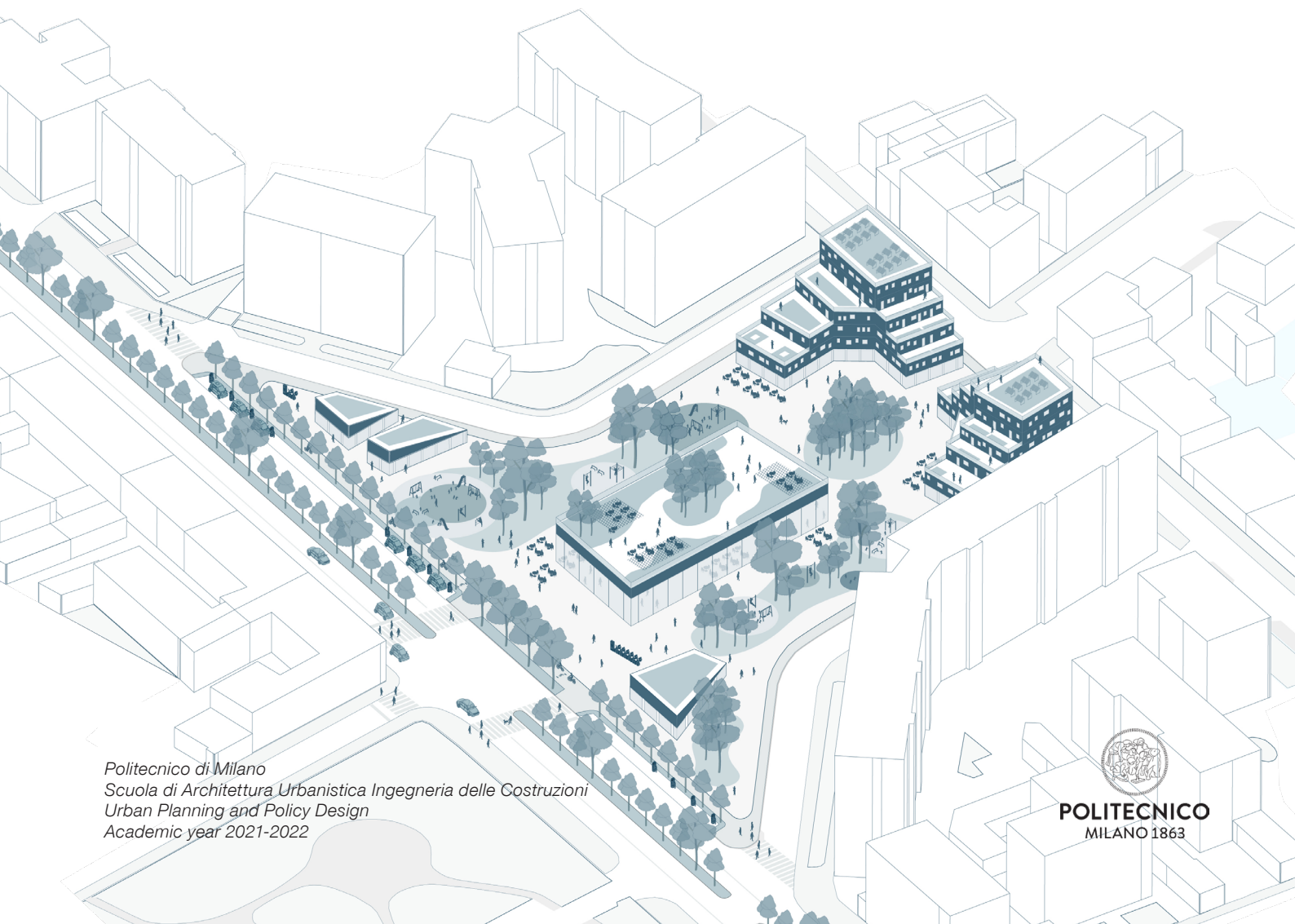


# REINVENTING CLIMATE HOUSING

RECLIMING:  
reinventing Piazzale Martesana as a  
trigger for urban climate resilience  
and social housing in Milan

*Thesis Supervisor: Ass. Prof. Eugenio Morello*

*Master Student Candidate: Gianfranco Eportentosi*









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# ***Sinossi***

In che modo l'edilizia sociale può essere il fattore scatenante che spinge le città a adottare misure di resilienza per far fronte ai cambiamenti climatici? Come i temi dell'abitare sociale e della resilienza climatica possono incontrarsi nella progettazione di nuovi spazi urbani? Come queste tematiche sono adattabili alla città contemporanea? E quanto saranno rilevanti i temi del clima e dell'abitare nella città del futuro?

Queste sono le domande di ricerca fondamentali da cui partire per la tesi, che si suddivide in due parti principali. La prima parte ha il compito di introdurre le tematiche principali del lavoro, produrre delle analisi del territorio sul quale sviluppare il progetto e infine per elencare una serie di riferimenti utili allo sviluppo del progetto.

Quindi la tesi inizia definendo cosa si intende per Climate e Housing, e capire perché mettere in relazione questi temi. Successivamente si definisce l'ambito di lavoro sul quale applicare in modo concreto i temi introdotti. Quindi la tesi prende in considerazione i concorsi di Reinventing Cities organizzati da C40 come opportunità per coniugare alla progettazione di spazi urbani le sfide climatiche e dell'abitare sociali. Infatti, la città di Milano ha deciso di partecipare alla terza edizione dei concorsi, presentando sei ambiti periferici da reinventare in primis dal punto di vista abitativo, ma pur sempre considerando i "classici" temi di RC ovvero quelli dell'efficienza energetica, della circolarità, zero emissioni, resilienza e sostenibilità delle città. La seguente tesi ha preso quindi in considerazione il sito di Piazzale Martesana nel quartiere di Gorla-Precotto. Su questa area sono poi emerse una serie di analisi e considerazioni sviluppate nei primi capitoli. In particolare, sono state sviluppate una serie di analisi generali e di considerazione del bando di RC e le richieste specifiche. Successivamente la parte analitica si suddivide in due parti: la prima riguarda una serie di analisi sulle condizioni problematiche dal punto di vista climatico e dell'abitare a Milano e nel quartiere Gorla-Precotto.

La seconda parte invece si occupa di analizzare una serie di strumenti di pianificazione per Milano e di capire se possono affrontare le problematiche del clima e dell'abitare che sono emerse nel capitolo precedente. La prima parte della tesi si conclude poi con la rappresentazione di una serie di riferimenti progettuali e ottime applicazioni pratiche dei temi climatici e abitativi. Per quanto riguarda la seconda parte della tesi, si riprende il Piazzale Martesana e le sintesi dei capitoli analitici per svilupparne il progetto.

Come prima cosa si definiscono dei principi cardine progettuali grazie alla considerazione di una serie di strumenti di pianificazione e progettazione forniti dal concorso di Reinventing Cities, dal PGT e altri. Successivamente si sono definite delle strategie di assetto della piazza, tramite definizione grafica, ma anche scritta ovvero con il supporto delle 10 sfide di RC che sono state legate alle strategie e scelte progettuali. Dopo aver definito in modo strategico e schematico la ridefinizione del piazzale, si è proceduto con la rappresentazione attiva e pratica del progetto finale, spiegandone le azioni apportate e giustificandole.

La tesi si conclude con la rappresentazione schematica di come le azioni progettuali siano legate alle 10 sfide di Reinventing Cities e ad alcuni dei Sustainable Development Goals delle Nazioni Unite. Vengono poi tratte delle conclusioni in risposta alle domande di ricerca iniziali, dimostrando le scoperte finali e i risultati pratici della tesi.

# ***Abstract***

How can social housing be the trigger for cities to adopt resilience measures to cope with climate change? How can the themes of social housing and climate resilience meet in the design of new urban spaces? How are these themes adaptable to the contemporary city? And how relevant will climate and living issues be in the city of the future?

These are the fundamental research questions to start from for this thesis, which is divided into two main parts. The first part has the task of introducing the main themes of the work, producing an analysis of the area on which to develop the project and finally listing a series of useful references for the development of the project.

Then the thesis begins by defining what is meant by Climate and Housing, and why to relate these themes. It then defines the scope of work on which to apply the introduced themes concretely. Then the thesis considers the Reinventing Cities competitions organised by C40 as an opportunity to combine the design of urban spaces with the challenges of climate and social housing. The city of Milan decided to participate in the third edition of the competitions, submitting six suburban areas to be reinvented primarily from a housing point of view, but still considering the "classic" RC themes of energy efficiency, circularity, zero emissions, resilience and sustainability of cities. The following thesis, therefore, considered the Piazzale Martesana site in the Gorla-Precotto district. A series of analyses and considerations developed in the first chapters then emerged in this area. In particular, a series of general analyses and considerations of the RC notice and specific requests were developed. Subsequently, the analytical part is divided into two parts: the first concerns a series of analyses on the problematic conditions from the point of view of climate and living in Milan and the Gorla-Precotto district.

The second part, on the other hand, is concerned with analysing a series of planning instruments for Milan and whether they can address the problems of climate and living that emerged in the previous chapter. The first part of the thesis then concludes with a series of planning references and excellent practical applications of climate and housing issues. In the second part of the thesis, the Piazzale Martesana and the summaries of the analytical chapters are taken up to develop the design. First, design principles are defined through the consideration of a series of planning and design tools provided by the Reinventing Cities competition, the PGT and others. Next, strategies for the layout of the square were defined, through graphic definition, but also in writing, i.e. with the support of the 10 RC challenges that were linked to the design strategies and choices. After strategically and schematically defining the redefinition of the square, an active and practical representation of the final design was made, explaining the actions taken and justifying them.

The thesis concludes with a schematic representation of how the design actions are related to the 10 challenges of Reinventing Cities and some of the UN Sustainable Development Goals. Conclusions are then drawn in response to the initial research questions, demonstrating the final findings and practical results of the thesis.

# ***Introduction to Climate and Housing***

| WHAT CLIMATE?

| WHAT HOUSING?

| WHY CLIMATE AND HOUSING?

| REINVENTING CITIES ON A GLOBAL SCALE

/ Winning projects

/ 10 challenges to be addressed

| MILAN SITES IN COMPETITION

/ Piazzale Martesana

/ Photo Essay

| FUTURE PROJECT DEVELOPMENTS

| REINVENTING CITIES PLANNING RULES

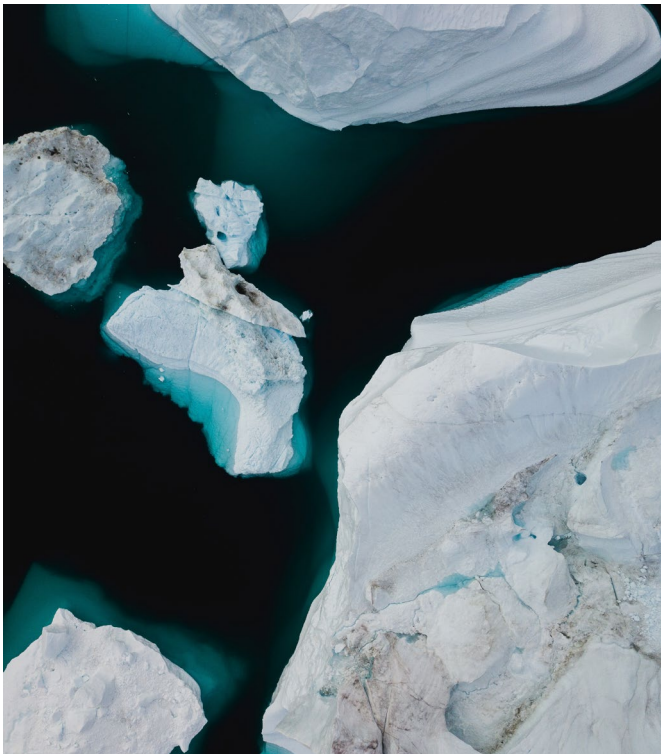
# 01

This first chapter introduces the themes of the Reinventing Cities competitions, the goals and strategies and the 10 challenges that C40 has set together with many cities around the world that have decided to join the climate challenges for their cities. There have already been two editions of Reinventing Cities and very promising results have been seen, which are reported below. Below is the case of Milan which, in this third edition, decided to bring climate and resilience issues linked to social housing. Therefore, a topical issue for Milan, but one that will be increasingly relevant in the coming years.

Finally, the chosen project site, Piazzale Martesana, is reported. Starting from the competition announcement, understanding the potential and criticality of the area and studying the rules for developing a project.



# WHAT CLIMATE? CLIMATE



Annie Spratt - Unsplash



Tobias Rademacher - Unsplash

What will the climate be like in cities? How is the quality of life within them changing? What are the consequences and climate problems today? And who suffers them most?

These are questions that need to be answered in order to embark on new horizons in planning and designing the cities we will live in. These are necessary questions to understand climate issues and to bring them into the design phase of this thesis. First of all, we need to understand what is meant by climate. Climate means the prediction and estimation of how climatic phenomena change over the long term, through the use of specific instruments that monitor a series of meteorological variables.

As has been known for many decades, the climate of our planet is changing rapidly and in a fairly short time. The causes are many, first and foremost the overheating of the Earth and the rise in temperatures due to the activity and lifestyle of us humans. Ranging from the use of non-renewable and emission-releasing energy sources to the poor efficiency of the energy produced and used. As in the field of mobility and especially building construction. Rising average temperatures bring with them serious consequences for the entire planet, often manifested as extreme weather phenomena, which are becoming increasingly frequent in all parts of the world. And they will increase in intensity as temperatures rise.

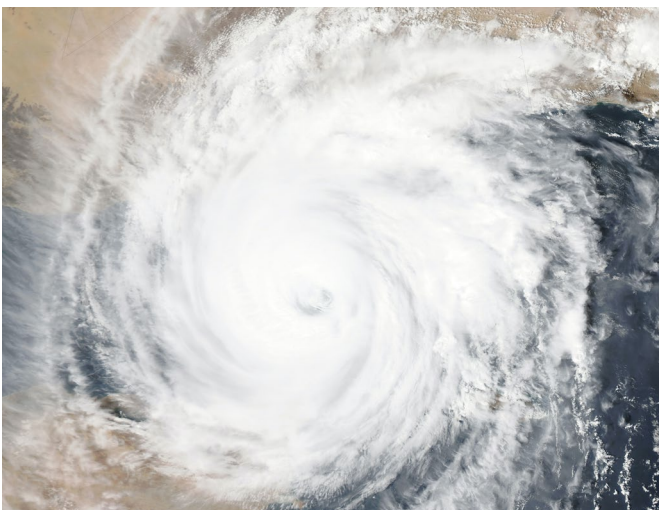
These extreme climate phenomena are heavy rainfall (flooding of rivers), hail (destruction of crops and flora) and hurricanes (destruction of entire villages) and extreme wildfires. But also the melting of glaciers and polar ice caps that lead to rising sea levels and a desalinisation of the seas, breaking the delicate balance between marine ecosystems. More heat leads to an increase of certain pollutants in the atmosphere and thus to

poor and dangerous air quality. As if this were not enough, man directly and uncontrollably destroys large quantities of trees and plants every year and consumes the planet's soil. In fact, these natural elements are excellent allies in counteracting rising temperatures and the climate change they cause. These are issues that major international organisations are trying to take into account by adopting global strategies and setting very ambitious targets to counter these changes.

Indeed, the climate forecasts for the coming decades are very worrying. Estimates made by leading climate researchers describe a difficult future for the planet in the coming years. Temperatures are expected to rise steadily and its consequences catastrophically.

Who suffers most from these consequences? Where are extreme weather phenomena most frequent and intense?

Generally speaking, climate crises are most pronounced in countries that are often also the poorest and paradoxically contribute the least to temperature variation. Geographically, this refers to the global south and the Earth's hottest continents.



Nasa - Unsplash



Matt-Palmer - Unsplash

A very significant example is India, where every year record temperatures are recorded during the summer, causing the death of thousands of people from the heat. But drought as a direct consequence of global warming is also a very serious problem for large parts of the African continent its peoples and the nature that inhabits it. The two poles of the earth are also the areas that experience a great variation in temperatures during the year, these are not densely populated areas, but they cause knock-on effects that manifest themselves for example along the coasts of western countries, where the big cities are located.

We can therefore deduce that in general every part of the planet is affected, but to a large extent the southern areas of the planet, which are often also the poorest, the least technologically developed and least prepared to deal with such phenomena. This thesis will be concerned with producing analyses in this regard, but for an area in Milan, Italy, in a developed country and among the northern areas of the planet. In spite of this, can this also be considered an area of the population that suffers more from the effects of climate change? What are the reasons for this?

These are questions that will be answered in the following chapters after a careful analysis of climate phenomena in Milan.



# WHAT HOUSING?

# HOUSING



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In a world that continues to grow and has reached 8 billion people on the planet, what future does the housing market hold for the world? How will overpopulation be dealt with, will there be enough resources for everyone? Who will have access to housing? And under what conditions?

These are big questions that concern many issues related to urbanism and architecture of the future. The design and planning of cities, especially large metropolises that continue to grow in population and size, have a daunting task in the coming decades, namely the responsibility to provide housing for all.

There are two macro topics to be introduced. The first concerns the social and economic possibilities of populations to guarantee access to housing. We know very well that often the poorest populations of the globe do not have the economic possibility to build houses for all, such as social housing or housing with rent or purchase facilities.

And often these countries are the poorest, but also the ones with the highest population growth in recent decades. The more developed countries have more experience and resources to deal with housing issues. In the vanguard is Northern Europe, where access to rented housing for all is one of the most significant features of those cultures and of city planning and design policies. But we must also remember that in general the European population is decreasing in number and that we are even beginning to perceive the great redundancy of empty and uninhabited houses in rich and developed countries.

A paradoxical scenario is thus envisaged from this point of view: on the one hand, very large and growing populations, but with no real housing; and on the other hand, very developed populations that are decreasing in number, but that own in great abundance.

The second argument focuses instead on the environmental and resource impacts of new housing. Assuming, then, that every inhabitant of this mode has access to a house, what are the environmental impacts of building it? As mentioned earlier, we should start with the issue of empty and completely unused houses, linked to the issue of land use.

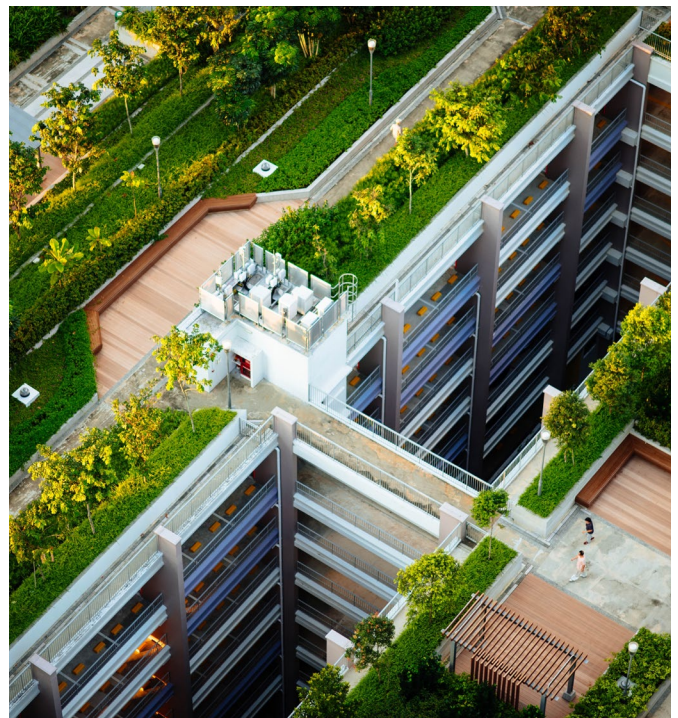
In fact, this is the first among the environmental impacts for new construction. eriving green and wooded areas is a duty we owe to the environment and to ourselves, in order to mitigate rising temperatures and related extreme weather phenomena.

Furthermore, the construction of new houses and flats needs to be as energy efficient as possible using renewable sources. The use of recycled, natural and local materials. Materials that have a low environmental impact in their production and transport.

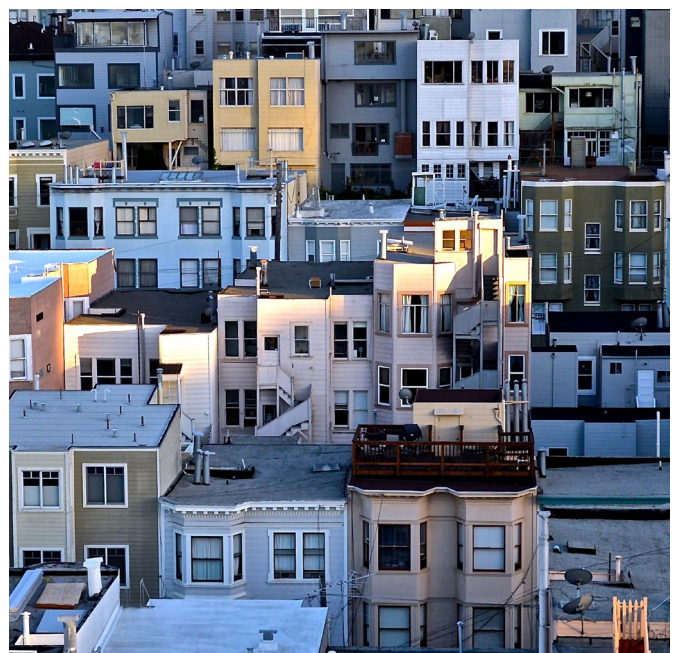
In conclusion, we can say that the housing issue, like the climate issue, will increasingly involve the whole world. At the moment some populations feel this phenomenon much more present and impressive, others much less so. But in the future we will probably see more and more large migratory phenomena and displacements of populations seeking a higher quality of life.

Is Europe ready to face these challenges? How is Italy, and especially Milan, addressing the issue? What measures and housing policies will be put in place in the face of falling population numbers in Milan?

To answer these questions, an analysis of the painification processes in Milan and the policies it intends to implement in the coming years will follow.



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# WHY CLIMATE AND HOUSING? WHY?

Why consider climate and housing together?  
Where do these two topics meet?  
How can they be related from a planning perspective? Are they two leading topics for planning and designing the cities of the future?

As described above, the topics of climate change and housing are the focal points of this thesis, which seeks to compare but above all relate them to each other.

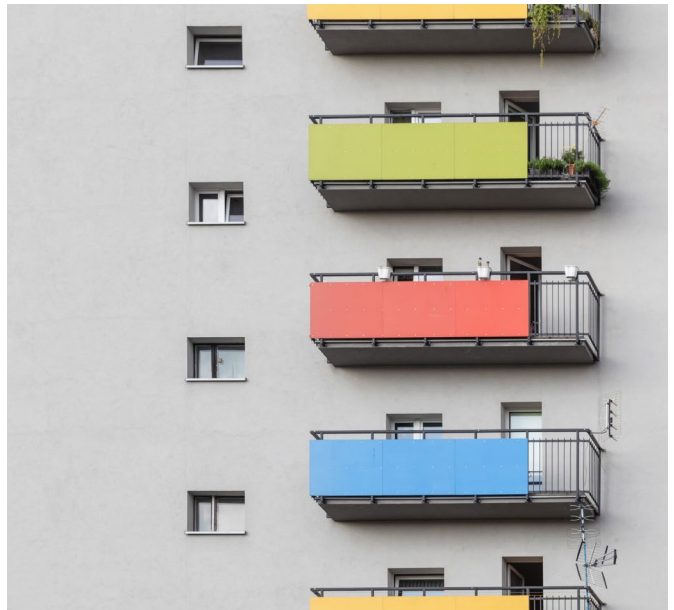
First of all, both of these topics concern a global and local scale at the same time (Glo-cal Issues), both open up scenarios that are visible in various parts of the world, phenomena that are generated by the same underlying issues.

In fact, starting from two objective data, population growth and rising global temperatures, one can deduce how climate and housing issues are directly linked and destined to collide.

On the one hand there is a growing need for housing and related services that cities must provide for their population, on the other hand this population is called upon to adopt sustainable lifestyles, to preserve food, energy and material resources. But above all, when it comes to housing, there is a need to provide housing that is sufficient for the demand and that has high



Freepik



Pawel Czerwinski - Unsplash

housing and environmental standards. We need integrated planning between quality of living for all and environmental sustainability.

In a city like Milan, it often happens that people with low housing standards are also those who suffer most from the effects of global warming. For example, those who live in a building with low energy efficiency, located in an area of the city without green areas or trees, and who therefore suffer a lot from the phenomenon of heat islands, are forced to use a lot of energy (and therefore a lot of emissions) to cool the flat, and in the winter months the same happens for outdoor heating. On the contrary, advantages and trade-offs can occur when living in an area of the city that uses natural shading, has a good amount of green areas and the building has high energy efficiency. In fact, the cooler temperatures outdoors, allow less indoor heating and less use of air-conditioning (with renewable energy) and produce fewer emissions that would cause more greenhouse effect and subsequent consequences.

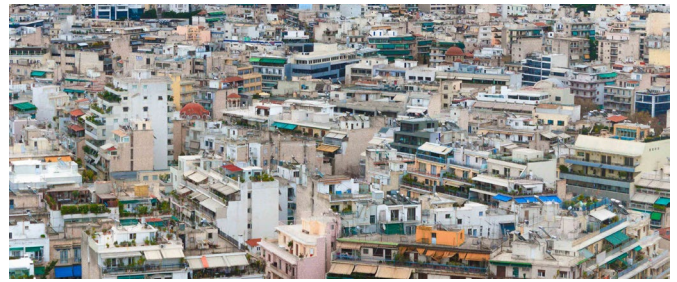
Usually the population residing in buildings and flats with low living standards are the poorer segments of the population with less economic power such as young families, students or the elderly.

Considering that, in spite of the Italian trend, Milan has a constant population growth and therefore a growing need for flats, also and above all for a very young population group; it becomes very important to understand how to ensure that these new inhabitants, who represent the future of society, can easily enter Milanese life.

It is in fact not easy in the first place because of the high costs of renting and buying a house. Prices on the real estate market in Milan are the



Juan Manuel Sanchez - Unsplash



Savvas Kalimeris - Unsplash

highest in Italy and among the highest in major European cities. In recent years, it has become very difficult for many inhabitants to live in Milan, even though there are very high salaries. For the poorest people, this represents an exclusion from the city or a stay, but on very uncomfortable living conditions.

This is where a joint reasoning between Housing and Climate can start. In fact, through the design and planning of cities and buildings with a high standard of sustainability to be allocated as public housing (Social Housing) can be a promoter of good practices for the climate and at the same time a mitigator of poverty in the city and a promoter of social inclusion and wellbeing of the population.

The intention is therefore to unite the two themes in the regeneration of a public space in Milan with a series of objectives linked to these two macro themes. The opportunity to think about this union is provided by the C40 Reinventing Cities competitions, which in Milan faces its third edition: Reinventing Housing, which proposes precisely a union between living and the quality of living in a sustainable city.

The following pages will therefore introduce the role of Reinventing Cities, what it is about and the objectives it sets itself. The areas competing for Milan and an introduction to the project area of this thesis will then be introduced.



# C40 ABOUT C40 CITIES ORGANIZATIONS

**A GLOBAL NETWORK OF MAYORS TAKING URGENT ACTION TO CONFRONT THE CLIMATE CRISIS AND CREATE A FUTURE WHERE EVERYONE CAN THRIVE.**





C40 is a network of mayors of nearly 100 world-leading cities collaborating to deliver the urgent action needed right now to confront the climate crisis. Together, we can create a future where everyone, everywhere can thrive.

*"Reinventing Cities: C40 Launces Competition for Global Cities to Pave the Way to a Sustainable Future"*

November 16, 2017

From that day C40 organised two editions of reinventing cities in 33 different cities around the world, and in 2022 there is the third one.



## WHAT DOES C40 DEAL WITH?

### RAISING CLIMATE AMBITION

- 1.5°C Climate Action Plans
- High-Impact Accelerators
- Inclusive & Thriving Cities
- Research & Knowledge

### SCALING UP CLIMATE ACTION

- Adaptation & Water
- Air Quality
- Energy & Buildings
- Food Systems
- Transportation
- Urban Planning
- Waste Management

### BUILDING A MOVEMENT

- Global Green New Deal
- Global Youth & Mayors Forum
- Cities Race to Zero

### INFLUENCING THE GLOBAL AGENDA

- Green & Just Transition
- Global Diplomacy & Advocacy
- Financing the Green Transition
- Engaging the Private Sector

# REINVENTING CITIES ON A GLOBAL SCALE

# REINVENTING

## ● SITES IN COMPETITION

Bologna  
 Bristol  
 Cape Town  
 Huston  
 Izmir  
 Lyon  
 Milan  
 Montréal  
 Naples  
 Paris  
 Phoenix  
 Reykjavik  
 Roma  
 San Francisco  
 Sao Paulo



## ● PAST COMPETITION SITES

Auckland  
 Chicago  
 Houston  
 Madrid  
 Milan  
 Montréal  
 Oslo  
 Paris  
 Reykjavik  
 Roma  
 San Francisco  
 Singapore

**10  
CHALLENGES**

**30  
NEW SITES**

**21  
CITIES**



Reinventing Cities is an international organisation that has been promoted by C40 to hold competitions to address 10 climate and environmental challenges in participating cities. This creates innovative and brilliant ways of tackling certain global issues like climate change and housing.

The vast majority of greenhouse gas emissions come from cities. And the population of cities is growing year by year, which is why the C40 Cities organisation had the initiative to organise competitions that could reinvent cities by stimulating sustainable development and innovative solutions for the environmental challenges cities face.

In 2022, Reinventing Cities launched the third edition of the competitions in which several cities around the world participate by choosing which areas of their city need to be reinvented.

# WINNING PROJECTS

Here are some of the winning projects from previous editions of C40 Reinventing Cities, the first was launched in 2017 and the second in 2019 and has so far seen 21 different cities around the world participate. The winning projects have passed two selections, in fact the competitions consist of a first phase for which the participating teams deliver a project proposal of interest where they outline in a general way their design intentions by explaining how they will tackle the 10 climate challenges (next page). There is then a second

phase in which only some of the proposed projects can participate; those that are found to be most interesting, original and innovative can move on to the next phase, which is to develop the project in detail. Finally, the committee will choose the winner.

The projects selected here are some of the most iconic from past years, and some of them are in Milan and have a good relevance to the project developed in this thesis.



## L'INNESTO

### Scalo Greco Breda Milan, Italy

1<sup>st</sup> edition winner



## CAMPUS FOR LIVING CITIES

### Madrid, Spain

1<sup>st</sup> edition winner



## TERCER SONIDO

### Villaverde Madrid, Spain

1<sup>st</sup> edition winner





**GREEN BETWEEN  
TESSITURE URBANE**

**Crescenzago  
Milan, Italy**

2<sup>nd</sup> edition winner



**MILANO PER LOC**

**Piazzale Loreto  
Milan, Italy**

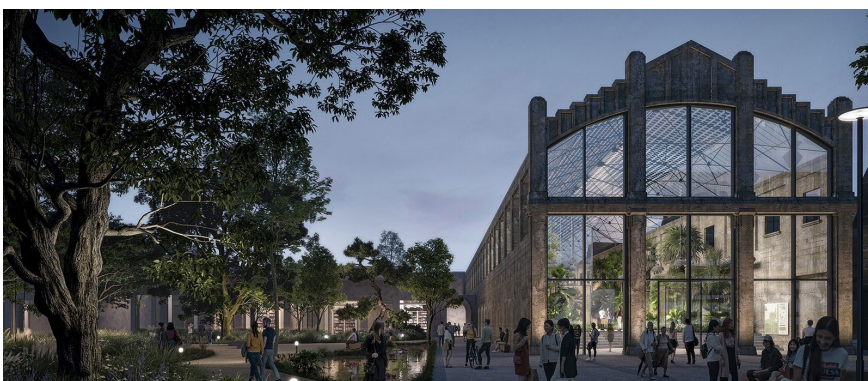
2<sup>nd</sup> edition winner



**CAMPO URBANO**

**Roma Tuscolana  
Roma, Italy**

2<sup>nd</sup> edition winner



**ARIA**

**Ex Macello  
Milan, Italy**

2<sup>nd</sup> edition winner

# 10 CHALLENGES FOR CLIMATE



The Reinventing Cities competitions are based on principles, or rather challenges, to be faced during the design process. The first two are mandatory for participating projects, while the others are optional.

These 10 challenges summarise the key principles to be adopted in RC projects and are also a driving force for stimulating innovative projects and solutions.



**Green Buildings and Energy Efficiency**

The aim is to reduce greenhouse gas (GHG) emissions and the environmental impact of energy production and consumption.



**Sustainable Construction and Building Life Cycle**

The aim is to reduce the project's inherent carbon footprint, i.e. the lifecycle greenhouse gas emissions generated during the construction and transport of building materials, construction operations and end-of-life aspects of the building.



**Low-Emission Mobility**

This challenge aims to promote sustainable mobility alternatives. Within their projects, participating teams will have to incentivise and promote walking, cycling, public transport, shared, electric and other low-emission vehicles, while discouraging the use of fossil-fuelled means of transport.



**Resilience and Adaptation Climate**

This challenge aims at the development of a project resilient to current and future site-specific climate risks.



**Sustainable Lifestyle and Green Jobs**

This challenge aims to exploit the site for the development of new ecological services for the area, which will help promote a more sustainable lifestyle and consumption habits, thus reducing the environmental impact of communities and creating green jobs in the city.



**Sustainable Management of Water Resources**

This challenge aims to develop sustainable water management systems.



**Circular Resources and Sustainable Waste Management**

This challenge aims to accelerate the transition to a zero-waste city and to develop a sustainable waste management system for the operational phase of the project to reduce greenhouse gas emissions and provide co-benefits such as reducing the extraction of scarce resources and the consumption of fossil fuels.



**Green Spaces, Urban Nature and Biodiversity**

This challenge aims to protect biodiversity and develop urban vegetation and agriculture to mitigate climate risks and promote environmental sustainability.



**Social Inclusion and Community Participation**

The objective of this challenge lies in the development of inclusive services and interventions that meet the needs of the local population and involve the local community itself and its actors in project implementation.



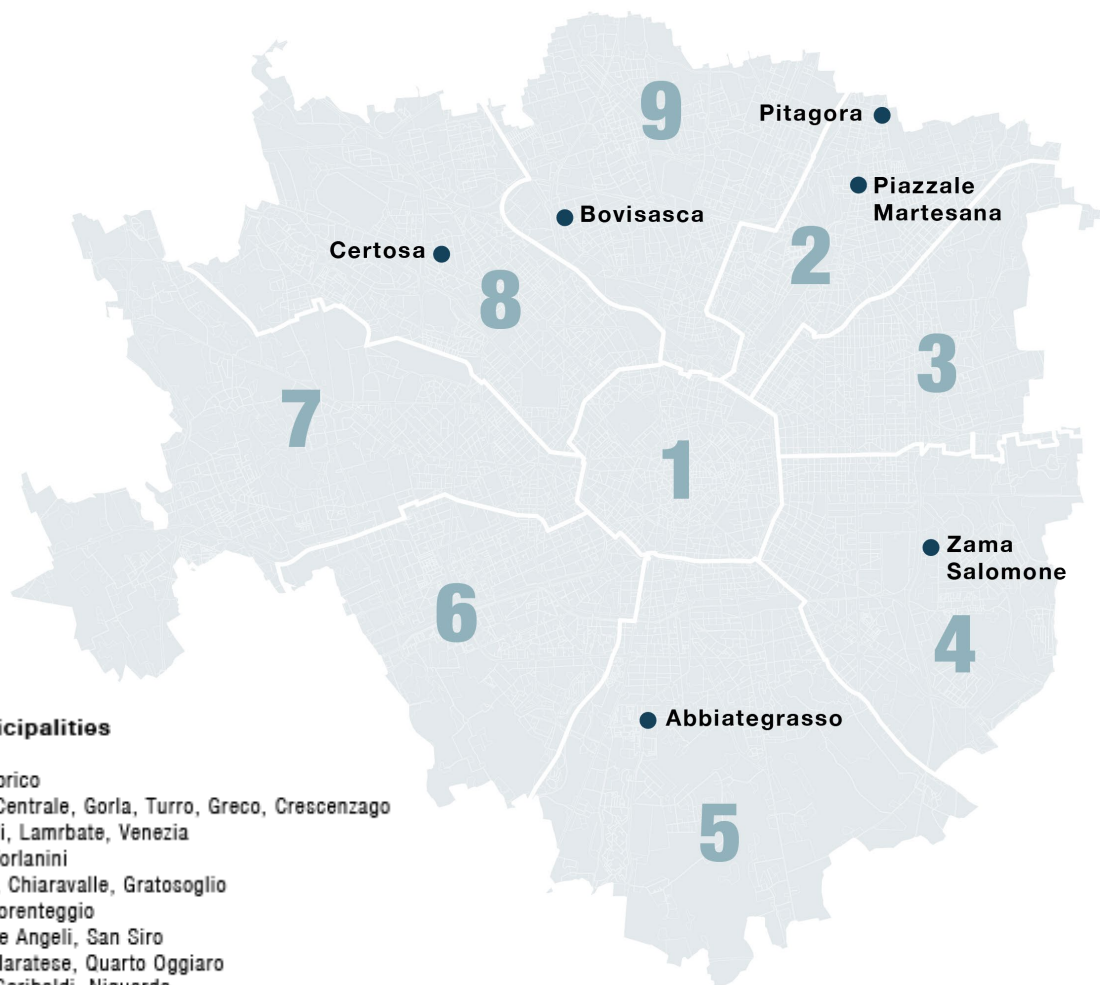
**Quality Architecture and Urban Design**

This challenge aims to combine environmental performance with high quality architecture and urban design.



# MILAN'S SITES IN COMPETITION

# MILAN



## Milan municipalities

1. Centro Storico
2. Stazione Centrale, Gorla, Turro, Greco, Crescenzago
3. Città Studi, Lambrate, Venezia
4. Vittoria, Forlanini
5. Vigentino, Chiaravalle, Gratosoglio
6. Barona, Lorenteggio
7. Baggio, De Angeli, San Siro
8. Fiera, Gallarate, Quarto Oggiaro
9. Stazione Garibaldi, Niguarda

For the third edition of Reinventing Cities, Milan decided to choose six participating sites with a view to reinventing them.

The main difference from the previous editions is that they have chosen areas that have Public Residential Housing (Social Housing) or that are preparing to be able to accommodate shares

of it. In this edition, in fact, we are talking about Reinventing Housing, again linked to climate issues and the 10 challenges.

The 6 areas in Milan are all located on the outskirts of the city, but some of them have interesting urban aspects to be considered for the planning phase.

## BOVISASCA

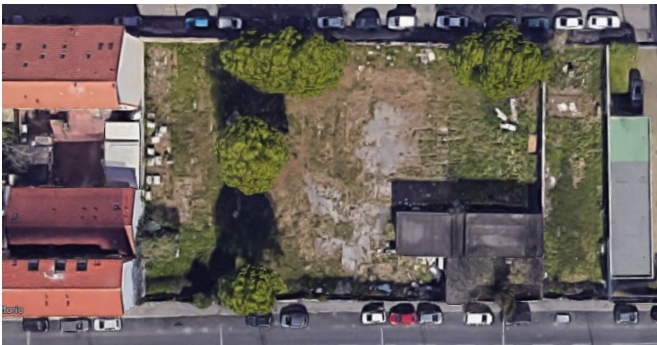
The Bovisasca site is located in Municipality 9 of the Municipality of Milan. Relevant is the presence in the immediate vicinity of the Bovisa FNM station, a railway junction between the centre of Milan and the north of the metropolitan area, reachable in a few minutes on foot. The context of reference is characterised by areas of environmental redevelopment, where regeneration of buildings and open spaces, urban forestation, aimed at improving the environmental conditions of production areas and the realisation of ecological connections.

**Zone:** 5

**Area:** 1.800 mq

**Expected functions:**

- Social Housing Quotas
- green areas
- citizen services
- activate the ground floor levels
- stimulate a social and functional mix



## ABBIATEGRASSO

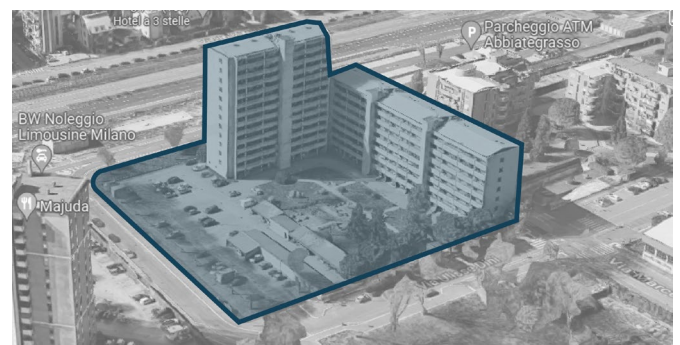
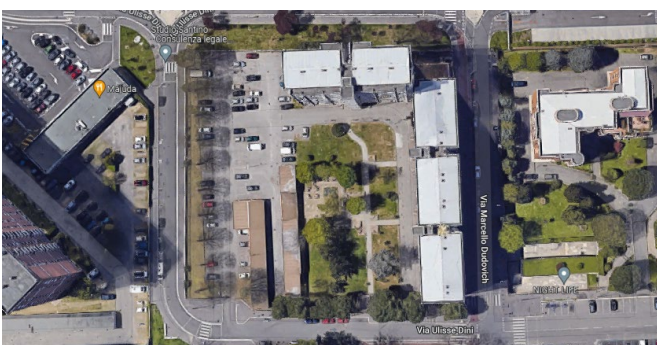
The Abbiategrasso site in Via Dini 14 within Zone 5 of the Municipality of Milan is easily accessible thanks to the presence of the M2 underground - Piazza Abbiategrasso station, which takes about 20 minutes to connect the site to the city centre. Its accessibility is aided by its proximity to the primary urban road system, which includes Via dei Missaglia's north-south axis as well as the southern ring road and motorway system.

**Zone:** 9

**Area:** 7.940 mq

**Expected functions:**

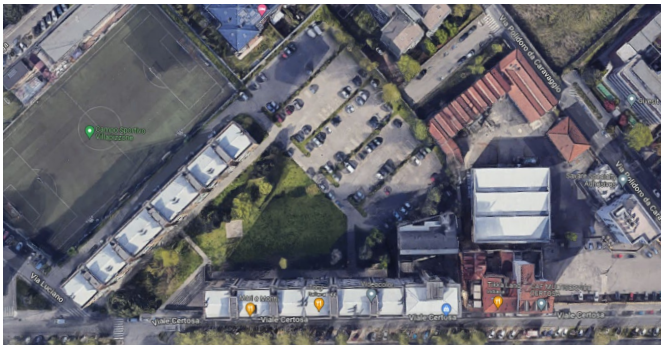
- new functional and social mix,
- affordable social housing,
- public spaces
- green areas
- services for the neighbourhood
- redevelopment existing ERP





## CERTOSA

The site is located at 186 Viale Certosa, in Municipality 8 of the Municipality of Milan, in an area where the PGT foresees interventions of urban forestation, regeneration of existing buildings and open spaces, aimed at improving their environmental performance. Furthermore, the urban context is characterised by the presence of sports facilities, schools and the presence of Monte Stella Park, one of the most representative parks in the city. The area is predominantly residential, with tertiary and productive facilities as well.



**Zone:** 8

**Area:** 4.200 mq

### Expected functions:

- Affordable housing units
- de-paving
- green areas and related services
- use of offsite technologies also applied to the redevelopment of existing public residential buildings
- ground floors more sustainable and efficient



## ZAMA SALOMONE

The area in Via Oreste Salomone, in Municipality 4 of Milan, is located in the south-eastern part of the Forlanini district, and is part of a programme that envisages the construction of social housing under an Agreement between the Municipality of Milan, the Lombardy Region and Aler. The western boundary of Via Zama is bordered by the railway line, which is the main north-south junction in the eastern part of the city. To the north, the subway at Via Lombroso provides accessibility to Porta Vittoria.

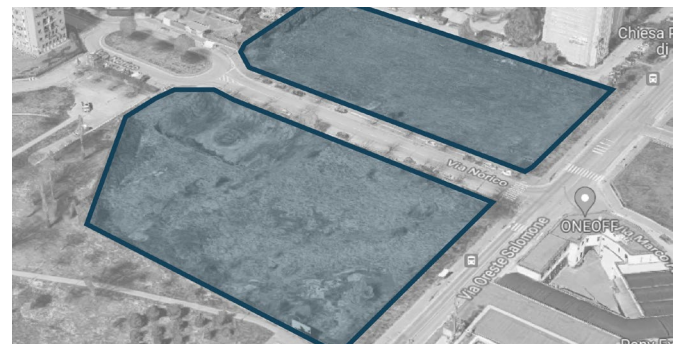
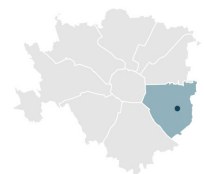


**Zone:** 4

**Area:** 15.935 mq

### Expected functions:

- Social Housing for rent and sale,
- functional and social mix
- green areas and related services
- potential innovative technologies



## PIAZZALE MARTESANA

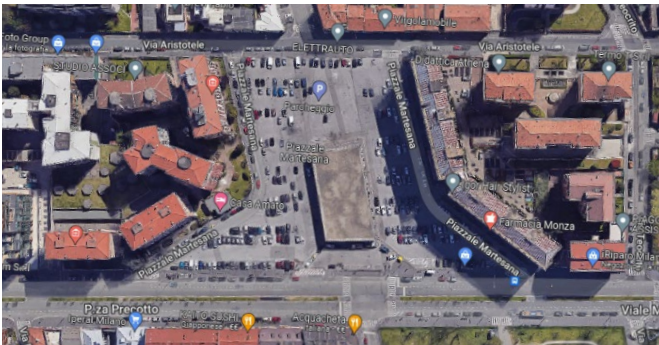
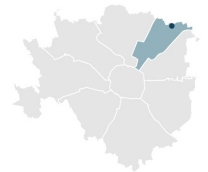
Piazzale Martesana is located in Milan's Zone 2 on the Viale Monza road axis, about 300 metres from the line 1 Gorla and Precotto metro stations. The presence of the Naviglio Martesana, along with numerous existing and newly planned green areas in the area, defines an ecological corridor that characterises the territory. The surrounding urban context is primarily residential, with neighbourhood services, as well as significant areas of Public Residential Construction.

**Zone:** 2

**Area:** 11.700 mq

### Expected functions:

- Public services
- Social Housing
- de-paving
- integration of activities and spaces
- active ground floors
- social inclusion, employment opportunities, sustainability and improve quality of life



## PITAGORA

The via Pitagora area is located in the Municipality of Milan, Municipality 2, near the Sesto Marelli stop and 500 metres from the Villa S. Giovanni stop of the underground line 1.

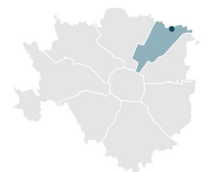
It is in an area of widespread urban renewal along the Viale Monza axis, which is characterised by architectural regeneration of buildings and urban regeneration of open spaces. It is also barycentric with respect to the Greco airport and the urban regeneration underway in the Adriano district to the northeast.

**Zone:** 2

**Area:** 4.800 mq

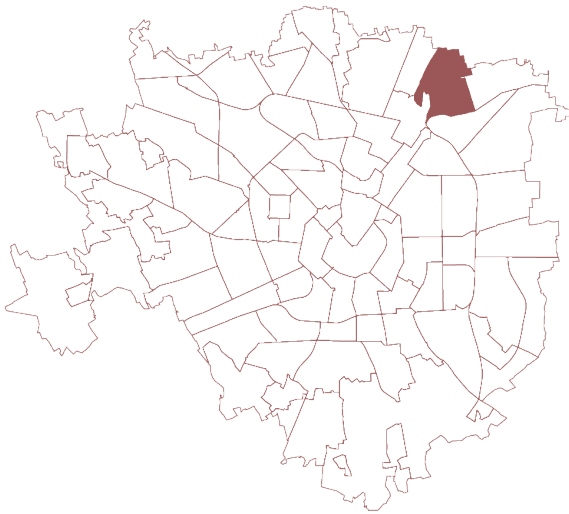
### Expected functions:

- social housing
- functional and social mix
- integration of activities
- active ground floors
- job opportunities and improve the quality of life in a sustainable way





# M PIAZZALE MARTESANA ARTESANA



Milano Neighborhoods

The area of Piazzale Martesana is located in **Municipality 2** of the Municipality of Milan, directly on Viale Monza, one of the main roads in the north-east quadrant of the city, which connects Piazzale Loreto with the nearby city of Monza.

Of the six areas competing in this edition of C40, the Martesana area is one of the largest, and includes mainly public urban areas such as big roads, car parks and pavements. It's also located in an **attractive urban context** in terms of services, proximity to the M1 metro and accessibility to the city centre.

In addition, the area in question is located in a district that could be considered peripheral, but nevertheless has a direct connection to the M1 metro, which passes under Viale Monza and will



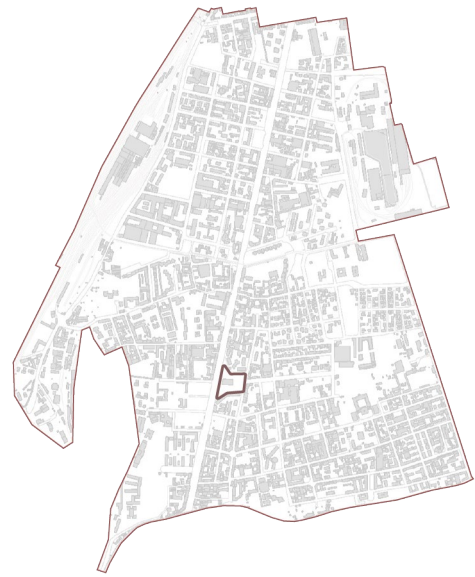
Piazzale Martesana front view - Bing maps

also be extended in the coming years.

The site is therefore well placed in a context of municipal mobility and **great accessibility**, making it a potentially important **urban node** for this sector of the city.

Going to focus on the area itself, it is mainly areas dedicated to **parking, roads and pavements** that are surplus to green or tree-lined areas, which are practically absent. This was a very motivating point for the choice of this site, as there is a great opportunity for re-greening, forestation, depavement etc.

Piazzale Martesana is therefore set to be a very interesting area, with various design cues and urban themes of great relevance, which prompted me to develop a project according to the canons of C40.



Gorla - Precotto Neighbourhood



Piazzale Martesana relation with viale Monza - Bing maps



Piazzale Martesana back view - Bing maps



Piazzale Martesana is located in the **Gorla-Precotto district** (NIL 16), an area of historical memory and former site of numerous tertiary and manufacturing establishments, which together with its residential context of reference underline a distinct urban suburb connotation.

The surrounding district is characterised by a number of **ERP settlements** (the largest being the complex in via Sant'Erlembaldo, a little further south), numerous green spaces and part of the path of the **Naviglio Martesana**.

To the west, there is also the **Greco-Breda railway yard and depot**, already involved in a

profound process of urban transformation and redevelopment thanks to the implementation of the **'Innesto' project**, winner of the first edition of Reinventing Cities, which aims to create new places for social housing and collective activities, as well as the reconnection with the Bicocca district beyond the railway line.

A short distance to the west is the **Villa Finzi Park**, while to the east, along the Naviglio Martesana, is the Martiri della Libertà Iracheni Vittime del Terrorismo Park. The area is also characterised by the presence of **numerous schools**: Scuola Paritaria Ss. Innocenti Paritaria School in Via Asiago 5, Ipsc Caterina da Siena in Via Demostene



Main Urban elements - personal elaboration



40, Ics Italo Calvino in Via Frigia 4, Carnovali Primary School in Via Giovanni Carnovali 19), **healthcare facilities** (Presidio Fatebenefratelli e Oftalmico in Via Stefanardo da Vimercate 14, Azienda Ospedaliera Istituto Ortopedico Gaetano Pini in Via Isocrate 19), **cultural and sports venues** (Teatro Zelig in Viale Monza 140, Cameroni Sports Centre in Via Bechi Giulio 2).

Piazzale Martesana today presents itself as a large, **irregularly shaped area** that Viale Monza to the west and Via Aristotle to the east, is currently used as a **public car park and on Saturdays hosts the weekly market**. The absence of permeable surfaces in the area contributes to the **'heat**



Orthopaedic Institute Gaetano Pini - personal photo



Erodoto green areas - personal photo



Canale Martesana - personal photo



Viale Monza - personal photo





**island'** effect, with obvious repercussions on the lifestyle of the neighbourhood community. At the centre of the forecourt there is an electrical **substation operated by ATM**, currently operational, which serves the nearby MM1 stations of Gorla and Precotto.

The structure, built in the 1960s, is today only partially occupied by the installations, and **presents flexible spatial and structural**

<b>ATM BUILDING</b>	<b>1050 mq</b>
Height	7 m
Floors	2
Function: Technological and Environmental Infrastructures	

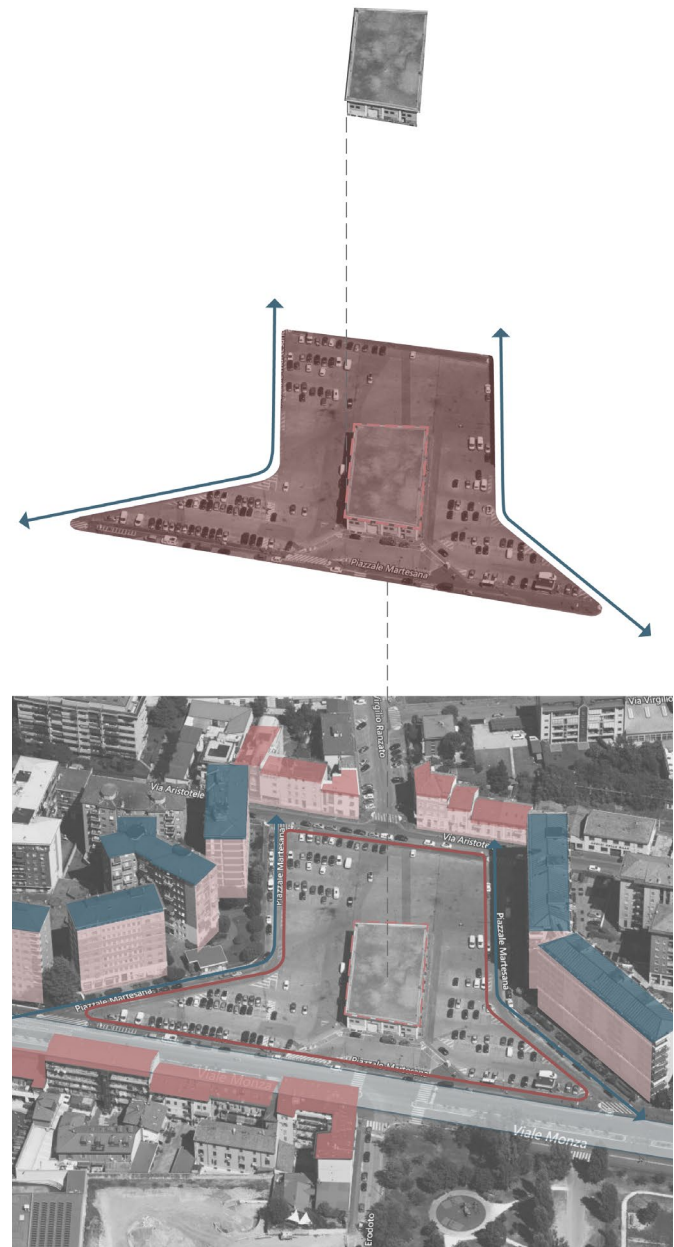
<b>PIAZZALE MARTESANA</b>	<b>11.170 mq</b>
Paved areas	9.000 mq
Parking lots	> 300
Sidewalks	691 mq

#### CONTEXT BUILDINGS

● Sides average height	27-30 m
Sides average floors	9-10
● Front/back average height	15 m
Front/back average floors	4-5

**characteristics** that could also be compatible with different functions, which could potentially be housed in the same structure subject to appropriate procedures for securing the spaces used to operate the facilities.

The building is organised on **two levels**, one above ground and one underground. The above-ground level is occupied in the rooms to the north by transformers and other equipment, while the



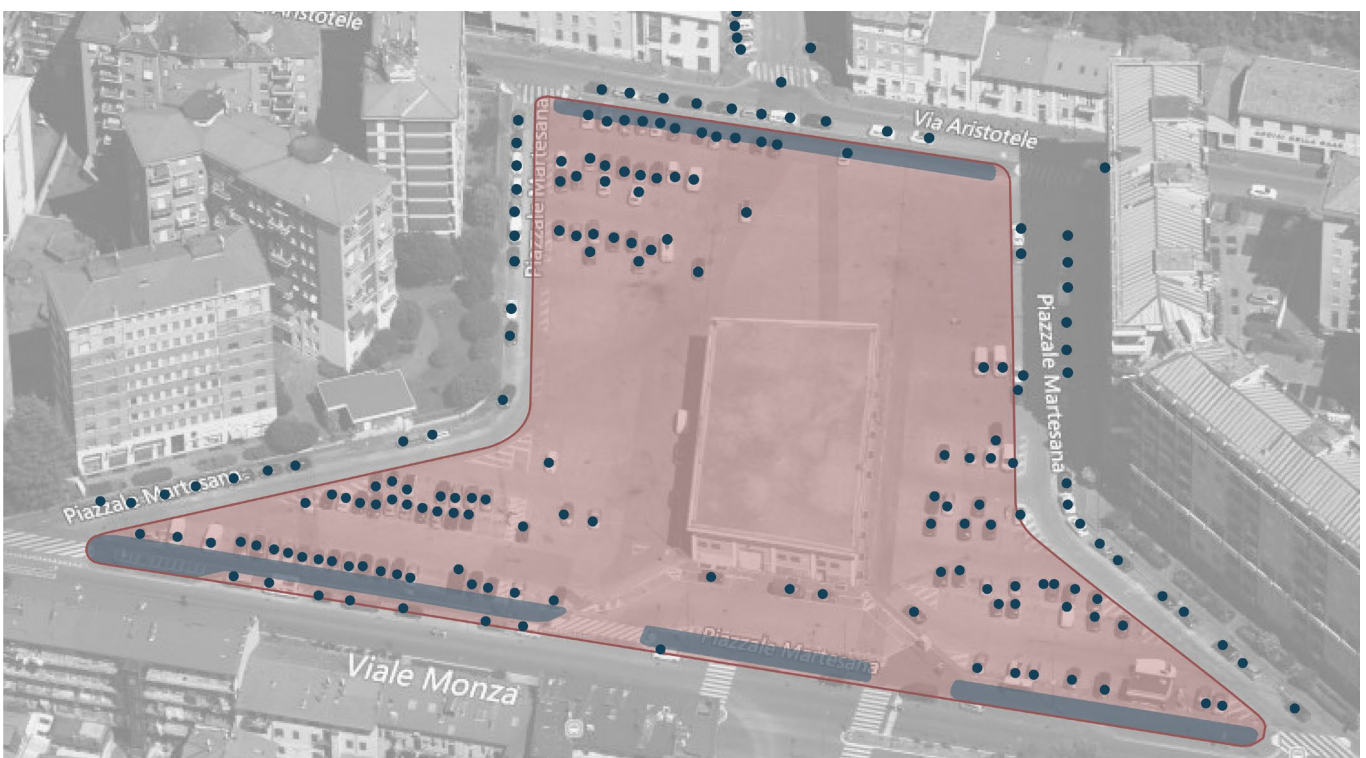
central part is only partially occupied by electrical installations.

The **basement level**, devoid of equipment and installations, houses a shower room and adjoining changing room for **maintenance workers**. Finally, the basement level is directly connected to the main **MM1 tunnel** via an underground tunnel on the west side.

The entire basement level is also bordered by a cavity that provides light and air to the underground rooms and through which several and air to the basement rooms and through which various plant ducts run. Proposals may provide for the integration of **new compatible functions** within the existing structure, including through the insertion or flanking of new volumes, always with

appropriate structural verifications and securing of the critical areas; the construction of a new building could also be envisaged that would accommodate existing facilities and **guarantee the continuous operation of the system**, which is closely linked to the operation of the metro, or the demolition and reconstruction of the building and the **relocation of the installations in the new structure**, always guaranteeing the continuity of service.

Furthermore, it will be **essential to guarantee independent access to the substation** premises for maintenance personnel and for possible replacement of large equipment such as transformers.



As illustrated above, the Martesana square has only one function, that of parking. From these pictures one can also see the quantity and extent of it, but also the factor of **too much parking supply**, which leads to **underutilisation** of the square, emerges.

From what can be seen from the satellite photo and the inspection carried out (next pages) that the car park is not full, it could **at least accommodate trees, or green areas** between the various sets of parking spaces. Also highlighted are the few **pedestrian areas** that are only located along Viale Monza and fragmented.



# PHOTO ESSAY

## VIALE MONZA



1



2



5



6



8



9

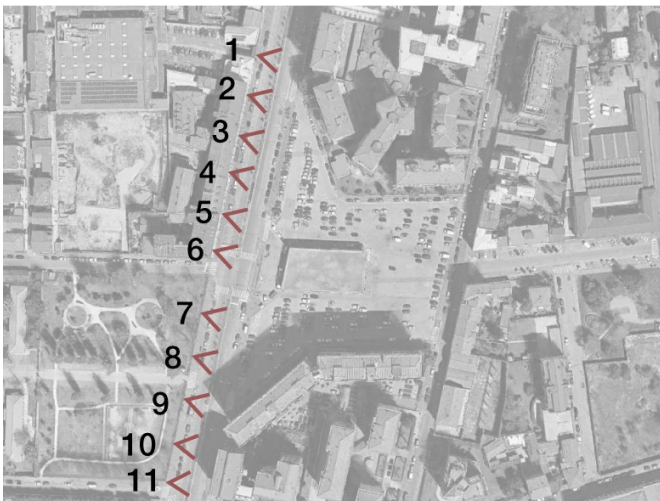




3



4



Site Visit - 3 Oct 2022



7



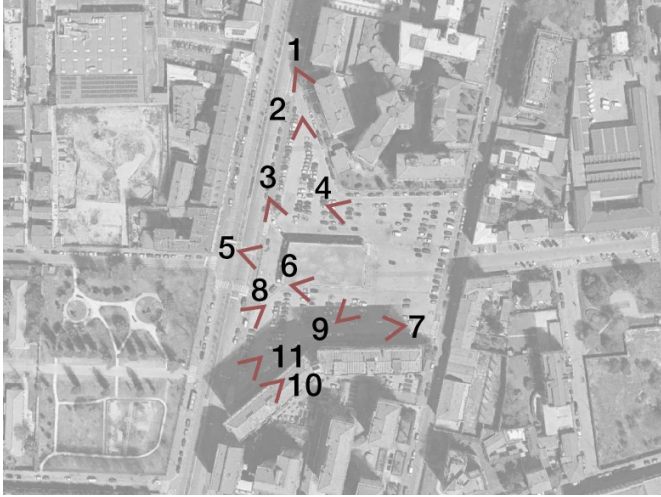
10



11



# PIAZZALE MARTESANA



Site Visit - 3 Oct 2022



1



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11



### VIALE MONZA SEEN FROM PIAZZALE MARTESANA



1



2

### VIA ARISTOTELE



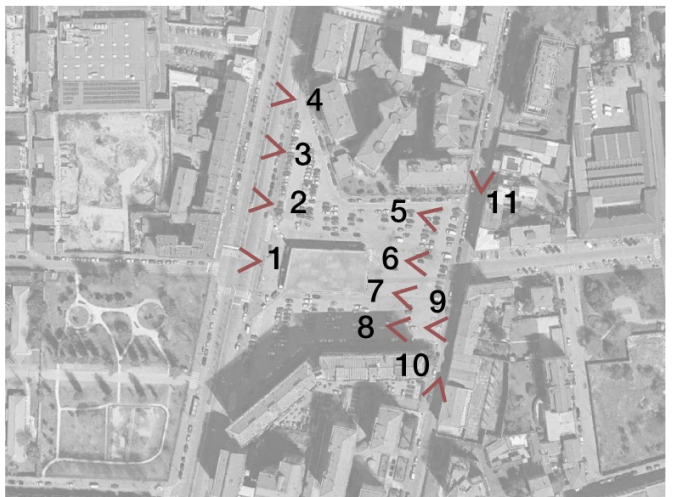
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Site Visit - 3 Oct 2022





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11



# FUTURE PROJECTS DEVELOPMENTS

# FUTURE



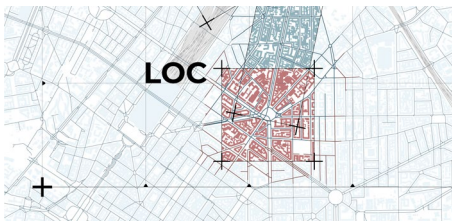
**Ex Falk Areas,  
Sesto San Giovanni**



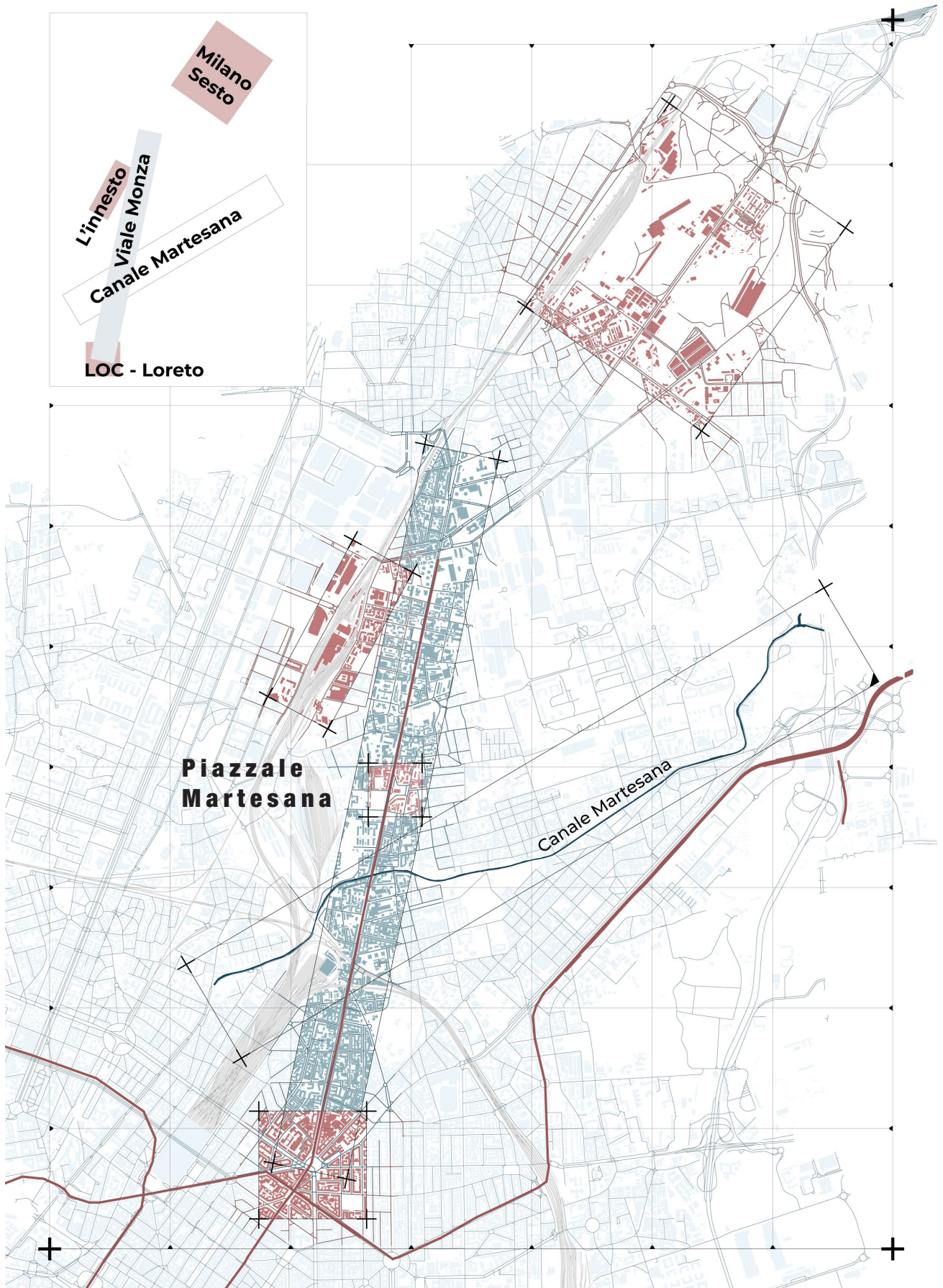
**Scalo Greco Breda**



**Piazzale Loreto**







# REINVENTING CITIES PLANNING RULES

# RULES

## DESCRIPTION

The area has no building potential. Pursuant to Art. 6 para. 7 of the NA of the PdR, the index of territorial constructability does not apply to areas intended for existing roads public roads or public use, regardless of their classification in the RLP. However, specific regulatory provisions may allow the realisation of services of general interest and/or urban functions on the site.

According to Article 9, paragraph 15 of Regional Law 12/2005, the construction of public facilities and facilities of public or general interest, other than those those specifically provided for in the services plan.

Following in accordance with Art. 8 paragraph. 3 item 11 of the PdS of PGT, in the areas designated for infrastructure for mobility and existing public transport, the location of urban functions is allowed, including private ones, indicated in Article 5, paragraph 15 of the Norme di Attuazione (NA) of the Implementation Rules (NA) of the Rules and Regulations Plan (PdR), by means of a justified resolution of the Municipal Council that will define both the scope of intervention and the specific urban planning/building instrument implementation tool to be used.

It is therefore possible to transfer, in whole or in part, rights building rights from direct or indirect appurtenance.

With regard to building quantities, the indices and parameters relative to the area, such as the calculation of the gross surface area, must be calculated according to the parameters and modalities described in Art. 5 - Definitions and

## REFERENCE REGULATIONS

*PGT - PdR*

*Art. 6. Paragraph 7: The Territorial Buildability Index does not apply to the following areas:*

*b. areas destined for existing public roads or public use, regardless of the classification in the PGT*

*Regional Law 12/2005*

*Art. 9. Paragraph 15:*

*The construction of public facilities and facilities of public or general interest, other than those those specifically provided for in the service plan, does not entail the application of the variant procedure to the plan itself and is authorised subject to a reasoned resolution of the municipal council.*

*PGT - PdS*

*Art. 8. Paragraph 3 Item 11:*

*In the areas destined for existing mobility and public transport infrastructures, the localisation of urban functions, including private ones, indicated in Article 5, paragraph 15 of the Rules and Regulations Implementation Rules of the Regulatory Plan is permitted, by means of a justified resolution of the Municipal Council that will define both the scope of intervention and the specific urban planning/construction tool to be used. The total or partial transfer of building rights from direct or indirect appurtenance is therefore possible. It is also permitted to locate only urban commercial functions in the existing spaces of the mezzanines and in the areas designated for mobility and public transport infrastructures in front of railway stations owned by non-municipal authorities, by means of an agreed building permit.*

*PGT - PdR*

*Art. 5. Paragraph 15: Urban functions - are divided into the following functional categories:*

- a. residential;*
- b. productive;*
- c. office, tourist accommodation and private services;*
- d. commercial;*
- e. rural.*



## DESCRIPTION

urban parameters of the NA of the PGT which is also the reference for all urbanistic definitions and parameters.

It must be considered that the services of public or general interest indicated in the “Service Catalogue” (PdS - NA Art. 5 Paragraph. 2) as a result of an assessment process and under subordination, agreement or accreditation if privately owned or managed, do not contribute to the calculation of the quantity of Gross Surface Gross Floor Area (SL) that can be built on.

In addition to the previous rules, we should remind that the area belongs to the category of Urban Renewal Areas (ARU), the definition of which can be found in the Rules Plan (Art. 22).

Afterwards, it is necessary to understand the development requirements and constraints of this type of area. Article 23 in fact specifies that ARU areas are identified in Table R03 of the Regulatory Plan. (Page 87)

In short, it can be deduced that public or general interest functions such as public residential building (ERS) do not count towards the amount of gross building area. It is therefore possible to realise a free share of public residential building in compliance with the building regulations and the regulations of the TMP defined for ARU areas. But as far as the realisation of other functions is concerned (Art. 5 Paragraph 15) the building regulations of Milan and the indications of the notice and the PGT must be taken into account.

## REFERENCE REGULATIONS

*PGT - PdS*

*Art. 5. Paragraph 2: The services in the Catalogue are divided into:*

- a. existing and newly planned localised services (ERS) identified in Table S.01, in Table S.02 and in the Nuclei of Local Identity (Cards);*
- b. newly foreseen services to be localised to be identified, once realised, in Table S.01, Table S.02 and in the Local Identity Nuclei (Cards).*
- c. newly planned localised services (indirect appurtenances) to be identified in Table S.02.*

*PGT - PdR*

*Art. 22*

- 1. Urban Renewal Areas (ARU) are those parts of the city where the design of public spaces is incomplete.*
- 2. The objective in these areas is to encourage urban development aimed at upgrading the existing public space system through a redefinition of the relationship with private spaces and to encourage the creation of new local systems of collective spaces.*

*Art. 23 Paragraph 2:*

*For ARUs, in cases of building renovation, new construction and urban restructuring, the following indications apply, represented in Table R.03:*

- a. alignment of at least 50% of the height line of the building on the boundary with the public space within the Envelope Limit (IL). In the case where the building lot is inserted in an existing curtain wall, only in interventions with a prevalent urban residential function, the height of the tallest adjacent building in the curtain wall that can be reached in excess of the maximum territorial buildability index is valid, through the use, alternatively or in compound form, of building rights, including equalised rights, bonuses as per article 13, paragraph 11, and shares of Social Residential Housing;*
- b. setback of at least 3 m of the building height line from the property boundary towards the public space. The area resulting from the setback must be predominantly green, suitably planted and preferably for public use. This last indication is prescriptive for interventions subject to agreement.*

## PIAZZALE MARTESANA SPECIFIC CARD REQUESTS FOR COMPETITION

### DESCRIPTION

The site is also included in the green infrastructure network, with the aim of acting on the increase of urban greenery to reduce the input of stormwater into the sewage system and favour the mitigation of heat islands and the raising of standards housing standards. In particular, Table S03 'Green and Blue Infrastructure and Municipal Ecological Network' of the PdS includes the area among the 'Squares to be partially depaved and planting', i.e. squares and open spaces for which an arrangement is envisaged that increases the green, permeable and planted areas pursuant to Art. 10 paragraph 5 letter g) of the NA of the PdS of the PGT.

#### Additional considerations and constraints:

- There is no provision for the possibility of applying the award related to the competition procedure provided for in Art. 13.11 of the NA of the PdR;
- Proposals must comply with the regulations of the Municipality's Building Regulations of Milan and, with regard to distances from existing buildings, to Ministerial Decree Ministerial Decree No. 1444/68
- Any new volumes to be built must be compatible and respectful of the existing morphological context, guaranteeing an adequate area depaved area and destination to equipped green spaces;

Note that within the perimeter of the site there is an Electricity Substation operated by Atm, identified in table S01 "Public services and services of public or general interest" of the PGT PdS among the technological infrastructures and for environment. The announcement of Reinventing cities specifies

### REFERENCE REGULATIONS

PGT - PdS  
Art. 10 paragraph 5:

*Infrastructure for environmental regeneration and resilience of built environments includes:*

- a. 20 new parks, green basins foreseen in the large urban regeneration areas, indicated in the table with a punctual symbol within the perimeter of the entire intervention, as the location will be defined in the implementation planning;*
- b. Environmental Regeneration Areas, defined and regulated by Article 15, paragraph 3) of the Rules Plan Implementation Rules;*
- c. Priority areas for the realisation of interventions for the reduction of hydraulic risk, i.e. areas of the city where "nature-based solutions" (NBS) to increase water infiltration during exceptional meteorological events can be realised on public areas, according to the indications of the Simplified Hydraulic Risk Document, to which we refer*
- d. Public areas to be forested/planted, i.e. areas of municipal property for which urban forestation or planting is planned, depending on their characteristics and location;*
- e. Parking spaces to be cleared and planted, i.e. spaces currently used for parking, which are to be converted to green areas with total removal of the pavement and subsequent planting;*
- f. Parking spaces to be partially paved and planted, i.e. parking spaces for which it is planned to remove the pavement in certain areas, with the creation of permeable and planted strips or islands;*
- g. Squares to be partially paved and planted; i.e. squares and open spaces for which it is planned to increase green, permeable and planted areas.*



## DESCRIPTION

that the substation lends itself to being partially re-functionalised, provided that adequate space for its operation.

The possible insertion of new volumes can be realised in adjacent to the east and south sides, while on the north side it is necessary to ensure adequate distance from the windowed wall of the rooms where the transformers are located.

The structure, built in the 1960s, is today only partially occupied by the facilities, and has flexible spatial and structural characteristics that could also be compatible with different functions, which could potentially be housed in the same structure after appropriate procedures for securing the spaces used for the operation of the facilities. The building is organised on two levels, one above ground and one underground.

The above-ground level is occupied in the rooms to the north by transformers and other equipment, while the central part is only partially occupied by electrical installations. The basement level, devoid of equipment and installations, houses a shower room and adjoining changing room for maintenance workers.

Finally, the basement level is directly connected to the main MM1 tunnel via an underground tunnel on the west side. The entire basement level is also bordered by a cavity that provides light and air to the underground rooms and through which several and air to the basement rooms and through which various plant ducts run. The proposals

may provide for the integration of new compatible functions within the existing structure, also through the insertion or flanking of new volumes, always with appropriate structural checks and securing of the most critical areas; the construction of a new building could also be envisaged that would accommodate existing facilities and guarantee the continuous operation of the system, which is closely linked to the operation of the metro, or linked to the operation of the metro, or the demolition and reconstruction of the building and the relocation of the installations in the new structure, always guaranteeing the continuity of service. Furthermore, it will be essential to guarantee independent access to the substation premises for maintenance personnel and for possible replacement of large equipment such as transformers.

Finally, the call defines the objective of the call; that is, to reinvent the square, today dedicated exclusively to mobility infrastructure, by initiating a process of urban and environmental regeneration including through depaving, reforestation and reconnection with nearby public spaces. The settlement of a mix of services and urban functions integrated into the surrounding built context, following the specific disciplines provided for in the TMP.

It is possible to foresee quotas of Social Residential Housing and accessory urban functions compatible with it. The introduction of active ground floors is recommended, also through the insertion of cultural and aggregative spaces, in order to favour social inclusion and offer new job opportunities.

# ***Research and Analysis on Climate and Housing***

## **| CLIMATE PROBLEM ASSESSMENT**

- / Urban Heat Islands**
- / Soil Impermeability**
- / Flooding Phenomena**
- / Poor Trees Cover**
- / Bad Air Quality**
- / Hard and Soft Patterns**

## **| CLIMATE SYNTHESIS MAP**

## **| HOUSING PROBLEM ASSESSMENT**

- / High Real Estate Costs**
- / High Income Disparity**
- / Scarce Housing Supply**

# 02



This chapter is divided into two parts: the first provides data and demonstrations on the climate situation in Milan and the Gorla Precotto district. In particular on heat islands, the issue of urban forestation and air quality in Milan, along with other related topics.

The second part, on the other hand, presents research work on the topic of living in Milan, what it means to live in Milan and how much one spends on rent or housing in Milan. With a view to the realisation of social residences at reduced prices, it is, therefore, necessary to understand how much there is a need for this type of intervention and services for some of the weaker segments of the population at risk of leaving the city due to high housing costs.

To conclude, issues are raised, trying to come to some conclusions or summaries of what the research has brought to light. To have objective assessments of how to act from a planning perspective.

# CLIMATE PROBLEM ASSESSMENTS

## CLIMATE

**What are the climate-related problems in Milan?**

**What causes them?**

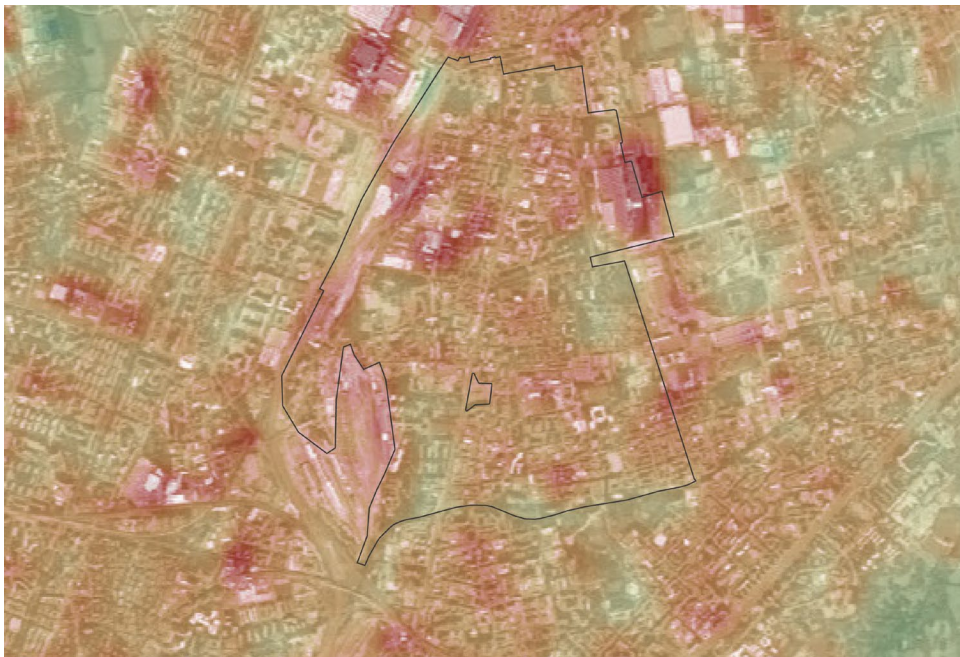
**How do the problems relate to each other?**

After introducing the project site, it is necessary to make a more in-depth analysis of the problems concerning the climatic conditions of Milan and the areas surrounding Piazzale Martesana.

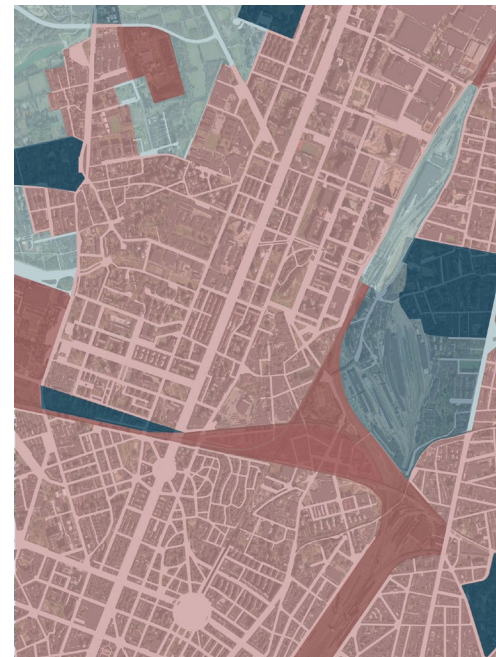
Then the topic of high temperatures in the city and the creation of so-called urban heat islands will be explored. Then reference is made to the impermeability of the soil in Milan, a topic very closely related to the previous one, and also to that

of flash floods. Rising temperatures also cause the creation of air pollutants such as ozone and secondary pollutants. Finally, the temperature rise is also largely due to the scarcity of green areas and forestation in Milan. A city that is very dense and saturated with buildings, and which finds few spaces to renovate and transform (Hard and Soft Pattern).

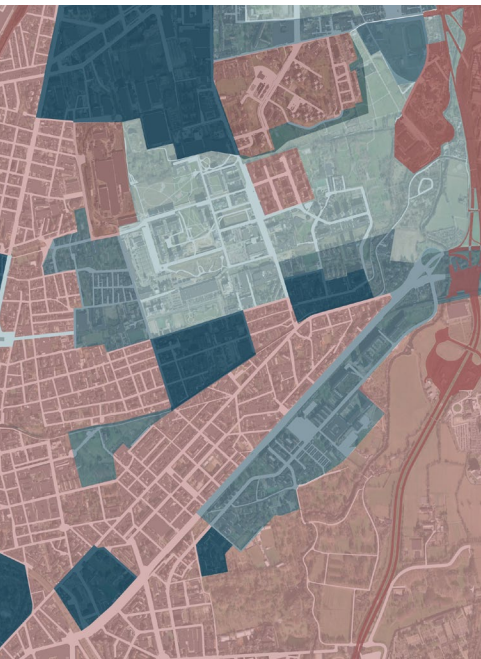
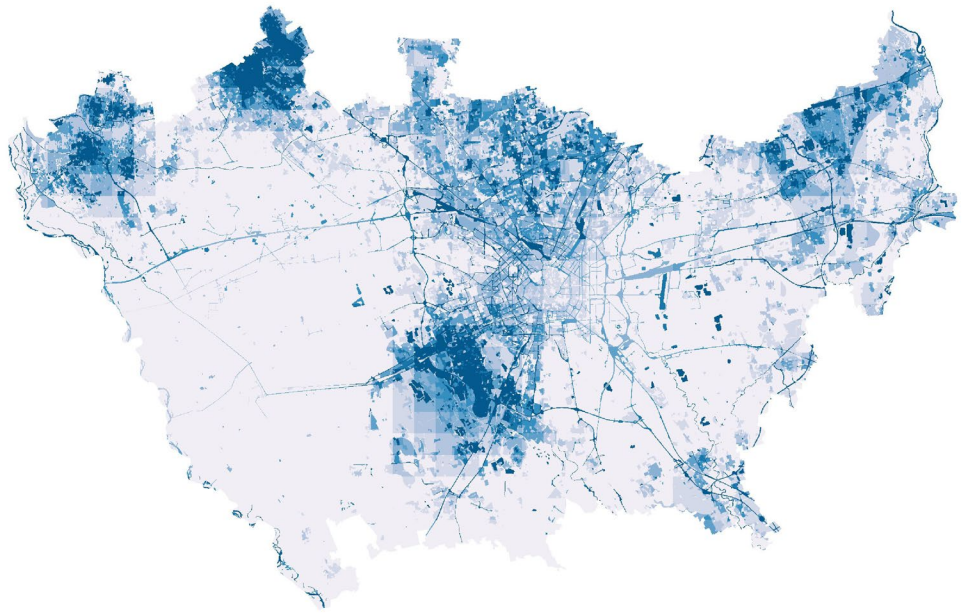
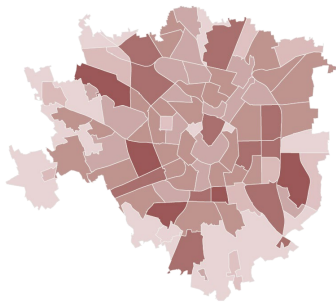
Finally, a summary map of the climate-related problems is defined, while highlighting some opportunities to be exploited for the Piazzale Martesana project.



*Personal Elaborations*







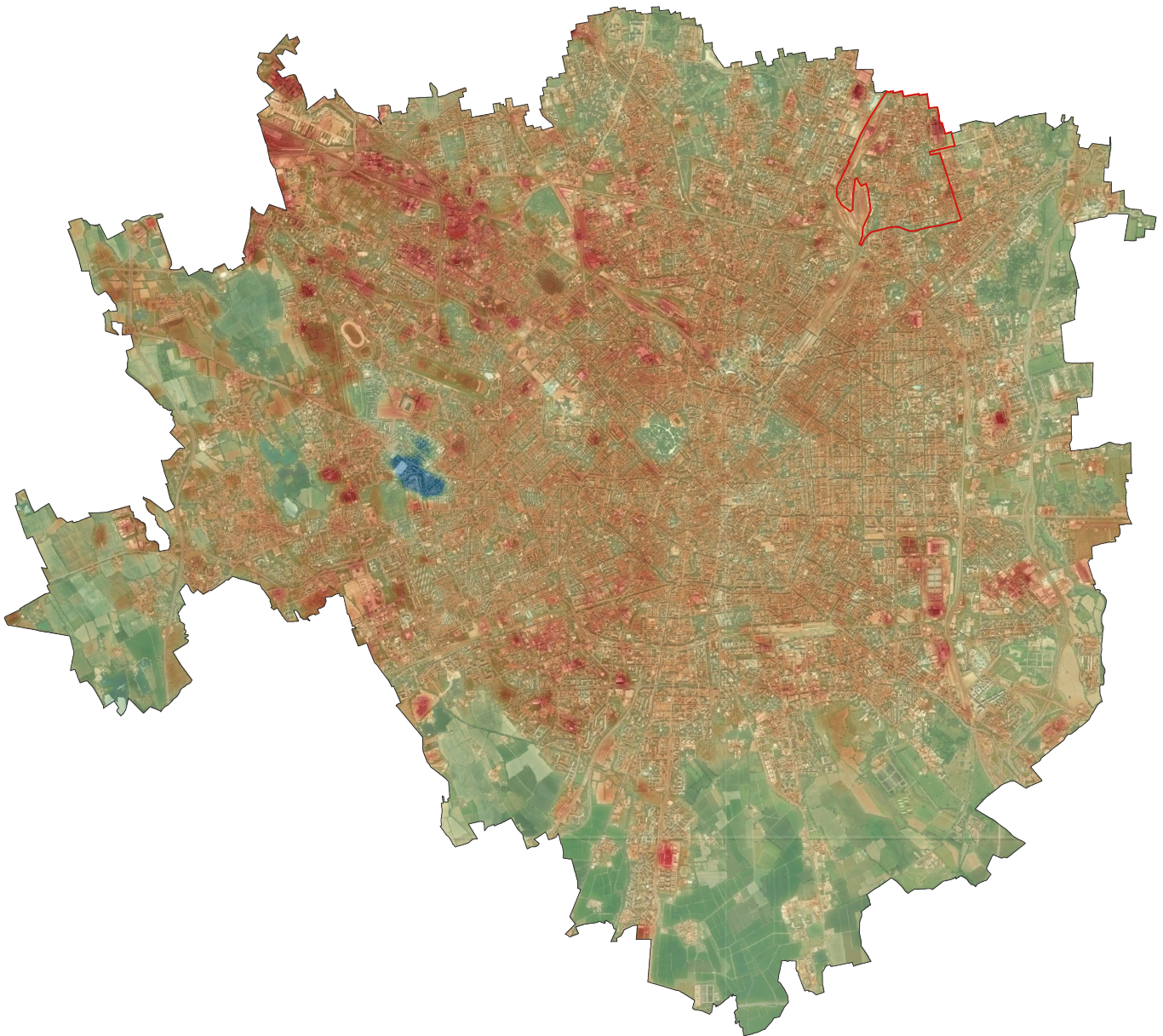


# URBAN HEAT ISLANDS

The problem of heat islands is very serious and worrying in Milan, in the hottest months of the year unmanageable temperatures come close and are harmful to humans and the environment. One of the objectives is to mitigate this phenomenon,

starting with public and highly paved areas such as Piazzale Martesana.

The map was created using the QGIS tool and data taken from the ESRI Satellite, USGS Global



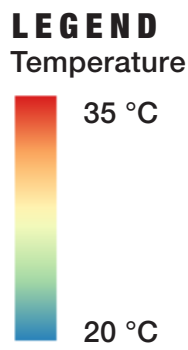
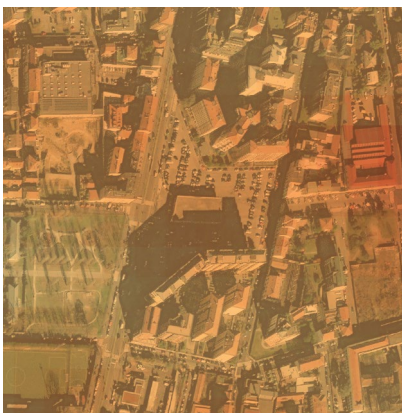
*Land Surface Temperature of Milan*

*Data Source: USGS  
Personal Elaboration*

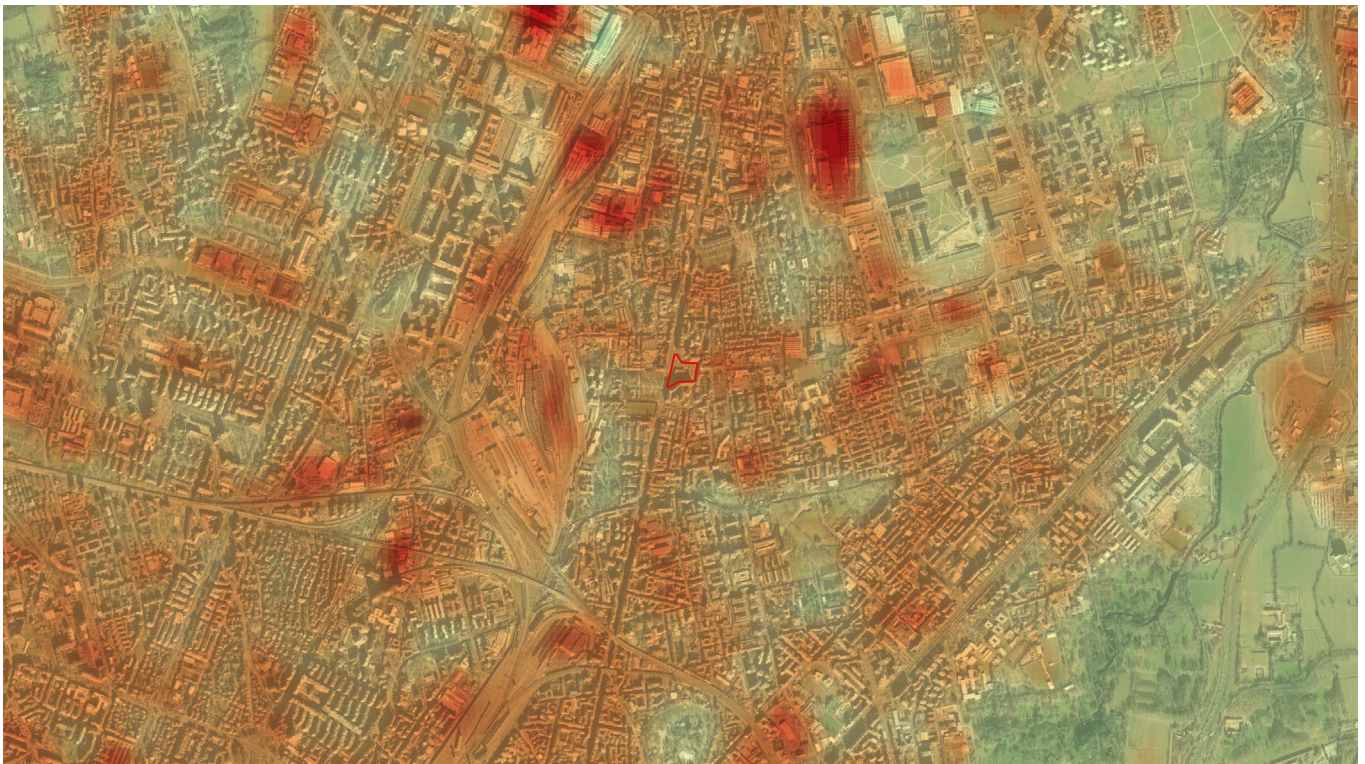
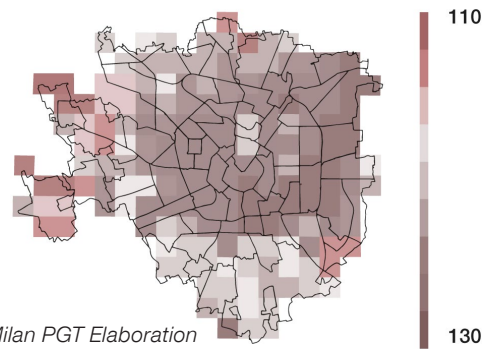


Visualization Viewer-GloVis, and the result is a representation of what is called Land Surface Temperature, which then indicates how hot an area is during the day. In this case, it is a day in August where were recorded very high and significant

temperatures. It can be seen that the entire surface of Milan has temperatures above 30°C. The same applies to the Gorla Precotto district, which has very significant heat peaks in some areas.



Annual average of days with  $T > 25^\circ$



Land Surface Temperature of Gorla-Precotto



# SOIL IMPERMEABILITY

Closely related to heat islands is the issue of soil permeability. In fact, what is usually permeable is associated with green areas and trees. When these green elements are scarce, there is not only a lack of urban quality, but also an increase in average temperatures. Finally, the degree of

permeability of soils is also linked to the issue of flooding, another major problem to be considered for Martesana square. The map was created using shapefiles from the Milan and Lombardy Region Geoportale with the Qgis tool. The aim is to represent the urbanised areas, which include



*Impermeable areas of Milan*

*Data source: Geoportale della Lombardia  
Personal re-elaboration*



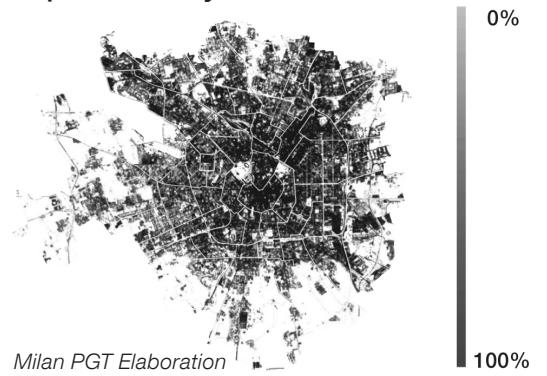
paved areas, roads, buildings and transport infrastructure; overlapping permeable areas such as parks, gardens, wooded areas, rivers and bodies of water (in white). This is to represent the significant gap between the percentage of permeable and non-permeable areas. In fact, one

can see that there are very few permeable areas and that they decrease as one moves towards the city centre. The Martesana square, being completely asphalted, plays an important role in its renewal, as a reference point for other urban depaving and forestation actions.



- LEGEND**
- Permeable areas
  - Buildings
  - Impermeable Areas
  - Martesana square

**Impermeability of surfaces**



Impermeable areas of Gorla-Precotto

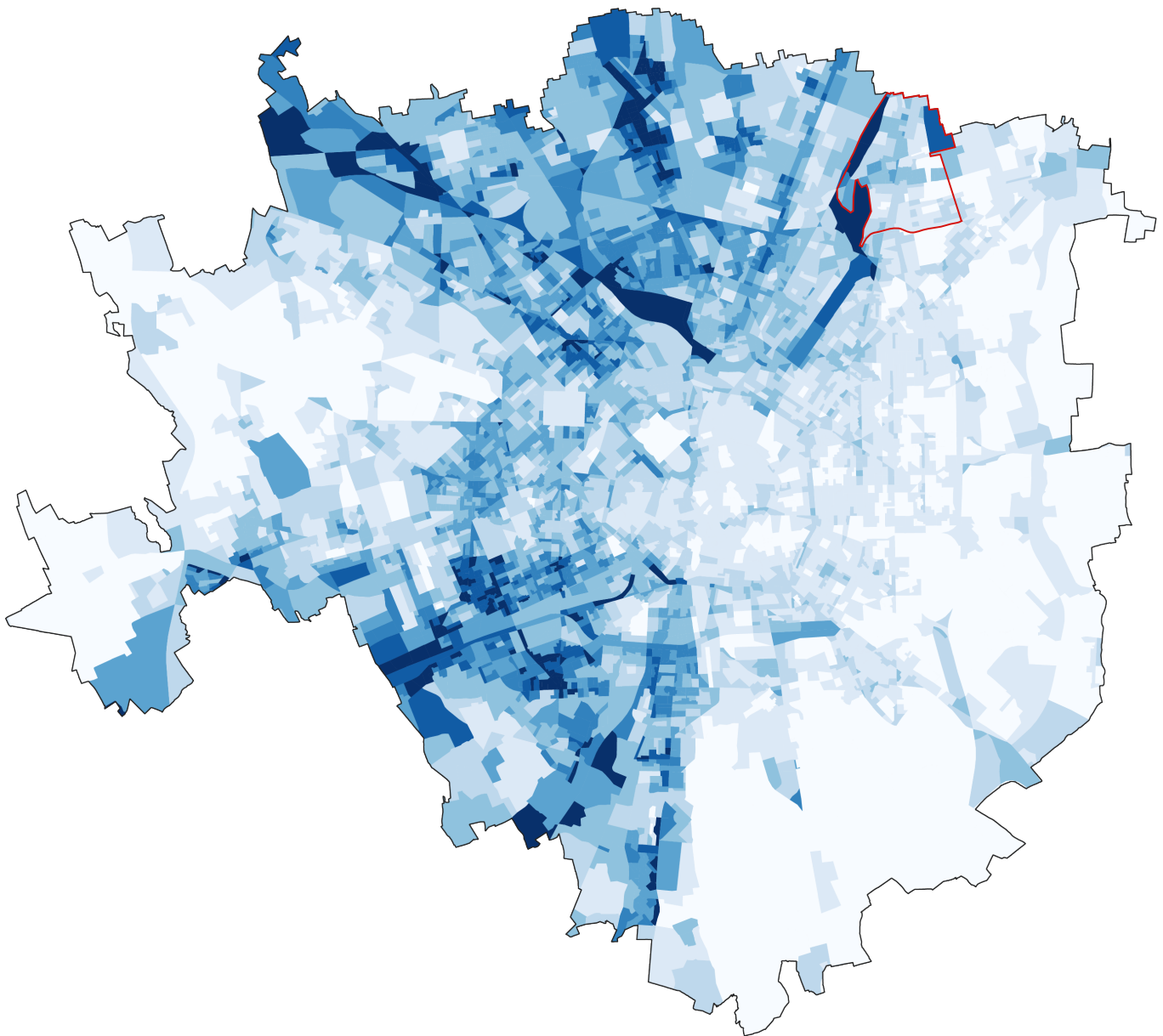
Data source: Geoportale della Lombardia  
 Personal re-elaboration

# FLOODING PHENOMENA

The permeability of soils determines the behaviour of the city and the degree of resilience that can be achieved in the event of heavy rain. In recent years, there have been more and more extreme phenomena of sudden downpours that have put Milan in difficulty, especially in the northern and

southernmost areas of the city that had a low amount of permeable areas.

The map in question shows how urban areas are prone to water runoff. In fact, light blue areas are those that have an easier time letting water permeate into the ground, in contrast to dark blue



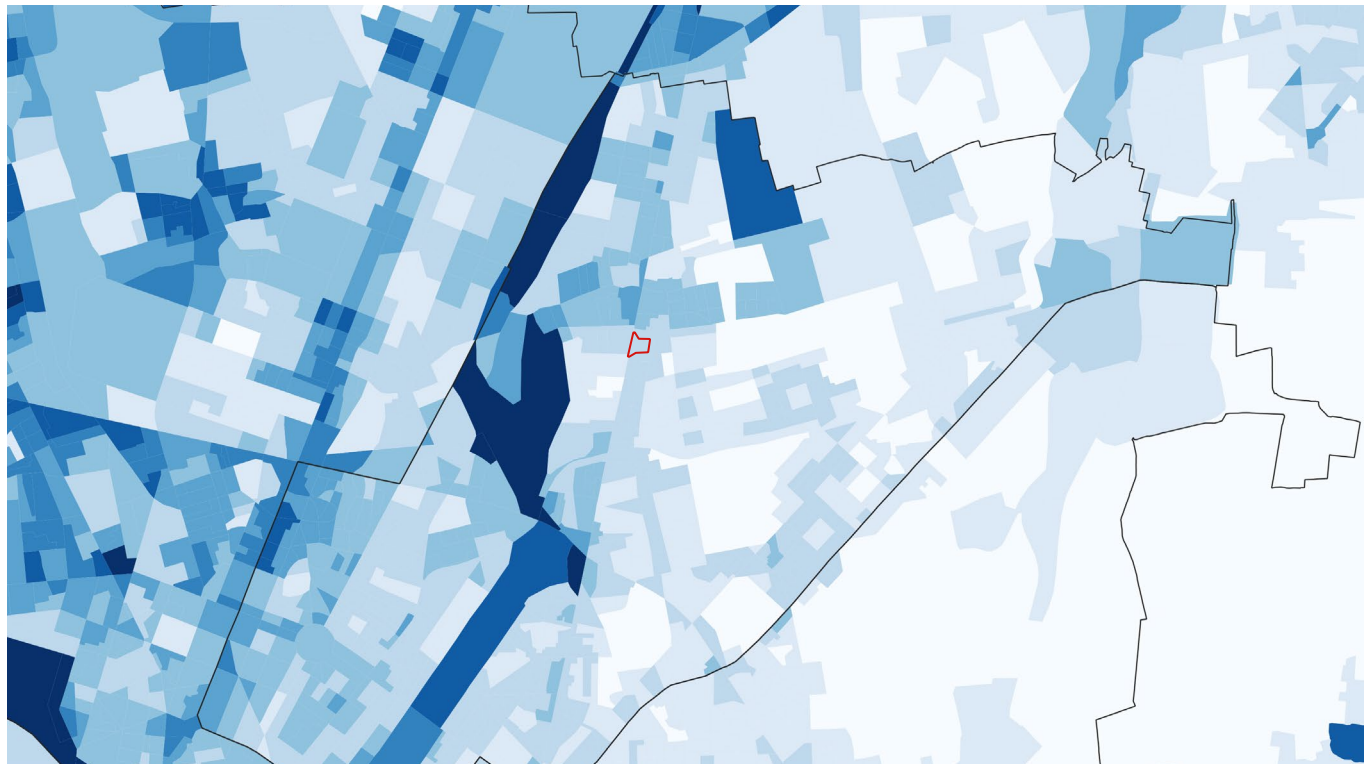
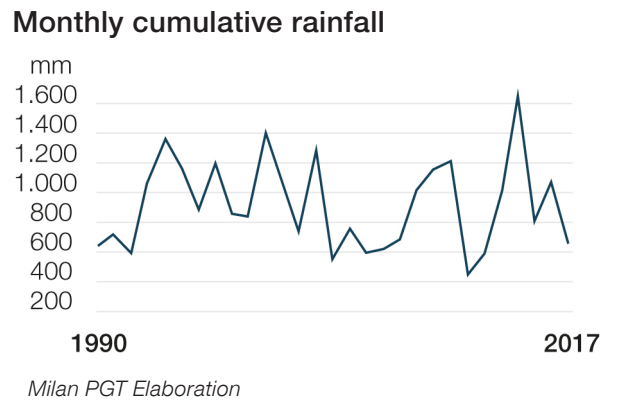
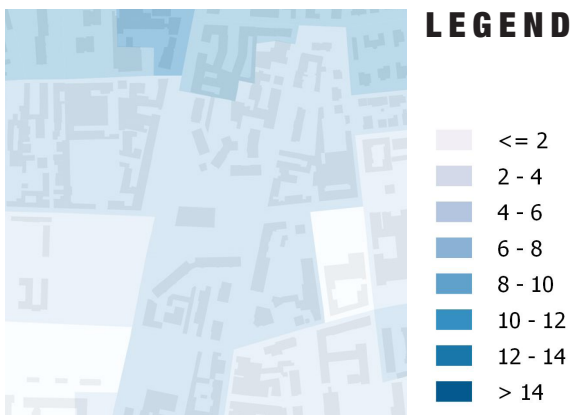
*Annual maximum Runoff of Milan*

*Data source: Laboratorio di Simulazione Urbana Fausto Curti - Politecnico di Milano  
Personal re-elaboration*



areas where runoff is more difficult. Precisely the latter are usually the areas most at risk of flooding due to sudden rainfall. The Gorla-Precotto district has areas with good soil permeability with the exception of areas of railway yards or large infrastructures. Piazzale

Martesana has in general good permeability, but it should not be excluded that there are practically no natural permeable areas in an area of more than 10,000 mq.



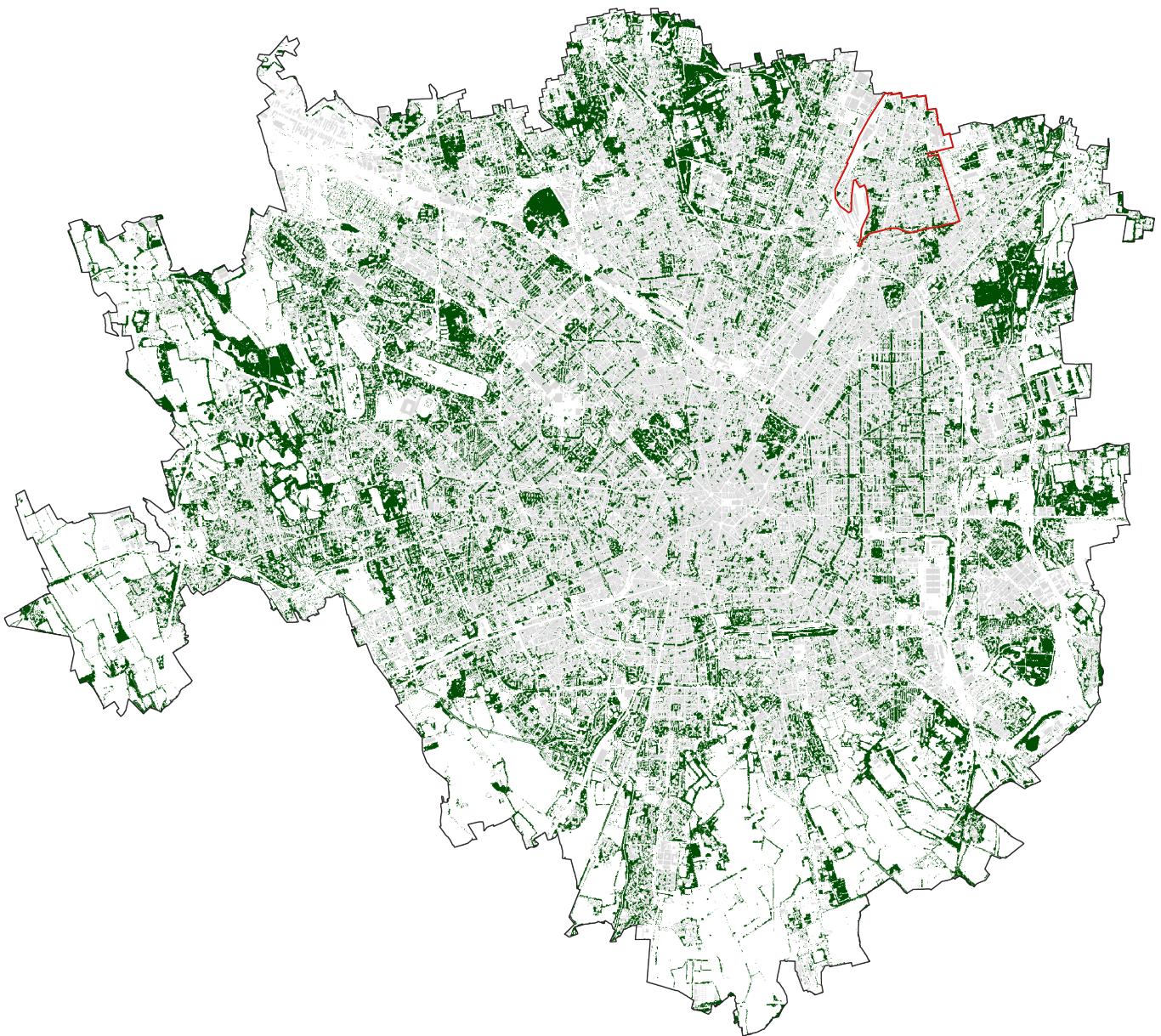
Annual maximum Runoff of Gorla-Precotto

Data source: Laboratorio di Simulazione Urbana Fausto Curti - Politecnico di Milano  
 Personal re-elaboration

# POOR TREES COVER

The forestation map represents the territory of the metropolitan city of Milan and the wooded areas currently present. Highly wooded and recognisable areas are highlighted, such as along the Ticino and Adda rivers, as well as heavily wooded areas north of Milan. Equally evident is

how areas with trees are very scarce or absent for tens of square kilometres when we are near urban centres as Milan. The map depicting tree coverage in Milan is very significant as it clearly shows that the city has a scarcity of trees, not even in the peripheral areas do significant levels of natural



*Tree Canopy of Milan*

*Data source: Laboratorio di Simulazione Urbana Fausto Curti - Politecnico di Milano  
Personal re-elaboration*



shading occur.

It is precisely this factor that is of major importance for a city that wants to mitigate rising temperatures and heat islands.



**LEGEND**

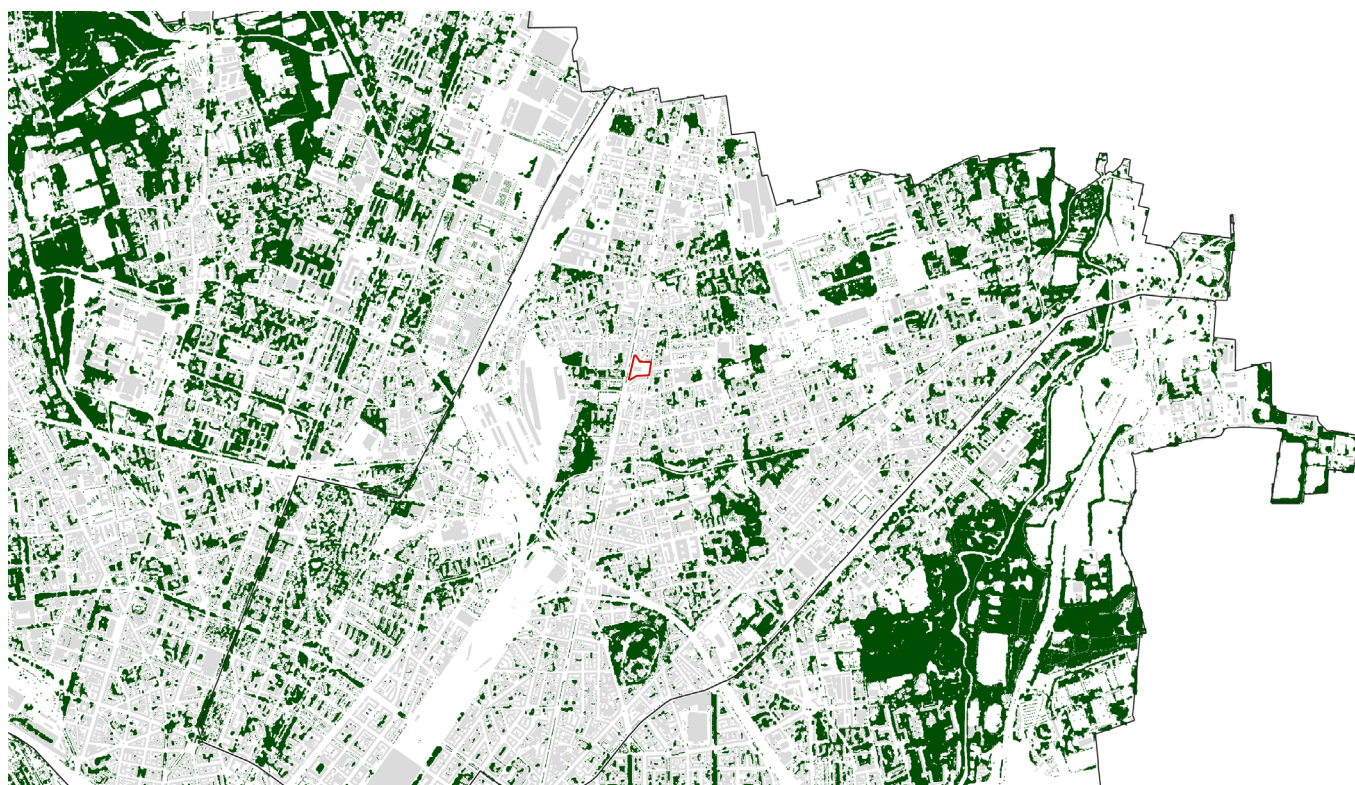
■ Tree Coverage



**LEGEND**

■ Potential Tree Coverage

ForestaMi.org



Tree Canopy of Gorla-Precotto

Data source: Laboratorio di Simulazione Urbana Fausto Curti - Politecnico di Milano  
Personal re-elaboration

# BAD AIR QUALITY

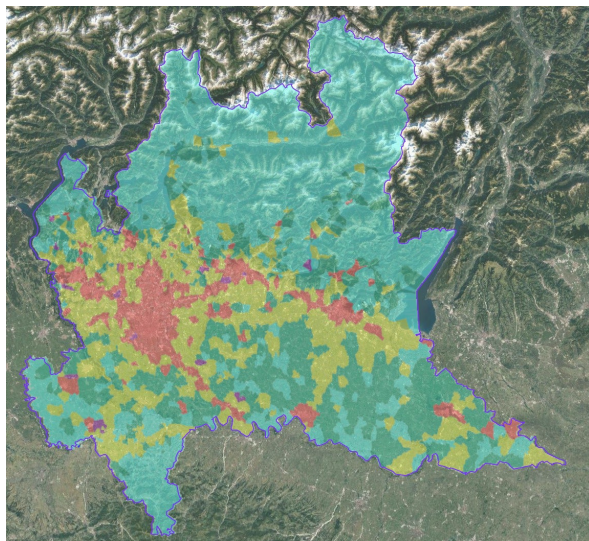
The issue of air quality is very important and significant for Milan and the entire Padana plain, as it is the most polluted region in Europe. With frightening levels of CO<sub>2</sub> and greenhouse gas emissions all year round. Below is a series of indicators (A.R.P.A.) useful for understanding air quality in Lombardy. It can be seen immediately that the Milan area and all the urbanised areas to the north of it are in a rather serious situation all year round.

How is air quality involved in climate change? Milan's bad air is the consequence of a number of factors. First of all, there is the fact that the province of Milan has a high density of mobility infrastructure and buildings, which emit large quantities of air pollutants every day.

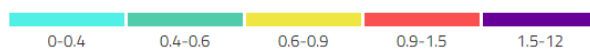
Subsequently, these pollutants are not easily disposed of in the atmosphere, as the Po Valley is subject to few air currents. Finally, high temperatures have been shown to create secondary pollutants and ozone. Thus, polluted air is very much related to climate issues, leading to two major consequences.

Firstly, air pollution and consequently the rainfall of plants and humans who breathe the air. And the second reason is that some of these agents are greenhouse gases, i.e. those gases that contribute to increasing land temperatures by creating heat islands, overheating and in the long run even prolonged drought phenomena, with short breaks of very heavy rainfall.

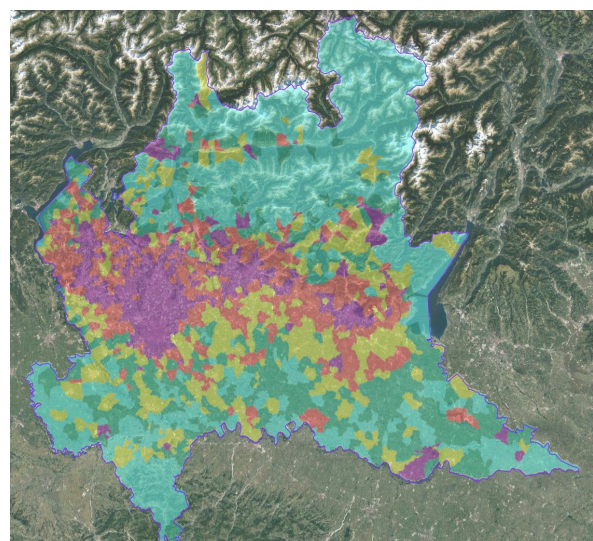
## ANNUAL PM10 EMISSIONS PER KM<sup>2</sup> - 2019



PM 10 t/Km<sup>2</sup>



## ANNUAL NOX EMISSIONS PER KM<sup>2</sup> - 2019

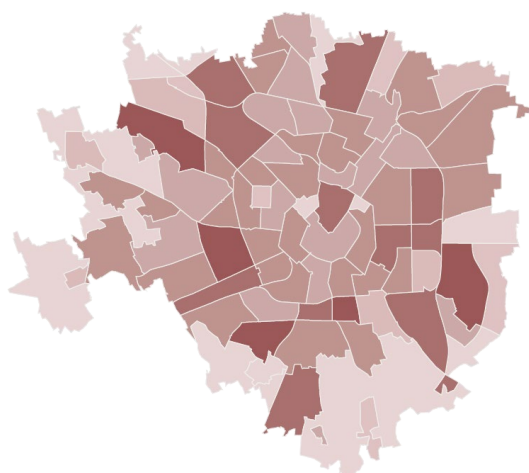


NOX t/Km<sup>2</sup>





## MORTALITY DUE TO NO2



### Gorla - Precotto

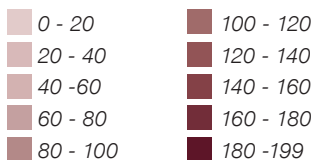
Mortality index (estimate per year)

**106** people on 100,000 inhabitants

Avoidable deaths (estimate per year)

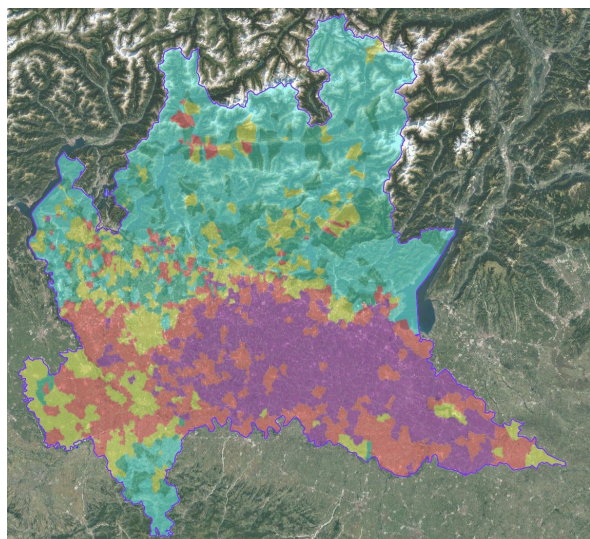
**31**

Deaths per 100,000 inhabitants

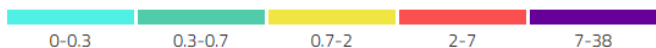


Cittadini per l'aria - datas: NO2 No Grazie 2020 - Personal re-elaboration

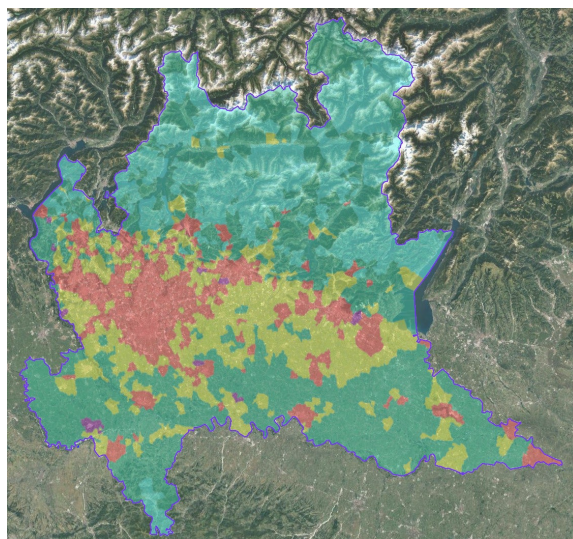
## ANNUAL NH3 EMISSIONS PER KM2 - 2019



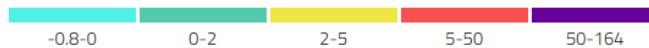
NH3 t/Km<sup>2</sup>



## ANNUAL GREENHOUSE GAS EMISSIONS PER KM2 - 2019



Greenhouse gases kt/Km<sup>2</sup>



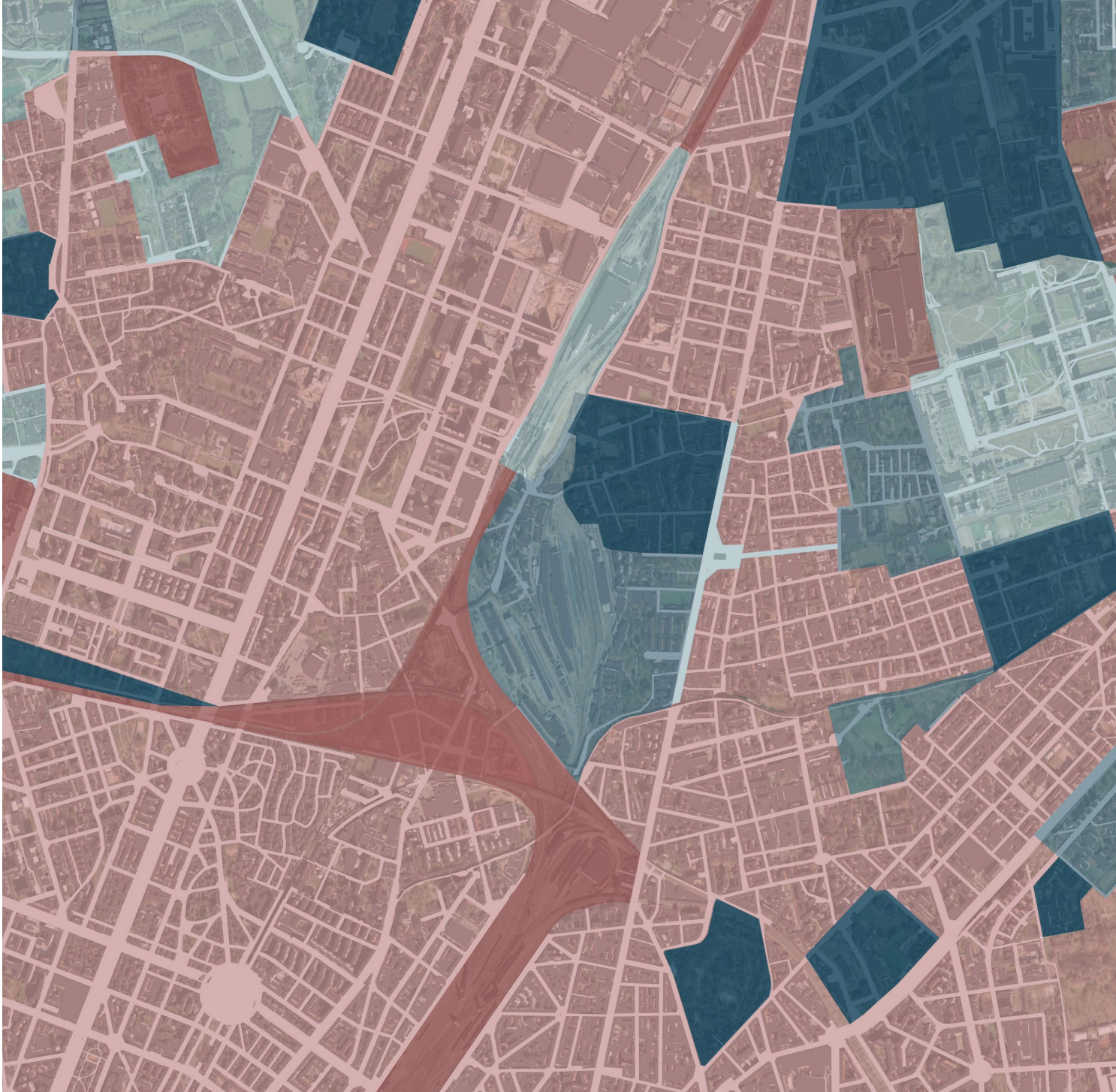
ARPA - Regione Lombardia



# HARD AND SOFT PATTERNS

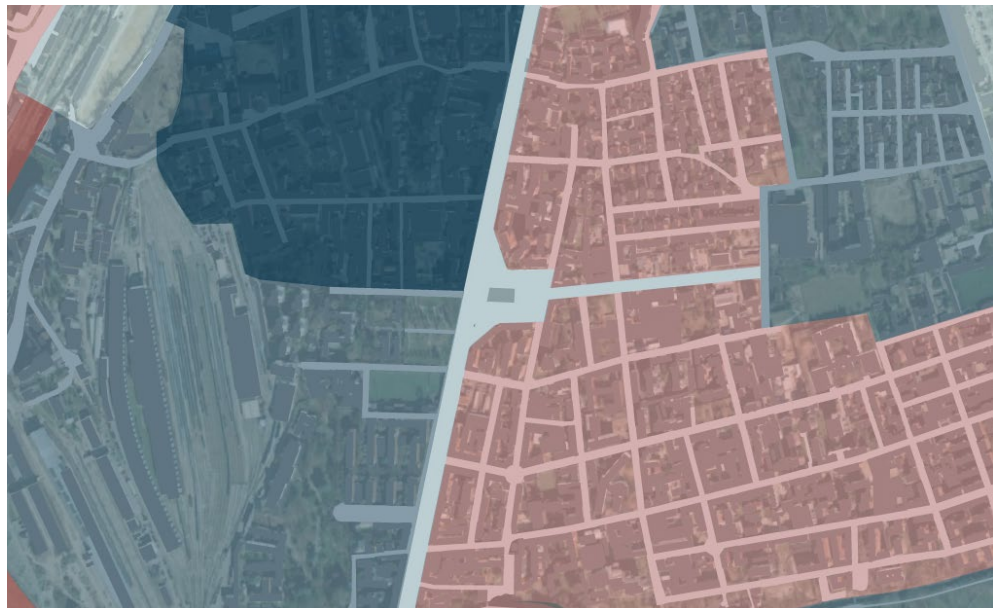
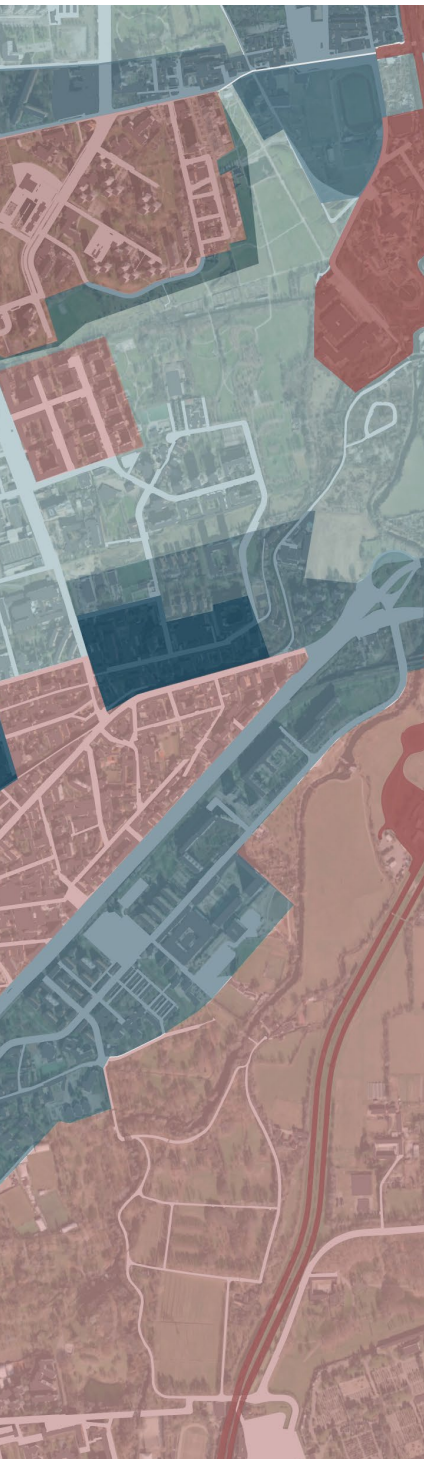
Hard & Soft Pattern refers to those areas that are more or less likely to undergo a transformation in the future. This transformation can take place on different territories, with urban fabrics of different

densities, which have more or less built-up areas. The classification of areas is also made on the basis of the future transformation of an area where, for example, an implementation plan is planned or



*Personal Elaboration*





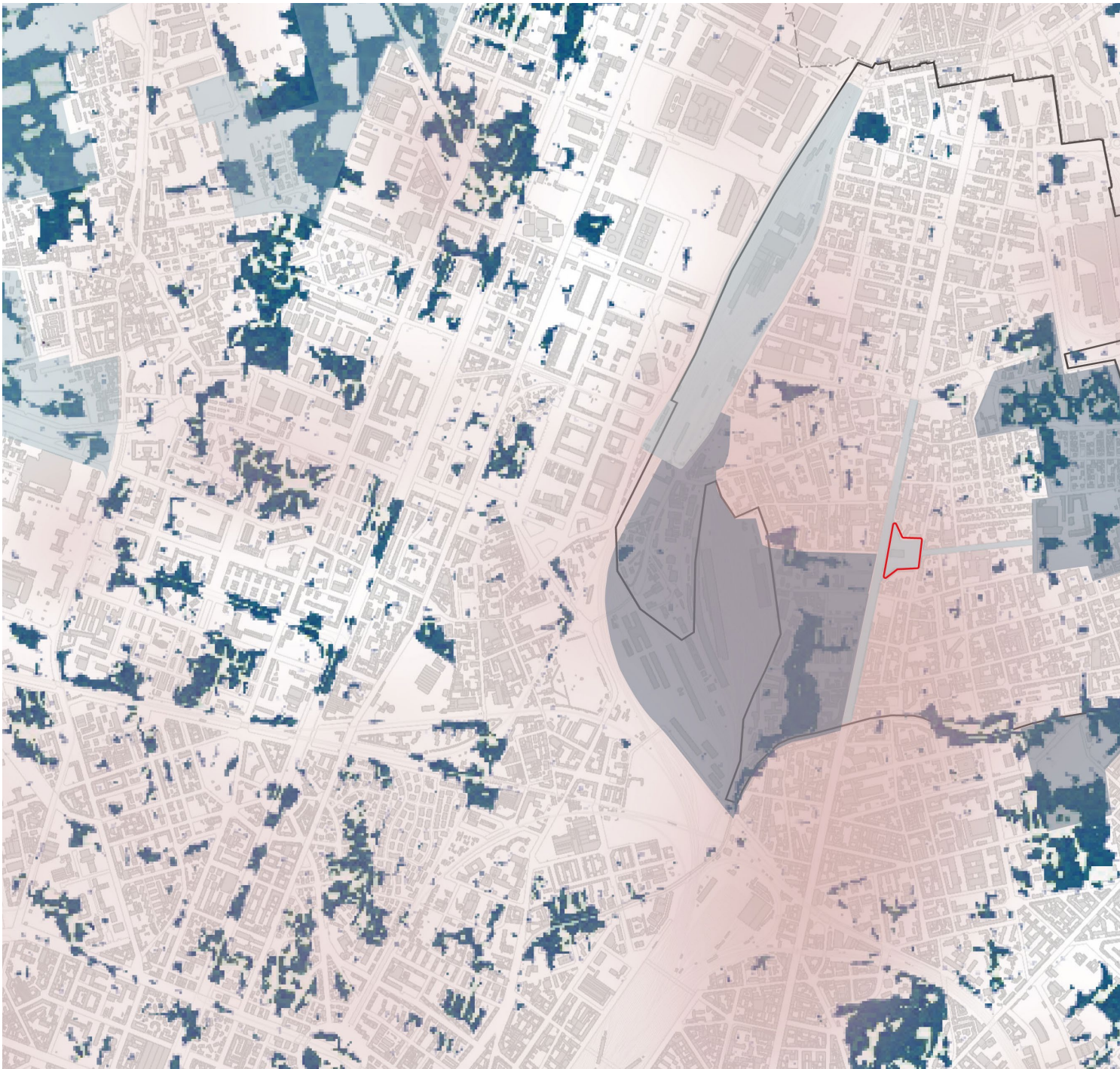
**LEGEND**

- Hard**  
*No intervention:*
    - Unchangeable physical context
    - Unchangeable land use
    - Protected areas
    - Private ownership
  - Less Hard**  
*Minor intervention:*
    - Unchangeable land use
    - Private ownership
    - Minor depavement interventions
- In-Between**  
*Changes of phisical context and minor changes in land use:*
    - Areas In-Between projects
    - Potential transformation areas
    - Mostly public ownership
  - Less Soft**  
*Land use and physical context transformation:*
    - Public ownership
    - Open and green areas
  - Soft**  
*Complete change of Land use and physical context:*
    - Public ownership
    - PGT transformation areas

The classification of the areas represented in the five categories is entirely subjective and is the result of a series of analyses previously made and information gathered. Piazza Martesana is therefore an area that will undergo a major transformation in the coming years, and the same applies to the Greco Breda yard, which is undergoing a transformation. The context of the neighbourhood, on the other hand, is quite difficult to change in an impactful way, unlike some areas bordering the Adriano district (still incomplete) and near the large Greco yard.



# CLIMATE SYNTHESIS MAP SYNTHESIS



*Personal Elaboration*





This map relates the issues concerning the climatic and environmental situation in the Gorla-Precotto district. It shows the areas that experience high temperatures and cause so-called Heat Islands.





Overlaid there is the tree canopy in this sector of Milan. It can be seen that the heat island phenomenon is present where natural elements are scarce.

Also shown are the areas that are most easily transformable or are about to undergo imminent transformation due to their disused or abandoned use. The main elements of emissions and indicators that define air quality in Milan are then reported.

## POTENTIALITIES

This map brings out major issues and problems that will have to be addressed in the design phase. There is therefore a great opportunity to be able to analyse this data and to change it by designing and defining precise targets and objectives to counteract the phenomena of climate change.

## LEGEND

-  Heat Islands
-  Soft Patterns
-  Less Soft Patterns
-  Tree Canopy

# HOUSING PROBLEM ASSESSMENTS

# HOUSING

**What are the housing-related problems in Milan? What causes them?  
How do the problems relate to each other?**

After having defined the climate-related issues, we now try to refer to the issues of living in Milan. Therefore, objective data on house sales and rental prices must be taken into consideration.

We know from the national observatory of the housing market that the cost of living in Milan reaches the highest levels in Italy in some districts. Even real estate buying and selling sites such as Immobiliare.it, which collects data from the ads it records on its site, describes an upward trend in the last few years of selling and renting a property in Milan. In recent years we have also seen a general increase in the cost of living in Italy and

consequently also in Milan and house prices. Despite this, wages have remained the same over the past decades, indeed one should also consider the great inflationary phase of the global market and see that wages have gone down in most cases.

In a city like Milan that has high living costs, which are bound to increase, is a normal salary still affordable and sufficient to live within the city? Is Milan becoming a city for a small elite, a city for the rich?

How important does it become for a city to have a diversity of people living in it? Is Milan an inclusive city to all intents and purposes or does it limit the possibilities of residence for certain categories of people?

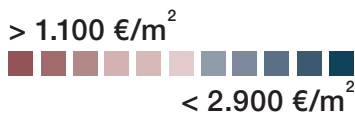
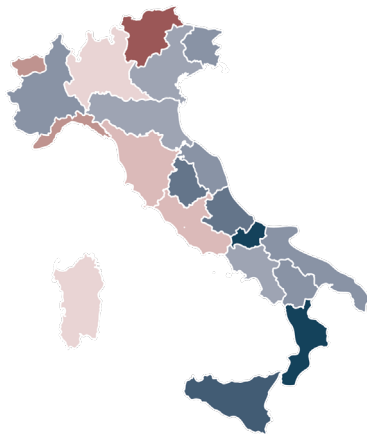




# HIGH REAL ESTATE COSTS



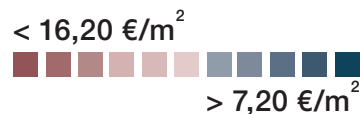
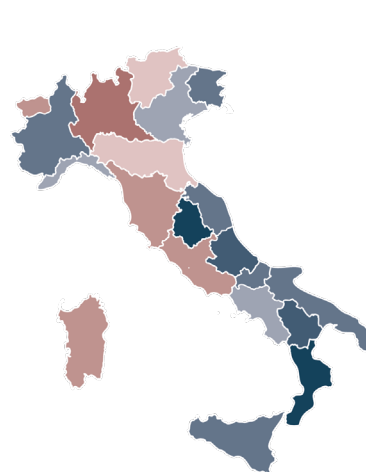
## SALE



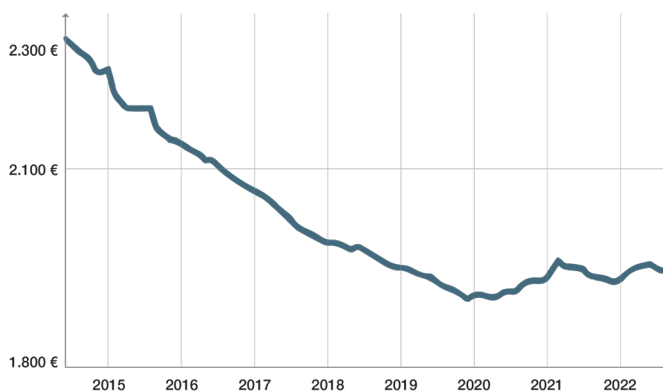
Average sales prices in Italy regions - Sep. 2022



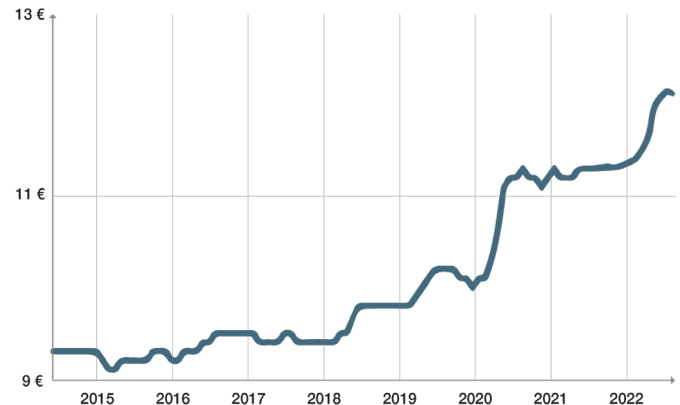
## RENT



Average rent prices in Italy regions - Sep. 2022



Average sales prices in Italy 2015-2022



Average rent prices in Italy 2015-2022

In Italy, the average regional cost of buying a house is quite low, given the size of the territories and their morphological heterogeneity, and the same applies to Lombardy in general. As far as the price trend since 2015 is concerned, there has been a decrease until today. Once again, a general view of the whole of Italy is shown, whose market moves from some undervaluation of properties located, for example, in the country's inland areas.

*Immobiliare.it*

With regard to rental prices in the Italian regions, it can be seen that Lombardy is the region with the highest prices. A major influence from this point of view is certainly Milan and the surrounding municipalities or those belonging to the metropolitan city.

The trend of average prices in Italy has seen an important growth since 2018/2019 and is expected to continue.

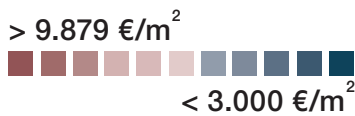
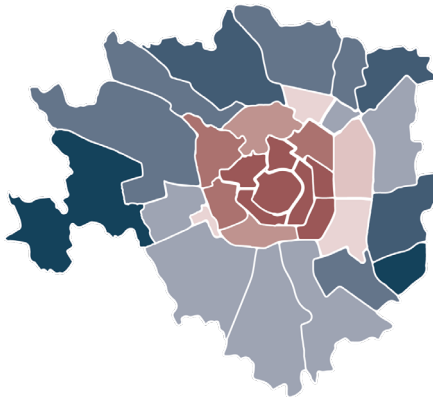


# MILAN



## SALE

**Average price 5.126 €/m<sup>2</sup>**

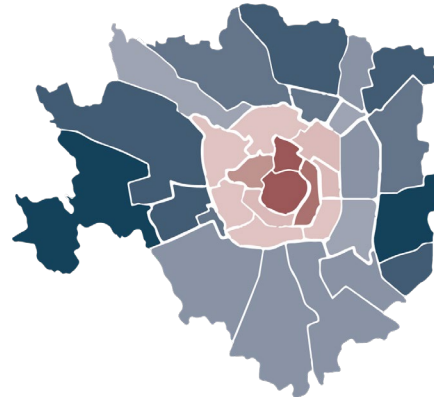


Sales prices in Milan - September 2022

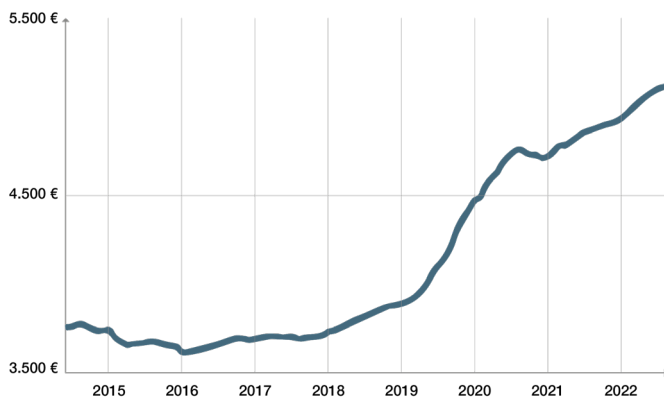


## RENT

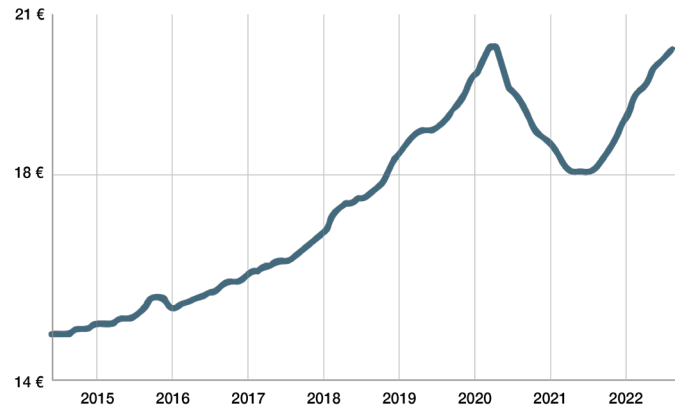
**Average price 20,34 €/m<sup>2</sup>**



Rent prices in Milan - September 2022



Average sales prices in Milan 2015-2022



Average rent prices in Milan 2015-2022

The situation of buying and selling houses in Milan is very significant as we are faced with very high prices. Especially the more central areas. These are the highest values among Italian cities. There has been an almost exponential increase in the average price since 2019. This connotes the situation of difficult access to buying a house in Milan.

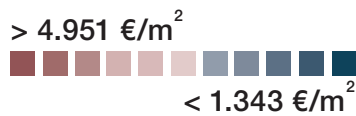
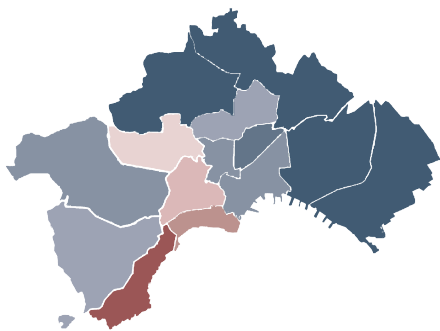
Rental prices in Milan are the highest in Italy, it is a city in high demand and frequented by young students and families. As a city with many opportunities, this results in very high rental prices, but not always housing conditions for everyone. The rental price trend has continued to grow steadily since 2015 and is likely to remain high in the coming years.

# NAPLES



## SALE

**Average price 2.706 €/m<sup>2</sup>**

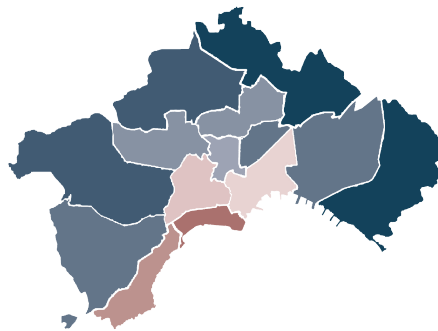


Sales prices in Naples - September 2022

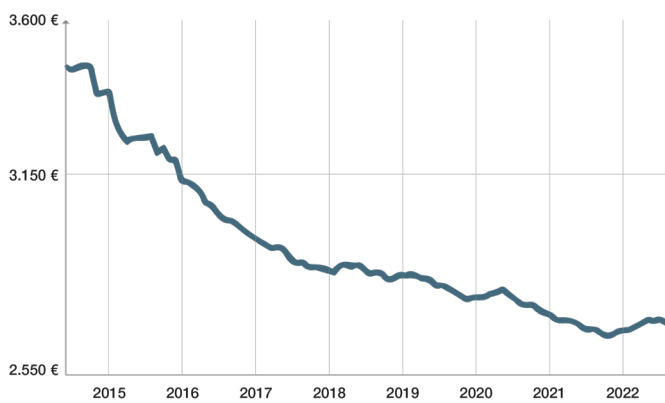


## RENT

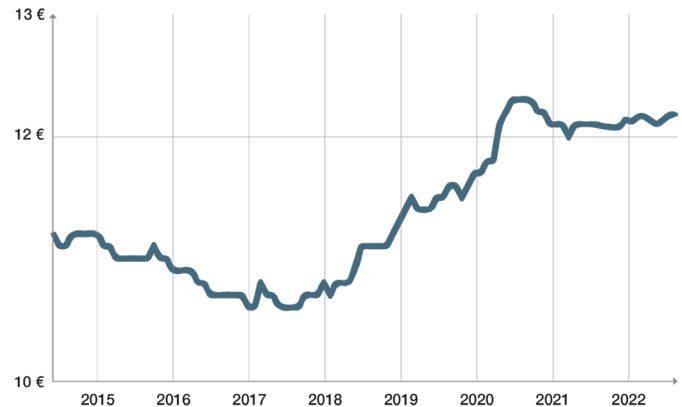
**Average price 12,18 €/m<sup>2</sup>**



Rent prices in Naples - September 2022



Average sales prices in Naples 2015-2022



Average rent prices in Naples 2015-2022

Naples is one of the most important cities in the south of Italy, a metropolitan and very large city, and frequented by many young people. In some ways it has aspects in common with Milan, despite this, the average purchase price of real estate is much lower.

And the average price trend since 2015 has been steadily decreasing.

Also in terms of rental prices, Naples compared to Milan has much lower prices, the cost of living in the south of Italy is generally lower, unlike in some neighbourhoods such as Posillipo or in the centre of Naples in general. Average rental prices have remained fairly constant in recent years.

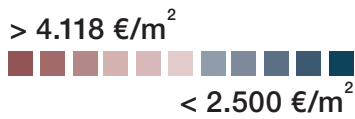
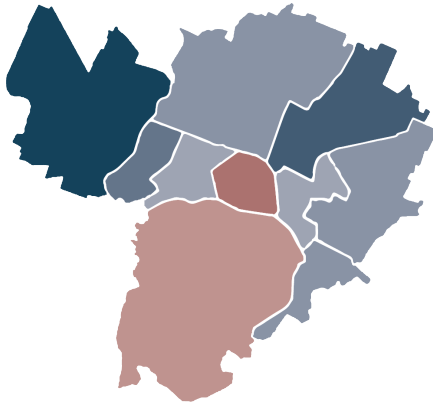


# BOLOGNA



## SALE

**Average price 3.223 €/m<sup>2</sup>**

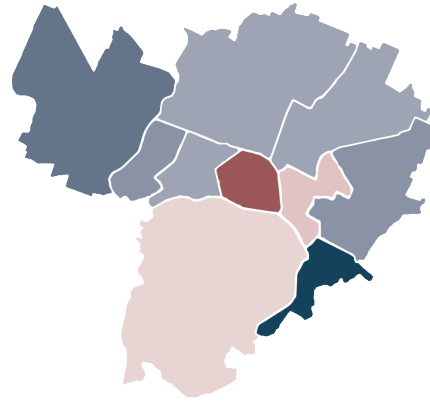


Sales prices in Bologna September 2022

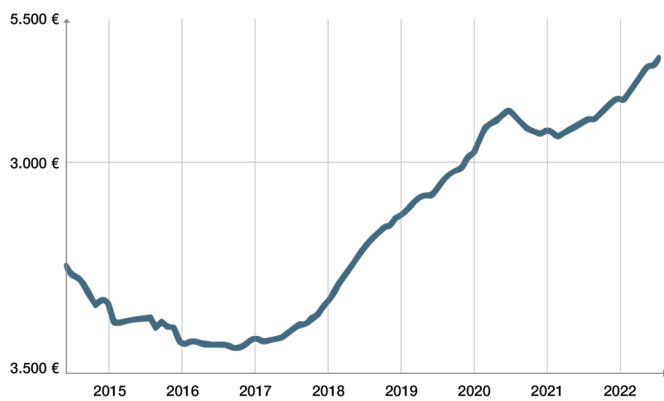


## RENT

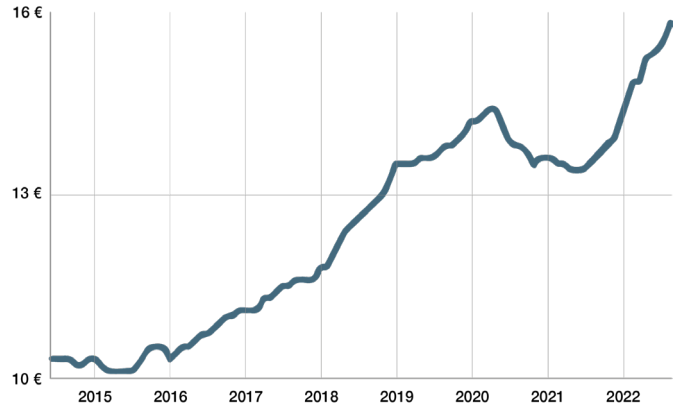
**Average price 15,83 €/m<sup>2</sup>**



Rent prices in Bologna- September 2022



Average sales prices in Bologna 2015-2022



Average rent prices in Bologna 2015-2022

Bologna is another important metropolitan city in Italy, a university city and very full of young people like Milan in some ways. In fact, the selling prices are quite high.

In fact, you can see that the price trend has risen a lot in recent years (almost double since 2017).

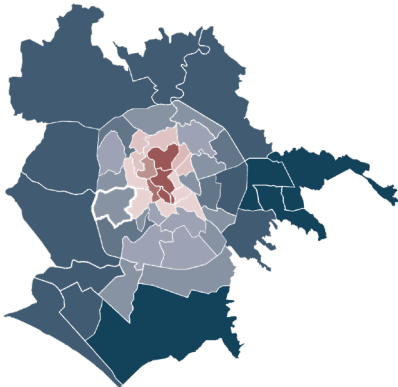
Like Milan, Bologna is very popular with young university students who choose to rent rooms and flats to live in. As a result, average prices are quite high, and as for selling, there have been very important price increases since 2016-2017.

# ROME



## SALE

**Average price 3.310 €/m<sup>2</sup>**



> 7.277 €/m<sup>2</sup>



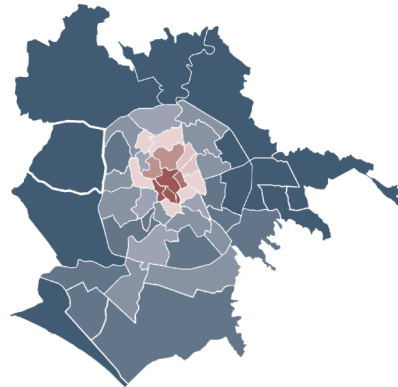
< 1.759 €/m<sup>2</sup>

Sales prices in Rome - September 2022



## RENT

**Average price 14,38 €/m<sup>2</sup>**

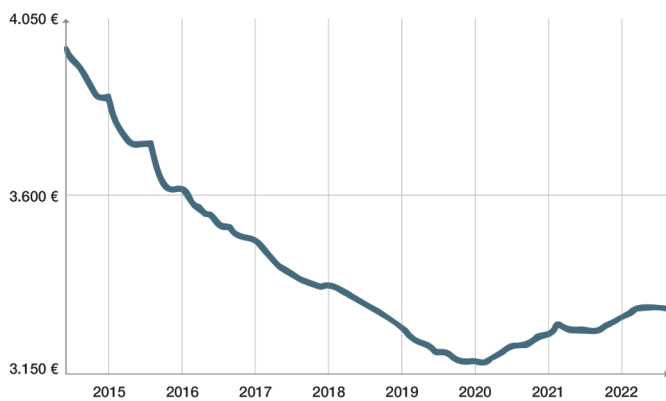


> 24,05 €/m<sup>2</sup>



< 9,49 €/m<sup>2</sup>

Rent prices in Rome - September 2022



Average sales prices in Rome 2015-2022



Average rent prices in Rome 2015-2022

Rome is the largest city in Italy, it has a great variety of neighbourhoods and therefore heterogeneity of purchase prices. That is why there is a very wide gap between maximum and minimum prices. The maximum ones in fact (city centre) exceed even the prices in Milan. In spite of this, average prices have steadily decreased in recent years.

Also for rental prices there is a really important gap between prices in the city centre and those in the suburbs, this is always due to distance from the centre, morphological characteristics and proximity to services. Average rental prices have remained very constant in recent years.

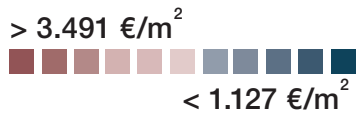
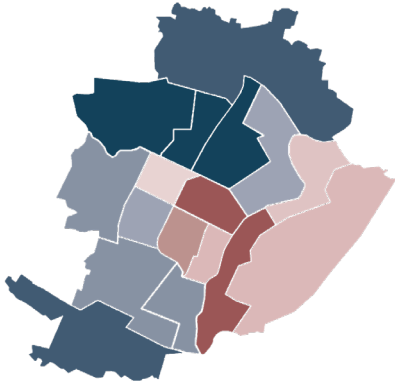


# TURIN



## SALE

**Average price 1.947 €/m<sup>2</sup>**

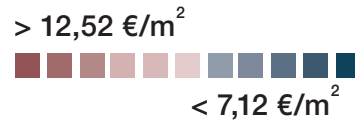
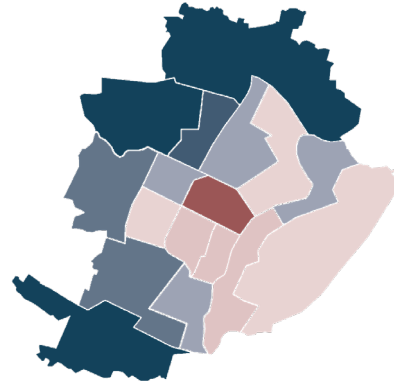


Sales prices in Turin - September 2022

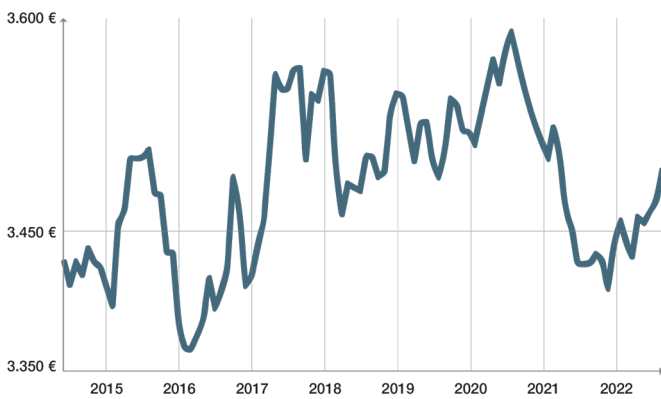


## RENT

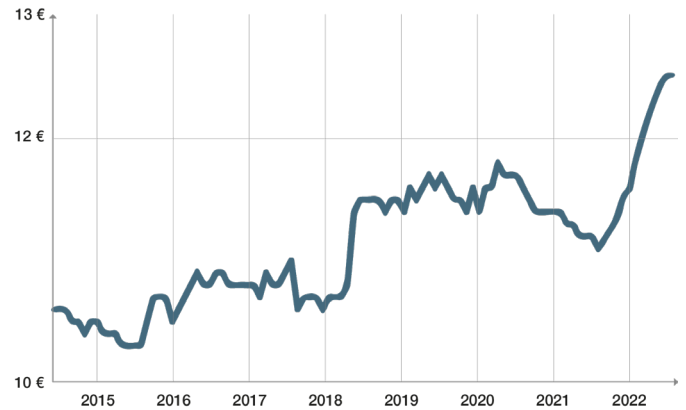
**Average price 9,72 €/m<sup>2</sup>**



Rent prices in Turin - September 2022



Average sales prices in Turin 2015-2022



Average rent prices in Turin 2015-2022

Turin is one of the most important cities in northern Italy, and has similar characteristics to Milan, being a metropolitan and university city. But it presents low prices for buying a house, which have also remained constant over time.

The average rental price also remains low compared to that of Milan, in contrast to the city centre district. And the price trend has also increased by a few units in recent years.

# HIGH INCOME DISPARITY

In order to understand the situation of real estate prices in Milan, there are several articles and news about it in local newspapers. Among them is the very significant and straightforward article on the subject by 'Dealflower: Financial and Local news'.

Also very useful is a graphical representation of the data that Milan represents on the so-called 'Wealth Map', which breaks down property prices for Milan's neighbourhoods.

*"Wages are the same, but the cost of living is rising. This is why Milan is becoming an increasingly prohibitive city for the middle class: from rents that rise, because they are regulated by a city market, to transport and food costs, to*

*wages that are regulated by national dynamics and not those of the Lombard capital.*

*Living and working in the city? It is now impossible, the price of real estate in Milan has exploded to such an extent as to indicate the city as the most expensive in Italy with an average of 20 euros per metre for rent, compared to a national figure of 11.2, reports Idealista.*

*But how much does it cost today to live in a city like Milan?*

*An average family spends €3,314 per month. Of this, €441 is for food, €345 for transport, €25 for education and, above all, €869 for 'notional' rent (i.e., the calculated expense of rent if those*

## THE MAP OF RICHNESS

### Income change 2020





living in their own homes were forced to rent instead), according to ISTAT data estimated by the National Consumers' Union for Repubblica. Wages, however, are not keeping pace with the cost of living and its constant increase. The average gross income in the city in 2020 (i.e. before the pandemic) was EUR 31,777 per capita, as measured by the Ministry of Finance on Irpef declarations.

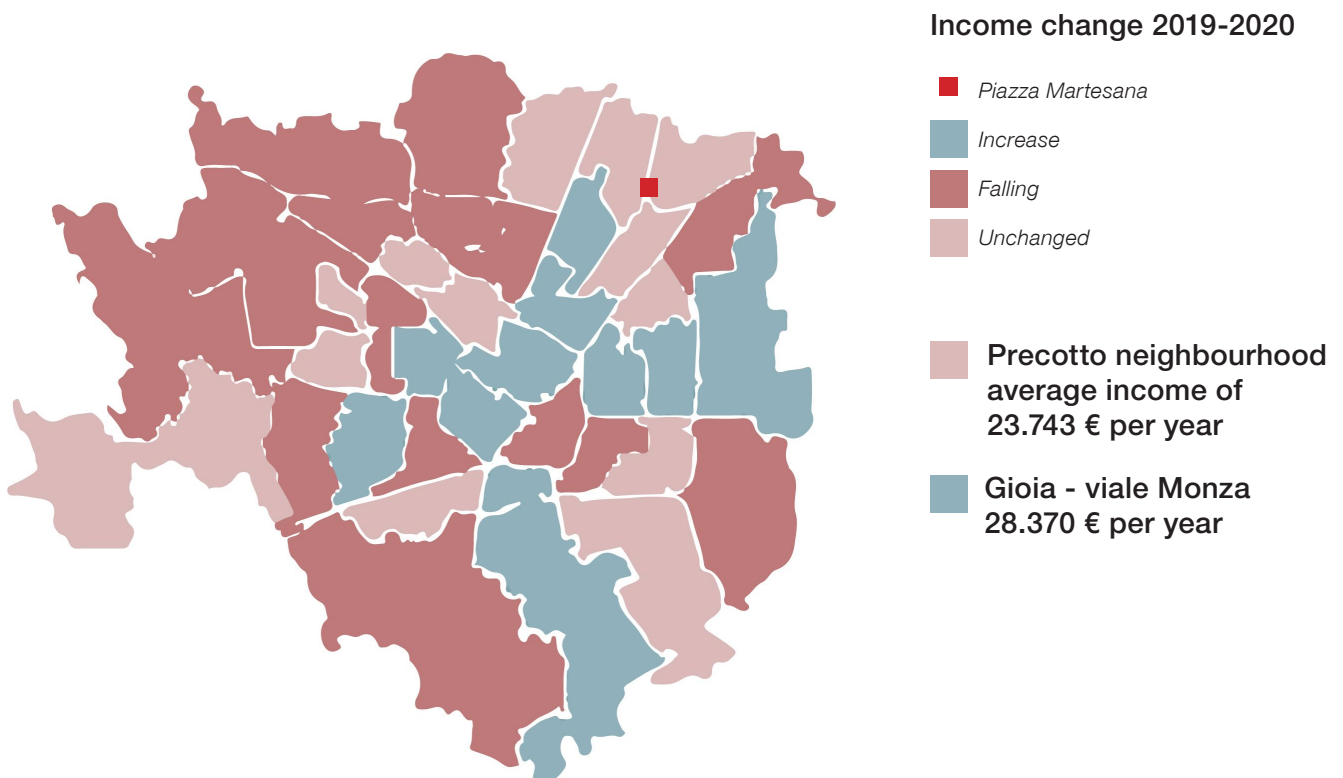
To be considered, then, is that the net salary of an executive is just over 60 thousand euro, for executives and clerks it is 35 and 23 thousand euro, and in the case of blue-collar workers it is 20 thousand, according to data from the JobPricing Observatory on private sector employees. So, with

just one salary in the family it is difficult, but even with two blue-collar workers' salaries in the family it barely covers the average expenditure.

The wage difference is not only in terms of level or job role. From a generational point of view, the pay difference between a young worker (25-34 years old) and a more mature one (45-54) is 42% in Milan compared to 22% nationally, considering then that often the first few years of work are spent flipping from one internship to another (the luckiest with expense reimbursement), internships and apprenticeships."

Dealflower - Milan increasingly a city for the rich  
17 May 2022

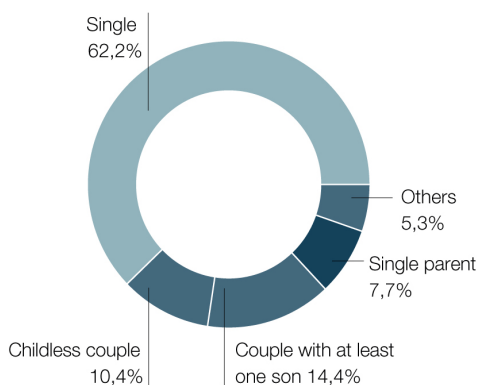
## Comparison of per capita incomes 2019-2020 (€)



# SCARCE HOUSING SUPPLY

## Household composition population 18-34 years old

84.123 households distributed as follows in 2015:



## ERP housing stock

27.945 housing under MM management

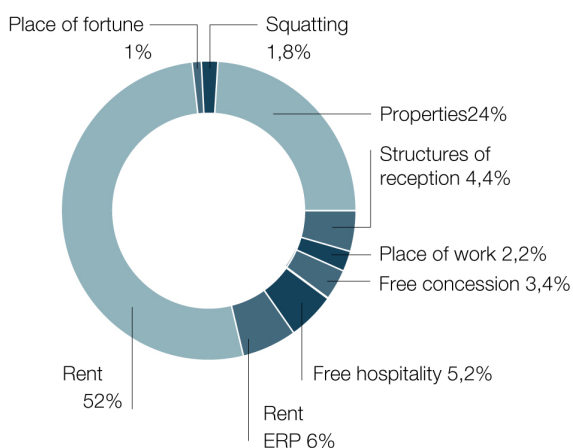
35.109 housing under ALER management

4.050 vacant ERP housing under MM management

il 14% of ERP housing under MM management

25.192 applications for ERP housing 2018, of which 2/3 eligible

## Foreign residents by type of accommodation, 2015



Milan PGT Elaborations

Approximately 12 per cent of the Milanese population lives in social housing. The units are owned by the Lombardy Region, which owns most of the public housing that is managed by ALER (Azienda Lombardia Edilizia Residenziale) and has a total of 35.109 units.

Then there is other housing that is owned by the municipality and managed by MM (Metropolitana Milanese SPA), which has a total of 27.945 units. Finally, there are also privately managed ERS housing offers on the municipal territory, i.e. managed by operators who have an agreement with the municipal administration, but where it is necessary to apply directly to the private operators.

At first glance, this may seem like a large amount of housing supply, but in reality the demand for it is far higher than the supply.

Every time there is a call for applications for access to this type of housing, a large number of applications are received, many of which are also valid and deserve to be allocated.

But we know that access to a council house requires many requirements and specific social conditions in order to benefit from it. The Milan City Council website provides a detailed list of the necessary requirements.

The offers of social housing that the municipality proposes are many and advantageous, sometimes rent prices are a third of the market price. Among the various ERS housing offers are:

- subsidised social housing in disposal;
- co-housing with shared services (co-housing) in transfer.
- subsidised social housing for rent with a future sale pact;
- subsidised rental housing with an agreed rent;
- leasehold housing at an agreed rent;
- leasehold housing at moderate rent;
- public rental housing at social rents;



- subsidised housing for university students.

The question must be asked whether this supply of housing is sufficient to meet demand. Better still, one must ask oneself whether this supply will be sustainable in the future, or whether integrated planning will be necessary with regard to the design of widespread, high-quality social housing.

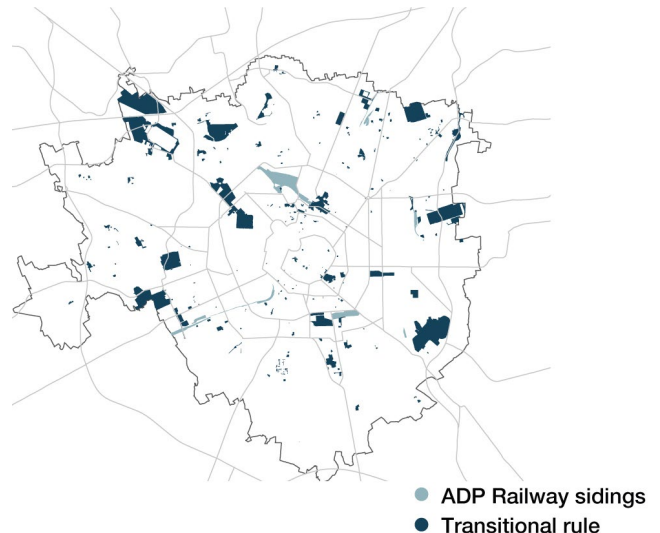
Despite the fact that in recent years there have been many new Public Housing projects in Milan, I think there will be an increasing need for this kind of housing, especially for all those weak segments of the population who are starting a new life, such as university students, young families, immigrants and new workers. As mentioned earlier, the Milanese housing market is regulated by the dynamics of the city, whereas salaries are limited to national standards, where there are different realities based on the cost of living.

In a way that will face many important challenges such as the rising cost of living, the global climate crisis, mass migratory phenomena, energy crises... We need to try to foresee the consequences of all this, to act to provide certainty for the younger population through a series of policies and planning at a national level, as the National Recovery and Resilience Plan (PNRR) could do, which will allocate 2.8 billion euros for suburbs, social housing and public buildings in Italy, including Milan.

At the regional level, on the other hand, again with PNRR funds (EUR 250 million), regeneration of social housing is planned, since there are problems of structural decay, lack of maintenance, delinquency and illegal occupation of housing. There is also the problem of the splitting up of units beyond their renovation, as some very large flats need to be divided into several units in order

to differentiate the housing supply and increase the social mix among inhabitants according to specific demands.

Therefore, it becomes of great importance to ensure that especially the younger population, the one that will take care of the future of society, is facilitated in the best possible way to live in Milan. Social Housing must be seen as an advantage or help to initiate young people to live in the city. In fact, the ultimate goal is to ensure that, once they have reached a certain economic stability, ERS users can easily get to buy a house in Milan (despite the high prices). This will create all the economic advantages for Milan, which will benefit from brilliant minds and workers who adopt sustainable lifestyles and live with quality in the city that has welcomed them.



**ERS in implementation and programming**

**Quotas realised in implementation of the current PGT**

- 27.920** m<sup>2</sup> gross area
- 15.000** m<sup>2</sup> gross area university residences
- 290.768** m<sup>2</sup> gross area of which
- 58.970** related to the Abitare 1 and Abitare 2 programmes
- 59.934** m<sup>2</sup> gross area planned in the Social Housing Framework Agreement
- 171.864** m<sup>2</sup> gross area planned in different programmes

# *Planning of Milan and Piazzale Martesana*

## | PLANNING GOVERNMENT TOOLS

/ UN - Sustainable Development Goals

/ PGT Milano 2030 - The Vision

/ DdP

/ PdR

/ PdS

/ Hydrogeological Components

/ NIL 16 Gorla Precotto

/ PAC

/ PUMS

/ Synthesis map

/ Synthesis map - Focus

# 03

This chapter analyses Milan's urban planning instruments that serve to understand the rules and characteristics of the urban sector in which Piazzale Martesana is centred.

Among the instruments is certainly the most important one, namely the Piano di Governo del Territorio (Territorial Government Plan) of the Municipality of Milan, which, with its three main components, gives a complete and specific picture of the territory.

Below are the details of the Gorla-Precotto district by means of the NIL (Nuclei di Identità Locale - Nuclei of Local Identity) sheets, also from the Milan Municipality. The PAC, i.e. a plan on air and climate in Milan, is a rather new but significant instrument of great importance for Milan, which does not boast a good reputation for the quality of the air it breathes or climate conditions in general.

Lastly, the PUMS, a plan regulating sustainable mobility, and the SDG's, which are instruments that apply on a global scale as they are promoted by the United Nations and are basically goals aimed at promoting sustainable development in the nations that adhere to them.



# PLANNING GOVERNMENT TOOLS

## PLANNING

**How do planning instruments deal with the issues of climate change and social housing? Are these two topics considered together or addressed separately?**

Among the planning or design instruments there is the most relevant one for Milan and Lombardy, the Piano di Governo del Territorio (PGT) which is divided into three main sections as will be explained later.

This is an instrument that is very interesting in its general vision, its broad objectives and the strategies it intends to adopt for specific areas of the city. In particular, the Plan Document defines pivotal themes, pillars from which Milan must start in order to achieve objectives by 2030.

Among the great challenges is climate change, which will be tackled for entire urban areas, with the integrated regeneration of railway yards, or large disused industrial areas. But work will also be done on existing housing with greater energy efficiency, increased sustainable mobility, etc.

The objective of Milan as a city of opportunities, attractive and inclusive is also defined, which through strategy 9 (Regenerating the city. The suburbs at the centre) wants to implement a series

of measures for social housing.

As another tool, we have the SDG's, which globally define well-defined targets for 2030 and which concern poverty in the way, access to housing and basic goods, but also the adoption of sustainable lifestyles and the realisation of cities resilient to climate change.

Subsequently, the Climate Air Plan defines for Milan a series of issues such as better air quality, inclusive Milan and fresher Milan.

Then there is the PUMS, which deals with sustainable mobility for the metropolitan city of Milan and promotes the pretation of slow lines such as bicycle lanes and the use of public transport and its extension in the city.

These are tools that talk about climate and housing issues, and address them from a planning and design perspective.

**But do these tools work together? Are they integrated to achieve the same goals? Are they really feasible objectives or do they remain suggestions and pure recommendations without a concrete basis for investment or research?**



The Sustainable Development Goals, SDGs, are a set of 17 interlinked goals, defined by the United Nations as a strategy "to achieve a better and more sustainable future for all"

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**SDGs**



The P.G.T. - Piano di Governo del Territorio (Territorial Government Plan) replaces the old General Regulatory Plan and is the instrument through which the municipal administration plans the urban development of the territory. The TMP is composed of three different acts: the Plan Document, the Services Plan and the Rules Plan and is valid for five years.

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**PGT**



The Air and Climate Plan is a tool to protect health and the environment, aimed at reducing air pollution and responding to the climate emergency.

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**PAC**



The Sustainable Urban Mobility Plan (SUMP) is a strategic plan that is designed to meet the mobility needs of individuals in order to improve the quality of life in the city in the medium to long term, with periodic interim reviews.

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**PUMS**

# UN - SUSTAINABLE DEVELOPMENT GOALS



The Sustainable Development Goals, SDGs, are a set of 17 interconnected goals defined by the United Nations as a strategy 'to achieve a better and more sustainable future for all'. All of the goals are listed below, highlighting those that most closely relate to the themes of the thesis

and those that will be used for the project phase. Some of the respective targets to be achieved by 2030 are then given. In other words, objectives that are concrete and that set precise targets with deadlines. Those most relevant to the development of the thesis are listed.



## TARGETS



**7.1** By 2030, ensure universal access to affordable, reliable and modern energy services

**7.2** By 2030, increase substantially the share of renewable energy in the global energy mix

**7.3** By 2030, double the global rate of improvement in energy efficiency.



**8.1** Sustain per capita economic growth at least 7 per cent gross domestic product growth per annum in developed countries.

**8.3** Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation (growth of micro-, small- and medium-sized enterprises).

**8.6** By 2020, substantially reduce the proportion of youth not in employment, education or training



**11.1** By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

**11.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport

**11.6** By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

**11.7** By 2030, provide universal access to safe, inclusive and accessible, green and public spaces.



### 11.c

Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

**12.2** By 2030, achieve the sustainable management and efficient use of natural resources

**12.4** By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

**12.5** By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

**12.8** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.



**13.1** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

**13.2** Integrate climate change measures into national policies, strategies and planning

**13.3** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

# PGT Milano 2030 - The Vision

A CONNECTED, METROPOLITAN AND GLOBAL CITY



A CITY OF OPPORTUNITIES, ATTRACTIVE AND INCLUSIVE



A GREEN, LIVEABLE AND RESILIENT CITY



ONE CITY, 88 NEIGHBOURHOODS TO BE CALLED BY NAME

A CITY THAT REGENERATES ITSELF



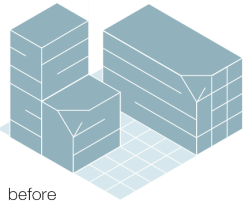
## STRATEGIES

1. Connecting places and people. Nodes as development platforms
2. Transform, attract, excel. The opportunity of urban voids
3. Innovate and include. Emancipating through work
4. Making Milan fair. More houses for social rent
5. Making space for the environment. Projects for soil and water
6. Designing a new ecology. Sustainability standards
7. Adapting to social change. Services close to all citizens
8. Re-connecting neighbourhoods. Public space as a common good
9. Regenerating the city. The suburbs at the centre

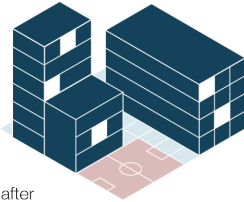


# STRATEGY 4: Making Milan fair. More houses for social rent

public housing services



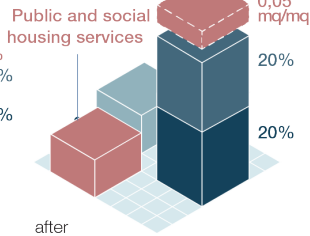
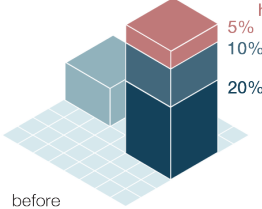
From monetisation of ERS share and burden relief



## REDEVELOPMENT OF PUBLIC HOUSING SERVICES

PDR ART. 9 AND 15

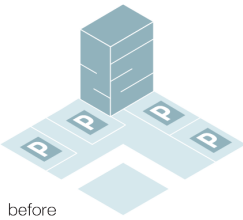
Facilitated agreement for sale  
Moderate tenancy  
Social housing



## PROMOTING SOCIAL RESIDENTIAL HOUSING (ERS)

PDR ART. 9

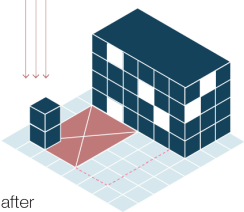
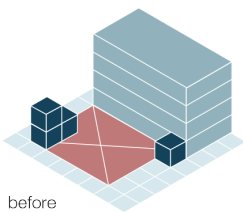
Facilitated agreement for sale  
Moderate tenancy  
Social housing



## NEW AREAS FOR ERS

PDS ART. 8

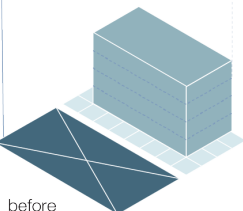
-20% Reduced demand for services



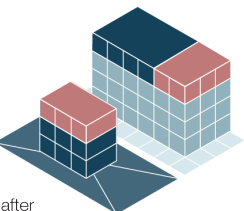
## AFFORDABLE RENT SUPPORT

PDS ART. 11

ST>10.000 mq  
SL>10.000 mq



40% Residential SL for ERS

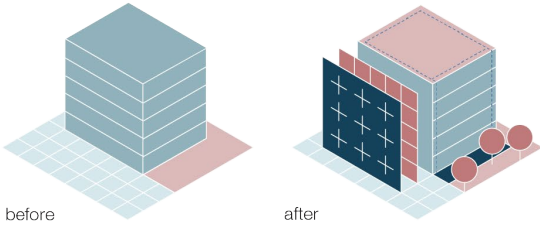


## MANDATORY SOCIAL HOUSING

PDR ART. 8 AND 9

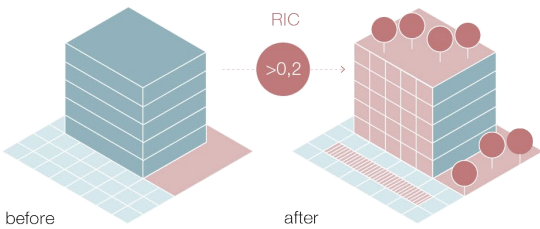


# STRATEGY 6: Designing a new ecology. The standards of sustainability



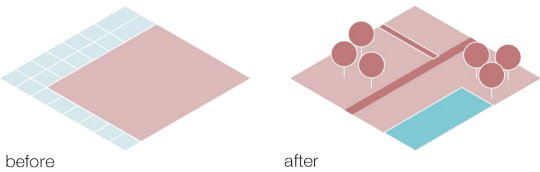
## MINIMISING CO2 EMISSIONS

PDR ART. 10



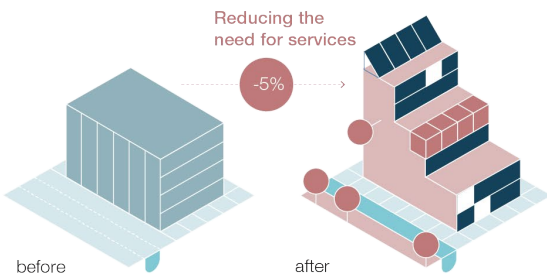
## CLIMATE IMPACT REDUCTION INDEX

PDR ART. 10



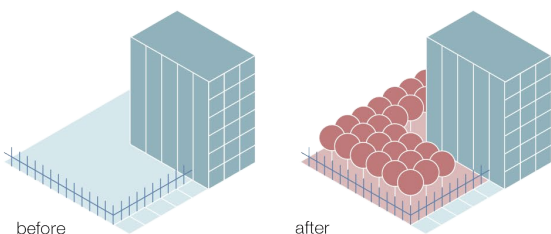
## SUPPORT FOR THE REALISATION OF THE FUTURE METROPOLITAN PARK

PDR ART. 10



## ECOSYSTEM SERVICES

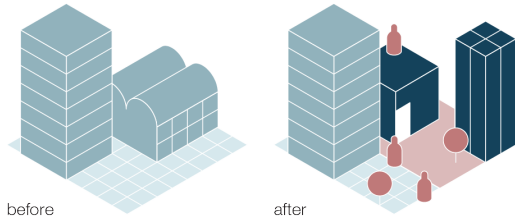
PDS ART. 8 AND 10



## URBAN FORESTATION

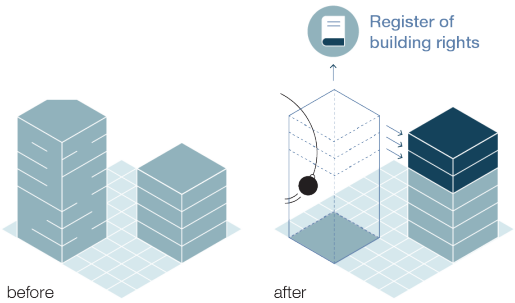
PDR ART. 10

# STRATEGY 9: Regenerating the city. Suburbs at the centre



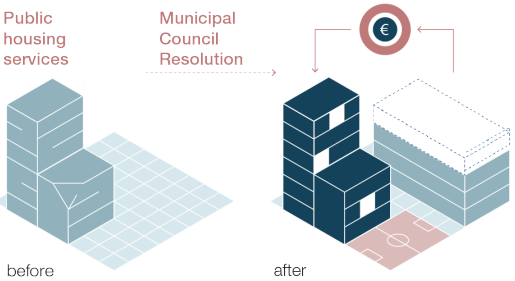
## REGENERATION

DDP ART. 3 PDR ART. 13 PDR ART. 15



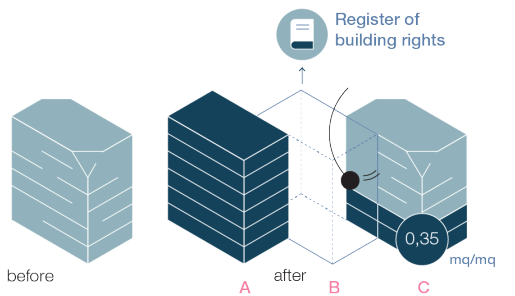
## EQUALISATION AND TRANSFER OF BUILDING RIGHTS

PDR ART. 15



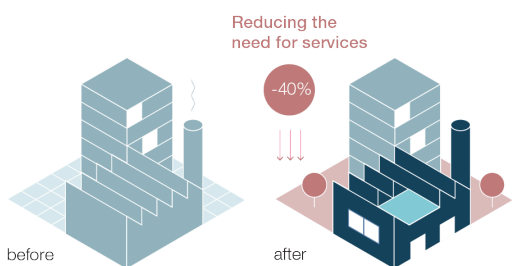
## OPTION TO MONETISE ERS SHARES

PDR ART. 5



## RECOVERY OF ABANDONED AND DISUSED BUILDINGS

PDR ART. 11



## AMENITIES

PDS ART. 11

# DdP

## DOCUMENTO DI PIANO - DOCUMENT PLAN

In addition to having a section devoted to illustrating a very strong vision for the city of Milan, the Plan Document also has the task of representing its intentions, goals and strategies through maps. The City of Milan's online maps is available.

One of the most important of these maps is the plan document (D01), which is a series of strategic areas and spaces in the territory, to give them a future role and objective. In the case of Martesana square, we are in the context of urban renewal and environmental regeneration.

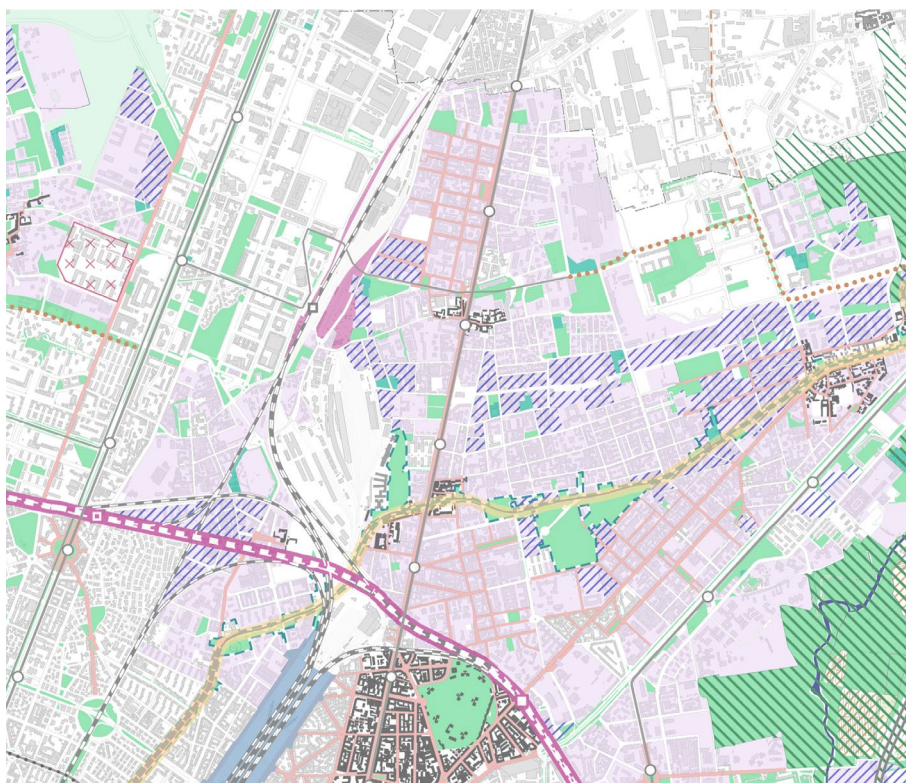
Next, we find the landscape map (D02), i.e. that map which indicates that they possess landscape rules (altercation, building distances) rather than natural areas relevant from a landscape point of view. In this case, it is interesting to observe the areas along the Martesana canal and the protected

areas. As far as the square is concerned, however, we are in a context that needs to be rethought from a landscape point of view.

Finally, the plan document provides an outline of the ecological network (D03). This table is of particular importance for the development of a reinventing cities project. As it helps to understand which areas of environmental regeneration, but above all where the ecological network runs through the city and to which places it branches out. Piazza Martesana is seen to be crossed by the regional ecological network known as the green and blue infrastructure.

Finally, the DdP presents its specific implementation rules where reference articles are specified for the elements represented in each map.

### D01 Project Plan



PGT - DdP Comune di Milano

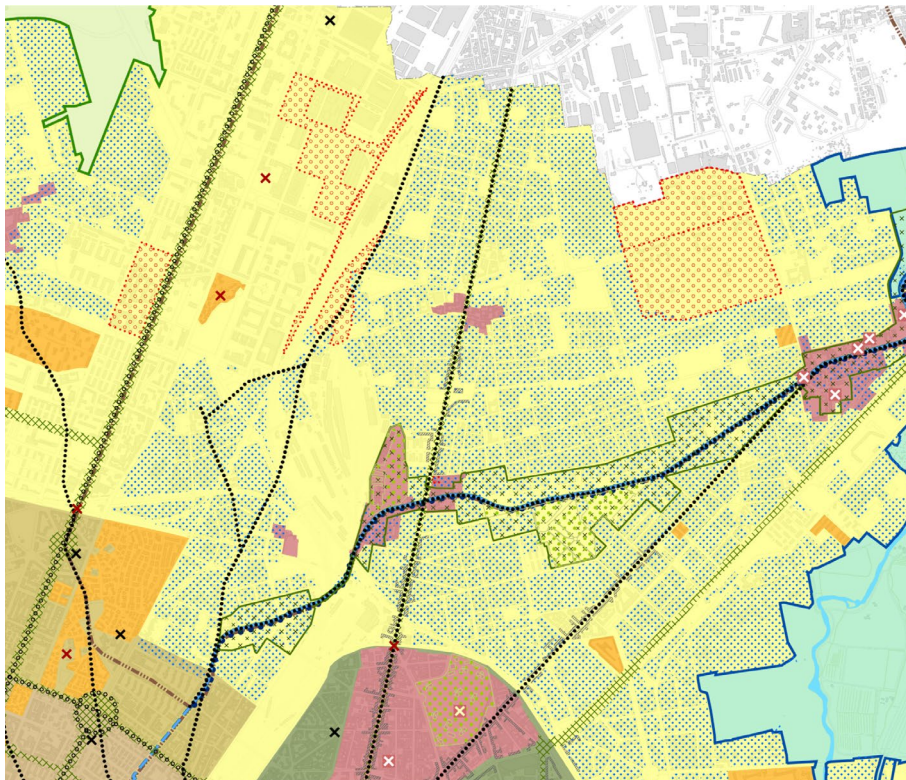


#### LEGEND

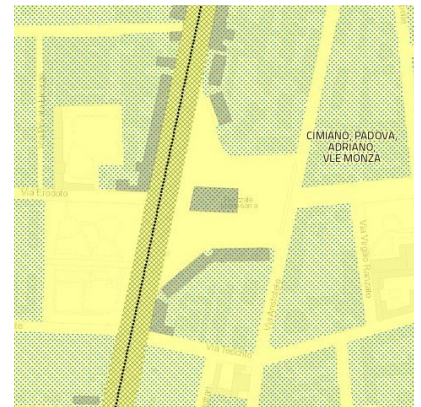
- Spaces with a pedestrian vocation
- Areas of Urban Renewal
- Areas of environmental regeneration
- Existing urban green
- New urban green area



## D02 Landscape map



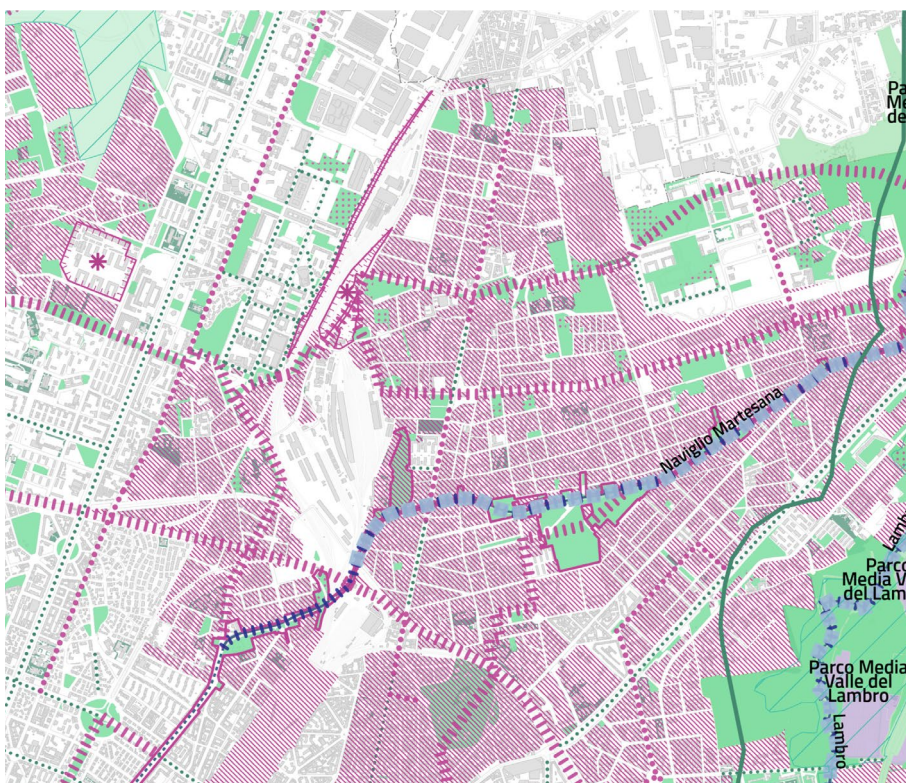
PGT - DdP Comune di Milano



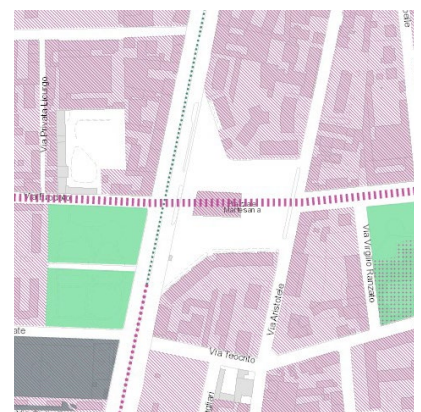
### LEGEND

- Landscape guide tracks
- Yellow Areas of Current Regulatory Plans
- Light Green Areas of redefinition of the urban landscape
- Green cross-hatch Green components that structure the urban form

## D03 Municipal Ecological Network Scheme



PGT - DdP Comune di Milano



### LEGEND

- Existing linear green connections
- ..... Linear green connections to be made
- Thick Pink Green and blue infrastructures
- Light Purple Areas of environmental regeneration
- Light Green Existing urban green
- Dark Green Green inside services



# PdR

## PIANO DELLE REGOLE - RULE'S PLAN

The plan of rules is that part of the plan whose task it is to define the rules that define the plan and, above all, the rules that will then be applied for the proper transformation of the city.

It, therefore, becomes a huge reference point for planners developing projects on the Milanese territory. Based on how the rules plan is defined, one understands the true 'shape' of the plan and the direction the city will take in the years to come.

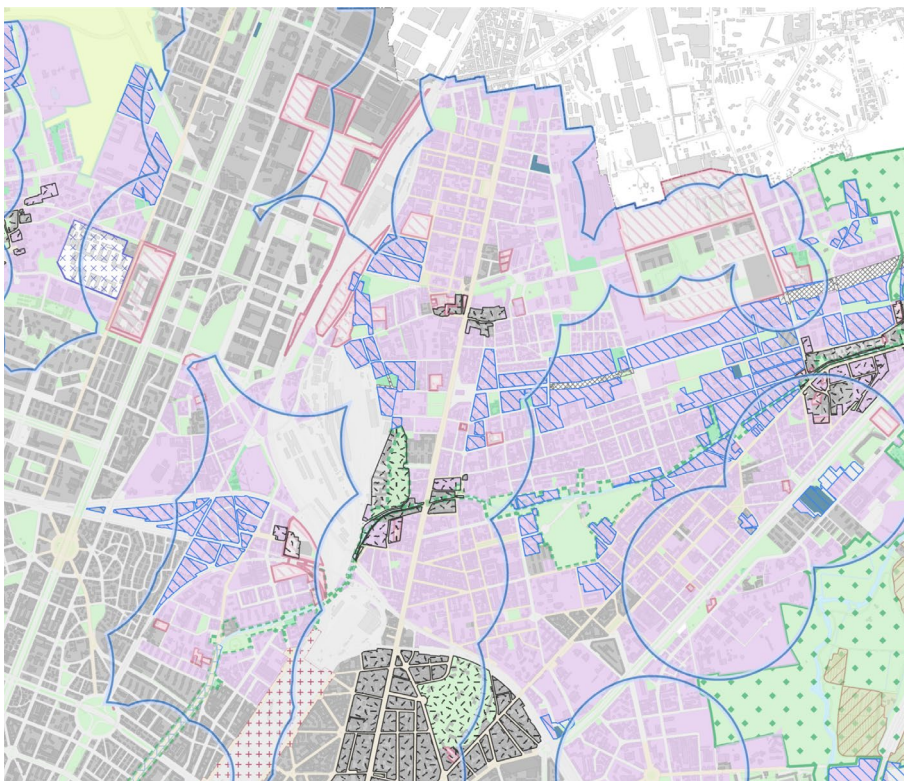
Among the most important documents for the thesis work are the Urban Indications (R02) that reiterate the areas of urban renewal, but linked for example to those streets with a pedestrian vocation such as Viale Monza that passes tangent to Piazza Martesana. This element consequently gives the square a pedestrian vocation as a future node of slow mobility.

Next, we find the table of Morphological Indications (D03) for piazza Martesana and its context substantially indicates the alignments of the buildings and the relationship between open and built space concerning projects that envisage the construction of new buildings and volumes.

Lastly, the table of Administrative and Soil Defence Constraints (D05) indicates the main constraints in the area. Basically, in this area of the Gorla district, numerous water wells are of great importance for a city like Milan. Each of these wells, therefore, has an absolute protection area of 10 m from the well within which no new construction is possible.

A very important part of the plan of rules is the technical implementation regulations that with various articles and paragraphs regulate the plan and direct the projects for Milan.







## R02 Urban planning indications



PGT - PdR Comune di Milano

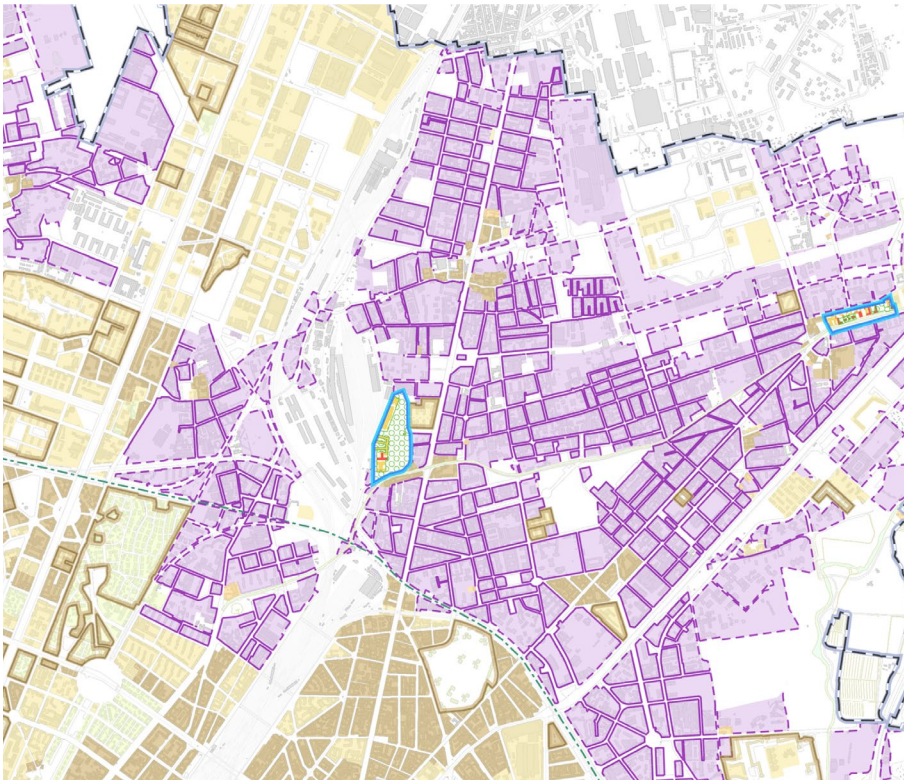


### LEGEND

-  Spaces with a pedestrian vocation
-  Areas of Urban Renewal
-  Areas of environmental regeneration
-  Approved and adopted ongoing measures - Scope not implemented
-  Existing urban green
-  New urban green area



### R03 Morphological indications



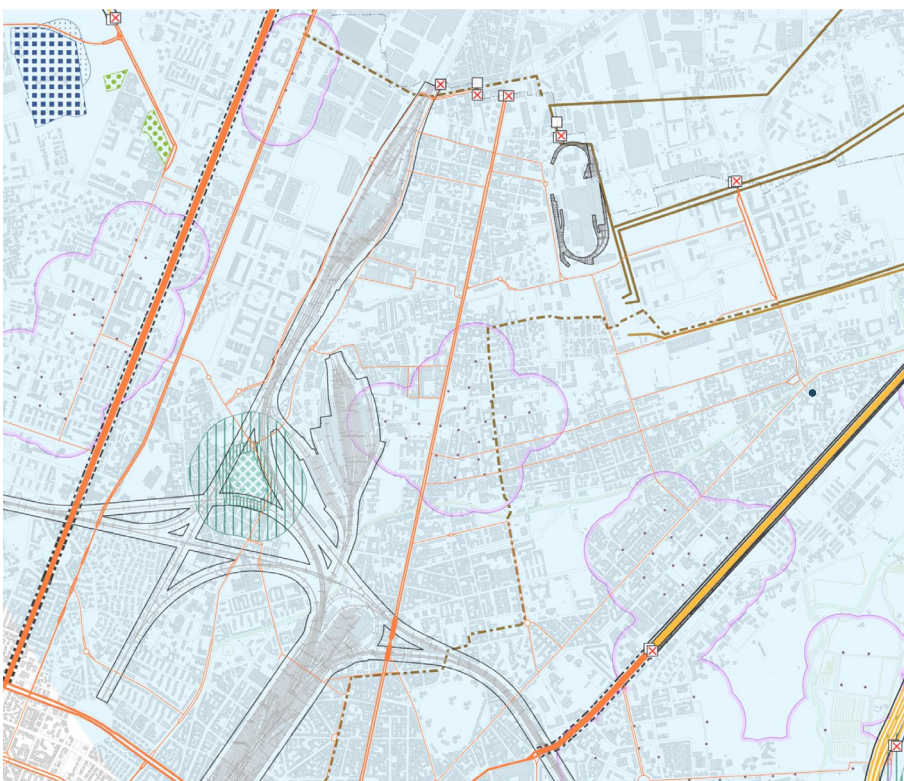
PGT - PdR Comune di Milano



#### LEGEND

- Urban renewal fabrics
- Alignment of at least 50% of the height line of the building on the boundary with the open space within the boundary envelope

### R05 Administrative constraints soil protection



PGT - PdR Comune di Milano



#### LEGEND

- Absolute protection area of 10 m
- E2 - Urban neighborhood streets
- Areas around astronomical observatories



# PdS

## PIANO DEI SERVIZI - SERVICES PLAN

The Services Plan, as it implies, aims to describe and represent the local and urban services of the city. Together with the Plan of Rules and Services, they dialogue concerning areas that are being developed, completed or for which a regeneration project will be carried out.

As in the table of public services and services of public or general interest (S01) we find represented the existing services with different colours and areas that are regulated by the Rules Plan with a project in the process of implementation or approval. The most relevant one near the Martesane area is the regeneration of the Greco Breda railway yard.

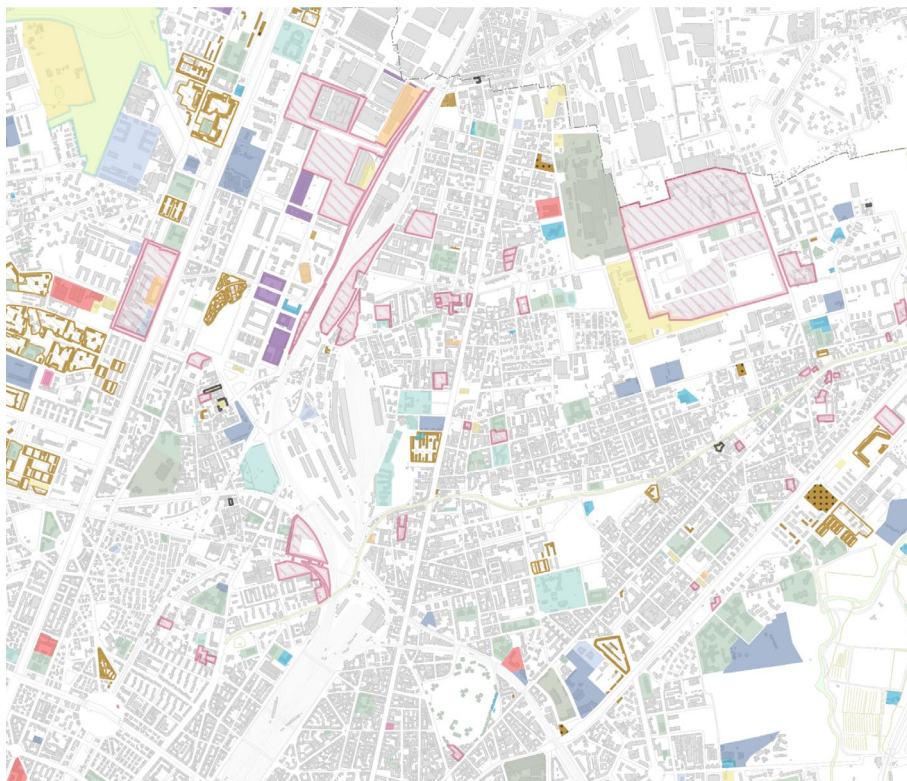
Next, the urban green and mobility infrastructure system table (S02) represents the local public transport (LPT) services such as the M1 metro line and its stations, the tram line the roads to

be regenerated and the existing and planned cycle paths. It should be noted that along Viale Monza there is already a cycle lane alongside the pavement, which could be better related to Piazza Martesana.

Finally, we find the tables of green and blue infrastructures and the municipal ecological network (S03) where the basic ecological services for the city are illustrated. Where the ecological network passing through Piazza Martesana is mentioned, but also the blue network of the Martesana canal. In addition, the latter is considered an area in need of partial depaving and forestation.

Also in this section of the plan, there are technical regulations specifying use designations, change of use, urban functions and the various subdivisions.


## S01 Public Services and Services of Public or General Interest




PGT - PdS Comune di Milano



### LEGEND

 Approved and adopted ongoing measures - Scope not implemented

EXISTING PUBLIC AND PUBLIC OR GENERAL INTEREST SERVICES

 Technological and environmental infrastructures

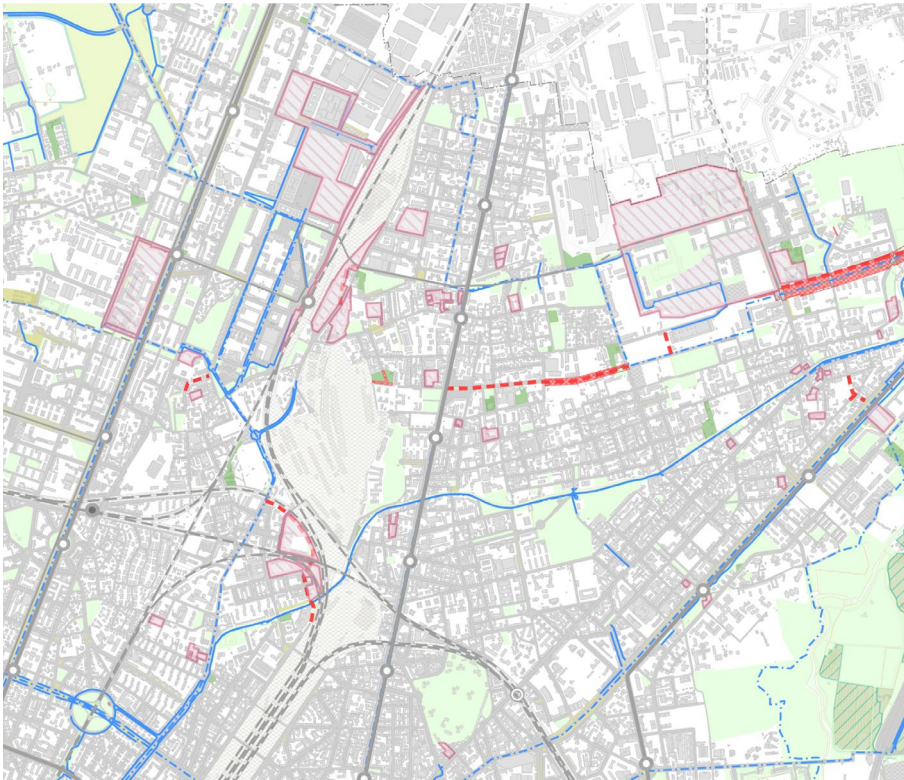
 Sport

 Health

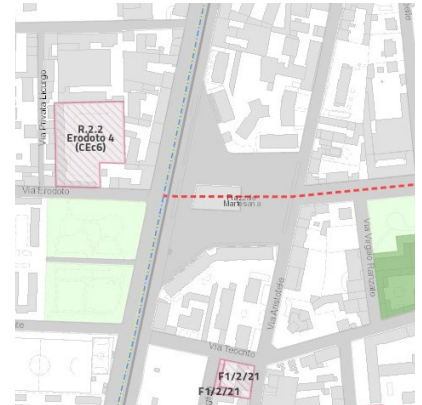
 Instruction



## S02 The urban green system and mobility infrastructure



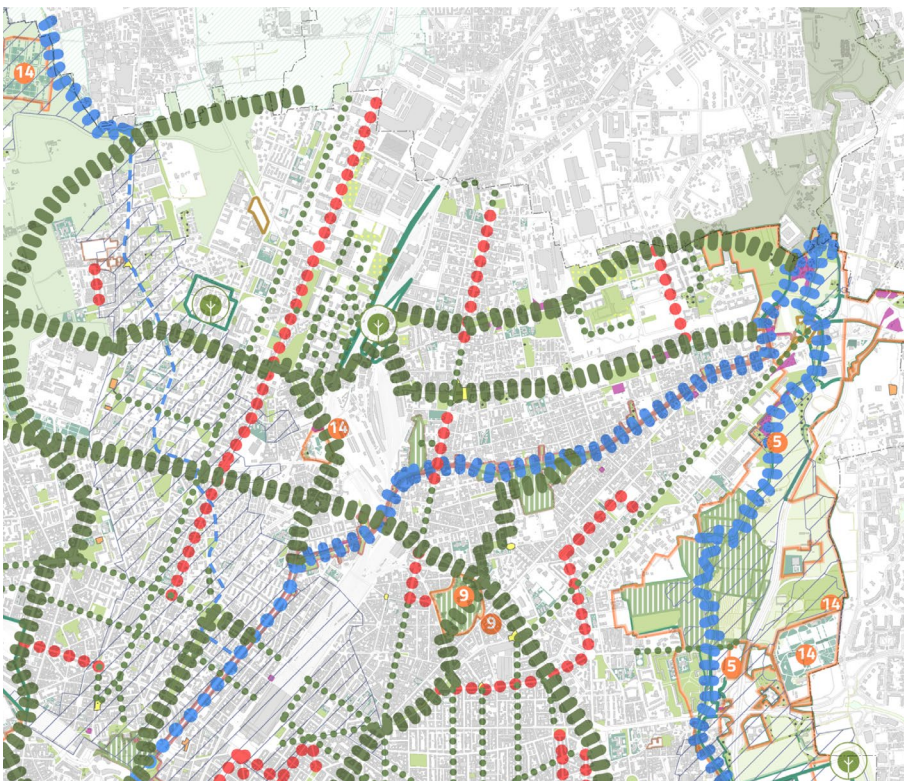
PGT - PdS Comune di Milano



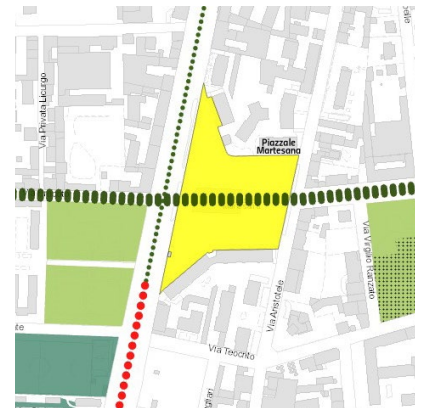
### LEGEND

- Carrier network of cycle routes
- Road infrastructure in anticipation
- Existing road infrastructures
- Approved and adopted ongoing measures - Scope not implemented
- Existing urban green
- New urban green area

## S03 Infrastrutture verdi e blu e rete ecologica comunale



PGT - PdS Comune di Milano



### LEGEND

- Existing linear green connections
- Green infrastructures (including green rays)
- Linear green connections to be made
- Square to be partially de-paved and planted
- Existing urban green
- Green inside the services



# Hydrogeological Components

After the three main components of the G.P.T. illustrated on the previous pages, it is also necessary to refer to the tables referring to the geological and hydrogeological components. The area concerned is totally paved and at risk of flooding in the event of heavy and intense rainfall.

Table G04 shows the map of constraints, which for the Martesana square are hydrological, i.e. the limit of 10 metres from water wells and a 200-metre portion area from them. It is interesting to note that there are no particular constrained or at-risk areas for the Martesana Canal, unlike the Seveso River further west. In fact, it has areas that are subject to flooding and overflowing of the river.

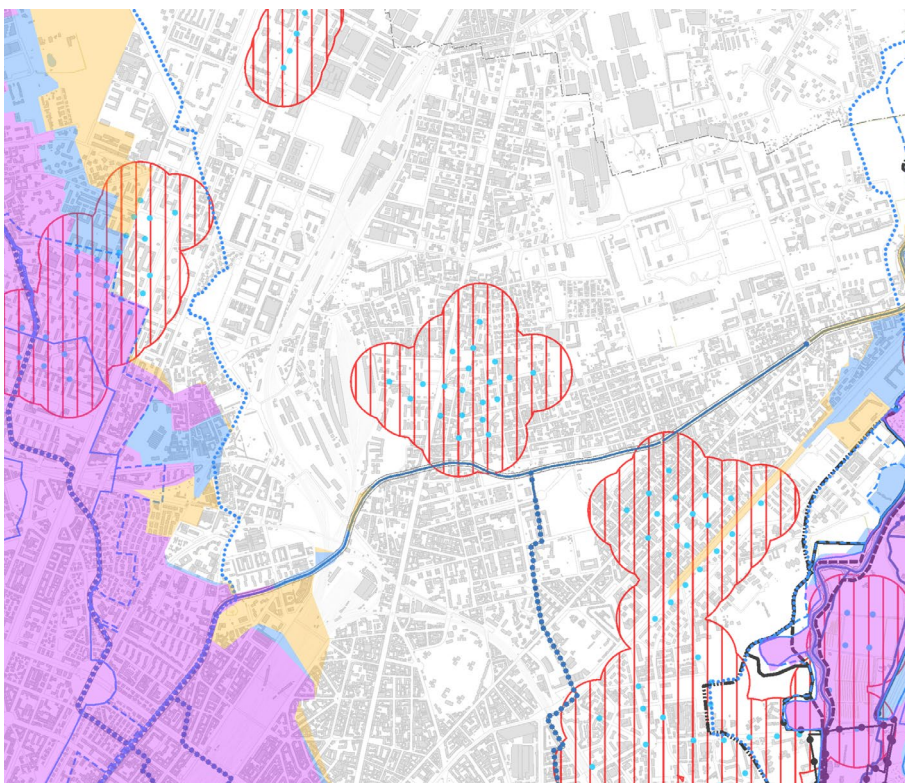
This is also confirmed in table G13 on hydraulic risk, which confirms that there are no particular risk problems.

Nonetheless, it is worth considering the fact that heavy rainfall has become increasingly frequent and sudden in recent years. This must be a warning for any particularly paved and urbanised area of the city, including Piazza Martesana.

For the precautionary principle, the project will in any case adopt forms of depaving, permeable green areas, and natural and draining paving. In order to prevent Piazza Martesana and especially Viale Monza from becoming a hydraulic risk zone, certain problems must be prevented while there is still time.

In fact, the square can play an important role in mitigating this risk by draining and channelling water before it reaches the Martesana canal or the areas further south where rivers usually overflow (Seveso river-Niguarda district).

## G04 Map of Constraints



PGT - Geological, hydrogeological and seismic components - Comune di Milano

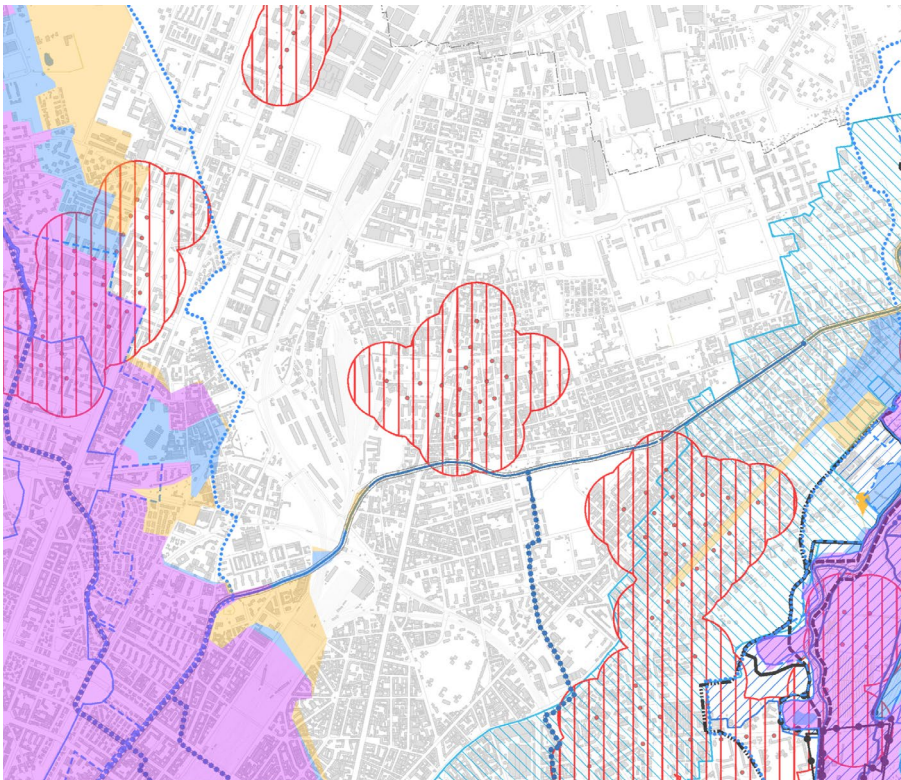


### LEGEND

- Absolute protection zone of 10 m
- Area of protection - 200 m or chronological criterion



## G13 Hydraulic Risk Map



PGT - Geological, hydrogeological and seismic components - Comune di Milano



### LEGEND

- Absolute protection zone of 10 m
- Area of protection - 200 m or chronological criterion

## FINAL PGT CONSIDERATIONS

The P.G.T. gives a vision of the city plan, in this case, up to 2030, and shows us how it intends to achieve a series of objectives with precise laws, urban planning indications and cartographic representations.

Piazza Martesana is located in a neighbourhood undergoing transformation, which will have to undergo regeneration, but which retains strong potential.

Above all the theme of green connections: the square has the opportunity to change its face from an extended open-air car park to a green hub for the neighbourhood, offering services, and adapting to extreme climatic conditions. A square that focuses on the pedestrian and not on cars, on green elements and meeting spaces and not on an anonymous surface.

From the point of view of services, when talking about mobility, it is clear that the square must

be rethought for other purposes, for other users who move in a sustainable and highly accessible way. Leave room for slow mobility by bicycle, by remaking the bicycle lane on Viale Monza, and by trying to interconnect this slow line with that of the metro, not only connecting the Gorla and Precotto stations with the square, but also favouring intermodality through the provision of facilities for parking bicycles, or bike sharing.

The services for this area will also be commercial, neighbourhood services, and above all social housing at subsidised prices, as already illustrated in the Reinventing cities call for proposals.

It will also be necessary to give an identity to the square, giving it a positive reputation, where a wide range of users can find it comfortable and convenient to stay, a place designed both for activities for young people and for the elderly who populate the quarter in large numbers.

# NIL 16: Gorla - Precotto

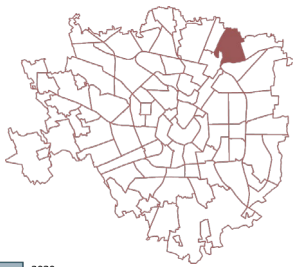
The municipality of Milan is divided into 88 districts and each of them has its own name and its own identity to be rediscovered or strengthened. The Nuclei di Identità Locale (Nucleus of Local Identity) are therefore a subdivision of Milan by neighbourhoods with different characteristics that are illustrated in the special reference sheets.

## Socio-demographic data

The initial section gives a concise representation of the structure of the resident population through the articulation of descriptive indicators of the local reality, at the state of affairs and forecast, where possible, in order to perspective the expected demographic evolution. The main indicators of the demographic structure concern the population structure by age classes, prevailing social groups

The NIL fact sheets represent a veritable territorial atlas, a tool for verification and consultation for planning services, but above all for knowledge of the neighbourhoods that make up the different local realities, highlighting unique and different characteristics for each nucleus.

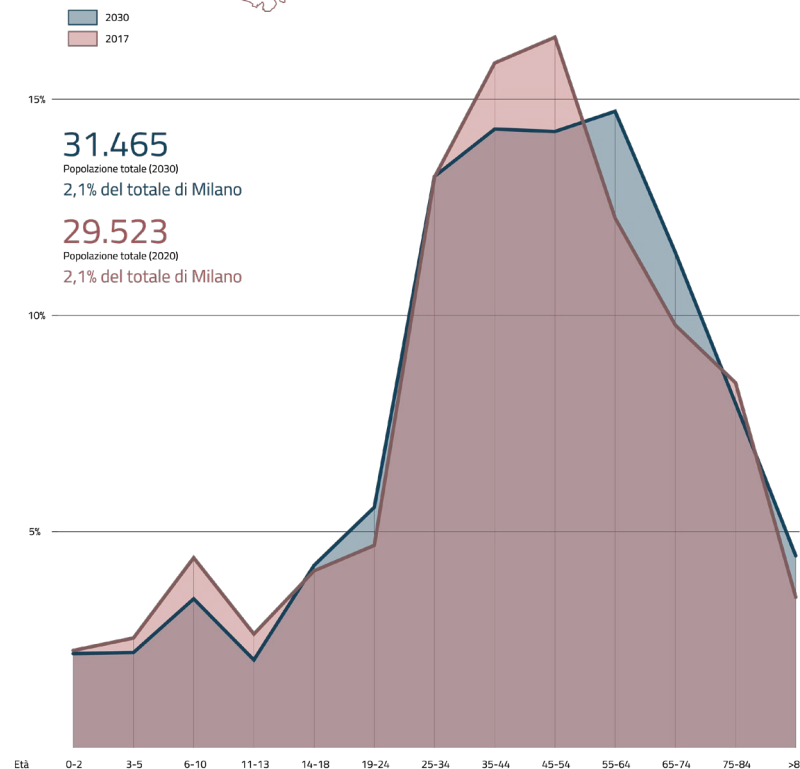
and growth trends. Significantly, the number of residents is growing, but the youngest age group (0-18) is clearly decreasing in contrast to the oldest age group that is growing (elderly over 65). 93% of the surface area is urbanised, a significant figure indeed, very high. In contrast, the green function of the land is only 13% .



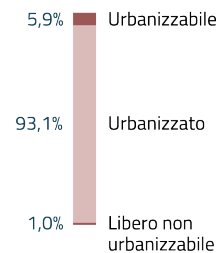
**9.841** ab/km<sup>2</sup>  
Densità abitativa

**15.957**  
Famiglie

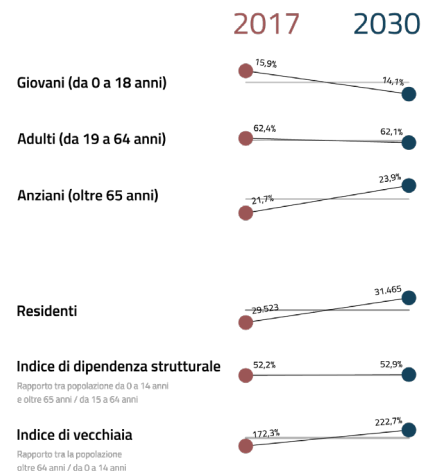
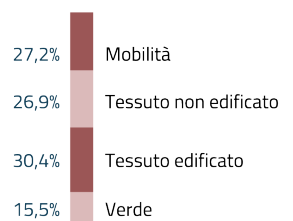
**23,4%**  
Popolazione straniera



### Componenti del suolo



### Uso prevalente del suolo nel TUC



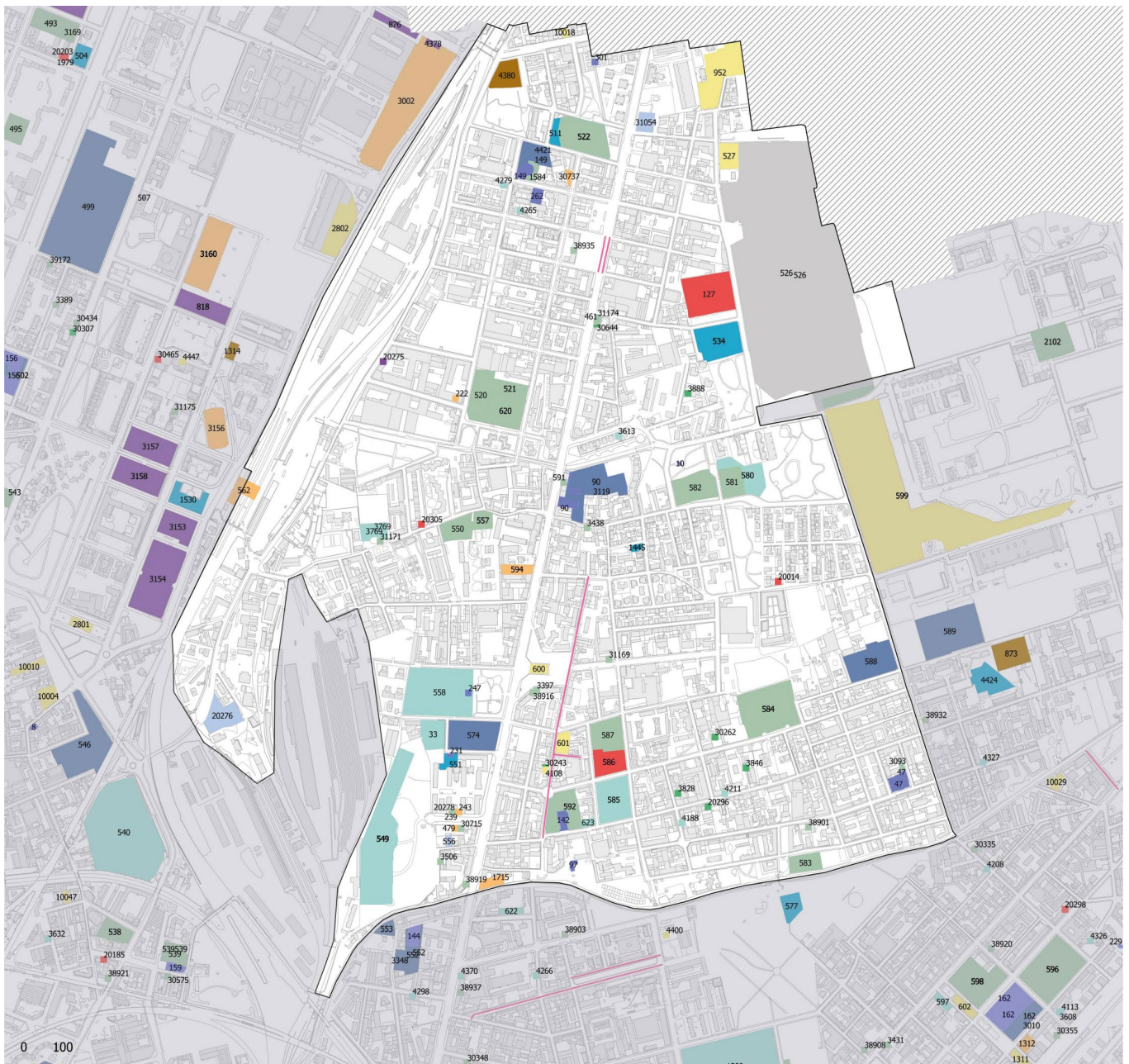
PGT - NIL 16: Gorla-Precotto



## Provision of existing services

The offer of services is represented in the second section and in the case of Gorla-Precotto we find some health-related services such as hospital services; green areas, but not very well connected and small to medium-sized; services related to sport.

Personal services such as social housing rather than cultural services are very scarce. Of relevance is the neighbourhood market along Via Aristotele that passes tangent to Piazza Martesana.



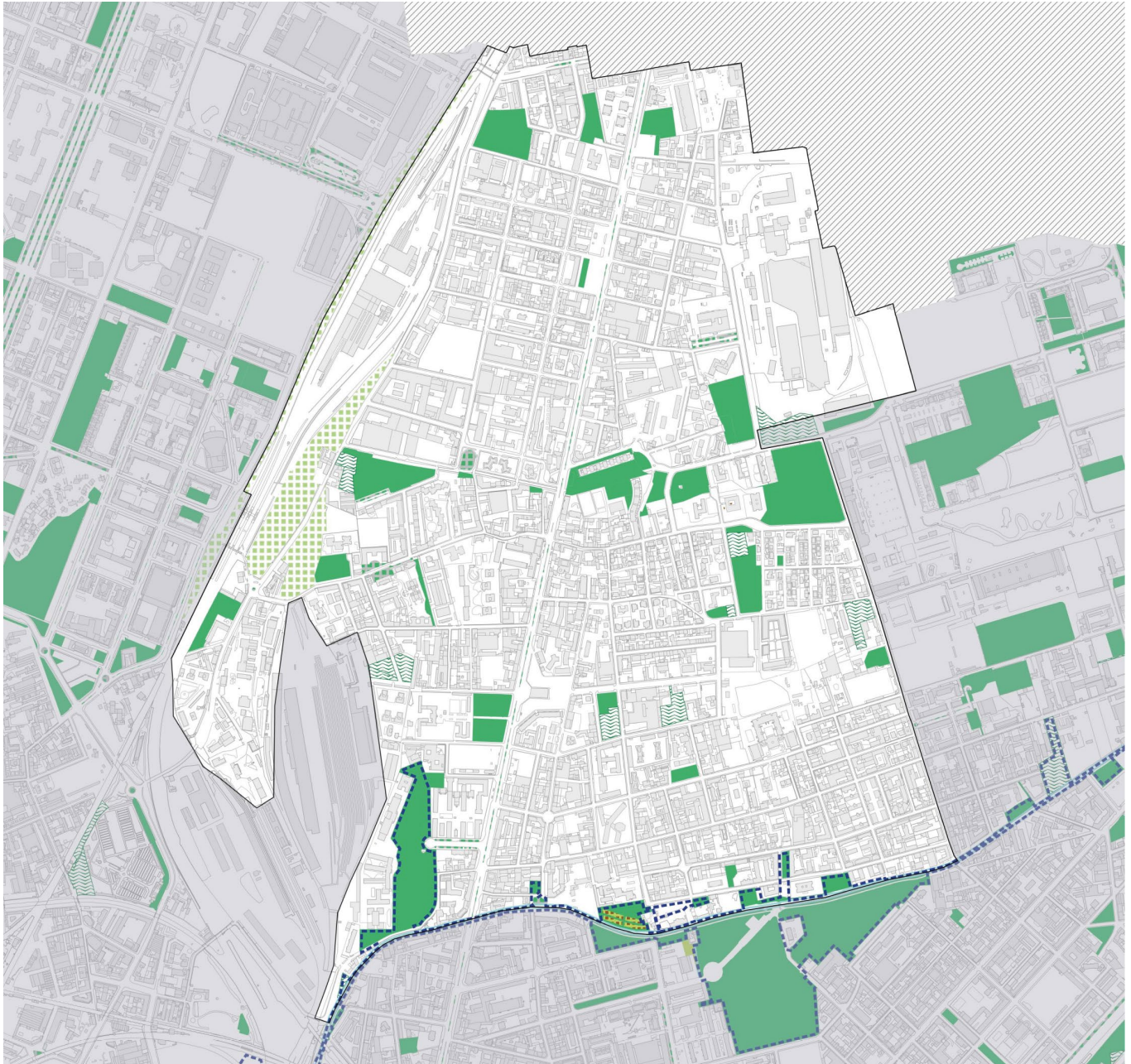
PGT - NIL 16: Gorla-Precotto



## Green and water system

In the next section, the green and water system is depicted. Of particular interest in the neighbourhood are the Villa Finzi Park to the south, the Martesana Canal that borders the neighbourhood, the Francesco Di Cataldo Park and the future green areas of the Greco Breda yard. Finally, a series of punctual insertions of new green areas scattered around the neighbourhood are planned.

-  Street market
-  PLIS Martesana proposal
-  Urban gardens
-  New Urban Parks
-  Housing services
-  New Forecast Green
-  Existing Urban Green









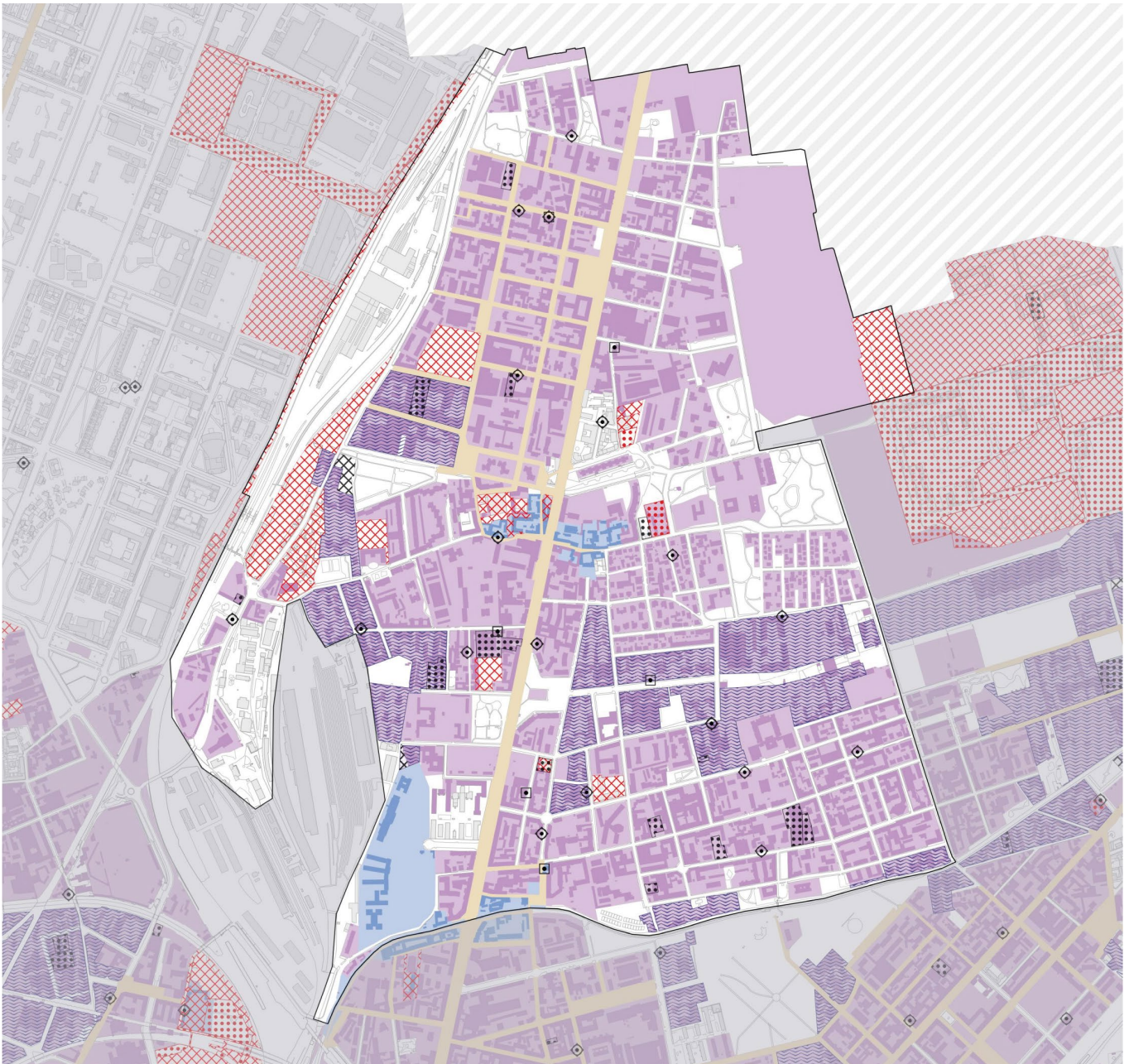
PGT - NIL 16: Gorla-Precotto



## Regeneration and transformation

In this section, the propensity for change is made explicit through the identification of ongoing transformations in urban planning and construction. For Piazza Martesana we know that the building dedicated to the technological infrastructure of the metropolitan network is present, which falls within the urban renewal areas; and that Viale Monza is about to be a street with a strong pedestrian vocation.

-  Transitional Rule not implemented
-  Transitional Rule implemented
-  Environmental Regeneration
-  Areas of urban renewal
-  Pedestrian Spaces
-  External Historical Nuclei



PGT - NIL 16: Gorla-Precotto



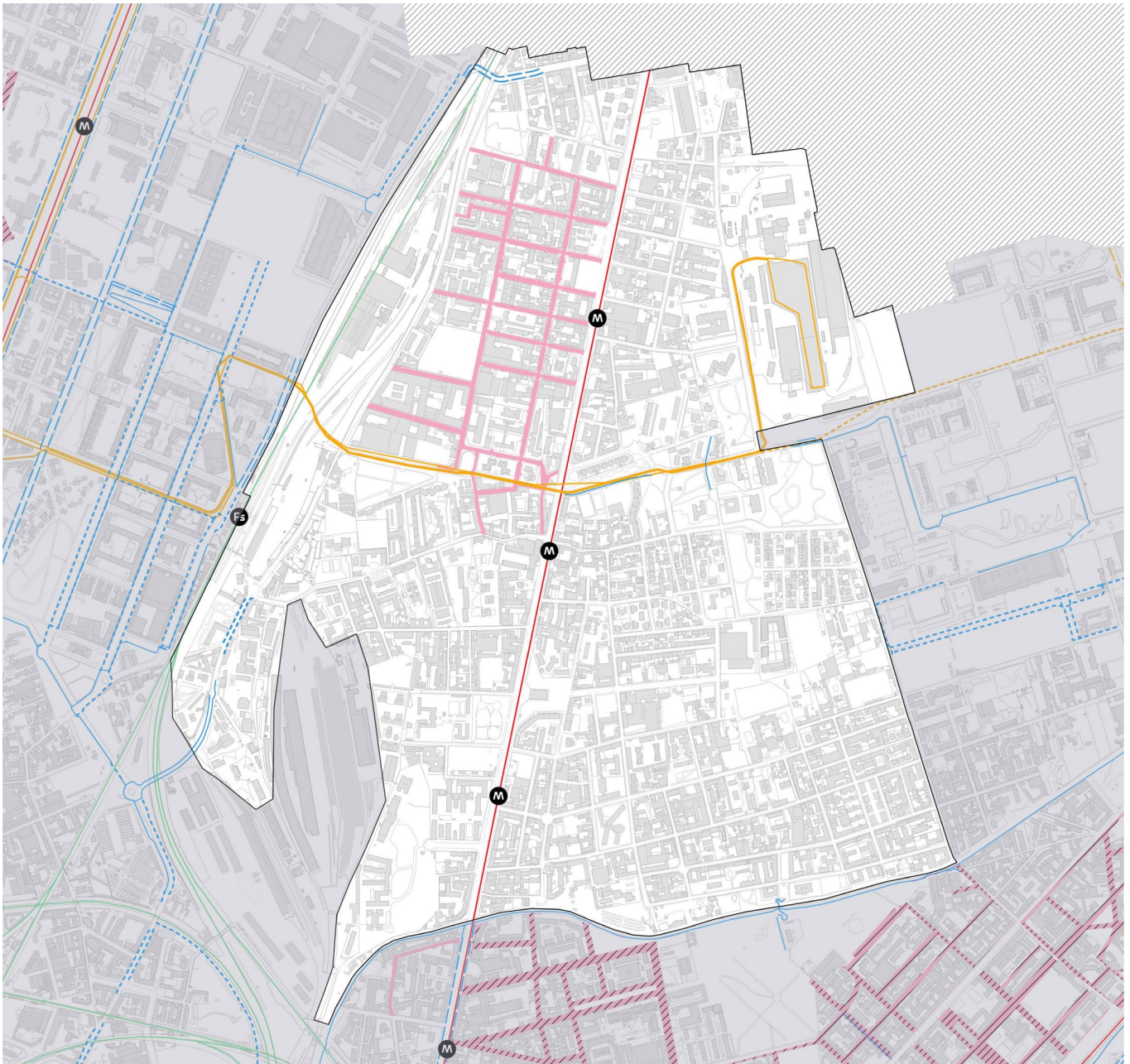




## Mobility and accessibility

In this last section are shown the infrastructure networks, identifies areas defined as high accessibility and pedestrian areas. In the district, the M1 metro line is highlighted (which will also be extended to Monza in the coming years) the tram line that runs horizontally through the district from the Bicocca district to Adriano. And finally, the presence of roads with a speed limit of 30 km/h in the Precotto district is recalled. The latter may also be an idea to bring to the Piazza Martesana area.

- Tram network
- Bicycle and pedestrian network
- Metropolitan network
- Zone 30



PGT - NIL 16: Gorla-Precotto

# PAC

## What is the Air and Climate Plan?


On 4 October 2019, the Municipal Council (with Resolution no. 1653) approved the guidelines for the start of the procedure for the elaboration of the Air and Climate Plan: a tool to protect health and the environment, aimed at reducing air pollution and responding to the climate emergency.


The Plan is aimed at reducing air pollution and contributing to the prevention of climate change through mitigation and adaptation policies for the territory of the Municipality of Milan, respecting the principles of the right to health, equity and justice and considering the priority criteria of social inclusion and the protection of the weaker sections


of the population. Addressing the transition to a 'zero-emission' city in an integrated manner, also from the point of view of environmental and social justice The Plan aims to transform air quality and climate actions into a systemic investment that guarantees a sustainable and flourishing urban society and economy


The Plan is a transversal and strategically oriented device for the planning and programming tools already envisaged by the Administration. It is oriented towards common objectives of reducing greenhouse gas emissions, improving air quality, adaptation to climate change and social equity and health protection.


## FIVE TOPICS

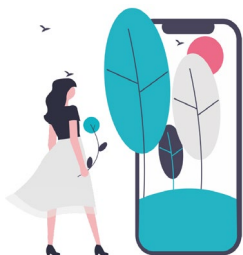
 **1. HEALTHY AND INCLUSIVE MILAN:** a clean, fair, open and cohesive city

 **4. MILAN COOLER:** a greener, cooler and more liveable city that adapts to climate change

 **2. MILAN CONNECDED AND HIGHLY ACCESSIBLE:** a city that moves sustainably, flexible, active and safe

 **5. MILAN AWARE:** a city adopting conscious lifestyles

 **3. POSITIVE ENERGY MILAN:** a city that consumes less and better



PAC illustrations





## 22 OBJECTIVES



**1.1** - Reduction of environmental impacts in city time management;

**1.2** - Advanced decision support and effectiveness evaluation system for interventions;

**1.3** - Actions aimed at protecting sensitive areas, residents and city users from exposure to air pollution;

**1.4** - Actions aimed at the containment of the phenomenon of dust rising;

**1.5** - Limitation of high polluting emission activities other than vehicular traffic;

**1.6** - Air Fund;

**1.7** - Circular Economy;

**1.8** - Sustainable Urban Design;

**1.9** - Risk Communication and Resilient Emergency Management



**3.1** - Carbon Neutral territorial transformations;

**3.2** - Decarbonisation of 50% of municipal building consumption;

**3.3** - Redevelopment of private building stock;

**3.4** - New thermal energy production;

**3.5** - Covering electricity consumption with renewable sources for 45% of domestic uses and 10% for tertiary and industrial uses, post-efficiency



**4.1** - Implementation and monitoring of the climate change adaptation process;

**4.2** - Urban cooling and reduction of the 'heat island' phenomenon;

**4.3** - Milan 'Sponge City'



**2.1** - Net reduction of motorised personal mobility for private use;

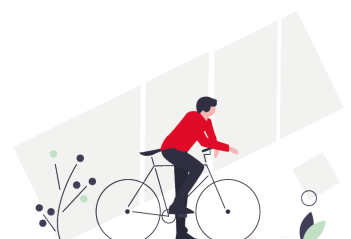
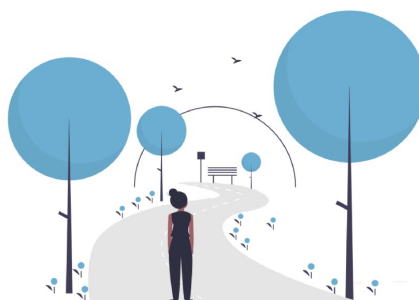
**2.2** - Establishing a 'Zero Emission Zone'



**5.1** - Aware and resilient citizens;

**5.2** - Aware and Responsible Enterprises;

**5.3** - Aware and Innovative Milan



PAC illustrations

# PUMS

## SUSTAINABLE MOBILITY URBAN PLAN

Il Piano Urbano della Mobilità Sostenibile di Milano è un piano strategico per soddisfare i bisogni di mobilità della popolazione, assicurare l'abbattimento dei livelli di inquinamento atmosferico e acustico, la riduzione dei consumi energetici.

Ha lo scopo di aumentare dei livelli di sicurezza del trasporto e della circolazione stradale, la minimizzazione dell'uso individuale dell'auto privata e la moderazione del traffico, l'incremento della capacità di trasporto, l'aumento della percentuale di cittadini trasportati dai sistemi collettivi e la riduzione dei fenomeni di congestione nelle aree urbane.

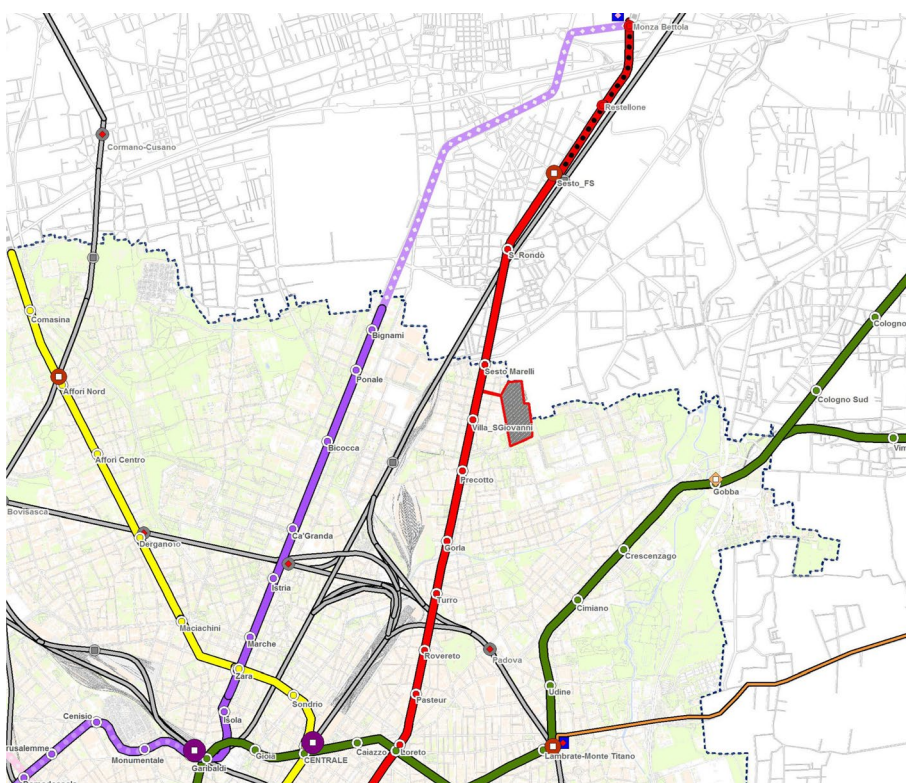
In particolar modo è interessante osservare come oltre al PGT che si occupa in parte di mobilità, sia stato istituito un'ulteriore strumento specifico per questo tema. Infatti è una misura che è entrata

in vigore da pochi anni a livello nazionale. E fino ad ora è sempre stato un piano facoltativo da realizzare, invece dal 2023 sarà obbligatoria la loro redazione da parte delle amministrazioni comunali.

Di seguito sono riportati alcuni elaborati sul Pums di Milano, che introducono i temi più rilevanti della mobilità sostenibile. Ad esempio la creazione di Zone 30 in specifici quartieri di Milano per ridurre l'inquinamento acustico, diminuire il traffico in zone residenziali, ridurre la velocità di percorrenza delle strade 30 per garantire maggiore comfort ai pedoni che la percorrono.

In seguito ci sono le nuove reti ciclabili e la loro ramificazione sempre maggiore nella città e l'ampliamento del trasporto pubblico locale come l'estensione di linee del tram e della Metropolitana (M1).

## Local Public Transport



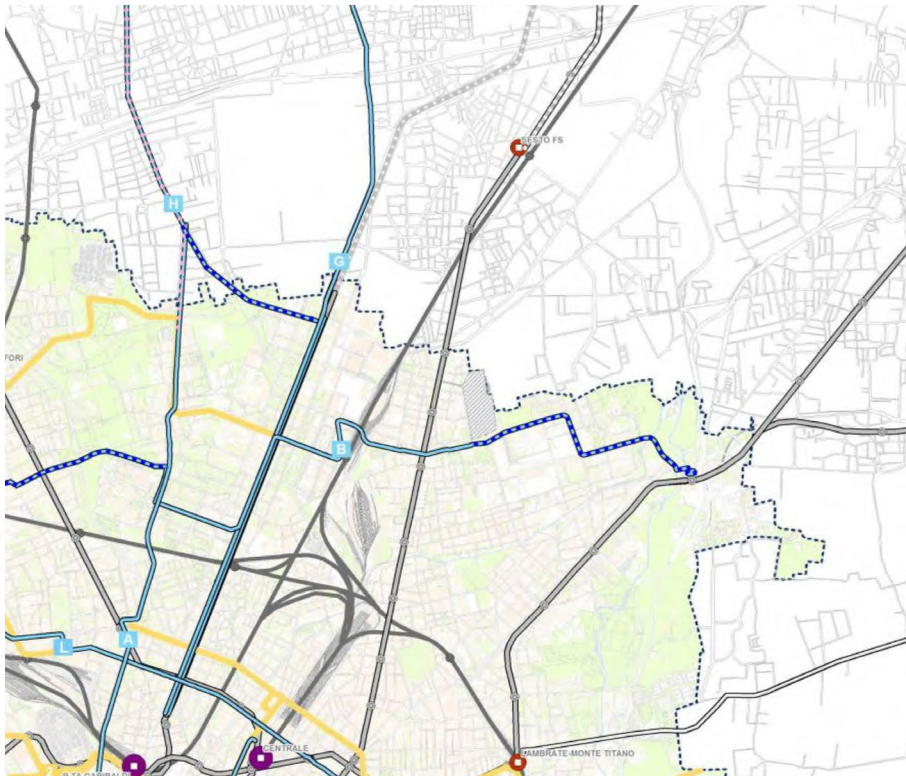
The public transport map presents the main metro networks in Milan. Of particular importance for Piazza Martesana is the M1 line and the stops between it, namely Gorla and Precotto. These give a strong accessibility and urban significance to the site in question.

- M1
- - - M1 Extension
- M2
- M3
- M5
- - - M5 extension
- Rail lines

Comune di Milano - PUMS



## Local Public Transport - 02

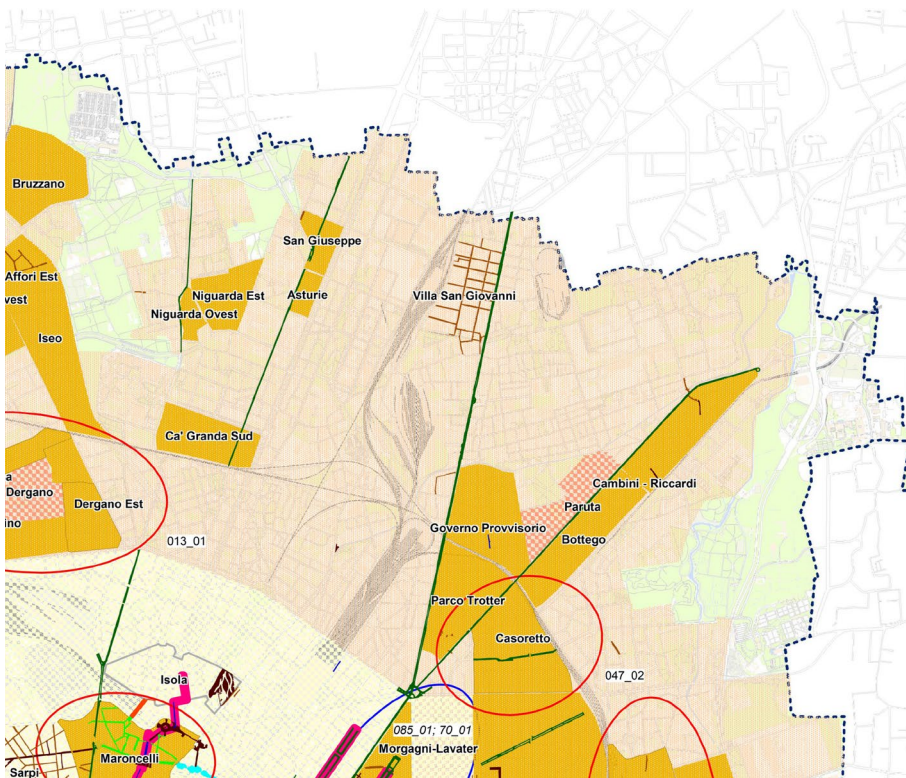


Comune di Milano - PUMS

The PUMS also envisages public transport, the tram and its extensions and branches intersecting metro lines at relevant urban nodes.

- T Lines
- - - Tram lines, extensions and regenerations
- Fast corridors
- Rail lines

## Traffic Moderation



Comune di Milano - PUMS

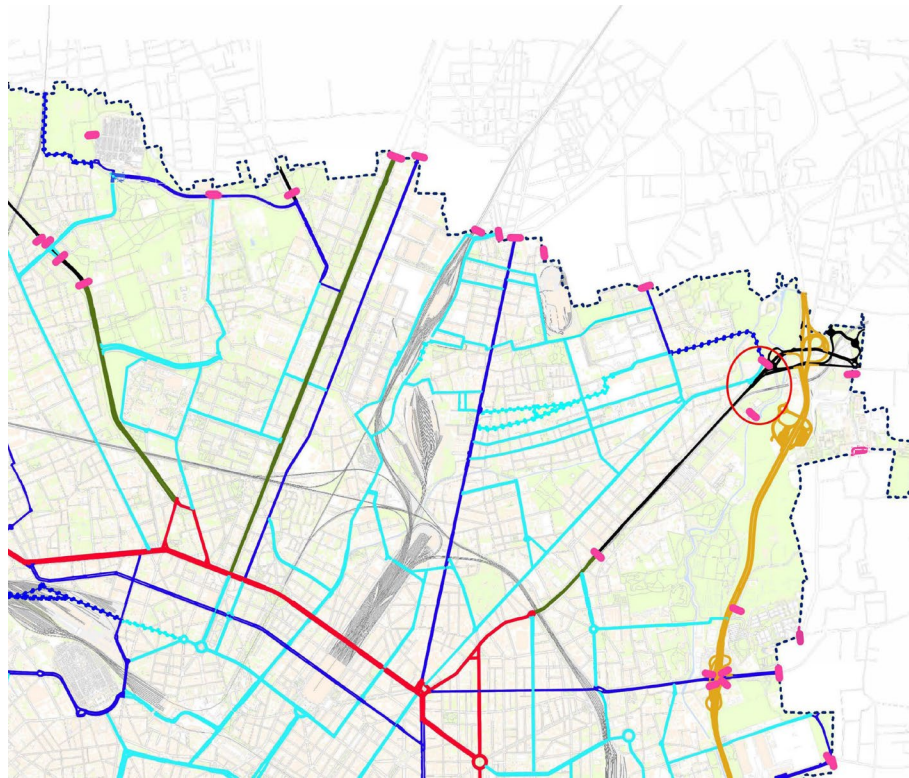
An urban sustainable mobility plan also means the restriction of those vehicles that are not sustainable such as cars running on energy from non-renewable sources. In the traffic moderation table, the thirty and future thirty zones are highlighted. That is, entire urban sectors where the speed for motor vehicles is limited to 30 km/h.

- Zone 30
- Redevelopment of axes and nodes
- City 30\*
- - - Zone 30 in implementation
- Zone 30 under project

\*City 30: area within which widespread adoption of the 30 km/h speed limit is feasible. The limit can be extended to all roads that do not play a strategic role in the general organisation of public transport circulation.



### Street Network

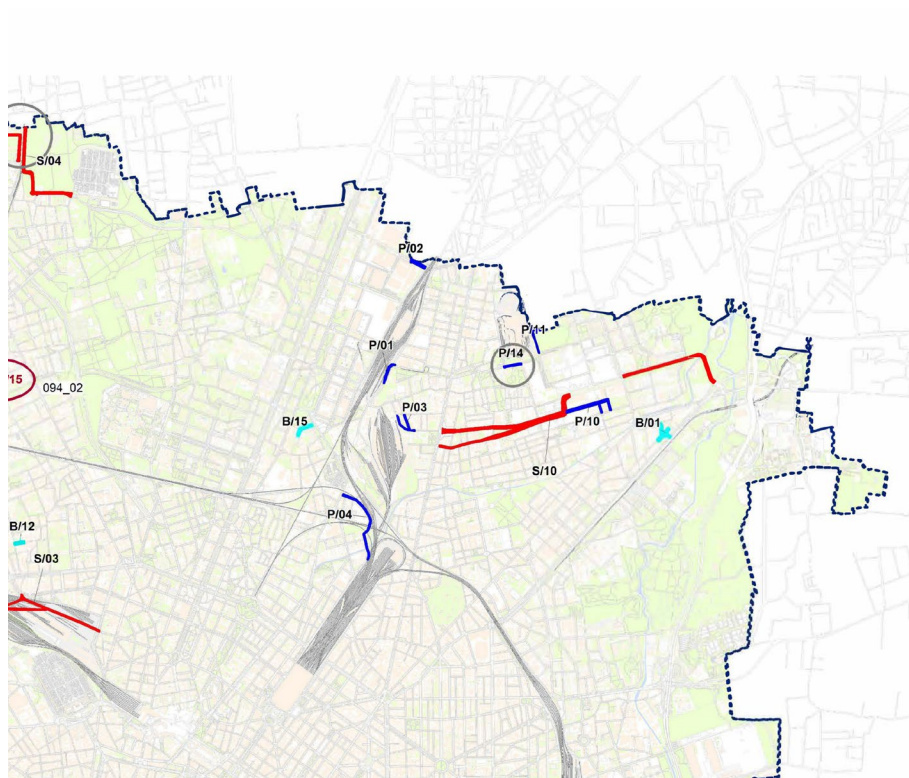


Comune di Milano - PUMS

This elaboration simply defines the city's road network in a hierarchical manner.

- Secondary network - local inter-zonal roads
- Secondary network - local inter-zonal roads under project
- Secondary network - neighbourhood streets
- Primary network - inter-neighbourhood roads
- Main network - Highways

### Street Network 02



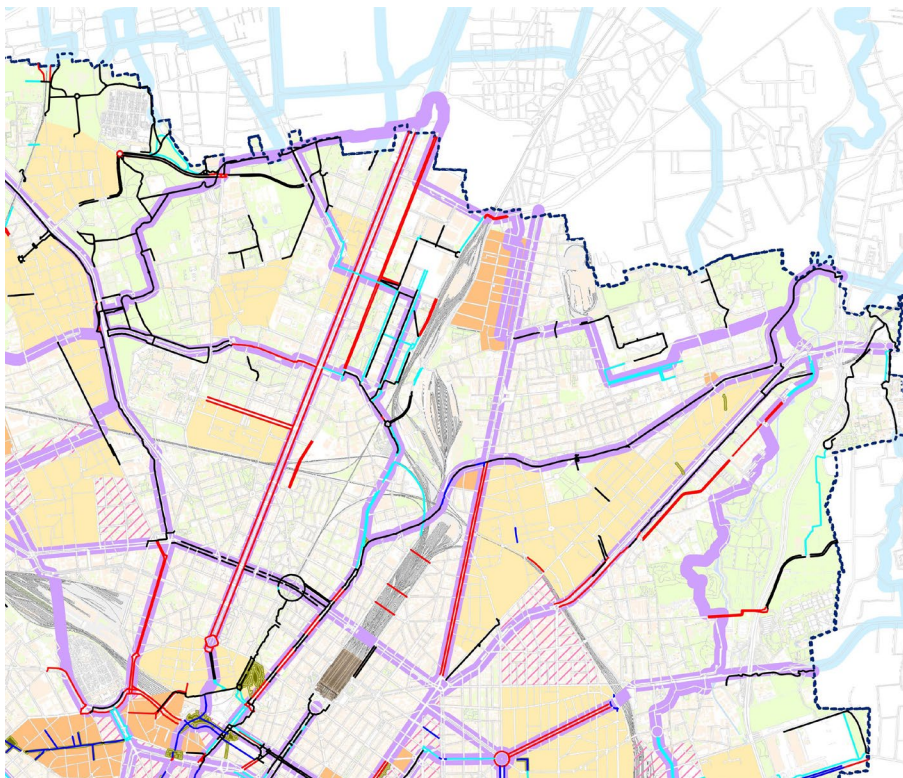
Comune di Milano - PUMS

The road networks are then classified according to the type of interventions that are being carried out or are to be carried out on the territory. For each intervention there is a precise description of the road change. in the case of Piazza Martesana we have along Via Ranzato and the square including it an intervention to reconnect the main urban road network.

- Strategic interventions for the reconnection of the main urban road network
- Project Roads in the Framework of Urban Interventions
- Project Network



## Cycling Mobility



Comune di Milano - PUMS

A very useful and interesting paper is the one concerning the bicycle network and its future expansion. Near Piazza Martesana, along Viale Monza, there is currently one cycle lane in each direction, which is classified as a priority cycle route network. And in general the Gorla Precotto district is classified as diffuse project areas with facilitation measures for cyclists.

- Project cycle network: reference scenario
- Project cycle network: plan scenario
- PUMS priority cycle route network
- Diffuse project areas with facilitation measures for cyclists
- Existing diffuse areas with facilitation measures for cyclists

## FINAL PUMS CONSIDERATIONS

By analysing some of the most interesting tables of the PUMS, one can understand the purpose of this instrument through the urban planning indications it provides.

It can be seen that there is integrated planning of slow mobility, city public transport, and road traffic. The tables with the most planning proposals are those concerning the planning of new slow lines. These illustrated in the "Cycling Mobility" table are designed both at the urban and macro scale and at the level of individual neighbourhoods.

In this table, it is very important to note that many of Milan's major road axes are considered within an integrated priority cycling network. This means that in the coming years there will be a gradual conversion of major thoroughfares from fully car-oriented to bike-oriented.

Especially along roads under which a metro line passes, the use of other means of local transport

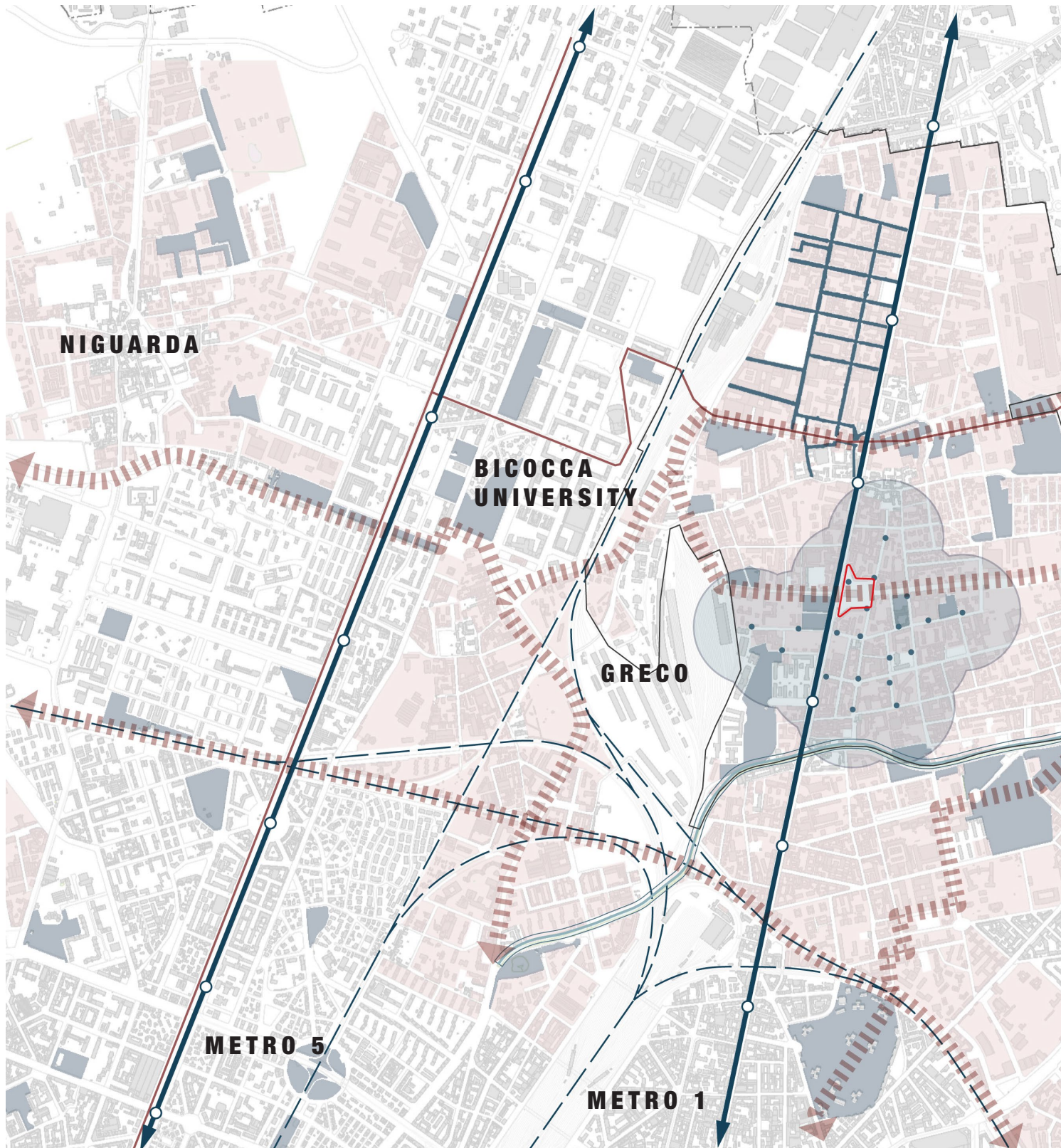
will be encouraged, but pedestrianisation, '30' zones and roads will also be favoured, and greater safety for pedestrians and bicycles will be improved.

This will also be the case for the areas bordering Piazzale Martesana and Viale Monza, which connects one of the most central and iconic areas of the city of Milan, Piazzale Loreto (the square will be regenerated over the next few years) with the outskirts of Sesto San Giovanni and the large integrated urban regeneration project of Milano Sesto.

Viale Monza will be one of the axes on which to focus most for the construction of new cycle paths, widespread pedestrianisation, reduction of mobility and congestion, and strengthening of interchangeability between the various means of public transport.



# SYNTHESIS MAP



Personal Elaboration





In the summary map, all those elements that are fundamental for understanding the area under analysis are grouped. This map shows the main themes of Milan's planning instruments that are related to Piazzale Martesana, especially what emerged from the TMP by the related NIL 16 that focuses on the district. It then shows the ecological network that crosses the area, and the metro and tram lines that intersect, creating urban interchange nodes. Then also the constraints and in particular that of the water wells since one of them is located right in the square. Finally, we can see at the scale of the neighbourhood that it is classified almost entirely as an urban renewal area.

## POTENTIALITIES

There are many potentials that emerge. First and foremost is the strong urban value of the square, which is well accessible from the metro and is located on Viale Monza, an artery connecting Milan and Monza. From an ecological point of view, it is the protagonist of one of the axes of the RER and also has the element of the Navilgio (a little further south).

## LEGEND

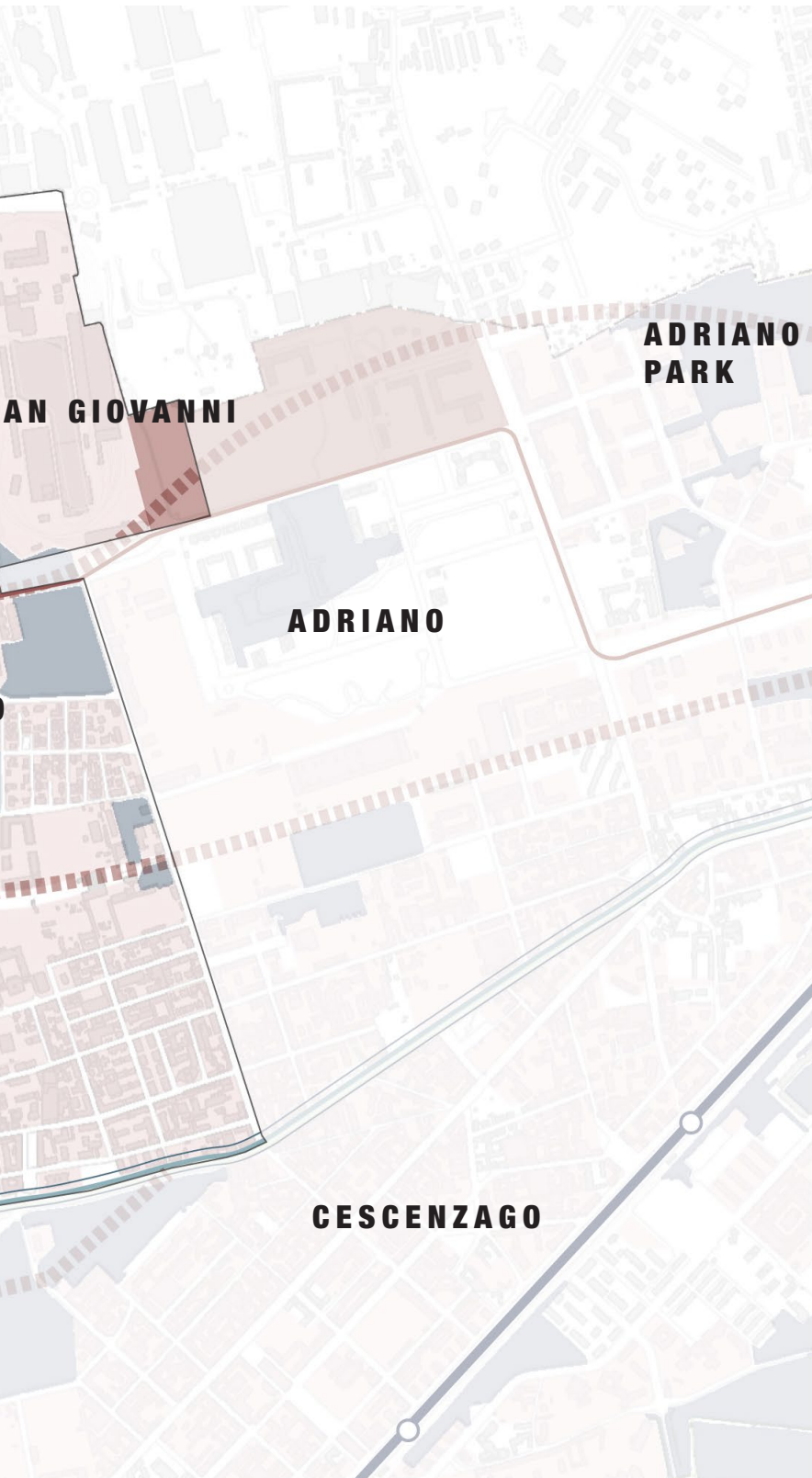
- *Aqueduct Wells*
- *Tram network*
- *Martesana canal and area of protection*
- - *Railway*
- *Metropolitan network*
- |||| *Regional Ecological Network*
- *Green Areas*
- *Areas of Urban Renewal*
- *Protection Areas*

# SYNTHESIS MAP - FOCUS



Personal Elaboration





## POTENTIALITIES

Many potentials emerge. First and foremost the strong urban value of the potential mentioned above emerges more in this map.

The connections of the ecological system unite the Piazzale Martesana with the regeneration areas of the Greco-Berda (west) port, which was a participant in the first edition of Reinventing Cities, i.e. the Innesto project. To the east, on the other hand, the ecological network connects with the Adriano district, the new parks and the existing one overlooking the river Lambro. It is worth noting that Piazzale Martesana is located between two stops of the M1 underground, Gorla and Precotto, which gives it a very important role and great potential for urban development. One must also take into consideration that the square is part of a local context in which it is immersed. The Gorla Precotto district has some services but lacks others, such as park areas, and cultural and sports spaces. This represents a stimulus for the design phase. And from the point of view of mobility, Piazzale Martesana is today a traffic junction that could represent a turning point concerning the moderate use of cars in the neighbourhood, establishing thirty or shared streets zones.

## LEGEND

- *Aqueduct Wells*
- *Tram network*
- *Martesana canal and area of protection*
- - *Railway*
- *Metropolitan network*
- |||| *Regional Ecological Network*
- *Green Areas*
- *Areas of Urban Renewal*
- *Protection Areas*
- *Zone 30*

# ***Research Context: Best Practices on Climate and Housing***

## | BEST PRACTICES

- / Cenni di Cambiamento
- / LOC - Piazzale Loreto
- / L'innesto
- / Villaggio Barona
- / Green Between Tessiture Urbane
- / Moneta
- / Welhome
- / Opifici Ventidue
- / Abita Giovani
- / CasaCrema
- / Aria - Ex Macello
- / Laboratorio - Sur / Tercer Sonido
- / 8 Tallet
- / Campus for Living Cities
- / Recipe for Future Living
- / Campo Urbano
- / Fabres Cordero
- / Energy Carousel
- / Ecopolis Plaza



This chapter aims to present some successful projects dealing with social housing and the topics of climate resilience, environmental sustainability and circularity.

Examples of the design of buildings and open spaces such as squares or parks, but also residential complexes or facilities for personal services are given. There are Italian and Milanese projects, but also others from abroad, and projects that have won previous editions of Reinventing Cities.

The ultimate aim is to understand which urban space design styles and rules are successful, effective and resilient for contemporary cities.

# BEST PRACTICES BEST

**For a design that links climate and housing issues, what are the references to follow? What references are necessary for the realisation of a project for new ways of living and the environment?**

The following are several innovative and effective projects in dealing with the issues of climate resilience and community living solutions. To achieve a design result that works, it is necessary to take examples from the most original projects of recent years.

There are an increasing number of best practices from which to take inspiration, both from the point of view of spatial design and the application

of policies aimed at activating certain specific dynamics of the territory in question.

There are charitably references to design choices made regarding the city and the specific territory in which one finds oneself, and therefore one must take inspiration from these projects but with detachment from the specific design choices.

Among the many examples are those from previous editions of Reinventing Cities, but also projects from social housing cooperatives and Ecosistema Urbano, which provide design cues very much related to the themes of the thesis, and with very interesting urban graphics and designs.









# CENNI DI CAMBIAMENTO



**Location:** Milan, Stadio - Ippodromi

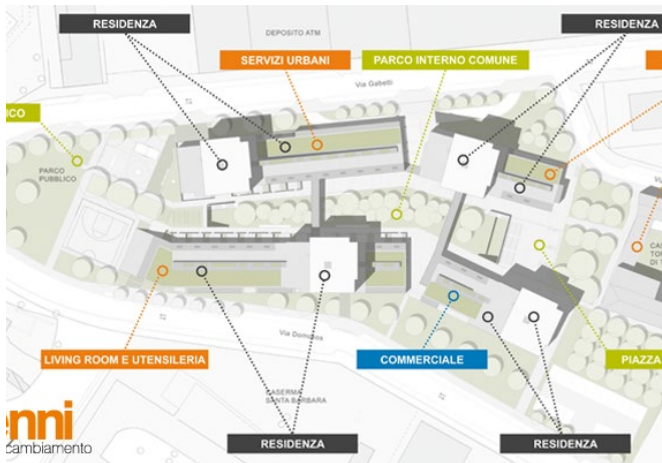
**Year:** 2013

**Client/Project Leader:** Redo sgr

**Designer/Architect:** Rossi Prodi

**Social and Technical advisor:** FHS

*Source: Fondazione Housing Sociale - Cenni di Cambiamento*









# LOC PIAZZALE LORETO



**Location:** Milan, Loreto - Casoretto - NoLo

**Year:** 2021

**Client/Project Leader:** Redo sgr

**Design Team:** Metrogramma Milano Srl, Andrea Caput, Mobility in chain Srl, LAND Italia Srl, Temporiuso Srl, Futureberry Srl, Squadrati Srls, Starching Srl, with Matteo Gatto and Renovatio Design

**Environmental Expert:** Arcadis Italia Srl

*Source: c40reventingcities.org*









# L'INNESTO



**Location:** Milan, Gorla - Precotto

**Year:** 2019

**Client/Project Leader:** Redo sgr

**Architect:** Barreca & LA Varra

**Environmental Expert:** ARUP Italia Srl

*Source: c40reventingcities.org*









# VILLAGGIO BARONA



**Location:** Milan, Barona

**Year:** from 2003

**Founders:** Fondazione Attilio e Teresa Cassoni, 'Associazione Sviluppo e Promozione – ASP, parrocchia dei S.S. Nazaro e Celso

**Developers:** Comune di Milano, Fondazione Cariplo, Banca Popolare di Milano

Source: *Villaggio Barona.it*



it su via privata Teresa e Attilio Cassoni



verso il giardino pubblico









# GREEN BETWEEN TESSITURE URBANE



Location: Milan, Crescenzago

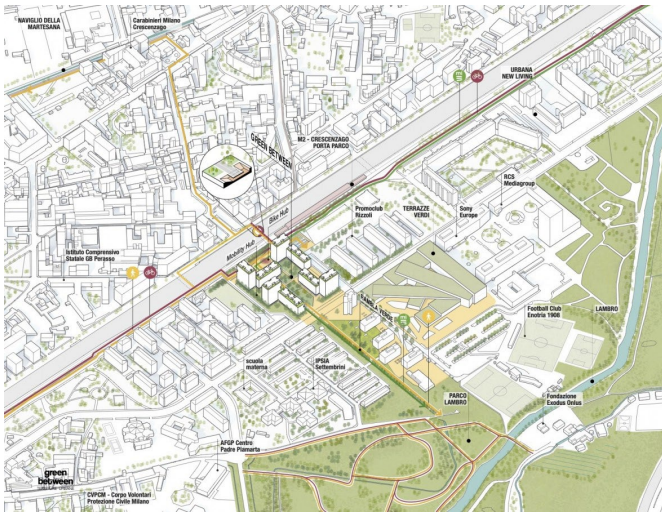
Year: 2021

Team Representative: Redo sgr Spa

Architect: ARW

Environmental Expert: Stantec S.p.A.

Source: [c40reinventingcities.org](http://c40reinventingcities.org)









# MONETA



**Location:** Milan, Affori

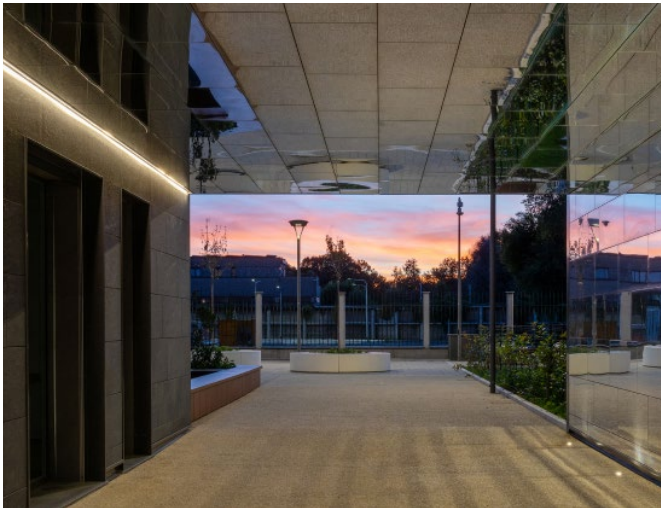
**Year:** 2020

**Project Leader:** Redo sgr Spa

**Technical and Social Advisor:** Fondazione Housing Sociale

**Designers:** Mpartner, Beretta Associati, MAB Architettura

*Source: Monetamilano.it*









# WELHOME



**Location:** Bergamo

**Year:** 2014

**Team Representative:** Redo sgr Spa

**Social Advisor:** Fondazione Casa Amica

*Source: Redosgr.it*







# OPIFICI VENTIDUE



**Location:** Cremona

**Year:** 2013

**Fund Management and Property:** Redo sgr Spa

**Designers:** Rsg S.r.l. – Progetto Architettonico Arching S.r.l., Ariatta Ingegneria dei Sistemi S.r.l., D&D S.r.l., Controllo Costi e Programma Lavori

**Partnership:** Comune di Cremona  
Regione Lombardia

*Source: Fondazione Housing Sociale.it*









# ABITA GIOVANI



**Location:** Milano

**Year:** 2013

**Fund Management and Property:** Redo sgr Spa

**Social and Technical Advisor:** Fondazione Housing Sociale

**Promoters:** Regione Lombardia, Aler Milano  
Fondazione Cariplo, Fondazione Housing Sociale

**Partnership:** Comune di Milano

*Source: Fondazione Housing Sociale.it*







*Collaborazione  
Azione*



*Lavoro*



*Cultura*



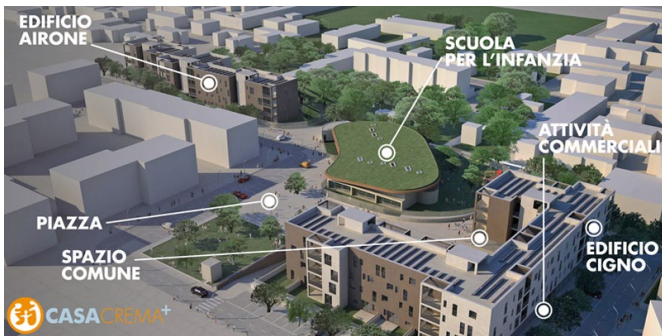
*Scambio*



*Sport e  
Tempo libero*



# CASACREMA



**Location:** Crema

**Year:** 2011

**Architects:** D2U\_Design To Users

**Fund Management and Property:** Redo sgr Spa

**Social and Technical Advisor:** Fondazione Housing Sociale

**Partnership:** Comune di Crema

*Source: Fondazione Housing Sociale.it*









# ARIA EX MACELLO



**Location:** Milano, Corsica neighbourhood

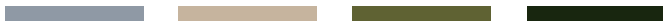
**Year:** 2011

**Team representative:** Redo Sgr Spa

**Architects:** Snøhetta Oslo AS, Barreca & La Varra, Cino Zucchi Architetti s.r.l., Stantec S.p.A., Chapman Taylor Architetti S.r.l.

**Environmental Expert:** Stantec S.p.A.

*Source: c40reinventingcities.org*









# LABORATORIO- SUR / TERCER SONIDO



**Location:** Madrid, Spain

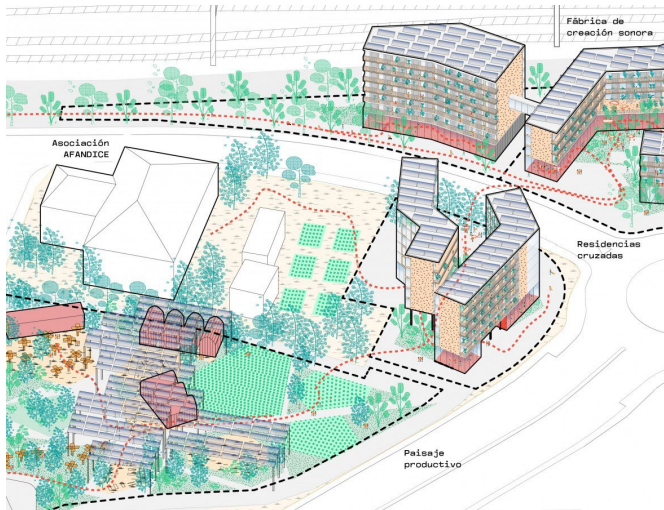
**Year:** 2021

**Team leader / Developers:** GSA - GLOBAL STUDENT ACCOMODATION

**Architects:** SENSUAL CITY STUDIO /  
LABORATORIO DE CUIDADOS URBANOS/  
BARDAJÍ ASOCIADOS/ ESTUDIO PERIFERIA

**Environmental Expert:** ZERO-CONSULTING,  
ECCOO

*Source: c40reinventingcities.org*









# 8 TALLET



**Location:** Copenhagen, Denmark

**Year:** 2010

**Client:** St. Frederikslund Holding

**Project Leader:** Ole Elkjaer-Larsen, Henrick Poulsen  
**Project Manager:** Finn Norkjaer, Henrik Lund

**Architects:** BIG –Bjarke Ingels Group

*Source: archdaily.com*









# CAMPUS FOR LIVING CITIES



Location: Madrid, Spain

Year: 2019

Team representative: UNEXUM

Architects / Environmental Experts:  
AMBITARE ARCHITECTURAL STRATEGIES

Source: [c40reinventingcities.org](http://c40reinventingcities.org)

















# CAMPO URBANO



**Location:** Roma Tuscolana

**Year:** 2021

**Team representative:** FRESIA RE SpA

**Architects:** Arney Fender Katsalidis

**Environmental Experts:** Habitech

**Others:** Mobility in Chain, Elementa, CX, Labins, Laura Gatti Studio, Giuseppini Studio, Orizzontale, Bioedil, Robert Bird Group, Reset

*Source: c40reinventingcities.org*

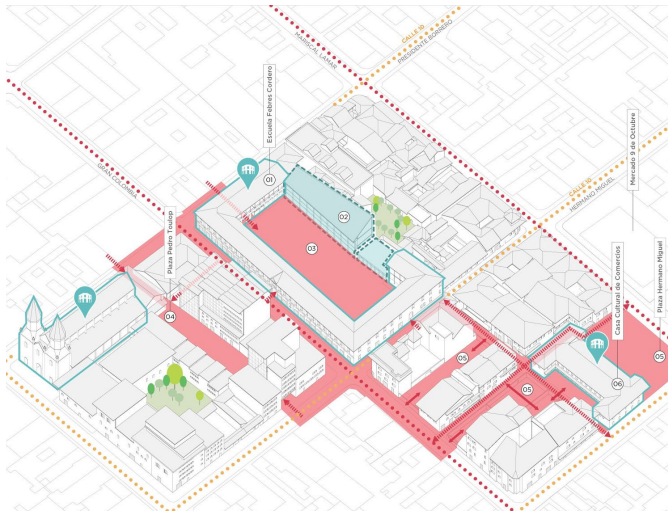








# FEBRES CORDERO



**Location:** Cuenca, Ecuador

**Year:** 2017

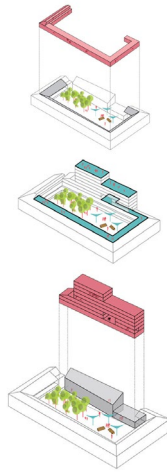
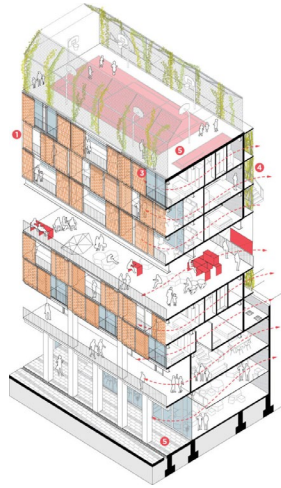
**Client:** IADB – Inter American Development Bank

**Architects / Project Manager:** Ecosistema Urbano

Source: [ecosistemaurbano.com](http://ecosistemaurbano.com)









# ENERGY CAROUSEL



**Location:** Dordrecht, Netherlands

**Year:** 2010-2012

**Client:** Municipality of Dordrecht

**Architects / Project Manager:** Ecosistema Urbano

*Source: ecosistemaurbano.com*









# ECOPOLIS PLAZA

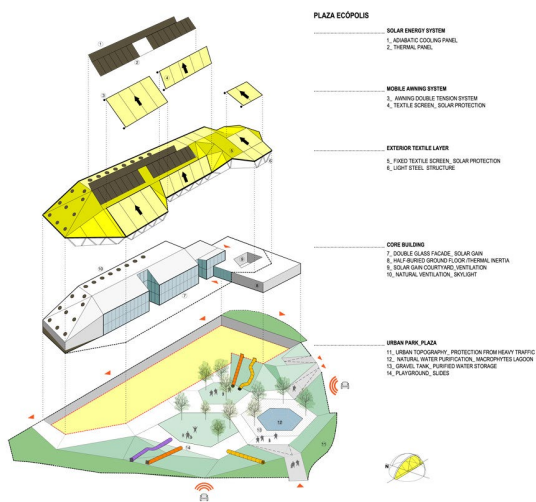


**Location:** Rivas - Vaciamadrid, Madrid, Spain

**Year:** 2009 - 2010

**Client:** Municipality of Rivas Vaciamadrid

**Architects / Project Manager:** Ecosistema Urbano







# ***A Vision for Piazzale Martesana***

| DEFINE PILLARS AND PROJECT TOOLS

| VISION AND OBJECTIVES

| CROSS THE 10 CHALLENGES

| STRATEGIC MAP

| 25 PROJECT ACTIONS

# 05



In this chapter, a strong vision for the Piazzale Martesana begins to emerge. The design cornerstones and the morphological and layout characteristics of the elements are outlined.

It is then necessary to develop a series of strategies for the redevelopment of the square considering the main themes of the call for reinventing cities and the demands that other instruments make for good planning and design of places in Milan.

By developing good basic strategies that are related to the 10 challenges that Reinventing cities recommends, we then move on to the definition of actual design actions to be applied in the area.

# DEFINE PILLARS AND PROJECT TOOLS

## PILLARS

In this section, reference is made to the various planning instruments, designs and objectives defined in the previous pages.

The instruments that Milan's Air Climate Plan and some indications of the TMP that also coincided with the requirements of the Reinventing Cities call for proposals are then reported.

The 10 challenges and the selection of some of the most relevant SDGs are reported.

The ultimate aim is to group these, analyse them and break them down into themes. In practice, we arrive at a summary of the main issues these tools deal with.

### PAC



### PGT



### 10 RC CHALLENGES



### SDG'S





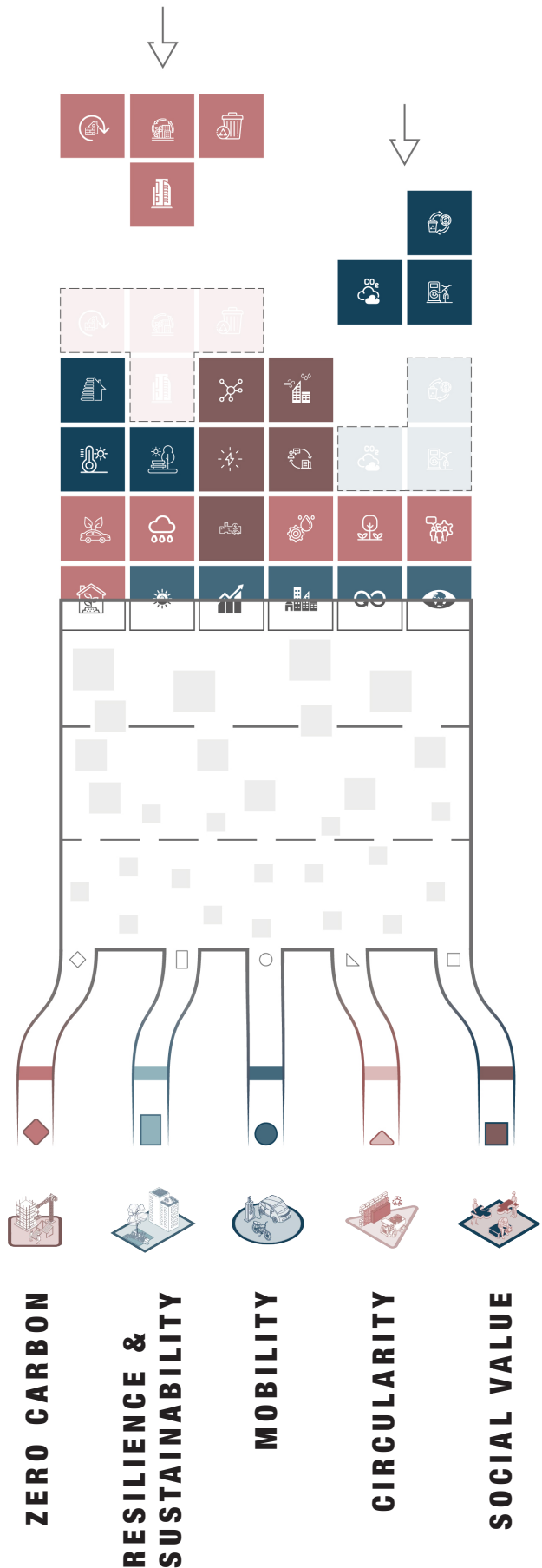
To arrive at a set of principles that we will call pillars, it is necessary to group the various tools and tool drivers mentioned above and consider them one by one.

1. In the first step, the various tools belonging to different subject areas are interlocked in a game of Tetris they arrive from above and are interlocked, but they are separated from each other and all have the same shape.

2. A second phase must consist of 'ungrouping' the elements from their original affiliation and mixing them up.

3. Then one begins to give a shape, a weight, a size to the elements, which are analysed and understood.

4. Finally, there is a final selection and grouping according to various themes of belonging.



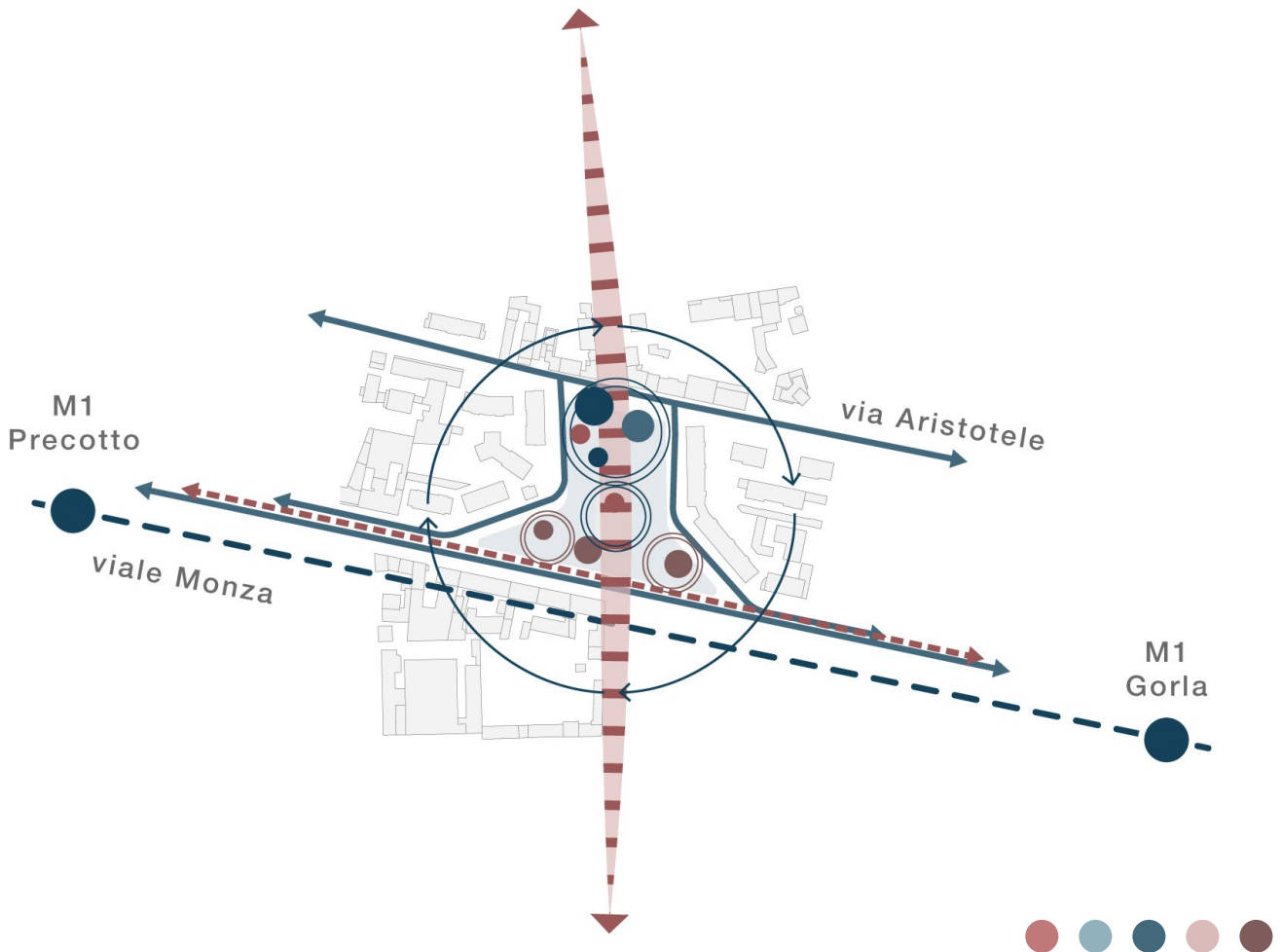
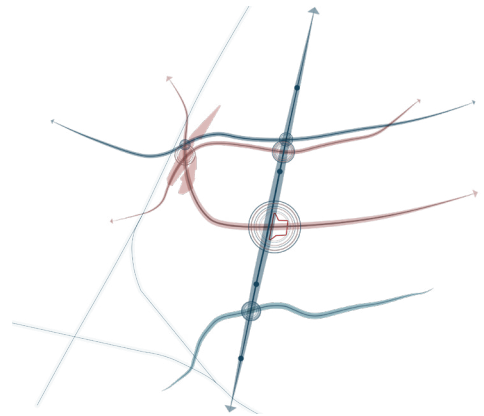
**FIVE PILLARS**

# VISION AND OBJECTIVES

# VISION

Once the thematic pillars have been found, it is necessary to understand what objectives are to be achieved and the overall vision for Piazzale Martesana.

Then, through the creation of evocative diagrams and the description of the objectives for each pillar, the first design intentions begin to be outlined.







## SOCIAL VALUE

*Ensuring spaces for sociality and culture. Providing economic advantages to access housing for economically fragile persons.*

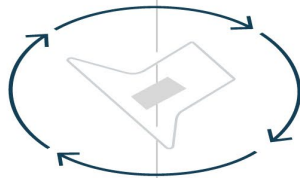


## ZERO CARBON

*Use environmentally sustainable materials, which require low emissions in their production. Reuse site materials as a design element. Make use of local water resources and the 'waste' produced.*



## CIRCULARITY



*Designing and building while minimising carbon emissions. Both from the point of view of energy sources and their use in construction and mobility, and from the point of view of mitigation of existing emissions through urban forestation and CO2 sequestration.*



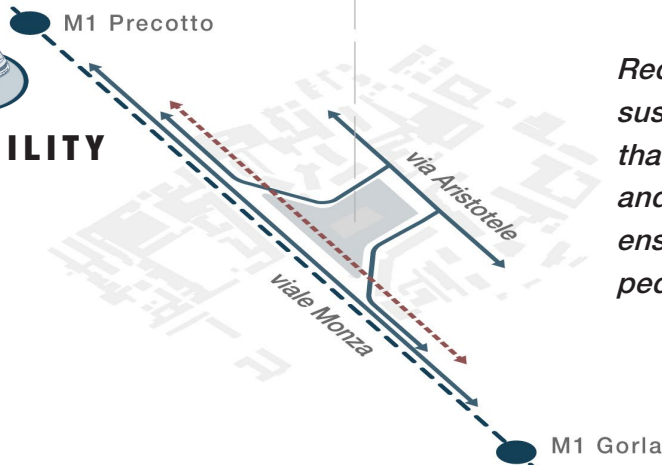
## RESILIENCE

*Designing spaces for living and experiencing the city with works that are resilient and adaptive to climatic changes, but still provide urban comfort in risk management.*



## MOBILITY

*Redesigning the spaces of slow and sustainable mobility as opposed to mobility that causes emissions and creates disturbance and disorder in the city. Designing the street ensuring space, comfort and safety for pedestrians and bicycles.*



# CROSS THE 10 CHALLENGES

# CHALLENGES

## ZERO CARBON



### Challenge 01: GREEN BUILDINGS AND ENERGY EFFICIENCY

The project intends to address this challenge by reducing consumption, optimising consumption and producing energy from renewable sources. Regarding the reduction of consumption, the project envisages the realisation of building envelopes optimising summer and winter behaviour; designing according to a climate-responsive building design integrated with outdoor spaces. Consumption can also be optimised through the efficient production of thermal energy by means of a system composed of multi-purpose, reversible heat pumps powered by renewable electric energy produced locally by photovoltaic panels and energy taken from the grid. District heating and cooling systems can also be used to minimise heat losses. Finally, it is intended to produce energy from renewable sources through the installation of photovoltaic panels by exploiting roofs, reducing emissions and heat islands.



### Challenge 10: QUALITY ARCHITECTURE AND URBAN DESIGN

Milan is a city growing in population every year, home to thousands of young people coming to study and looking for temporary housing, and young families or couples seeking work and greater stability and permanence over time.

It is increasingly necessary to adopt flexible and adaptive solutions, capable of responding to the demands of new forms of social housing. The project therefore intends to generate a housing mix by proposing a range of accommodation capable of maximising the social variety of the neighbourhood (families, young couples, students, temporary workers), thus fostering a lively community life.

Furthermore, to generate a typological mix of dwellings, which, for example, can be realised using X-Lam technology, which makes it possible to work with relatively small modular spaces (3x6 m), but which are flexible and can be aggregated into different types of settlement, and capable of integrating private and shared spaces. Finally, the housing solutions should be able to guarantee the implementation of mitigation and adaptive strategies from a climatic and ecological point of view.



## RESILIENCE AND SUSTAINABILITY



### Challenge 04: RESILIENCE AND ADAPTATION CLIMATE

Actions to address this challenge will be aimed at mitigation and adaptation to climate change and thus the provision of spaces that remain resilient to it, ensuring urban comfort under all climatic circumstances. The project therefore includes the re-greening of many areas, the provision of green roofs, providing natural shading through forestation and tree planting and the use of NBS (Nature Based Solutions). Water collection, management and recycling systems will be installed (Challenge 6).



### Challenge 05: SUSTAINABLE LIFESTYLE AND GREEN JOBS

The site today presents itself as a very large parking area and the project proposal is to put people and their ability to use new spaces for socialising in the neighbourhood at the centre.

Where there used to be cars, there are now plans to partially de-pave the area and create green, play and outdoor sports areas. It is planned to include new housing with very sustainable and resilient standards; to bring new inhabitants, especially young students and families who can adopt responsible lifestyles and bring innovation to the neighbourhood. The technological and metro infrastructure building will be recovered and partially refurbished and filled with new commercial and cultural functions to serve people.



### Challenge 08: GREEN SPACES, URBAN NATURE AND BIODIVERSITY

The project intends to provide green spaces for the square, through the partial de-paving of surfaces, but also the exploitation of the roofs of the buildings in order to mitigate the influence of heat islands and to allow greater filtering of heavy rainfall. The project thus joins an ecological system of green spaces along the regional ecological corridor, joined by the Martesana blue infrastructure, which can be reached and travelled on foot or by bicycle. The green areas will have a variety of plant species, creating an increase in the biodiversity of the area and using elements that are well adapted to the local climate and geographical conditions. Along Viale Monza, trees will be planted that are able to screen the noise of cars and above all have a high capacity to absorb CO<sub>2</sub>. On the subject of circularity, the green areas will have a different topography as excavated land will be reused to make green hillsides.

## MOBILITY



### Challenge 03: LOW-EMISSION MOBILITY

Piazzale Martesana represents an important node for mobility, in particular it is located between two stops of the M1 metro, along the Viale Monza that starts from Piazzale Loreto and arrives at Sesto San Giovanni in the direction of Monza. Along this avenue there is also a cycle lane that crosses the square but also the Martesana Canal and its cycle path. To meet this challenge, the project wants to increase the use of slow and sustainable mobility through the almost complete pedestrianisation of the square; limiting car entrances only from two one-way side streets with a speed limit. Reducing the number of on-street parking spaces and providing carsharing or carpooling facilities. In addition, facilities and parking spaces for bicycles and bikesharing will be provided. All this will be done to favour greater accessibility to the area, but above all to allow the area to be connected to other local and urban mobility systems such as the metro line, tramway, and major cycle routes such as the Martesana.

## CIRCULARITY



### Challenge 02: SUSTAINABLE CONSTRUCTION AND BUILDING LIFE CYCLE

Pursuing this challenge requires a project planning phase that questions all activities developed throughout the project life cycle. In order to follow as sustainable and circular an approach as possible and minimise environmental impacts that can be assessed with the Life Cycle Assessment methodology.

It is first necessary to start with the correct choice of materials that have the least impact during their production (non-renewable energy, waste). The characteristics of materials should therefore be those of renewability, recyclability and environmental certification. The optimisation of the quantity of material used in production with an optimisation of the resources employed should not be overlooked. Finally, to further reduce emissions, it is necessary to plan the transport of materials, favouring those from local production chains.

During the construction phase, on the other hand, it is necessary to precisely define the quantities of materials to be used and to reuse waste, to practise waste separation in the factory and on the building site, and to reduce the use of pollutants and the production of fine dust. Then calculate the time and energy to be used in construction to reduce waste. Finally, practise prefabrication techniques that benefit both the workers and the reduction of accidents as well as the environment and the economic costs of the project.

As a final step in the circularity of materials, techniques of reuse, regeneration or reconditioning, recycling, energy recovery of materials or landfilling can be adopted.





### Challenge 06: SUSTAINABLE MANAGEMENT OF WATER RESOURCES

For this challenge, it is envisaged to install a rainwater collection and disposal network using SuDS (Sustainable Urban Drainage Systems) techniques, e.g. rain gardens or vegetated drainage channels (bioswales) by inserting vegetated ditches and trenches along infrastructures or in car parks, as well as bio-retention areas at tree and flower beds. Inolter the consumption of drinking water can be reduced, by encouraging the reuse of existing water and educating residents in the control and saving of water resources, the objectives of reducing drinking water consumption and raising awareness of the risks of water scarcity can be achieved.



### Challenge 07: CIRCULAR RESOURCES AND SUSTAINABLE WASTE MANAGEMENT

In order to generate low CO2 emissions, it is also necessary to think about maximising the use of available resources, and therefore to design with a circular economy and circular processes in mind. The aim of this project is to use materials from local supply chains and the use of natural waste from the manufacture of certain materials and to reuse them as design elements. With regard to waste management, a hierarchical approach is envisaged: from prevention to reuse, from recycling to energy recovery. During the construction phase, it is intended to develop zero-waste site management, thanks to the industrialisation and prefabrication of the construction process. Finally, in order to make the community more informed, it is envisaged that information guidelines will be developed to promote changes in lifestyles by encouraging the reduction of goods and increasing the awareness of local actors and citizens. Implementation will take place through the Planet App.

## SOCIAL VALUE



### Challenge 09: SOCIAL INCLUSION AND COMMUNITY PARTICIPATION

The project aims to provide social housing at affordable prices. Public housing can be used to ensure access to housing for more economically fragile segments of the population such as young students or families. In this way, a young and innovative neighbourhood community can be developed around social inclusion and cultural development. Reference is therefore made to the Planet Community Experience method, which uses the systemic approach, considering people, organisations and macro-systems and supporting social networking and the exchange of resources in a circular perspective. This is realised through the provision of sharing and flexible spaces on the ground floor of buildings (neighbourhood hubs) as a reference point. And on the digital side, the Planet App can be used to book spaces, organise events, open discussions or raise issues. Finally, there will be a Community Manager who will deal with a range of social housing issues, community needs, make innovative proposals with the support of cooperatives and partner associations.

# STRATEGIC MAP

# STRATEGIC

## OUTDOOR LINES AND SURFACES

Special flooring to accommodate children's games or outdoor sports areas

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Green and permeable spaces within the square and along Viale Monza where bioswales are to be placed

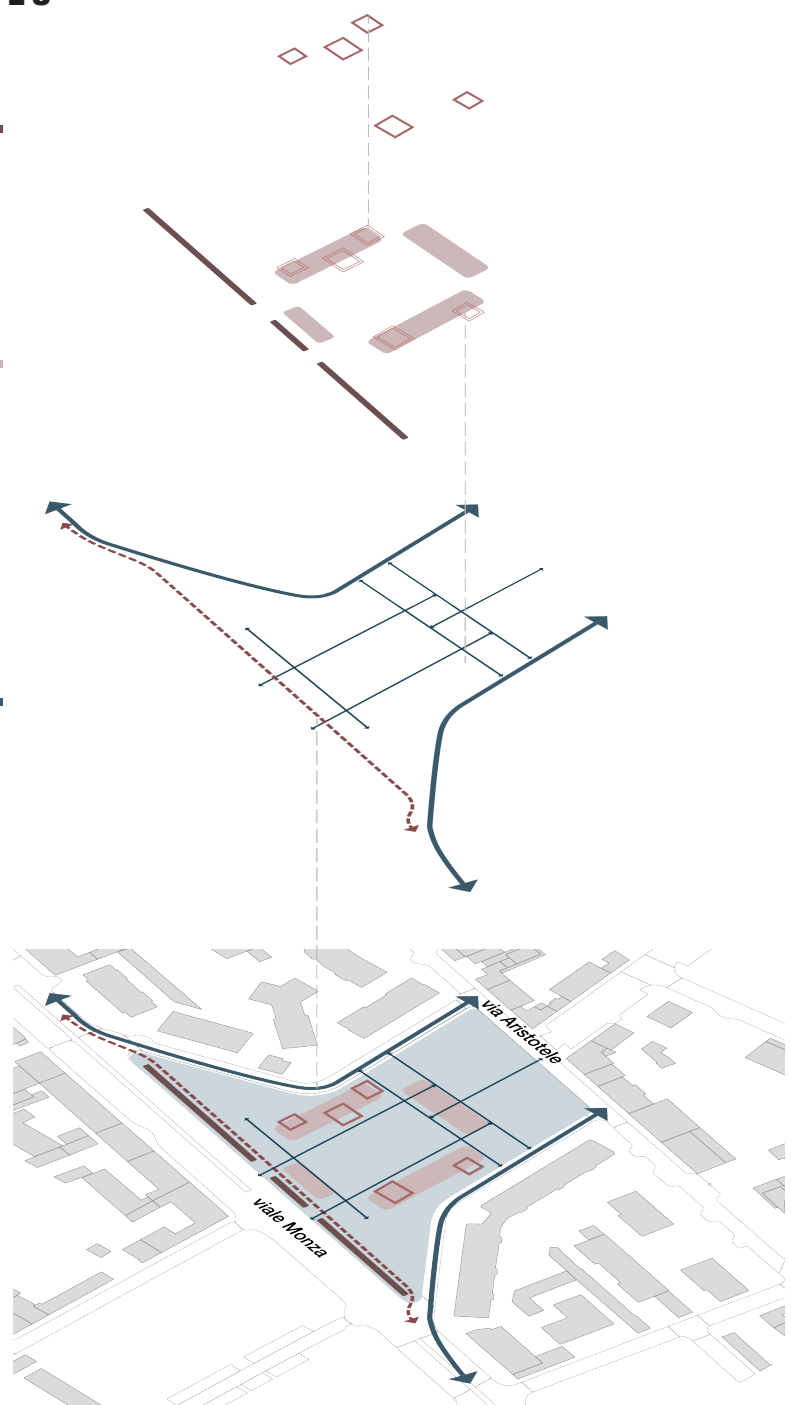
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The strategy map is divided into two parts. The side one represents the design intentions of the road layout, slow mobility and green and thematic areas.

---

This first part of the strategic map represents the design intentions of the road layout, slow mobility, green areas and thematic areas.

The design on these elements should be integrated with the pedestrian mobility inside the square, a good accessibility to outdoor spaces from streets.





## BUILT UP AREAS

Above the big commercial building at the centre of the square, there will be outdoor spaces related to the commercial activity at the ground floor.

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Green roofs are located above residential buildings and the commercial ones, with the possibility to take care of them and their green elements

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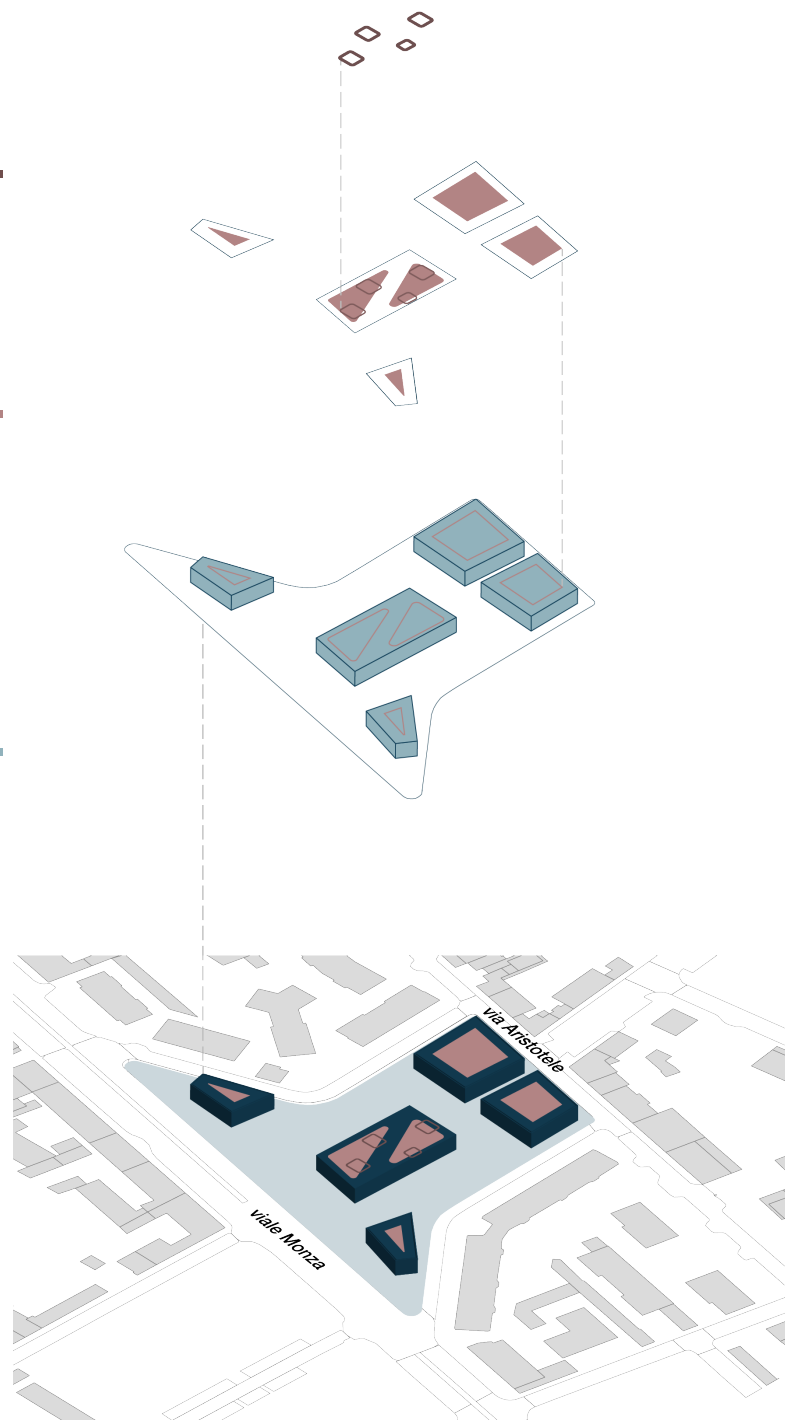
New commercial buildings are the ones that should stay close to viale Monza to ensure their accessibility. Instead the new residences are located along via Aristotele to favour more privacy to the inhabitants.

---

This first part of the strategic map represents the design of built up areas.

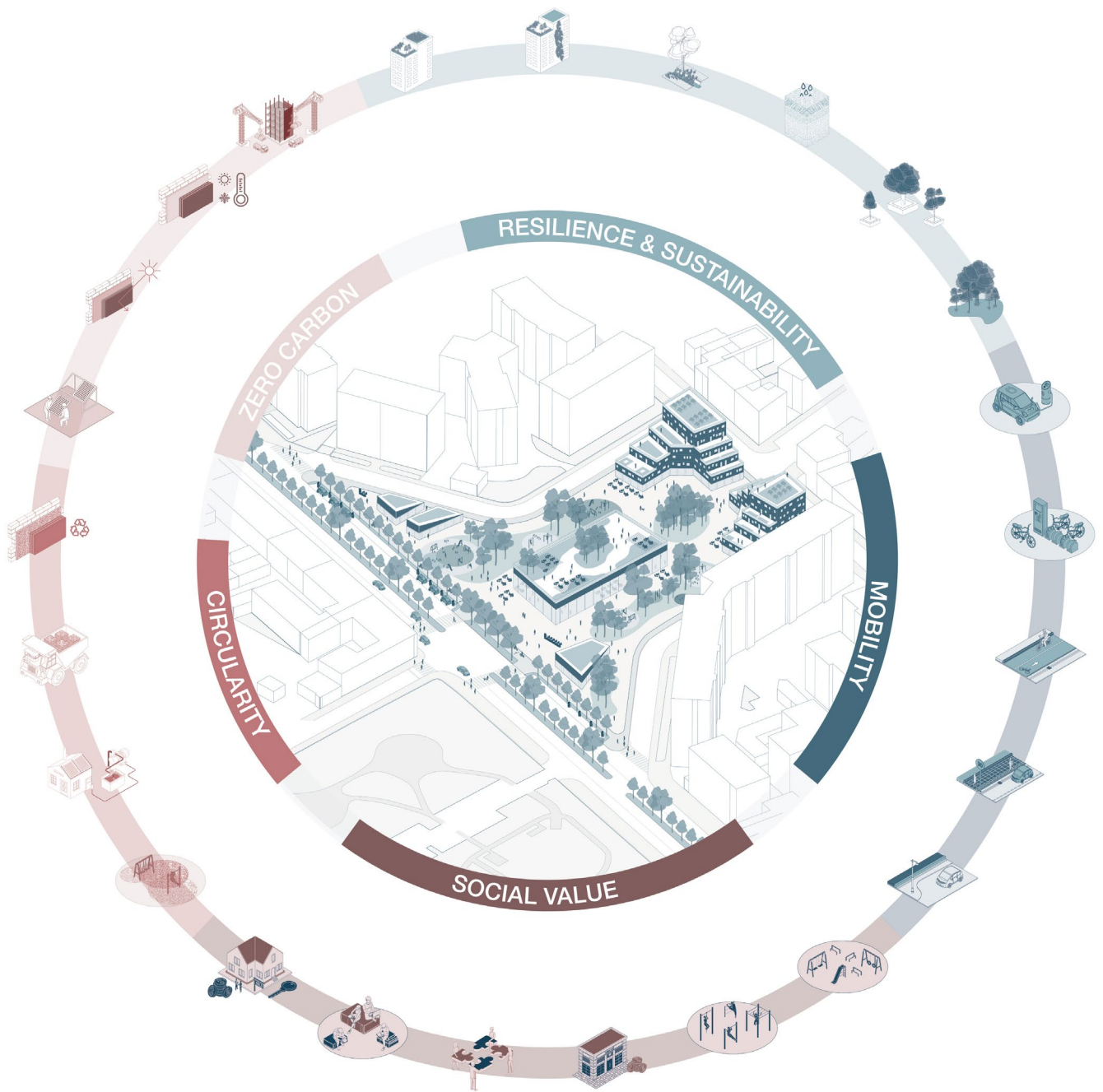
The approximative collocation of the new residential and commercial buildings, with the maintenance and reuse of the existing one at the centre of the square.

Above the buildings are designed green roofs and outdoor collective spaces.



# 25 PROJECT ACTIONS

# ACTIONS





Following the development of general strategies for the redevelopment of the forecourt, a number of design choices were detailed with the definition of a series of precise actions.

A series of axonometric actions are shown, which are subdivided according to their theme. A total of 24 actions are found distributed over the 5 project pillars.

For the Zero Carbon actions, we identify the abatement of heat island effects with the use of well-insulated building materials from heat and cold, and sunlight-reflecting materials; the use of energy from local renewable sources; and construction that takes place in phases.

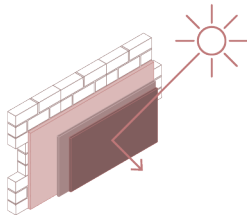
For Resilience and Sustainability there are a number of actions to increase urban greenery, and to mitigate extreme weather events of heat and rain.

For the themes of Circularity, the aim is to use recycled construction materials, and the waste from them to create street furniture for the square.

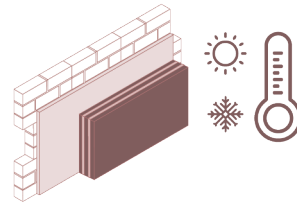
The Social Value themes have actions aimed at fostering social interactions by providing outdoor and indoor meeting spaces.

Finally, Mobility is oriented towards sustainability, low emissions and pedestrian road safety.

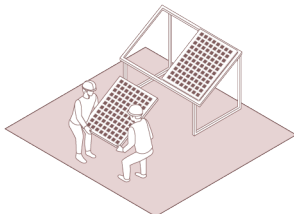
## ZERO CARBON



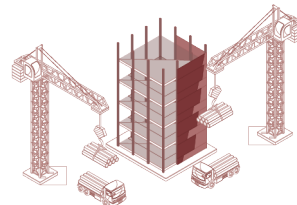
**Use of sunlight-reflecting materials** for both the walls of the buildings and the new pavements in the square. In order to ensure greater comfort inside the houses and mitigate the effect of heat islands, and reduce energy consumption to cool rooms.



**Use building materials that are well insulated against heat and cold** to lead to lower energy consumption to cool or heat indoor spaces and thus reduce CO2 emissions.

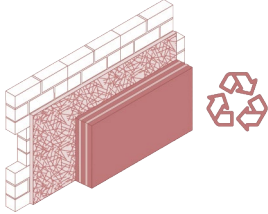


**Install solar and photovoltaic panels** on the roofs of new residences to produce clean, local energy for use in flats and especially for communal and commercial spaces on the ground floors.

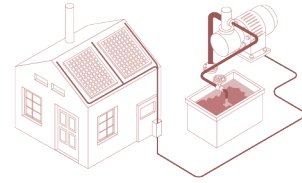


**Planning the construction site and building in phases** while trying to reduce waste in the transport use and management of construction materials and vehicles. Such as the prefabrication of certain building components.

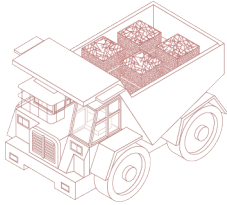
## CIRCULARITY



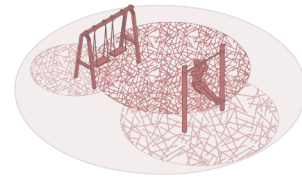
**Use recycled and natural building materials** to reduce material waste and make more use of their potential.



**Install rainwater harvesting systems** on the roofs of new homes to reuse it after it has been cleaned and purified. This reuses a natural source, but reduces the effect of heavy rainfall.



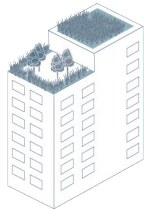
**Collect and reuse construction material waste** from the construction site for other construction and urban design.



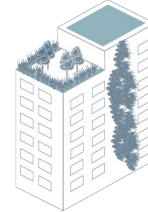
**Create outdoor spaces for recreation and sport with recycled materials** in order to reduce waste in the production of new materials and thus reduce emissions.



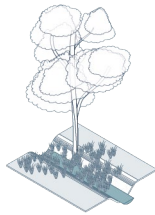
## RESILIENCE AND SUSTAINABILITY



**Create green roofs** using low-maintenance flora that can absorb heat and water in a resilient manner to reduce the impact of heat islands and excessive rainfall.



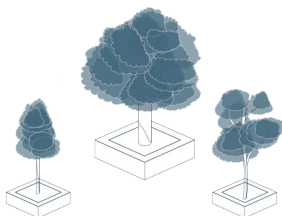
**Use green walls** with climbing and evergreen plants to reflect sunlight, absorb heat, and thus reduce indoor cooling consumption and make an urban climate cooler outdoors.



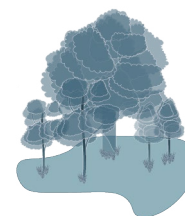
**Design bioswales** mainly along roads to absorb rainwater efficiently, mitigate flooding and design quality street greenery.



**Use highly water-draining paving** for the squares and associated play and sports areas, as well as for the pavements and parking spaces along the streets.

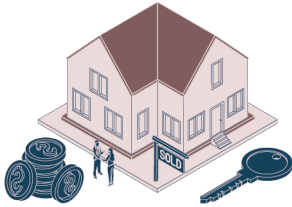


**Plant trees** to mitigate heat islands, cool and shade the outdoor climate and thus the indoor climate. But trees can also absorb a lot of CO<sub>2</sub> and reduce noise pollution.

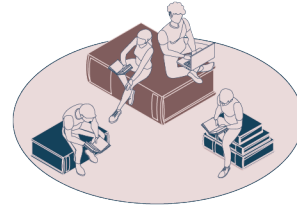


**Create new green spaces by depaving** the existing parking areas and then adding trees and plants to increase biodiversity in the square, provide permeable areas for normal water runoff.

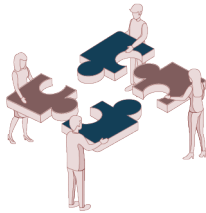
## SOCIAL VALUE



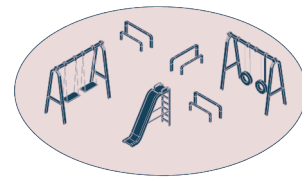
**Facilitate access to housing** with low rents for students and young families. In order to create a winning social mix for the neighbourhood and its inhabitants.



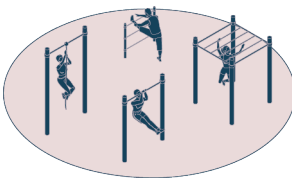
**Designing smart collective spaces for culture, study and work** to foster social interaction and ensure accessible work and study spaces for all.



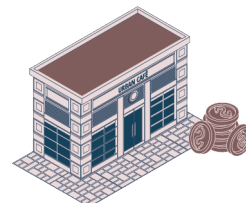
**Providing spaces for social interaction** between residents of dwellings and establishing relationships between them to create a small community that communicates and collaborates to care for its spaces.



**Designing outdoor spaces** and facilities for children's play and social interaction.



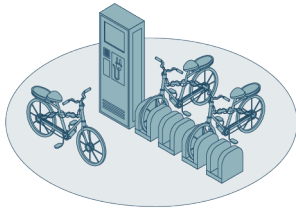
**Designing outdoor sports and workout spaces** and facilities with innovative and intuitive equipment for use by a wide range of the population.



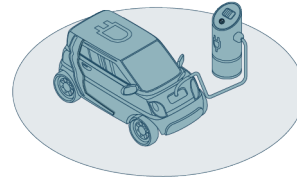
**Providing job opportunities** for residents with easier access to employment with rent concessions for commercial or craft activities in the square



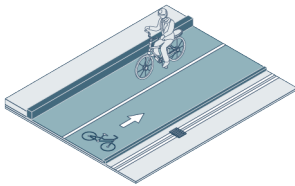
## MOBILITY



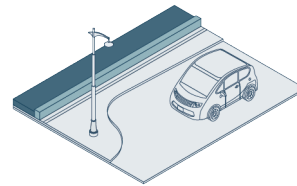
**Provide spaces for electric bike-sharing** and parking spaces for bikes, thus promoting the use of slow and sustainable mobility.



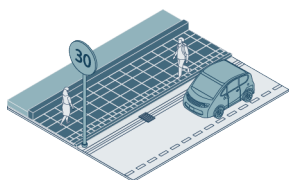
**Provide parking spaces for electric car-sharing,** reducing the number of parking spaces in the square and leaving some of them free and others for charging shared electric cars.



**Designing safe and wide cycle routes,** which join the existing network of cycle routes and encourage interchange between the other transport typologies.



**Design shared streets safe for pedestrians,** making the car uncomfortable to cross this kind of streets.



**Design limited speed streets** (max 30km/h) to make pedestrians feel comfortable and safe to cross the streets.

## ***Project Representation***

| MASTERPLAN

| FUNCTION DIAGRAMS

| SECTIONS OF THE NEW PIAZZALE MARTESANA

/ Section A-A'

/ Section B-B'

/ Section C-C'

/ Section D-D'

| ON-SITE ACTIONS

| FINAL PROJECT MASSING

| OVERVIEW OF THE NEW PIAZZALE MARTESANA

# 06



In the following chapter, we have the evolution of the previous one with the application of the project actions on the ground.

The design of the new Martesana square is thus represented in detail and specificity by the design of the project Masterplan.

Some significant data on the functions and uses of buildings and open spaces are given through a series of diagrams.

A series of sections outline the overall situation of the square and its new conformation and insertion within the urban context.

And finally, a 3D representation of the project by referring to the actions carried out in the area, also thanks to some design focus.

# M MASTERPLAN



The new Piazzale Martesana is a pioneering example of how to reinvent an urban space according to the creters of **innovation** from the point of view of **climate resilience** and social prevention for access to **housing**.

Piazzale Martesana is a place with low greenhouse gas and CO2 emissions, exploiting the on-site **production of energy from renewable sources**, a project realised with the most up-to-date material energy standards, taking into account the conscious production and **management of the life of the building materials used** (Lyfe Cycle Assessment) and the resources used to make them. Piazzale Martesana **collects and reuses rainwater** to cope with heavy rainfall and urban flooding, and to reuse water for periods of drought or emergency urban needs.

The new Martesana square is green, with around **500 trees and shrubs** planted both in

the **green areas and on the balconies and roofs of the buildings**. The square thus takes on a new reputation and image in relation to the neighbourhood and the entire city. Through urban greening, the square is made more visually pleasing, but above all in terms of **urban comfort, perceived temperatures, muffled noise and absorbed CO2**.

Urban greening serves the Martesana square to enrich it with quality and beauty.

The new Martesana square presents a mix of simple functions that **reawaken the soul of the place**. In fact, the functions that have been introduced are predominantly commercial and neighbourhood craftsmanship, in addition to the new residences.

The other mix is the social one, in fact it is the type of people who will populate the square that will make it come alive. The residences and



outdoor **spaces are designed for a target group of mainly young students and families.** The proximity to numerous schools and the Bicocca University will in fact provide a target audience of young people using the spaces for play and sport, but also for study and work.

Piazzale Martesana is a **totally pedestrianised open space designed for sustainable mobility** that integrate and strengthen its accessibility towards itself and the city. Through the remaking of

the bicycle lane that passes tangent to the square along Viale Monza and along which **bike-sharing points and car-sharing parking spaces** are placed favouring intermodality between the **slow mobility of pedestrians and bicycles** with that of sustainable car use and especially the metro via the nearby Gorla and Precotto stations.

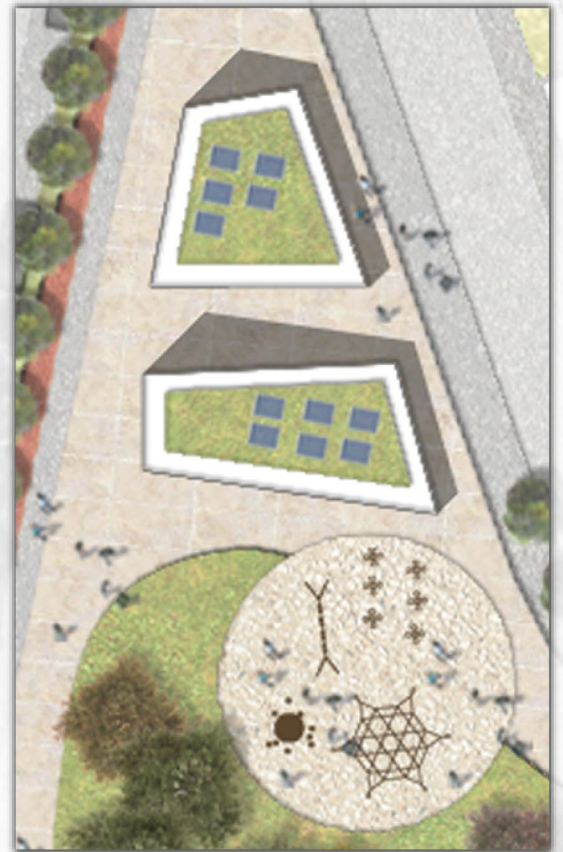




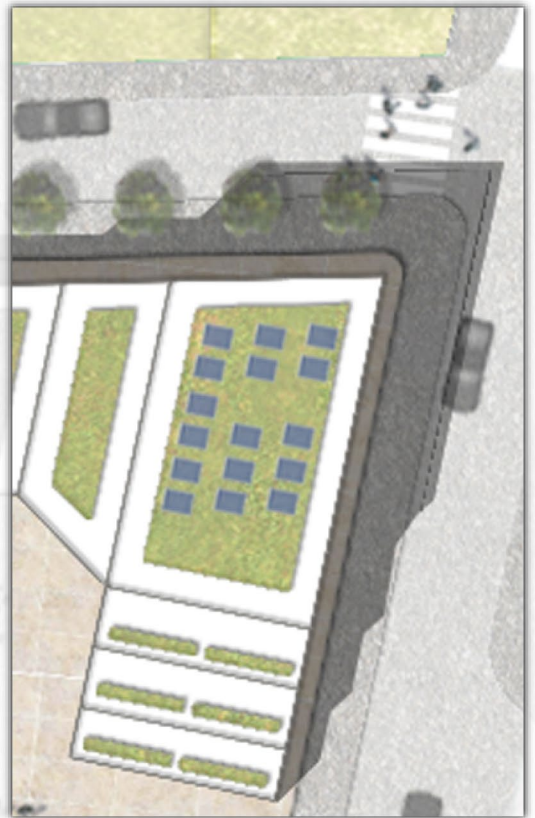
The design focuses of the Masterplan are represented here. Some details of the project actions are then given. It is then highlighted how areas of the square have been depaved and re-naturalised to accommodate shrubs, trees and lawn.

Along Viale Monza, the pedestrian crossings giving access to the square are noted, and how the pavements are bordered by bioswales and tree rows. One notices the sloping roofs of the buildings with the addition of solar panels and the terraces of the flats. The play and sports areas have different paving from the square as they are natural, draining and recycled materials.

Finally, the commercial buildings along Viale Monza and which have a lot of accessibility for pedestrians coming from the metro.







# FUNCTION DIAGRAMS

# FUNCTION

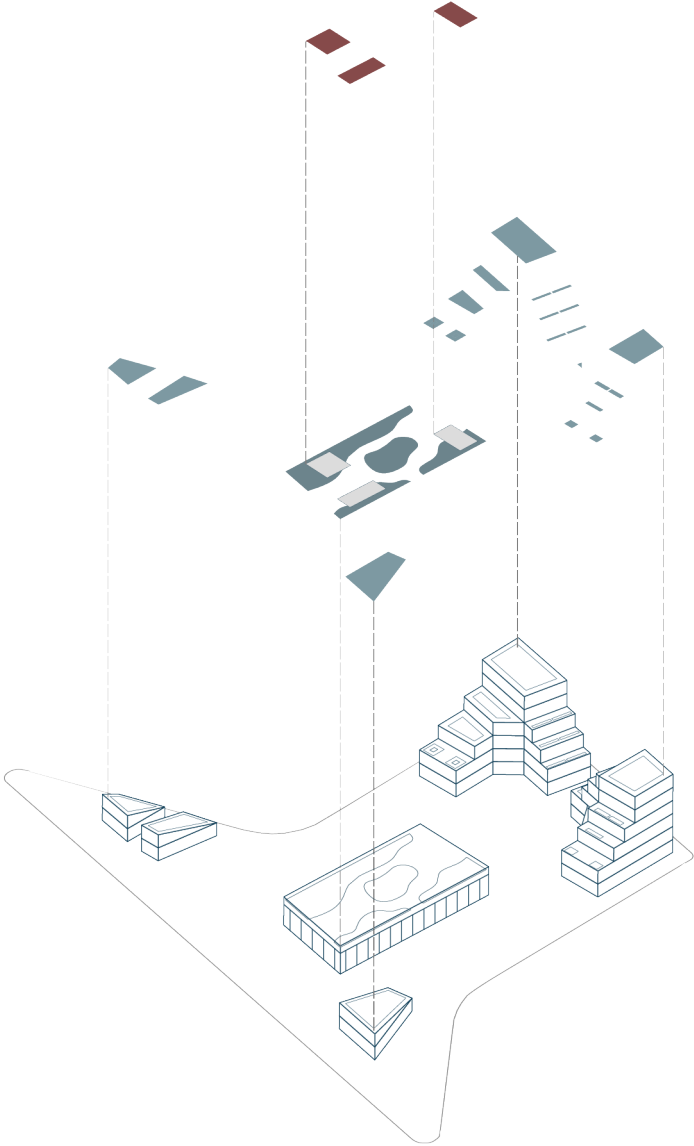
## FUNCTIONAL ROOFS

### COMMERCIAL ROOFS 153 mq

Spaces related to commercial activities on the ground floor. They are bar and retail spaces, and a way to enjoy the view of the square between the plants and the large roof.

### GREEN ROOFS 1.130 mq

Green roofs are mainly placed on new buildings and are intended to reduce the impact of heat islands on the square and the surrounding urban environment. The roofs of the new residential buildings are planted and walkable by the inhabitants and the community living in those spaces.



All project buildings are equipped with structures to accommodate green roofs, trees and small shrubs, and solar panels for the use of renewable energy are placed in the new residential and commercial buildings.



## GREEN SPACES AND PLAYGROUNDS

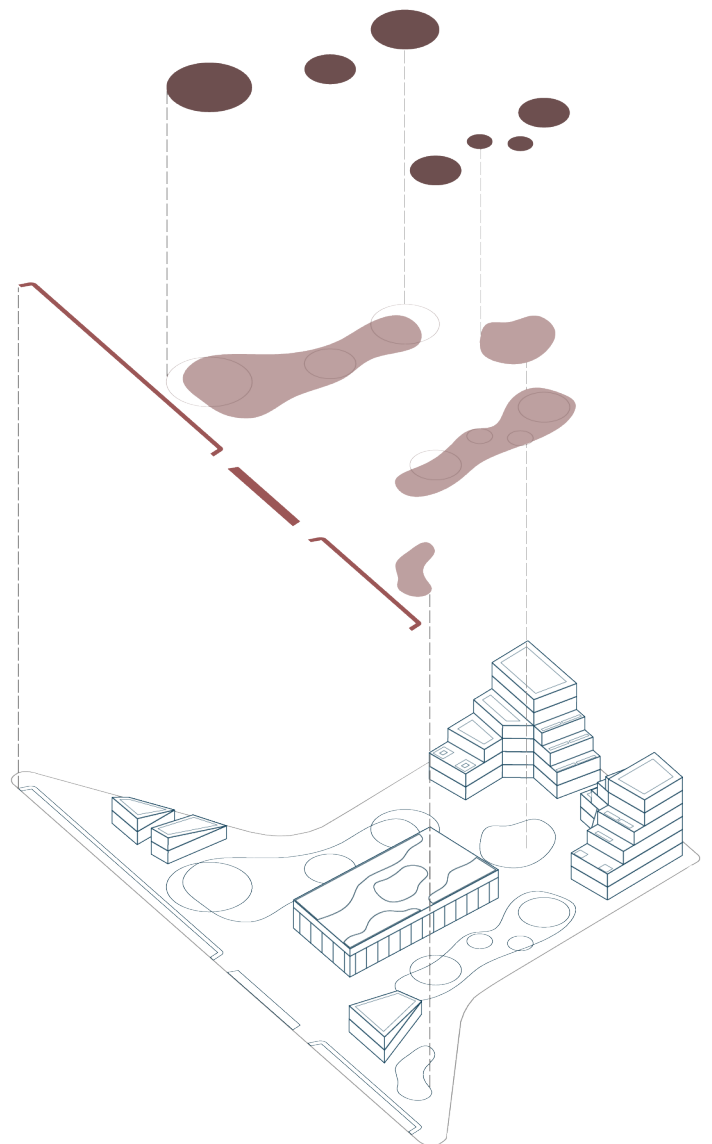
### PLAYGROUNDS 595 m<sup>2</sup>

They are located within the green areas and are therefore shaded and surrounded by greenery. They are themed areas divided by space and equipment for children and play, but also for people who want to practise outdoor sports with appropriate equipment.

### BIOSWHALES AND GARDENS 2.250 m<sup>2</sup>

Green areas are placed between the buildings to allow adequate external cooling and cope with heat islands. They are areas with quality lawns and trees and an overall high biodiversity. With shading features, efficient CO<sub>2</sub> capture and noise reduction. Bioswales are then placed along the streets to allow the placement of trees, but above all to allow water to drain away more easily and avoid urban flooding.

The purpose of including green and recreational areas is because of a climatic and social factor. On the one hand, the aim is to reduce the outside temperature and the impact of heat islands by means of natural solutions (trees, lawns, bioswales, etc.), and on the other to provide spaces that connote the function of a square, spaces for social interaction, play, sport and relaxation.



## FUNCTIONS QUANTITIES

### RESIDENTIAL 3.557 mq

The residential buildings are developed in height, from the first floor to the fifth, scaling up in floor area. This allows more space for light and architectural quality with the inclusion of real balconies and views of squares. The flats will be distributed for a social mix of people, but mainly for students and young families.

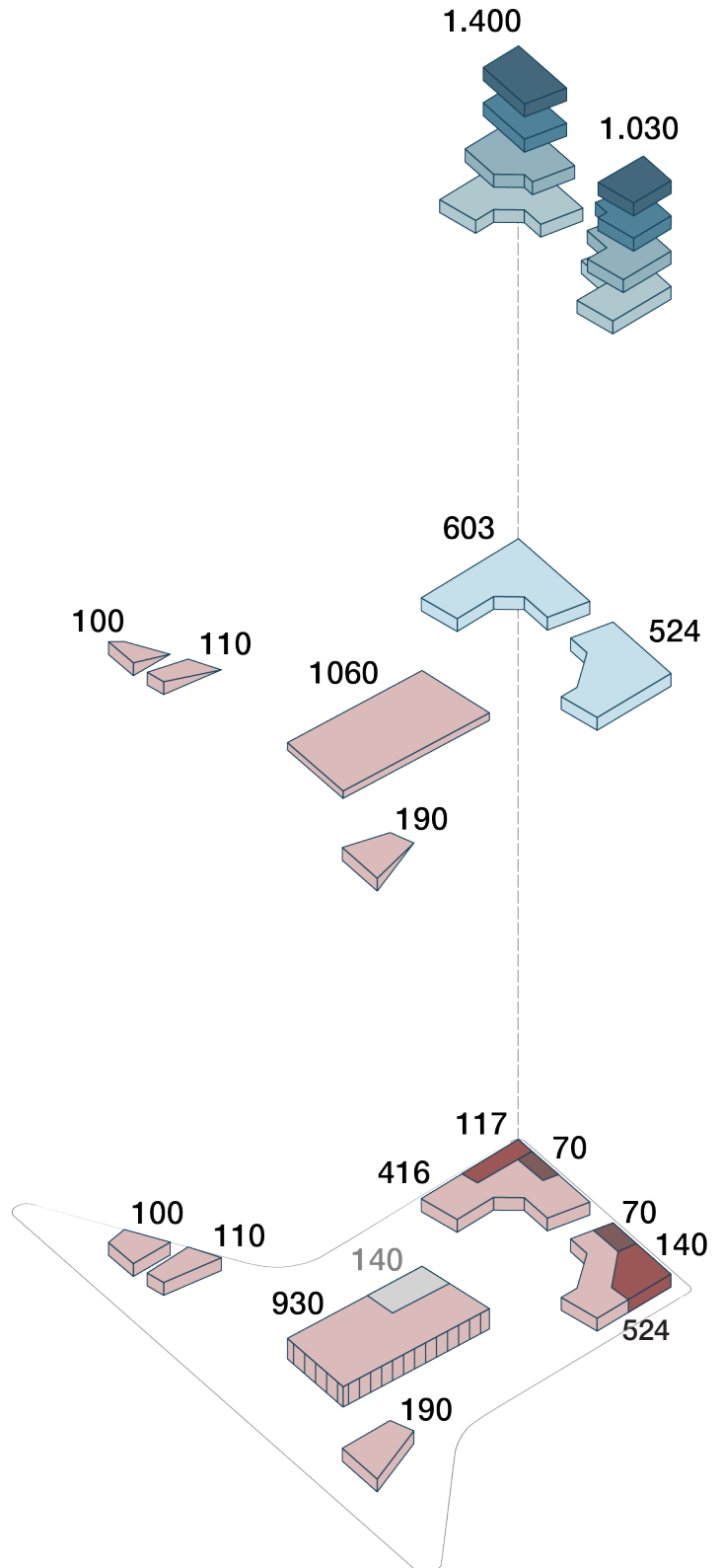
### COMMERCIAL - ARTISANAL 3.520 mq

The commercial spaces are on the ground floor of the residential buildings, which have an active frontage to the square, then along Viale Monza there are other small commercial buildings and finally the almost complete refurbishment of the building for the technological infrastructure of the M1 metro line.

Then the building was refunctionalised as a commercial building with a surface area of approximately 1000 square metres.

### COMMON SPACES 257 mq

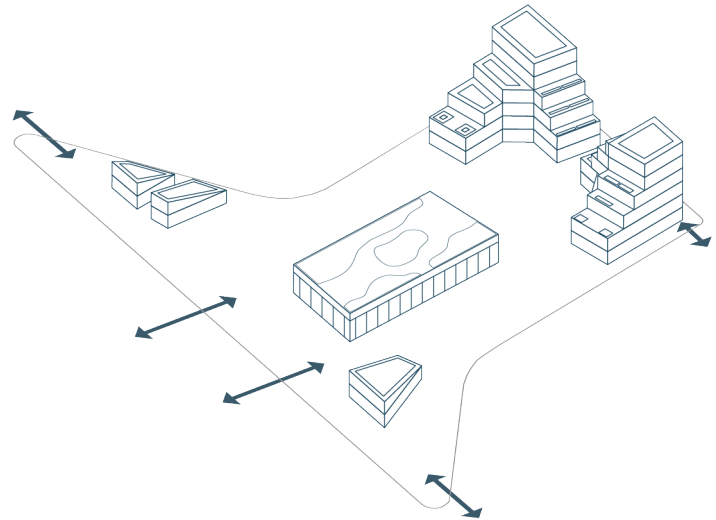
These are interior spaces designed for residents, after which interactions and debates can take place, but also spaces for exhibitions or events.





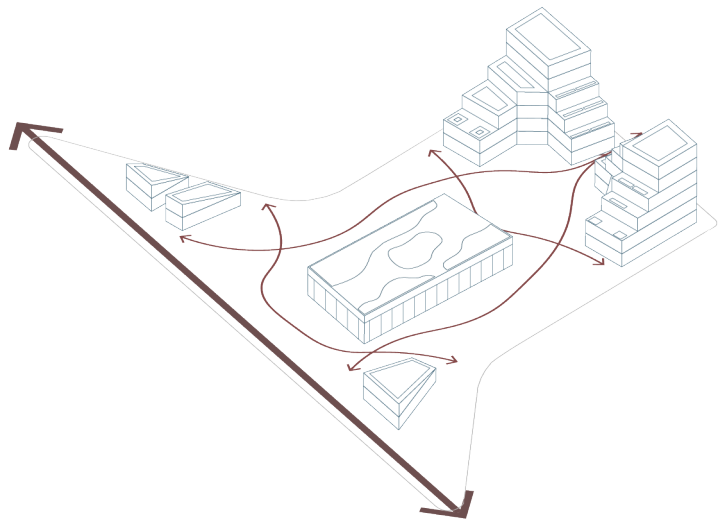
## ACCESSIBILITY

Access to the square is allowed for pedestrians and no longer for cars (except in emergencies). Access to the square is via Viale Monza with large pedestrian crossings from Via Aristotle from the rear, and from one-way side streets where a maximum speed of 30 km/h is permitted



## MOVEMENT IN SPACES

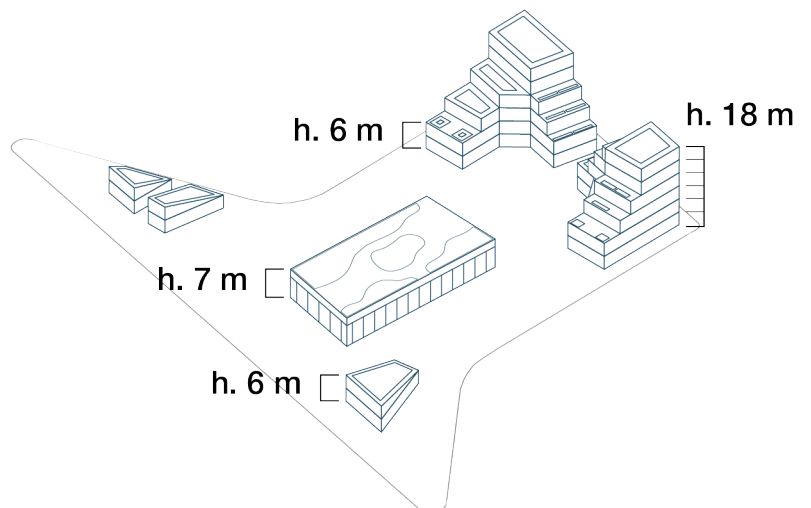
Mobility within the square is totally pedestrianised. It is possible to easily reach every place in the square without taking difficult, but intuitive and natural paths. In addition to internal mobility on foot, there is the possibility of crossing the square on a bicycle path, in continuity with the existing lane of Viale Monza.



## HEIGHT

The heights of the residential buildings are somewhere between the buildings along Aristotle Street (15-18 m) and those on either side of the square (27-30 m). That is to say, the residences have a maximum height of 18 metres (3 metres per storey) for the highest points and 6 metres for the lowest, considering the staggered characteristic of the buildings.

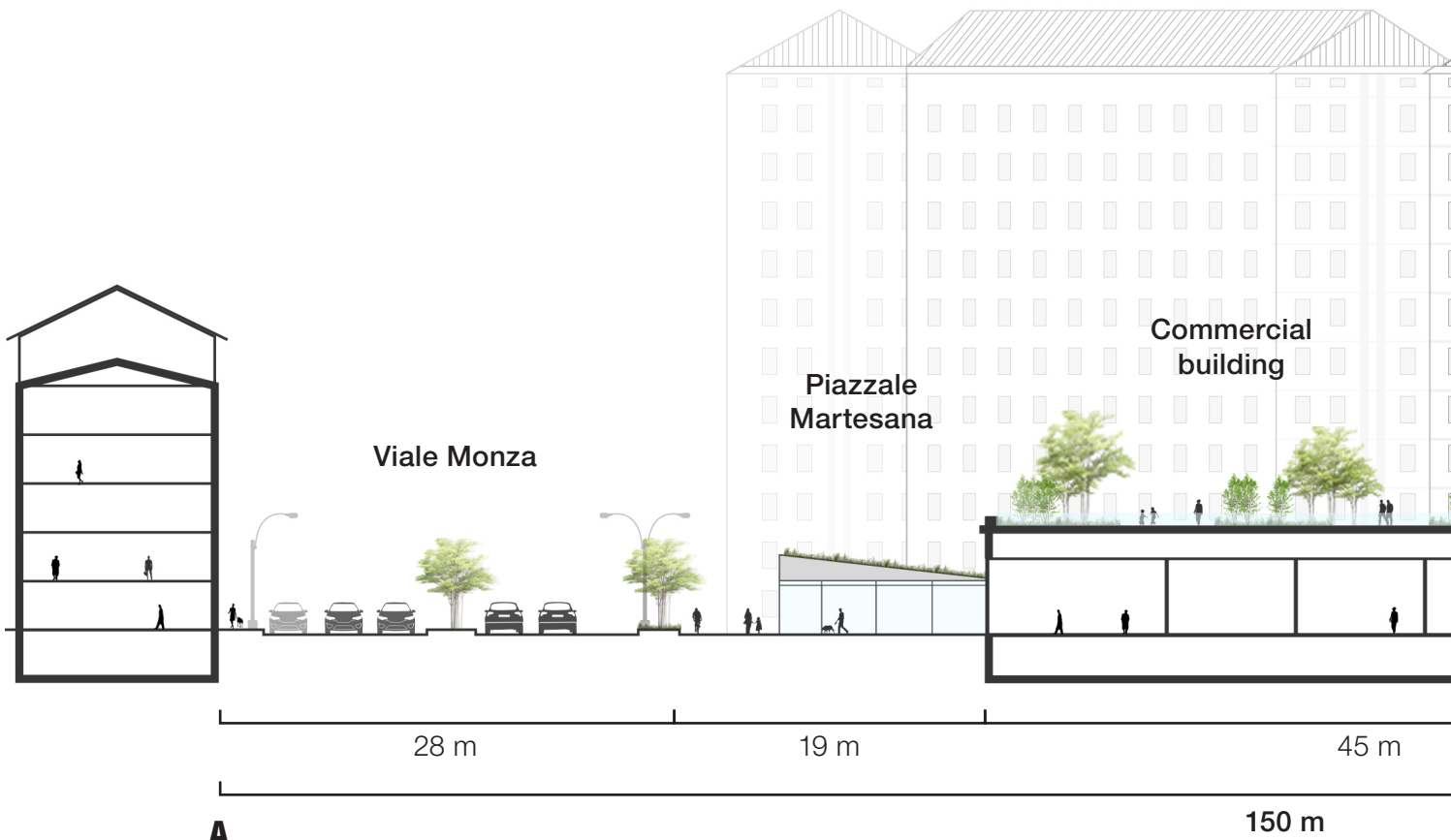
New commercial buildings, on the other hand, have a maximum height of 6 metres (2 storeys) and the existing one of 7 metres plus the use of the green terrace.



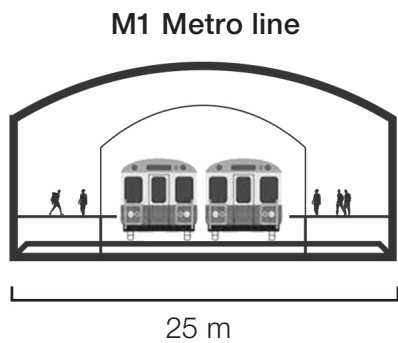
# SECTIONS OF THE NEW PIAZZALE MARTESANA

# SECTIONS

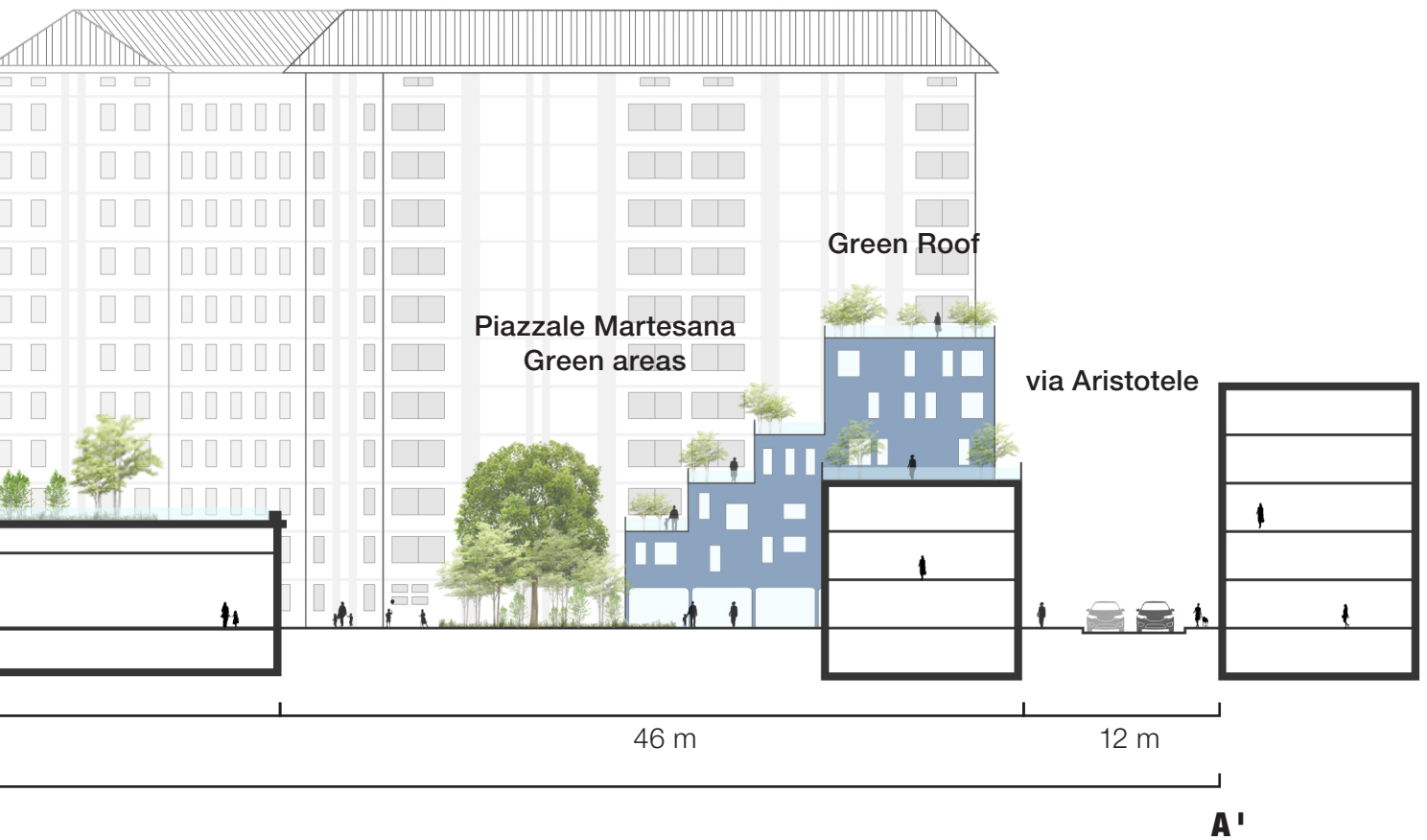
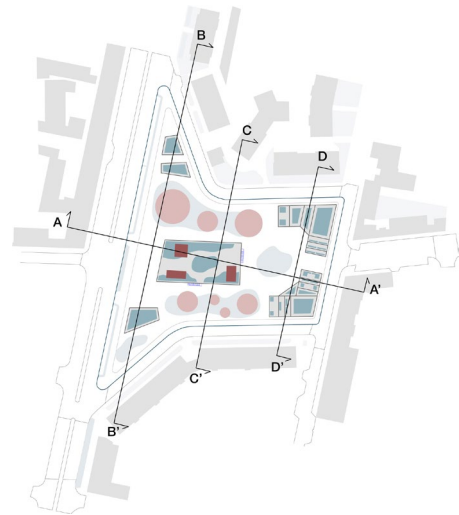
## SECTION A-A'



A







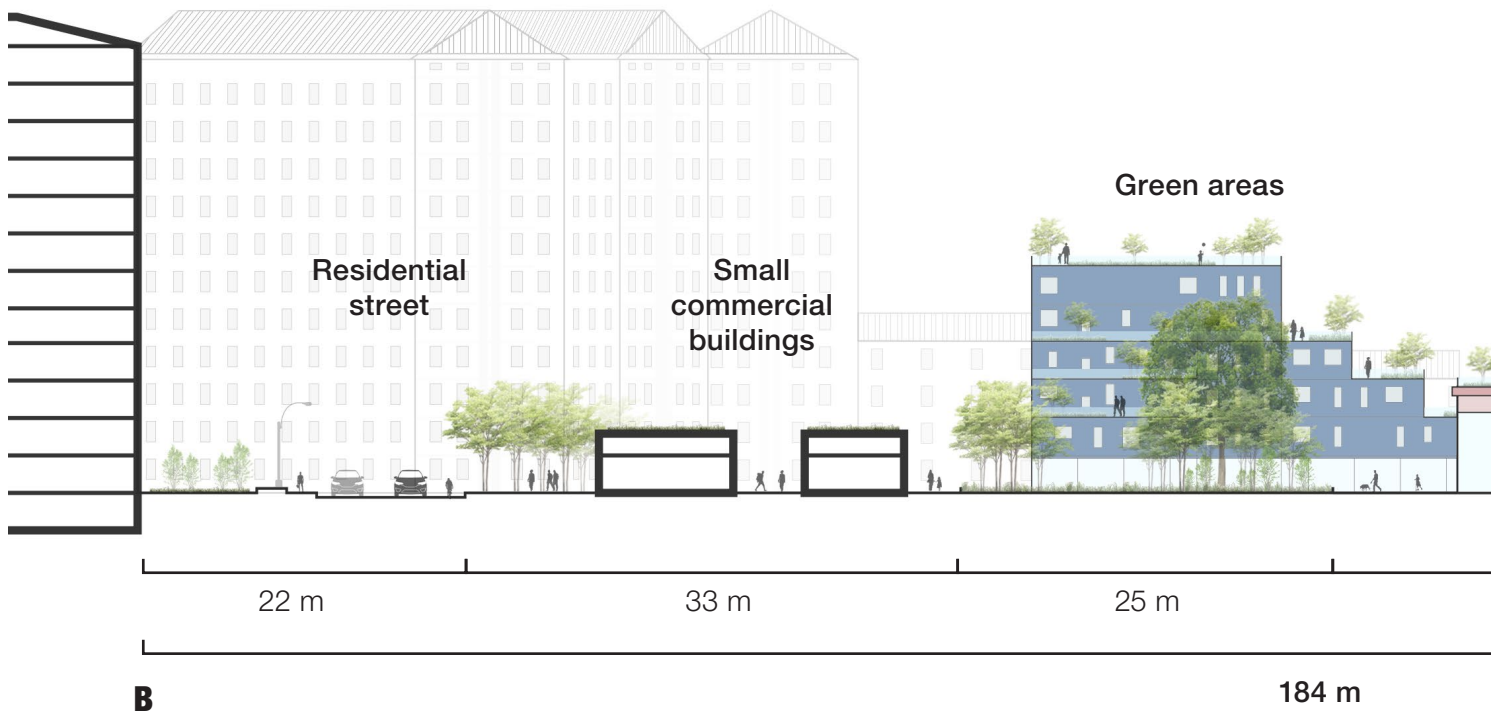
The section represents a cut from west to east of Piazzale Martesana, starting from Viale Monza, which is cut across and ends up cutting the opposite street, Via Aristotle.

We can therefore see the two lanes in each direction of Viale Monza, followed by the project's bioswales and the resurfacing of the cycle path,

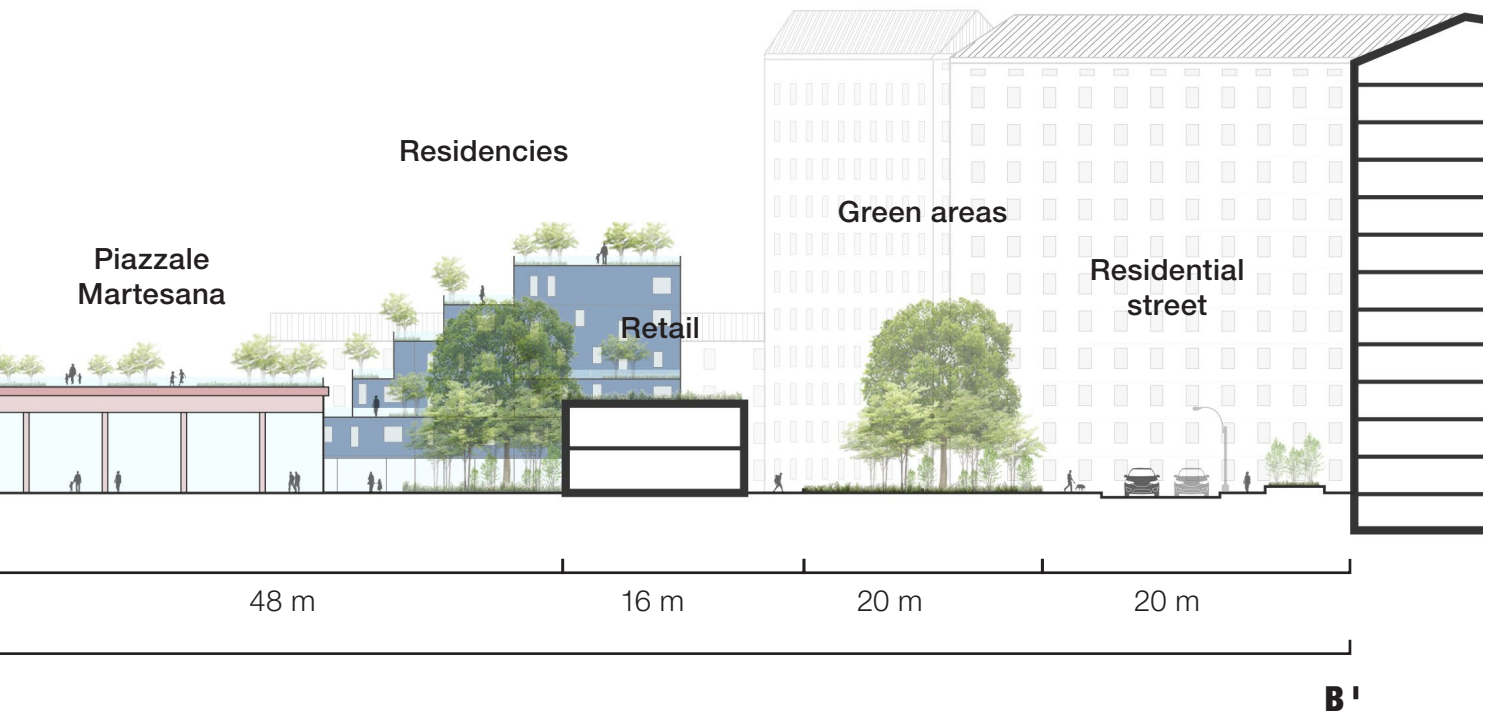
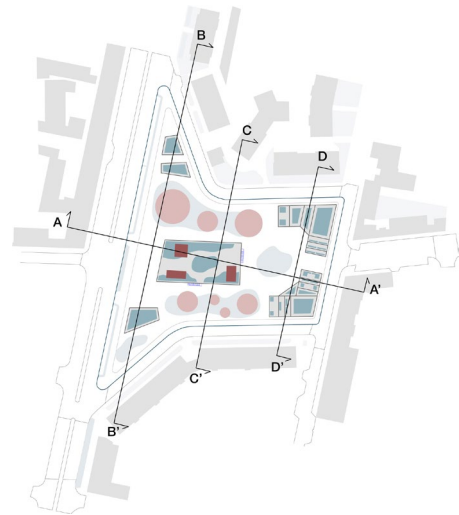
which becomes a protected cycle lane for a stretch of about 170 metres.

The section then continues by cutting through the existing building re-functionalised for commercial activities; green areas of the square and the new social housing and via Aristotle and the surrounding buildings.

# SECTION B-B'



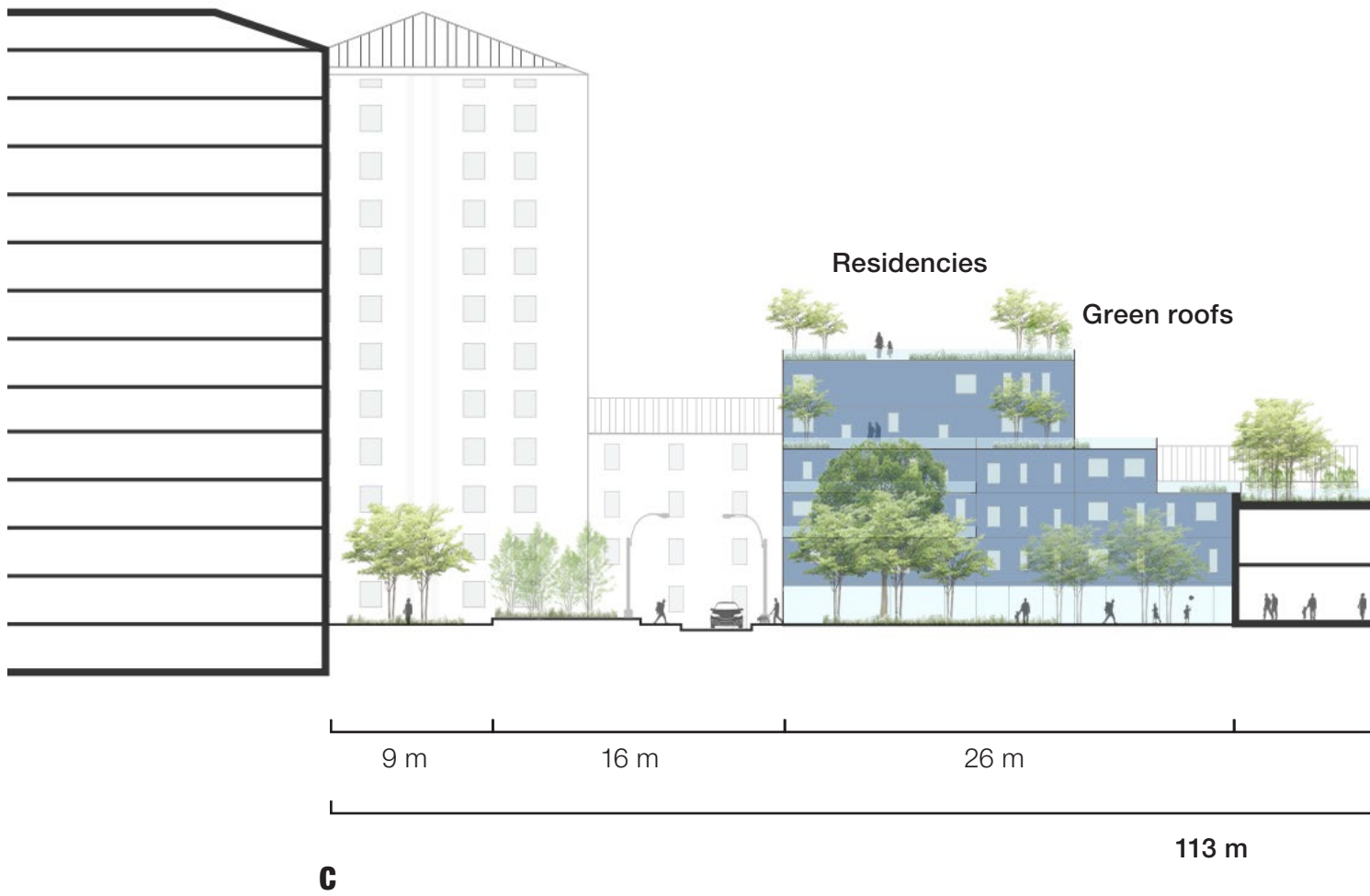




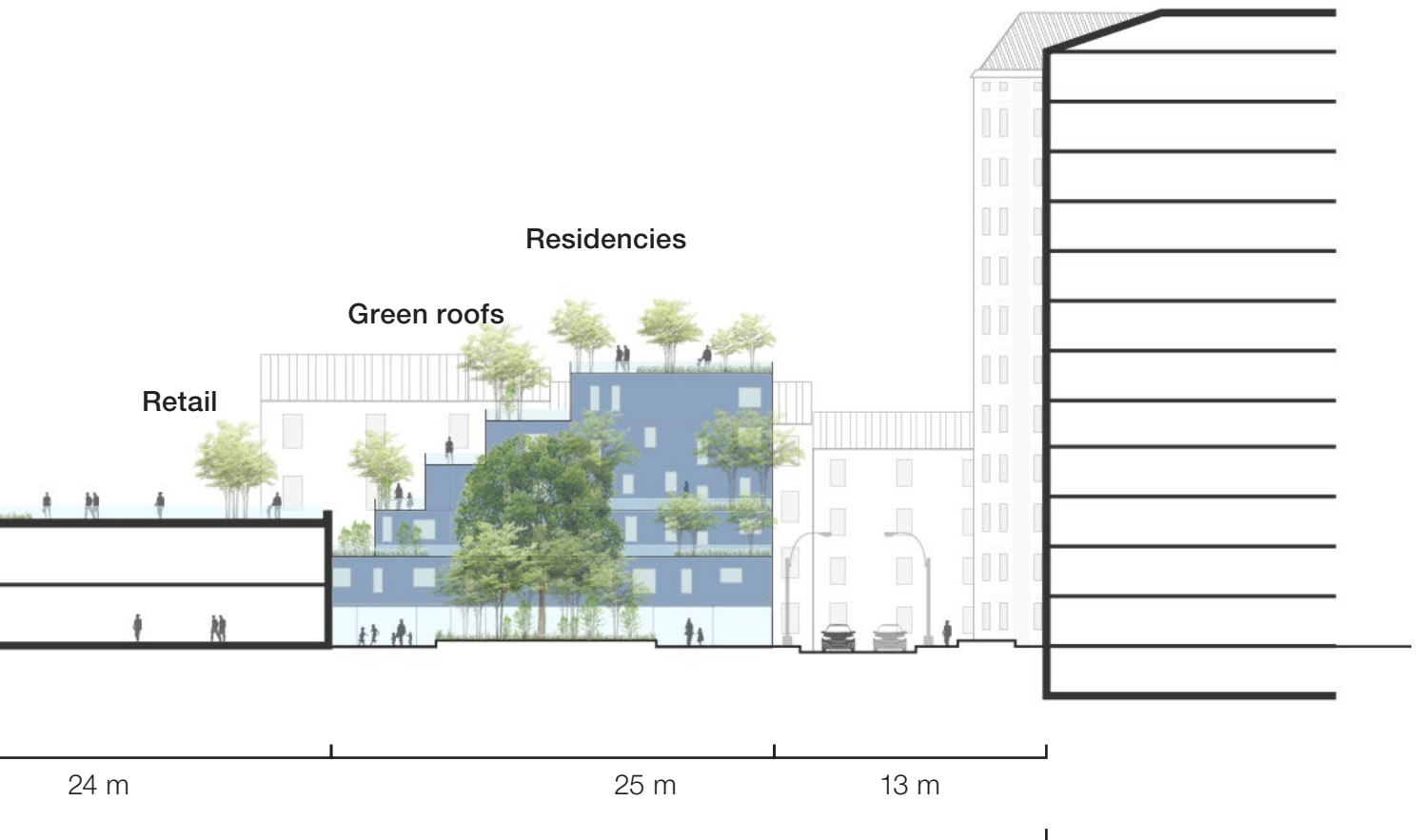
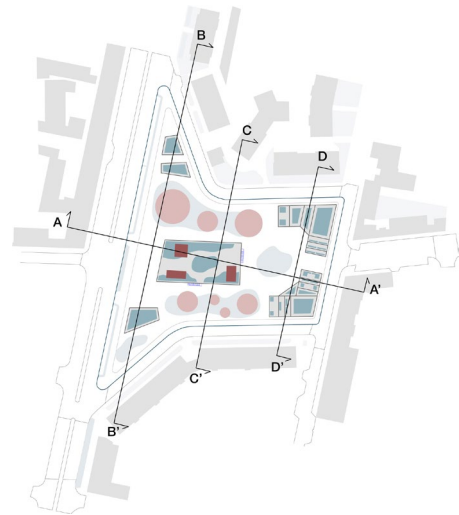
This second section is the largest (184 m) and can be considered a quasi-territorial section. It has a north-south cut parallel to Viale Monza, but with the view facing Via Aristotle. The streets delimiting the boundaries of the square on the sides are then sectioned off; the new commercial buildings are placed along Viale Monza in such a way as to ensure high accessibility to a widespread public.

In the background we then notice the ATM building re-functionalised as a commercial building with its full-wall glazing and green roof, and the social residences rising to a height of 18 metres, not too high compared to the dwellings along Via Aristotle, nor too low compared to the 10-floors residential buildings on either side.

# SECTION C-C'







**C'**

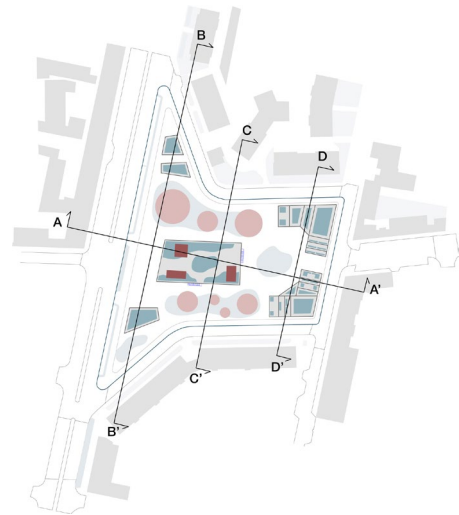
The section represented cuts the square from north to south as exactly in the centre. The sectioned parts therefore include the two streets on either side, but above all the ATM building re-functionalised as a commercial building, where one can also see the reuse of the roof, which houses trees and various green elements, and the relaxation and refreshment areas that

are connected to the activities below. One then notices the trees in the square and the green and play areas. In the background are the subsidised residences that have ground floors with shop windows for shops or catering or bar activities to activate the square.

# SECTION D-D'





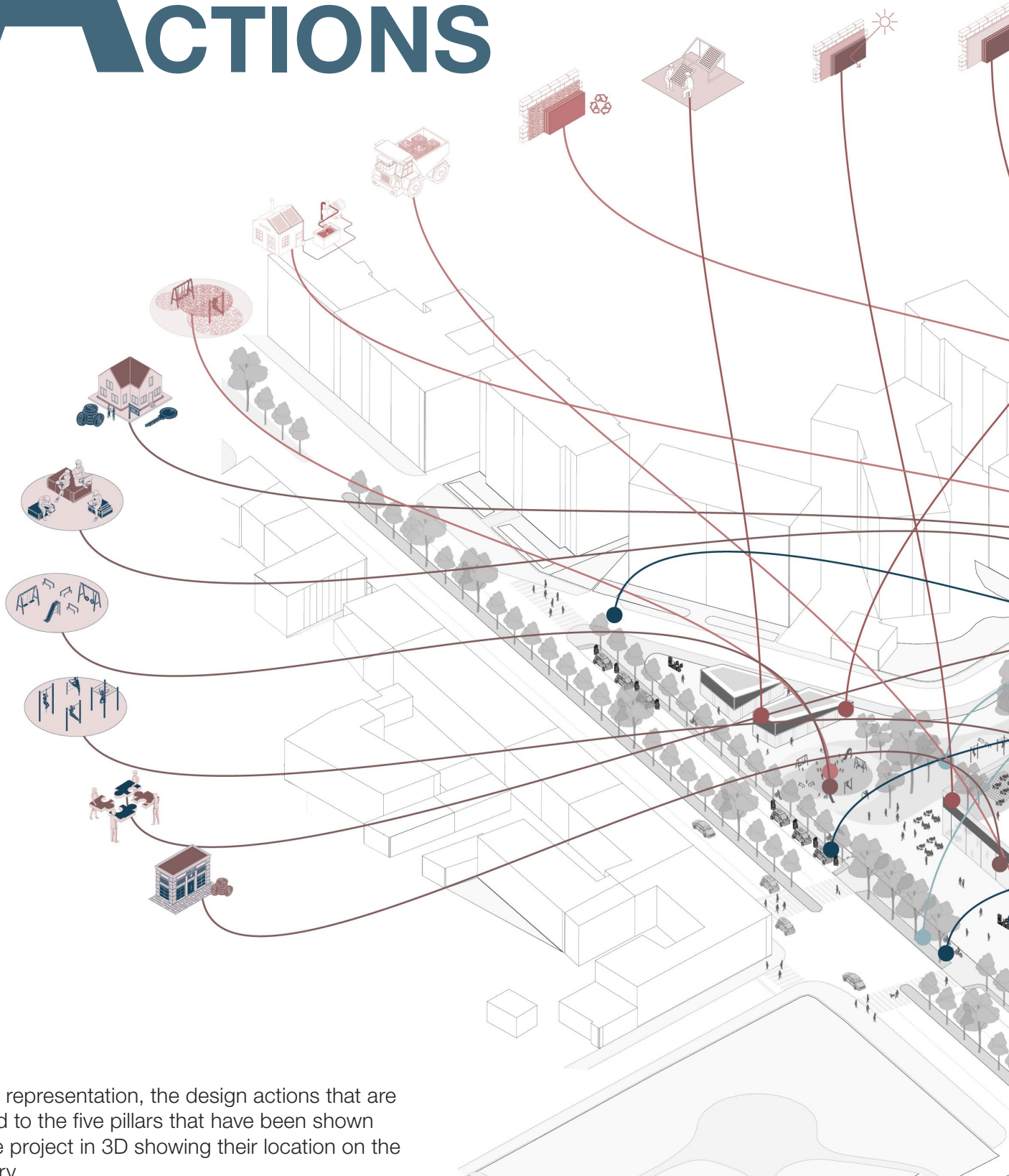


This section is intended to focus more on the new social housing on the east side of the site. The section cuts through the square for 30 metres along with it and the adjacent trade, the two new residential developments are dissected. One notices the height of the buildings, i.e. 6 levels of which five storeys above ground, numerous balconies to favour the passage of light into the

rooms, ventilation, and cooling of the rooms with the installation of plants and shrubs on the balconies. Underground parking spaces for residents and active ground floors with shop windows to accommodate commercial and craft activities are noted. In the centre, part of the square (30 of the 45 m) is sectioned off as a meeting place and passageway for the residents of the neighbourhood.

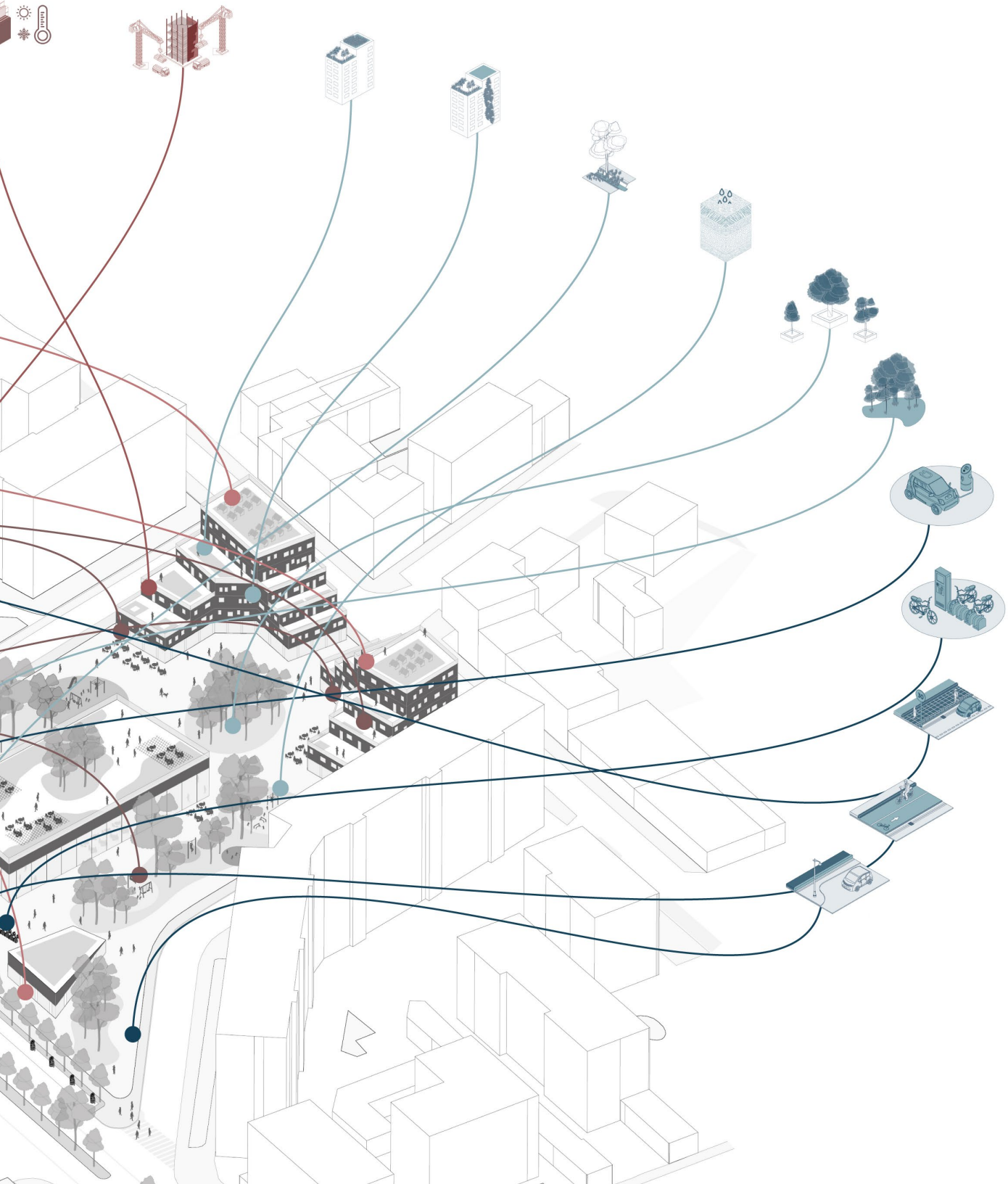
# ON-SITE ACTIONS

# ACTIONS

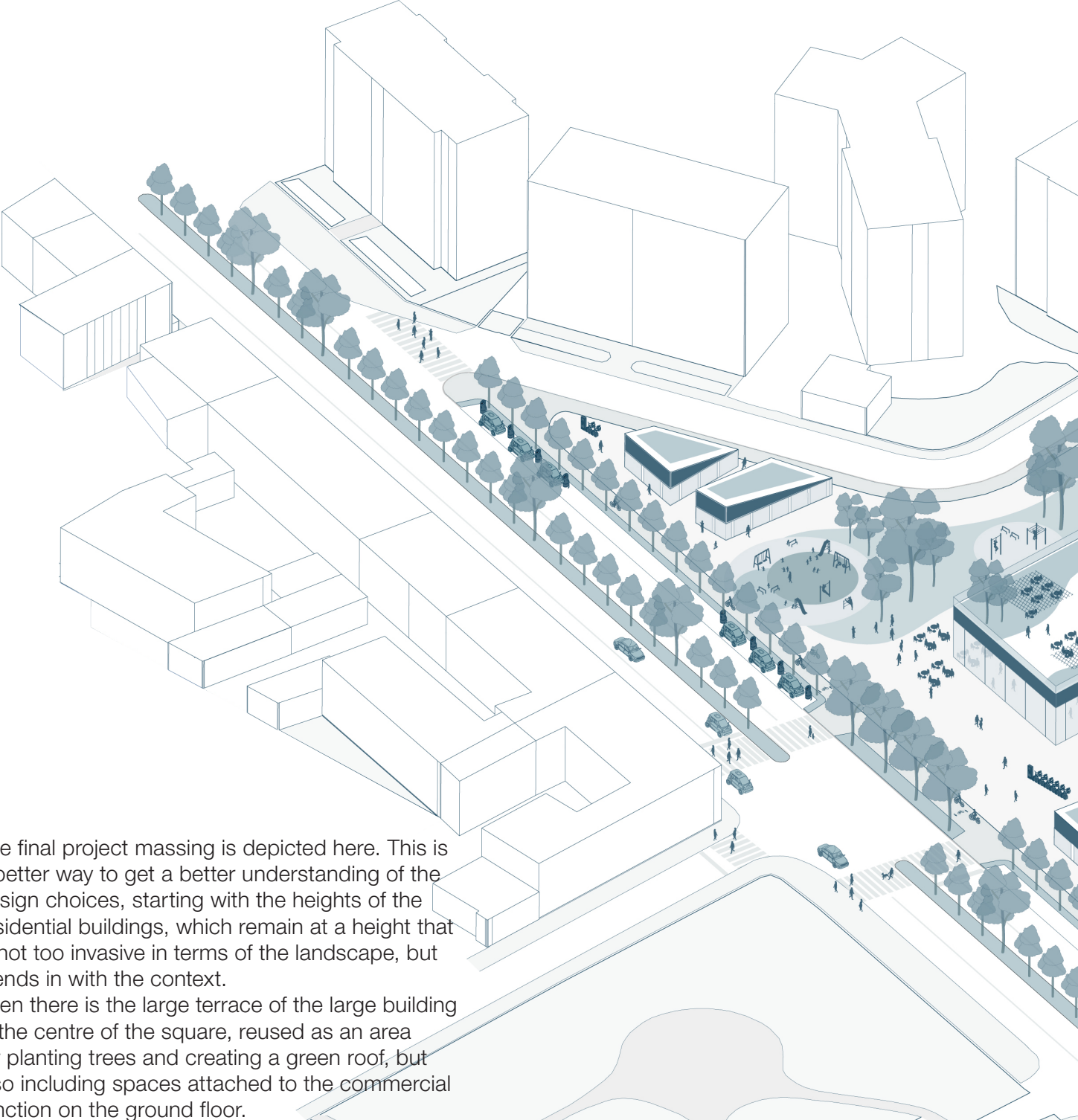


In this representation, the design actions that are related to the five pillars that have been shown on the project in 3D showing their location on the territory.



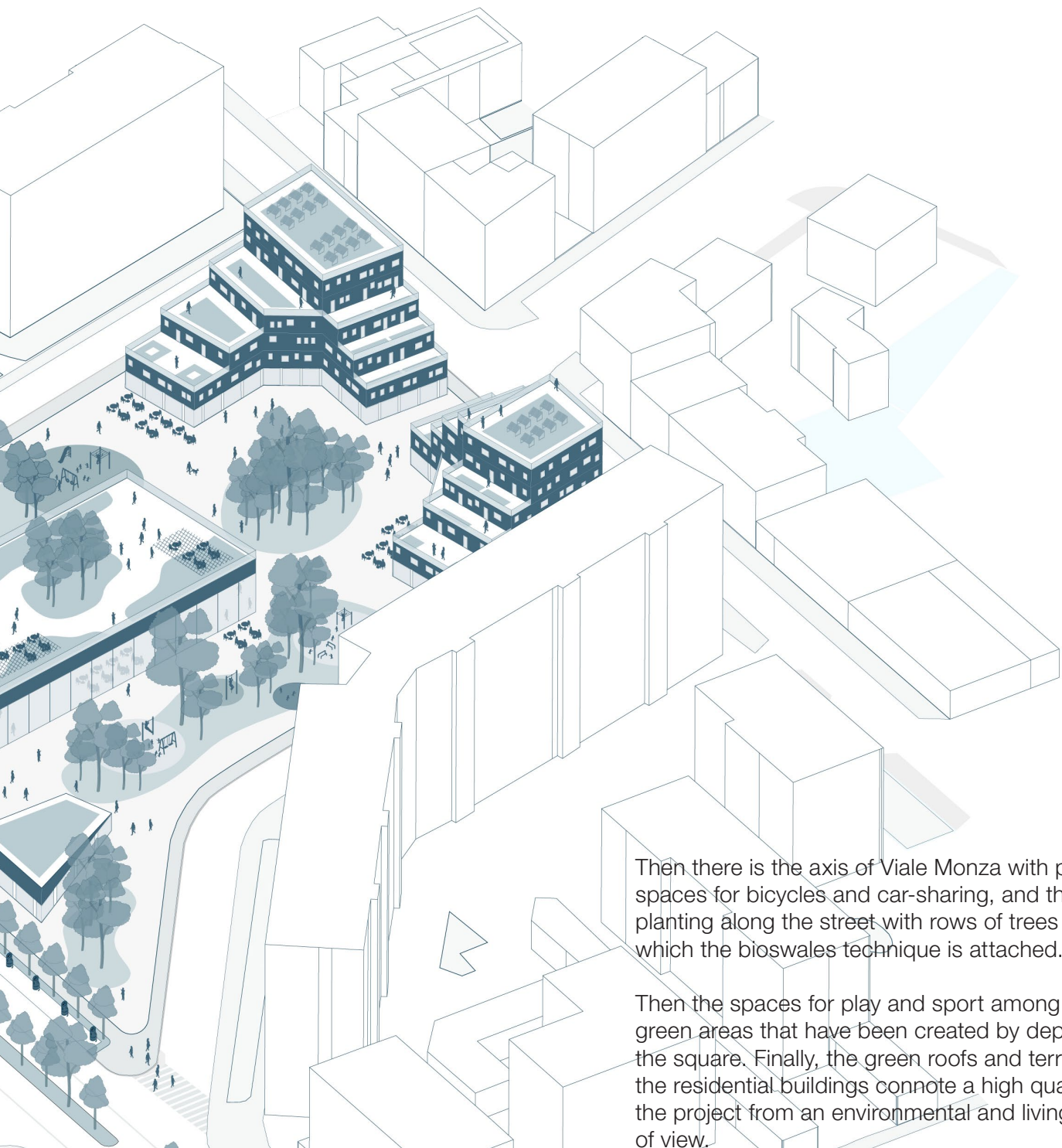


# M FINAL PROJECT MASSING ASSING



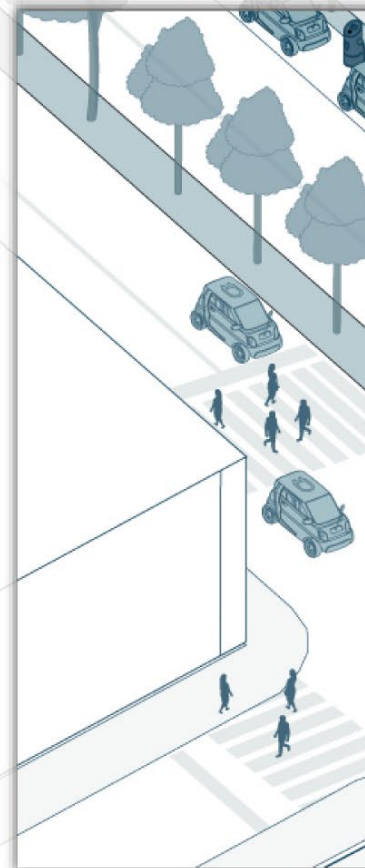
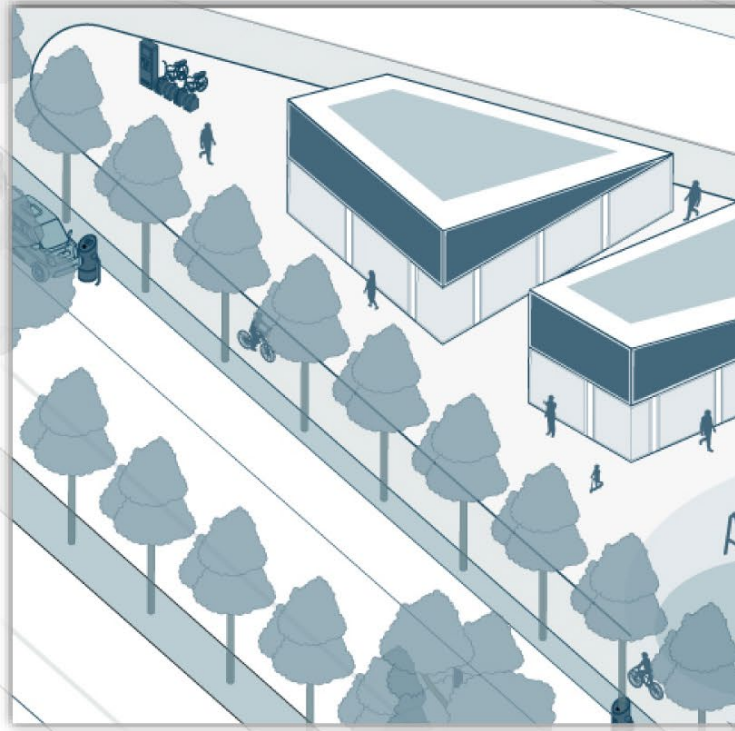
The final project massing is depicted here. This is a better way to get a better understanding of the design choices, starting with the heights of the residential buildings, which remain at a height that is not too invasive in terms of the landscape, but blends in with the context. Then there is the large terrace of the large building in the centre of the square, reused as an area for planting trees and creating a green roof, but also including spaces attached to the commercial function on the ground floor.





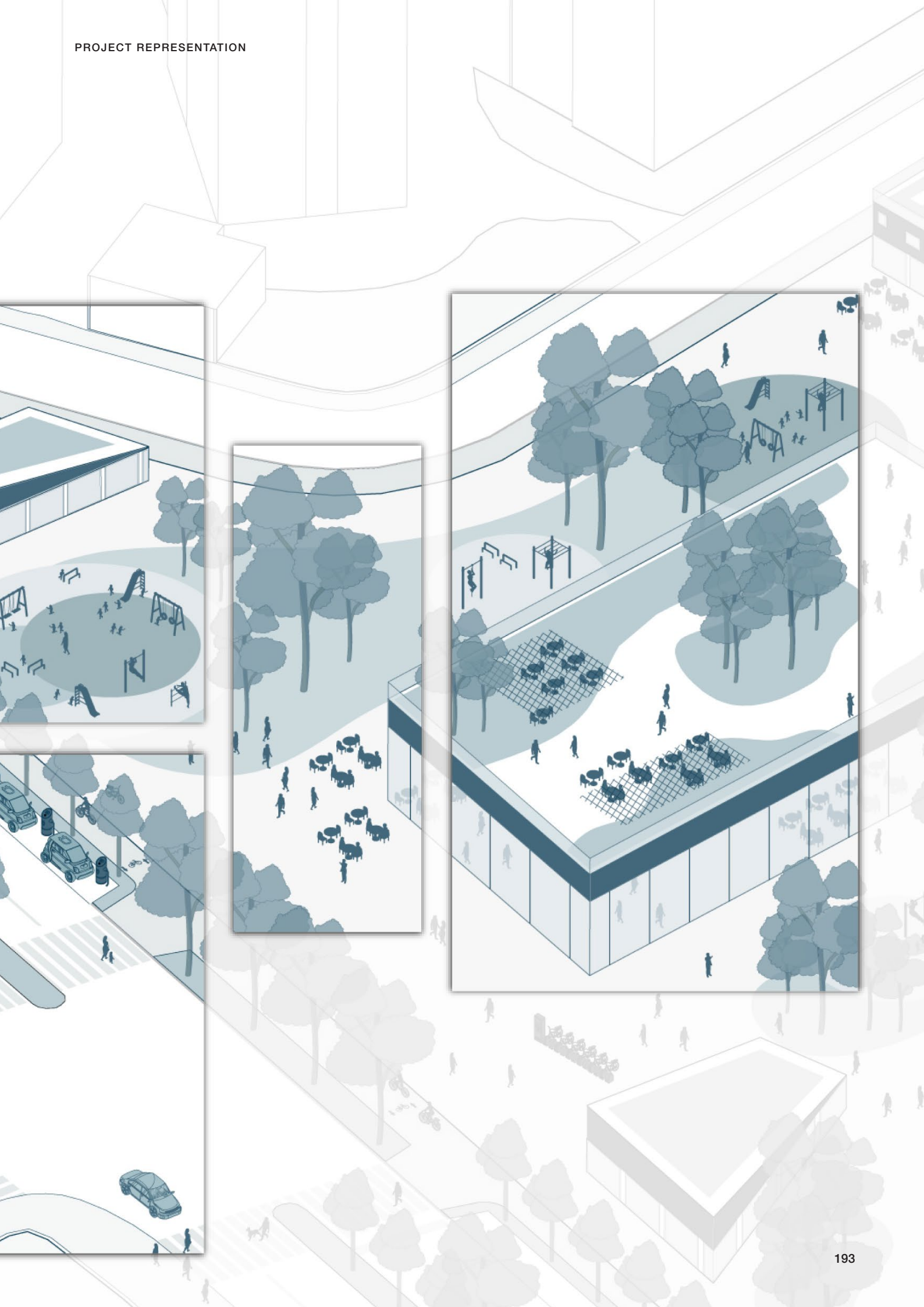
Then there is the axis of Viale Monza with parking spaces for bicycles and car-sharing, and the planting along the street with rows of trees to which the bioswales technique is attached.

Then the spaces for play and sport among the green areas that have been created by depaving the square. Finally, the green roofs and terraces of the residential buildings connote a high quality of the project from an environmental and living point of view.



The purpose of this representation is to highlight certain project parts drawn in three dimensions in order to better understand the total configuration of the project. There are focuses on bioswales pedestrian crossings, electric car charging areas, bike sharing, play areas and commercial activities

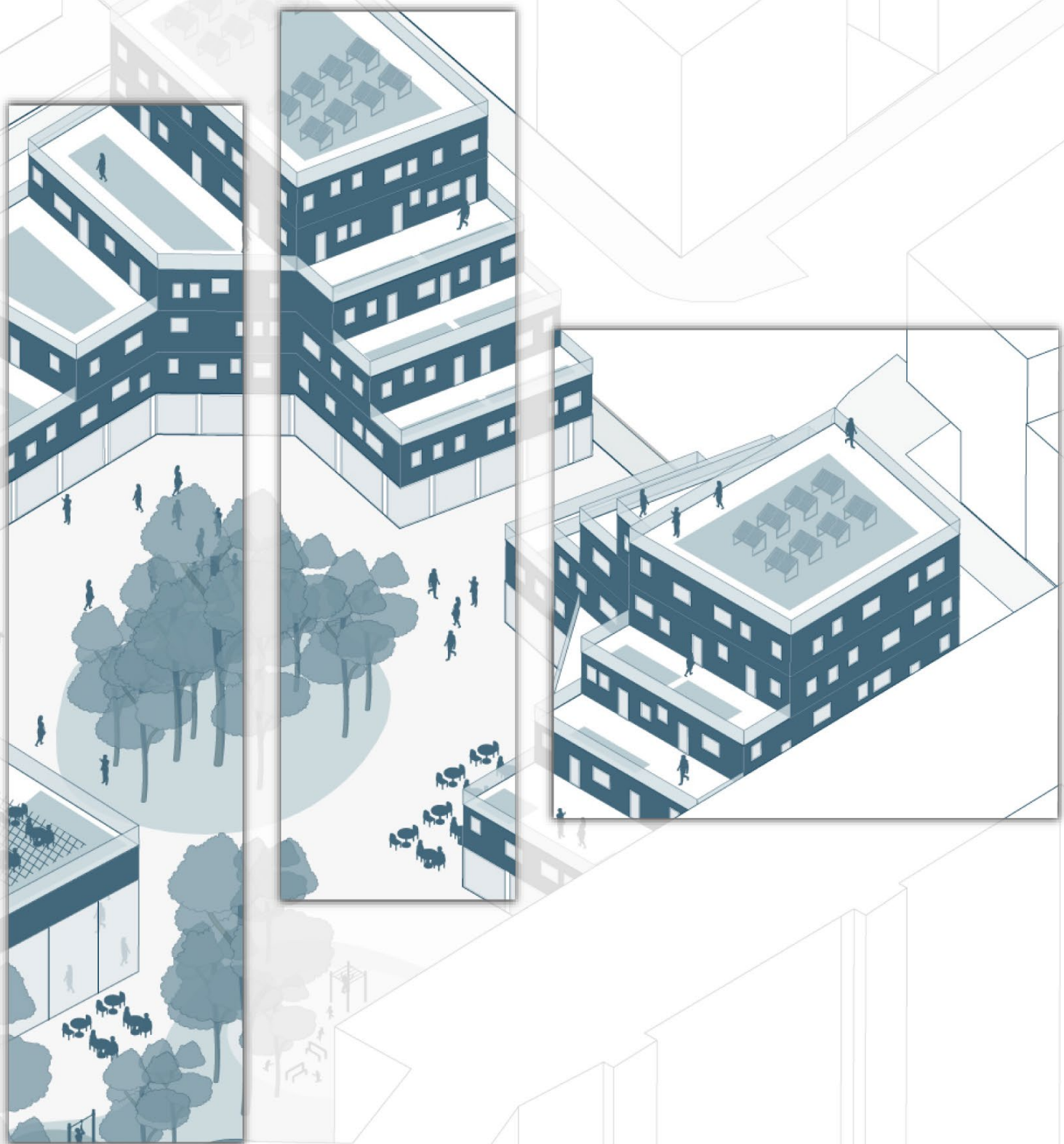




The purpose of this representation is to highlight certain project parts drawn in three dimensions in order to better understand the total configuration of the project. There are focuses on green areas, residential buildings and green roofs, and outdoor dining.









# OVERVIEW OF THE NEW PIAZZALE MARTESANA

# OVERVIEW







# ***Project Final Results***

| LOCALIZING THE SDGs

| FINAL CONSIDERATIONS AND OUTCOMES

# 07



In this last chapter, as a final conclusion, the representation of the 10 challenges of Reinventing Cities related to the Sustainable Development Goals that are linked to the project actions are given.

In this last chapter seeks to draw answers to the questions that were previously posed. It thus demonstrates the need to adopt innovative solutions to deal with the obvious problems that the contemporary city is facing and will have to face.

The thesis sought to provide project proposals for the regeneration of a small part of the city of Milan. But with the intention that this example of urban regeneration may be a trigger for further regeneration in those parts of the city that need it.

# LOCALIZING THE SDGS

## PROJECT ACTIONS

INSTALL SOLAR PANELS

USE OF INSULATION MATERIALS

CONSTRUCTION BY PHASES

CREATE BIOSWHALES

COLLECTION OF RAIN WATER

GREEN ROOFS

GREEN WALLS

PLANT TREES

PROVIDE ELECTRIC CAR SHARING

PROVIDE BIKE SHARING

ZONE 30 STREETS

SHARED STREETS

PROVIDE PROTECTED CYCLE PATH

## SDG



## 10 CHALLENGES

GREEN BUILDINGS AND ENERGY EFFICIENCY

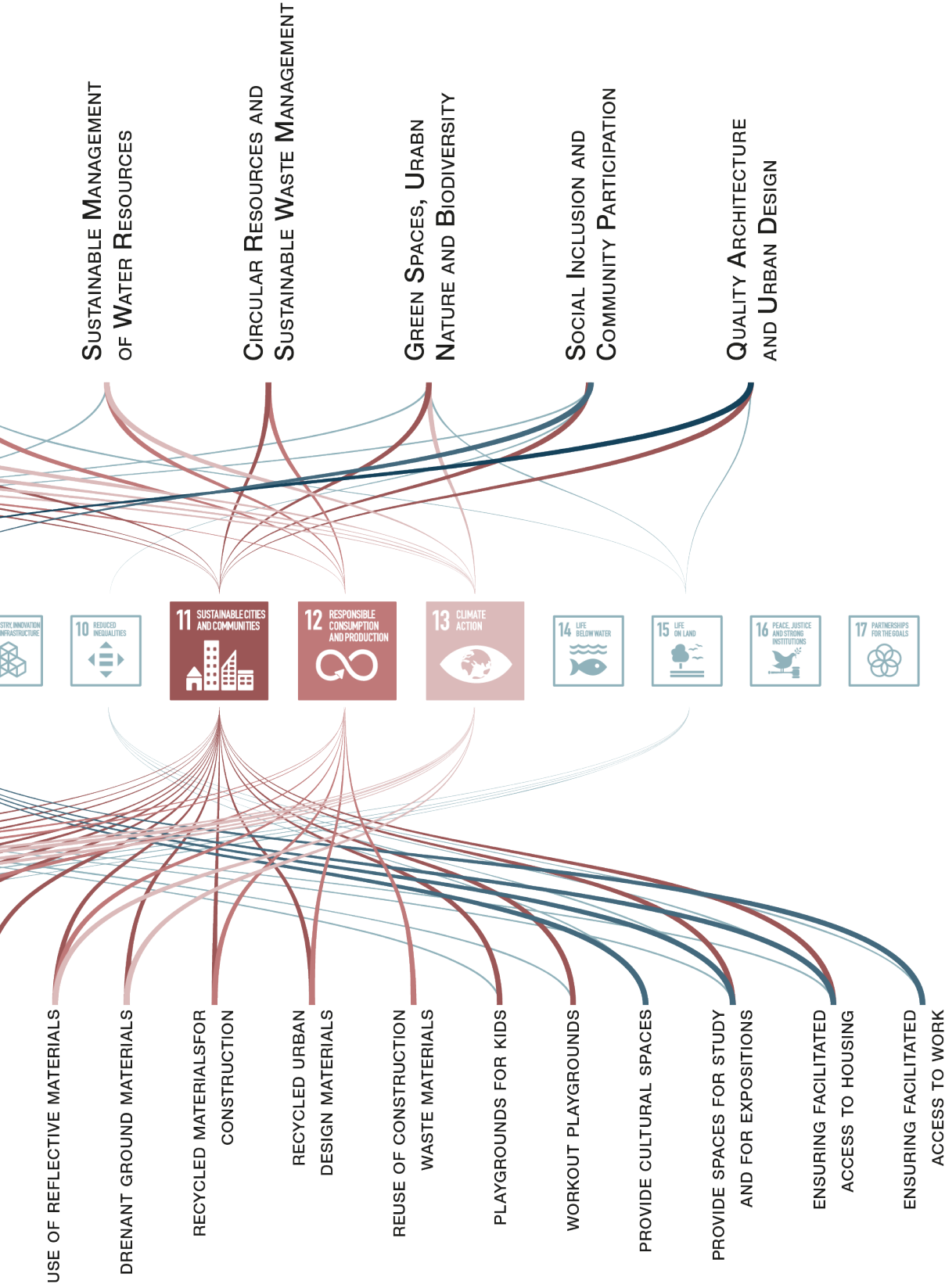
SUSTAINABLE CONSTRUCTION AND BUILDING LIFE CYCLE

LOW-EMISSION MOBILITY

RESILIENCE AND ADAPTATION CLIMATE

SUSTAINABLE LIFESTYLE AND GREEN JOBS





# C

## FINAL CONSIDERATIONS AND OUTCOMES

At the beginning of the thesis, questions were posed on the main themes of climate resilience of cities and innovation to meet the demand for rent-controlled housing. After introducing the themes, the question was asked how they could fit together in the design of the contemporary city and how these major challenges could be addressed in the future.

The C40 Reinventing cities competitions are a window into the future of cities, they have the great merit of bringing urban innovation with advanced techniques of climate resilience, sustainability and circularity. It was therefore very useful to approach the themes with a design and realistic approach, referring to a specific city and area. The reinventing cities competitions were able to stimulate the design of the Piazzale Martesana also thanks to the best practices of previous years, which dealt with climate-centred projects but also began to introduce the issue of living.

Milan took the opportunity of this third edition of the competition to focus on the theme of public housing and economic facilities for access to housing. This orientation on the part of Milan and its administration is also evident in the Piano di Governo del Territorio (Territorial Government Plan), where a series of strategies are outlined to deal with this problem in the city's suburbs and for a weak segment of Milan's population.

Therefore, it must be acknowledged that the ideas and objectives of the Milan administration are in line with those of the Reinventing Cities competitions about housing, but also the climate factor.

For several years now, Milan has been adopting more and more planning strategies to improve the city's climate conditions. For example, through the Climate Air Plan, some very important and demanding goals have emerged for Milan, which will face major climate challenges.

What emerges from the thesis is how the two main themes are closely linked and how they will be increasingly so. In the previous chapters, therefore, the problems in Milan and Martesana square in terms of climate and living have been demonstrated.

Through maps created using special programmes, the problems of heat islands for Milan and Piazzale Martesana in particular were illustrated. This is a very real and concrete problem, which can also lead to problems related to excessive rainfall and few permeable surfaces that can drain water. There is also evidence of few green areas in Milan, and especially few trees. These have great benefits with high resilience and adaptation potential for cities. Trees could change the look and feel of the city, the way Milan is experienced.

Concerning living, a series of data was collected to demonstrate the high property values that exist in Milan, which may be justified in some respects, but have reached a threshold that is too high for a large part of the middle class. Access to Milan is 'discriminatory' and selective for a certain type of population that does not yet have the necessary resources to 'survive' in a city like this. It has therefore been shown that there is a high need for social housing, both for economic and community reasons, to be able to establish relations and



relationships between the inhabitants of the neighbourhoods, strengthening the possibilities for the younger population to be able to live in Milan.

As explained at the beginning of the thesis, one must broaden one's gaze and observe the phenomena of mass immigration due to the climate and the enormous growth of the population in the often poorer areas of the world that do not have access to housing and consequently do not have the technology to cope with certain difficult climatic situations. These are two issues that intersect often and in every part of the world, which is why Milan must also be ready and take immediate action.

Here the climate influences living, and living adapts to and 'counteracts' the climate, which continues to change. The question is therefore how to live resiliently and sustainably, but also how to ensure that everyone can do so with equal opportunities.

The thesis has fielded a series of actions based on natural solutions for climate adaptation such as urban forestation, depaving, the introduction of bioswales, and green roofs and walls. These actions are recognised as effective and aesthetically appreciated in modern urban design.

Actions that make use of materials recycled from construction sites to create playgrounds or street furniture for the square itself. But also the collection of water, which seems to be in excess during certain times of the year, but if conserved and reused in the warmer months can make a difference in the dry times of summer.

Good practices for the new resident population, which can find comfortable public and private spaces. Through the creation of dedicated spaces for play and sports outside and spaces for study and work inside the buildings.

Actions are provided to address the energy efficiency of buildings by using insulating and sunlight-reflecting materials, and the exploitation of renewable energies such as solar energy produced on-site, to minimise CO2 emissions from the square.

And finally, sustainable mobility initiatives were made with the use of bicycles and shared cars powered by electricity. This discourages the use of cars, which are no longer at the 'centre' of the square, but remain at the edges and become the least convenient means of getting around. Piazzale Martesana values the pedestrian, his speed and urban rhythms.

The thesis, therefore, demonstrated how resilient and sustainable living is possible for all, through an urban regeneration project of a single-function, anonymous and sterile square that has become the identity and community centre of the neighbourhood, but also an example of resilience and climate adaptation. A pilot project aimed at generating domino effects in the area, pursuing a wider regeneration of the neighbourhood and Milan as a whole.

08



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