



Regeneration Urban Design

Alessia Grazia D'Aleo (10838581), Enrico Gravina (10776313), Giulia Piacentini (10795838), Laura Fernandes (11069469), Morillo Cremasco (11059259), Maria Cristina Zambon (10734582), Mario Zanetti (10799962), Marta Locatelli (10766380), Martina Mensi (10840078), Pietro Pizzo (10793629), Sania Shakil (11048328)

A.Y 2024/2025

1 ANALYSIS OF THE SITE AND CONTEXT	4
1.1 LOCATION.....	4
1.2 PLANNING FRAMEWORK.....	4
1.3 PARTICIPATION PROCESS	5
1.4 EXISTING SITUATION.....	5
1.4.1 Existing uses, land use	5
1.4.2 Existing figure-ground, morphology, urban texture, landscape	5
1.4.3 Existing green system	6
1.4.4 Existing accessibility system.....	6
1.4.6 Geological and seismic situation	6
1.4.7 Depth of phreatic zone	7
1.4.8 Heat islands.....	7
1.4.9 Noise pollution	7
1.5 HISTORY.....	7
2 VISION.....	7
3 CONCEPT PLAN	8
4 MASTERPLAN	9
4.1 MASSING	9
4.2 OPEN SPACES DESIGN.....	9
4.3 INFRASTRUCTURES	10
4.4 UTILITIES	11
5 PROGRAM OF USES	11
5.1 <i>HYBRID MIX AREA</i>	12
5.2 MARKET.....	13
5.3 SHOWROOM.....	13
5.4 OFFICES AND COMMERCIAL	13
6 LANDSCAPE INTEGRATION	13
7 INTEGRATED SUSTAINABILITY STRATEGY	14
7.1 DECARBONIZATION AND CLIMATE CHANGE.....	14
7.1.1 Energy efficiency and low-carbon energy consumption.....	14
7.1.2 Sustainable construction materials	14
7.2 CIRCULAR ECONOMY	15
7.2.1 Composting of organic and green waste for the green areas	15
7.2.2 Greywater Treatment and Recycling	15
7.3 CLIMATE RESILIENCE AND ADAPTATION.....	16
7.3.2 Cooling technologies and eco-materials.....	16
7.5 INCLUSIVE ACTIONS, SOCIAL BENEFITS AND COMMUNITY ENGAGEMENT.....	16
7.5.1 Social housing.....	16
7.5.2 Social reintegration.....	17
To foster a more inclusive community, a partnership is established with San Vittore Prison (1 km away) and the Cesare Beccaria Juvenile Institute (6 km away). This initiative offers opportunities for social reintegration and educational recovery, engaging inmates and young offenders in the maintenance of public spaces and on-site training and educational programs. The program takes inspiration from ReverseLab, a project developed in collaboration with the Design Department of Politecnico di Milano, emphasizing the value of design as a tool for empowerment, responsibility, and skill-building.	
.....	17
7.5.3 Green Services for the site and the neighborhood	17
8 ECONOMIC FEASIBILITY	17
9 MASTERPLAN METRICS.....	17
9.1 PROJECT CHOICES.....	17
9.2. PROJECT CONTRIBUTION TO THE PUBLIC CITY.....	17
9.3. URBANIZATION TAXES REQUIRED	18
9.4. PROJECT URBANIZATION WORKS AND THEIR COST INSTEAD OF URBANIZATION TAXES	18

9.5. PARKING REQUIREMENT	18
10 ENVIRONMENTAL ASSESSMENTS.....	18
10.1 SOIL REMEDIATION	18
10.2 WATER BALANCE.....	18
10.3 ENVIRONMENTAL CONSTRAINTS.....	18
10.3.1. Belonging to natural protected areas	18
10.3.2. Belonging to hydrogeological risk areas.....	18
10.3.3. Belonging to earthquake risk areas	19
10.3.4. Belonging to historical/culture significance areas.....	19
10.4 HUMAN CHARGE.....	19
10.5 ENERGY AND AIR POLLUTION.....	19
10.6 WASTE.....	19
10.7 AIR POLLUTION	19
10.8 NOISE POLLUTION.....	19
10.8.1 Noise pollution generated	19
10.8.2 Noise pollution received	20
10.9 MOBILITY	20
10.9.1 Traffic generated by the intervention	20
10.9.2 Public transport level.....	20
10.10 ELECTROMAGNETIC POLLUTION	20
10.11 LAND.....	20
10.12 WATER RESOURCES.....	21
10.13 LANDSCAPE.....	21
10.13.1 OVERALL DEGREE OF LANDSCAPE IMPACT	21
10.13.2 Mitigation and Enhancement Measures	21
10.13.3 Lanscape preservation	22

1 Analysis of the site and context

1.1 Location

Porta Genova is a lively neighborhood in Milan, located in the South-Western part of the city. It is known for its cultural atmosphere, with art galleries and design studios, and for offering a mix of traditional buildings and contemporary spaces. The area attracts people with its street art, markets, and the vibrant nightlife scene, especially along the Naviglio Grande, which is lined with cafes, restaurants, and shops, making it a popular spot for both locals and tourists.

The site of Porta Genova yard, located in the homonymous quarter is well-linked to the rest of the city thanks to the presence of M2 subway station “Porta Genova” and a wide system of tram lines. Analyzing the distance from the main train stations of Milan, Centrale FS is 4.8 km North-East of the site, reachable in 1 hour and 3 minutes on foot or 17 minutes by M2 metro line. Approximately in the same direction, Cadorna is 2.3 km far, 32 minutes apart walking or 11 minutes by M2 metro line, while Garibaldi FS is 4.2 km far, reachable in 58 minutes on foot and 10 minutes by M2 metro line. 4 km westwards there is San Cristoforo station, that will become a crucial railway node after the closure of Porta Genova yard. It can be reached using the M2 up to Romolo and the train or the M2 up to Sant’Ambrogio and the M4 metro line.

The area is also distant 2.8 km from Duomo and the city center, that can be reached walking in North-East direction for 30 minutes, in 19 minutes by tram or in 21 minutes by subway. CityLife is instead 3.4 km distant in North-West direction, reachable in 48 minutes walking or 28 minutes by metro. Porta Genova quarter is also full of attractions and points of interest, such as Mudec, Milan Museum of culture, Base, a hybrid cultural center with many purposes, and Armani Silos, a living and open-to-the-public space devoted to fashion experiences. Moreover, Darsena, one of Milan’s most vibrant nightlife spots, is just half of a kilometer and 7 minutes walking eastwards.

It is interesting to analyze the presence of public green spaces nearby. The site is 200 meters south of Don Luigi Giussani Park and is divided by Naviglio Grande from Baden-Powell Park. Via Bergognone, being a tree-lined avenue, constitutes a greenway that can be linked to Baden-Powell gardens. In addition, a further greenway starts from the yard and develops westwards up to the newborn park in San Cristoforo.

1.2 Planning framework

The total area taken in exam in the project is approximately 88,000 sqm, divided into two main zones: the Porta Genova railway yard covering about 63,000 sqm and being the actual site of the project, and a linear park as a greenway spanning around 25,000 sqm, from San Cristoforo Station till the road aside Pisotti industry.

The yard is 1,100 meters long, with a South-Western section of 100 meters and a North-Eastern section of 30 meters.

At least half of the total development land, 44,000 sqm, must be allocated to open green spaces or public areas, in line with Milan city plan. This includes the entire 25,000 sqm of the greenway and an additional 19,000 sqm of green space within the yard.

The maximum Gross Floor Area (GFA) results to be 44,000 sqm and can be developed in the project, but specific constraints must be applied:

- A territorial building index of 0.5 must be observed, which includes the station and warehouse.
- A minimum of 70% of the 44,000 sqm designated for building structures must be allocated to non-residential uses, totalizing 30,800 sqm. The remaining 30% is designated to have a residential purpose for a maximum of 13,200 sqm.

Further constraints were introduced by the Superintendency in March 2018, establishing maximum height limits for potential new buildings, as detailed in Board A2. The main railway tracks have no height restrictions. Red area shows where the building height is limited to a maximum of 13 meters, while the orange area requires that new constructions match the height of the existing buildings directly opposite.

Several existing buildings on the site are protected and must be preserved, including the warehouse, the old train station, and the “Ponte del Supplizio” bridge. Additionally, the dark green area, which faces the canal, must remain open to maintain key landscape views.

Other site constraints include restrictions on building over the underground area, where construction is strongly discouraged. There is also a requirement to demolish existing walls and fences on the site.

1.3 Participation process

The project involves several key stakeholders. Armani Silos and MUDEC (Museum of Cultures) represent significant cultural and commercial interests. The Comune di Milano, potentially overseeing metro infrastructure, along with Regione Lombardia, plays a critical role in urban planning and governance. Residents are important stakeholders, with a focus on improving the quality of life in the area. Legambiente advocates for biodiversity and the expansion of green spaces. Finally, the train station remains a central element of the site, influencing both transportation and development strategies.

1.4 Existing situation

1.4.1 Existing uses, land use

Milano Porta Genova represents an area with great potential for urban transformation, characterized by a mix of functions and a post-industrial identity. The current use of the train station and active tracks is planned to be dismissed in 2030, opening new opportunities for urban redevelopment.

The area is already a key reference point for fashion and design, hosting institutions such as MUDEC, Armani Silos, and BASE. Additionally, the residential area is characterized by the presence of shops, artisanal workshops, and commercial activities, contributing to the vibrancy of the neighborhood. The presence of a large, partially abandoned railway yard offers the opportunity to rethink the space in a sustainable and innovative way. The area already benefits from several green spaces, such as Parco Segantini and other smaller urban parks, which provide residents and visitors with recreational areas. The regeneration project could build upon these existing parks by expanding green infrastructure, creating new public gardens, and enhancing pedestrian and cycling paths to promote sustainable mobility. Through a redevelopment plan that respects the history and identity of the place, Scalo Porta Genova could become a virtuous example of urban renewal, enhancing its post-industrial heritage and strengthening its role as a cultural and creative hub.

1.4.2 Existing figure-ground, morphology, urban texture, landscape

The urban fabric of the site is divided into two distinct parts. To the north, a grid pattern dominates, separated from the southern section by the curved railway line. South-East, adjacent to the rail yard and the grid, a triangular formation emerges where three streets converge at Porta Genova station (Via Casale, Via Vigevano, Corso Cristoforo Colombo), creating a trident-like shape. These streets are interrupted by the Naviglio and the Darsena, which define two straight edges. Lastly, the linear axis of the historical city center’s beltway further structures the urban layout.

1.4.3 Existing green system

The site of Porta Genova Yard is enclosed in a thriving green system, to be expanded with future plans of the Piano di Governo del Territorio (PGT). The new green areas of Porta Genova will take part in connecting Don Luigi Giussani Park to Baden-Powell Park and Segantini Park, enhancing the local green system of boulevards and green areas. Thanks to the planned Green River, the Porta Genova Yard will become part of an even wider green infrastructure, enabling ecological connectivity to the planned San Cristoforo Yard Park and the existing Parco Agricolo Sud.

1.4.4 Existing accessibility system

The project area offers high accessibility, being served by the three main public transport systems of the city: buses, trams, and the subway.

Regarding surface transport, the area is provided by two bus lines (74, 325) and three tram lines (2,9,10) while on the underground, the area is served by the M2 metro line. Additionally, it is worth mentioning another tram line (14) and the M4 metro line, both reachable on foot and using other means of transport starting from Porta Genova, which also provides access to the design district of Via Tortona. The Porta Genova area is traversed by a road open to traffic that connects the outskirts of Milan to the city center and crosses the Naviglio at the Via Valenza Bridge. There are also pedestrian and cycle paths along the canal and within the district. The design district of Via Tortona is provided by a bus line (68), which runs along Via Bergognone, and a tram line, that runs along Via Solari (14).

1.4.5 Existing utility networks

The primary utility networks around the Porta Genova site are concentrated along a few key axes, with the extension of Via Bergognone acting as a central infrastructural spine for both the electricity and sewage networks.

The medium-voltage electricity grid (15–23 kV) enters the site from the west along this axis, also extending near the Pisotti company. Additional branches follow Alzaia Naviglio Grande and Via Valenza. The northern section, near Porta Genova station, is served by low-voltage lines (220–380 V), with high-voltage lines around the tram-served square.

The sewage collection system similarly follows the extended Via Bergognone alignment, with connections also present along Via Tortona in the north and Via Valenza to the south, linking further into Corso Colombo and Via Vigevano. New internal connections will rely on these existing network axes.

The gas distribution network does not currently cross the site but surrounds it, running along Via Valenza, Via Ventimiglia, and partially along Via Tortona and Via Bergognone. A medium-pressure user connection (A2A) is located on the western edge near the Pisotti company and could be leveraged for future distribution.

Dedicated work will be necessary to connect new developments within the yard with the existing utility networks.

1.4.6 Geological and seismic situation

The entire Municipality of Milan is classified as a low seismic hazard area (Zone 3), with ground acceleration values between 0.025 and 0.050 g. Previously classified as Zone 4 (lowest low hazard) in 2003, as of October 2019 seismic investigations shall be conducted prior to. In the site, the seismic amplification factor of 1.3 indicates a 30% increase in seismic forces, necessitating enhanced structural design criteria. This requires the integration of advanced seismic safety measures in urban regeneration projects, including retrofitting existing buildings, optimizing foundation solutions, and employing flexible, earthquake-resistant construction

materials. The F2 classification of the site indicates moderate geological feasibility with minor limitations, requiring preliminary geotechnical investigations.¹

1.4.7 Depth of phreatic zone

In the site, most of the unsaturated zone depth above the water table depth is around 8-10 m, while only a portion north to Porta Genova station is around 10-12 m. Generally, the depth is stable. Even if it is not below the 5 m constraint, attention should be put in planning underground construction works, because risks like water infiltration and flooding due to high precipitation could arise.

1.4.8 Heat islands

The Porta Genova railway yard is located within a significant urban heat hotspot, due to the low permeability index and the high building density. The summer average daytime surface temperature ranges from 34.4-36.6°C, as indicated by the Milan Urban Atlas. The surrounding areas to the south experience similar high temperatures, while to the north (including the former industrial block and fashion district) and east towards Porta Genova station and the Darsena area, temperatures are up to 2°C higher. Only the Darsena, "Don Luigi Giussani" park and the Naviglio Grande canal offer relatively cooler areas, highlighting the critical role of ecological spaces. Given the anticipated worsening of heat conditions due to climate change, there is a clear need to enhance and connect these green areas for cooling and improving the urban environment.

1.4.9 Noise pollution

The site and its surrounding area are primarily classified within Class 4 (out of 6) areas of intense human activity, indicating a high level of urbanization and human influence. To the west, near the boundary with the Pisotti industry, the area is classified as Class 5, signifying a high-noise industrial zone. The southern part of the site, around Baden-Powell Park, is a mixed-use and residential area. In front of the Porta Genova station, the tram railways contribute additional noise pollution. Class 4 areas, according to the "Norme Tecniche di Attuazione", are characterized by moderate levels of noise exposure, mostly due to transportation, commercial activities, and urban factors.

1.5 History

Inaugurated in 1865, Porta Genova Station is the city's oldest and is surrounded by a much older historical location. The region consists also of imprints from different historical periods, including traces dating back from the Spanish presence in Milan. For centuries, the development of the neighborhood has been shaped by its transportation networks, initially the Navigli canal and later the rail infrastructure that came with the industrial revolution. As a result, Porta Genova became a strategic hub where manufacturers, businesses, and eventually large industries established themselves throughout the 19th and early 20th centuries, contributing to the area's dense urbanization and environmental degradation. Since then, the region has undergone a significant transformation. The local economy and identity have gradually shifted towards textiles, fashion, design, and recreational activities – sectors that continue to define the Porta Genova community until today.

2 Vision

The DECO project stands on three foundational pillars that shape its vision and methodology: people, community and place. The first is designing for people - those who know and live in Porta Genova today, as well as those who will form its future community. This means creating

¹ Comune di Milano, August 2019, 'VAS_RA_All2 Quadro di riferimento territoriale e ambientale'

affordable housing, spaces for work and study, healthcare services, access to local food: everything necessary for people to live well, grow together, and build a strong social fabric. *Community* is the second pillar. The goal is to foster an urban ecosystem that brings people together and supports the growth of a resilient society - one that not only adapts to change, but also actively shapes it through social, economic, and environmental actions. These responses are deeply rooted in *place*, the third pillar. Every place has its own identity and ecosystem. Fieldwork and on-site research revealed Porta Genova's specific characteristics and needs, guiding the project toward a coherent design identity that integrates circular processes and nature-based solutions. The project embraces urban regeneration across social, economic, and environmental dimensions. It applies adaptive reuse, circular economy principles, and strategies for ecological resilience.

At the heart of this vision is a redefinition of so-called “non-places”, a term coined by anthropologist Marc Augé to describe transient spaces like airports and train stations—places that lack memory, identity, and relational value. DECO challenges this perception and builds on the intrinsic neutrality of such spaces, which already offer universal access and inclusivity, regardless of cultural, racial, or religious background. This perspective reframes Porta Genova's transient nature as an asset rather than a limitation. **Thus, DECO proposes a living hub—a place to live, work, connect, and thrive. Here, businesses grow alongside a creative community, particularly in design and sustainability sectors. Public spaces are intentionally crafted, with special attention to well-being, accessibility and ecology.** The adjacent warehouse evolves into a market, while the station becomes a showroom and exhibition space, reinforcing the continuous flow of people, goods, and ideas. The masterplan strengthens connections to one of Milan's most iconic landmarks—the Navigli canal. In this way, the intervention seeks to redefine the role of Porta Genova's railway yard - not as voids within the urban fabric but as integral, multifunctional spaces.

The project's core principles—sustainability, thoughtful design, respect for heritage, community, and resilience—are reflected in its visual identity. The DECO logo features a green palette and a Ginkgo Biloba leaf, which is symbol of resilience, growth, and unity. Open spaces within the project subtly reference Art Deco aesthetics, paying homage to the area's rich design legacy and industrial character. The *Terzo Paradiso* by Michelangelo Pistoletto, integrated into the design of the garden and playground, acts as a unifying symbol that brings the project's pillars together. As conceived by Fondazione Cittadellarte, the *Terzo Paradiso* represents the merging of nature and artifice - a new harmony between the natural world and human creativity - making it a powerful emblem of social and environmental regeneration.

In redefining Porta Genova as a regenerative urban node, DECO offers an experience based on the convergence of design culture, community, circularity and inclusive ecosystem. It is not merely a redevelopment, but a renewed identity, performing and non-conforming, for a district that reflects Milano's future: resilient, creative and connected.

3 Concept plan

Five focus areas have been identified across the site, conceptually interconnected and integrated with the surrounding context. In the South-West area there will be a *hybrid mix* area, hosting buildings dedicated to several different uses (social housing, laboratories, gym, bar...). Moving North-East, the warehouse area will be completely transformed into a local food market set within an urban piazza, reimagining the building's role and enhancing its value. This square will border a second major redevelopment area: the *offices and commercial* zone, where a large C-shaped building will rise, primarily hosting offices and startups in the fields of design and

fashion. The North-East area will feature a second square, centered around Porta Genova Station, that will be repurposed as a showroom for design and manufacturing exhibitions.

Another key aspect of the project is the creation of new connections, both in terms of mobility and ecological continuity. The railway fence currently enclosing the freight yard and the wall closing the site on the Southern part of the site will be removed; while a new connection between Via Bergognone and Baden-Powell Park will be created. The entire redevelopment area will be featured by a wide landscaped greenway, designed as a multifunctional green corridor that will serve as a connecting loop between the linear greenway coming from San Cristoforo, Baden-Powell Park, and Don Luigi Giussani Park. This pedestrian and cycling route will not only link the district's main green hubs, but also offer spaces for rest, social interaction, and outdoor activities, becoming a central element in the everyday life of the new neighborhood.

4 Masterplan

4.1 Massing

Much of the built volume within the site is concentrated in the areas designated as *hybrid mix* and *offices and commercial*, which together account for 92% of the total construction volume. The remaining 8% is distributed between the railway station and the warehouse, both historically significant buildings that will be preserved and repurposed, becoming new focal points for the neighborhood.

The *hybrid mix* area will be mostly dedicated to social housing buildings, with some other hybrid uses at lower floors of each building. Ten buildings will characterize the area, accounting for 19,605 sqm of GFA, that represents 45% of the total built GFA. 67% of the *hybrid mix* area, corresponding to 13,200 sqm, is covered by social housing floors, respecting the constraint on social housing maximum GFA. Assuming 85% is net usable space (11,220 sqm), the estimated hosting capacity is around 800 people. Based on Milan's housing regulations, the minimum living space per person is 14 sqm for up to four occupants, and 10 sqm for each additional person. Bedrooms must be at least 9 sqm for single occupancy and 14 sqm for double. The design will include a mix of single and double student accommodations, as well as co-living spaces for students and young professionals, ranging from 2 to 7 roommates. The final capacity depends on unit layouts, shared spaces, and local compliance requirements.

In the *offices and commercial* area, a C-shaped building will be built, occupying a GFA of 20,490 sqm, which represents 47% of the total built GFA. Of this building, 63% will be dedicated to offices and start-ups, while the remaining 37% will accommodate other functions and services supporting the needs of workers. The central part of the building is designed as a Venetian *sottoportego*, with the two lower floors entirely open to create a covered pedestrian passage. This ensures permeability across the site, connecting the inner garden to the redesigned Via Valenza sidewalk.

4.2 Open Spaces Design

All the buildings, whose footprints collectively cover 10,835 sqm of ground area, are in the lower part of the site. The buildings in the *hybrid mix* area are aligned with the Naviglio canal, while the others follow the curve defined by the Porta Genova railway yard. The upper part of the site is characterized by a continuous cycle-pedestrian greenway that connects San Cristoforo Park, Baden-Powell Park, and Don Luigi Giussani Park. The project also includes additional green areas, which together with the greenway amount to approximately 41,000 sqm. These areas are integrated into the urban context and evenly distributed throughout the site.

In the *hybrid mix* area, five green spaces are planned. In the two western areas, small gardens will be created, featuring cycle-pedestrian paths that link the bike lane to the residential buildings. A third area will be dedicated to community urban agriculture, built using natural materials and made available to citizens and associations through gratuitous loan agreements. This initiative supports the sale and consumption of zero-kilometer products, even at the nearby market. In the fourth area, an additional garden referring to Art Deco style will be created, featuring covered tables that could serve as workstations for students.

The food market will be located at the center of the square, which sits slightly below street level and therefore will feature broad stepped seating on its southern side. On either side of the structure, two decorative fountains will be installed, designed with a star-shaped Art Deco motif. These elements serve to visually highlight the historic warehouse and reinforce its role as the focal point of the square, also reducing the heat island effect.

The office building will enclose a large garden, with pedestrian paths weaving through flowerbeds designed to reflect Art Deco motifs. The layout of the paths will trace the forms of a Ginkgo Biloba leaf and Michelangelo Pistoletto's *Terzo Paradiso*, evoking their symbolic meanings of resilience, continuity, and renewal. The garden will open toward Via Valenza through the central *sottoportego*.

The square in front of the showroom will be adorned with tiles arranged to evoke once again the shape of the Ginkgo leaf, creating an iconic space that highlights the trident of streets radiating from it.

Another significant intervention will be the construction of a bridge designed to connect Via Bergognone and the new site to the southern bank of the Naviglio, linking the green system to Baden-Powell Park. The bridge will be closed to vehicular traffic, accessible exclusively to pedestrians and cyclists. It will have a total length of 15 meters and a width of 6.5 meters, divided into a bike lane (3 meters wide) and a pedestrian lane (2 meters wide). The passage will be 6 meters above the water level. Additionally, on the northern bank of the site, stairs with a dedicated bike tunnel and an elevator for people with disabilities will be installed, while on the southern bank of the canal, both stairs and a ramp will be provided.

A children's playground will be built, designed to integrate seamlessly into the urban context. Given the presence of a kindergarten in the area, the playground will provide a safe and pleasant environment where children can play. Shaped after *Il Terzo Paradiso*, here symbolising continuity even among life phases.

4.3 Infrastructures

The project promotes inner mobility through a network of pedestrian and cycling paths that efficiently connect all areas of the site and integrate seamlessly with the surrounding urban fabric. The nearby Porta Genova M2 metro station supports the use of public transportation, further reinforced by the dense network of tram lines around Porta Genova Square and along the site's southern edge. Car access is planned to connect the site to the wider city without cutting through it, encouraging soft mobility while ensuring strong connections to all major surrounding roads. A new restricted traffic street is proposed in front of the warehouse to facilitate last mile logistics for the market.

The project also includes an underground car park under the social housing area, accessible from Via Bergognone and Via Stendhal. It will be on a single floor, covering a total area of 3,300 sqm and providing 200 car spots. This amount has been calculated assuming a dimension of 2.3 x 4.5 meters for each spot and 3.2 x 6 meters for disability parking (assumed to be 2% of the total number of places) and a width of 4.5 for all the connecting streets. The parking area is sized to

ensure at least one space per residential unit, with additional spaces made available to the municipality for use by workers from the surrounding areas or visitors to the site.

Conversely, no dedicated parking area has been planned adjacent to the office building, to encourage the use of public transportation, given the proximity to Porta Genova Square. However, the south-eastern section of the building will be equipped with a row of service parking spaces for short-term stops (loading and unloading, taxis, etc.). Via Bergognone is reimagined as a key link to the southern district, thanks to the construction of a new bridge connecting it to Via Eugenio Villoresi—enhancing both pedestrian and cycling mobility.

4.4 Utilities

Additional utility systems have been incorporated into the project. Regarding the sewage network, it is important to note that the main existing sewer lines are below Porta Genova Square and Via Bergognone. Blackwater from the *hybrid mix* Area will be fully connected to the sewer system on Via Bergognone, as will the market and the westernmost section of the office buildings. Conversely, the discharge from the eastern office block and the new showroom will be connected to the existing sewer line located in the square.

The water is pumped from the aquifer located on the western side of the site, allowing its use for both heating and domestic hot water (DHW) production. Initially, the water from the water table goes through several pre-treatments, including pre-filtration, disinfection, and softening, to clean it. After treatment, the water is used by a multi-purpose heat pump located in the underground garage of the residential building. The heat pump provides both heating and cooling services, as well as domestic hot water (DHW). The hot water is then supplied to reduce flow fixtures, which are designed to save water.

The site is connected to the existing electricity grid via the closest cabin (Area Convenzionale: AC012E00016). The external electricity grid will supply, together with the solar panels, the necessary energy for the whole area, considering the implementation of an energy community, in which the member can act as producers, consumers, or both. Moreover, the project area has two technical rooms within a fully integrated energy and water hub, which use modular and space-saving components and has a digital and centralized energy management and monitoring system to minimize physical control panels. They are dedicated to water treatment, hydraulic interface heat pump system and energy controls, including groundwater extraction and treatment systems (with groundwater pumps, pre-filtration, disinfection and softening treatments), a multi-functional heat pump system (for heating, cooling, and DHW), solar energy inverters, battery storage, hydraulic systems, a maintenance space and safety system. They are located on the underground level of the residential and office buildings, with an area of 420 and 750 sqm, respectively, aimed to reduce visual and acoustic impact and following local codes and fire regulations.

Lastly, the fiber optic network is designed to connect all buildings by following the curve defined by the former railway yard, employing a layout that is both simple and effective.

5 Program of uses

The site will feature a heterogeneous mix of public and private buildings with varying numbers of floors. The social housing buildings, the office complex, and the showroom are classified as private structures, whereas the market is intended to serve a public function. The surrounding land is predominantly designated as public space. Exceptions include the courtyards of the office and residential buildings, which, while privately owned, are intended for public use.

5.1 Hybrid mix area

The hybrid mixed-use area features residential, commercial, working and recreative buildings that are strategically designed to foster a sense of neighborhood and community. Embracing the concept of Scattered Hospitality, the layout prioritizes openness and connection, avoiding the isolating effect of a single large high-rise block, which limits movement and negatively impacts well-being. In this area 10 buildings will be built. In each one, the last floors will be dedicated to social housing designated especially for students and young adults and will host around 800 people. On the other hand, the first floors will have many different functionalities.

Together with social housing, the following facilities will be provided:

- A two-floor gym will be hosted inside of one building, and it will be accessible to both residents and external members. The ground floor will be dedicated to a weight room, while the second floor will host space for a variety of courses. The decision to incorporate a space for sports aligns with the vision of creating a comprehensive urban district, where all needs can be met, and with the goal of promoting health and a sense of community.
- Two laboratories will be located on the ground floor of two different buildings. The new district, thanks to its strategic location near the Mudec, Armani Silos, and fashion and design universities, offers open and accessible spaces to students and professionals, who can use them to develop university or personal projects, thus fostering creativity and collaboration.
- An atelier will occupy two floors of another building. It will serve as a creative and flexible space dedicated to the design, experimentation, and production of innovative concepts within the field of design. Conceived as a multidisciplinary laboratory, this atelier encourages interaction across various design disciplines, from product to fashion design, from sustainable design to digital manufacturing.
- Two ground floors are occupied by urban manufacturing, which is a production model that integrates light manufacturing activities within the urban context, promoting local, sustainable, and low-impact production. It includes workshops, ateliers, studios, and micro-enterprises operating in sectors such as design, advanced craftsmanship, fashion, 3D printing, and digital manufacturing – often combining innovative technologies with traditional know-how.
- A private library will be located on the ground floor of a building, with a bright open space designed for relaxation and informal interaction. It will serve as a further place for students, but it will be also accessible to anyone as a place for study and research, or to purchase or rent books and multimedia materials.
- Two bars will serve the residential area, being placed at the ground floor of two buildings. They can represent both a place where to have a quick break and an aggregation point for the neighborhood.
- Above one of the two bars, a single-floor auditorium will work as a versatile event space venue for hosting presentations, conferences or shows and will remain accessible during the evening hours.
- A medical center will be put over the gym to provide the neighborhood with health assistance. Designed to efficiently meet the needs of prevention, care, and rehabilitation, the medical center can host specialist clinics, diagnostic laboratories, medical offices, and spaces dedicated to overall well-being. Unlike hospitals, a medical center often focuses on non-urgent, scheduled healthcare services and can integrate both public and private medical activities.
- The complex will have a main ground floor reception at the entrance, providing support, information, and access management for visitors and users of all buildings. Near the main reception, a spacious lounge area will offer comfortable seating for residents and guests to relax, wait, or have an informal meeting.

5.2 Market

The warehouse will be transformed into a temporary-use market featuring a variety of stalls and vendors, where both local residents and passersby can purchase and enjoy regional products and DeCo (Denominazione Comunale d'Origine) goods, including those from the Parco Agricolo Sud Milano. In this way, the space will become a slow food hotspot. The market will be framed by a public square designed to highlight its presence and function as a vibrant social hub - offering places to sit, eat, and relax. A vehicular access point for last-mile logistics will also be integrated to support efficient delivery operations. Inspiration for the market concept includes renowned examples such as the Mercado de San Miguel in Madrid (Spain), the Ferry Building Marketplace in San Francisco (USA), and the English Market in Cork (Ireland).

5.3 Showroom

The current train station will be renovated and transformed into a space dedicated to showrooms and exhibitions, as a temporary use. Located in an area already strongly connected to the world of design and fashion, the new use of the station will become a reference point for brands, creatives, and visitors, offering a dynamic space to showcase collections, installations, and innovative projects. This will be a meeting place that will enrich the cultural and creative identity of the district.

5.4 Offices and commercial

The area between the warehouse and Porta Genova Square, which is currently partially abandoned and partly occupied by a parking lot, will be transformed into a large open space, within which a massive building will rise, enclosing a green area. Many of the floors will be dedicated to offices and startups spaces available for eco-friendly companies involved in fashion, art design fields, to foster innovation and entrepreneurship.

The building has three different parts from West to East. In the first one, on the ground floor, a canteen will be built, including a communal space designed for eating, socializing, and gathering. Moreover, it will be open even at night-time so that its function will not be limited to working hours. Additionally, six floors of offices space will be provided and on the last floor a bar will be placed to be used both in winter, as a closed space, and summer, with a panoramic rooftop. The second part will be provided by just a top floor of offices, 2 different relax areas, one aiming to serve the lower floor workers and the other for upper floors workers, functioning also as a food court where to have lunch, use microwaves or have rest. The other two floors will be dedicated to a conference room and a gym to be used for office and startup workers. The third block will be characterized by the first two floors assigned to be small recycling factories, which is to close material loops at the urban scale and reduce extraction of virgin resources, while the last three floors will work as offices.

6 Landscape integration

The project integrates well with the surrounding context. To support this integration, the entire wall that bordered the railway area was torn down, allowing for the creation of new connections between the existing urban fabric and the area of interest. Several key links have been established, particularly with the design district, an important asset for design students living in the social housing. Other connections involve the greenway, a pedestrian and a cycling path that links the entire project area, stretching from Don Luigi Giussani Park to San Cristoforo Park. Additionally, a brand-new bridge, accessible to pedestrians, cyclists, and people with disabilities, connects Baden-Powell Park with Via Bergognone, reinforcing accessibility to the northern part of the site.

Regarding the structure, starting from the southwest, each building block follows the morphology of the existing urban fabric and mirrors the blocks on the opposite side of the Naviglio. This approach aims to preserve the continuity of the existing landscape and ensure visual harmony with what is already in place. The square near the warehouse follows the natural slope of the terrain, using it to create tiered seating where people can relax and enjoy the products offered by the market inside the warehouse. Another square is in front of Porta Genova station, where the project emphasizes the trident-shaped street layout through a paving pattern that recreates the shape of a Ginkgo Biloba leaf.

The project features permeable buildings, with ground floors hosting public functions to encourage interaction. There are no fences or barriers, creating an open relationship between buildings and public space. In the office area, a ground-level portico connects the internal green courtyard with the surrounding pedestrian zone, further enhancing accessibility and openness

7 Integrated Sustainability Strategy

As part of DECO’s vision for a resilient and regenerative Porta Genova, the following strategy for ensuring sustainability at social, economic and environmental levels was designed.

7.1 Decarbonization and Climate Change

7.1.1 Energy efficiency and low-carbon energy consumption

Based on the climate target ‘Zero Carbon by 2040’ of the European Commission, the model of energy community is introduced to reduce the dependency on carbon-based and nonrenewable energies. Solar panels are applied together with green gardens on the rooftop of the residential buildings in the *hybrid mix* area. The PV panels are angled to divert some stormwater runoff into cisterns, which collects water for irrigating the edible garden on the rooftop itself. Moreover, the south-facing walls of the office building are covered with vertical solar panels.

7.1.2 Sustainable construction materials

To cut embodied carbon, only certified low-impact materials are employed in the site. Construction materials play a critical role in carbon storage due to their longevity, offering long-term sequestration potential for greenhouse gases.² Technologies like CarbonCure inject captured CO₂ into fresh concrete, increasing its strength and durability while locking in emissions. Considering DECO’s GFA, this results in a reduction of approximately 97,3 tons of CO₂. Beyond carbon capture, the project emphasizes reducing material consumption and selecting low-impact alternatives. Components, such as cross-laminated timber and concrete mixes incorporating ground granulated blast furnace slag (GGBFS)³ or fly ash, help lower the global warming potential and material footprint. Additionally, the use of prefabricated modular elements in the *hybrid mix* area, warehouse, and train station renovations minimizes waste, shortens on-site construction time, and enhances quality control—further supporting sustainability through reduced energy use and emissions.⁴

² Elisabeth Van Roijen; Sabbie A. Miller; Steven J. Davis. Building materials could store more than 16 billion tonnes of CO₂ annually. *Science* 387, 176-182 (2025).

³ Massachusetts Institute of Technology – MIT. How does the climate impact of cross-laminated timber compare to steel or concrete? Ask MIT Climate. 2023.

⁴ Clement Mostert, et al. Climate and resource footprint assessment and visualization of recycled concrete for circular economy. *Resources, Conservation & Recycling* 174 (2021) 105767.

7.2 Circular economy

7.2.1 Composting of organic and green waste for the green areas

The integration of a decentralized composting system presents a sustainable and circular solution for managing on-site food waste and garden waste. Based on a conservative estimate⁵, the site produces around 140–160 kg/day of organic waste, including market and office activities. While, the garden maintenance can generate approximately 19kg/day of waste. To manage this combined stream, the site hosts 6 composting units, spaced every 2–3 buildings in the *hybrid mix* area and next to the market and the offices, following EU guidelines.⁶ Each unit is equipped with solar panel roofs to provide renewable power supply and shade, water network connections for cleaning operations, and a connection to the electricity network. The compost generated can reach up to 17 tons per year, which is sufficient to fertilize up to 5,600 sqm of green areas annually at standard rates.

7.2.2 Greywater Treatment and Recycling

The greywater treatment and reuse system reduce potable water consumption, lowering wastewater discharge, and promoting local water circularity. A physical and hydraulic separation is required among the greywater network (showers, sinks, washing) which goes to the treatment units; blackwater network (kitchen sink, toilet) that goes directly to main municipal sewer, and the rainwater network, which is treated naturally and recharges groundwater.

Treating greywater to a quality suitable for reuse in toilet flushing allows to save approximately 25,500 cubic meters of freshwater per year. The system relies on French Reed Beds which are a niche application of phytoremediation, consisting of a waterproof basin filled with gravel and planted with aquatic and non-aquatic species. Chemical, physical, and biological processes remove contaminants, thanks to the interaction between the substrate, plants, wastewater, and microorganisms. French Reed Beds are ideal for domestic greywater treatment because they offer high purification efficiency, minimize odors, and integrate well into urban environments.⁷ Six surface beds of 500 sqm treat the greywater, collected by underground pipes from the *hybrid mix* area, the market and the showroom. They are located 2 to 5 meters away from the building footprints to allow maintenance and protect the building structure from excessive moisture. The water is stored in tanks equipped with UV disinfection (UV) before being pumped back into the buildings' toilet networks. Tanks require around 5–8 sqm of footprint, assuming a 2-meter height, plus at least 1 meter of free space around for access.

The greywater from the offices is less polluted than domestic wastewater; for this reason, the external walls of the *sottoportego* are covered with green façade that work as a vertical French Reed Bed. Specific plants are coupled with slow sand filters to clean the greywater. The expected greywater production is approximately 36.35 cubic meters/day. The process follows a floor-by-floor collection and treatment approach. Pipe network and storage tank are necessary to distribute and collect the greywater. This green wall system maximizes both treatment efficiency and additional benefits like thermal insulation and urban biodiversity enhancement.

Moreover, these green surfaces act as pollinator corridors, which enhance biodiversity by providing habitat for insects, bees, butterflies etc. Moreover, they enable a cooling mechanism that reduces the urban heat island effects.

7.2.3 Recycling and circularity of existing materials

⁵ Osservatorio Internazionale Waste Watcher, Caso Italia (2024)

⁶ Zero Waste Europe Guides/01 (2019)

⁷ Rizzo et al., (2018). French Reed Bed as a Solution to Minimize the Operational and Maintenance Costs of Wastewater Treatment from a Small Settlement: An Italian Example. Water,

The existing asphalt surfaces in the open-air parking lot next to the Porta Genova train station building are demolished and recovered to create aggregates for structural base layers in new underground parking decks. Besides being cost-effective, recycled asphalt conserves natural resources by reducing the need for virgin materials, water and landfill use.

The existing fence of Porta Genova's yard is composed primarily of traditional red clay bricks and concrete elements, both characteristic of the site's industrial past. Following its demolition, the materials are recovered for reuse on-site. Reclaimed bricks will be integrated into new façades and low walls, while crushed concrete will serve as aggregate for permeable pavements and foundational layers. Recycling reduces embodied carbon, supports circular economy, and grounds the design in site-specific memory.

7.3 Climate resilience and adaptation

7.3.1 Rainwater Management

A distributed system of surface-level bioswales, rain gardens and permeable pavements is introduced to mitigate stormwater runoff, reduce pressure on municipal drainage. This strategy helps reduce flood risks and supports the long-term water resilience of the area, especially during peak rainfall events or droughts. These areas remove debris and pollution through native vegetation and permeable soils. Bioswales are integrated beside pedestrian and cycling paths and along the greenway too, channeling the water towards the rain gardens and, finally, recharging the water table. Permeable pavements are essential to diminish pollutant concentrations through physical filtration and biological processes, allowing the stormwater to infiltrate and reducing peak discharge rates.⁸ Therefore, permeable materials, such as porous asphalt, are implemented along the soft mobility paths in the site.⁹

7.3.2 Cooling technologies and eco-materials

To mitigate the frequent heat island effect in Milan, porcelain tiles and heat reflective and cool paint are adopted as part of cooling technologies, thanks to their greater reflection of sunlight.¹⁰ Porcelain tile, with a low moisture permeability and absence of flammable properties, can be used as a building cladding material; while nano-engineered aerogel paint reduces surface temperature by 15 to 20 degrees Celsius, while providing superior heat insulation and a hydrophobic surface finish.¹¹

7.5 Inclusive actions, social benefits and community engagement

7.5.1 Social housing

Social housing in Milan currently faces a significant student accommodation crisis. With around 14 universities in the city, the demand for student housing spaces has exceeded the availability. The shortage of affordable and convenient student housing affects the students' wellbeing as well as their academic performance. Thus, student's accommodations have been implemented to enhance their livability quality.

⁸ Yao-Ming Hong, 2021. The simplified design method of permeable pavement system for urban catchment. Environmental Challenges 2 (2021) 100014.

⁹ U.S. Environmental Protection Agency. NPDES: Stormwater Best Management Practice —Permeable Pavements. EPA-832-F-21----- December 2021.

¹⁰ Silvia Croce, Daniele Vettorato. Urban surface uses for climate resilient and sustainable cities: A catalogue of solutions. Sustainable Cities and Society 75 (2021) 103313.

¹¹ How Reflective Paint Contributes to a Greener Built Environment. Innovation Partner for Impact. 2024.

7.5.2 Social reintegration

To foster a more inclusive community, a partnership is established with San Vittore Prison (1 km away) and the Cesare Beccaria Juvenile Institute (6 km away). This initiative offers opportunities for social reintegration and educational recovery, engaging inmates and young offenders in the maintenance of public spaces and on-site training and educational programs. The program takes inspiration from ReverseLab, a project developed in collaboration with the Design Department of Politecnico di Milano, emphasizing the value of design as a tool for empowerment, responsibility, and skill-building.¹²

7.5.3 Green Services for the site and the neighborhood

A real-time weather and emergency alert system is implemented to alert residents and inform the neighborhood about important environmental issues, increasing the preparedness and fostering social safety. The system works via text, app and building sensor alarms.

8 Economic Feasibility

The acquisition cost of the area was estimated at 300 million euros, and the horizon time was established as 8 years, considering also the costs for design, remediation, urbanization and construction. The contributions for the last category of cost were divided between 41% for offices, 30% for residential, 20% for retail and 9% for makerspace and urban manufacturing. Moreover, 50% of buildings, regardless of the use, are meant to be sold, meanwhile the remaining 50% of facilities are expected to be rented. As a result, the equity multiple was equivalent to 1.35, demonstrating a profitable project taking into consideration the initial investments.

9 Masterplan metrics

9.1 Project choices

The project involves the construction of 10 new buildings with hybrid functions, including a total of 13,200 square meters of social housing. This amount corresponds exactly to the maximum allowable area for residential use, representing 30% of the total Gross Floor Area (GFA).

The remaining GFA will be divided into a new building for offices and retail and on some floors of the residential buildings. It will be allocated as follows:

- 4,945 square meters for production facilities
- 9,680 square meters for commercial and retail spaces
- 15,220 square meters for offices
- 750 square meters for hybrid uses (like area relax for the offices).

The total planned GFA for the project is 43,795 square meters, remaining within the regulatory limit of 44,000 square meters.

9.2. Project contribution to the public city

The project standards will be entirely represented by land, subdivided into areas transferred to public ownership and easements. This means that both Public People Facilities and Monetized Land are equal to zero, as they are not required in this case.

The transferred areas - land given to the City in property - include the San Cristoforo linear park, the greenway (at least the section not built above the underground parking), and the public

¹² Nova.News - Quotidiano online di Agenzia Nova. Milan: prisoners involved in the maintenance and protection of public parks. 2021.

squares at the Warehouse and Train Station. The easements refer to private land with a public use agreement, totaling 20,099 square meters, divided into residential park, offices park and greenway on the underground parking. The overall area dedicated to project standards amounts to 73,052 square meters, thereby exceeding the required minimum of 44,000 square meters.

9.3. Urbanization taxes required

Taxes on the Gross Floor Area will amount to a total of € 10,492,500, divided into €1,320,000 related to social housing (approximately €100/sqm) and € 9,172,500 for the remaining functions (approximately €300/sqm). The project does not include the development of big-size offices and/or big-size commercial spaces.

9.4. Project urbanization works and their cost instead of urbanization taxes

Project urbanization works and their cost instead of urbanization taxes are about 10.594.720 €, subdivided in public facilities and infrastructures. Public facilities are parks (5.305.120 €), plazas (1.347.600 €) and pedestrian and bike paths (2.835.000 €). It should be noted that public facilities are already counted as standard. Infrastructures are sidewalks and linear car parking in Via Valenza - near offices' building - (226.100 €) and underground utilities connections with the surrounding urban grid - that are greywater pump network, blackwater network and electricity grid - (832.000 €). Total cost of urbanization work is larger than the urbanization taxes required, as indicated by the City plan.

9.5. Parking requirement

Public parking is not required because Porta Genova yard is attached to a transit station (subway M2). For this reason, the project does not include the construction of public car parks. According to national regulations (L. 122/89), 1 square meter of parking space is required for every 10 cubic meters of built volume, resulting in a minimum requirement of 3,960 square meters of private parking. The project includes the construction of an underground parking facility with a total surface area of 17,500 square meters. It should be noted that some charging stations will be installed for electric cars and bikes in the underground car park.

10 Environmental assessments

10.1 Soil remediation

The Porta Genova area is currently as polluted as all the railway yards of a metropolis. The project will remediate the site to improve the condition of the soil.

10.2 Water balance

Currently, the impermeable area covers about 33,830 square meters. The project plans to make a total of 8,156 square meters permeable, while 10,156 square meters will be occupied by buildings, and an underground parking lot of 15,520 square meters will be built (part of which will be beneath an area that is currently permeable). Draining flowerbeds will be installed along the greenway, above the underground car park.

10.3 Environmental constraints

10.3.1. Belonging to natural protected areas

There are no protected natural areas and/or Local Parks of Supra-municipal Interest (PLIS) within the area affected by the project.

10.3.2. Belonging to hydrogeological risk areas

There are no hydrogeological risk areas within the area affected by the project.

10.3.3. Belonging to earthquake risk areas

There are no earthquake risk areas within the area affected by the project.

10.3.4. Belonging to historical/culture significance areas

The area affected by the project does not contain any significant historical, archaeological, or cultural features.

10.4 Human charge

The human charge is estimated starting from the GFA with different parameters in relation to different land-use destinations. The total equivalent inhabitants of the urban transformation of this area will be 1.328 inhabitants. Social housing will host 264 inhabitants (GFA/50 GFA/inhab), offices will host 456 equivalent inhabitants (GFA/35 GFA/inhab), commerce will host 484 equivalent inhabitants (GFA/20 GFA/inhab), and production will host 124 equivalent inhabitants (GFA/40GFA/inhab).

10.5 Energy and air pollution

The project includes the installation of photovoltaic panels on the rooftops of residential buildings and office spaces, complementing the existing electrical grid to which the district will be connected. The objective is to minimize environmental impact and enhance the sustainability of the area. Groundwater-source heat pumps will be installed to provide heating in winter and cooling in summer for the buildings. These systems exploit the stable temperature of the groundwater to ensure high energy efficiency and reduced environmental impact throughout the year.

10.6 Waste

The production of municipal waste attributable to the urban transformation is estimated at 973,424 kg/year. This value is obtained by multiplying the total equivalent inhabitants resulting from the urban redevelopment of the area by the domestic waste generation per person, which is estimated at 733 kg per equivalent inhabitant per year.

10.7 Air pollution

The district will not host any conventional electricity production facilities, thereby ensuring that no additional pollution will be generated as a result. In prediction, there will be an increase in traffic, people will be encouraged to use environmentally sustainable means of transport, such as bicycles or electric cars, supported by the installation of charging stations.

Regarding the context of the area in which the project is located, Milan falls into the “moderate” air quality category for approximately 8 months of the year ($12.1 - 35.4 \mu\text{g}/\text{m}^3$ of PM_{2.5}). It should be noted that the area will be subject to pollution due to traffic, as it is adjacent to Via Valenza, a busy road with significant traffic both day and night. No industrial facilities are present in the vicinity.

10.8 Noise pollution

10.8.1 Noise pollution generated

The intervention will lead to a moderate increase in noise pollution, as the area will become a public park with a greenway, fostering social interaction and foot and bike traffic - particularly in spaces such as community gardens. It is important to note that the residential buildings are intended for social housing and will primarily accommodate students and young workers. One of the buildings will house a gym on the ground and first floors, which may generate noise due to music and weight training activities. Another building will host a ground-floor café, designed

to accommodate residents also during evening hours, providing a space for social interaction and community gathering. The former warehouse, which will be converted into a market, is expected to produce noise within the adjacent square. However, this will not impact the residential or office areas, as it is located approximately 40 meters away from both. The office area is not expected to be a significant source of noise, even though the canteen will remain open during evening hours. The train station will be converted into a showroom, that will produce some noise pollution but in the context of a busy square where there is already a tram stop.

10.8.2 Noise pollution received

The transformed area will be exposed to significant levels of noise pollution due to its proximity to the heavily trafficked Via Valenza, with impact from passing trams. It should be noted that significant measures will be required to ensure adequate acoustic insulation for the office spaces, as they directly face Via Valenza. Additionally, the adjacent Naviglio area is a well-known nightlife destination, contributing further to ambient noise levels through frequent social gatherings and evening activities.

10.9 Mobility

10.9.1 Traffic generated by the intervention

The project includes the construction of an underground parking facility of approximately 17.500 square meters. Such an infrastructure is likely to increase the flow of private vehicles in the area, particularly electric cars, as several charging stations for electric vehicles will be installed.

10.9.2 Public transport level

The area is well served by public transportation, with a nearby metro station and several tram and bus stops located in the surrounding area. A bicycle lane will be built running along the entire greenway, and several bikes will be provided for a bike-sharing service.

10.10 Electromagnetic pollution

The intervention area (former Porta Genova railway yard) is not located in the immediate proximity of high-voltage power lines or electrical substations, which are the main sources of extremely low-frequency electromagnetic fields (ELF, <50 Hz). Based on publicly available data and regional environmental monitoring (ARPA Lombardia), no significant sources of ELF radiation are recorded within or near the site boundaries. Therefore, exposure to low-frequency electromagnetic fields is considered negligible for the purposes of environmental and health impact assessment.

The project site is in an urban context where typical sources of high-frequency electromagnetic fields (RF-EMF) include mobile phone base stations, Wi-Fi antennas, and broadcast transmission infrastructure. No high-power broadcasting facilities (e.g. radio/TV transmission towers) are present within or near the site. Mobile phone base stations may be present on nearby buildings, as is typical in urban settings, but these installations are subject to strict compliance with national exposure limits as regulated by current legislation (e.g., Italian DPCM 8 July 2003). According to available data and environmental assessments conducted by ARPA Lombardia, the exposure levels in the area remain within the legal safety thresholds, and the project site does not lie in the immediate vicinity of any known high-intensity RF-EMF sources. As a result, no significant high-frequency electromagnetic exposure risks are associated with the planned intervention.

10.11 Land

The newly urbanized land will cover approximately 12,143 square meters, currently occupied by railway yard tracks. Urbanization will result from the construction of an underground parking facility. At ground level, a greenway will be developed, incorporating a shared pedestrian and

bicycle path, bordered by planting beds and native tree species. The project’s filtering surface will amount to approximately 33,000 square meters. The permeability index, calculated as the ratio between the filtering surface and the total transformation area, will be approximately 0.5258.

10.12 Water resources

The water consumption attributable to the urban transformation is calculated by multiplying the total equivalent inhabitants by the per capita domestic water consumption, which is estimated at approximately 200 liters per equivalent inhabitant per day, equivalent to 73 cubic meters per year per equivalent inhabitant. The total annual water consumption is therefore estimated at approximately 96,944 cubic meters, corresponding to 265,600 liters per equivalent inhabitant per year.

10.13 Landscape

10.13.1 Overall degree of landscape impact

The area affected by the project is a decommissioned railway yard, predominantly paved and characterized by disused tracks. Within the site, several historically significant elements are present, including a former warehouse and the train station, both of which fall under the category of heritage buildings. Additionally, a metal pedestrian bridge crosses the site, serving as both a functional and symbolic connection.

Key sensitive landscape elements include the Naviglio Grande (a waterway of high perceptual and recreational value), Via Valenza (a historically significant and commercially active street with high traffic flow), the pedestrian bridge, the warehouse, and the train station. These elements are to be preserved and integrated into the new urban fabric.

The intervention involves the removal of existing railway tracks, which will be replaced by a greenway. On currently paved areas, hybrid-use buildings (residential, commercial, and productive) will be constructed, with a height limit of six floors. In the western portion of the site, office buildings of up to eight floors will be introduced. The historic structures—the warehouse and train station—will be preserved and enhanced through adaptive reuse strategies, becoming focal points within the renewed urban setting.

The intervention will not obstruct the visual permeability of the site. On the contrary, the existing wall separating the area from the Naviglio will be demolished, enabling clearer visual and physical connections between the historic assets and the waterfront. The morphological integration of the new buildings is effective, as their volumes and profiles will align with the existing built environment across the Naviglio and Via Valenza.

The overall degree of landscape impact has been assessed through a qualitative analysis, considering the nature of the intervention and the constraints established by the City Plan.

10.13.2 Mitigation and Enhancement Measures

The following strategies will be implemented to mitigate impacts and enhance landscape integration:

- Planting of native trees along the greenway
- Creation of public urban gardens to encourage community engagement
- Use of natural materials and color palettes consistent with local historic architecture
- Installation of green roofs to improve ecological performance.

- Design of visual corridors oriented toward key landscape and cultural elements, such as the pedestrian bridge, the historic station, the warehouse, and the Naviglio Grande

10.13.3 Landscape preservation

Regarding landscape preservation constraints (as indicated in the City Plan), construction in the westernmost portion of the project area is limited by view corridor regulations and may not exceed the height of the existing buildings located on the opposite bank of the canal (approximately 8 floors).

Moving slightly eastward, the maximum allowable building height is reduced to 13 meters (approximately 4 floors). No new construction is permitted in front of the warehouse. Continuing further east, the 13-meter height limit remains in effect.

Additionally, the warehouse, the train station, and the iron pedestrian bridge are subject to mandatory preservation and must be retained in their current form.