point of bringing back its navigability, it seems still like a long way to get there: today the canal and its hydraulic systems are more accompanied by the feeling of decay and indifference.

In the case of the reuse and regeneration of the canal, there should be a lot of work done in the urban stretch of Pavia, as there are a lot of issues surging along the canal: abandoned or disused areas, and generally a lack of activities along the canal, which doesn’t create an attractive environment for resident and visitors alike. For the real regeneration of the canal, it’s important to bring it back to the everyday lives of people, mainly by bringing public activities to the canal and inventing its role as a public space.

⁷ Direzione Generale Territorio et al., Piano Territoriale Regionale d’Area Navigli Lombardi, (document of the plan, 2015). https://issuu.com/adasto.marketing.design/docs/nl_2014_digitale_link

3. INFRASTRUCTURE REUSE

With the continuous changes in society, the very way it functions is transformed, leaving discarded some of the elements. The process of post-industrial transformation taking place in western societies since the second half of the 20th century resulted in vast territories left derelict and disused in the urban and periurban environments. The same phenomena touched many infrastructural systems, leaving them obsolete, which from the turn of the century started to be seen as a potential for redevelopment, bringing more public and green space to the city's fabric, as well as promoting soft mobility. In this chapter is discussed the practice of post-industrial reuse, emphasizing the transport infrastructural reuse, touching a variety of scales: from vast territorial context to denser urban fabrics.

POST-INDUSTRIAL HERITAGE

The system of Navigli in its role as an infrastructural network greatly contributed to the spatial and economic development of Lombardy. Likewise, other canals in Europe during the 18th century became significant drivers of industrialisation, used for transportation, irrigation and as power generators for mills.⁸ Thus, in comparison with the majority of infrastructural systems of that time usually being single-purpose, the canals were performing multiple functions: the role of water distribution, transport and energy production. With

the advancement of other types of transport infrastructures, such as rail and roads, the function of canals as transport links started decreasing and many have since been abandoned for navigation. In the case of Naviglio Pavese, while the gradual decrease in usage started with the arrival of rail, the full stop of navigation happened in the 1960s, due to the development of motor-vehicle transport, which took over as a preferred transport mode for many industries.

Comparable processes of abandonment happened to a wide range of built heritage in the second half of the 20th century. The process of multiplication of neglected areas, attributed to deindustrialisation and coupled with the post-modern transformation of society, left deep marks on the urban environments and territories spreading far beyond, expressed in the vast space of derelict lands. The brownfields contribute to growing urban degradation and represent potential territorial, social and economic damage and danger to social well-being. According to ISTAT in 2012, the disused industrial sites represent about 3% of the total territory of Italy,⁹ with Lombardy accounting 11,3% of the national total.¹⁰ All this territory represents a huge resource, and reclamation of these areas is of great public importance: the regeneration of existing heritage can give benefits of reducing the environmental impact and limiting the urban land use.

In many cases, adaptive reuse, is defined as “the process of reusing an existing site, building, or infrastructure that has lost the function it was designed for, by adapting it to new requirements and uses with minimal yet transformative means,”¹¹ represents one of the most effective and sustainable tactics for the reintegration of the disused heritage or brownfields into the fabric of the city. While the majority of the examples of adaptive reuse regard cultural heritage, a few decades ago the process of adaptation of industrial brownfields and structures became more common, lately often featuring more cases of conversion of obsolete infrastructures for new public uses.

Since the 1980s with the growing climate awareness, in the western world the vast post-industrial heritage and brownfields started to be seen as a resource for redevelopment of territory for creating valuable eco-sustainable and public spaces. The projects, often created by landscape architects, were aimed at finding the balance between the process of urbanisation, ecological and natural habitat.¹² Around the world different successful examples of reusing post-industrial heritage, perceived as a landscape and turned into green spaces, such as Duisburg Nord Landscape Park by Latz+Partners, Zollverein Park in Essen by OMA and Gas Works Park in Seattle. The late trend in the practice is represented by the adaptation of disused (usually transport) infrastructure, that allows creation of interesting green and public spaces in the urban fabric.

8. Steffen Nijhuis, and Daniel Jauslin, “Urban Landscape Infrastructures: Designing Operative Landscape Structures for the Built Environment” in *Research In Urbanism Series 3*, no 1 (2015) 13-34. <https://doi.org/10.7480/rius.3.874>

9. Corrado Vizzarri, et al., “A holistic approach for the adaptive reuse project selection: The case of the former Enel power station in Bari,” *Land Use Policy* 111 (2021), <https://doi.org/10.1016/j.landusepol.2021.105709>

10. Osservatorio Permanente della Programmazione Territoriale, *Relazione annuale sullo stato della pianificazione in Lombardia* (2011)

11. Matteo Robiglio, *RE-USA : 20 American Stories of Adaptive Reuse. A Toolkit for Post-industrial Cities* (Berlin: Jovis, 2017)

12. Luca Maria Francesco Fabris, and Gerardo Semperebon, “Greenways as a New Potential for Shrinking Cities: The Case of Milan” (2019), *Proceedings of the Fábos Conference on Landscape and Greenway Planning* 6, no 1, article 54, <https://doi.org/10.7275/zjxh-hp81>

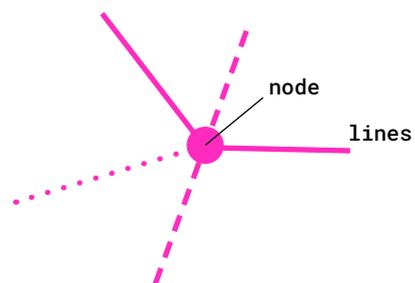
ADAPTIVE REUSE OF INFRASTRUCTURE

Infrastructure has had a fundamental role in building industrialised economies. Increasing populations and expanding economies have resulted in a huge expansion of infrastructural networks worldwide.¹³ Over time, infrastructures generally become less efficient, and their ability to perform reduces. At the same time, the decline in demand can happen through changes in the economy or technology, leaving some of the infrastructures obsolete.¹⁴ If there is no intention to prolongate the functional life by maintenance or repair, in the case of mono-purpose infrastructures the process of abandonment becomes quickly prominent, because once outmoded, its elements become suddenly neglected and usually are not suitable for alternative use, with no previous reconversion. As the number of disused infrastructures is increasing, there is an emerging question of what to do with **obsolete infrastructures**. On one side there is the logical solution of decommissioning, often leading to total demolition; from the other side, there is a relatively recent trend of adaptation of the infrastructure to new uses.

Reclaiming neglected infrastructures can provide a low carbon travel experience by promoting new uses, delaying decay, and reestablishing continuity within the environment.¹⁵ While “infrastructure” is a broad term and can include a variety of developments, the transport reuse examples seem to gain the biggest momentum in the practice and the public eye. The most prevailing examples of reuse usually involve railway lines, due to a large number of kilometres of disused lines which became available in Europe at the end of the 20th century, though other types of infrastructures reconversions are possible, such as highways, bridges, waterways and riverfronts.

The main characteristic of the **transport system**, consisting usually of linear elements, nodes or both, plays an important role in defining the reuse potential for the infrastructure. The linear elements, such as disused railways, viaducts and canals act as potential pathways, and their regeneration could provide space for new recreational activities, supporting sustainability and local development. On the territorial scale, their importance is primarily seen in their role as connection elements, able to promote slow mobility.

Transport network components morphologically can be divided into two typologies: nodes and lines. Nodes represent the points of convergence of different lines.



For the functional upgrade of disused railways, one particularly successful solution is their conversion into **greenways** dedicated to soft mobility routes for walking and cycling. The examples of **rail-to-train** conversion, or so-called greenways started to emerge in the 1990s, in Europe and the USA. The trails connecting territory on the regional level can be used both for everyday commuting and for tourist purposes. Today Europe has almost 20 000 km of greenways, with Italy having 950 km of reclaimed railways in the form of greenways, bicycle paths or tourist trains.¹⁶ Although usually in Italian context those trails are short-distanced and isolated, they represent a big potential for the slow tourism development of the regions. In addition to the reconversion of disused infrastructure to slow mobility trails, this practice gives the potential for the reuse of heritage and abandoned sites along the course.

On the urban scale, the reuse of linear transport infrastructure could become a solution for the regeneration of the neighbourhoods and the incorporation of new public and green spaces inside the densely populated urban fabrics. Often those infrastructural developments give the benefit of position within the centre, while in the case of linear infrastructures, the characteristic of the redevelopments inspired the use of the now common term “linear park.” In the urban environment too, the connective role is established for both users and biodiversity, acting as pathways and **green corridors**.

13. Martin W. Doyle, and David G. Havlick, “Infrastructure and the Environment,” *Annual Review of Environment and Resources* 34 (2009): 349–73, <https://doi.org/10.1146/annurev.enviro.022108.180216>

14. Idem.

15. V. Ferretti, and A. Degioanni, “How to Support the Design and Evaluation of Redevelopment Projects for Disused Railways? A Methodological Proposal and Key Lessons Learned”, *Transportation Research Part D: Transport and Environment* 52 A (2017): 29–48, <https://doi.org/10.1016/j.trd.2017.02.008>

16. Rete Ferroviaria Italiana, “Atlante delle Greenways: dal Diuso al Riuso”, <https://www.rfi.it/en/about-us/Sustainability/social/Greenways.html>

CASE STUDIES

The following case studies are merging examples of transport infrastructure adaptive reuse, divided into the typologies, depending on its characteristic and infrastructural use.



THEN



NOW

TYOLOGIES

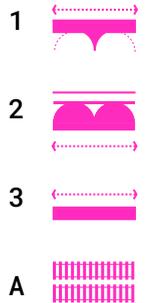
BY POSITION :

BY TRANSPORT MODES :

<p>Viaduct</p>	1	A	Railway	
<p>Under-infrastructure</p>	2	B	Road	
<p>On Land</p>	3	C	Air field	
		D	Waterway	

PROMENADE PLANTÉE (COULÉE VERTE)

Location: Paris, France
 Designers: Jacques Vergely, Philippe Mathieux
 Opening year: 1989
 Typology: canal
 Previous use: railway line, viaduct
 Current use: linear park
 Length: 4.7 km



Promenade Plantée, also called Coulée Verte is the first elevated parkway built on the viaduct of an abandoned railway in the 12th arrondissement of Paris, France, running for a total of 4.5 km, out of which 1.5 km are elevated, after which the promenade descends to street level.

The railway line, opened in 1859 in southeast of the city and decommissioned in 1969, the urban planners were rethinking the use of the viaduct for the revitalization of the neighbourhood, and an initiative was taken to make the railroad line itself into a public park. Promenade was reopened to the public in its role in 1994, becoming a landmark of the arrondissement. The space under the viaduct in the archways, named Viaduc des Arts, was converted into various art studios, workshops and galleries. The development inspired the famous reconversion Highline in Manhattan.



THEN



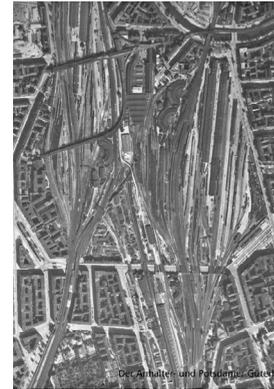
NOW

HIGH LINE

Location:	Manhattan, NY, USA	1	
Designers:	James Corner Field Operations, Diller Scofidio + Renfro, Piet Oudolf	A	
Opening year:	2009		
Previous use:	viaduct - railway line		
Current use:	linear park		
Length:	2.3 km		

The most well-known example of the adaptive reuse of the disused infrastructure is the High Line in New York, creating a widely known “precedent” of potential of reuse for creating quality public spaces and renewing of the neighbourhoods. The project positions itself as a community-led initiative, managed by Friends of the High Line, formed by local activists and united by the common vision for reuse of an elevated railway running across West Manhattan, dismissed since the 1980s and destined at the time for demolition. After the design competition, in 2006, the construction of the first phase began, opened in 2009. The High Line is now one, continuous, linear park stretching for 2.3 km, and is the third most visited tourist attraction in Manhattan.¹⁷

The project’s influence grew rapidly, inspiring other initiatives around the USA and the world: numerous similar projects started to be developed involving similar infrastructure. But the big fame of the linear park soon was clouded by the levels of gentrification induced on the surrounding area to the point that the High Line decided to share “know-how” through the toolkit, organising the actions and tools that others can implement to enable “embed equity in all phases of park planning.”¹⁸ The toolkit is intended to reduce inequities resulting from infrastructural racism, to create free and accessible green public spaces that have the potential of bringing ranges of benefits to the local communities. Moreover, there have been created the High Line Network - a group of 36 infrastructure reuse projects, joined by the mission of supporting the development of vibrant, equitable public spaces.



THEN



NOW

PARK AM GLEISDREIECK

Location:	Berlin, Germany	3	
Designers:	Atelier Loidl Landscape Architects	A	
Opening year:	2011		
Previous use:	railway crossing		
Current use:	park		
Surface:	10 ha		

A triangular-shaped area, known as Gleisdreieck (triangle of rails) was formed by the intersection of different railway lines and was once separating the neighbourhoods of Kreuzberg and Schöneberg. When ceased to be used, located in proximity to the Berlin Wall, the area had turned into no-man’s-land taken over by nature, but after the unification, it regained its central position within the city’s fabric.

There were several plans made for it from the 1970s, including construction and road building, but initiatives by citizens who deemed it crucial as a recreational space successfully blocked the construction. The City of Berlin decided to turn the area into a large urban park, composed of different sections, that together would join parts of the city. The western part of the redevelopment designed by Atelier Loidl is characterised by a broad programme and activities, featuring a skate park, broad asphalt paths and open green spaces, offering a variety of facilities for park users.

17. Matteo Robiglio, “Why Adaptive Reuse?” *The Adaptive Reuse Toolkit: How Cities Can Turn Their Industrial Legacy into Infrastructure for Innovation and Growth* (2016). <http://www.jstor.org/stable/resrep19022.5>.

18. “Community First Toolkit”, High Line Network, accessed on June 5, 2022, <https://toolkit.highlinenetwork.org/>



THEN



NOW

TEMPELHOFFER FELD

Location: Berlin, Germany
Designers: GROSS.MAX Studio
Opening year: 2010
Previous use: airfield
Current use: park
Length: 355 ha

3

C

The field changed many uses over the centuries but always pertained to its characteristic as a field. It has been occupied by the Templar Order for its commanderies in the 13th century (from this episode the place took its name), then used for agriculture, and from the 18th century served as the Parade ground for the Prussian army, since when it started to be used mainly for military purposes. In the 1920s the field started to function as an airport, and with the new terminal built during the Nazi's rule, it became the largest and the busiest airport of its time. The Tempelhof airport served as the main gateway to West Berlin during the Cold War and was hosting a base for US Air Force.

With the unification and Berlin gaining back the airport from the military, the airport started falling into disuse in the 2000s, not bringing any more commercial benefits. The last flight was done in October 2008, after which the airport was closed. The Tempelhof Feld is an example of strong local participation and activism against the redevelopment of the field: in 2009 the local activist group "Squat Tempelhof" with the protest expressed their desire for Tempelhof to be a public place. In May 2010, Tempelhof opened to the general public as a park, being the city's largest park, and the biggest inner city open space in Europe. The future of the park was secured by a public referendum in 2014, and the masterplan was the result from the competition won by GROSS.MAX studio.



THEN



NOW

CANAL CORRIDOR - KING'S CROSS

Location: London, United Kingdom
Designers: Townshend Landscape Architects
Opening year: 2017
Previous use: canals, industrial site
Current use: park
Surface:

3

D

In the heart of King's Cross, the Canal Corridor runs along the Regent's Canal in London and is a part of a larger redevelopment of a once derelict industrial neighbourhood. The Regent's Canal, completed in 1820, linked King's Cross with the industrial cities in the north, and with later construction of the railway it became an important transport hub. From the second half of the 20th century, the commercial traffic stopped along the canal and the area fell into disuse and gradually became a place known for its creative atmosphere and nightlife. Despite its potential, the area was crippled by crime, unemployment, and a poor quality environment. From the beginning of the 2000s, redevelopers noticed the potential of the site and started the lengthy process of transformation into the hub for creative spirit and innovation.

Through the layering of different uses and values, such as a historical transport and environmental and recreational corridor, Regent's Canal defines a changing and diverse linear waterscape.¹⁹ Today the towpaths are used by walkers and cyclists, and the waterway is used again for tourist boat trips.

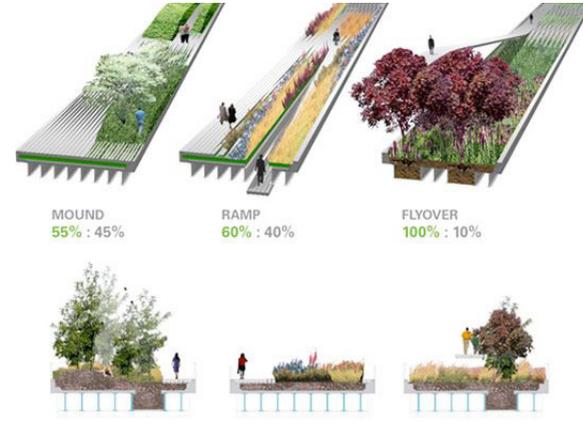
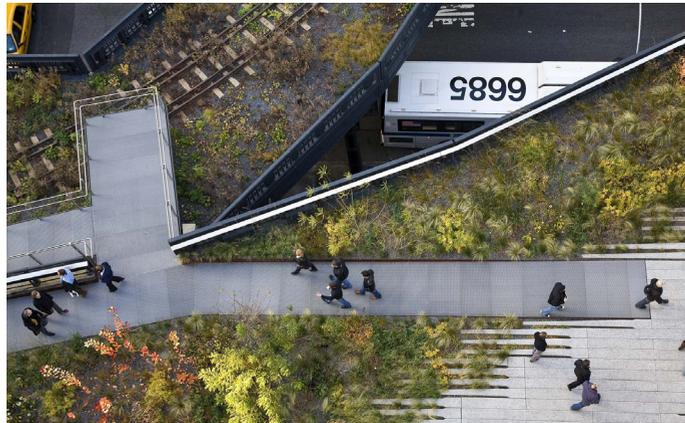
¹⁹. Beatriz Cabau, Patricia Hernandez-Lamas & Johan Woltjer (2021) Regent's Canal Cityscape: From Hidden Waterway to Identifying Landmark, The London Journal, DOI: 10.1080/03058034.2021.1924960



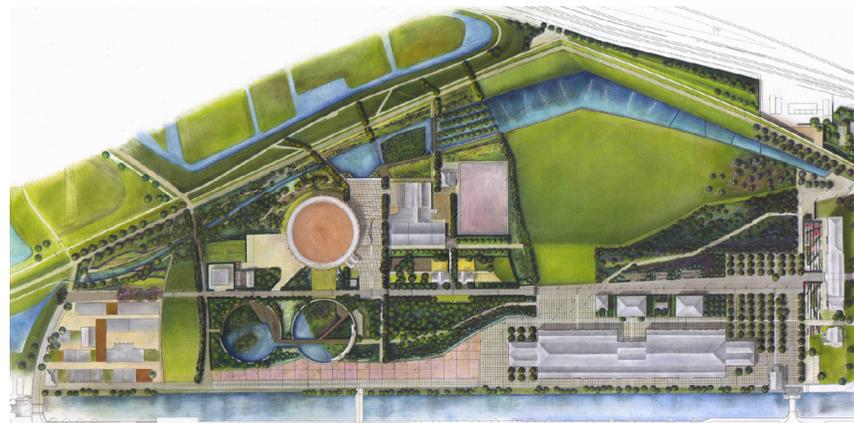
Townshend Landscape Architects, Canal Corridor, 2017.



MVRDV, Seoulllo 7017 Skygarden, 2017.



James Corner Field Operation, High line, 2009.



Gustafson Porter + Bowman, Cultuurpark Westergasfabriek, 2006.

4. INFRASTRUCTURE FOR RESILIENCE

Since the end of the last century, science became very clear about the effects that human-driven increase in surface temperature will have on the global scale. The detrimental consequences of climate change are already affecting many regions at different rates and severity and are expected to increase over time. Urgent actions are needed to be carried out by nations worldwide, that include prevention and adaptation strategies to develop the resilience of the cities and communities. In this process the new approach to urban infrastructure could play an important role, in reducing or softening the possible adversities. Discourses developed at the turn of the century, such as Landscape Urbanism, are on the front line of reviewing the role of infrastructure and landscape in managing complex urban and environmental processes.

CLIMATE EMERGENCY

Urban environments play a major role in climate change and are the most vulnerable to its aftereffects. Globally, cities are the primary sources of greenhouse gas emissions driving climate change: they account for 70% of all carbon dioxide emissions while occupying only 2% of the land.²⁰ In addition, many cities are becoming more vulnerable to the impacts of climate change, such as extreme heat,

floods, ecological degradation, etc.; the possible negative consequences threaten the well-being of the large share of the world population concentrated in dense urban areas. It's already become clear that the main challenge of the global society of today is drastically reducing GHG emissions and preparing for incoming unreversible repercussions. The planet is getting closer to point of no return, the time is running out to implement the actions promised in the Paris Agreement, stating that limiting warming to 1.5°C over pre-industrial levels is a threshold necessary to prevent even more catastrophic effects on the planet as a result of climate change. However, current plans to address climate change are not ambitious enough to achieve this goal. Profound transformations and aggressive actions are required to meet net-zero, involving every aspect of life, and among them rethinking the urban environment is one of the most important steps. Urban spaces must respond to social and cultural needs, with an integrated approach, incorporating sustainability principles.

Extreme weather events are becoming more frequent, less predictable and more severe. The main framework for tackling the consequences is defined by simultaneous processes of mitigation and adaptation. Mitigation is mainly concerned with reducing the impact by limiting or zeroing emissions and can be

done by mixed approaches on a range of scales. Urban management should be effective in terms of the use of resources, reusing and recycling when possible and aiming to create circular systems; the urban environment should be green and compact, enhancing the uptake of carbon and encouraging the use of soft mobility or public transport. In the case of built heritage, the mitigation can be implemented by retrofitting and reusing what has been already constructed, and if the new structures are necessary, aiming at net-zero performance. Adaptation is the process that aims at creating resilient cities, acting proactively by determining risks and solutions. In such a manner, a resilient city can be prepared for future climate impacts and limit the severity of negative effects.²¹

As part of the adaptation strategy, the concept of resilience plays an important role in preparing for extreme events and recovering after them. "Climate resilience" refers to the ability to withstand, and recover from, natural hazards. The strategy for creating the coping mechanisms can involve multiple sectors and approaches, but as the priority, it is important to assess the primary vulnerabilities. While for the general stability of the city in case of any types of emergency events, there should be a strong institutional and social web that can provide help for the most vulnerable, in addition, more specific engineering and planning solutions can be implemented to adapt the urban environment to the emergencies.

²⁰. UN-Habitat, *Guiding Principles for City Climate Action Planning* (2015) United Nations Human Settlements Programme, <https://e-lib.iclel.org/wp-content/uploads/2016/02/Guiding-Principles-for-City-Climate-Action-Planning.pdf>

²¹. World Bank, *Guide to Climate Change Adaptation in Cities: Executive Summary* (2011), <https://openknowledge.worldbank.org/bitstream/handle/10986/27396/653590WP0v100B0n-0Handbook0Final0020.pdf?sequence=4&isAllowed=y>

URBAN RESILIENCE

As part of the adaptation strategy, the concept of resilience plays an important role in preparing for extreme events and recovering after them. Urban Resilience can be defined as the ability of the city and society to resist, adapt and respond positively to stresses, while Climate resilience refers specifically to the ability to withstand, and recover from, natural hazards. There is a broad consensus that cities need to become more resilient to shocks and stresses in the face of climate change, and that promoting urban sustainability and climate change resilience must be tied together.²² Some of the cities, first - big metropolises, followed by a wide range of cities, started to be interested in the concept of "urban resilience," usually as a response to shocks caused by disasters of different nature, but especially natural one. Today when climate-related risks are one of the most dangerous ones, it often results in Climate Adaptation plans, as a tool for cities to adapt to possible climatic cataclysms, which often deal with water cataclysms adaptation strategy.

The strategy for creating the coping mechanisms can involve multiple sectors and approaches, but as the priority, it is important to assess the primary vulnerabilities. While for the general stability of the city in case of any types of emergency events, there should be a strong institutional and social web that can provide help for the most vulnerable, in addition, more specific engineering and planning solutions can be implemented to adapt the urban environment to the emergencies. In this process, the infrastructure plays a crucial role, firstly, with its ability to withstand critical events without major disruptions that can be devastating for societies, and secondly, by helping to respond to emergencies and diminish aftereffects.

²². Robin Leichenko, "Climate change and urban resilience", *Current Opinion in Environmental Sustainability* 3, n 3 (2011): 164-168, <https://doi.org/10.1016/j.cosust.2010.12.014>.

²³. Gary L. Strang, "Infrastructure as Landscape", *Places* 10, no 3 (1996): 8-15.

²⁴. Steffen Nijhuis, and Daniel Jauslin, "Urban Landscape Infrastructures: Designing Operative Landscape Structures for the Built Environment" in *Research In Urbanism Series* 3, no 1 (2015) 13-34. <https://doi.org/10.7480/rius.3.874>

ROLE OF INFRASTRUCTURE

Infrastructure is defined as basic facilities, structures, installations and services, needed for the functioning of society. Originally, the term was referring to the physical structures and facilities required to operate a society (e.g. roads, sewage, power supply); today it is understood in a broader sense as a system or framework (not limited to the physical or man-made) that creates the foundation for the functioning of the modern world and includes a wide range of categories.

The existing infrastructural developments are the descendant of the industrial revolution: the advancement in transport networks was done by canals during the late 1600s and early 1800s, which could offer places that didn't have any water links the connection to the natural waterways, progressing the circulation network and commercial activity of humankind. In the 19th century, the advancement of land communication was brought by the development of the railway, and in the 20th-century telecommunication networks were established. Infrastructures became the basis for human activity and allowed the broadening of its influence on the Earth.

Nowadays, the infrastructure constitutes an integral part of the urban landscape because of its scale and prevalence.²³ The combination of those sustains the flows and fluxes which constitute a complex and interlaced system of the urban environment and spread far beyond in hinterland. Infrastructure has been used to obtain control over nature, while the environment has been denied its inherent dynamism in favour of more regulated and static systems. The infrastructural developments, usually constructed for single purposes, although beneficial in economic and geopolitical terms, often have been leading to the disruption of cultural and natural landscapes.²⁴

At the turn of the 21st century, the concept of infrastructure started to broaden to a more hybrid approach, aiming to facilitate social and ecological interactions in the urban systems. Considering the growing awareness of global warming and in response to the need for massive societal and urban transformations in order to mitigate and adapt to climate change, professional discourses were developing in the fields of architecture, urbanism and landscape architecture, such as Landscape Urbanism, which puts at its centre the renewed concept of infrastructure, that encompass sustainability and climate adaptation strategies, making it an essential part of the design and planning.

LANDSCAPE URBANISM AND INFRASTRUCTURE

In the last few decades, different discourses on ecological urbanism have gained momentum as means of developing sustainable urban areas based on mobility, energy, water, and green spaces. Driven by social needs they tend to include integrated strategies and policies that address urban development's negative effects by combining adaptation and mitigation. Different approaches, or as Christopher Gray calls it “insert-adjective-here urbanism” or - different “-isms”, were developed at the turn of the century.²⁵ Led by the growing awareness of climate change, and as a critique of modernism for its inability to provide livable and meaningful public spaces,²⁶ various strategies began evolving for making ecological processes operational in design, which utilizes natural phenomena in the creation of urban landscapes. Inside countless rhetorics, two particularly notable cross-disciplinary discourses emerged - Ecological Urbanism followed later by Landscape Urbanism, reflecting the renewed concept of urbanism and landscape.

Ecological urbanism emphasises the importance of design in balancing the conflict between natural processes and anthropological activities in modern society. Oppositely to a frequent perception of the urban environment as separate from nature, Ecological urbanism views the city as an ecosystem and a part of the natural world, in other words, it hosts organisms and allows interaction between them and the environment. Those systems can be seen on various scales, from the smallest to the largest, and ecological urbanism aims at forming “closed”, self-sustaining systems: importing and consuming fewer resources, producing less waste, and recycling both,²⁷ while also, constituting the urban form should be adapted to natural processes, such as air circulation, water flows and biological cycles.

Landscape urbanism is a hybrid discipline that can be described as a shared form of practice between fields of architecture, urbanism and landscape architecture. In landscape urbanism, a range of landscape-derived ideas is utilized to comprehend contemporary urbanism. On the whole, the term landscape holds central meaning in the discipline and

is used as a broad concept, including the natural features and modern urban conditions. The concept first appeared in the 1990s, but a more established formulation of this new discipline happened in the “Landscape Urbanism Symposium and Exhibition” in Chicago in 1997 giving rise to both straightforward and abstract research,²⁸ but all are based on the idea that landscapes can be used as models and bases for urban initiatives and as a lens by which to analyse cities, capturing the changes, transformations, and adaptations that occur in time. The landscape can thus be viewed as an analogue to contemporary processes of urbanization and as a unique medium that can authentically reflect today's indeterminacy, mutability and change. From this perspective, the processes become the foundation of the discipline, rather than static models.

Commonly, cities' most permanent and enduring elements are linked to their fundamental landscapes: topography, geology, climate and waterways. Starting from this notion, Landscape Urbanism became a method of understanding the complex urban condition, addressing infrastructure, water management, biodiversity, and anthropologic activity. Considering the relationship between natural systems and the city's infrastructure, urban strategies can be developed by designing networks of

landscape infrastructure that support ecological systems and processes, as well as managing possible climate adversities.

Landscape Infrastructure is a design concept, that originated from Landscape Urbanism discourse, investigating the cities' future depending on their capacities for collecting, exchanging, and distributing goods, services and resources. It shifts infrastructure from a purely functional focus to one characterized by a broader range of activities that define the urban environment.²⁹ The conceptualization of landscape as infrastructure can be characterized as a goal-oriented approach in which the landscape is viewed as an operative field that defines and sustains urban development, with ecological, social and economic processes acting as design means. Process and the flows happening over time become the main focus of the development of the urban environment, as well as flexibility, multifunctionality and adaptability of the systems, while the infrastructural approach serves as a framework that facilitates interactions between natural and human systems. Often, water plays the central role in the concept of Landscape Infrastructure, regarding its fundamental role in the sustainability of ecosystems, and considering the water-related risks that the environments are prone to.

25. Christopher Gray, “Landscape Urbanism: Definitions & Trajectory”, *SCENARIO 01: Landscape Urbanism* (2011).

26. Charles Waldheim, “Landscape Urbanism: a Genealogy”, *Praxis: Journal of Writing + building* no 4 (2002).

27. Anne Whiston Spirn, “Ecological Urbanism: A Framework for the Design of Resilient Cities” (2012), <https://annewhistonspirn.com/sharefiles/Spirn-EcoUrbanism-2012.pdf>

28. James Corner, “Terra Fluxus” in *Landscape Urbanism Reader* (New York: Princeton Architectural Press, 2006).

29. Steffen Nijhuis, and Daniel Jauslin, “Urban Landscape Infrastructures: Designing Operative Landscape Structures for the Built Environment” in *Research In Urbanism Series* 3, no 1 (2015) 13-34. <https://doi.org/10.7480/rius.3.874>



Part five: Masterplan

Transportation, green and water infrastructures are important agents that facilitate processes that shape the built environment and contemporary landscapes. Movement and flows are at the core of these landscape infrastructures. They facilitate aesthetic, functional, social and ecological relationships between natural and human systems. We interpret them as Flowscapes. Flowscapes explores infrastructure as a type of landscape and landscape as a type of infrastructure. The hybridisation of the two concepts seeks to re-define infrastructure beyond its strictly utilitarian definition, while allowing spatial design to gain operative force in territorial transformation processes.¹

1. Steffen Nijhuis, and Daniel Jauslin, "Urban Landscape Infrastructures: Designing Operative Landscape Structures for the Built Environment" in *Research In Urbanism* Series 3, no 1 (2015) 13-34. <https://doi.org/10.7480/rius.3.874>

1. CONFLUENCE AS INFRASTRUCTURE

The proposal for regeneration and reuse treats the area as infrastructure, including in this term different interpretations and concepts discussed earlier. First of all, it performs the function of Urban Resilience Infrastructure, by helping to reduce the society's carbon footprint, as well as to adapt and prepare for possible extreme events and repercussions of climate change. Secondly, it takes the

role of Recreation and Slow Tourism Infrastructure, by becoming a leisure destination with a range of activities, promoting soft mobility fluxes and offering facilities for travellers and residents alike. The final goal of the proposal is to increase the resilience of the city of Pavia and promote Pavia's territorial position within Slow tourism Infrastructure, by strengthening its role as the Crossroad of routes.

URBAN RESILIENCE INFRASTRUCTURE

With the number of extreme weather events rising, people already feel the effects of climate change. In order to limit the adversities, there are two main strategies: mitigation and adaptation. As a final goal to create a more resilient society, it's necessary to embrace changes in all aspects of daily lives, such as food and travel. It is also necessary to start adapting the urban environment for the changes: creating a support system for adaptation of people and society. It is essential that a framework, an infrastructure, is developed so that these changes can occur.

The derelict urban areas represent a potential for a city's transformation towards a greener and more prepared-for-climatic-changes future. Those areas could be transformed into tools for mitigating and adapting to climate change, creating an infrastructure for urban resilience. The same could happen to the Confluence, one of the Transformation Areas of Pavia, which could play an important role in the city

due to its characteristics. Firstly, it is located right near the centre, on the Ticino river, promoting at the same time the regeneration of the waterfront, which seems a priority for the Municipality with the project "Pavia Città d'Aqua." Secondly, the area has strong association with Naviglio Pavese, corresponding to its final stretch before meeting the Ticino, meaning that the possible regeneration of the canal would bring uses to the area, and vice versa.

The area of Confluence could become an Infrastructure for strengthening urban resilience, a sustainable transit-oriented development. It could function as an **eco-district of Pavia**, an area in which the city concentrates all of its sustainable practices in order to create a resilient, green district, allowing to accelerate actions on sustainability and climate change.¹ For this, it is important to increase the resilience and sustainability in ecological, social or economic frameworks.

1. Joan Fitzgerald, *Greenovation: Urban Leadership on Climate Change* (Oxford University Press: 2020).

LOCAL CLIMATE RISKS

The effects of climate change mainly depend on geographical location. Those effects are already being felt throughout Italy: heatwaves, droughts, and more frequent flooding are among the extreme events that are becoming more frequent. According to the National Strategy for Adaptation to Climate Change by the Italian Ministry of Environment:

In Italy, the most significant impacts expected in the coming decades will be due to the exceptional rise in temperatures (especially in summer), an increase in the frequency of extreme weather events (heat waves, droughts, episodes of intense rainfall) and a reduction in average annual precipitation and annual river flows.²

The document expresses that the Po River valley is one of the most exposed to hydrogeological risks, with the exposure of flooding being the most concerning.³ In the summer 2022, the opposite magnitude of hydrological risks is being experienced: the Po is witnessing the worst drought in 70 years.⁴ It is estimated that the water crises can affect several major socio-economic sectors, including agriculture, electricity production, tourism development and drinking water supplies.

The plan for climate adaptation of Lombardy, mentions the consequences concerning both flood and drought risks, defining some strategies that should be implemented. For the hydrogeological risks the following strategic guidelines are indicated: adapting current flood protection strategies and systems in accordance with future climate; guaranteeing the necessary space for watercourses and limiting the extent of impermeable surfaces to ensure the natural water retention capacity of the soil.⁵ Drought mitigation in the document consists of a reduction of the water demand, optimisation of available reserves and agricultural systems and reinforcement of consumption monitoring systems.

Pavia is the city located on the banks of the Ticino and a few kilometres away from the confluence with the Po, which is a highly flood-prone area. The city centre is located at around 5 meters elevation from the river banks, the risk of flooding is considered low, while the area stands lower, and enters the substantial risk zone. The ordinary flood of the Ticino happens statistically three times every four years, and usually in autumn, with a capacity of about 900 mc\'.⁶

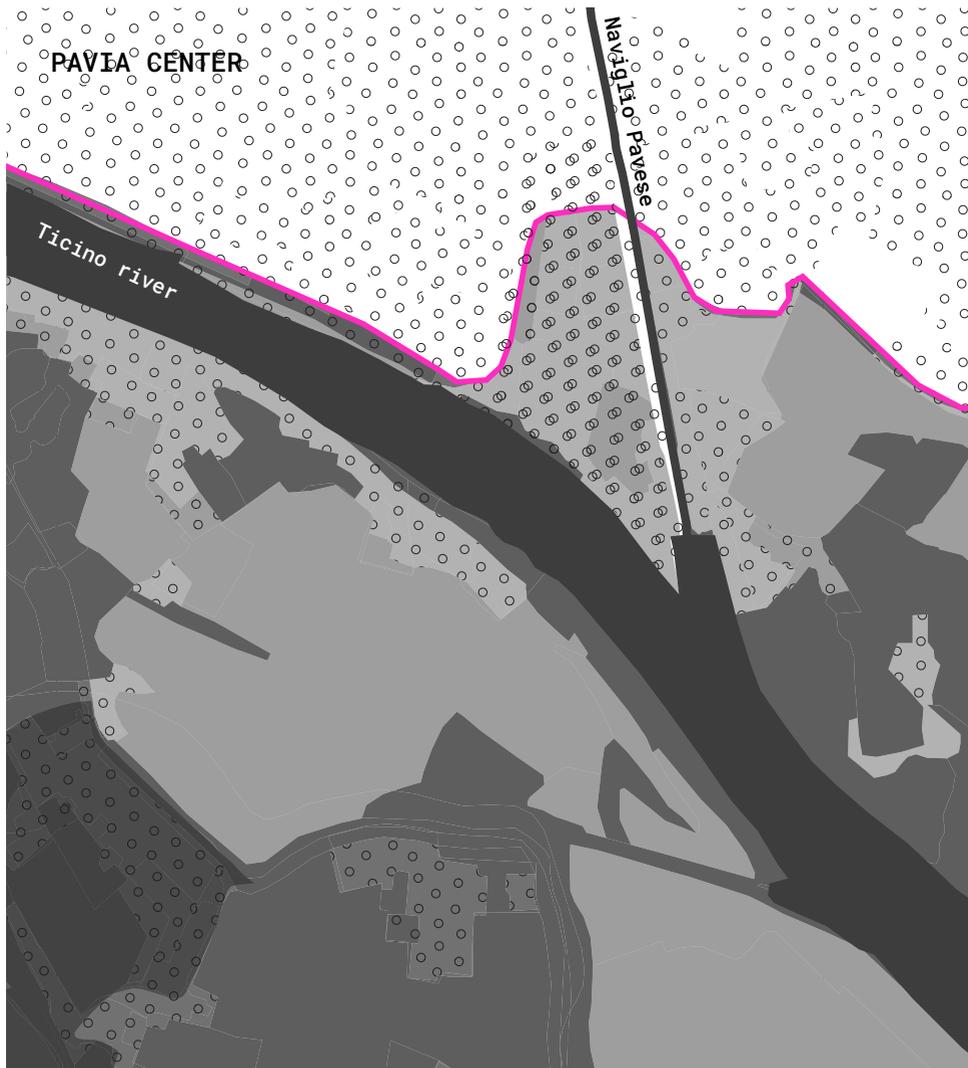
2. Ministero dell'Ambiente e della Tutela del Territorio e del Mare, *Strategia Nazionale di Adattamento ai Cambiamenti Climatici*, (2014)

3. Idem

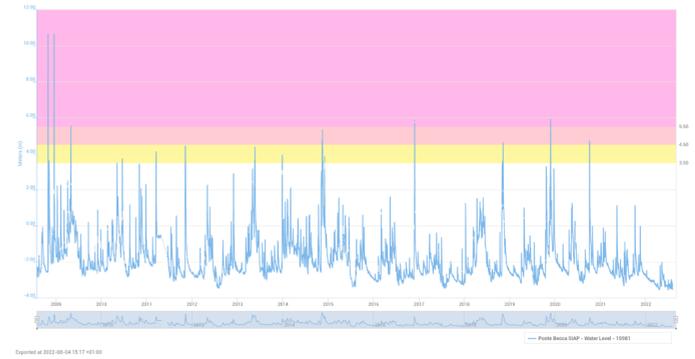
4. "Il Po in secca: mai così da 70 anni," *La Repubblica*, June 22, 2022, https://www.repubblica.it/green-and-blue/2022/06/22/foto/il_po_in_secca-355019966/1/

5. Regione Lombardia, and Fondazione Lombardia per l'Ambiente, *Documento di Azione Regionale sull'Adattamento al Cambiamento Climatico* (2015).

6. Comune di Pavia, *Piano di governo del Territorio: Studio di Incidenza* (2011).



Ponte della Becca, located at the Confluence of Ticino and the Po (8 km away from Pavia), water level measurements (2009-2022)



flood risk zone



Mai così in secca dal 2007: le immagini del Po e del Ticino senza acqua 2



News articles about the flood and the drought, that happened in the course of the same year (2019)

Floodable zones, probability map

50 years event higher probability of flooding
 500 years event lower probability

populated

Source: Regione Lombardia, mappa Piano di Gestione Rischio Alluvioni (PGRA), 2020

1. "Maltempo, fiume Ticino esonda a Pavia. Allerta per il Po," Sky tg24, (November 25, 2019) <https://tg24.sky.it/cronaca/2019/11/25/maltempo-fiumi-allerta-ticino-po-esondazioni#00>
2. "Mai così in secca dal 2007...", La Repubblica, (March 21, 2019) https://milano.repubblica.it/cronaca/2019/03/21/foto/po_ticino_siccita_fiume_secca-222160184/1/

RECREATION AND SLOW TOURISM INFRASTRUCTURE

The Confluence, due to its position at the point of convergence of different routes, and in between the Ticino and Naviglio has big potential for performing tourism and recreational role. Part two reviewed the position of Pavia within the network of Slow Tourism, being the point of Crossroad of numerous historical routes and cycle paths. The city claims to have the identity of Crossroad of Routes, given by the Council of Europe, but this status doesn't have any real manifestation in the city's image today. Slow Tourism, being an environmentally friendly alternative to conventional travel, has seen steady growth in the last decade. This niche becomes of interest to both public administrations and travellers, expecting to continue the expansion. With the completion of the VENTO national cycle route and the growing popularity of Via Francigena, it is safe to predict the increase in the fluxes of travellers, since better Tourism Infrastructure, leads to a growing number of users.

Today's state of Pavia's Soft Mobility Infrastructure is similar to many other mid-size Italian cities: the existing soft mobility network needs improvements both on a territorial and urban scale regarding the quantity, quality of the routes and their safety. Accommodation is another essential service for tourism, and while in the city there are various tourist accommodations present, such as B&B's and some hotels, there are a few lower price segment options, such as hostels, that usually are popular among pilgrims or slow travellers.

The recreation infrastructure is another important part of the tourism offer of the place since the majority of the travel happens within the scope of leisure. But the main importance of recreation and sports facilities is in the increased well-being of the residents, both physical and mental. Recreation infrastructure, especially green areas, result to be critical to the vitality of cities, acting as open public space and creating better city-nature connections.

Pavia is located in the heart of the Ticino Natural Park, which is a place rich with biodiversity and counts numerous nature trails, but the urban green space appears to be rather limited. For Pavia, the primary recreation role for a long time was mainly performed by its river. The city is located far from the sea, and the banks of the Ticino became popular places for recreation: Pavia's beaches along Ticino have for a very long time represented the "sea of Pavia" for the locals. The river, and water in general, was playing an important role in the leisure of the inhabitants for swimming, navigation with the boats, fishing, and sunbathing. Already in 1895, there was opened the first equipped Public Bath on the Ticino. The water recreation persists till today in the city but to a much lower extent. Swimming and frequenting the beaches of Pavia were common till the 1980s, and some navigational clubs are still present on the banks of the river.



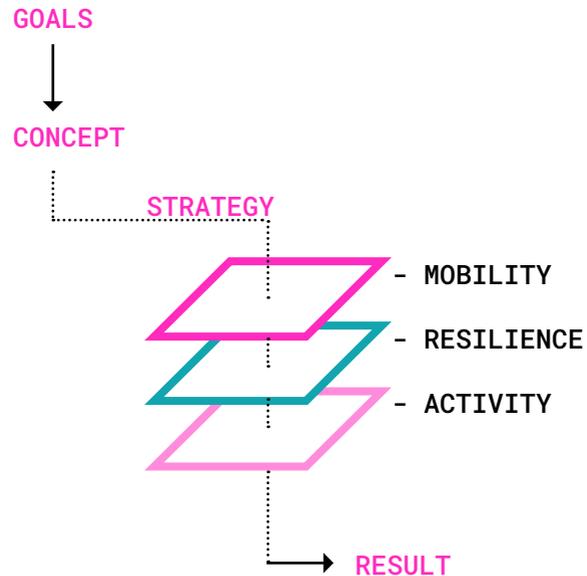
Historical photos of the public baths and beaches along Ticino.

Source: http://www.paviaedintorni.it/soloimmagini_file/MINI_ALBUM_FB/minialbum_bagni_ticino.htm

2. MASTERPLAN FOR CONFLUENCE

The Masterplan is based on strategic actions that create recreational and public space for Pavia, promote urban regeneration while mitigating and adapting to the risks of climate urgency. Based on the analysis, there were defined seven main general **GOALS** that the Masterplan would like to contribute to, which together contributed to the main **CONCEPT** for the Confluence Masterplan. Next, there were defined frameworks of the **STRATEGY**, which were divided into three levels (or topics) based on the actions, that act both on the territorial and city scale. The final **RESULT** represents one out of many possible interpretations of the sum of strategic actions.

MASTERPLAN'S STRUCTURAL FRAMEWORK



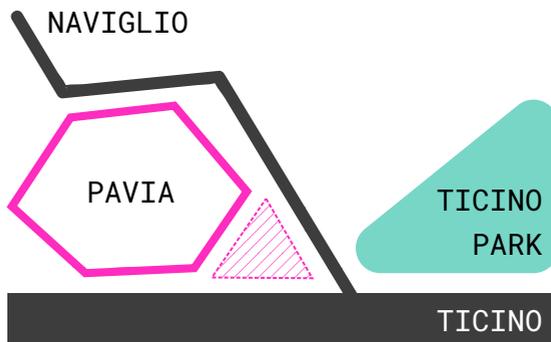
GOALS:

1. Urban regeneration of the Confluence Area by bringing new uses and functions.
2. Development of slow tourism and soft mobility of Pavia, emphasising its identity of Crossroad of routes.
3. Climate mitigation by reducing environmental impact of the society.
4. Climate adaptation by preparing in advance for possible natural risks.
5. Underlining the role of the area within the Priority area for Biodiversity protection.
6. Regeneration of Naviglio Pavese and of the Ticino waterfront.
7. Creation of public space, recreational activities and facilities for residents and visitors.

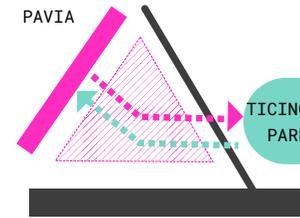
CONCEPT

In the case of Confluence, its position plays a central role, giving a potential for regeneration of the area. The place is in between the fundamental and characteristic elements of the territorial context, but today acts as an alienated entity and rather creates an isolated island, or barrier, rather than a transition space. The idea is to regenerate the area, by reinventing its role as a space of encounter and transition of different landscapes that surround it.

THE CONFLUENCE ACTS AS CONNECTIVE LANDSCAPE, BETWEEN THE TICINO AND NAVIGLIO, PAVIA AND ITS NATURAL SURROUNDINGS.

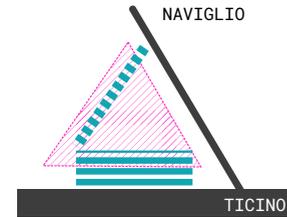


diagrammatic representation of the position of Confluence



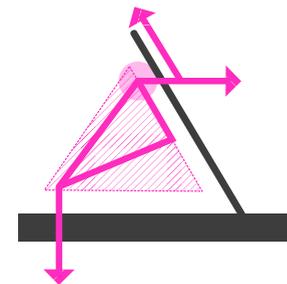
BUFFER ZONE BETWEEN PAVIA AND THE TICINO NATURAL PARK: COEXISTENCE AND SYNERGY

habitat for biodiversity, and recreation for the city



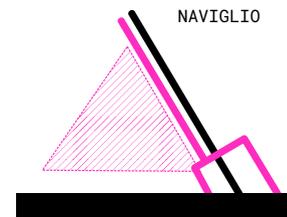
BLUE-GREEN INFRASTRUCTURE FOR WATER RISKS MANAGEMENT

implementation of bioswales, wetlands and retention ponds



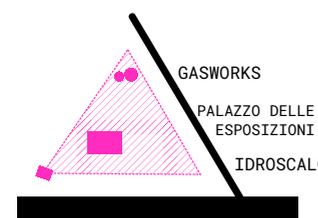
SPACE OF THE FLOWS AND MOVEMENT

welcoming and transferring the fluxes of Soft Mobility Network



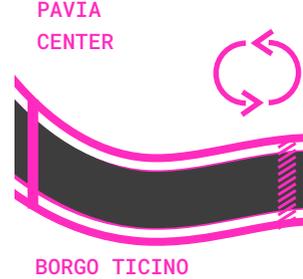
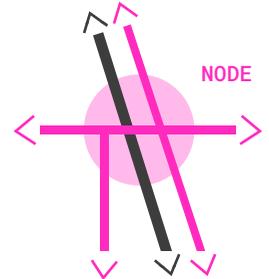
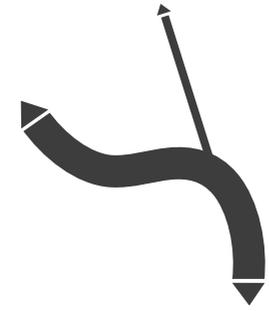
NAVIGLIO PAVESE INFRASTRUCTURAL REUSE

creation of a public green space with a range of activities



ADAPTIVE REUSE OF HISTORIC BUILDINGS

reuse of architectural heritage (Idroscalo), and city's facilities (Gasworks, Palazzo delle esposizioni)

<p>① NEW BRIDGE (PEDESTRIAN/CYCLE)</p>	<p>② WATERFRONT RING ROUTE</p>	<p>③ CROSSROAD OF ROUTES</p>	<p>④ NAVIGLIO NAVIGABILITY</p>	<p>⑤ VENTO CYCLE ROUTE</p>
<p>better connection between Borgo Ticino and historical center of Pavia</p> <p>panoramic viewpoint on Ponte Coperto and Borgo Ticino</p> <p>new fluxes to the area</p>	<p>creation of a panoramic Ticino waterfront ring route</p> <p>redevelopment of the riverfront of the Ticino</p>	<p>strengthening the role of a node with urban and visual design</p> <p>promotion of the identity of the Crossroad of Routes through territorial marketing tactics</p>	<p>aiming for restoration (at least partial) of navigability of Naviglio Pavese, recovering the waterway Locarno-Milan-Venice, including Naviglio Pavese</p>	<p>development and promotion of National Cycle Route VENTO</p> <p>improvement of the cycle infrastructure of the city preparing incoming fluxes with VENTO</p>
 <p>Diagram 1: Ponte Coperto and Borgo Ticino. Shows a bridge structure (Ponte Coperto) crossing the Ticino river, with a plus sign indicating a new connection.</p>	 <p>Diagram 2: Pavia Center and Borgo Ticino. Shows a curved waterfront ring route connecting the Pavia Center and Borgo Ticino.</p>	 <p>Diagram 3: Crossroad of Routes. Shows a central node with multiple intersecting routes.</p>	 <p>Diagram 4: Naviglio Navigability. Shows a curved path representing the Naviglio waterway.</p>	 <p>Diagram 5: Vento Cycle Route. Shows a cycle route connecting Torino, Venezia, and Vento.</p>

+ URBAN RESILIENCE BENEFITS

+ BETTER CONNECTIVITY

+ WATERFRONT REGENERATION

+ ECONOMICAL BENEFITS FROM TOURISM

+ RESTORATION OF NAVIGLIO

+ SOFT MOBILITY
+ SLOW TOURISM



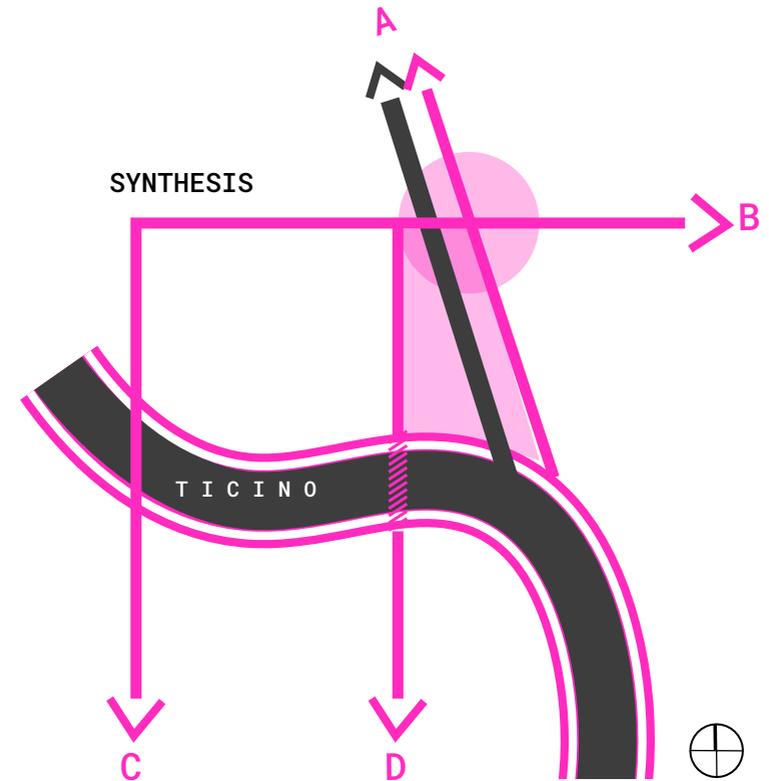
MOBILITY

The Mobility level of the Masterplan first of all promotes slow mobility, both on territorial and urban scales. Within the territory it works with the vectors that cross Pavia, established with the analysis of routes ('cammini' and cycle routes); the flows and movement that those vectors provide could constitute a valuable impulse for the gradual transformation of the area and the city. But to facilitate the movement, that today is very much absent from the area, there is a need to improve the accessibility and constitute new space for the flows. The solution that the Masterplan provides is to create a pedestrian bridge, that not only allows now to only to invite movement through the area, but also creates a Ticino circular route for pedestrians and cyclists, promoting waterfront regeneration to both sides of the river. This movement, corresponding to the pedestrian and cyclist routes, passes through the area meeting at the crossroad, which will become Slow travel Hub, reused Ex Gasometer complex hosting travel facilities. The identity of Crossroad of routes discussed in part two could physically manifest itself within the northern border of the area in this Hub. Those actions could go in synergy with the development and promotion of the VENTO national cycle path, which would also require the improvement of the city's cycle infrastructure.

On an urban mobility scale, the trajectory of the movement on of pedestrians is less straightforward but creates better access through the ramp-stair plaza and better transversality of the area in general. Closer to Ticino it creates an intricate web of paths for slow and panoramic enjoyment of renewed waterfront landscape. The vehicle movement is left quite limited, with the creation of a limited traffic zone and accessibility only for the resident or service automobiles (ex: access towards Palazzo delle Esposizioni and small parking for service cars)

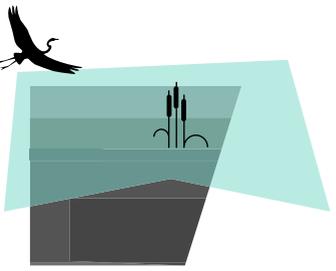
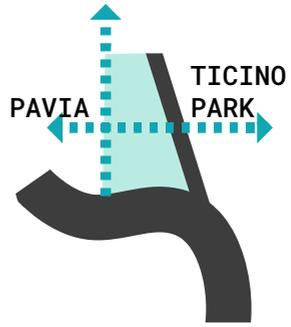
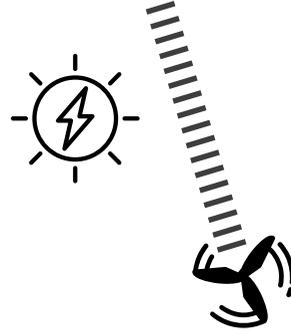
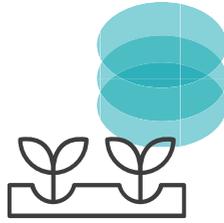
Another vector, that is planned to be revived with the Masterplan, is restoring the navigability (or at least partial) of Naviglio Pavese, allowing tourist and sports navigation along the canal. This action is thought to be implemented slowly but incrementally since the big restoration works are required to revive the functions of the locks. As the hypothesis, the first phase of this strategic action could correspond to the project by allowing recreational navigation on the last basin of Naviglio with no yet needs for major scale works of restoration. This action can act as a test project and show the possibilities for the navigability of Naviglio.

 - MOBILITY STRATEGY



DIRECTIONS

- A** - MILAN
- B** - VENICE, ROME
- C** - AOSTA
- D** - TURIN

<p>① FLOODABLE RIVERFRONT PARK</p>	<p>② TRANSITION AREA: CITY - NATURE</p>	<p>③ GREEN ENERGY GENERATION</p>	<p>④ BIOSWALE AND RETENTION POND</p>	<p>⑤ GASHOLDERS TO VERTICAL FARMS</p>
<p>creation of constructed wetland area</p> <p>management of floodwater and stormwater</p> <p>water filtration and storage</p>	<p>buffer zone between the city and Ticino Park</p> <p>introducing green space closer to the city center</p> <p>green corridors of the Ticino Park for biodiversity</p>	<p>hydroelectricity from Naviglio Pavese</p> <p>solar energy panels</p> <p>filtration of Naviglio water with floating wetlands</p>	<p>adapting existing topography for water management</p> <p>Roggia Carona act as bioswale and discharge channel in case of rains</p> <p>the water can be stored, filtrated and reused</p>	<p>urban agriculture for resilience</p> <p>collection, storage and reuse of water</p> <p>low environmental impact food production</p>
				

+ URBAN RESILIENCE BENEFITS

+ CLIMATE RESILIENCE



+ BIODIVERSITY



+ GREEN ENERGY



+ WATER MANAGEMENT



+ FOOD SECURITY

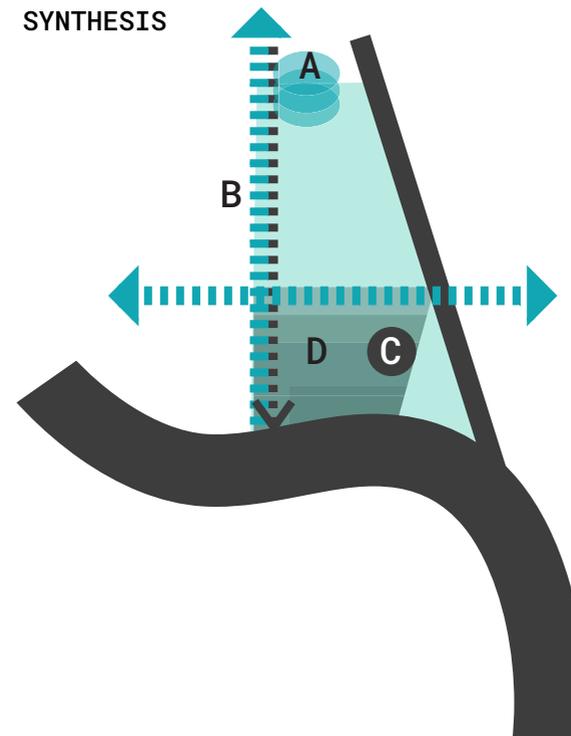


RESILIENCE

The Confluence is located within the Priority Area for the biodiversity of Ticino Valley, and has the potential due to its location of playing a fundamental role in the creation of Blue-Green Infrastructure for Pavia. The benefits of this kind of Infrastructure are now discussed more often as a solution to building climate resilience in urban scenarios. In the case of Pavia, because of its location on the bank of Ticino, with the changing climate there is a growing risk of more often and severe floods. This risk can be mitigated by designing the areas, that will welcome, infiltrate, delay and store the water - the constructed wetlands. The area adjusting to the Ticino reveals itself as a perfect location for their implementation, as it can both work for floodwater management, stormwater, in case of heavy rains, and also a possible solution for treating urban wastewater. The benefits of wetlands also include water filtration and habitat creation, adjoined by the creation of green public space with unique landscape qualities. Thus, Confluence Park will create a green gradient between the city and Ticino Park, promoting biodiversity growth coupled with increased residents' wellness.

Another type of blue-green infrastructure that the area already poses is the moat of Roggia Corona, which today acts as a discharge channel of Naviglio. In the Masterplan Roggia continues its role, which can be more precisely defined as a bioswale, with the intervention of valorisation of clearance from the debris present today in the moat. The Naviglio, in its turn, with the state of modern technology, can act as a power generation by implementing small-scale water turbines at the bottom of the channel along its course, that are safe for wildlife and do not alternate the course of water in any way. The waters of the canal can be purified too, employing floating wetlands, the system that allows the biological filtering by the plants' absorption of pollutants.

The last strategic action of the Masterplan is centred around the strengthening of the resilience of the city, by providing urban agriculture, which in this case can be a step toward increased food security. The structure of disused Gasholders provide an opportune solution for implementing vertical farming technology in a reused construction. This technology offers increased crop yield at a small consumption of land and resources, and crop resistance to extreme weather conditions.



ELEMENTS

- A** - VERTICAL FARM
- B** - ROGGIA CARONA
- C** - RETENTION POND
- D** - FLOODABLE PARK

<p>① REINVENTION OF NAVIGLIO WATERFRONT</p>	<p>② EX GASOMETER - SLOW TRAVEL HUB</p>	<p>③ PALAZZO ESPOSIZIONI - SLOW FOOD MARKET</p>	<p>④ IDROSCALO REUSE - COMMUNITY CENTER</p>	<p>⑤ RECONNECTION WITH THE CITY</p>
<p>public and active lifeline of Pavia</p> <p>beach and a swimming pool in the waters of Naviglio</p> <p>active area (sports, playgrounds, watersports) and urban tribune</p>	<p>tourism facilities in vicinity to the nodal point of slow mobility</p> <p>bike repair workshop, rental and parking</p> <p>hostel - accomodation for travellers and pilgrims</p>	<p>reduction of the size, introduction of permanent function - slow food market</p> <p>space for temporary exhibitions</p> <p>local food and agroproduction promotion</p>	<p>the terrace on Ticino with public cultural program and activities</p> <p>visitor centre</p> <p>public square and reconnection with the city</p>	<p>the access plaza, for better accessibility to the area</p> <p>stair-plaza allowing the descent to the area, and creating a public space</p>
	<p>* ADAPTIVE REUSE</p>			

+ ACTIVITIES

+ ACTIVE WATERFRONT



+ TOURISM SERVICES



+ FOOD MARKET



+ CULTURAL PROGRAM



+ ACCES POINT





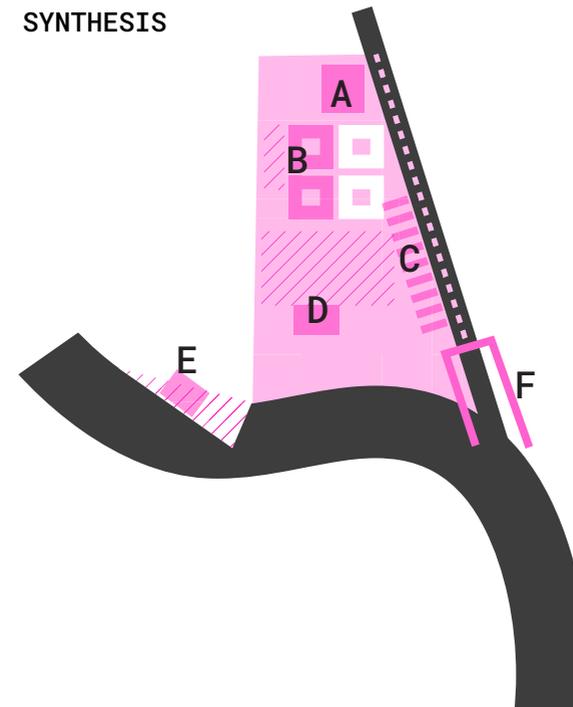
ACTIVITY

The Activity level of the Masterplan deals with the different functions its components perform, and therefore with activities that the space can offer or host. The current state of the area is characterised by a persistent low level of performed activities, and for the transformation of the area, attracting new ones is an essential part. Especially, reflecting the concept of infrastructure, Confluence is given the types of functions that could add benefits to the community and the city. From another point of view, activity level represents a set of actions that would be performed in order to reinstate the area for new uses.

The Masterplan with the regeneration of the Naviglio waterfront tries to bring as many recreational activities to the area as possible, to reinvent it as a pole of attraction of Pavia. One of the characteristics of Naviglio will be the water recreation on the canal, so the intervention foresees the construction of infrastructural elements that allows those new uses, such as Lido, dock or urban tribune. The area will host also other outdoor sports, such as paddle and table tennis, basketball or gym.

Then there is a series of adaptive reuse hypotheses of the heritage that is already present in the area: Ex Gasometer, Palazzo Esposizioni, Idroscalo. The complex of the gasworks, located in the vicinity of the crossroad mentioned in the Mobility strategy, in the Masterplan is defined as a Slow travel Hub with facilities especially focusing on the needs of slow tourists. The reuse of Palazzo delle Esposizioni brings it a new function of Slow Food Market, while Idroscalo - a community and visitor centre on the Ticino. Moreover, the area adds two additional residential blocks, continuing the urban fabric of Pavia from west to east, and adds an Access plaza, that act as a tool of reconnection of the area with the city, allowing to cross the difference of levels between the two through the ramp-stairs, that in its configuration creates public space.

SYNTHESIS



ELEMENTS

- A - GASWORKS *
- B - RESIDENTIAL +
- C - BEACH
- D - EXPOSITION PALACE *
- E - IDROSCALO *
- F - CONFLUENCE

- * - ADAPTIVE REUSE
- + - NEW CONSTRUCTION

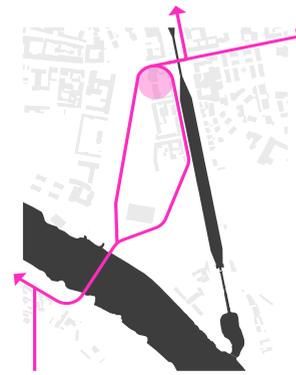


RESULT

With the actions proposed within the Strategy divided into three pragmatic levels, the Masterplan aims to answer complex problems that persist within the area by encountering the multidimensional solution for its regeneration. The Infrastructural approach to Confluence as a whole allows looking at it from the perspective of utility and function that it could perform for the benefit of the area, the city and society. With this approach, the regeneration becomes a tool for the construction of a more resilient and sustainable Pavia, rather than a final aim on its own.

The strategic actions are summed by the mean of diagrams, divided into three levels mentioned earlier: Mobility, Blue-Green and Activity. Diagrams, by showing their spatial disposition, allow a better understanding of the merging of the actions in creation in the final result of the Masterplan.

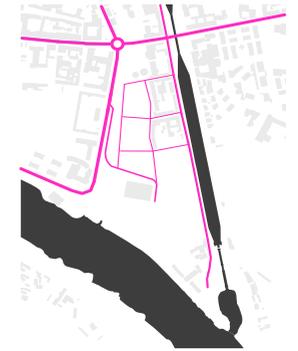
MOBILITY



soft mobility network

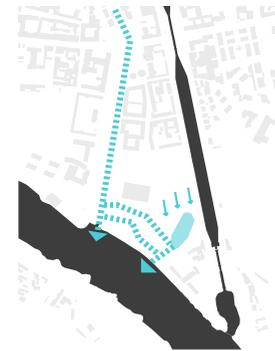


pedestrian mobility

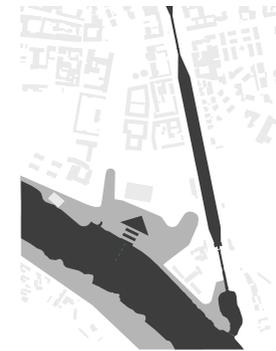


vehicle mobility

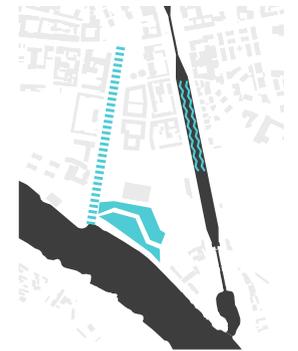
RESILIENCE



storm water management

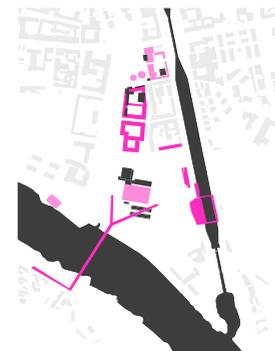


floodwater management

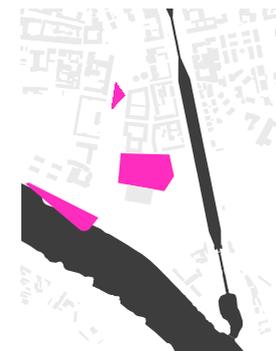


wetlands and bioswale
for water filtration
and habitat

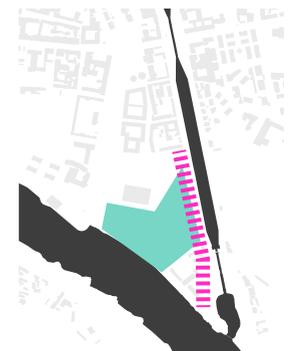
ACTIVITY



demolition/reuse/new



new plazas



confluence park
wetland and Naviglio

+ CROSSROAD *

* ADAPTIVE REUSE

Slow Travel Hub. Adaptive reuse of the Gasworks workshops for the facilities for the travellers on the crossroad of routes.

▷ ACCESS PLAZA

Connective plaza creates a point of pedestrian access to the area and a public space.

✂ SLOW FOOD EXPO *

Adaptive reuse of Palazzo delle Esposizioni, as the Slow Food Market of the local agricultural production, partially maintaining its function as temporary exhibition center.

// EVENT PLAZA

The plaza in front of the Slow Food Expo, represent a flexible space for temporary urban events of different type and scale. Concert, festivals circus, etc.

L NAVIGLIO WATERFONT

Naviglio is given the status of recreational and active lifeline of Pavia, hosting leisure activities along its waterfront.

~ CONFLUENCE PARK

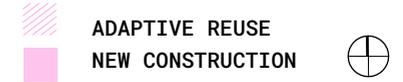
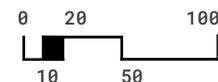
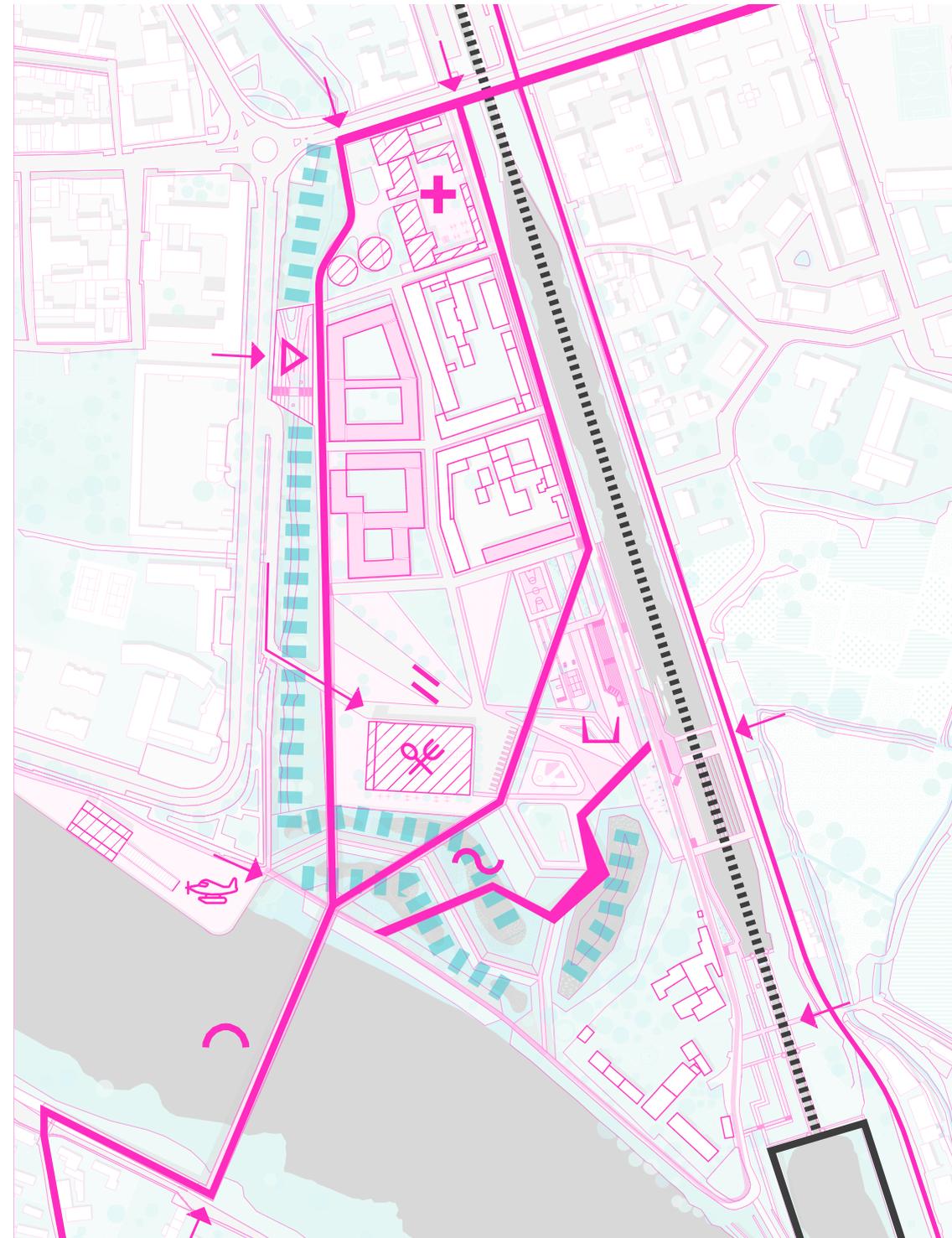
The Blue-Green Infrastructure including wetland, retention pond and bio swale, help mitigate extreme water events and creates public green space and important habitat for biodiversity of the Ticino Landscape.

✈ IDROSCALO *

Community and Visitor center in the building of reused Sea plane base.

◡ TICINO BRIDGE

for pedestrian & cyclists representing 'cammini' of Pavia



BEFORE



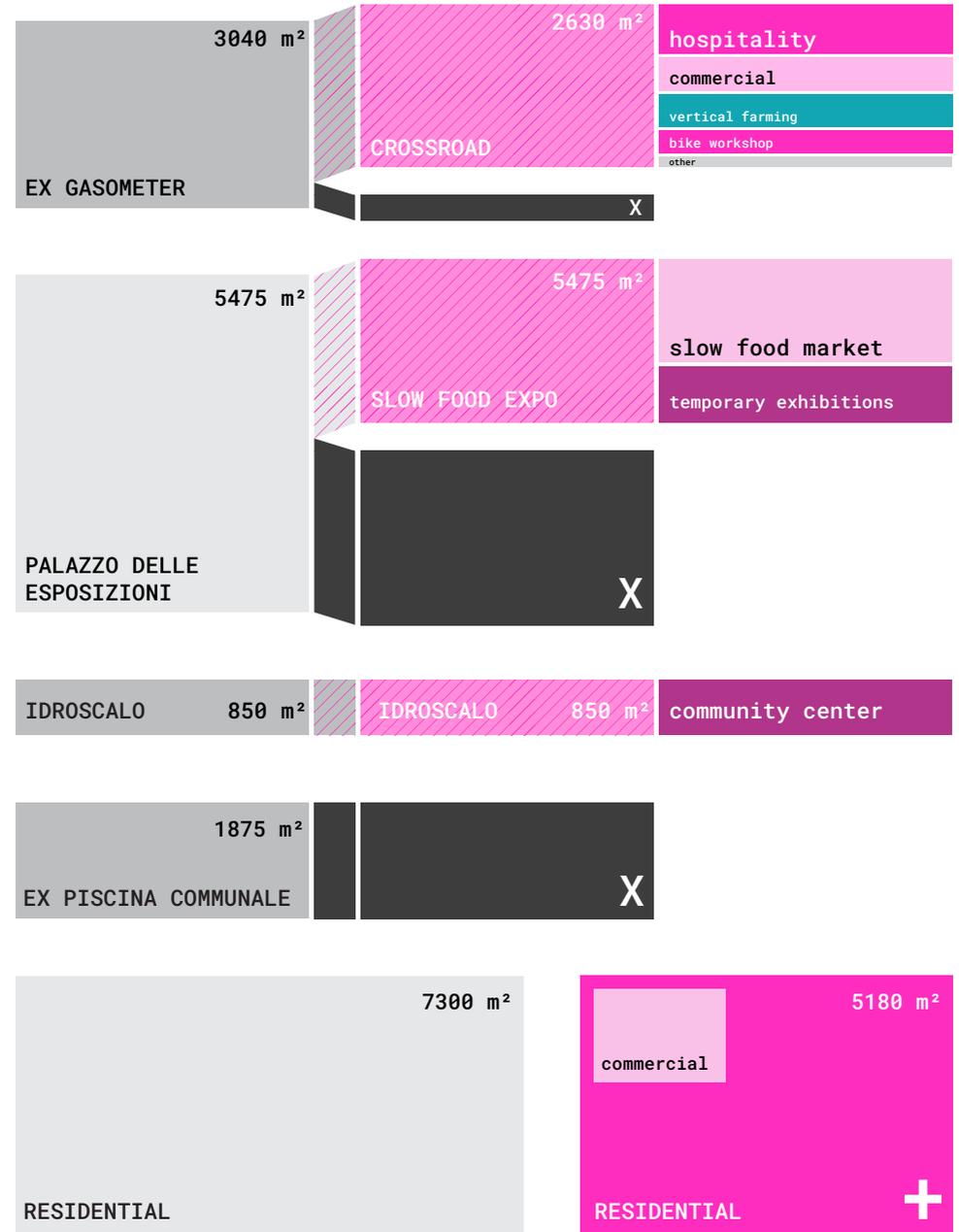
REUSE / DEMOLITION

IDROSCALO

As already seen in Part three, the area counts several abandoned architectural complexes: Idroscalo, Ex Gasometers and Swimming Pool. Out of those buildings, only one - Idroscalo - is considered to be an architectural heritage of regional scale (from 2009), which underlines the need for its urgent preservation, considering the state of degradation it happens to be in today. And, indeed, the building for some time has been the centre of debates and plans for restoration and reuse, including several projects (one of which has been already approved by the Municipality but hasn't been implemented), and one international competition, that brought broad attention and many ideas for the adaptive reuse of the building as a community centre. The Masterplan follows this rhetoric, underlining the use of Idroscalo as a community space, and foresees a public devotion to the area around the Idroscalo too, with the creation of the waterfront plaza continuing up the ramp to the interior of the Idroscalo. The building has a history of being an infrastructure for travellers, being the aeroplane base serving the line Torino-Trieste, an intermediate station for the refuelling, service and the resting break for the passengers. The new function of the Idroscalo can reflect those past functions too, and besides the community centre also performs the function of a visitor centre and information point.

EX GASOMETER

The oldest standing building in the area, the early-industrial complex of production of city gas constructed in the 1980s - Gasometer - has also been a centre of urban transformation agenda for many years, but with another outlook. The municipal plans for this area are usually considering the total demolition of the complex since it is not considered to be a part of the local heritage. But as seen in many examples around the world, gasometers have become an important part of "industrial archaeology", due to their significant historical and cultural value.⁷ Both structure of the gasholder and the gasworks workshops are the witnesses of industrial development of Pavia, and with this viewpoint, in the Masterplan, the complex is guaranteed existence in the future by the means of adaptive reuse. Yet, some smaller buildings, such as later constructed warehouses and extensions, have been decided to be removed, since they have a lower quality of construction or poorer state of preservation. The reused complex is destined to be reused for tourism facilities, especially catering to the needs of slow travellers and pilgrims, benefiting from the advantageous location at the node of different "cammini" (routes) and underlining the concept of "The Crossroad of Routes" of Pavia. The planned functions include a hostel, facilities for travellers with bikes, such as repair workshop, parking and rental; commercial and service areas that also could answer the different needs of the slow tourists, such as sports shop, bar/cafe, baggage deposit service, laundry and simply the place to rest and recharge all the necessities before continuing the journey.



7. Luigi Fiorino, Raffaele Landolfo, and Federico Massimo Mazzolani, "The refurbishment of gasometers as a relevant witness of industrial archaeology", *Engineering Structures* 84 (2015): 252-265, <https://doi.org/10.1016/j.engstruct.2014.11.035>.

PALAZZO DELLE ESPOSIZIONI

The only building in the area that is still in use, is Palazzo delle Esposizioni, the exhibition hall built in 1960 for the showcase of local agricultural production. The Palace from its construction was hosting events, mainly centred around food and wine, featuring degustations of a wide range of products of Pavia province: wines, sausages, cheeses, and different delicacies, some of them holding DOC and DOP denominations. Today the exhibition hall hosts from time to time different events, mainly trade shows (pet products, art, home decor etc), but the majority of the time remains unused. The Masterplan, having in mind the regeneration of the area, thought to bring permanent uses to the Hall, centred around local food as it had once in the past. The strategy of reuse consists in downsizing the Exposition palace, dedicating half of the main exposition hall to a slow food market, and promoting the agricultural producers from the province. The rest of the space rests available for temporary exhibitions, providing flexible configuration for smaller events. The disused spaces towards the river (the barns that once were used for demonstration of the cattle) and the entrance building (that once was hosting a smaller exposition hall but today is used for storage) are thought of being demolished to allow bigger green space for the wetlands and the Event Plaza. The latter will take on some of the functions of the former Palazzo delle Esposizioni, by allowing the outdoor space for temporary events, such as trade shows and fairs, but also concerts, circuses and amusement parks.

SWIMMING POOL

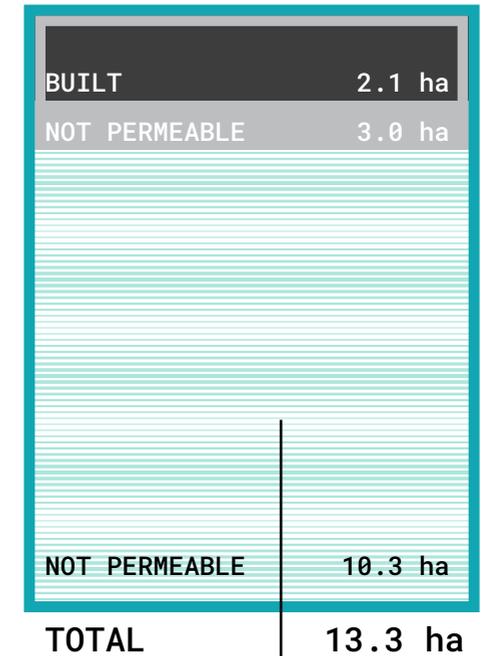
The Municipal Swimming Pool was abandoned after its closure in 2009 because of outdated specifications, that were requiring increased maintenance. Due to this fact, the small dimension of the constructions and the apparent lack of heritage value, the reuse scenario of the complex is considered impractical. In the Masterplan the complex is destined for demolition. In its place, and the neighbouring camp of Sinti settlement, two residential blocks are constructed, continuing the existing line of urbanisation from west to east. A part of residential buildings could be built as social housing, which could welcome a percentage of the people that used to live here already for almost 40 years - the Sintis.

PERMEABILITY

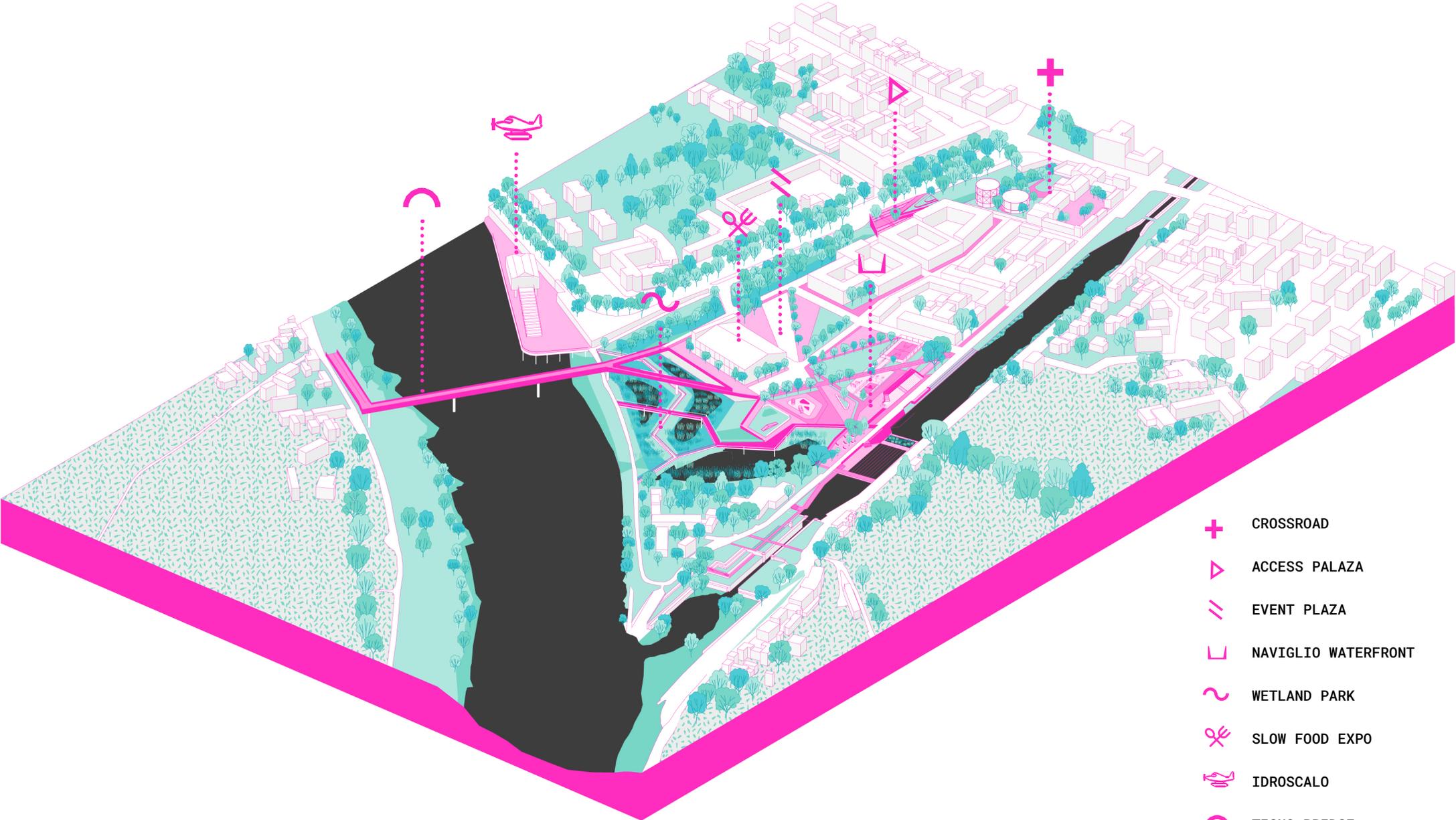
BEFORE



THEN



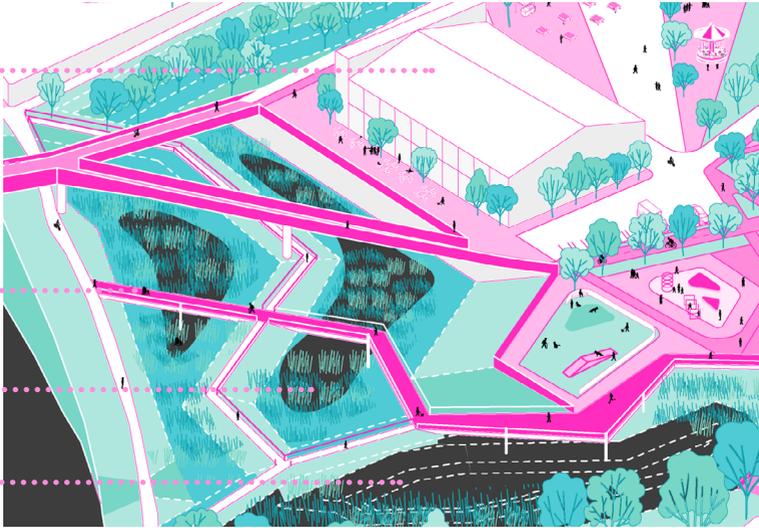
GENERAL AXONOMETRY



- + CROSSROAD
- ▷ ACCESS PALAZA
- // EVENT PLAZA
- └ NAVIGLIO WATERFRONT
- ~ WETLAND PARK
- ✂ SLOW FOOD EXPO
- 🏊 IDROSCALO
- ⤿ TICNO BRIDGE

CONFLUENCE PARK **SLOW FOOD EXPO**

- SLOW FOOD MARKET
- EXHIBITIONS
- BRIDGE
- ELEVATED PATHWAY
- WETLAND
- DETENTION POND

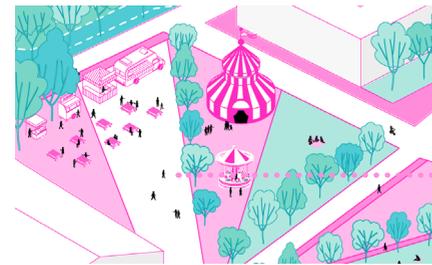


ACCESS PLAZA **CROSSROAD**



EVENT PLAZA

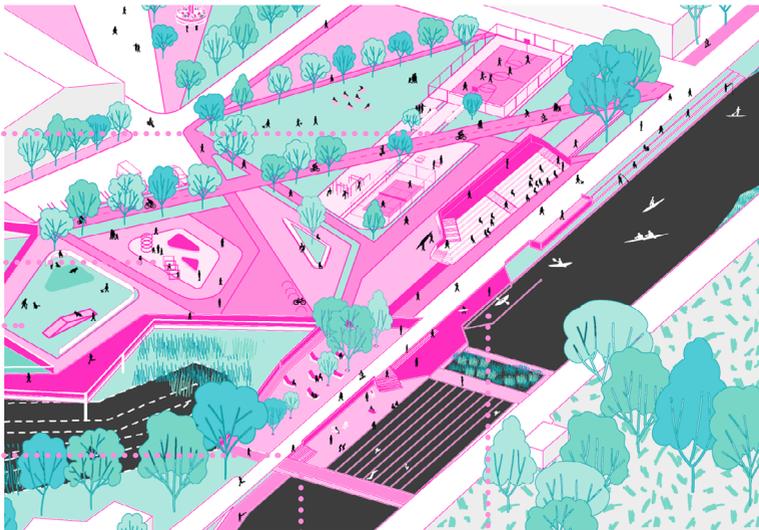
- VERTICAL FARMING
- HOSTEL
- BIKE REPAIR



..... PLAZA FOR
..... TEMPORARY EVENTS

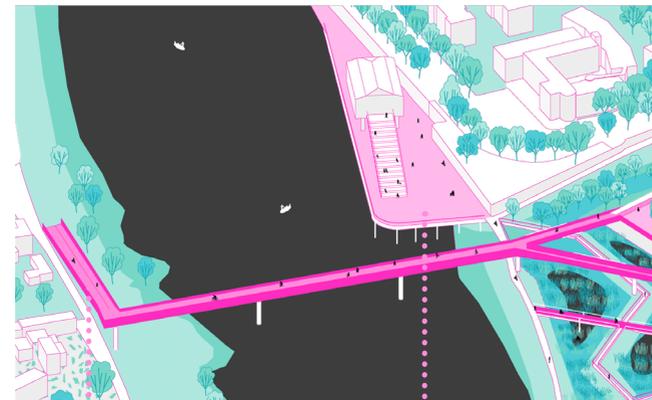
NAVIGLIO WATERFONT

- OUTDOOR GYM & SPORTS
- PLAYGROUND
- DOG PARK
- LIDO



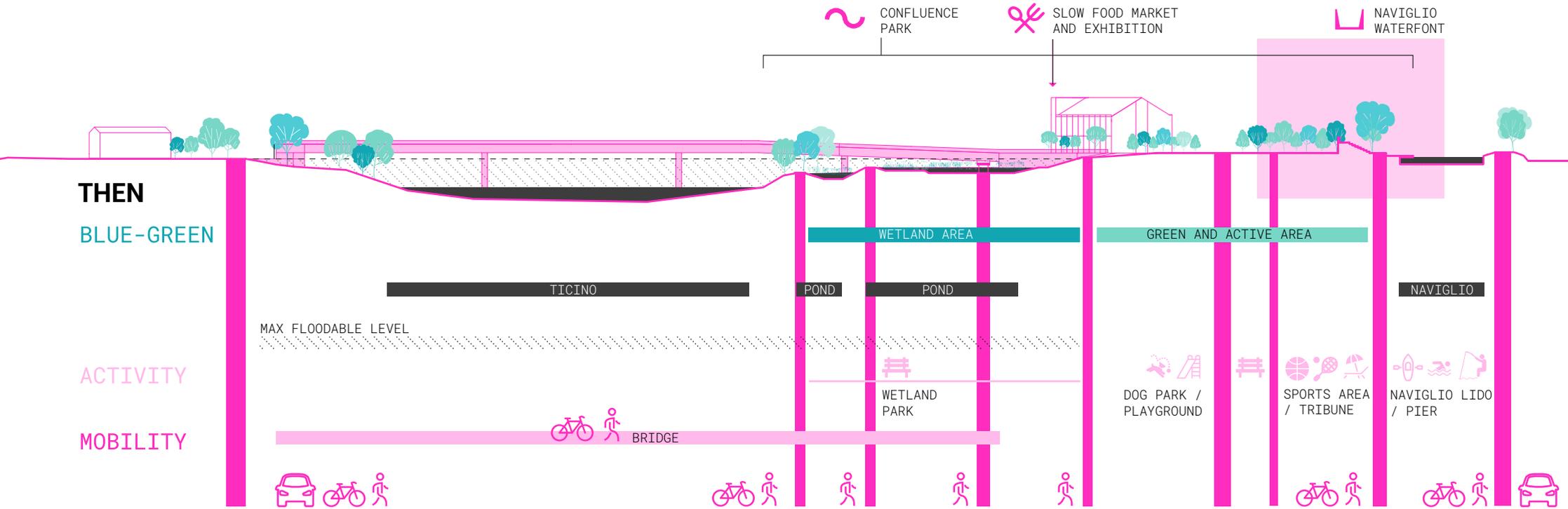
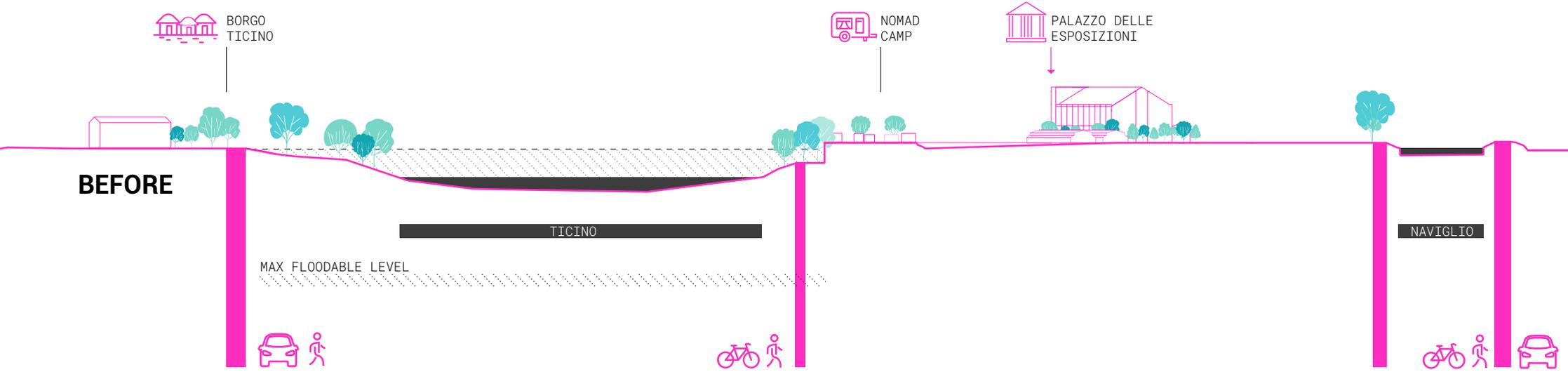
- NAVIGLIO SWIMMING POOL
- KAYAK LAUNCH

BRIDGE **IDROSCALO**



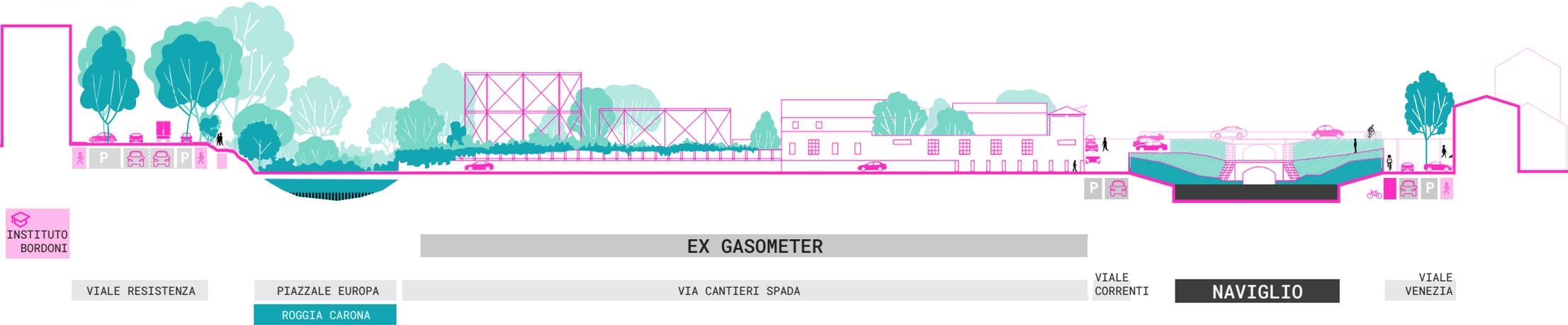
- 6% RAMP
- IDROSCALO PLAZA

GENERAL SECTION

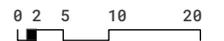
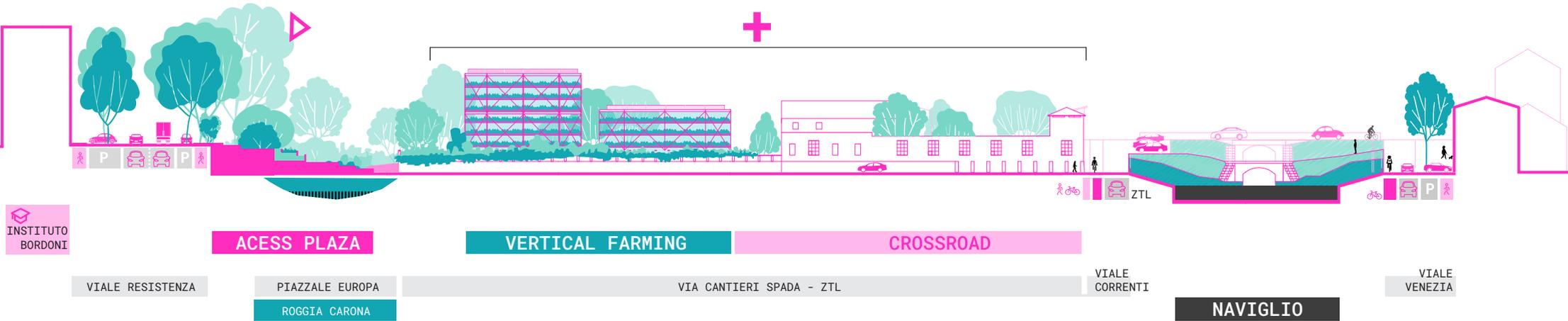


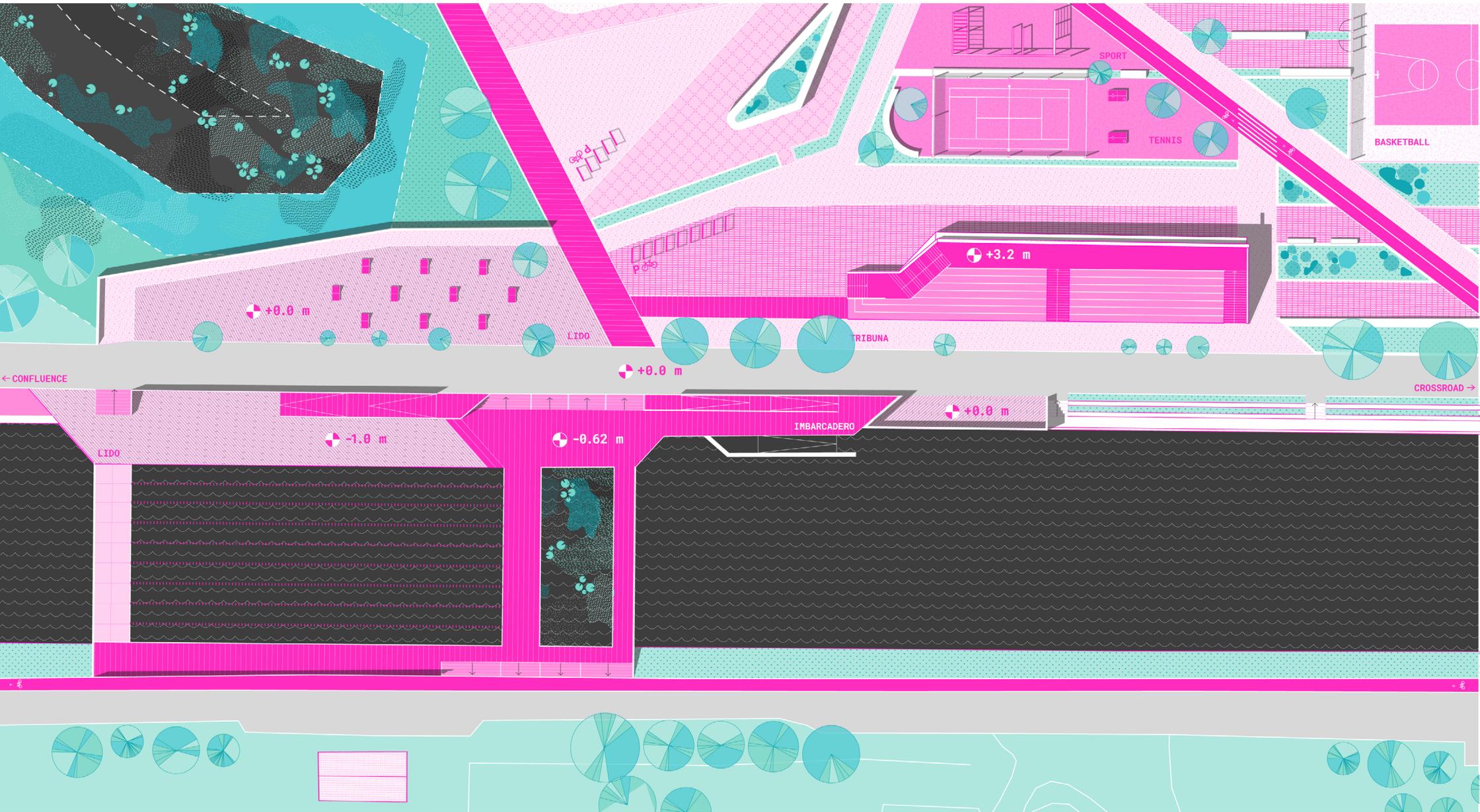
+ CROSSROAD

BEFORE

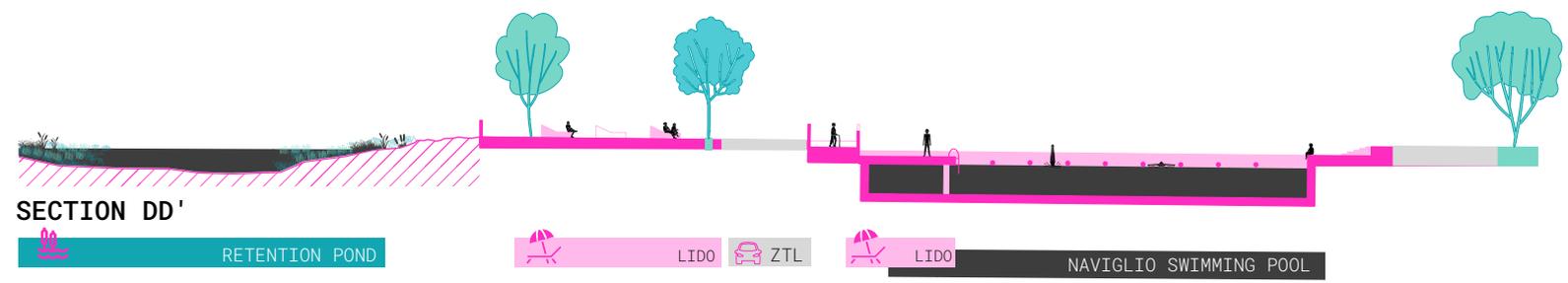
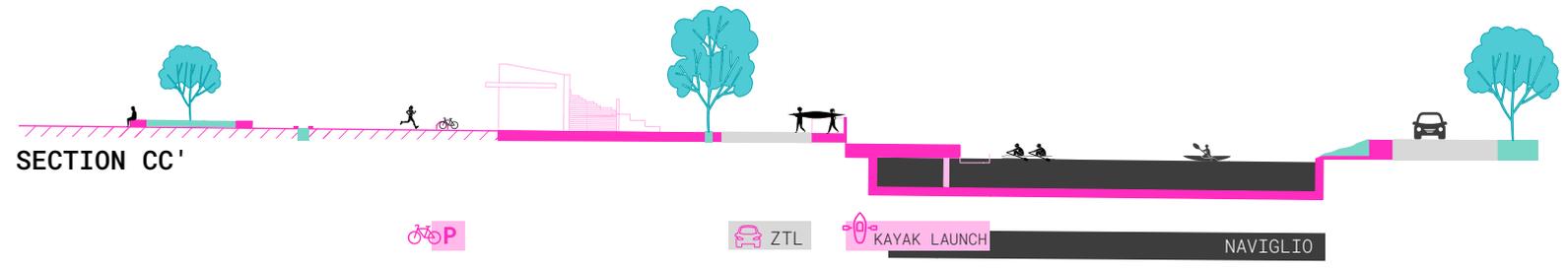
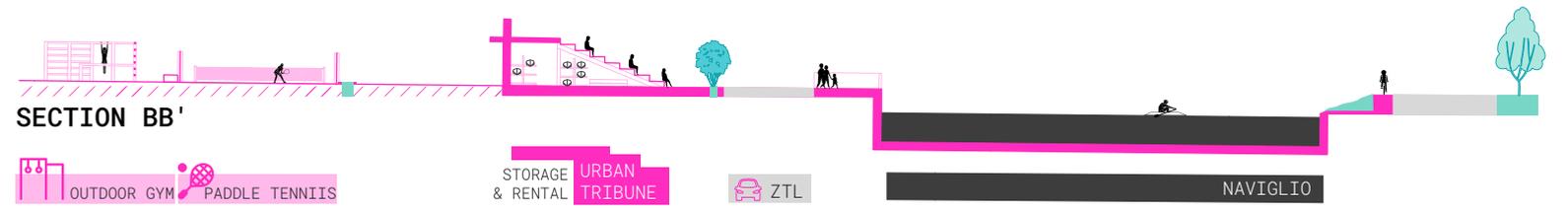
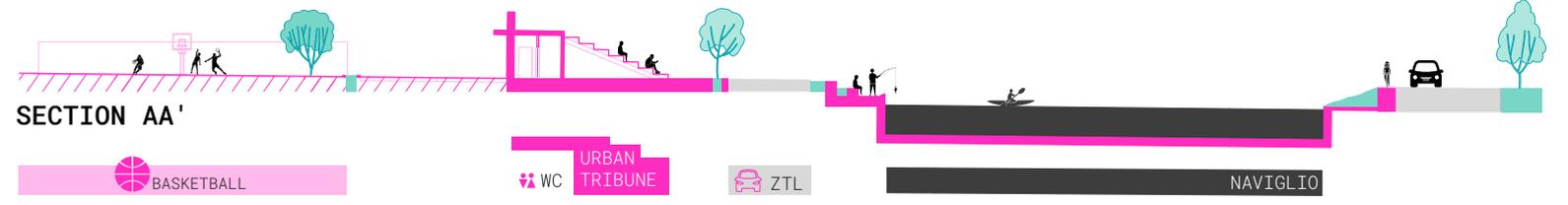
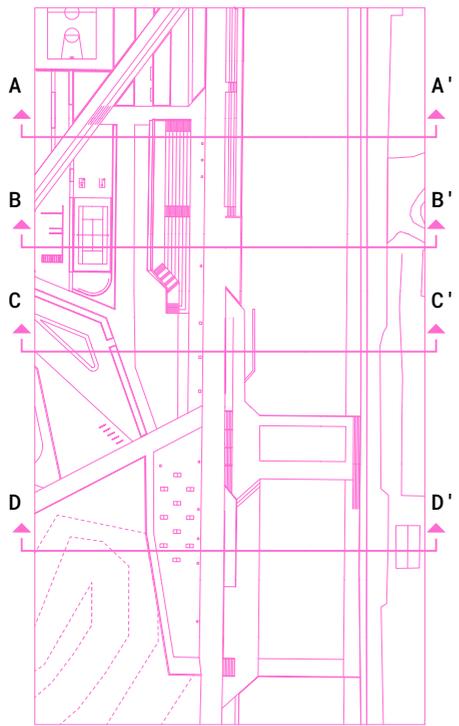


THEN





NAVIGLIO WATERFONT



Adda and Lorenzo

30 and 33 y.o.
secretary and digital entrepreneur,
residents of Pavia

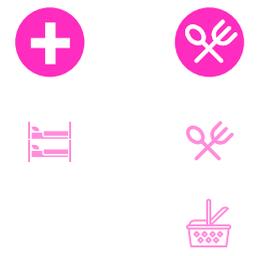


Adda. We come here often to play with our dog, Raia in the **dog park**. Sometimes, we like to go to **Slow Food Market** for an Aperitivo with friends or for small groceries of local produce. I also like going to **Lido** during summertime.

Lorenzo. I sometimes go for a quick jog in the **Confluence Park** and use the **Outdoor Gym**.

Jean Paul and Marion

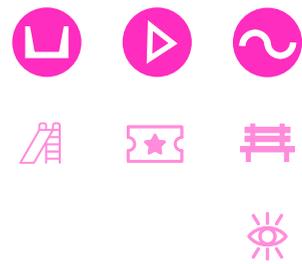
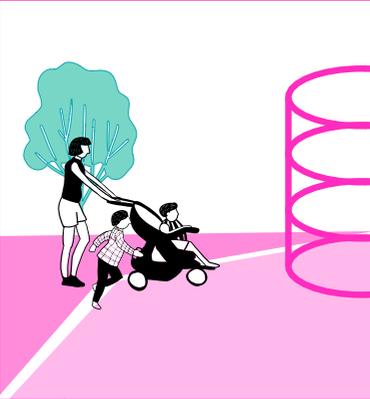
45 and 46 y.o.
pilgrims from Nantes, France



Marion. Last summer we did Camino de Santiago and really liked the experience. This year we've decided to go on Via Francigena from Aosta till Rome. We choosed to sleep in **hostel** because it's located right on the way, which makes it easier for us to see a bit of the city and to continue tomorrow morning our journey. I've read there is local **food market**, which we will definitely visit, cause we always try different local food on our way.

Diana, Sam and Leo

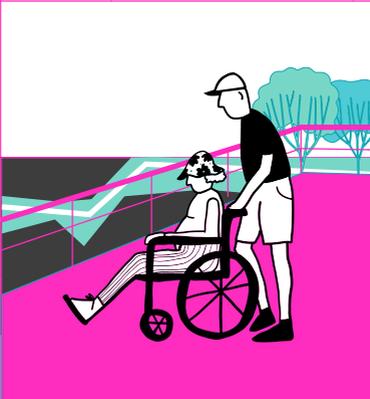
35 and 3 y.o.,
residents of Pavia



Diana. When we go for a walk, for me it is important to go somewhere interesting for kids, where they enjoy playing. So, we often come here for **playground**, which are very few in Pavia. When there are some events such as festival on the **plaza** we come too. But for me personally, I prefer the **Park**, since it is very quiet and beautiful there, especially in the spring when it gets flooded.

Gino and Silvia

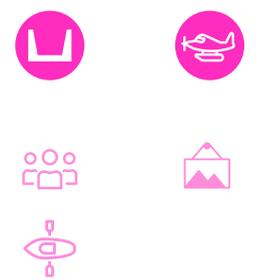
72 y.o., retired,
residents of Pavia



Gino. We live in Borgo Ticino, right next to the Confluence to other side of the river. The area has transformed completely in recent years, and now we are happy to have a **park** to go just nearby the house across the **bridge**. The area now has many people coming in the area and there are many events, and sometimes we go to some in the **plaza** in front of Palazzo della Esposizione.

Claudio, Sara and Ahmed

21 and 22 y.o.,
students in University



Sara. We came from different places to study in Pavia, and so far we like the city. We usually come to the place just to chill along the **Naviglio** on the **tribune** with friends to share some beers.

Ahmed. I started learning how to kayak at **Lido**, since it looks safer for beginners than in the river. **Idroscalo** is cool too, I like the events.

Andrea

53 y.o., financial advisor,
lives in Milan

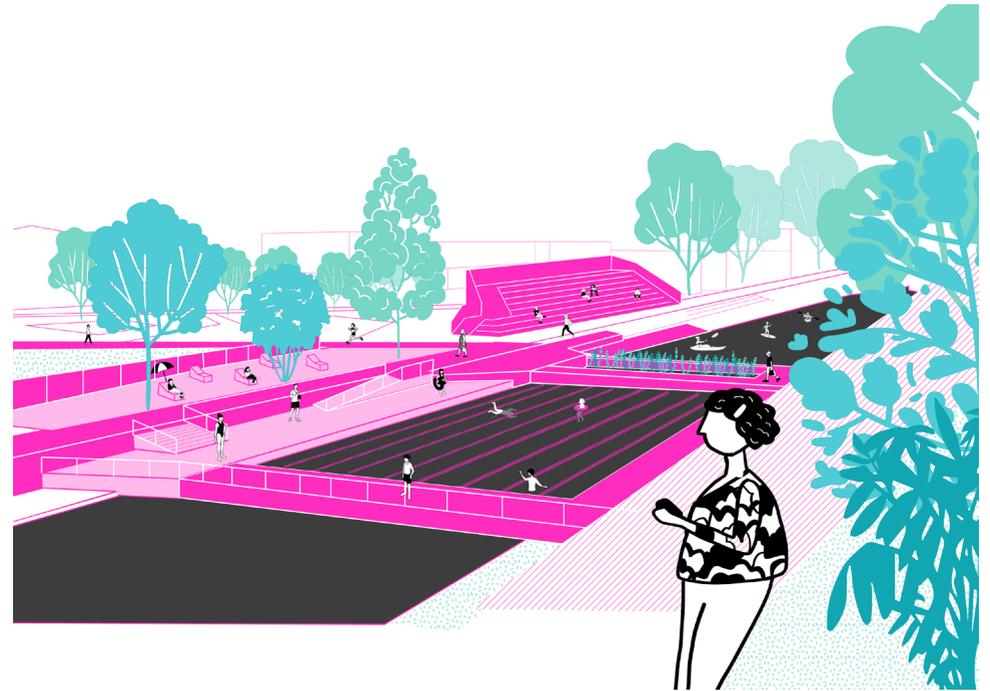


Andrea. I prefer to spend my weekends actively outside, arriving to **Confluence** by bike in one hour and enjoying the cycle path along Naviglio on my way. When I cycle to further places, like further along VenTo, I stop at the **bike repair** for a quick check, and continue with the **bridge**, which opens a beautiful panorama on the Ticino and the city.

+ CROSSROAD



NAVIGLIO WATERFONT



Bibliography:

- Allen, Stan. "Infrastructural urbanism", in *Points + Lines: Diagrams and Projects for the City*, 46-59. New York: Princeton Architectural Press, 1999.
- Baracca, Claudio, and Gigliola De Martini. "Trent'anni di trasformazioni urbane a Pavia: Note per la lettura degli atti urbanistici dal 1963 al 1994" in *Annali di Storia Pavese* no. 28. Pavia: 2000: 303-31.
- Bascapé, Giacomo C, and Alberto Vigevani. *Il Naviglio di Milano e gli antichi canali lombardi*. Milan: Il Polifilo, 2014.
- Belanger, Pierre. *Landscape as Infrastrutture*. New York: Routledge, 2017.
- Bertelli, Guya. *Sulle Tracce Della via Francigena: Punti Di Vista Sullo Spazio Pubblico*. Santarcangelo di Romagna, (RN): Maggioli, 2014.
- Brandolini, Filippo. "Pavia: Vestigia di una Civitas Altomedievale." Master thesis, Università degli Studi Milano, Milan, 2011. https://www.academia.edu/4311218/Pavia_Vestigia_di_una_Civitas_altomedievale
- Careri, Francesco. *Walkscapes: Walking as an Aesthetic Practice*. 2002. Reprint, Barcelona: Editorial Gustavo Gili, 2017.
- Castronovo, Valerio , and Alberto Mioni. *Archeologia industriale in Lombardia: Milano e Bassa Padana*. Milano: 1982.
- Clément, Gilles. *Manifesto del Terzo Paesaggio*. Macerata: Quodlibet, 2018.
- Conti, Andrea, Deni Ruggeri, and Luigi Bartolomei. "Soft Infrastructure as Landscape – a Methodology for the Assessment and Improvement of the User Experience of Soft Mobility." *Transportation Research Procedia* 14 (2016): 2314 – 2323. <https://doi.org/10.1016/j.trpro.2016.05.248>
- Croce, Stefano. "Redevelopment of Gasometer Area in Pavia with Social Labs and a Vertical Farm." Master thesis, Università di Pavia, Pavia, 2011.
- de Solà-Morales, Ignaci. "Terrain vague". In *Territorios*, 181-193. Barcelona: Gustavo Gili, 1995.
- Dickinson, Janet E., Derek Robbins, and Les Lumsdon. "Holiday travel discourses and climate change." *Journal of Transport Geography* 18 (2010): 482-489. <https://doi.org/10.1016/j.jtrangeo.2010.01.006>
- Dickinson, Janet E., Les M. Lumsdon and Derek Robbins. "Slow Travel: Issues for Tourism and Climate Change." *Journal of Sustainable Tourism* 19, no.3 (2011): 281-300. <https://doi.org/10.1080/09669582.2010.524704>
- Direzione Generale Territorio, Urbanistica, Difesa del Suolo e Città Metropolitana. *Piano Territoriale Regionale d'Area Navigli Lombardi*. 2020.
- Fabris, Luca Maria Francesco , and Gerardo Sempredon. "Greenways as a New Potential for Shrinking Cities: The Case of Milan." *Proceedings of the Fábos Conference on Landscape and Greenway Planning* 6, no 1, article 54, 2019. <https://doi.org/10.7275/zjxh-hp81>
- Heitmann, Sine, and Peter Robinson, Ghislaine Povey. "Slow Food, Slow Cities and Slow Tourism" in *Research Themes for Tourism*. CABI, 2011.
- Hung, Ying-Yu, and Gerdo Aquino. *Landscape Infrastrutture: Case Studies by SWA*. Basel: Birkhauser, 2013.
- Lay, Maxwell G. *Ways of the World : a History of the World' s Roads and of the Vehicles that Used Them*. New Brunswick : Rutgers University Press, 1992
- Leichenko, Robin. "Climate change and urban resilience." *Current Opinion in Environmental Sustainability* 3, n 3 (2011): 164-168, <https://doi.org/10.1016/j.cosust.2010.12.014>.
- Lydon, Mike and Anthony Garcia. *Tactical Urbanism : Short-Term Action for Long-Term Change*. Washington, DC: Island Press, 2015.

- Lynch, Kevin. *Image and the City*. Cambridge: MIT ; Harvard University Press, 1960
- Mandić, Ante, Željko Mrnjavac, and Lana Kordić. "Tourism Infrastructure, Recreational Facilities and Tourism Development." *Tourism and Hospitality Management* 24, no. 1 (2018): 41-62.
<https://doi.org/10.20867/thm.24.1.12>
- Nijhuis, Steffen, Daniel Jauslin, and Franklin van der Hoeven. *Flowscapes: Designing Infrastructure as Landscape*. Delft: TU Delft, 2015.
<http://resolver.tudelft.nl/uuid:15505481-89e1-491c-848b-953291833c40>
- Plevoets, Bie, and Koenraad van Cleempoel. *Adaptive Reuse of the Built Heritage: Concepts and Cases of an Emerging Discipline*. Routledge, 2019.
- Prina, Vittoria. *Pavia Moderna: Architettura Moderna in Pavia e Provincia 1928-1980*. Pavia: Cardano Libreria Ed., 2003.
- Prusicki, Marco, and Antonello Boatti. *I nuovi Navigli milanesi : storia per il futuro*. Santarcangelo di Romagna : Maggioli ; 2018.
- Robiglio, Matteo. *RE-USA : 20 American Stories of Adaptive Reuse: a Toolkit for Post-industrial Cities*. Berlin: Jovis, 2017.
- Waldheim, Charles. *Landscape as Urbanism: a General Theory*. New York: Princeton Architectural Press, 2016.
- Waldheim, Charles. *Landscape Urbanism Reader*. New York: Princeton Architectural Press, 2006.
- World Bank. *A Catalogue of Nature-Based Solutions for Urban Resilience*. World Bank, Washington, DC, 2021.
<https://openknowledge.worldbank.org/handle/10986/36507>