

# HAPPY SPACE

Regeneration Design of abandoned Scalo Farini  
railway yard in Milan



**Politecnico**  
Milano 1863

Faculty of Architecture, Urban Planning and Construction  
Master of Science Degree in Architecture-Building Environment -Interiors

# HAPPY SPACE

Regeneration Design of abandoned  
Scalo Farini railway yard in Milan

**Author**

Zhaowei Guo – 940559

**Supervisor**

Prof.Neratzia Tzortzi



# INDEX

|  |           |
|--|-----------|
| <b>ABSTRACT</b>                          | <b>08</b> |
| <b>01 INTRODUCTION</b>                   | <b>10</b> |
| Research Background                      | 11        |
| Research Meaning                         | 12        |
| Research Purpose                         | 13        |
| Methodology                              | 14        |
| <b>02 INVESTIGATION AND ANALYSIS</b>     | <b>16</b> |
| Landscape Composition                    | 17        |
| Landscape Characteristic                 | 18        |
| Problems of abandoned urban railway yard | 19        |
| <b>03 THEORETICAL BASIS</b>              | <b>22</b> |
| Sustainable Development Theory           | 23        |
| Urban Greenway Theory                    | 24        |
| Restoration Ecology Theory               | 25        |
| Landscape Ecology Theory                 | 26        |
| Health Promotion Theory                  | 27        |
| <b>04 CASE STUDY</b>                     | <b>30</b> |
| URBN Headquarters Park ,US               | 31        |
| Gleisdreieck park,Berlin                 | 33        |
| Nature Park,Berlin                       | 35        |
| The High Line Park,New York              | 37        |
| <b>05 STRATEGY SUMMARY</b>               | <b>40</b> |
| Form Regeneration                        | 41        |
| Ecological Regeneration                  | 43        |
| Function Regeneration                    | 46        |
| Cultural Regeneration                    | 48        |

# INDEX

|  |            |
|--|------------|
| <b>06 SITE ANALYSIS</b>                      | <b>52</b>  |
| Milan Railway Station Regeneration Agreement | 53         |
| Milan Green (s)                              | 55         |
| Miilano 2030                                 | 56         |
| Municipal plan of Project Area               | 57         |
| Environment Qaulity of Milan                 | 59         |
| Urban Context and Ongoing Project            | 61         |
| Exsiting Landscape and Facilities            | 63         |
| Existing Green and Tracks                    | 65         |
| Public Space User                            | 67         |
| Design Framework                             | 69         |
| <b>07 PROJECT DESIGN</b>                     | <b>72</b>  |
| <b>Masterplan</b>                            | <b>73</b>  |
| <b>Link</b>                                  | <b>75</b>  |
| Circulation System                           | 77         |
| Park Spines                                  | 79         |
| Path Type                                    | 83         |
| <b>Activity</b>                              | <b>85</b>  |
| Rendering                                    | 85         |
| Network                                      | 87         |
| <b>Ecology</b>                               | <b>89</b>  |
| Ecological Urbansim                          | 89         |
| Stormwater Management                        | 91         |
| Planting Design                              | 93         |
| Ecological resilience                        | 97         |
| Transformation of Railway Tracks             | 100        |
| Transformation of Industrial Structure       | 105        |
| Transformation of Waste Material             | 107        |
| <b>Health</b>                                | <b>109</b> |
| <b>Phasing Diagram</b>                       | <b>113</b> |
| <b>08 CONCLUSION</b>                         | <b>116</b> |
| <b>09 BIBLIOGRAPHY</b>                       | <b>117</b> |

# ABSTRACT

Urban space along the abandoned railways often become the representative of 'negative space' in the city because of a series of negative effects caused by abandoned railways such as traffic jams, urban space fragmentation, poor environmental quality and land value depression.

However, disused railways are not worthless. The transformed role of railways is always related to the development process of the city closely. In the past, these railways were important transportation carriers driving urban expansion and industrial development. However, they are special storage space and industrial heritage in cities at present. Under background of stock urban space development concept, abandoned railway space regeneration has become a common problem in cities worldwide. From the perspective of urban demand, excavating the multiple kinds of potential value and exploring regeneration possibilities of urban abandoned railway space that have become the core issues to study. This thesis mainly includes the following aspects:

(1) Understand the background, content and significance of the renewal of the abandoned railway area in Milan.

(2) Analyze the constituent elements and problems of abandoned

urban railways, and summarize the characteristics of abandoned urban railways.

(2) summarize the related theories and practical researches on the landscape regeneration design of abandoned urban railways, and summarize the pertinent theoretical support for this research, including sustainable landscape theory, greenway theory, landscape ecology theory, etc.

(4) Through the above research, put forward the renewal strategy of urban railway abandoned, including form regeneration, ecological regeneration, functional regeneration and cultural regeneration. Among them, the renovation of abandoned railway site buildings, supporting facilities, and the use of waste materials are explored.

(5) Interpret and analyze the excellent practical cases of urban railway wasteland renewal, and further broaden the ideas for the recycling design of abandoned railways.

(6) Finally, explore the characteristics of scalo farini, and by digging out the inspiring and attractive features of the negative area, propose a regeneration plan for the scalo farini railway yard to complete the transition from negative space to positive space, and create a unique "local spirit".

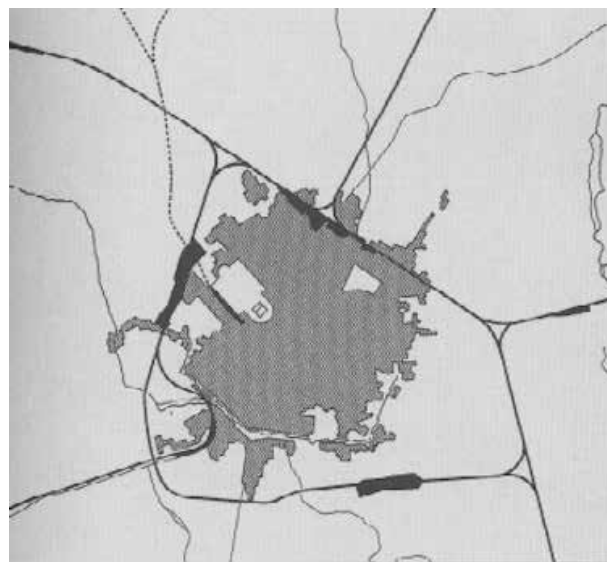
**Key words:** Abandoned railway area, Regeneration design

# 01 INTRODUCTION

## Research background

Thanks to its position and its commercial importance, Milan has always been a very important railway crossroads. Already at the end of the nineteenth century it was possible to take a train in Turin and get off in Venice thanks to the lines built to connect the cities of northern Italy. All the most important lines that transported goods and passengers inevitably passed through Milan, which had several stopovers from which to unload and load the trains.

The railway played such an important role in the life of the city that in 1912 the municipality launched one of the most ambitious urban projects of the time: it moved most of the railway track outwards to ensure that the railway reached the new residential districts and industrial suburbs, dismantling the existing Central Station. During the Thirties the network became more or less that of today: the new Central Station and the cargo ports of Lambrate, Farini, Greco and Rogoredo were built. Milan had become the railway capital of Northern Italy.



the Milan network between 1860 and the early 20th century



The Milan network in 1970.

After many years of relative operation, at a certain point two things happened: the first is that from the seventies onwards Milan has progressively lost its industrial vocation - which required a continuous flow, in and out, of raw materials and finished products - in favor of the development of the tertiary sector. Dozens of companies, such as Ansaldo, have had to close their Milanese factories, or move elsewhere. The second is that Italy, despite a highly developed railway network, has chosen to favor road freight rather than rail: according to a recent estimate by Eurostat, since 2000 the share of goods transported by rail in the internal market has been stable at around 10 per cent, with a very slight increase in recent years (the European average is 17.8 per cent). The overall share, on which no precise calculations exist, is estimated at around 6 per cent.

Today Milan is experiencing a new phase of development which is

## Research meaning

leading to crucial transformations from an architectural and urban point of view. Within an extremely changing scenario, the succession of historical phases, linked to the progression and socio-economic change of the city, has led to the inevitable transformation of the territory. Areas that in the past determined the identity of Milan as an industrial city, today see the development of new activities or in the most extreme cases, are abandoned. This is the case of the former Milanese railway yards, which from nerve centers connections of the Lombard capital have now become disused areas where wild nature is the master. In a context of growth, however, it is becoming increasingly necessary to reuse these areas, which, as in the past, will have to adapt in order to cope with the cultural context imposed by our time. Yet the case of Milan is unique in Italy, in terms of position and surface of the abandoned areas: seven now abandoned airports have been identified, almost all close to the center, which the municipality would like to obtain from Ferrovie dello Stato and subsequently redevelop.

**1. Economic significance:** For any project, the economic value often determines the feasibility of the project. Since the design is based on the transformation of an abandoned railway, the original facilities, materials and natural resources of some sites can still be used. The railway has a flat linear terrain, so the terrain processing will be relatively simple. Compared with other new projects after blind demolition, landscape regeneration design projects can be implemented at a lower cost.

**2. Environmental significance:** The regeneration plan of the abandoned railway area advocates the concept of protecting environmental resources. On the one hand, the precious limited land resources of the city are used rationally and effectively. On the other hand, it can beautify the urban living environment and maintain the healthy development of the city, so the city is abandoned. Railway area regeneration is a forward-looking sustainable planning and design.

**3. Cultural significance:** The abandoned urban railway area is the witness of urban development and carries the memory of urban development. Through the regeneration design, the abandoned railway can show the history of urban evolution and development to the public, especially the younger generation, and enrich the regional culture. Connotation, actively maintain the diversified landscape culture between regions.

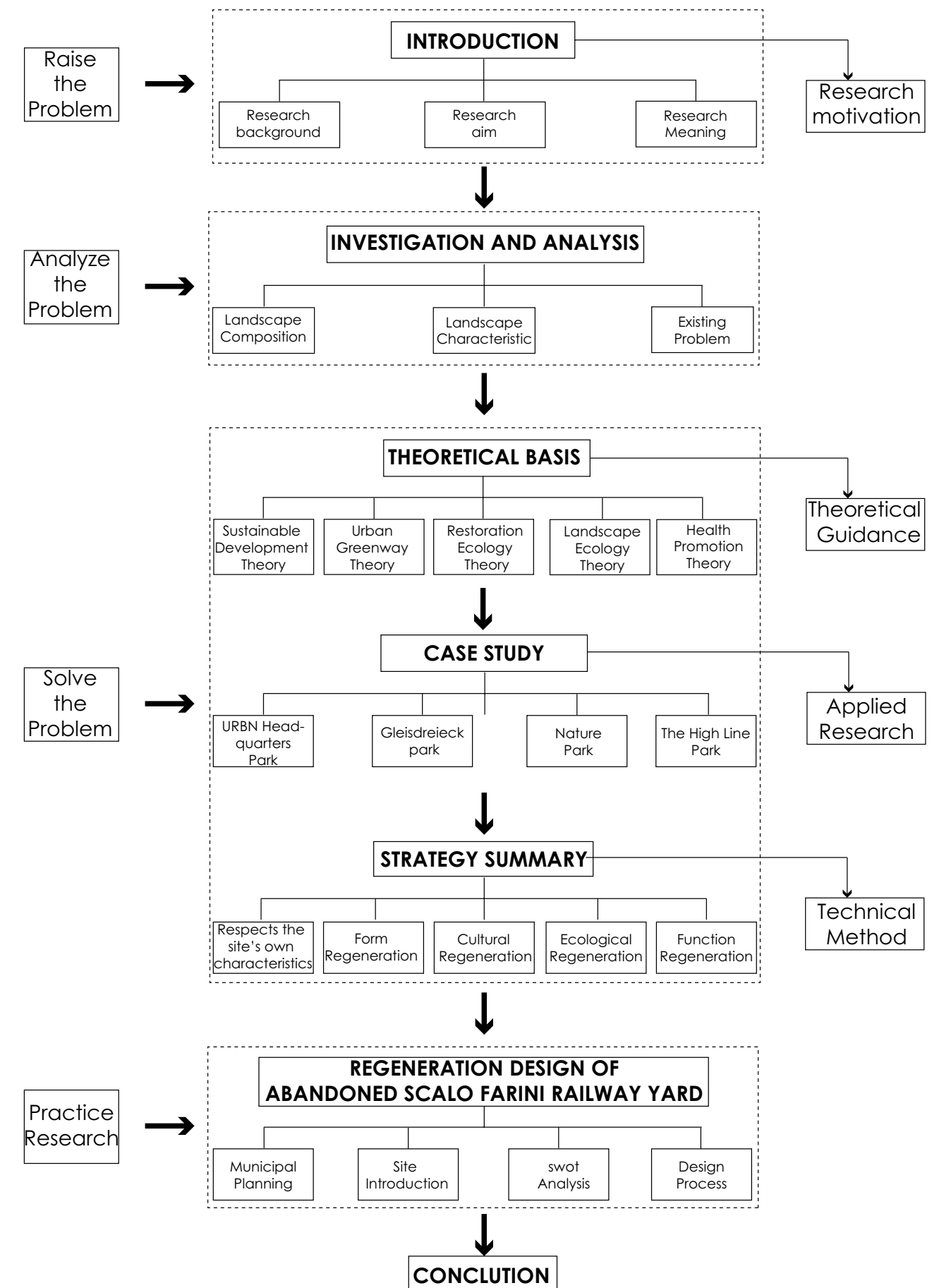
**4. Social significance:** The renewal design of the abandoned urban

## Research purpose

railway area integrates planning and design, art aesthetics and engineering technology science, etc., which is conducive to ending the development trend of the existing traffic space in the city and increasing or reducing urban land use. Rate, optimize the urban environment, enhance the investment environment, increase the value of urban land, and promote regional economic development.

Based on the above background research, the purpose of this thesis is to construct a systematic urban railway wasteland renewal design system, based on the overall consideration of the actual situation in Milan, socio-economic and political background, combined with case-based empirical research, and explore how to integrate the urban railway wasteland renewal plan is integrated into the overall layout of the urban space and the construction of the human settlement environment, and ultimately achieves the sustainable renewal and rejuvenation of the city.

## Methodology



## **02 INVESTIGATION AND ANALYSIS**

## Landscape Composition of Urban Abandoned Railway Yard

The abandoned urban railway area is a complex with very rich content, including a series of constituent elements. It not only contains the concrete physical entity of the railway and related supporting facilities, but also contains the internal and surrounding natural environment elements

and the very different social history and culture. Through literature survey, analysis and summary, I divided the landscape components of urban railway wasteland into three categories, namely, the main landscape, the subsidiary landscape, and the environmental landscape.

**Tab.1 The analytical table of landscape elements of railway wasteland**

| Number | Type                    |                      | Components and forms   |
|--------|-------------------------|----------------------|--|
|        | Major categories        | sub-categories       |  |
| 1      | Noumenon Landscape      | Route                | Roadbed, bridge and tunnel buildings, track  |
|        |                         | Boundary fence       | Stone fence, soil fence  |
|        |                         | Line type            | Straight line, curved line   |
| 2      | Accessory landscape     | Transport station    | Passenger station, cargo station, passenger and cargo station  |
|        |                         | Locomotive           | Vehicles, self-wheeling special equipment  |
|        |                         | Signal flag          | Signal machine, signal indicator, various signs  |
|        |                         | Logistics support    | Overhaul and maintenance equipment, housing construction, loading and unloading equipment, Power supply and drainage equipment |
| 3      | Environmental landscape | Natural environment  | Mountain and water, flora and fauna, climate, topography, others   |
|        |                         | cultural environment | Physical, virtual  |

**Tab.2 The analytical table of cultural environment elements**

| Number | Sub-categories | Components and forms  |
|--------|----------------|---|
| 1      | Physical       | Relevant stele marks, ethnic settlements along the line, cultural relics and historical sites and other humanistic entity records, leftover train operation diagrams, railway transportation production plans, dispatch records and other documents               |
| 2      | virtual        | Historical biographies, myths and legends, celebrity anecdotes, regional customs, allegorical symbols along the railway line, local festivals, and literary works, music works, film and television works, animation works related to the location of the railway |

## Landscape Characteristics of Urban Abandoned Railway Yard

### Industrial distinctiveness

The abandoned urban railway yard is a testimony and product of urban industrial development, leaving behind many buildings (such as stations, factory workshop, warehouses, etc.), mechanical equipment, industrial facilities, waste, etc. Old sleepers and rusty railroad tracks, empty stations and deserted sites, mottled walls and horizontal trusses, majestic tower cranes and artificial traces, all these deserted things have a strong visual impact on the industrial landscape. These strong elements of the times and industrial production colors are just irreplaceable unique landscape personality. These typical industrial landscape elements represent the technology and wisdom of an era, and are an important part of the process of human civilization. Their landscape personality has long-term significance for creating urban regional landscape features and showing urban regional features.

### Ecological vulnerability

The construction of the railway and the subsequent generation of abandonment are all human factors' compulsory intervention in the natural environment, because it changes the natural development process, thereby breaking the regional ecological balance, causing vegetation destruction, soil pollution, reduction of biodiversity, and self A series of ecological problems such as weakened restoration capacity and fragile ecological system. The follow-up process of environmental and

ecological restoration also requires proper human guidance. After a long period of ecological self-repair, the soil can be gradually improved, vegetation growth can be increased, biodiversity can be increased, and ecological balance can be achieved.

### Human continuity

The abandoned urban railway yard has witnessed the development and changes of an era, a period of history, and even a city. It is a product of the interweaving of natural succession and the process of human civilization, and it is a space-time link connecting the past and the future. Urban railway wasteland, as a transportation network that used to run through the urban development process, is relatively independent and has close connections with surrounding areas and even the entire city. The railway has witnessed social development and various changes in people's lives. Although it has lost its transportation value, it still contains rich cultural value. The inheritance of historical memory and cultural heritage is a continuation of spiritual wealth.

### Spatial scalability

The abandoned urban railway yard landscape is the same as the general linear landscape elements, with spatial expansion, diverging from one area of the city to another area, and slowly merging with the original landscape of the city. The abandoned urban railway yard landscape connects the surrounding scattered spaces with



## Problems of abandoned urban railway yard

different scales and different forms of expression, realizing the organic renewal and spatial expansion of the city, and finally forming a reasonable large space structure.

### Functional diversity

The abandoned urban railway yard landscape can not only improve the urban planning, restore the ecological environment, promote the development of tourism, promote economic improvement, and enrich the lives of citizens. While the abandoned urban railway yard loses its original transportation function, it also provides a natural corridor base for natural organisms, which plays an important role in maintaining biodiversity and the migration of wild animals and plants. The large-span structural characteristics of industrial buildings in the railway yard are conducive to the diversification of transformation methods and utilization methods. Different abandoned urban railway yards can be transformed into creative industrial parks, tourist attractions, parks and green spaces, slow-moving systems, and exhibition areas according to different site characteristics and place spirits.

### Existing problems

#### 1. Problem of road traffic system.

The abandoned urban railway yard, as a legacy of urban development, generally passes through the center of the city, affecting the improvement of the urban road system, road alignment, and unobstructed intersections. Some areas are difficult to pass even on foot.

#### 2. Problem of environmental security

The abandoned urban railway yard has been abandoned for a long time and lacked supervision and management. It is easy to become a place for urban garbage and waste to be piled up, which seriously affects the city's sanitation, and sometimes this kind of areas become a temporary resident for vagrants, which also brings security risks to urban security.

#### 3. Problem of illegal construction.

The abandoned urban railway yard is generally surrounded by original safe areas. The long-term abandonment has caused ineffective urban supervision, which has caused the proliferation of illegal buildings, shantytowns, and temporary buildings. The overall space environment is in dilapidated conditions, which greatly affects the image of the city.

#### 4. The problem of sewage discharge.

In general urban railway abandoned land, the urban drainage pipe network was not set up in the original planning and construction, and the domestic sewage from residents and illegal buildings along the railway line was discharged randomly, which caused serious accumulation of sewage in

some railway abandoned areas and caused local land pollution, affecting the growth of vegetation.

#### 5. Problem of urban planning.

Due to the existence of negative factors such as The abandoned urban railway yard, the long-term planning of the city is restricted, which affects the economic value and future development of nearby areas in the city. The abandoned urban railway yard has also become a negative weak space in urban management.

### Regeneration problems

#### 1. Ignore regional function positioning

The abandoned urban railway yard is an important part of the urban spatial texture, and its regeneration needs to be better integrated into the urban master plan and conform to the urban regional positioning. The regeneration of some abandoned urban railway yards ignored the overall positioning of the regional functions. They were only updated for renewal. The transformed area could not be integrated into the new urban space texture, that is, it failed to effectively repair the fragmentation of the landscape, resulting in the isolation of the area, increasing spatial heterogeneity, which is also an important aspect that requires us to think and improve in the practice of the abandoned urban railway yard update.

#### 2. Lose the beauty of the wilderness

Long-term unused and abandoned, the urban railway wasteland, a less polluted urban industrial area, has a

reversible self-repairing ecosystem. The performance of abandonment is generally overgrown with weeds and desolate wilderness. If the landscape renewal of the abandoned urban railway yard fails to excavate the beauty of the abandoned wilderness on the site, but directly uses modern garden landscape design techniques and forms to transform it into a uniform urban garden landscape, although significant changes have been made, it will also be lost the characteristics of the site.

#### 3. Block the local cultural network

The abandoned urban railway yard is not an isolated space, the value and potential of its regeneration mainly come from the profound local culture and social development context, and it comes from the development of the times and the transformation scenes of people's lifestyles that it has witnessed. Some existing cases of regeneration of the railway abandoned land, excessive development and reconstruction, destroying a large number of industrial landscapes that can be retained and reused, blocking the way to achieve memory inheritance through waste retention and reuse.

#### 4. Lack of landscape features

Because of the differences in culture, climate and other factors, the situation of the abandoned urban railway yard cannot be the same. If we overly rely on the design concepts and methods of the existing abandoned railway area renewal cases, the renewal area may lack characteristics, or even cause an absurd result that is incompatible with the surrounding culture and the appearance of the city.

## **03 THEORETICAL BASIS**

## Sustainable Development Theory

"Sustainable Development" originated in the late 20th century. It is one of the most important ideas of the last century and is widely accepted worldwide. Sustainable Development theory is based on the "3R" principle: reduce resource consumption, reuse of resources and recycling of resources. Sustainable Development theory requires a change in the traditional foundation development model that emphasizes economic benefits and neglects environmental protection: through industrial technology upgrades, structural adjustments, and rational layout, the original resource-based economy's extensive development model should be changed, and economic, social, and environmental benefits should be comprehensively considered, make full use of high and new technology, implement clean production and civilized consumption, form an intensive and efficient coordinated development pattern, so as to achieve the ultimate goal of harmonious and sustainable development of society, economy and ecological environment.

Therefore, regeneration of abandoned urban railway yard is a new problem faced by urban development, and it is also a practical embodiment of sustainable development theory. In terms of ecology and environment, regeneration of abandoned urban railway yard is helpful for ecological restoration and landscape construction of damaged areas caused by industrial production to achieve the harmonious development of human and nature. Economically, the recycling of old railway industry

materials will help reduce the cost of renovation. On the other hand, the potential benefits brought by improvement of the spatial landscape and the optimization of the ecological environment will also help to enhance the efficiency of the site and drive the value of the surrounding area. In terms of society, it provides citizens with a good platform for recreation and leisure, and through the infiltration of updated concepts, enhances people's understanding of the history of industrial development and resource recycling, so as to achieve the inheritance of social spiritual wealth.

## Urban Greenway Theory

Greenway theory originated in the United States. Normally, the Boston Emerald Necklace plan designed by Law Olmsted is considered to be the first real greenway system in the United States. In the era when its rail network was rapidly replaced by road transportation, the United States fully realized the potential value of the greenway network in many aspects, so it began to try the planning and construction of the greenway network in the 1950s, until the concept of greenway was developed in the 1970s. The meaning of green roads is very broad, and under different background environments and conditions, they will have very different meanings. Only a more representative definition is selected here: a greenway is a linear corridor that can improve environmental quality and provide outdoor entertainment. The linear open space established by artificial corridors such as urban railway wastelands, ditches, scenic roads used for recreational activities and Including all natural landscape routes and artificial landscape routes accessible to pedestrians and cyclists. It is an open space link that connects parks, nature reserves, scenic spots, historical sites, and other high-density gathering areas.

Greenway has many characteristics such as linearity, accessibility, and continuity, which leads to a variety of functional cooperation, which can be summarized as three functions of ecology, recreation, and social culture. Driven by the "rails-trails conservancy" in the United States, the movement of urban railroad abandoned land into walking trails began in 1998. As a

special type of greenway, the walking path transformed from the abandoned urban railroad land meets people's recreational needs and becomes an important link between the past and the present of American society and culture. The research object of this thesis, the abandoned urban railway yard, is a typical linear open space, which also has the characteristics of connectivity and accessibility. Due to the long time of being abandoned, its ecological, recreational, leisure and other functions as well as its historical and cultural heritage have been neglected. In the regeneration process of the abandoned urban railway yard, it should give full play to its ecological corridor function, recreational facilities in the morning, and excavate historical context. As a typical carrier of the greenway, it should be integrated into the regional and even the entire city's greenway network in terms of spatial layout.

## Restoration Ecology Theory

Restoration ecology originated from research on natural resource management such as mountains, grasslands, forests, and wildlife 100 years ago. Among them, the theories and methods of water and soil conservation and replanting after deforestation developed in this century are still used in restoration ecology. Restoration ecology studies the causes and texture of degraded ecosystems, taking into account social needs, and under the guidance of ecological succession theory, combined with certain technical measures to accelerate its progress and succession, eventually restore or establish a self-sustainable ecosystem with ecological, social and economic benefits. The research goal of restoration ecology is to explore the restoration and reconstruction of various ecosystems damaged by natural disasters and human economic activities. Its research objects are very wide, including natural disasters, such as ecological damage and ecosystem degradation caused by earthquakes, volcanic eruptions, mudslides, floods, etc., and environmental pollution caused by human activities such as mining, iron smelting, chemical industry, construction, and pollutant discharge. And ecological system degradation, through the flexible use of ecological restoration techniques, alleviating urban general environmental problems are the core issues of restoration ecology research.

The ecological environment of the abandoned urban railway yard is poor. In its landscape regeneration design, the theory of restoration ecology is introduced, which can effectively

solve the pollution problem in the site. Restoring the ecology of the abandoned urban railway yard has the dual functions of urban land development and ecological protection, and has economic value, ecological value and multiple uses. The application of restoration ecology in different regions is different. For example, unlike in the construction of nature reserves, the application in urban areas should take full account of human factors. Therefore, the ecological restoration project of the abandoned urban railway yard should comprehensively analyze the impact of various types of people in the city. In addition, the restoration of the abandoned railway ecological project should adapt to other urban landscape styles, and consider its impact on the lives of surrounding residents.

## Landscape Ecology Theory

Based on the theoretical framework of ecology, landscape ecology integrates the strengths of related disciplines such as geography to study landscape and large-scale regional resources and environmental management and management. One of its significance lies in its starting from the perspective of the structure, function and evolution of the regional landscape, understand the existing living conditions of the biological world (including humans).

The research objects and methods of landscape ecology reveal its holistic and macro-analysis system theory. It uses "patch-corridor-matrix" as the macro-analysis framework to break through internal limitations. In order to achieve the organic combination of the components in the system, to achieve the core purpose of "the whole is greater than the sum of parts". Landscape ecological planning is also based on this theoretical framework, emphasizing how to maintain the heterogeneity of landscape units and restore the connectivity and integrity of landscape ecological processes and patterns.

The abandoned urban railway yard studied in this thesis has a typical strip linear spatial form. Combined with the macro analysis framework of landscape ecology, it is not difficult to find that abandoned urban railway yard can play the role of ecological corridor. Ecological corridors usually have the functions of habitat, conduit, barrier, filter, source and sink. Almost all the landscapes in the system are divided by corridors, but they are connected together by corridors at

the same time to form an organic whole, which complements each other. The characteristics of the corridor highlight the important role of the corridor in the landscape. Research on corridors is currently mostly focused on biodiversity protection. Experts believe that corridors are conducive to the spatial movement, survival and continuity of species.

## Health Promotion Theory

There are many definitions of health promotion, but the most widely recognized is the definition under the "Ottawa Charter": "Health promotion is the process of urging people to maintain and improve their own health." This is a comprehensive social and political process. It not only strengthens personal skills and abilities, but also changes social, environmental and economic conditions to reduce the impact of these factors on the health of the people. Therefore, health promotion is a process of enhancing people's ability to control the determinants of health, thereby improving their health. Due to the specific content and methods of health promotion work, its theoretical basis must cover many scientific fields, such as sociology, behavior, communication, education, and science.

With people's renewed understanding of health, a modern concept of health has gradually formed, and the concept of "healthy city" has emerged. "Healthy City" is a city that continuously puts forward public policies, creates and improves the physical and social environment, so that people living here can support each other to complete various activities in the provincial capital and fully realize their potential. A healthy city guarantees a healthy living environment for residents. Accordingly, it is necessary to establish an organization and take effective actions.

At present, the impact of some abandoned urban railway yard on the surrounding environment has attracted public attention. It is for the purpose

of promoting a healthy life. How to transform it into a place that is beneficial to the physical and mental health of urban residents is worth pondering.

## **04 CASE STUDY**



# URBN Headquarters Park

US Navy Shipyard

3.6 hm<sup>2</sup>



- 1 URBN Common  
urban-ites united
- 2 Industrial Hedgerows  
planted infrastructure
- 3 Rail Lines  
renewed flows
- 4 Dry Dock No.1 + Flagship Field  
criss-crossed events and everyday
- 5 Bldg No.543 Terrace + Garden  
dockside

## History + Location

The Urban Outfitters Headquarters reclaims nine acres of the Historic Core at the decommissioned U.S. Adventuring out of their disparate locations downtown, the four corporate brands that make up URBN seized the opportunity to establish a new corporate campus through the adaptive reuse of huge masonry buildings centered around a 500 foot-long dry dock where the civic axis of Broad Street meets the Delaware River.

## Strategy

### Materials Reuse

When it came to selecting materials for the URBN headquarters, site forensics unearthed the 'life cycle' palette: appliquéd asphalt, age-old concrete, tired brick, rusted metal, peeling surfaces of text and enough residue to reconstruct this industrial-strength landscape. Rather than the usual 'hog and haul' of a typical demolition plan, a salvaging strategy was deployed, harvesting what most would consider undesirable detritus. No imported materials were necessary, nor desired. Numerous full-scale mock-ups challenged construction-as-usual habits and became critical in developing tactics for reuse that proved to be cost effective. The make-over of on-site materials has URBN-ites feeling as if their new campus has actually always been there.

### Ecological Performance

The URBN campus expands the client's aesthetic pursuit of material reinvention to establish a broader capacity for ecological performance. With the Yard's expanses of concrete and asphalt reused on-site, nearly a thousand cubic yards of waste didn't make it to a landfill and site perviousness was increased by about eight hundred percent. This new URBN sponge structures a network of bioswales that diminish runoff to the river, filtering water to support hedgerows that shade west facing window walls.



The previous material is used for the new pavement



Summer: Trees and perennial herbs work together to create a wild scene.



The retained railroad tracks, the original X-crossing form exudes new charm in the new environment



The steel on the edge of the coffee terrace and the tree pond comes from recycled old railroad tracks, and the tree pond is planted with maple trees and covered with recycled red brick rubble.



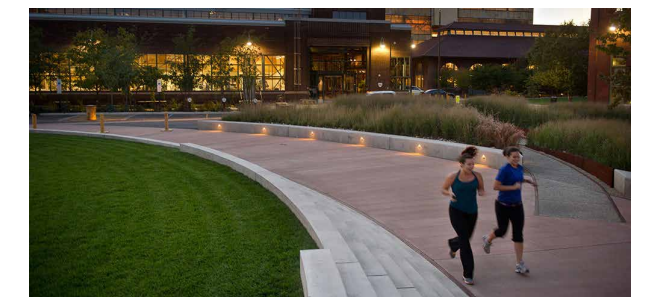
Overboard from No. 543 terrace, a new ecological vessel styled as an overgrown URBN logo is launched on the Delaware.

## Private Venture + Public Good

As a catalytic model for the Philadelphia Industrial Development Corporation's redevelopment of the 1200-acre former League Island, URBN set a high benchmark for not only the adaptive reuse of historic buildings, but also for the reinterpretation of a cultural landscape, one that distinguishes itself from the conventional Master Plan's suburban streetscape and corporate front lawns. The innovative client was willing to challenge the norms and listen to his headstrong landscape designer, who insisted that Dry Dock No.1 be designated and designed as a public park, not merely an extension of the his company's campus.



On the opening day, a large number of Philadelphia residents also participated, and the potential of the site was discovered to form a new gathering place.



Since moving to the Yard, employee turnover has dropped to 11 percent and fewer sick days are being used.



# Gleisdreieck park

Berlin, Germany

36hm<sup>2</sup>



## Strategy

### Simple but detailed

The designer hopes to consistently build a clear and modern park on the former railway station, so that the landscape architecture can return to its essence. Without any decoration, urban spaces can be created. These urban spaces produce strong poetic effects through exquisite details, perceptual materials and plants.

All elements of the park are designed according to the scale of the landscape. The 80-meter-long bench sculpture on the terrace and the light folded into different masts pass through the park, forming its own large-scale sculpture that constitutes the boundary of the entire site. .

## History + Location

The location of Gleisdreieck was once a triangular railway station. Since 1945, Gleisdreieck has been a wasteland. After entering the 21st century, people began to realize that it is an important ecological corridor in the Berlin green space system, which is formed along the abandoned railroad tracks. The green forest closely connects the two huge green lungs of Tiergarten in the north and Tempelhof in the east. Building this green space will obviously alleviate the urban heat island effect and improve the urban ecological environment. At the same time, building a charming park in the center of the city will undoubtedly provide a more pleasant outdoor public environment for the surrounding residents, and will also enhance the environmental quality of the entire city.



## Clear and diverse configuration

The vegetation and railway facilities are still preserved, but the railroad tracks that once dominated the site did not become the dominant element of the site's spatial structure on which the design plan relied. On the premise of not destroying the original site, functional areas such as amusement, walking, sports and cycling have been added. By means of an exceptionally large-scale and clear configuration many poetical types of scenery are created, together forming one big landscape: the freedom of the meadows, the backdrops of trees, the forest, the nursery, the large terraces, the small woods, the sport tracks, and the central plaza.





**Nature Park**  
Berlin, Germany  
18hm<sup>2</sup>



**History + Location**

The 18 hectare park is located on the former Tempelhof railway yard. The area where Sakiland Nature Park is located was once one of the busiest railway hubs in Berlin as a train marshalling yard. In 1952, it gradually became desolate. In 1995, Deutsche Bahn AG transferred 18 hectares of the land to the Senate. They served as compensation for interventions in nature that arose in connection with the expansion of traffic systems in the city center. The park is known for its mix of wild nature, decaying railway facilities and art.

**Strategy**

**Back to nature—Flora and fauna**

The park is a unique example of the emergence of an urban ruderal forest and is regularly examined by scientists. The initially sparse tree population became a dense forest with undergrowth. Climbing plants give it a primeval forest-like character. The forest now takes up two thirds of the area. The predominant tree species are the locust tree, which comes from North America, and the native birch. Both species are among the tree pioneers that quickly gain a foothold in new locations. Over time, enough nutrients have accumulated in the soil so that linden, Norway maple and English oak grow in the undergrowth.

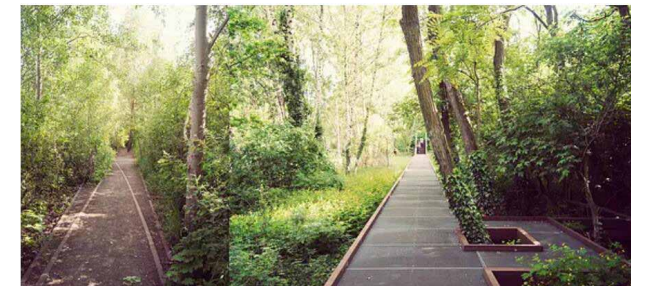
Many changes in the plant world are also reflected in the animal world. The number of "forest-dwelling" bird species such as nightingale, robin and blackcap is increasing. With increasing age, the forest will gain old and dead wood and will continue to change. Ideal biotopes for specialized fungi



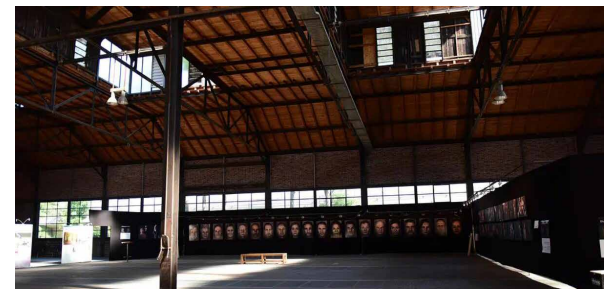
**Nostalgia**

**Art and derelict railway facilities**

Much of the former railway infrastructure remains on the site.



After the renovation of the old railway administration building, the information desk and cafe are located here



The locomotive repair workshop has now become a venue for hosting various cultural and artistic exhibitions and activities



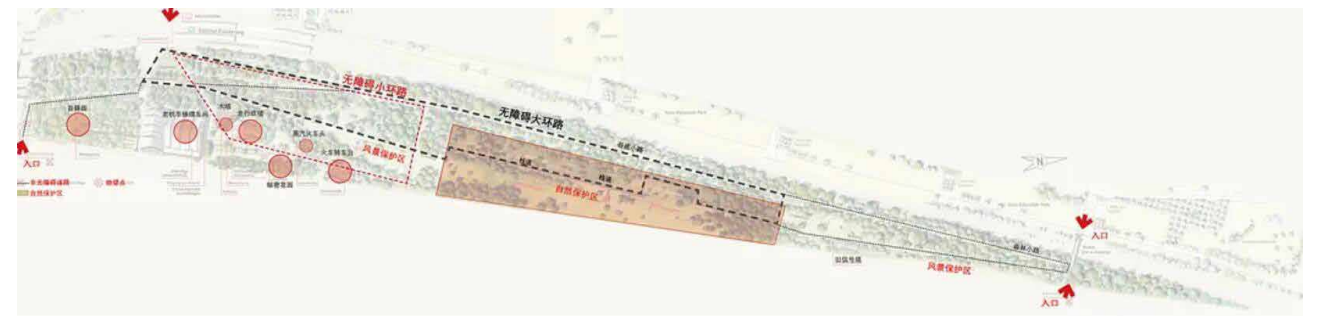
Tracks become paths



One of the oldest hubs in Germany



The old steam locomotive



The nature park has two handicapped accessible circular routes. Structures such as the water tower and turntable can be viewed on the small circular route, which is around 1 km in length. The large circular route is 2.7 km long and leads through the nature reserve.



# The High Line Park

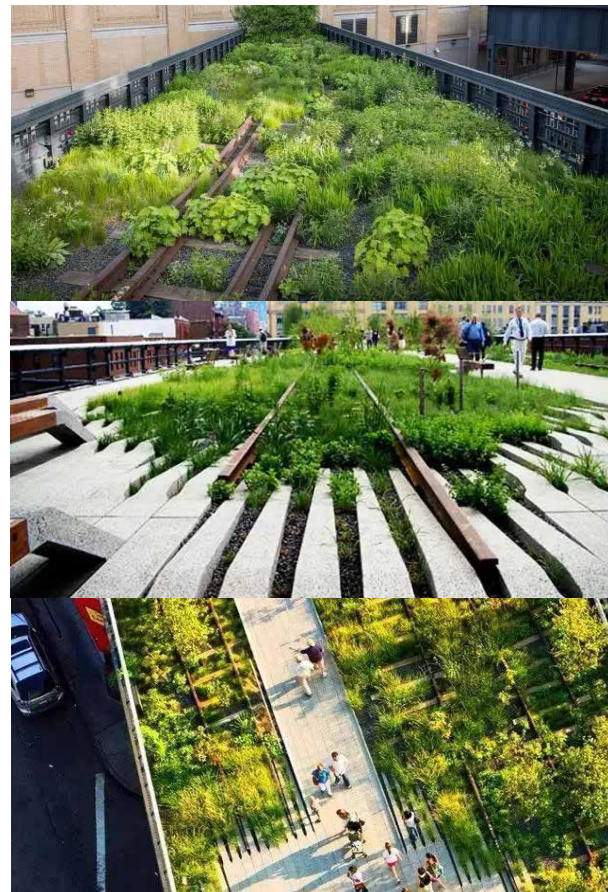
New York, US



## Strategy

### The fusion of natural and artificial

The selection and setting of vegetation is different from traditional pruning gardens, presenting a wild vitality, reflecting the extreme environmental characteristics of the site itself and the characteristics of shallow-rooted plants. Paving system: The strip concrete slab is the basic unit. Through the adjustment of the proportion, the plane is divided into different spaces, and it can also be flexibly changed according to the surrounding environment. There are open joints between the strip-shaped concrete slabs, and the joints are specially designed to be tapered so that plants can grow from between the hard concrete slabs.



Planting design of the High line park

## Design principle

The design cleverly strikes a balance between the landscaping of the high-line area and the preservation of the original industrial sense. The specific design scheme respects the site's own characteristics: its unity and linearity, its simple and clear practicality, its integration with grassland, bushes, vines, moss and flowers and other wild vegetation, as well as ballast, steel and concrete. Based on the accurate measurement of the area and scale of the high line, it uses less road surface and more original ground surface, plus various plants, creating a "slow pace" space.

## Unique landscape nodes

The rhythm of the High Line Park is very interesting and relaxing. From Phase I to Phase III, there are different facilities at different nodes in each section. The public spaces are stacked alternately, presenting different landscapes along a concise route.



1. At the entrance plaza of phase I, the suddenly truncated high line is erected in the middle of the street like a piece of art installation



2. The sun deck, large movable seats and the Hudson River in the distance complement each other.



3. Stepped viewing platform, using the bifurcation of the high line to make a sinking viewing platform



4. Chelsea bushes are a transitional zone between the phase I and phase II, and are planted with native American ornamental grasses and small shrubs.



5. Lawn stairs, the viewing platform lifts people's eyes to a few feet in the air



6. The woodland bus bridge, on which a metal bridge 8 feet above the high line is erected, people seem to be walking at the top of the forest.



7. Wildflower planting area, there are no buildings on both sides of this area, the sunshine is abundant, and the flowers are in full bloom.



8. The viewing frame, in order to commemorate the billboard hanging on the high line, the viewing frame becomes a window, which is a scene from every side.



9. Children's activity area, the third phase specially designed activity area for children.



## **05 STRATEGY SUMMARY**

# Form Regeneration

## Landscape visual elements

From the perspective of landscape aesthetics, visitors' most intuitive experience of the landscape comes from the visual experience of the external form. The form of the landscape is composed of various visual elements, and these processed elements can convey different information to people, thereby enriching the experience of visiting. The visual elements of the landscape mainly include form, color, feeling, texture, light and shadow. Regarding the design of landscape form regeneration, the particularity of the abandoned railway landscape determines that there are many factors that need to be considered in its design. The landscape form regeneration design of the abandoned railway needs to combine the landscape design aesthetics and landscape morphology. While continuing the original style and features of the site, it realizes a variety of landscape functions and at the same time integrates form and function organically.

The preservation situation of each abandoned railway is different, some only have sporadic buildings or platforms, and some have preserved all the railway elements, so the design forms are also different. From the perspective of the external environment and internal environment of the site, the existing external environment defines the overall shape of the design to a certain extent. How to transition, integrate and external environment is the first problem to be solved in the form regeneration design, and the internal environment is the main body of the regeneration design of the abandoned railway form,

focusing on factors such as recreational routes, spatial composition, and functional distinctions in the reconstructed site. In short, the renewal of the abandoned railway area needs to grasp the internal and external connection and expansion, and flexibly use elements such as points, lines, surfaces, scales, and proportions to create the most suitable form of the site.

The color composition of the abandoned railway landscape adopts different tones according to the design theme, which can continue the natural style or reflect the modern artificial beauty. Abandoned railway landscape can use colors to make visitors have a psychological resonance, or develop different associations, and the color plays a role in strengthening and setting off the atmosphere of the entire landscape. Specifically, it has the following functions: (1) Decorate and beautify the environment, emphasizing the environmental atmosphere of the new landscape after transformation (2) Express the emotional landscape, give visitors a deep impression (3) Using colors to distinguish each functional area and guide the tour route (4) Give personalized colors to special scenery, highlighting its particularity and importance.

Feeling is the different visual and tactile feelings that people produce in the process of appreciating and contacting landscape materials. The visual texture of the landscape changes due to the distance of the appreciation. Most of the abandoned railway landscapes have a special rough, hard, and vicissitude feeling. Retaining these special textures can

highlight the style of the site. Other newly added landscape elements can be natural textures such as logs, stone, sand, etc., or artificial textures such as metal, plastic, glass, etc., or they can mix the textures of the two to produce unexpected effects.

Texture is more colossal and refined than feeling, and mainly refers to the texture changes on the surface of landscape materials. The landscape regeneration design of the abandoned railway pays attention to the changes and coordination among the elements of the landscape. The same material has different forms of texture, and the texture changes between different materials will also produce contrast, causing subtle psychological changes in people.

Light and shadow are the most changing elements in landscape design. The source of light and shadow is divided into natural light and artificial light. It explains the light and shadow through the volume and the unevenness of the surface, and strengthens the contrast of the landscape and the sense of volume. Natural light changes all the time, which is difficult to control. Therefore, in the early stage of the design, the lighting factor should be fully considered to achieve the perfect light and shadow effects are as much as possible. The controllability of night scenes and indoor artificial light is relatively high. It is necessary to pay attention to minimizing the impact on the surrounding natural environment while saving resources.

## Landscape structure

The study of landscape structure forms is the basis for the renewal design of abandoned urban railway yard, and it is also the key to control the overall design. According to the distribution pattern of abandoned urban railway yard and the remaining situation, it can generally be divided into three structural types: point, linear, and radial.

### (1) Point structure

Due to the demolition and construction of the abandoned urban railway yard, only the old platform or some supporting facilities are left. These old buildings or structures can be regarded as a single point structure, which can be renovated to produce new uses full of characteristic historical symbols, such as railway museums, nostalgic landscape buildings and landscape sketches.

### (2) Linear structure

Linear structure refers to a long and intact railway line. Refer to the greenway design principles, take the abandoned railway line as the axis to connect various green spaces in the city and suburbs, and renew it into natural ecological corridors, leisure sports trails and other venues. Railways with special historical and cultural commemorative significance need to be protected as much as possible. Transforming into linear cultural heritage is a more feasible way of protection, which can promote cultural tourism along the line.

### (3) Radial structure

Radial abandoned railway refers to the divergent layout of the railway in

# Ecological Regeneration

## Landscape visual elements

space. For example, some abandoned railway distribution stations are formed by the collection and intersection of multiple lines. Generally, the abandoned urban railway yard of this structure is renewed into urban green spaces or park. The radial structure railway yard is more complex than the former two, it is composed of multiple point and linear structures, which can integrate multiple design strategies.

Different from the point structure, the linear structure and the radial structure railway may be adjacent to a variety of other land in the city, including commercial land, residential land, and public land. It is necessary to comprehensively consider the integration of various uses. The regeneration of linear structure and radial structure railway can completely follow the original railway track system, or add channels as appropriate, and become part of the urban walk system. Such traffic system can be used as a part of the city's green infrastructure, providing the city with a green space and a new choice for pedestrian.

When designing an abandoned railway landscape structure, the details of the transportation system are very important. First of all, the entrance and exit of the new landscape should be set up in a location that is convenient for entering and exiting the site, taking into account the passage of pedestrians, including the elderly, children, and the disabled. Secondly, strengthen the connection of park roads or recreational trails with the surrounding traffic system and surrounding blocks, and have a certain guiding effect, attracting people to participate or guiding people to enter the surrounding scenic spots.

As people pay more and more attention to the ecological environment, ecological idea has penetrated into the development of various fields of society. Ecological ideas and methods have been widely used in modern landscape design, and are committed to protecting natural landscapes through design methods. The landscape regeneration design of the abandoned railway restores and rebuilds the ecology of the site, recycles the abandoned facilities and materials of the site, improves the site's self-ecological recycling ability, and reflects the ecological concept of sustainability. The fact of ecological regeneration of abandoned railways requires the participation of multiple disciplines such as ecology, botany, physics, chemistry, and engineering technology.

## Pollution control

Urban abandoned railway landscape design should first solve the pollution problems in the site, mainly soil pollution. The soil pollution of abandoned railways mainly comes from domestic garbage, industrial and mining solid waste, and the transfer of atmospheric environmental pollutants. Domestic garbage includes garbage generated during the past operation of the railway and garbage added after being abandoned. For example, weeds grow along the abandoned railway, rusty rails, decayed sleepers, and shack built by vagrant along the railway. Industrial and mining solid wastes have been exposed to sunlight and natural weathering for a long time, decomposed to varying degrees and gradually spread, and the surrounding land has also been polluted. The trans-

fer of atmospheric pollution is due to pollutants emitted by factories, mines, enterprises and transportation vehicles. Some pollutants such as smoke and dust and heavy metal particles gradually settle into the soil environment. The other part is sulfur oxide and nitrogen oxides may be transferred to the soil with rainfall and snowfall. In addition, some abandoned railway land is used as farmland by surrounding residents, and the excessive application of chemical fertilizers and pesticides has caused serious pollution to the soil.

The solution to soil pollution is mainly to treat the contaminated soil through biological restoration methods after landfill or removal of solid waste, and plants can be used to improve the soil and the surrounding environment. For example, mixing some humus and grass seeds into the soil to increase soil fertility, so as to cultivate some microorganisms and plants to separate these pollutants, thereby purifying the contaminated soil.

## Planting design

Sustainable planting design focuses on the combination of ecological and environmental benefits of the plant community. The abandoned railway yard builds a plant community with stable structure, strong ecological protection function, low maintenance cost, and good self-renewal ability, which can be realized in the following ways.

(1) Respect the original landscape of the site. As the abandoned railway has not been managed for a long time, the plants that grow and multiply

naturally in the site have formed a unique plant landscape and have attracted the habitat of wild animals. The aesthetic effect of the natural and wild interest has been formed. Respect the site characteristics during planting design, protect the wild animals and plants on the site, and maintain the natural ecological balance that has been formed.

(2) The use of zonal vegetation. The zonal vegetation has strong adaptability to light, soil, and water, and beautiful appearance, dense branches and leaves, and strong ability to survive and multiply, which can quickly achieve greening effects, have strong anti-pollution ability, and are easy to extensive management. They do not need to be replaced frequently after planting. The root system of native tree species is deep and huge, which can loosen the soil, regulate the ground temperature, increase the content of soil humus, and promote the maturation of the soil. And it can attract more insects, birds and small animals to inhabit, bringing animal diversity.

(3) Cultivation in natural landscape. According to the actual situation, use the space resources of the site, choose various life styles and plants of different heights, colors, and seasonal changes, and scientifically match the hierarchical plant communities. By simulating zonal natural plants to create the landscape of the modified site, on the one hand, it can strengthen the regional characteristics, on the other hand, it can also avoid improper tree species matching.

The planting design of the New York

## Function Regeneration

High Line Park selected 210 native plants with different colors and characteristics. The flowering periods of these plants are staggered and full of wild vitality, which can guarantee the beautiful scenery of flowers blooming in the park from January to November. Considering the shallow layer of the soil, almost all plants are shallow-rooted plants. In order to express the beauty of the barrenness after the changes of the times, the design selectively retains the plants between the abandoned railroad tracks. At the same time, part of the planted area is very similar to the old appearance, retaining the old roadbed, railroad tracks and sleepers and other symbols of the site, which arouses people's memories of the history of the site.

### Site resource utilization

There are many resources in abandoned railway sites, including natural resources (soil, plants, water bodies, etc.) and non-natural resources (abandoned railways, buildings and structures, etc.). This part focuses on the use of non-natural resources. Reasonable retention or renovation based on actual conditions will reduce construction time and expenses. There are three main ways:

(1) Overall reservation. The overall preservation means that the abandoned railway landscape is almost inherited according to the original appearance, and only the contaminated part is treated. This kind of preservation method is generally aimed at those abandoned railway landscapes with important historical memorial value, such as the railway

line corridors as linear cultural heritage, etc., which can be displayed to the public in a fully preserved form.

(2) Partially reserved. Partial preservation refers to the selective preservation of abandoned railway landscapes, which are often monumental, mainly abandoned train carriages, rails, railway platforms and supporting facilities, while removing some highly polluted and severely damaged parts to create a brand new landscape.

(3) Art reprocessing. Fully retain the structure and elements of the abandoned railway site, combine architectural design, land art and other disciplines to create new elements, and carry out artistic transformation. The new landscape elements replace the original elements and become works of art that convey the spirit of the site. Although regenerated by modern methods, the landscape as a whole has changed, but in terms of form, material and scale, it still matches the atmosphere of the railway landscape.

In the past, the treatment of abandoned railways was relatively simple. They were generally simply demolished, restored to cultivated land, or converted into roads, which did not achieve the real development of landscape functions. Therefore, innovative design thinking and design techniques are needed to develop a variety of new landscape functions.

### Leisure fitness trail

The complete linear corridor area often has greater development value. The recreational and fitness trails transformed from abandoned railways are called "rail trails". Tens of millions of miles of rails are mainly distributed in the United States, Europe, and Australia. Rail trail has many outdoor uses, including biking, walking, hiking, horseback riding, etc. With its unique flat linear terrain, some shorter routes are also called linear parks. The Rail trail is only for pedestrians or bicycles. The RTC organization was established in 1986. In response to the phenomenon of increasing urban congestion, prominent mobility problems, and substantial increase in sub-healthy populations, the organization advocates the development of urban trail systems and participates in the transformation of a large number of abandoned railway regeneration projects. According to the survey, Those abandoned railways that have been successfully transformed into rail trails basically have good accessibility and flatness, and it is very easy to overcome the steep terrain environment, which can share space with many lines such as pipeline lines, typical transmission lines and telephone lines. The surface material

of the rail trail is different. Some are covered with gravel or crushed stone, and some are paved with asphalt. If they are specially paved, they are also suitable for the disabled

### Railway theme park

It is also a reasonable way to transform the railway into a railway theme park in a city with a relatively broad terrain. Railway theme parks can actively improve the social and environmental problems caused by over-industrial development, for tourists to visit, tour, learn, and entertain, and at the same time evoke people's memory of the history of industrial development, the history of railway development, and the history of war. Therefore, on the one hand, the railway theme park itself has the stigma of industrial civilization and carries the significance of recording the development of the city. On the other hand, it can integrate the transformation of historical relics and coexist with modern life, not only increase urban parks and green spaces, beautify the appearance of the city and maintain the urban ecology, but also it can provide people with more leisure and entertainment space, improve urban transportation, and bring new opportunities for urban development.

North Duisburg Park is a post-industrial landscape park in Germany. The design of the park reflects the industrial theme, combining industrial heritage and ecological green space. The old steel factory structures were given new functions. The old railroad tracks constitute the rail park, which is located at the highest level of the entire North Duisburg Park. It is not only

a pedestrian passage in the park, but also connects with surrounding urban spaces and enhances the function of open space. In the Railroad Park, you can overlook the panoramic view of the entire park, giving visitors a special experience, and some carriages have also been kept in the park, becoming commemorative landscape sketches.

### **Art Walk**

In addition to renewing the abandoned railway area into green land, it can also be transformed into a comprehensive space associated with art and commerce. The urban space structure is becoming more and more compact, and land resources are very precious. Therefore, it is particularly important to arrange various types of land reasonably. The regeneration of the abandoned railway area requires the pursuit of an artistic appearance on the basis of fully solving the activities and transportation needs. The Bastille Promenade and the elevated art district is located in an abandoned railway yard in the center of Paris. The government transformed it into a leisure walk path and a characteristic art district in Paris. The Bastille Trail is also known as the Green Trail. Along the route, there are many buildings with different styles in different historical periods, combined with native plants and waterscapes, so that the artificial landscape and the natural landscape are combined and set off. The trail runs through Louis Park at its eastern end. The elevated art area is under the elevated Bastille Trail. The 70 red brick arcades preserved under the elevated structures were transformed into art restaurants, cafes, artist studios, exhibition halls, etc., forming an elevat-

ed art corridor with a strong humanistic atmosphere, providing a function for people Rich, beautiful environment and rich historical and cultural heritage of leisure and entertainment venues.

### **Linear cultural heritage**

Linear cultural heritage refers to a linear or band with a collection of special cultural resources and a group of tangible and intangible cultural heritage in the area, which is a new concept of heritage protection has emerged in recent years and has been recognized and concerned by the international community and experts.

Railway cultural resources are gathered in all railway sites, whether it is still in use or the railway that has been abandoned reflects a certain historical background. For those abandoned railways that are linear or belt-shaped, the material and intangible resources in the railway area constitute a characteristic linear cultural heritage that needs to be protected and developed. In order to better protect and develop railway cultural heritage, it is necessary to fully introduce regional resource advantages such as surrounding towns, rivers, and mountains to form a series of cultural heritage scales. The railway cultural heritage realizes the exchange and interaction between modern society and history, and restores a more real railway cultural scene for the public. It has humanistic significance and cultural connotation. For example, the British Blaenavon Industrial Park, which was the main steel and iron in the world in the 19th century. The origin of coal is a testimony to the British Industrial Revolution at that time.

Almost all elements related to industry are still preserved here, including coal mines, iron ore, vegetable markets, original railway systems, furnaces, and workers' houses and communities. The park has been included in the list of world cultural heritage.

### **Railway Museum**

The abandoned railway has a distinctive architectural style and historical memorial value. If it is transformed into a railway museum, its landscape regeneration value will be maximized. There are already many railway museums in the world, some of which are transformed from abandoned railway buildings. The reconstructed railway building itself is one of the museum's collections, providing visitors with a good atmosphere to understand the history of the railway.

The Hong Kong Railway Museum was built by a railway station built 100 years ago. It mainly introduces the history and development of Hong Kong railway transportation. The museum exhibits many old railway equipment, historical pictures of trains and train models from various countries. The museum not only retains abandoned stations and some railroad tracks, but also prevents multiple train carriages representing different eras from being outdoors. Most of the carriages can be visited inside, allowing visitors to experience the history of railways first-hand, due to the building and collections have a certain history and viewing value, the museum often becomes a filming location for Hong Kong film and television workers.

## **Culture Regeneration**

### **Regionality**

The regeneration of abandoned railways generally takes into account multiple purposes. For example, in the form of greenways, it also has multiple functions such as ecological corridors, sports and leisure, urban landscape renewal, sightseeing and recreation, historical heritage protection, and popular science education. These collections of functions are closely related to the local geographic characteristics, inheriting the regionality requires respecting the traditional culture of the site in the design process, reflecting the local characteristics, and conforming to the natural evolution of the site, so that the regional culture can continue and develop. Reflect regionality in specific details, such as the use of patterns that symbolize local characteristics and customs, local architectural style buildings, and the use of local tree species. The Shengxing Station on the old Miaoli railway in Taiwan was transformed into a railway village with Hakka cultural landscape, and the street outside the station was transformed into a commercial street with railway and Hakka culture, including road paving, street lights, reception art, small squares, etc. Both have the dual theme of Hakka culture and railway culture to highlight street characteristics.

### **Venue spirit**

The site is an organic whole formed by the combination of natural environment and man-made environment. It reflects the lifestyle of people in a particular area and their own environmental characteristics. Norwegian scholar Noberg Schulz beli-

eves that venue spirit can be divided into two types, one is a sense of orientation, and the other is a sense of identity. The former refers to the ability of space to know where one is. The latter refers to the sense of identity and security of the venue. Any cultural system has its own spatial position recognition system, and the design is to distinguish and perceive these two kinds of judgments. Only by comprehending the spirit of the site and fully respecting the connotation and characteristics of the site can we design a work full of artistic tension and vitality.

The inheritance of the regional culture and the railway's own culture is the essence of the landscape regeneration design of the abandoned railway. Before designing, you need to understand the relevant historical background, combine local customs, and express historical culture through various forms. History and humanities is a broad concept, and its connotations are extremely rich, including economics, politics, art, religion, customs and many other aspects. The design of the memorial space for the Jewish victims in France puts the three carriages used to transport the Jewish prisoners in the site, and the wooden strips next to them are engraved with the names of the Jewish victims and other information. The names of 20 three-dimensional survivors made of carbon steel reflect the tenacity of the vitality of those people and cherish the memory of those who died in the tragic history.

## **Back to nature**

Ecological aesthetics emphasizes returning to nature. The regeneration design of the abandoned railway area fully demonstrates the natural beauty of the site, giving people the opportunity to get close to and perceiving the charm of nature, and arouse people's awareness of recognizing nature, caring for nature, and protecting nature, making ecological concepts a public awareness of society to achieve the goal of sustainable development of harmonious coexistence between man and nature.



## **06 SITE ANALYSIS**

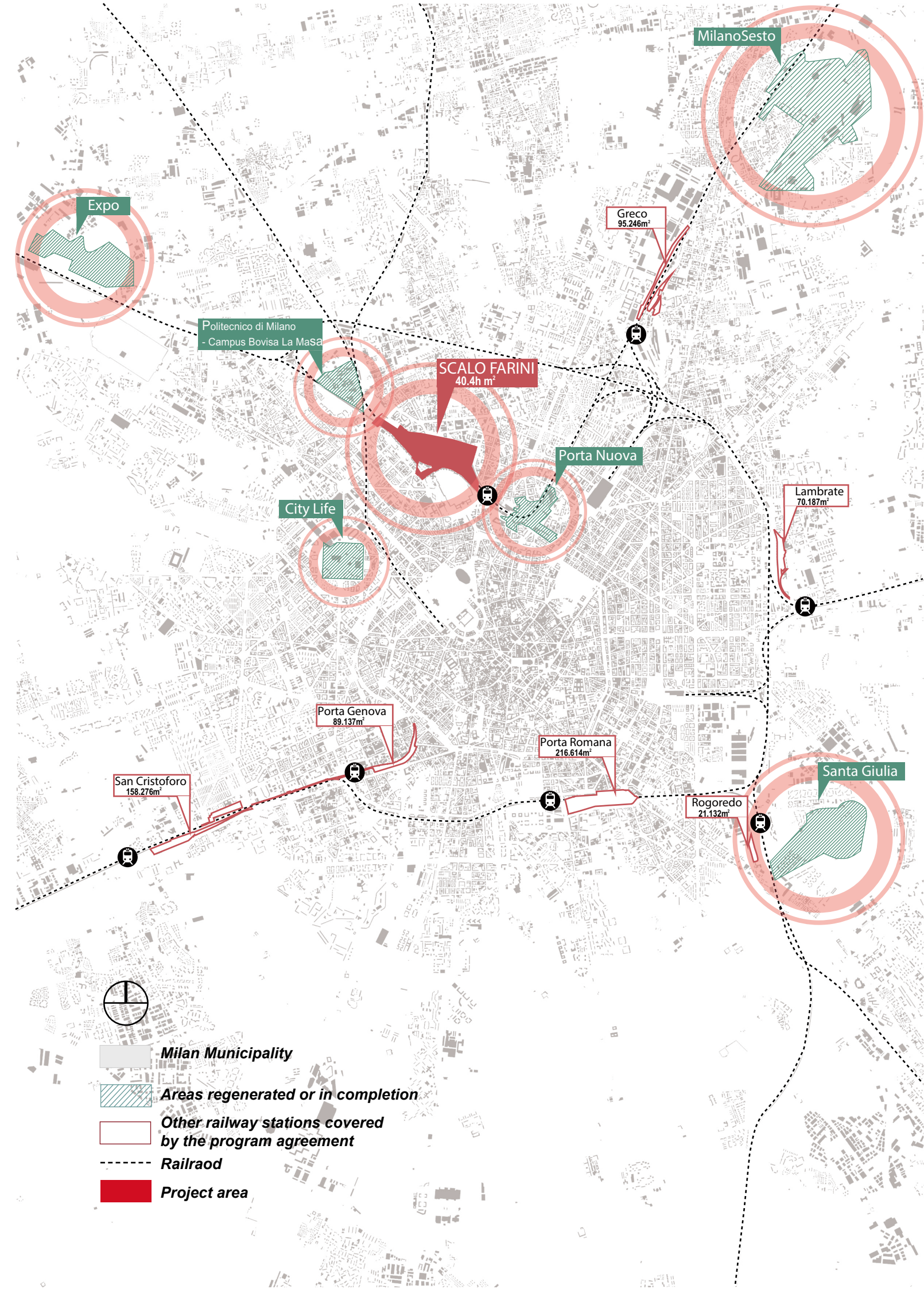
# Milan Railway Station Regeneration Agreement

There are seven railroad yards within the boundaries of the municipality of Milan (Farini, Greco-Breda, Lambrate, Rogoredo, Porta Romana, Porta Genova and San Cristoforo) and altogether they cover an area of 1,300,000 square meters, only about ten percent of which will still be taken up by active tracks. By now almost completely stripped of their function. The Scalo Farini, the largest of these voids, has been taken as a model for the search for these traces.

The transformation of the railway yards triggers the development and re-functionalisation of the belt line from Stephenson to San Cristoforo, thereby redefining a new relationship between city and railway with connections managed on the urban scale, transcending the current radial structure towards a network- and multi-centre system. The enhancement of the urban railway service through the future circle line offers moreover the chance of increasingly integrating the Milan public transport networks, intensifying the interchange hubs and the relationships between the city context and the metropolitan territory, which in the next decade will be affected by the development of new centralities of regional and national importance, such as the 'City of health' in Sesto San Giovanni and the "Milan Innovation District" by the Expo.

Farini area is located in the north-west urban sector, between the Bacula overpass and the Via Farini bridge, which crosses the railway line. The area is located in the southwestern urban sector and is intended for the construction of a large park. The northern portion of the tracks in operation consists of a large triangle bounded by the Valtellina and Aprica streets. The "Milano Lancetti" Passante station is located in the underground part of this portion, with exits adjacent to it and also directly in the area. The southern portion consists of a system of residual areas behind the railway, some larger.

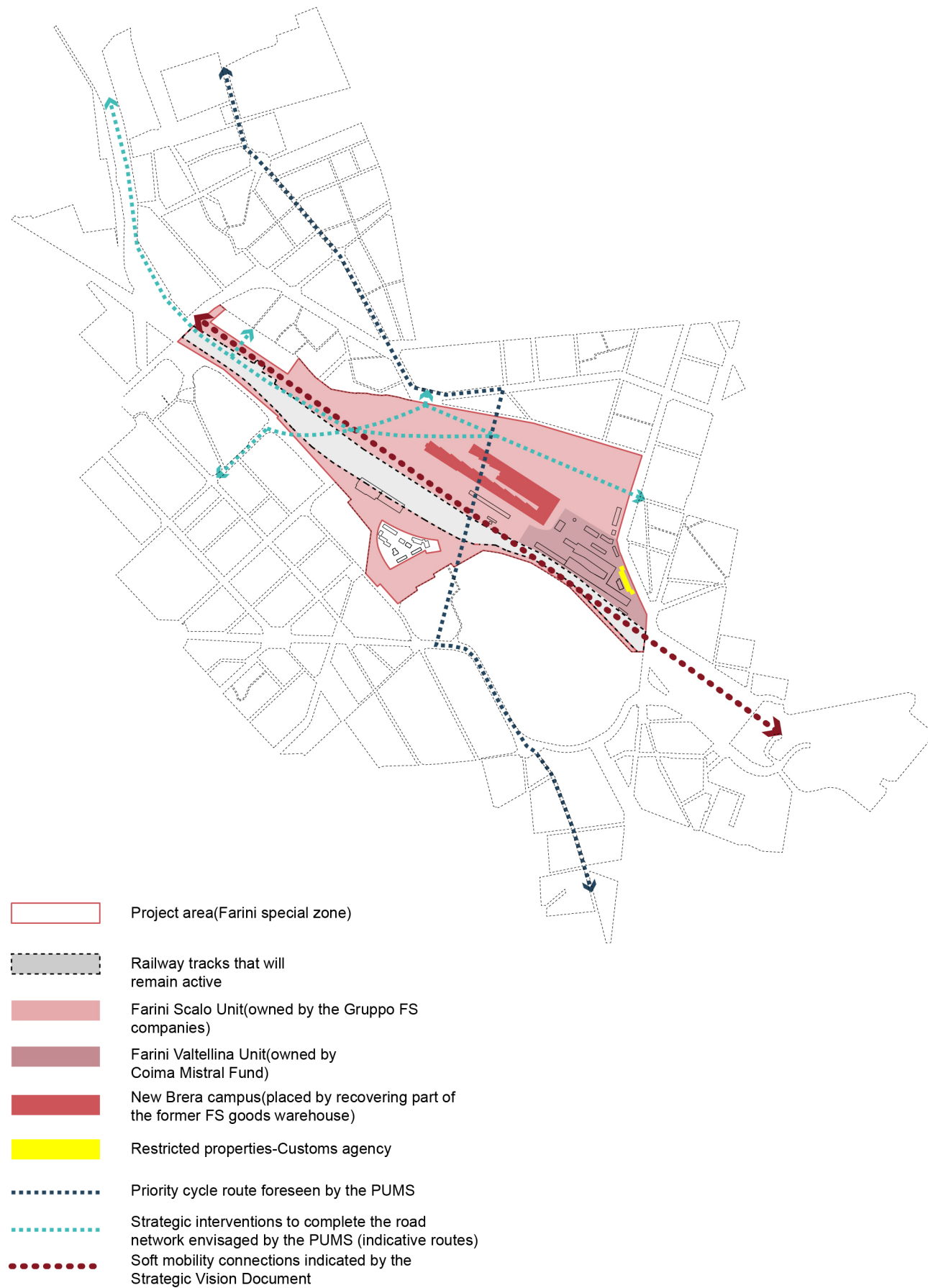
The new intended uses of the Farini railway yard might be considered in relation and complementary to the important transformations which, along the Sempione route, see the most consistent and recent episodes of urban transformation of the metropolitan area seamlessly interconnected: from the service sector hub of Porta Garibaldi to the university one of Bovisa, all the way to the fair hub of Rho – with the aforementioned future settlement of the scientific-university park – and the commercial one of Arese at the heart of the dynamic supra-municipal division of the Milan North-West.







# MUNICIPAL PLAN



“The Scalo Unit and the Valtellina Unit are nonetheless parts of the same “Special Zone” and, as such, subject to a unified Masterplan”.

“In order to guarantee a high degree of adaptability to the project facing very different economic scenarios that they could prospect in the coming years (e.g. a possible context of significant decline in the real estate market), the Masterplan does not immediately establish the type of buildings to be built, but adopts a flexible strategy that refers to the following phases definition of volumes and intended uses, based on of the needs that will gradually become evident”.

### Hypotheses and requests-Outcomes of the public consultations:

- Large park envisaged over two-thirds of the surface
- Host innovative production activities
- Scientific and technological research activity
- Crafts-related services
- Sports Citadel and the Music Citadel
- Services on a local scale , such as a library and a school hub (high schools), facilities for elders and youngsters, aggregation centres with cinema and theatre, and premises for associations, to be supplemented by the park activities and the other higher-scale functions.

### DATA AND TABLE

|                            | GREEN   | ST% |
|----------------------------|---------|-----|
| <b>FARINI SPECIAL ZONE</b> |         |     |
| Farini Scalo Unit          | minimum | 65% |
| Farini Valtellina Unit     | minimum | 70% |

| GROSS FLOOR AREAS          | Total square metres, including social housing and subsidised housing | Minimum reserved for non-residential functions | Minimum social housing according to the types referred to in Article 2.3.2 of the Technical Implementation Rules of the AdP | Square metres of ordinary subsidised housing as defined in Article 2.3.6 of the Technical Implementation Rules of the AdP |
|----------------------------|--|--|---|---|
| <b>FARINI SPECIAL ZONE</b> |  |  |   |   |
| Farini Scalo Unit          | 362.947  | 30%  | 52.170  | 30.213  |
| Farini Valtellina Unit     | 39.513   | 50%  | 9.878   | 0   |

| BUFFER ZONES         | mt  |
|----------------------|---|
| Mounmental Graverard | 50 metres from the boader of the cemetery |
| Tracks               | 30 metres from the last track             |

— FARINI COMPETITION GUIDELINES

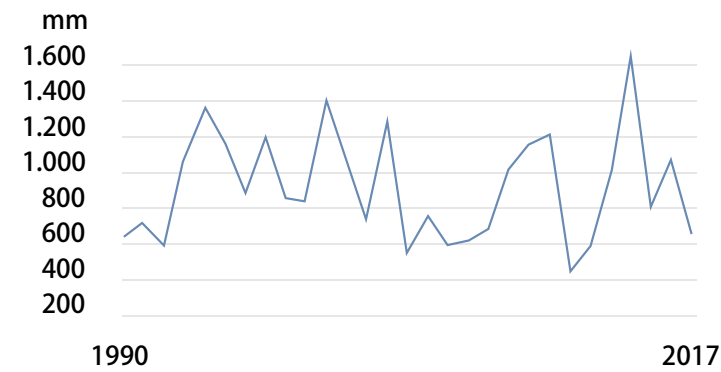


# ENVIRONMENT QUALITY OF MIALN

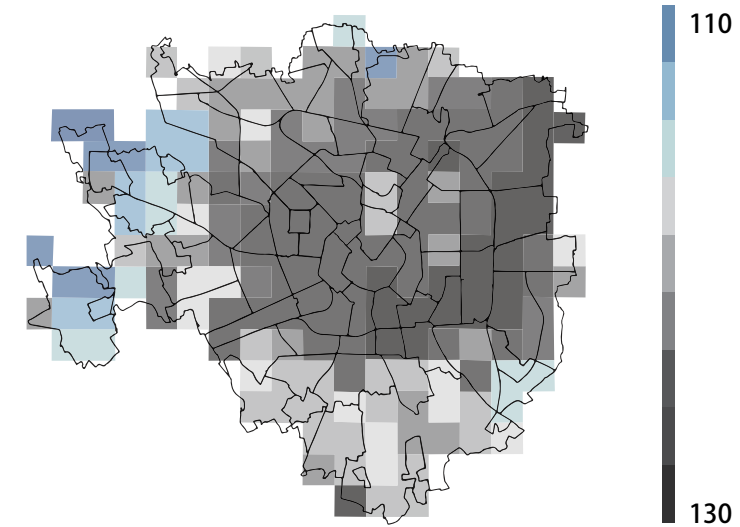
Surface waterproofing



Climate changes  
Cumulative rain monthly

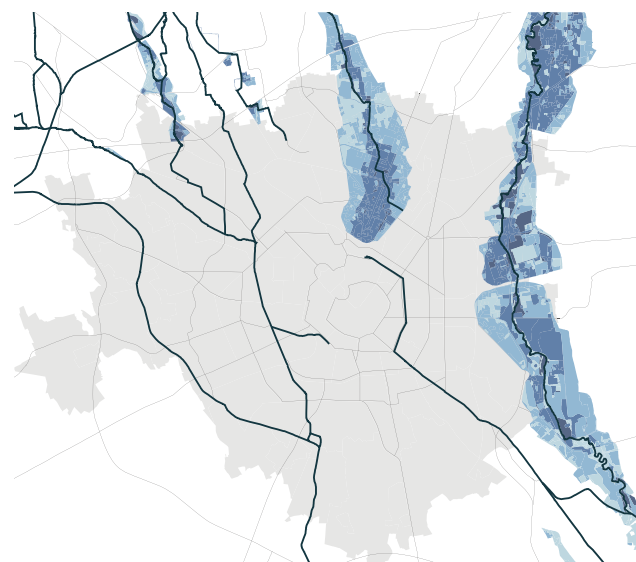


Annual average of days with  $T > 25^\circ$



The prevailing wind of the city of Milan comes from the south-west and becomes hot and polluted as it crosses the city. The consequence is that the neighborhoods in the north-east are warmer than those in the south-west.

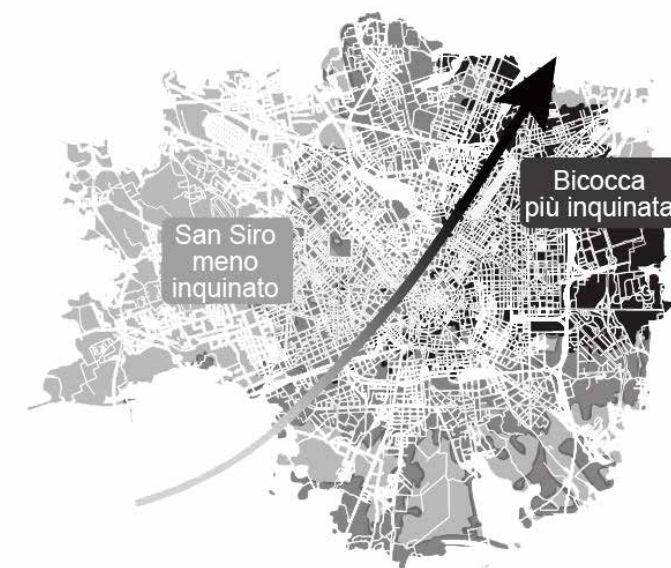
Water and risk



Floods in Milan



PM 2.5 fine particle pollution in Milan



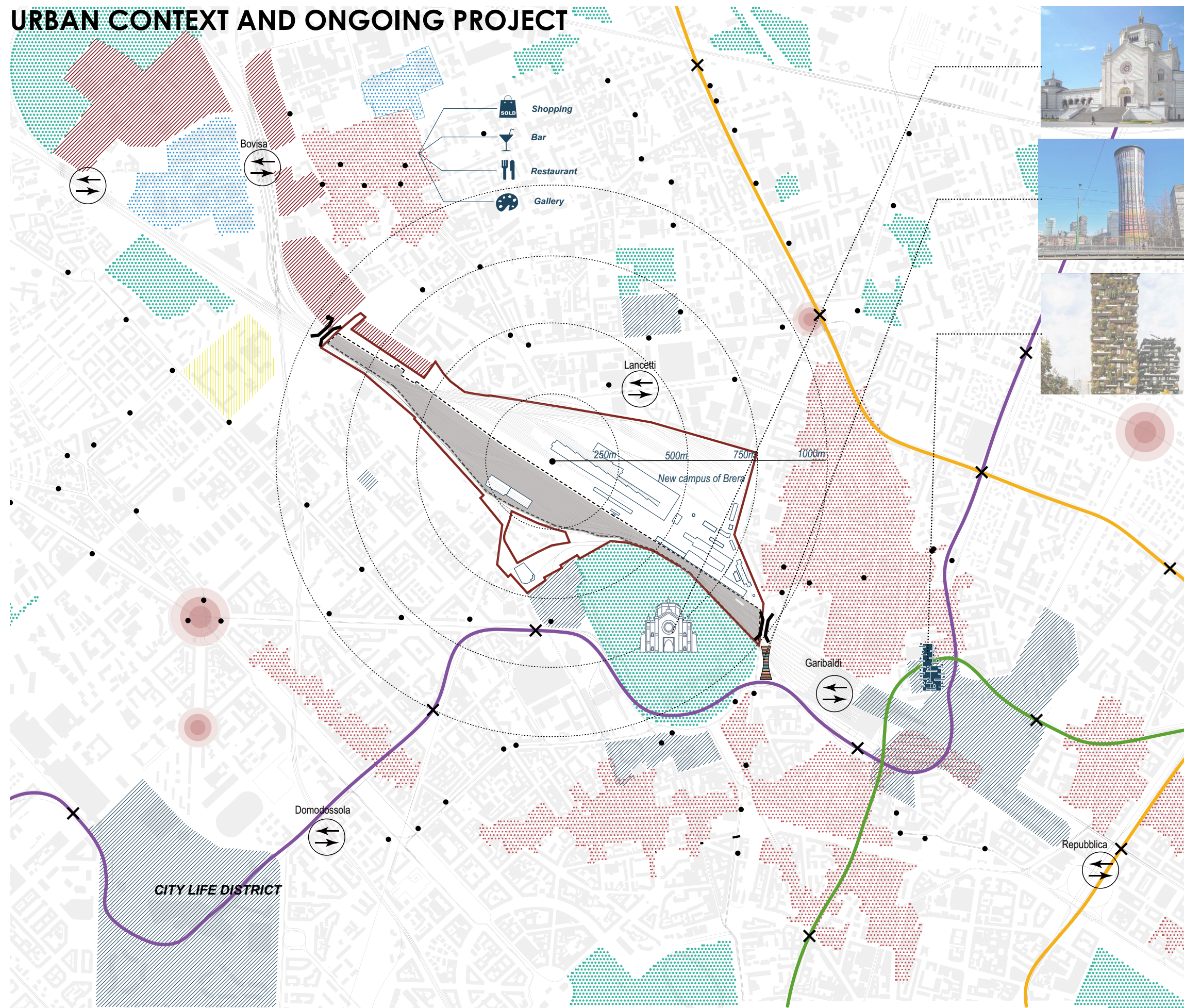
The prevailing wind of the city of Milan is a wind coming from the south-west. It is a wind that carries fine PM 2.5 particles throughout the city. The consequence is that the air in the north-eastern neighborhoods is more polluted than that in the southwestern neighborhoods.

- Waterways
- Risk 1
- Risk 2
- Risk 3
- Risk 4

The pollution data for the Milan urban area and the effects of the heat island tell us that the regeneration projects must create the conditions for inverting degenerative processes associated with both climatic changes and past projects that ignored environmental issues.



# URBAN CONTEXT AND ONGOING PROJECT

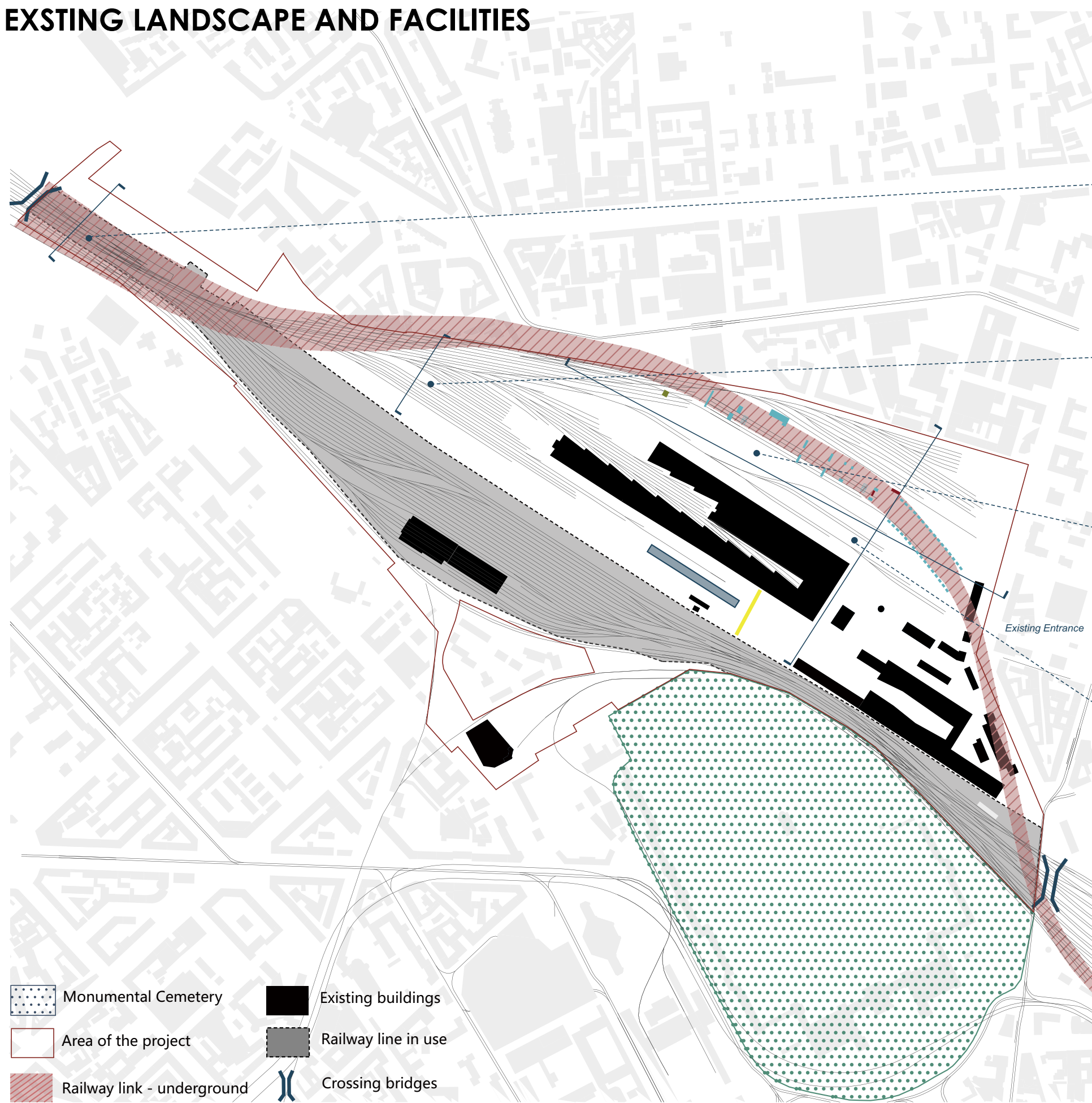


## LEGENDA

- Function**
- Area of the project
  - Railway line in use
  - Public life area
  - Parks
  - Politecnico di Milano - Campus Bovisa La Masa
  - High school
  - Areas of future regeneration
  - Area being rebuilt or completed
  - Small Square
- Traffic system**
- Metro lines
  - Metro stop
  - Bus and / or tram stop
  - Railway station
  - Crossing bridges
- Special buildings**
- Monumental Cemetery
  - Vertical forest
  - Rainbow tower



# EXISTING LANDSCAPE AND FACILITIES



- Monumental Cemetery
- Railway link - underground
- Existing buildings
- Railway line in use
- Area of the project
- Crossing bridges

## EXISTING LANDSCAPE



From the Ghisolfa Bridge



Wild forest and city's new skyline



North boundary



Underbrush    Groundcovers    Paving    Paving    Groundcovers

## EXISTING FACILITIES





# EXISTING FREEN AND TRACKS

## HISTORICAL EVOLUTION



2001-06

2010-06

2020-06

## UNDERBRUSH



*Coryza Canadensis*

*Phytolacca Americana*

Queen Anne's lace

*Verbena Officinalis*

*Parthenocissus Quinquefolia*

*Buddleja Davidii*



*Artemisia Vulgaris*

*Artemisia sp.*

*Setaria Italica*

*Oenothera sp.*

*Cinopodium Vulgare*

*Glaucium Flavum*

## WILD TREES



American sycamore

Tree of heaven

Siberian elm

Black mulberry

## TRACKS



## PAVING



Area of the project
  Railway line in use
  Existing buildings and facilities

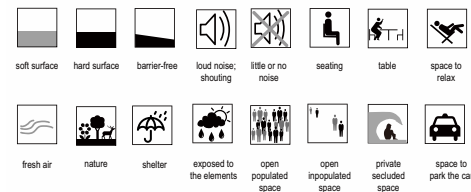
Railway
  Groundcovers
  Underbrush
 

 Wild trees

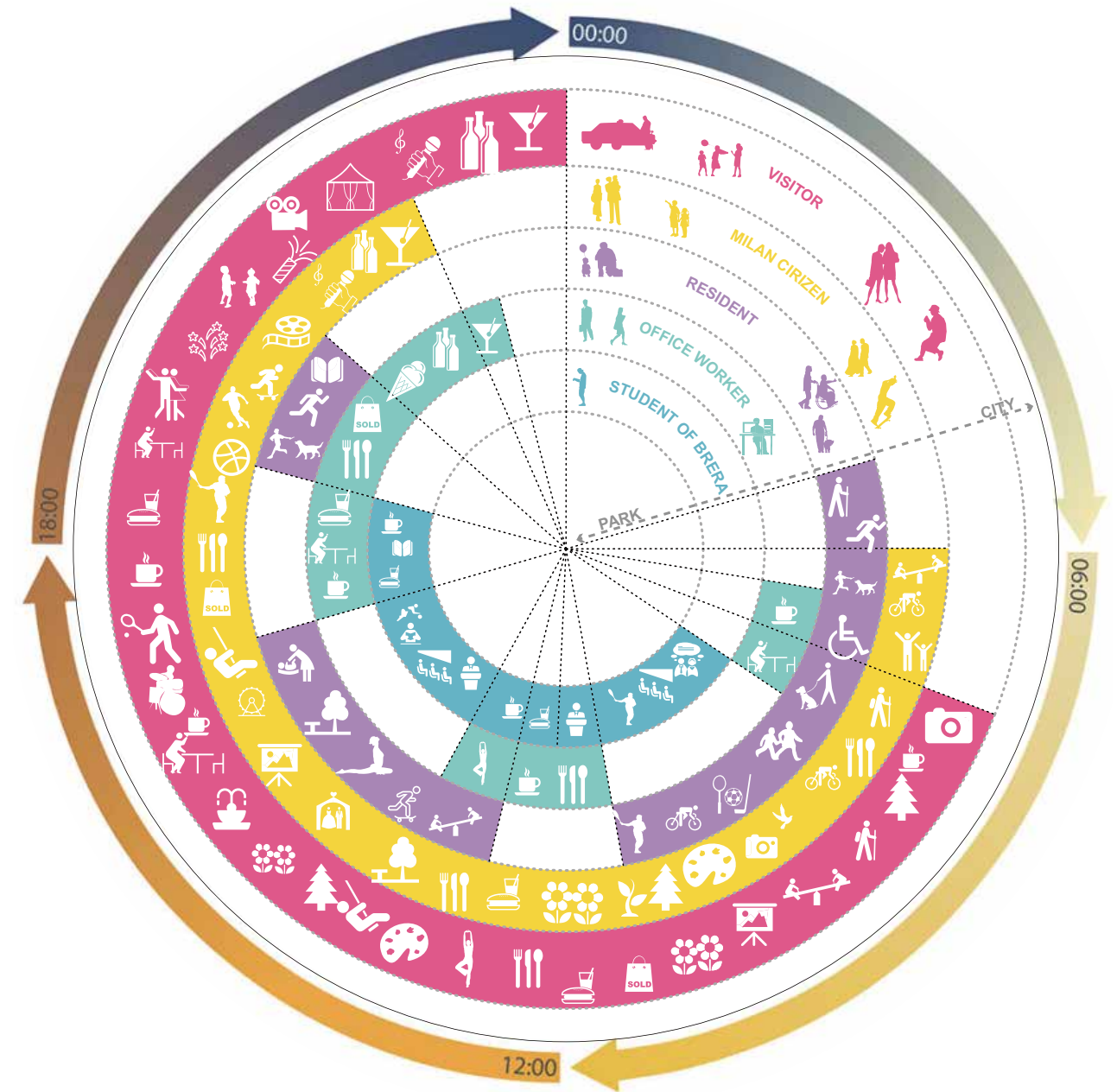


# PUBLIC USER

Database of user types observed in milan, their perceived desires and the requirements of happy public space.



|  |  |   |
|--|--|---|
| <p><b>Market seller</b></p> <p>desires<br/>a convenient space from which to sell goods.</p> <p>requirements</p>                              | <p><b>Office worker</b></p> <p>desires<br/>a space to eat outside with fresh air away from the computer.</p> <p>requirements</p>                       | <p><b>Naturalist</b></p> <p>desires<br/>an enclosed space from which to observe animals and insects.</p> <p>requirements</p>                            |
| <p><b>Market goer</b></p> <p>desires<br/>an easy way to exchange or buy goods.</p> <p>requirements</p>                                       | <p><b>Book reader</b></p> <p>desires<br/>a quiet secluded space where he can become totally absorbed by his book.</p> <p>requirements</p>              | <p><b>Dog walker</b></p> <p>desires<br/>a safe space to throw a ball or a stick.</p> <p>requirements</p>  |
| <p><b>Mother with baby</b></p> <p>desires<br/>a safety and accessible place to relax with baby.</p> <p>requirements</p>                      | <p><b>Picni enthusiast</b></p> <p>desires<br/>a quiet soft space in which to eat and relax.</p> <p>requirements</p>                                    | <p><b>Couple</b></p> <p>desires<br/>a space for intimacy secluded from other people.</p> <p>requirements</p>  |
| <p><b>Child</b></p> <p>desires<br/>space to play and run around in.</p> <p>requirements</p>  | <p><b>Local artist</b></p> <p>desires<br/>a space in which to make and sell sculpture and artwork.</p> <p>requirements</p>                             | <p><b>Local teenager</b></p> <p>desires<br/>space to hang out with friends.</p> <p>requirements</p>   |
| <p><b>Gardener</b></p> <p>desires<br/>a space in which to observe and plant</p> <p>requirements</p>  | <p><b>Busker</b></p> <p>desires<br/>a space to play music where there are people who will pay for it.</p> <p>requirements</p>                          | <p><b>Local elderly</b></p> <p>desires<br/>peace and quiet time to think and admire the scenery, a chance to get out the house.</p> <p>requirements</p> |
| <p><b>Commuter</b></p> <p>desires<br/>a secure space to park the car during the day</p> <p>requirements</p>                                  | <p><b>Fast food van owner</b></p> <p>desires<br/>a space to park near to lots of people.</p> <p>requirements</p>                                       | <p><b>Skateboarder</b></p> <p>desires<br/>a place to skateboard and relax with friends.</p> <p>requirements</p>   |
| <p><b>Out of town shopper</b></p> <p>desires<br/>a secure space to park the car while shopping, and a place to rest.</p> <p>requirements</p> | <p><b>Tourist</b></p> <p>desires<br/>a moment from the visit, subjects and objects to photograph, activities to participate in</p> <p>requirements</p> | <p><b>BMX Rider</b></p> <p>desires<br/>a safe place to ride his bike and socialize.</p> <p>requirements</p>   |
| <p><b>Teacher</b></p> <p>desires<br/>a place that can provide outdoor educational activities</p> <p>requirements</p>                         | <p><b>Handicapped</b></p> <p>desires<br/>a quiet space in which can access to nature.</p> <p>requirements</p>  | <p><b>Sunbather</b></p> <p>desires<br/>a quiet and sunny place</p> <p>requirements</p>  |
| <p><b>Student</b></p> <p>desires<br/>a place that can provide outdoor educational activities and physical</p> <p>requirements</p>            | <p><b>Runner</b></p> <p>desires<br/>space to run with fresh air and spaces for exercise.</p> <p>requirements</p>                                       | <p><b>Migrant</b></p> <p>desires<br/>a space in which he can learn more about the culture of the city.</p> <p>requirements</p>                          |



The mapping of different user requirement allows comparisons to be made between them. This drawing serves as a base from which conflicts and alliances can be identified between different users, the data here will be able to be mapped out in further work.

# DESIGN FRAMWORK

## SWOT ANALYSIS

### Strengths

- + Unique railway landscape
- + High green coverage
- + Factory architectural heritage
- + Convenient surrounding public transportation system
- + Surrounding prosperous business areas and university

### Weaknesses

- + Large area of railway line
- + Noise from the southwest railway
- + Weak north-south traffic accessibility

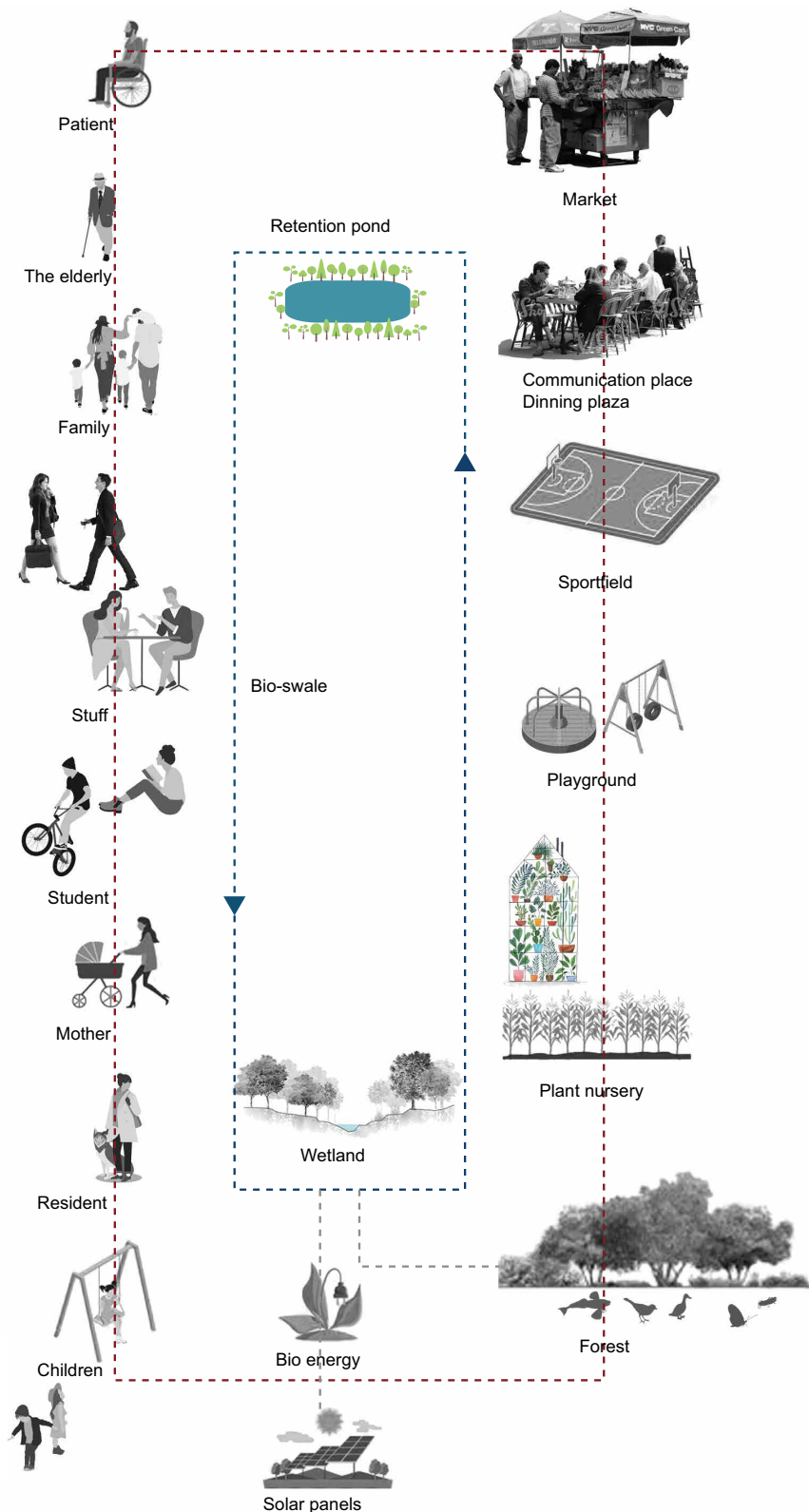
### Opportunities

- + Connect surrounding green spaces to develop into a green lung of the city.
- + Attract investors and drive the vitality of surrounding
- + Enrich the city's tourism resources
- A new activity place for surrounding residents
- + Stimulate the development of surrounding regeneration areas

### Threats

- + Pollution control
- + Coordination of business operations and ecological maintenance

## RELATIONSHIP

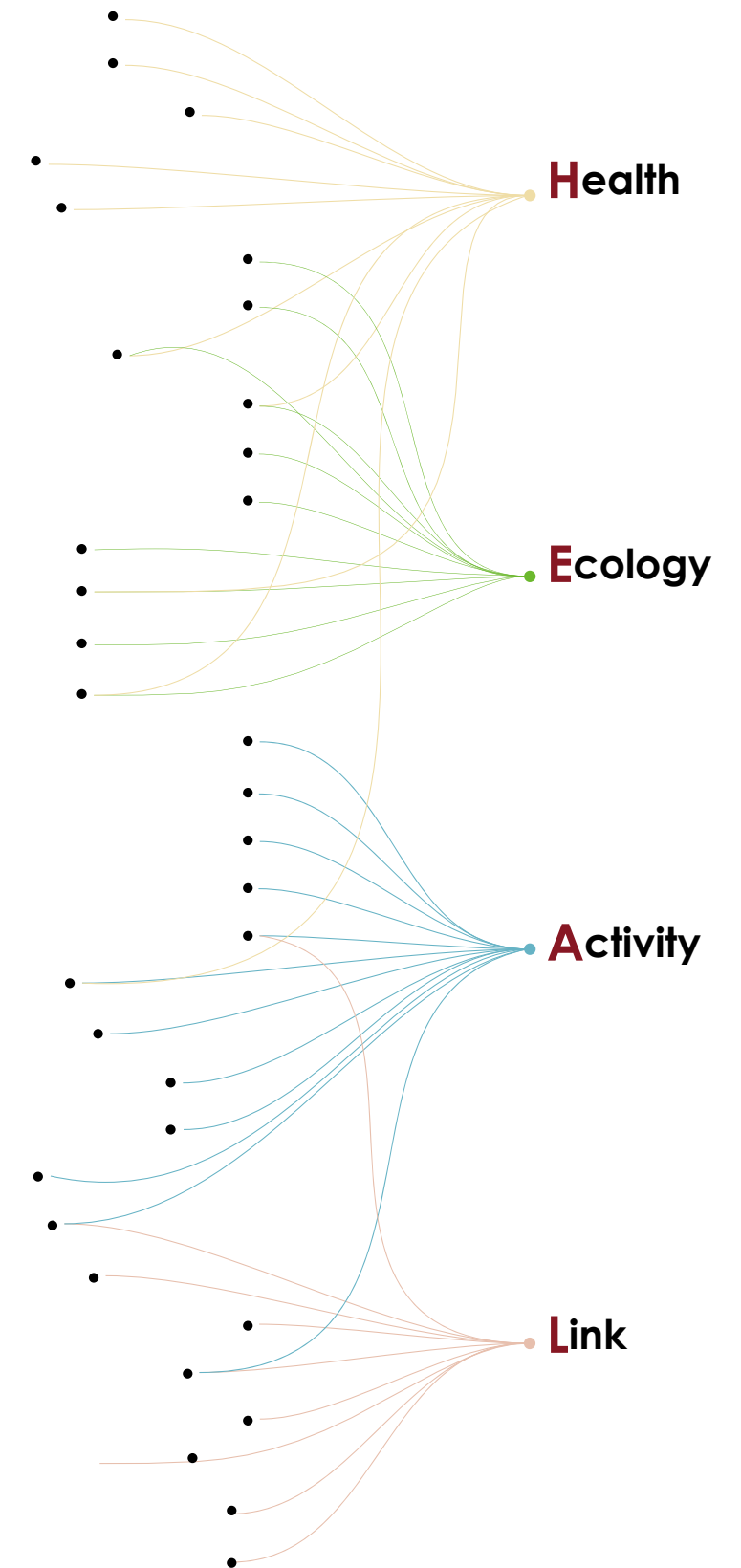


## PROGRAMING

- Accessible Design
- Leisure fitness
- Get close to nature
- Fresh air
- Natural play
- Industrial heritage reuse
- Recycling of waste materials
- Pollution control
- Optimal allocation of biomes
- Rainwater recycling
- Renewable energy collection
- Porous paving
- Planting design
- Wetland system
- Forest cluster
- Perfect service facilities
- Diversified node spaces
- Mutiple activity spaces
- New recreation programs
- Multi-functional open space
- Sport field
- Relaxing space
- Educational activities
- Education center
- Art center
- Parking lots
- Open interface
- Efficient transportation system
- Public participation
- Commercial introduction
- Streetscape
- Bike lane&Sidewalks
- Affordable housing

## CONCEPT

H·E·A·L



# 06 PROJECT DESIGN



# MASTERPLAN



1. Bio-retention pond
2. Preserved and restored railway forest
3. Children playground
4. Wetland forest (Ecological corridor)
5. Event street
6. Fountain plaza
7. Peace garden
8. Skateboarding garden
9. Railway garden
10. Game and chating garden
11. Crack garden
12. Event lawn
13. New Brera campus
14. Art street
15. Cafe
16. Railway lawn
17. Green street
18. Waterfall garden
19. Green house(Preserved industrial structure)
20. Mixed used district
21. Restricted property-customs agency
22. Car parking
23. Monumental cemetery
24. Future regeneration area

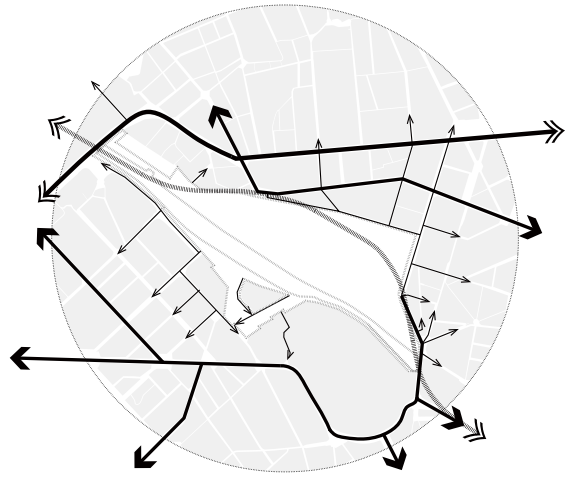




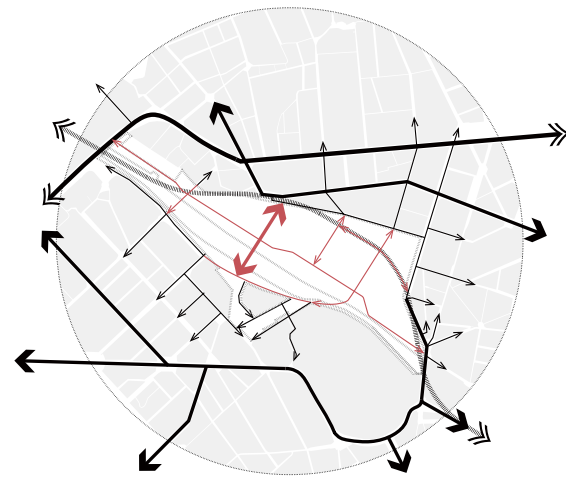
# LINK-Circulation System

## ELEMENTS

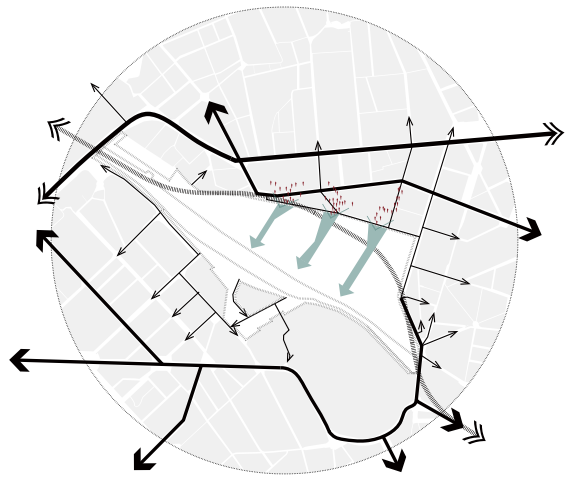
- ↔ Main road
- ↔ Second road
- ↔ Third road



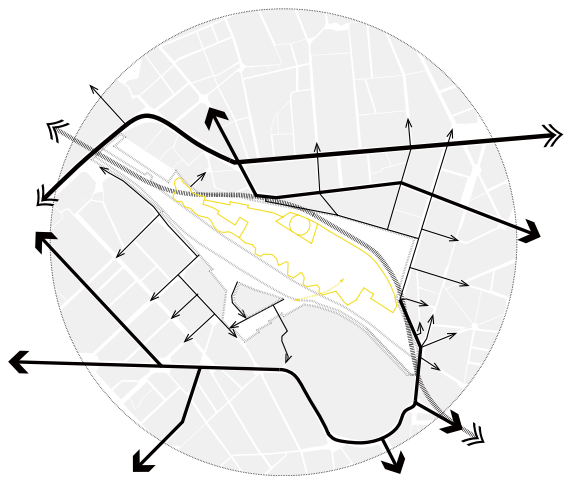
1) EXISTING ROAD



2) VEHICAL CONNECTION TO THE PARK



3) PARK SPINES



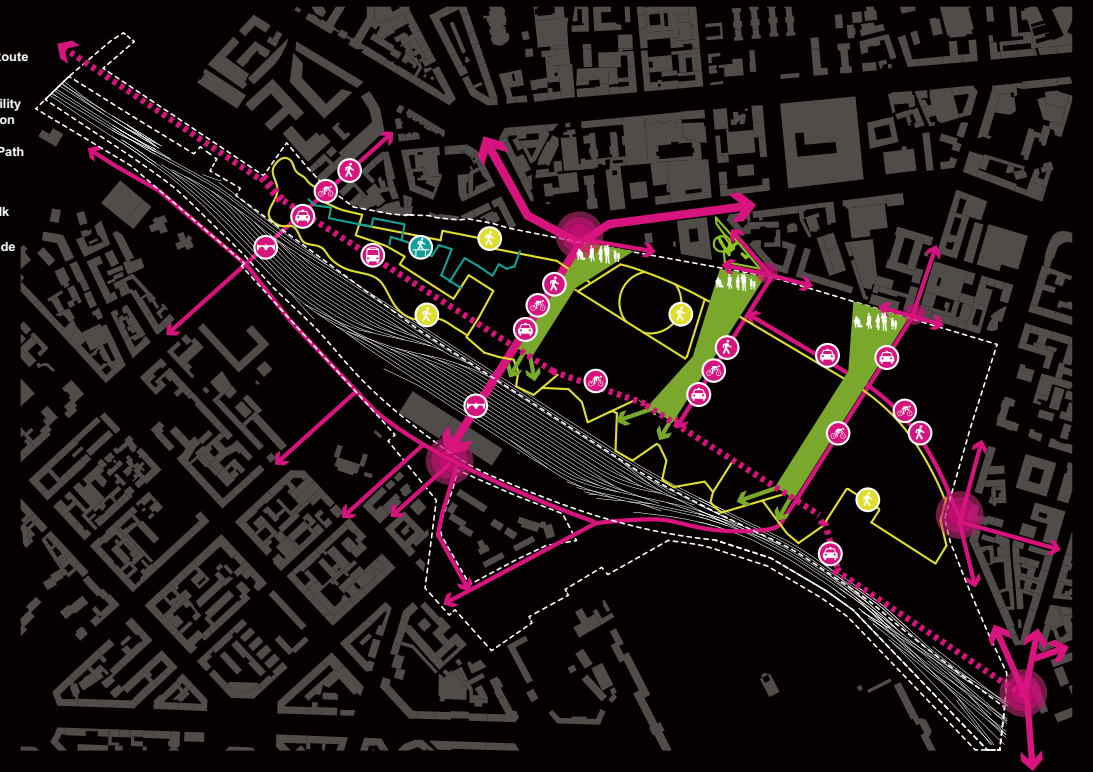
4) PARK PATHWAY NETWORK

# Circulation System

## COMPOSITE

### LEGENDA

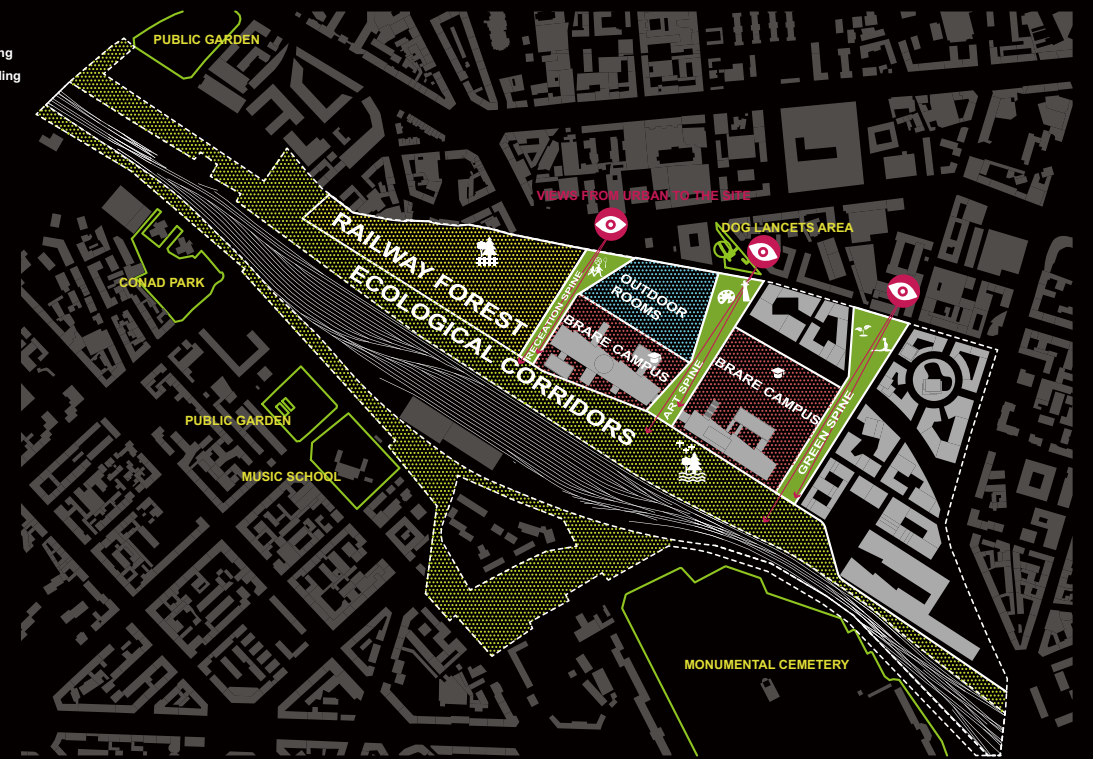
- Vehicle Route
- Soft Mobility Connection
- Walking Path
- Elevated Boardwalk
- Traffic Node



# Framwork

### LEGENDA

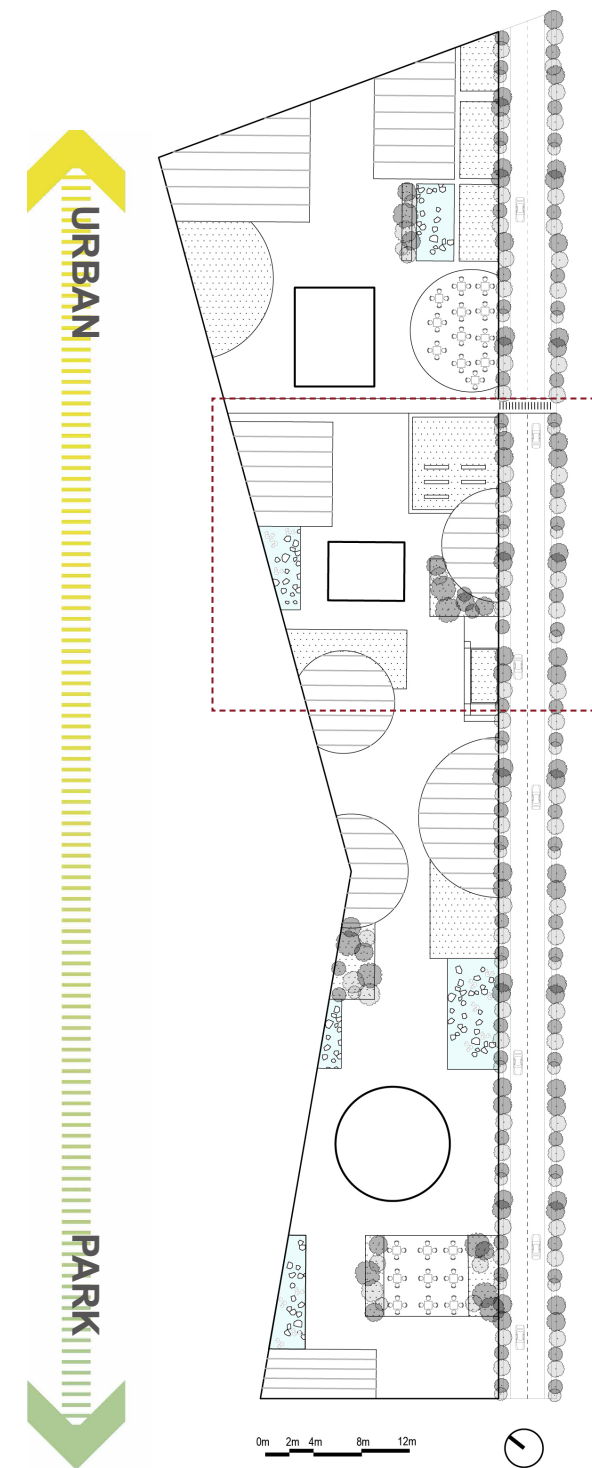
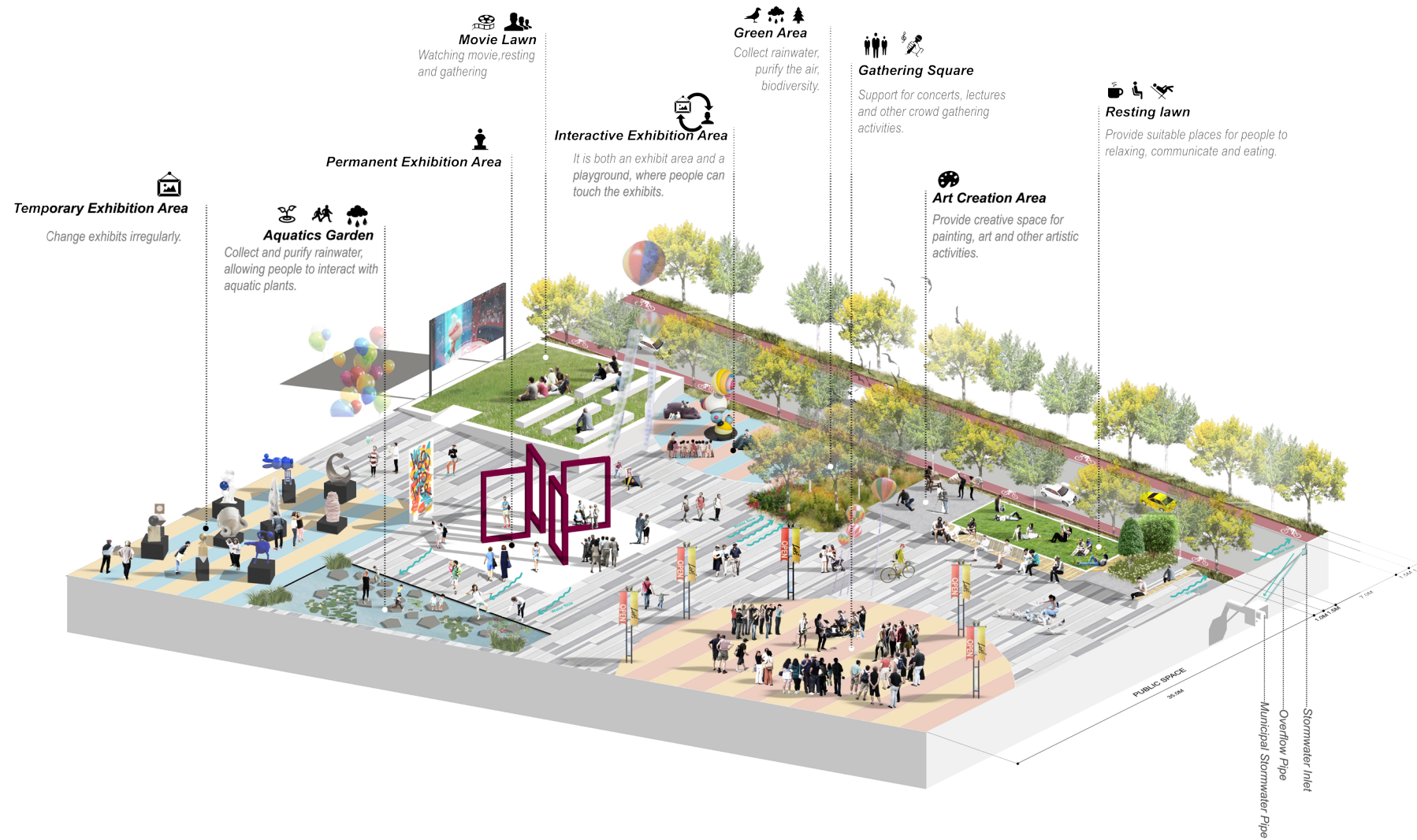
- Existing Building
- Proposed Building
- Existing Park





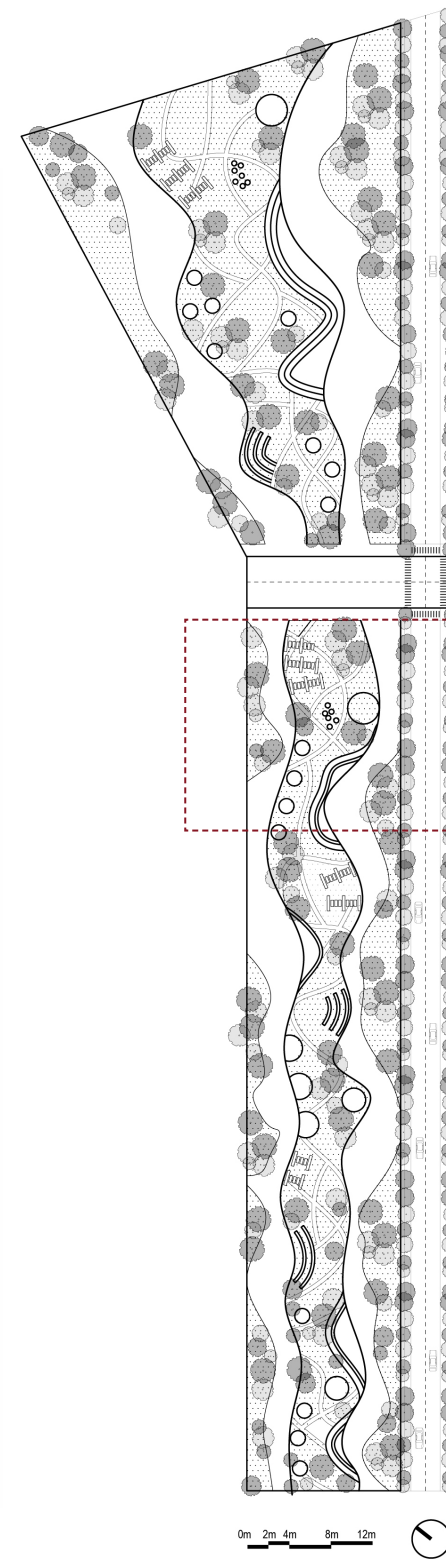
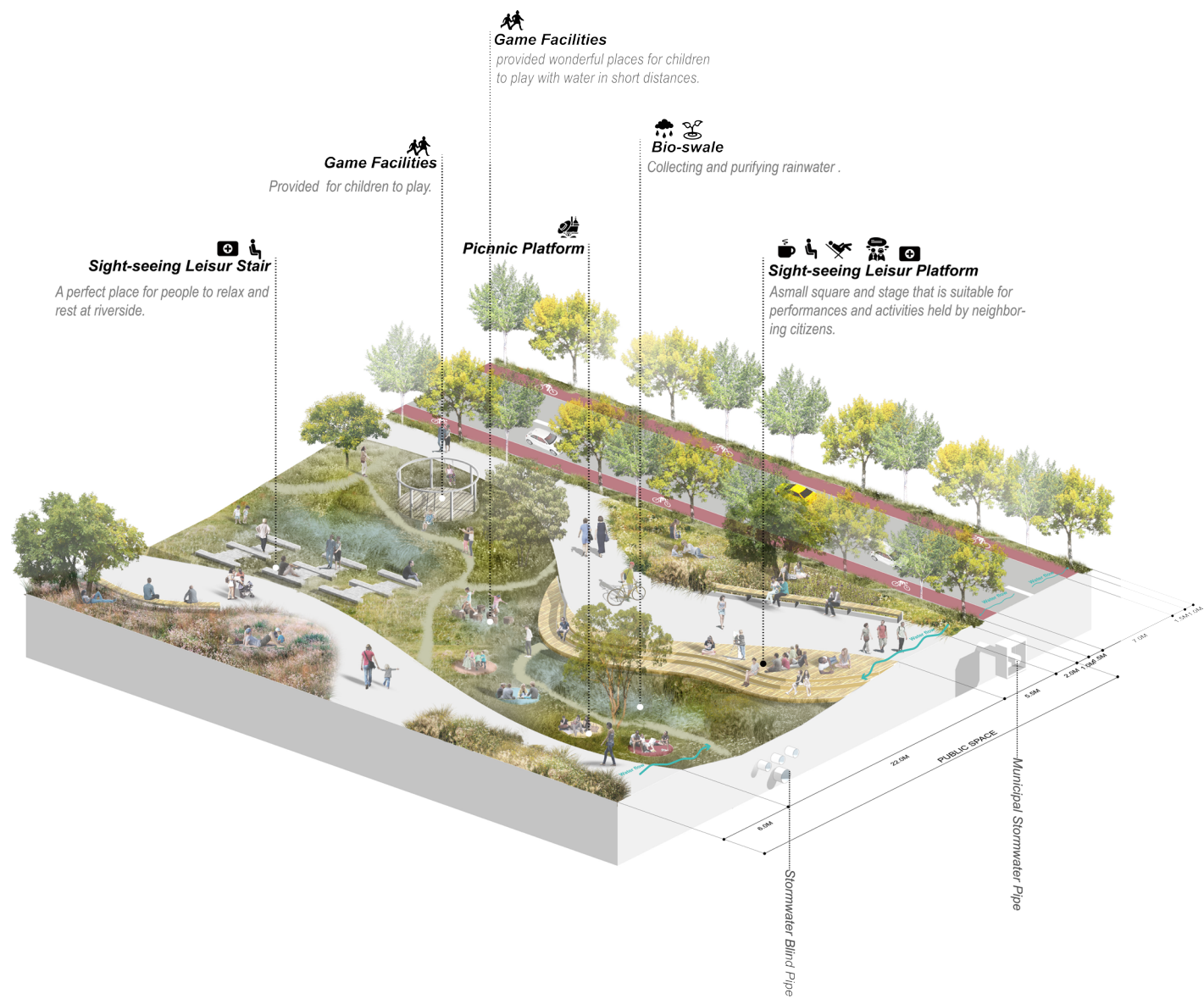


# LINK-Culture "Spine"

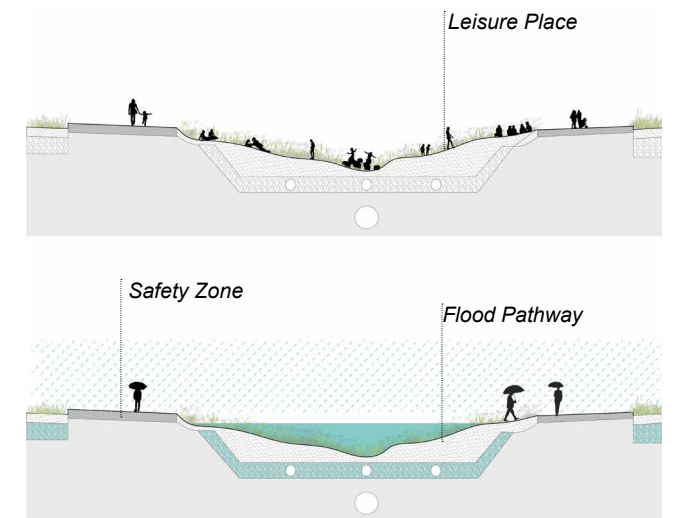


ART spine is a living room for art exchange between the city and the campus. It provides an urban inspiration space for complex social needs, performing arts activities, innovative culture, artistic creation, and interactive art installations.

# LINK-Green "Spine"



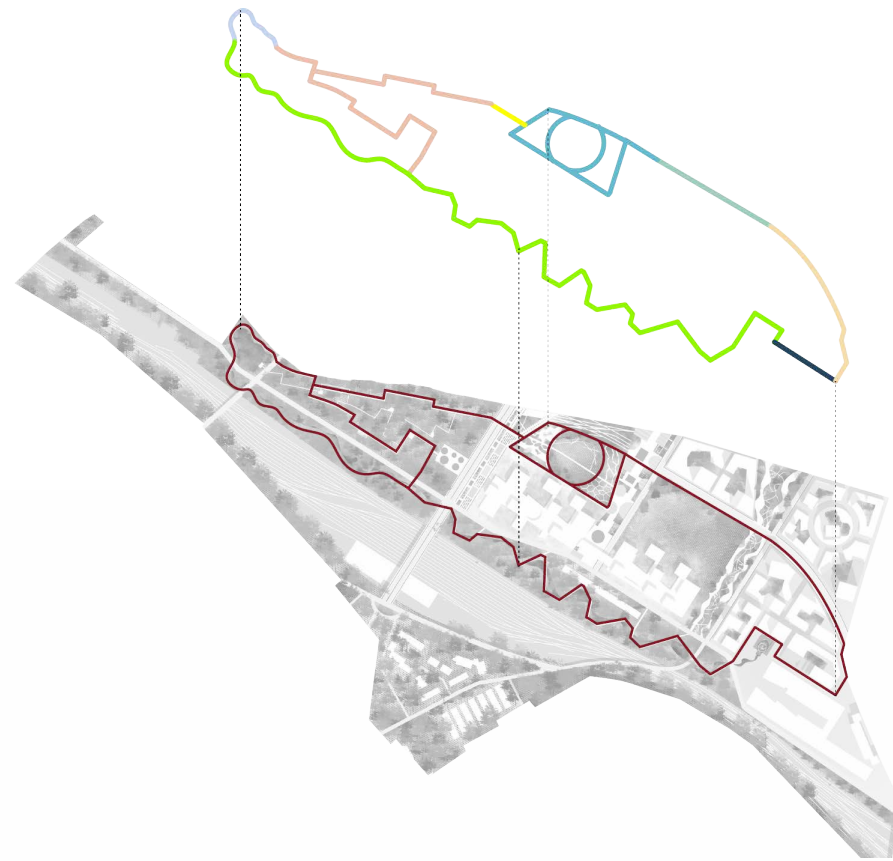
The green spine provide a strong pedestrian environment that is intergrated with water sensitive landscape strategies.it serves as a place to centralize the water, and provide activity and ecological functions, in which it is an recreation area for residents normally and it can prevent flooding in unexpected storm weather.



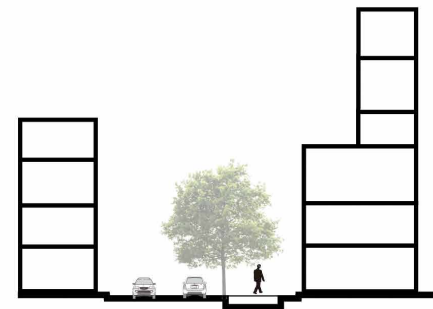
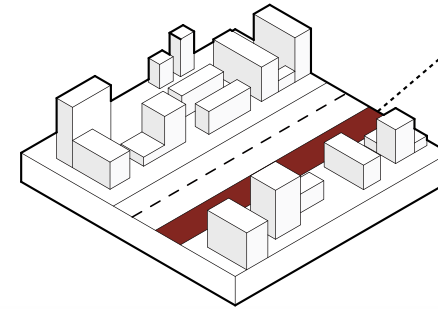


# LINK-Path Type

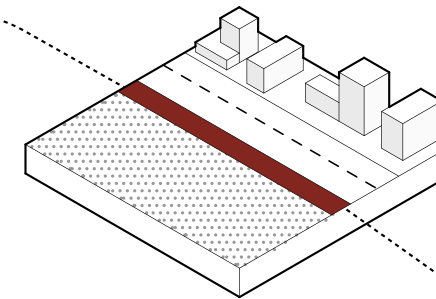
VARIOUS SPATIAL EXPERIENCE ALONG BRIDGE PATH



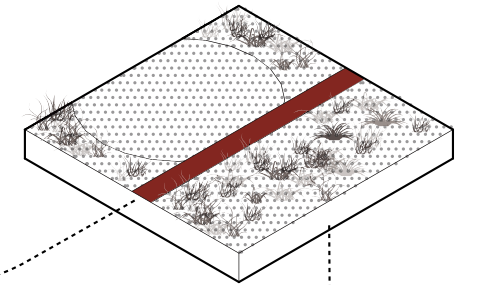
BRIDGE PATH @URBAN BLOCK



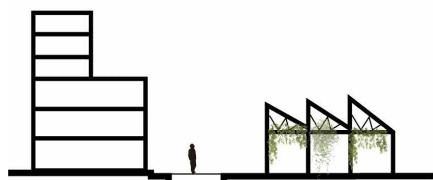
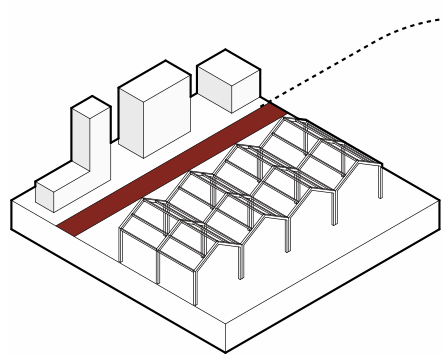
BRIDGE PATH @LAWN



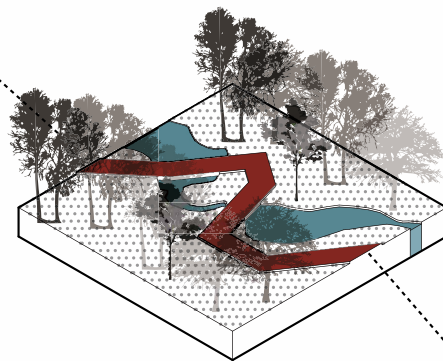
BRIDGE PATH @GARDEN



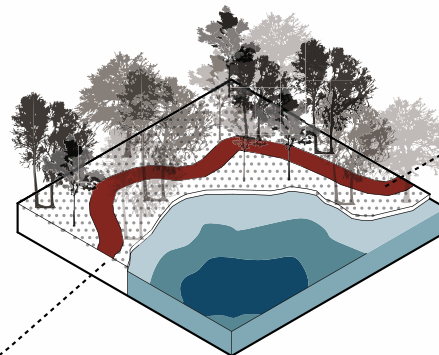
BRIDGE PATH @PRESERVED INDUSTRIAL STRUCTURE



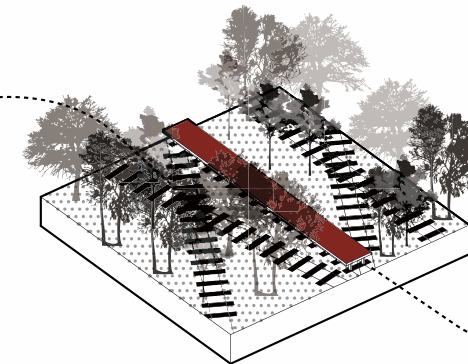
BRIDGE PATH @WETLAND



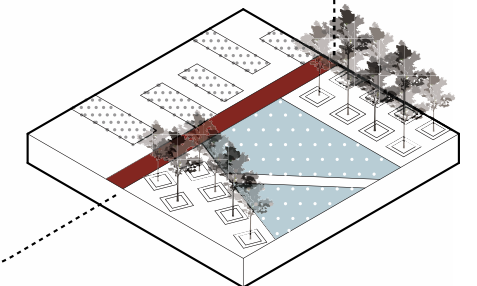
BRIDGE PATH @POND



BRIDGE PATH @RAILWAY FOREST



BRIDGE PATH @PLAZA





**ACTIVITY-Rendering**



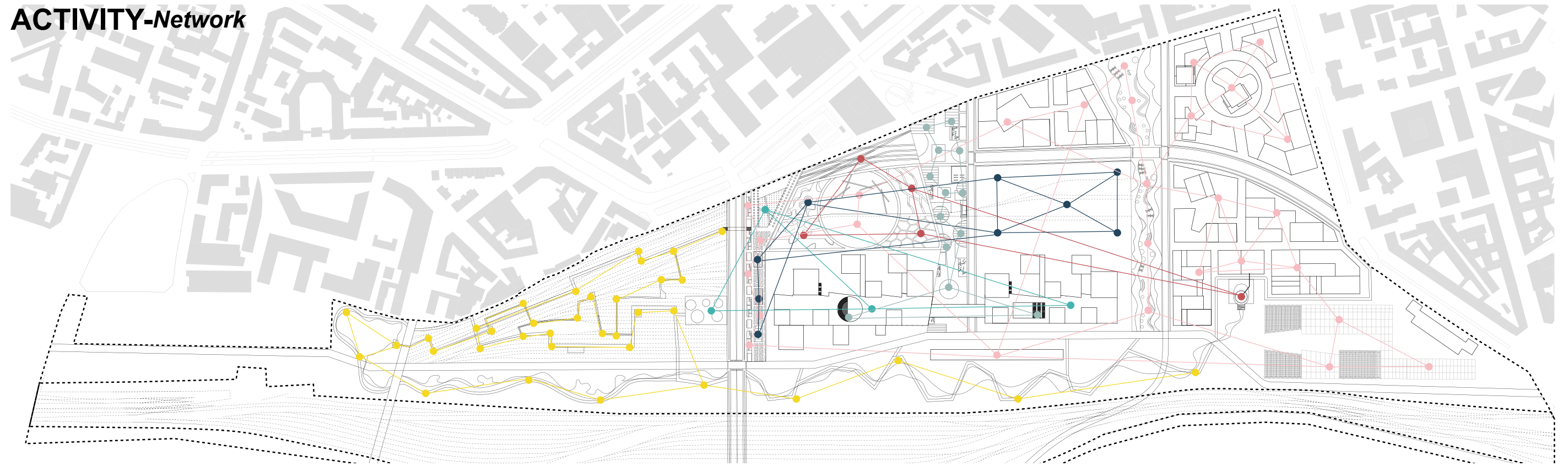
CRACK GARDEN



BIO-SWALE



# ACTIVITY-Network

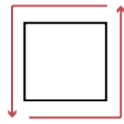


| Type        |                           | Spring&Summer | Fall&Winter | Day | Night | Natural Condition | No Or Little Noise | Barrier-free | Gathering Activity | No Crowd Discrimination |
|-------------|---------------------------|---------------|-------------|-----|-------|-------------------|--------------------|--------------|--------------------|-------------------------|
| Sport Field | Skateboarding Garden      | ●             | ●           | ●   | ●     | ●                 |                    |              |                    |                         |
|             | Multi-Purpose Sport Field | ●             | ●           | ●   | ●     |                   |                    | ●            |                    | ●                       |
|             | Railway Lawn              | ●             |             | ●   | ●     | ●                 |                    | ●            | ●                  | ●                       |
| Garden      | Waterfall Garden          | ●             | ●           | ●   |       | ●                 |                    | ●            |                    | ●                       |
|             | Crack Garden              | ●             | ●           | ●   |       | ●                 |                    | ●            |                    | ●                       |
|             | Game and Chating Garden   | ●             | ●           | ●   |       | ●                 |                    | ●            |                    | ●                       |
|             | Peace Garden              | ●             | ●           | ●   |       | ●                 | ●                  | ●            |                    | ●                       |
|             | Railway Garden            | ●             | ●           | ●   |       | ●                 |                    | ●            |                    | ●                       |
| Playground  | Children Playground       | ●             | ●           | ●   | ●     | ●                 |                    | ●            |                    |                         |
|             | Fountain Plaza            | ●             |             | ●   | ●     |                   |                    | ●            |                    | ●                       |
|             | Roof Plaza                | ●             | ●           | ●   | ●     |                   |                    |              |                    | ●                       |
| Recreation  | Recreation Street         | ●             |             | ●   | ●     |                   |                    | ●            |                    | ●                       |
|             | Green Street              | ●             |             | ●   |       | ●                 |                    | ●            |                    | ●                       |
|             | Green House               | ●             | ●           | ●   | ●     |                   | ●                  | ●            |                    | ●                       |
|             | Event Lawn                | ●             |             | ●   |       | ●                 |                    | ●            | ●                  | ●                       |
|             | Forest Cafe               | ●             | ●           | ●   | ●     | ●                 | ●                  | ●            |                    | ●                       |
|             | Mixed Used District       | ●             | ●           | ●   | ●     |                   |                    | ●            |                    | ●                       |
| Art         | Art Spine                 | ●             | ●           | ●   | ●     |                   |                    | ●            | ●                  | ●                       |
|             | Brera Campus              | ●             | ●           | ●   | ●     |                   | ●                  | ●            | ●                  | ●                       |
| Nature      | Wetland Boardwalk         | ●             |             | ●   |       | ●                 | ●                  | ●            |                    | ●                       |
|             | Forest Boardwalk          | ●             | ●           | ●   |       | ●                 | ●                  | ●            |                    | ●                       |
|             | Relation Pond             | ●             |             |     |       | ●                 | ●                  |              |                    | ●                       |

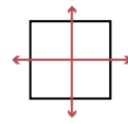
# ECOLOGY-Ecological Urbansim

1

Against the traditional Enclosed Block



Towards an Open Block

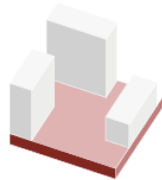


The new block has a more flexible open form. This block type has the following advantages:

- Enhancing the accessibility of the block center;
- Facilitating the provision of logistical channels such as medical treatment, technology and manufacturing.

2

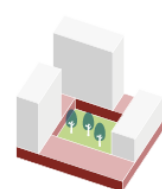
Plinth as an urban catalyst



Each block has multiple plinths. The plinth space can be used for shopping mall, a conference center, or open office space that require greater flexibility and function as a catalyst for high-density development and towers can be residences, research rooms or hotel with enough sunlight and ventilation. At the same time, these towers can be developed separately by different developers, ensuring diversity.

3

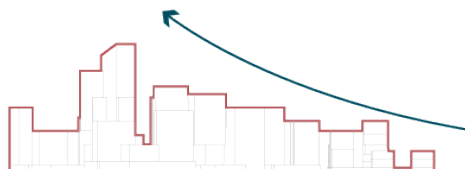
Overlapping Systems Plinths+Towers+Courtyards



- The overlapping of the three systems of Plinth, tower and courtyard ensures high-quality and differentiated blocks;
- Large spaces on the first to third floors provide more flexible function distribution;
- Setback space creates outdoor space for high-density cities; High floor area ratio while having good lighting and ventilation;
- A clear signal: even if The upper part is a private place, and the lower part is a public place that belongs to everyone.

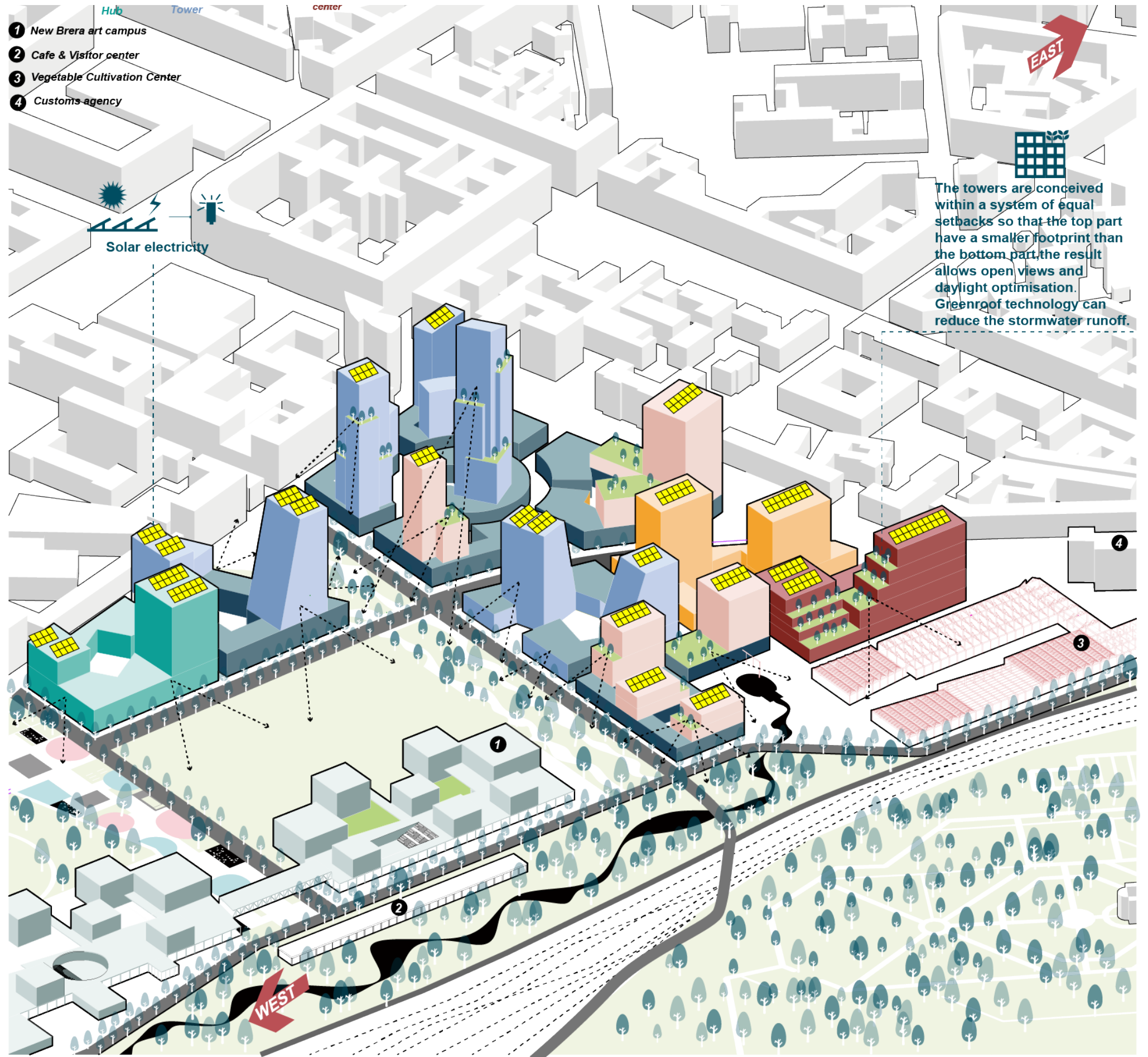
4

New skyline



N S

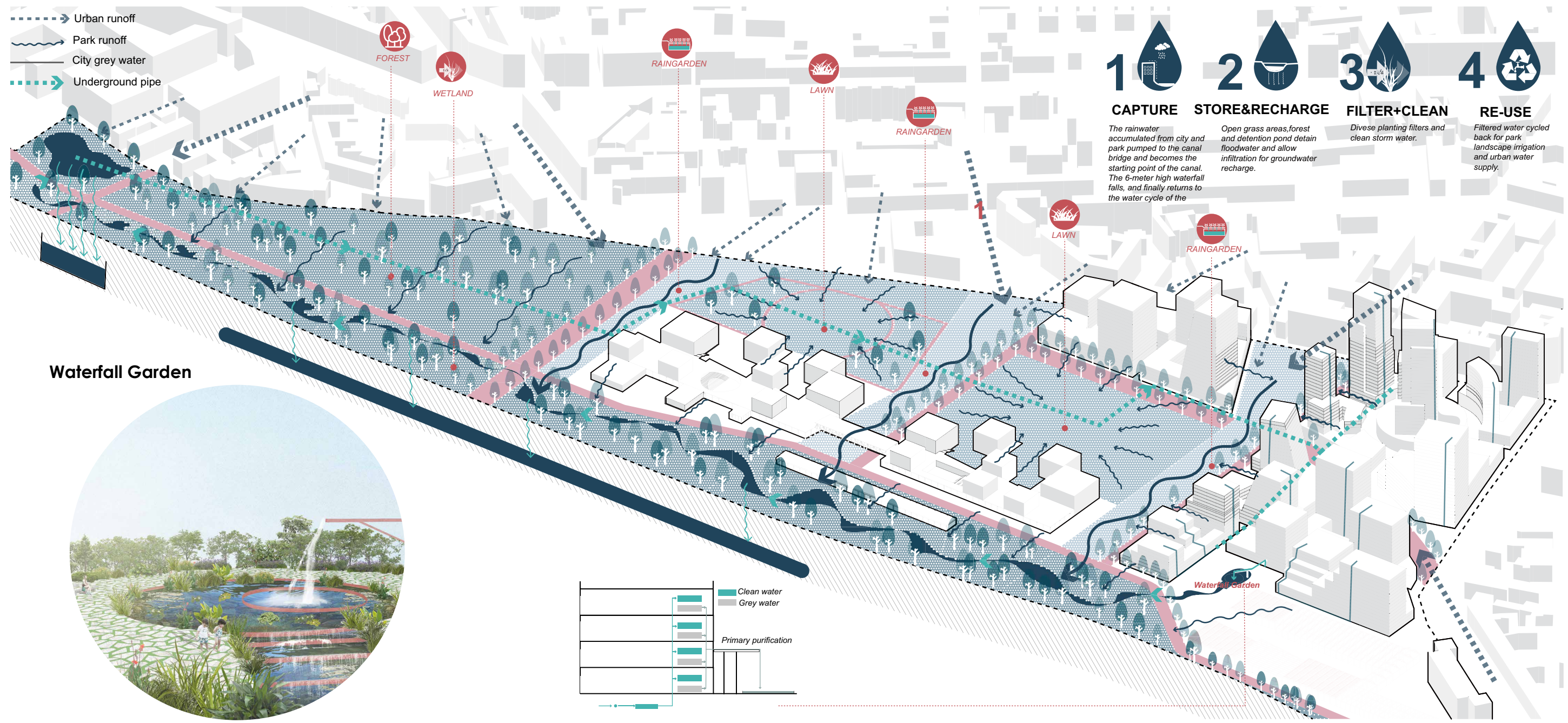
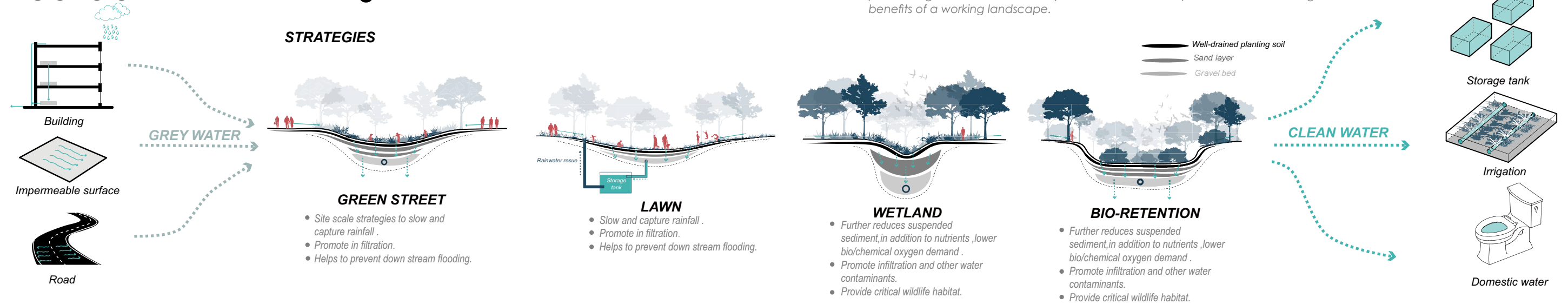
The height of the building increases from south to north, and while forming a new skyline, it also ensures sufficient sunshine and a good view height.





# ECOLOGY-Stormwater Management

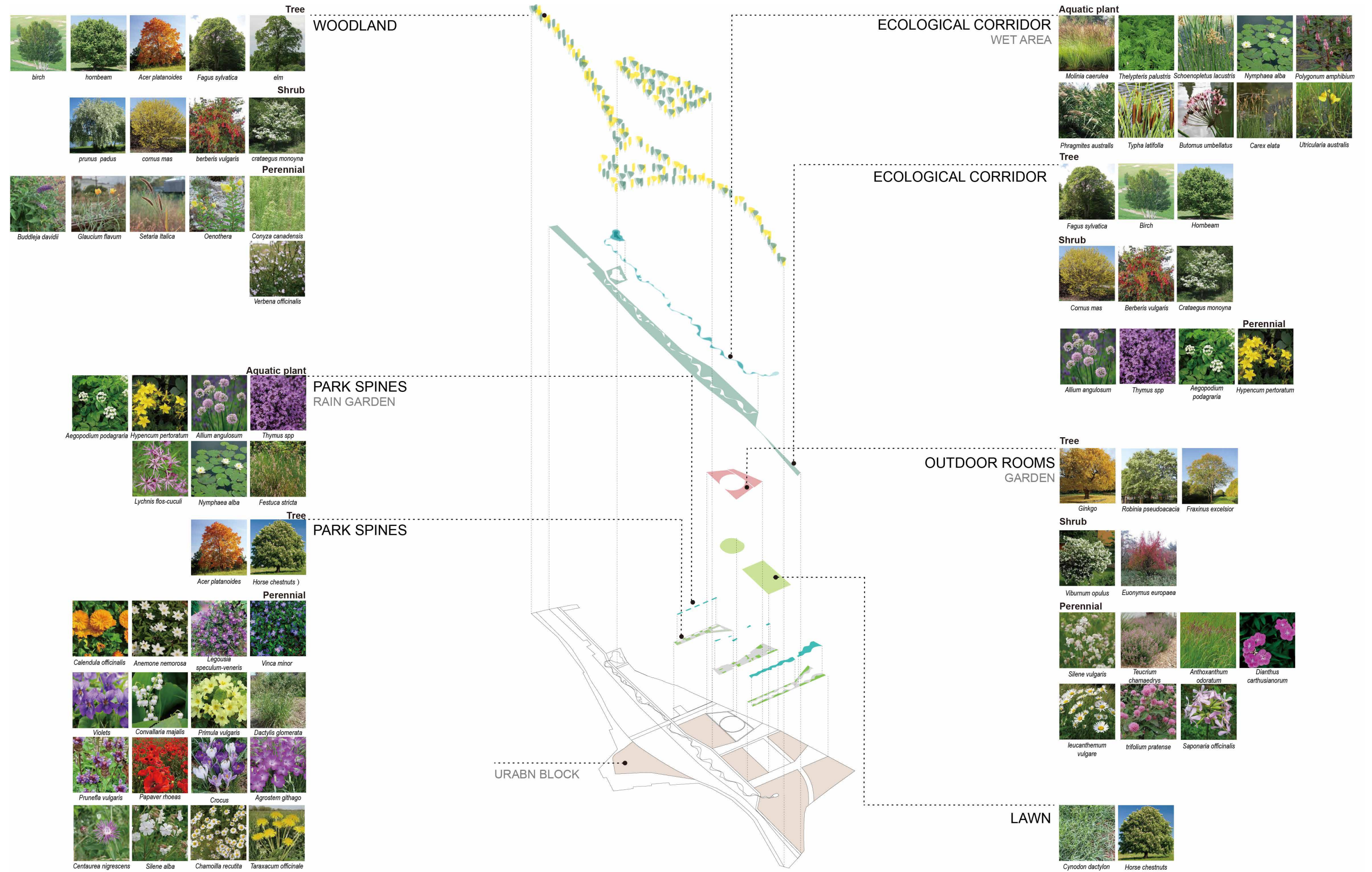
The design incorporates a robust stormwater capture system that will support the parks's irrigation demand. The system is visible to all park users, showcasing the benefits of a working landscape.





# ECOLOGY-Planting Design

Planting strategy offers specific insight into vegetation variation by zones and habitats to reflect promotion of ecological diversity and resiliencies.





# ECOLOGY-Planting Seasonal Change

## WOODLAND

### Tree

- Elm*
- Hornbeam*
- Acer platanoides*
- Fagus sylvatica*
- Pinus cembra*

### Shrub

- Prunus padus*
- Cornus mas*
- Berberis vulgaris*
- Crataegus monogyna*

### Perennial

- Glaucium flavum*
- Setaria Italica*
- Oenothera*
- Conyza canadensis*
- Taraxacum officinale*
- Prunella vulgaris*
- Buddleja davidii*
- Verbena officinalis*

## PARK SPINES

### Aquatic plant

- Aegopodium podagraria*
- Hypencum perforatum*
- Allium angulosum*
- Nuphar luteum*
- Lychnis flos-cuculi*
- Nymphaea alba*
- Molinia caerulea*

### Tree

- Acer platanoides*
- Horse chestnuts*

### Perennial

- Calendula officinalis*
- Anemone nemorosa*
- Legousia speculum-veneris*
- Vinca minor*
- Viola*
- Convallaria majalis*
- Primula vulgaris*
- Dactylis glomerata*
- Prunella vulgaris*
- Papaver rhoeas*
- Crocus*
- Agrostem gilthago*
- Centaurea nigrescens*
- Silene alba*
- Chamomilla recutita*
- Taraxacum officinale*

## ECOLOGICAL CORRIDOR

### Aquatic plant

- Thelypteris palustris*
- Molinia caerulea*
- Schoenopletus lacustris*
- Nymphaea alba*
- Polygonum amphibium*
- Phragmites australis*
- Typha latifolia*
- Butomus umbellatus*
- Carex elata*
- Utricularia australis*

### Tree

- Fagus sylvatica*
- Birch*
- Hornbeam*
- Pinus cembra*

### Shrub

- Cornus mas*
- Berberis vulgaris*
- Crataegus monogyna*

### Perennial

- Allium angulosum*
- Thymus spo*
- Aegopodium podagraria*
- Hypencum perforatum*

## OUTDOOR ROOMS

### Tree

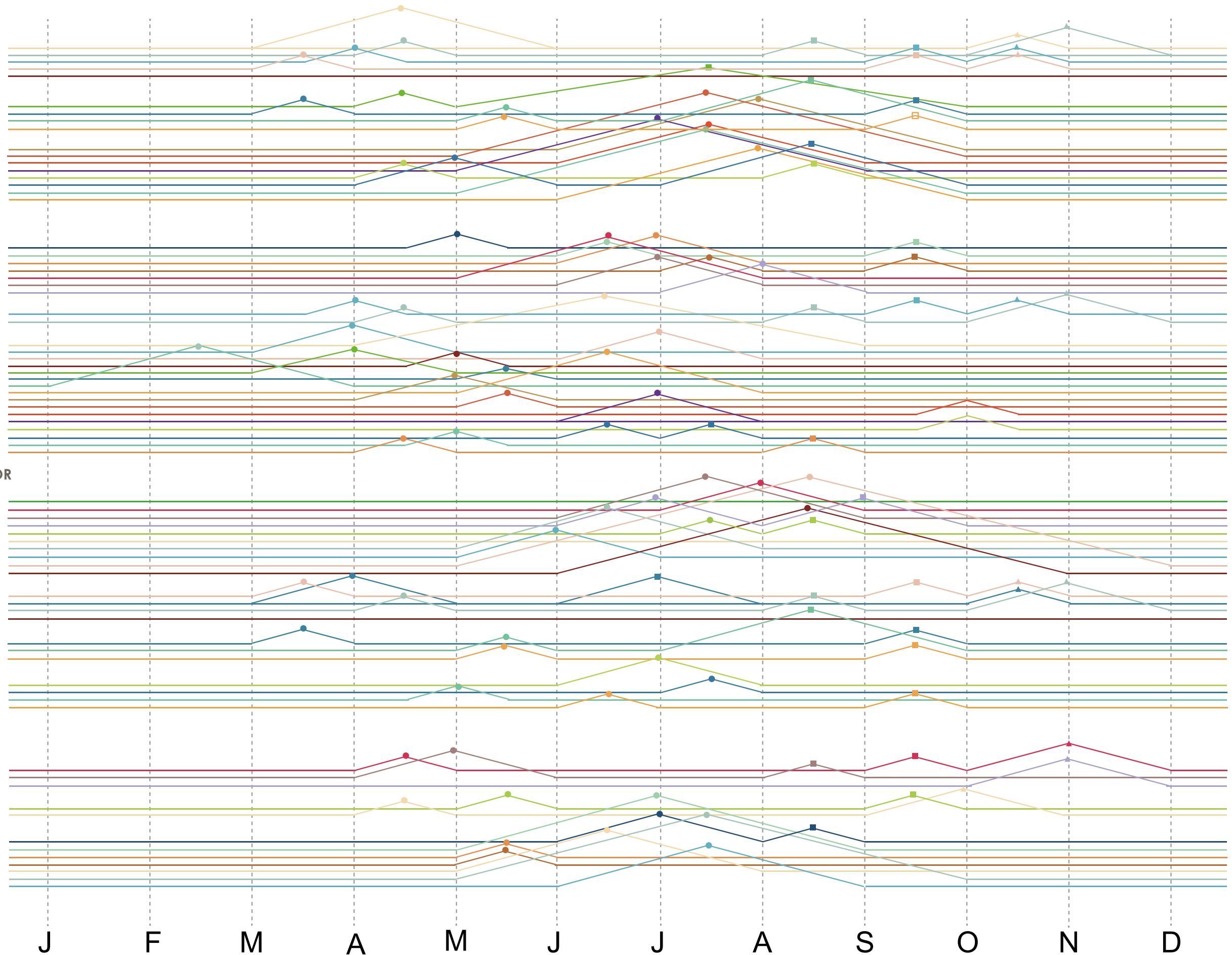
- Ginkgo*
- Robinia pseudoacacia*
- Fraxinus excelsior*

### Shrub

- Viburnum opulus*
- Euonymus europaea*

### Perennial

- Silene vulgaris*
- Teucrium chamaedrys*
- Anthoxanthum odoratum*
- Dianthus carthusianorum*
- leucanthemum vulgare*
- Trifolium pratense*
- Saponaria officinalis*







## ECOLOGY-Transformation

There are many resources in abandoned railway sites, including natural resources (soil, plants, water bodies, etc.) and non-natural resources (abandoned railways, buildings and structures, etc.). Focus on the use of non-natural resources. Reasonable retention or renovation based on actual conditions will reduce construction time and expenses. There are three main ways:

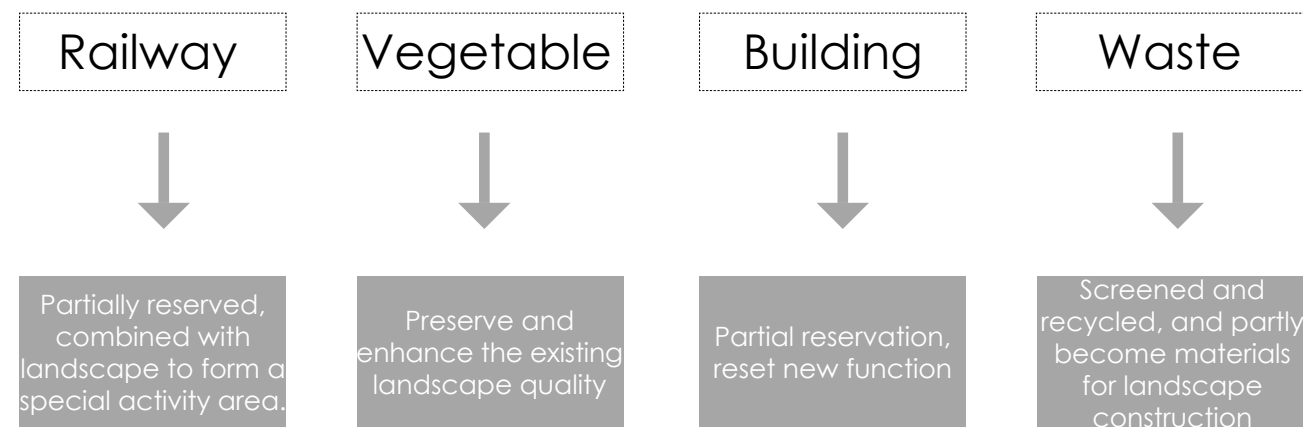
(1) The overall reservation. The overall preservation means that the abandoned railway landscape is almost inherited as it was, and only the contaminated parts are sorted out. This kind of preservation method is generally aimed at those abandoned railway landscapes with important historical memorial value, such as the railway line corridor as a linear cultural heritage, which can be re-exposed to the public in a preserved form.

(2) Partially reserved. Partial preservation refers to the selective preservation of abandoned railway landscapes, which are often of commemorative significance, mainly abandoned factory buildings, railroad tracks, railway platforms and supporting facilities. At the same time, some highly polluted and severely damaged parts are removed to create

a brand new landscape. For example, some disused railway systems connecting production nodes in old industrial areas can be transformed into a unique pedestrian system.

(3) Art reprocessing. Fully retain the structure and elements of the abandoned railway site, combine architectural design, land art and other disciplines to create new elements, and carry out artistic transformation. The new landscape elements replace the original elements and become works of art that convey the spirit of the site. Although deduced by modern methods, the landscape as a whole has changed, but in terms of form, material and scale, it still matches the atmosphere of the railway landscape.

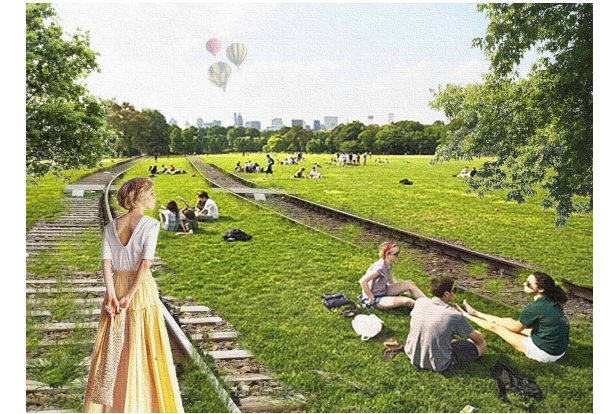
It should be noted that the natural resources are limited, and the controlled use should be considered in the landscape design. Especially for non-renewable resources, it is necessary to strengthen protection and reduce use, and always adhere to the principle of sustainable development. Use non-toxic and harmless materials made from recycled raw materials as much as possible, or recycle original materials to reduce energy consumption.



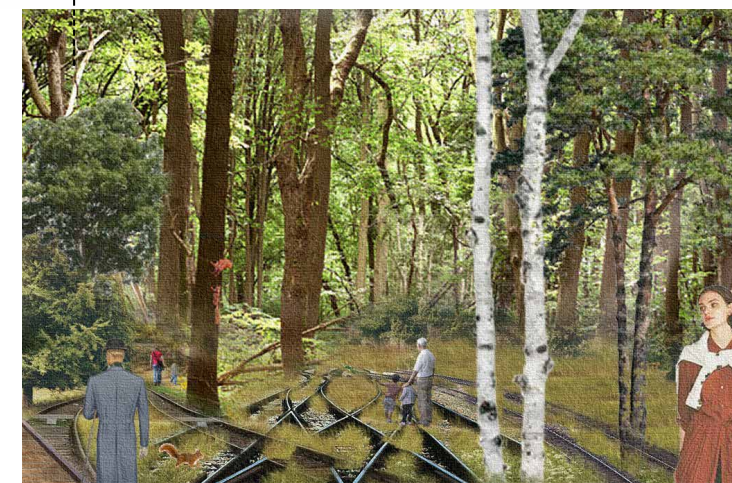
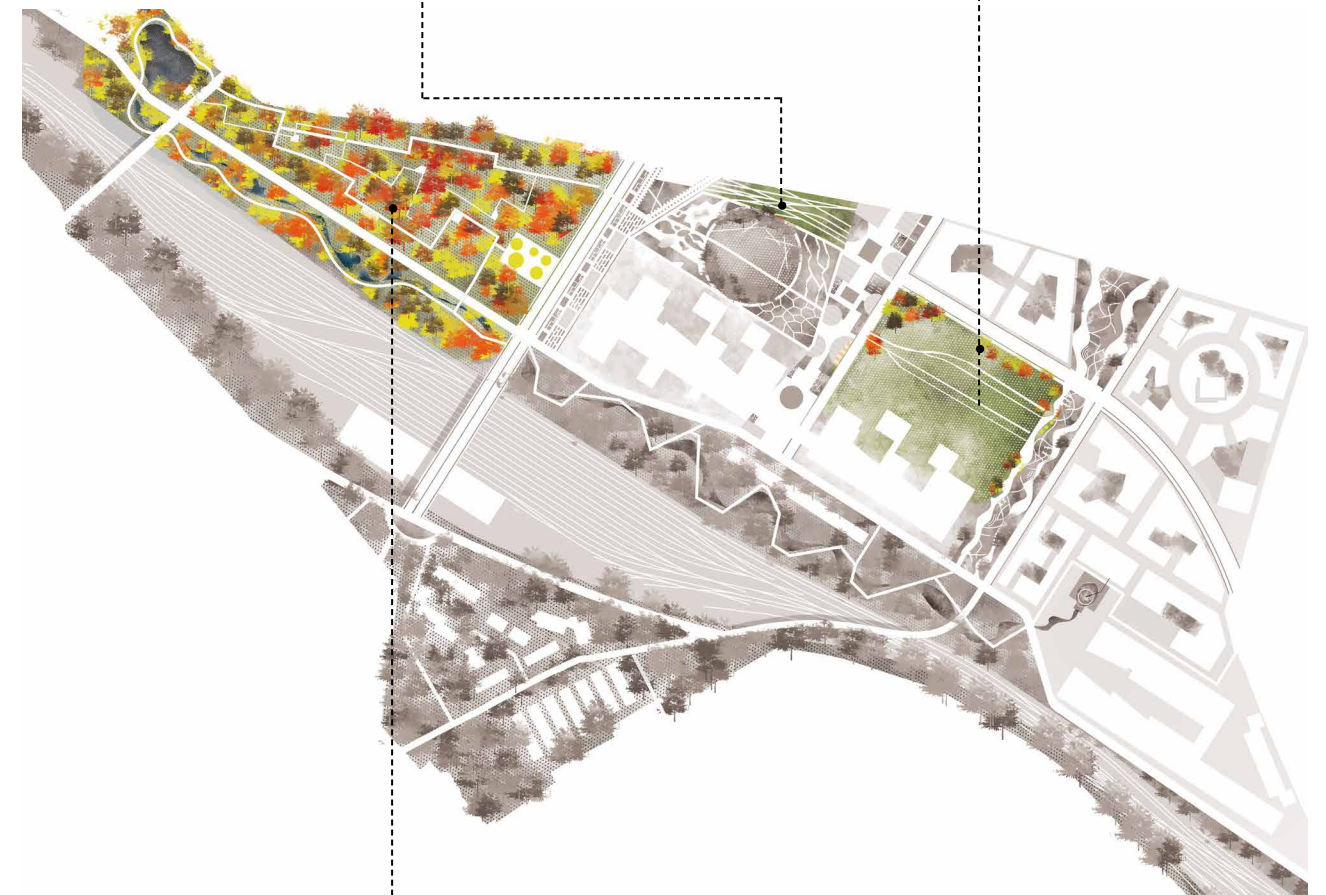
## ECOLOGY-Transformation of Railway Tracks



RAILWAY GARDEN



RAILWAY LAWN



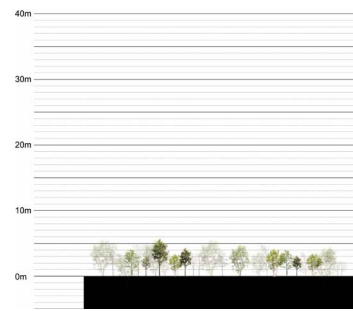
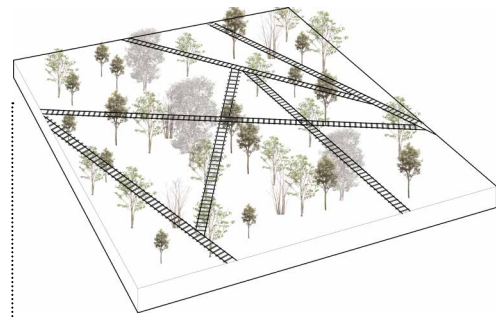
RAILWAY WOODLAND



# ECOLOGY-Railway woodlad

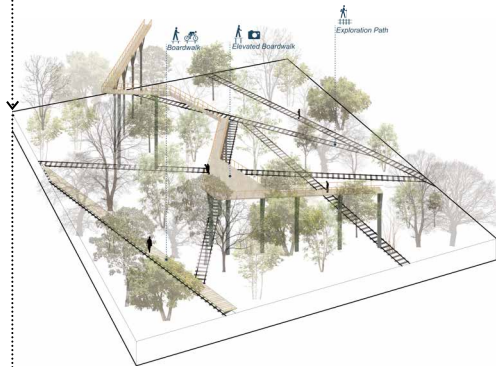
## Woodland restoration plan

Existing



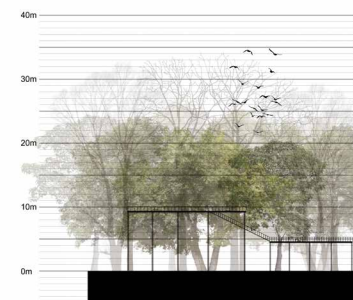
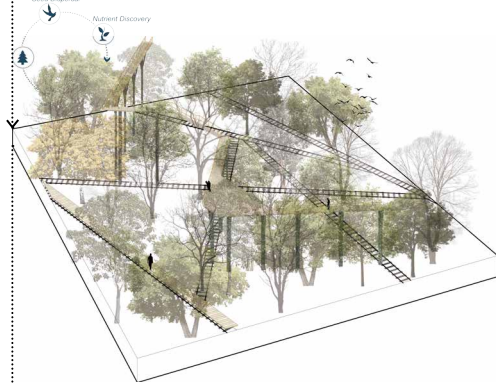
The initially sparse tree population became a dense forest with undergrowth. Climbing plants give it a primeval forest-like character.

3 Year



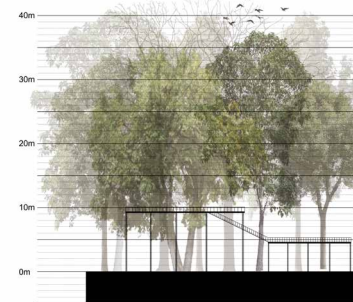
The initially sparse tree population grows, and the spread of plant roots can make the soil environment more stable, the nutrients in the soil accumulate during this time.

10 Year

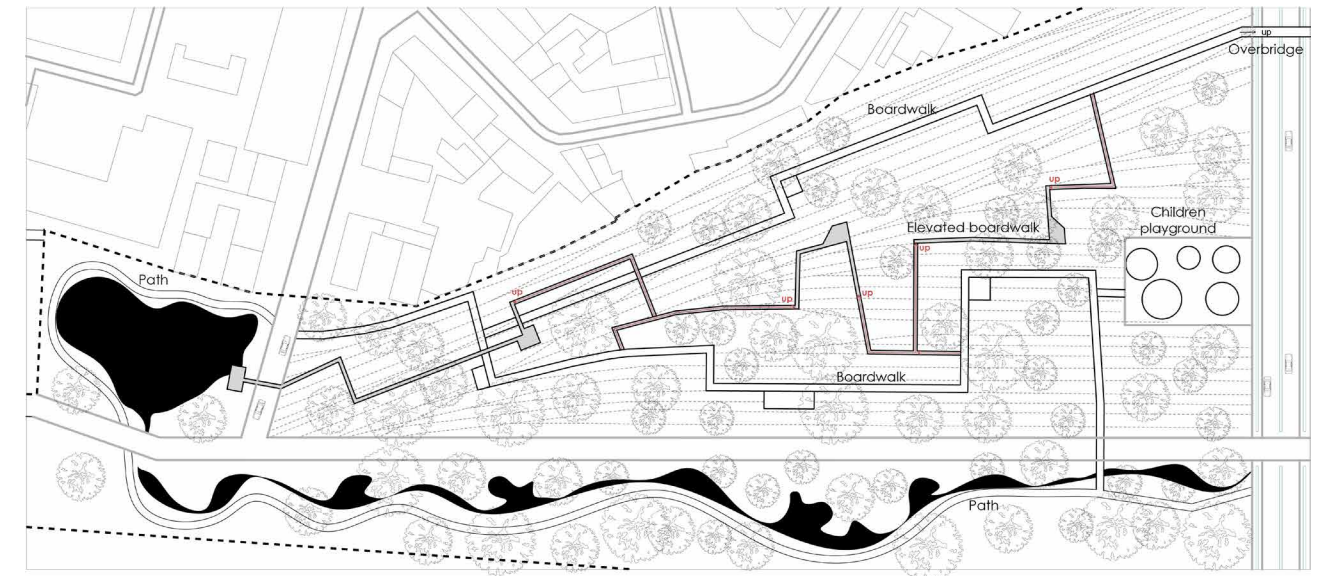


With increasing age, the forest will gain old and dead wood and will continue to change. Ideal biotopes for specialized fungi and insects are created, which make the forest even more diverse.

30 Year



A stable ecosystem is formed. The old railway relics and lush wilderness naturally create an independent small world for visitors to the railway park to discover and explore.



RAILWAY WOODLAND PLAN



PATH IN RAILWAY WOODLAND

An elevated boardwalk provides a unique perspective of the park from the treetops, while also providing an opportunity to become immersed in nature.



## ECOLOGY-Railway woodlad



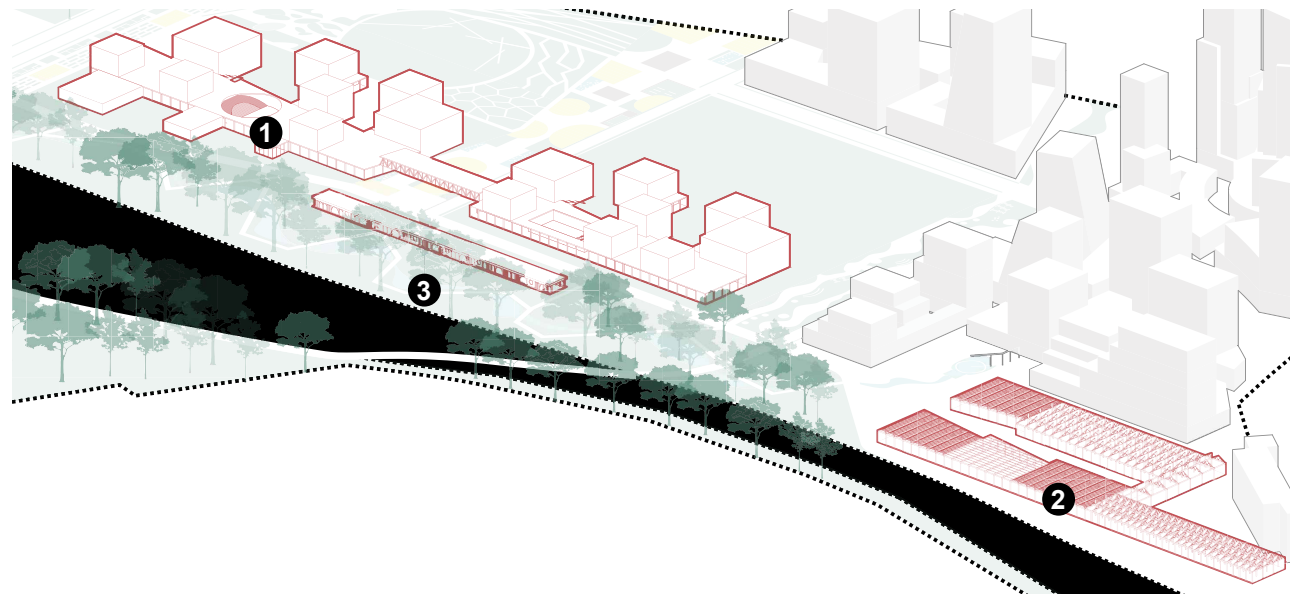
CHILDREN PLAYGROUND



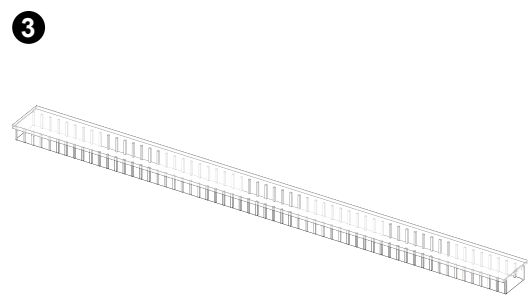
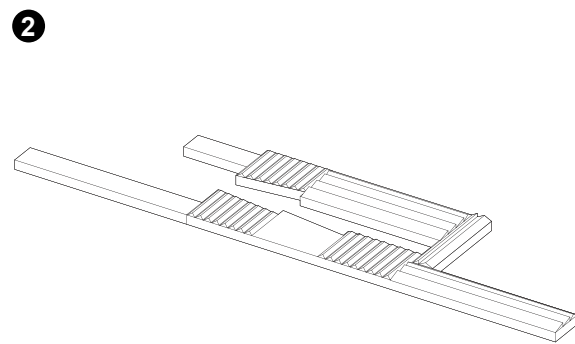
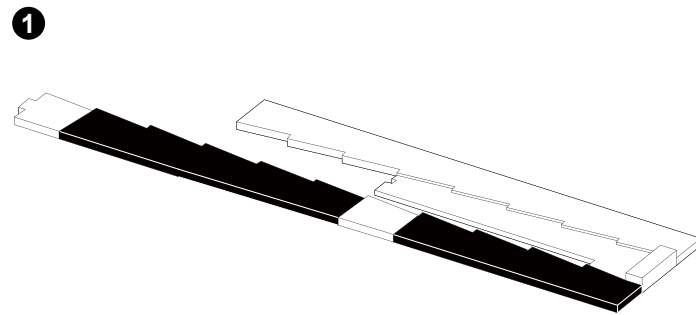
DETENTION POND



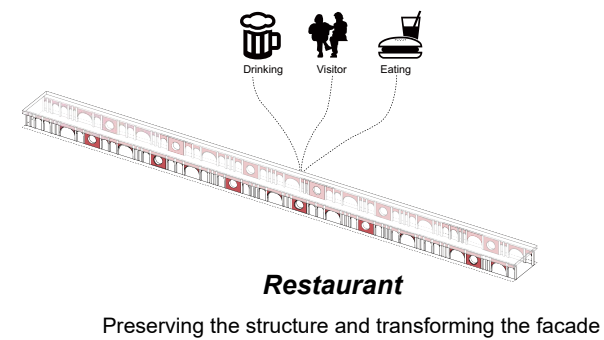
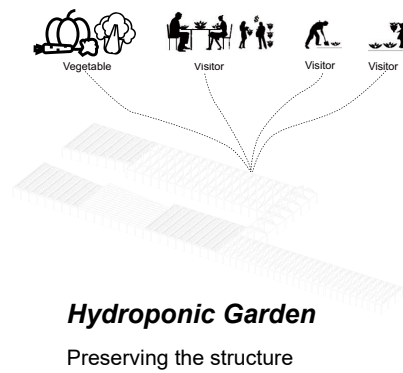
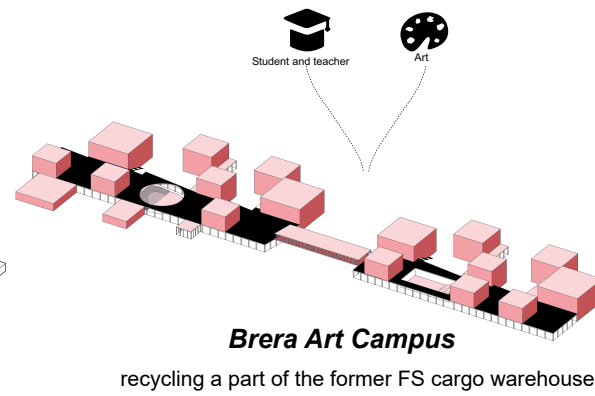
# ECOLOGY-Transformation of Industrial Structure



## Existing building



## Transformation



## Brera Art Campus

The framework of the Brera Art Campus needs will be:

1. Accommodate approximately 3,500 students and approximately 400 employees
2. Former FS freight warehouse
  - Educational and instrumental workshops with teachers' study, free study spaces ,
  - Teaching and self-service, bookstore open to the public
3. New buildings
  - Classrooms for teaching, departmental office meeting space, library,
  - Theater studio, educational exhibition spaces, scenographer painting workshop.
4. Exhibition spaces open to the public will be possibly classifiable as public green equipment, as long as they are integrated with the green plan.



## Hydroponic Garden

What is hydroponic garden for the city of Milano?

- a place for kids to play with hydroponics,
- an education center where you can learn about this kind of 'agroculture',
- a place for exploring and inventing new ideas for hydroponic technology,
- shop, where you can buy components for your own home gardening,
- a green fabric that produces elements for urban space such as vertical gardens;
- A large kitchen. Here, fresh vegetables are picked every day and then cooked in real time for the benefit of the visitors.



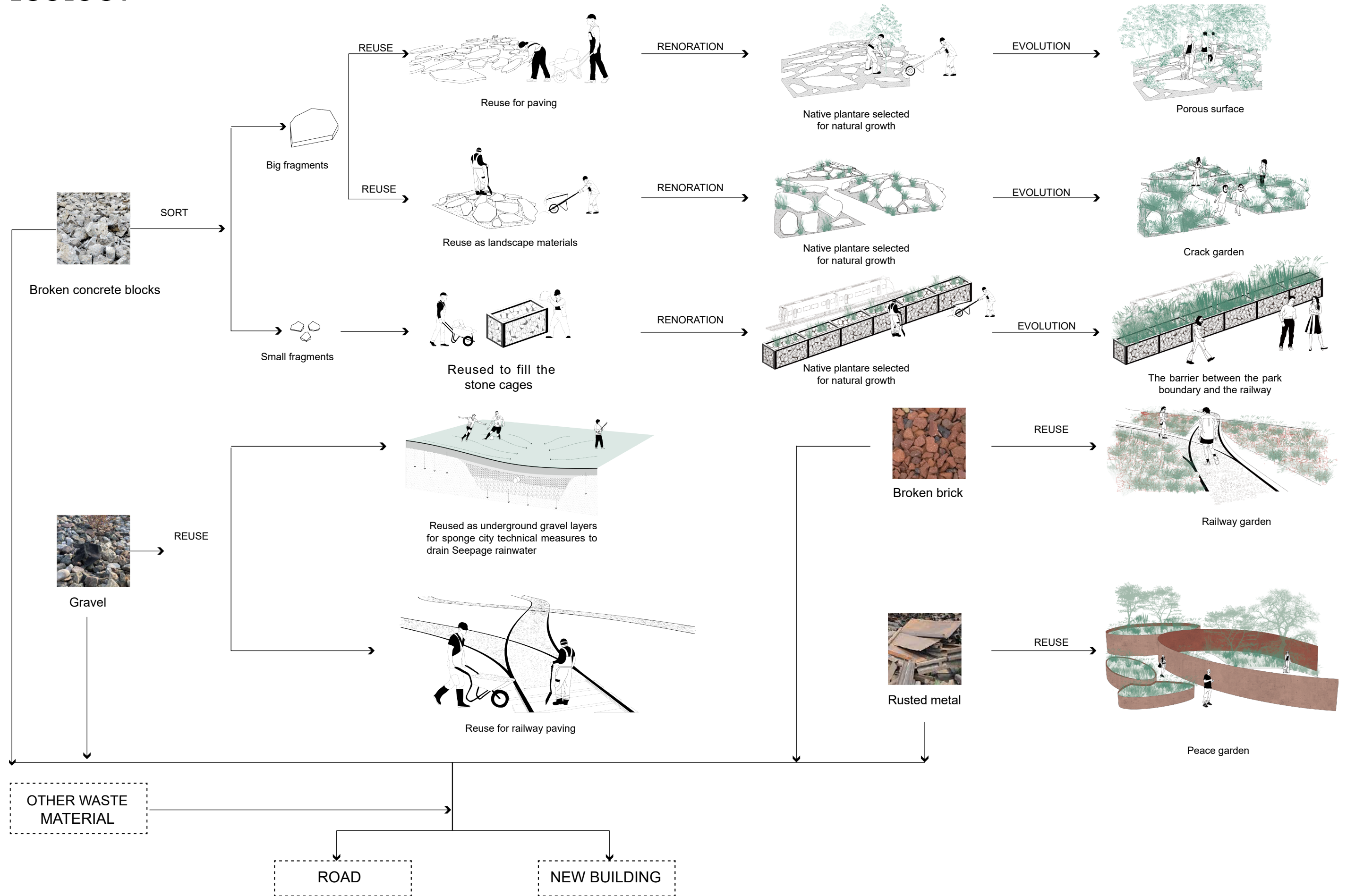
## Restaurant

What is the restaurant for the Farini?

- A place for visitors to relax,
- A chane to be close to nature,



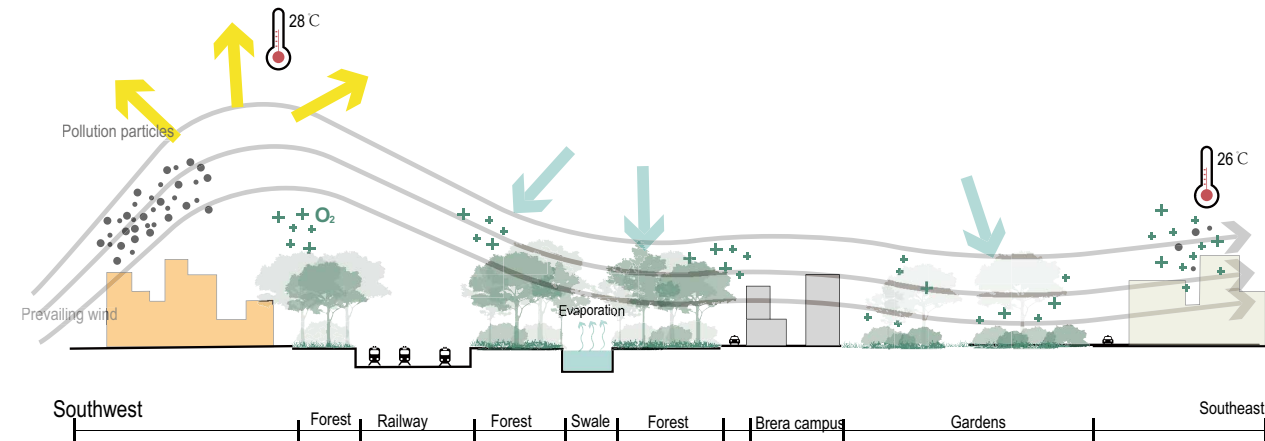
# ECOLOGY-Transformation of waste material



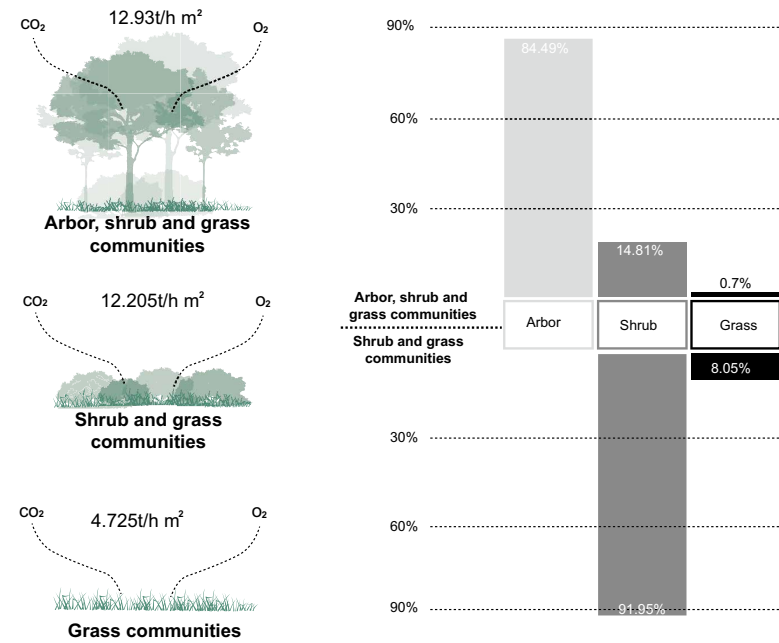


# HEALTH-Environment & Lifestyle

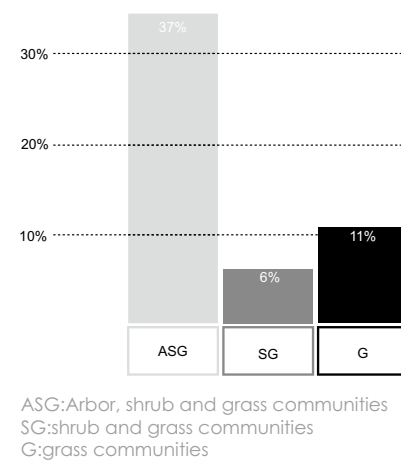
## Section



## Air purification efficiency



## Floor area ratio



## Environment value

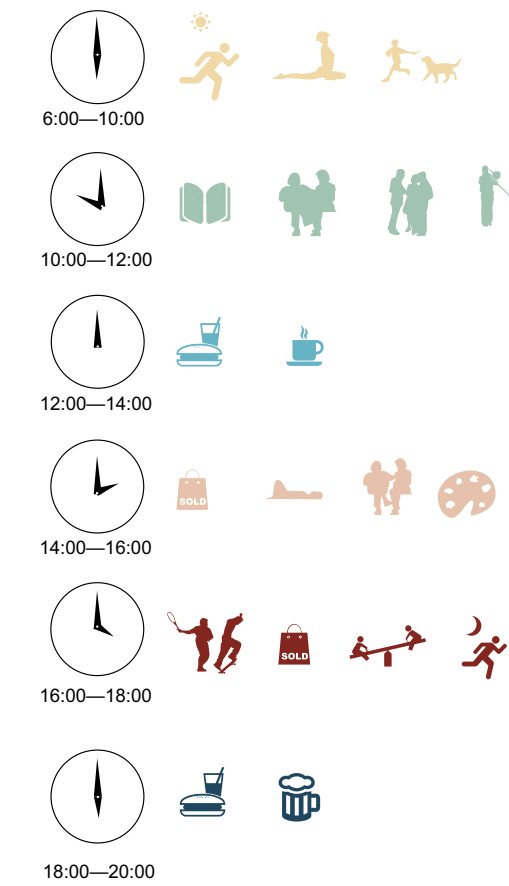
Strategic placement of trees in urban areas can cool the air by between 2°C and 8°C.

Large urban trees are excellent filters for urban pollutants and fine particulates.

Landscaping, especially with trees, can increase property values by 20%.

A large forest can cool the hot wind from the southwest and purify the most toxic particles in the air.

# HEALTH-Lifestyle



## GREEN LOOP

fdhsgiper skfibs sdufhi dsifisdh dkjafhdsls sidfipdn idufhsfiu .ksifasd kjdfhiudb difapfdgke skjafhi jkdszfhak ,dfkjasdph jdkfakj kjadfj kjfankl kjdfakj jfaj kjfja kjfkjd jksfaskj



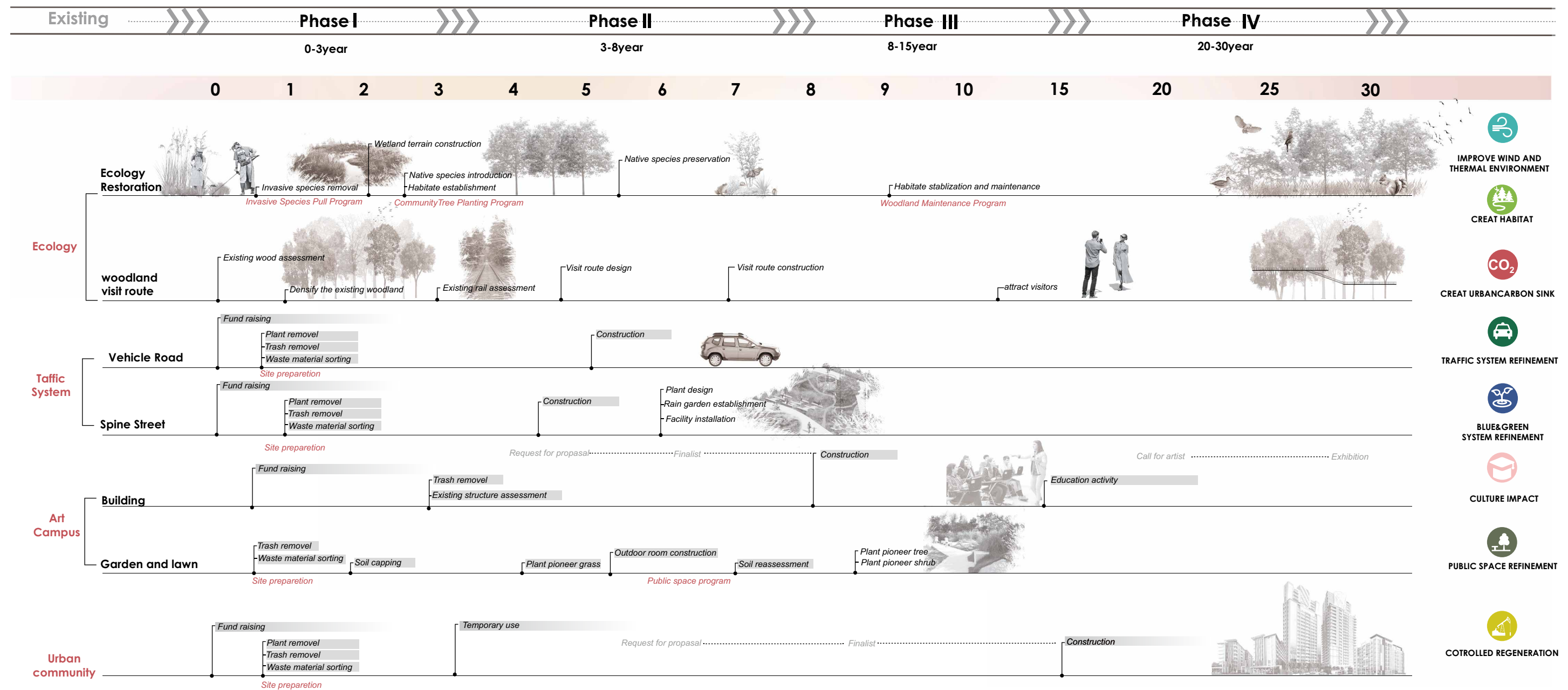
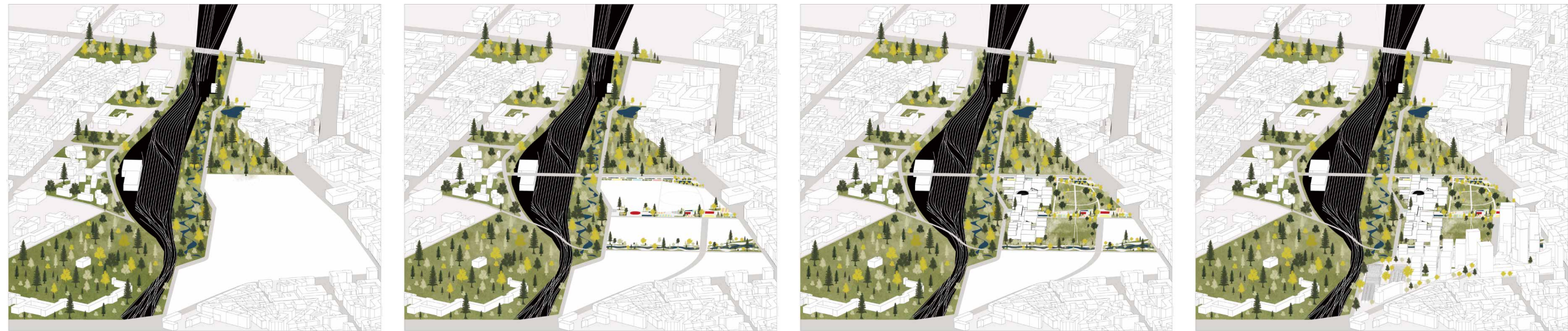
- PUBLIC OPENSOURCE
- BIKING
- INFILTRATION
- BIOSWALE
- ROAM
- URBAN RECREATION

Open space, recreation and sports fields, bike and jogging paths, natural habitats promote citizens to develop a healthy lifestyle





# PHASING DIAGRAM



# CONCLUSION

Given the size and complexity of the regeneration project, and bearing in mind that the process will take place over several years, within a constantly shifting economic and social context, the Masterplan aims to establish which, where and how the main elements of the public city effectively are, ensuring they be compatible with the existing yet capable of regenerating the area in relation to the city and the metropolitan area.

The aim of the thesis is, therefore, not to draw up plans identical to an “Implementing Plan” or a planivolumetric design of the area, but rather the representation of a regeneration strategy, with a special focus on the public areas, the connections and the green infrastructures, proving both the accomplishment of the general objectives and resilience over time in the face of the changing socio-economic scenarios of the city. In the process of transformation of the Milan railway yards, I have showed how to transform a negative into stimulus for sustainable development, it includes flowing contents:

**Streamlining resources** (integrated water management, control of soil consumption, reduction of distances, increase in proximity services, reduction of urban management costs)

Adaptation to climatic change (protection of human health, mitigation of the urban air pollution, improvement of the urban microclimate, protection and active enhancement of the historical-cultural heritage).

**Reinforcement of the municipal ecolo-**

**gical network** (increase in biodiversity and connectivity, greater efficiency of the ecosystems in providing environmental services).

**Improvement of urban quality** (A rational transport inter-modality project, Universal Accessibility)

**The ideal transformation of the economic development model**

**Enrichment of the offer of public spaces suited to citizens' new needs** (users from different generations and cultures, desire for contact with nature).

The new park becomes an urban, metropolitan and international level attractor by opening up to great public vocations that create identity and sense of belonging within the community:

**Culture:** inclusion in a circuit of cultural metropolitan spaces.

**Memory:** reinterpretation of history to identify the characters and potentialities of the place.

**Art and events:** park as incubator for art and platform for exhibits, workshops, festivals, large events and international formats.

The regeneration of the Railway Yards is the big chance Milan to prove how we can rethink the city without consuming new soil, restoring and re-naturalising large surfaces. It is precisely these large-sized public and open spaces, the new widespread infrastructure, which replaces the “rail” land and on which the new urban connections and relationships, those of the pre-existing districts with the new ones, are founded.



## BIBLIOGRAPHY

### Papers

Zhang, C., Dai, S. & Xia, H. (2020) Reuse of Abandoned Railways Leads to Urban Regeneration: A Tale from a Rust Track to a Green Corridor in Zhangjiakou. *Urban Rail Transit* 6, 104–115

Lin W (2018) Research on activation and utilization of urban abandoned railways. In: *Sharing and quality—2018 China urban planning annual conference paper collection (02 Urban Renewals)*, pp 509–522

Zuo Z, Li C (2017) Study on the construction and planning of high-density urban ecological pattern based on the reuse of abandoned urban railways. *Urban Archit* 21:37–40

Wu X, Jiang L (2005) Turning the abandoned railway line into an urban expressway—take the Yiwu Line transfer in the electrification reform of Zhejiang-Jiangxi Railway as an example. *Planner* 21(s1):43–46

Wang J, Xiang Y, Luo Y (2010) Urban abandoned railway planning strategy based on the concept of green corridor. *Northern Horticult* 5:129–132

Ma Y, Jiang H, Bian Y (2015) Landscape path of abandoned railway in Kwangzhou Greenway Park, Korea. *Ind Build* 10:65–68

Huang X (2014) Utilization analysis of abandoned corridors along the former Zhejiang-Jiangxi Railway in Shangrao City. *Transp Transp Acad Ed A01*:143–146

Eizaguirre-Iribar A, Etxepare L, Rufino JHM (2016) A multilevel approach of non-motorised accessibility in disused railway systems: the case-study of the vasconavarro railway. *J Transp Geogr* 57:35–43

Olendzki A (2008) A railway 'route' as a linear heritage attraction: the Hijaz railway in the Kingdom of Saudi Arabia. *J Heritage Tour* 3:159–175

Li G, Xu H, Liu D (2014) Interpretation of middle east railway architectural culture communication from the perspective of cultural line. *J Archit* 5:45–51

Bowker JM, Bergstrom JC, Gill J (2007) Estimating the economic value and impacts of recreational trails: a case study of the Virginia Creeper Rail Trail tourism economics. *Tour Econ Bus Financ Tour Recreat* 13(2):241–260

Oppido S, Ragozino S (2014) Abandoned railways, renewed pathways: opportunities for accessing landscapes. *Adv Eng Forum* 11:424–432

Ferretti V, Degioanni A (2017) How to support the design and evaluation of redevelopment projects for disused railways? A methodological proposal and key lessons learned. *Transp Res Part D Transp Environ* 52:29–48

### Web contents

[http://blog.sina.com.cn/s/blog\\_673c8b9e0101cls9.html](http://blog.sina.com.cn/s/blog_673c8b9e0101cls9.html)

<https://www.gooood.cn/urbn-headquarters-by-dirt.htm>

<http://y.haijuehuanbao.com/yushuishoujiliyongxitong/167.html>

<https://www.milanofarini.it/scalo-farini-come-sara-il-nuovo-quartiere/>

<https://www.ilpost.it/2017/04/09/scali-ferroviari-milano/>

<https://www.fssistemiurbani.it/content/fssistemiurbani/it/scali-milano/concorso-farini.html>

<http://www.agora-magazine.com/en/2018/11/01/milan-railyards/>

<https://www.pgt.comune.milano.it/dpmilano-2030-visione-costruzione-strategie-spazi/spazi/milano-metropolitana/sviluppo-dellhub-della-conoscenza-e-dellinnovazione-del-nord-ovest>

Zhaowei Guo  
940559  
9th December