
INNOVATION
MILE

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INNOVATION

Innovation Mile, a Vision or Feasibility?

Torino Innovation Mile: From a Broad Urban Vision to a Concrete Design Proposal for Strategic Investment

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Abstract

This thesis aims to investigate the transformation opportunities of some areas still undeveloped today (industrial voids) within the Spina Centrale of Turin, particularly starting from the proposals of certain stakeholders: the Innovation Mile project. The objective of this research is to propose a feasible and reproducible methodological framework for the design, seeking to bridge the gap between qualitative and quantitative aspects, collecting and analyzing data and information on the urban, social, and functional qualities of the areas under study, and translating this knowledge into strategic design choices, in a project context characterized by implementation difficulties (areas left unfinished for over 20 years).

The proposed approach is based on an in-depth contextual understanding of the Innovation Mile in Turin: a concept that promotes the regeneration of a specific area, defined by two areas connected by an axis approximately one mile long, where innovation is encouraged. The concept of "Innovation Mile," still relatively new, must be analyzed to fully understand its meaning and to determine why this specific term was chosen for this particular area of Turin.

Once these questions are clarified, a further inquiry arises: why has the Innovation Mile area, even before it was given this name, never developed and what was it like before becoming an urban void? And how does the surrounding area reach the current appearance today? Only once this framework is understood is it possible to investigate the quantitative aspects related to the community influenced by the project, in order to understand the real potential of the area and to propose a strategic approach that leads to a successful, implementable project.

By formulating the design approach, the thesis demonstrates how a complex and comprehensive regeneration strategy can be developed within a challenging urban context.

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Introduction

The objective of this thesis is to propose a methodological approach to make the transformations of the still undeveloped areas of the Spina Centrale in Turin feasible, as part of the Innovation Mile project vision.
This is an ambitious goal, considering that these areas have remained unfinished for over two decades.

The approach adopted is strategic and methodical: step by step, the aspects necessary to understand the project's potential are analyzed. First, it is essential to clarify the meaning of the term by which the project area is called: Innovation Mile. This relatively new concept is examined in its origins, meaning, and significance, the expectations associated with it, other contexts in which the term is used, and finally, how and for what purpose it is applied in the context of Turin.

After understanding the vision attributed to the area, the historical processes that led to the development and transformation of the entire Spina Centrale are retraced and analyzed. The Innovation Mile area represents a missing piece in the city's continuous evolution and its expanding economy.

To understand why this site has lagged behind, while neighboring projects were continuously developed and economically successful, a deeper analysis of socio-economic conditions, the target community, and the main stakeholders is necessary. A thorough investigation allows the identification of the site's potential and the definition of strategies capable of launching its development.

This thesis does not aim to produce a detailed design as a final outcome; rather, it seeks to establish a key strategic framework based on design, setting unified rules for the project space. A framework that defines clear boundaries within which investors can maintain the flexibility to realize their projects while staying aligned with the broader vision of the Mile.

As an academic research in the field of architecture, the thesis also leverages from a practical design component. The development focuses on a strategic framework applied to one of the two areas of the Innovation Mile, serving as an example of how the proposed model can be implemented. Spina 3 was chosen for this purpose, as it represents the largest and most urgent case: a neighborhood still lacking essential services, continuing to struggle despite ongoing regeneration and redevelopment efforts.

As a final step, the proposed design approach for achieving success requires a dedicated tool for the project, aimed at making it known first to the community and then to potential investors, the only actors capable of completing the development of the Innovation Mile: the creation of a website.

This thesis creates a strong link between research and analysis, both qualitative and quantitative, and a strategic design approach. This link is not linear, but cyclical, dynamic, and continuously updated: an infinite and innovative process that constantly evolves by integrating new information and results.

Innovation

In this chapter, the concept of innovation is analyzed, with the aim of not limiting its use to a mere buzzword, but making it a true cornerstone of the final project. First, the evolution of the term in the theoretical field is examined, according to the perspectives of scholars and economists, from its earliest use to the present day. Subsequently, its practical application is analyzed in the cases of physical innovation clusters, distinguished by various aspects that are studied and compared in the second part of the chapter. Next, the specific context of the project, Turin, is explored, documenting every available source, whether gray literature or scientific. At the end of the chapter, an original definition will be proposed based on these findings, moving beyond the concept of "Innovation Mile" as a mere buzzword. Finally, the necessity of the thesis is described, along with the approach adopted and the efforts made to develop it.

FROM THE ORIGINS TO THE MODERN MEANING
Introduction

Innovation

In today's world, we hear the word "innovation" a lot... What are the first things that come to your mind with this word? Novelty, technology, knowledge, intelligence, improvement, future. That's exactly what those who use this word want to express. This powerful word is used by companies, online platforms, newspapers, research institutes, the European Union, and even by the community supporting The Global Goals, as one of the global objectives.

The 17 objectives of the Global Goals, sometimes referred to as the Sustainable Development Goals, are part of a significant action plan that was created in 2015 and on which the governments of the 193 UN member states agreed. By 2030, these nations aim to have accomplished the Goals. Industry, Innovation, and Infrastructure is the ninth goal.

There are also other programs that promote and support innovation, such as the European Institute of Innovation and Technology (EIT): "Making innovation happen" – Europe's largest innovation network, financing and coordinating the development of innovation parks.

Other programs or institutions instead promote information on innovation, such as the European Innovation Scoreboard, which provides a comparative assessment of the research and innovation performance of EU member states, other European countries, and global competitors.

And many more...

So, this term, now firmly established in today's society, has seen a rapid increase in use over the last twenty years, and is more and more used in reference to urban districts and projects.

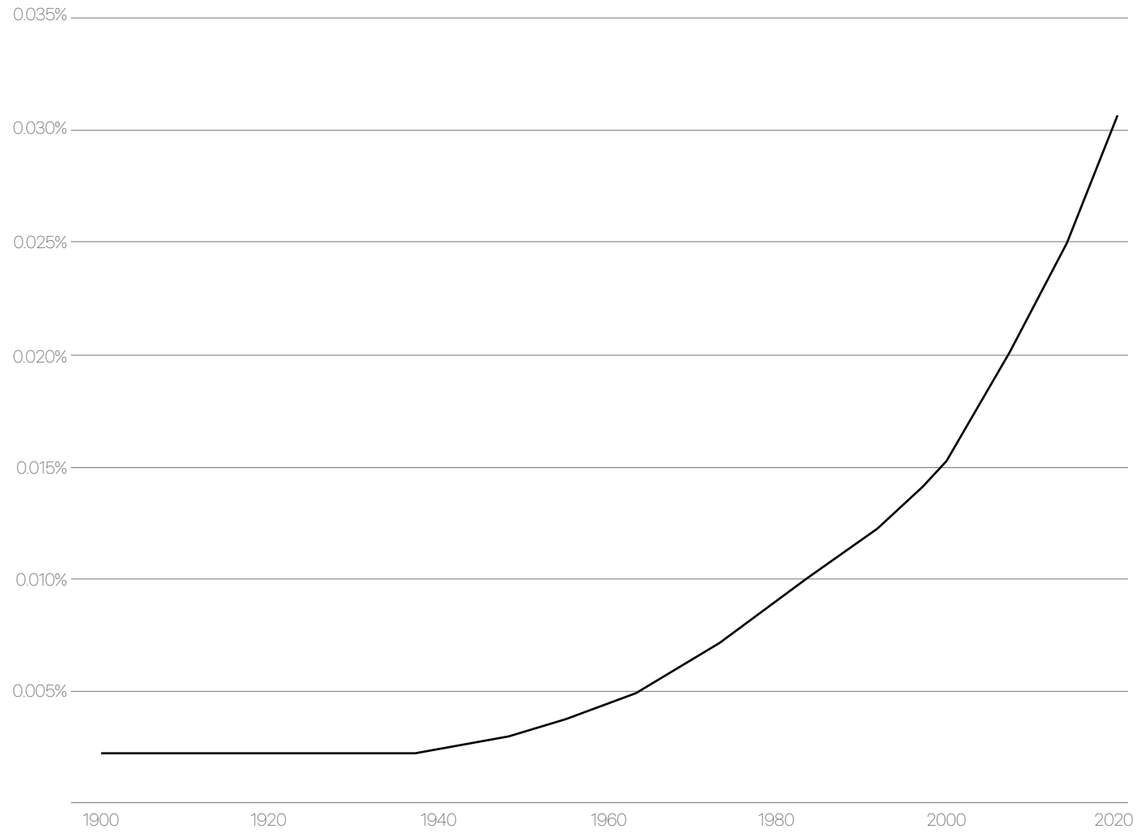


fig. 1 "Innovation" word usage throught the years. Data from Google Books Ngram Viewer (2022)

FROM THE ORIGINS TO THE MODERN MEANING

The meaning

Gabriel Tarde
Les lois de l'imitation

The term innovation has its roots in the late 19th century. Gabriel Tarde (1843–1904), a French sociologist and criminologist, is often recognized as the precursor of the concept . In his theory of "social invention" (Les lois de l'imitation, 1890), Tarde describes social life as guided by two complementary forces: invention, a small variation that nests onto a broader repetition, and imitation, the elementary social repetition that drives collective evolution. This invention–imitation pair is considered the theoretical antecedent of the better-known Schumpeterian theory of innovation–diffusion (Schumpeter, 1911).

Joseph A. Schumpeter
The Theory of Economic Development

Joseph A. Schumpeter (1883–1950), an Austrian economist, offers a new definition of innovation in "The Theory of Economic Development" (1911).

For him it is no longer a simple technological invention, but the application of new combinations that interrupt the circular-flow equilibrium of the economy, initiating a dynamic development process: "These spontaneous and discontinuous changes in the channel of the circular flow and these disturbances of the centre of equilibrium appear in the sphere of industrial and commercial life, not in the sphere of the wants of the consumers of final products."

In his model, the entrepreneur plays a crucial role: to carry out the new combinations he must obtain credit, i.e. new purchasing power, by taking on debt to raise the necessary capital. Credit thus becomes the necessary condition for the emergence and implementation of the innovations that drive economic growth. Before he requires any goods whatever, he requires purchasing power: he is the typical debtor in capitalist society, and the bank, by granting credit, becomes the true engine of economic expansion.

The entrepreneurial process works as follows: the innovator withdraws resources from their previous uses, implements the innovation and finally repays the debt; the credits disappear, while the profit remains in circulation, generating what Schumpeter calls "entrepreneurial deflation." Producing means combining resources and forces; innovating means doing so in a discontinuous way, not through small adjustments.

Economic development, in the Schumpeterian sense, coincides with the execution of these new combinations, which break down into five fundamental types:

Introduction of a new good, or a new quality of an existing good; New method of production, even if already tested in other sectors; Opening of a new market, geographic or customer-segment; Discovery of a new source of supply of raw materials or semi-finished goods; New industrial organization, for example through the creation or breakup of monopolistic positions.

Contrary to traditional theory, which emphasizes the accumulation of means of production, Schumpeter identifies credit as the fundamental mechanism: it is what "detaches" and reallocates existing resources toward new combinations, thus fueling the innovation and economic development process.

Joseph A. Schumpeter
Capitalism, Socialism and Democracy

After three decades of in-depth research, Schumpeter further expanded his theory in "Capitalism, Socialism and Democracy" (1942) by introducing the concept of "creative destruction" to explain how innovations entail the continuous overthrow of existing structures.

Joseph Schumpeter describes capitalism as an inherently dynamic and never stationary system: "Capitalism, then, is by nature a form or method of economic change and not... never is but never can be stationary." Capitalism is continuously driven by new consumer goods, new methods of production or transportation, new markets, and new forms of industrial organization, generating a process of incessant mutation that destroys the old and constantly creates the new.

According to this principle, innovation is creative because it generates new combinations, and at the same time destructive because it displaces or renders obsolete existing processes, creating an imbalance that gives rise to cycles and crises.

Everett M. Rogers
Diffusion of Innovations

Another important contribution to the understanding of the term as we know it today is the vision of Everett M. Rogers. In his book "Diffusion of Innovations" (1962) he introduces important novelties to the concept because he defines five decision stages in the development of innovation and five categories of innovation adopters. His approach is a multidisciplinary approach, uniting sociology, anthropology, communication, and marketing in a single framework. He focuses on the importance of social and communicative contexts that receive the innovation.

His definition of innovation: "An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption."

This "newness" in an innovation does not necessarily imply only new knowledge. He indeed explains that the "newness" aspect of an innovation can manifest in terms of knowledge, persuasion, or decision to adopt.

Moreover, the Innovation-decision process is the mental process through which an individual (or other decision-making unit) passes through five decision stages:

-Knowledge: exposed to the innovation's existence and understanding of how it functions.

-Persuasion: when the individual forms a favorable or unfavorable attitude toward the innovation.

-Decision: choice to adopt or reject the innovation.

-Implementation: innovation put into use.

-Confirmation: the individual seeks further confirmation of the decision made.

He also lists a classification of individuals based on their time of innovation adoption:

-Innovators: embrace risk and are able to experiment with new ideas.

-Early Adopters: are opinion leaders; their decisions most influence others.

-Early Majority: adopt before the average.

-Late Majority: adopt after the average; skeptical.

-Laggards: those tied to tradition, unwilling to change.

Rogers's model describes cumulative adoption over time with an S-curve: slow at first (innovators), accelerates with the early majority, then slows toward saturation (laggards).

He also explains that five perceived attributes of innovations can positively or negatively affect their rate of adoption: "Perceived attributes of innovations, relative advantage, compatibility, complexity, trialability, and observability, affect the rate of adoption."

-Relative Advantage: the degree to which an innovation is perceived as better than the practice it supersedes.

-Compatibility: the degree of consistency with existing values, experiences, and needs.

-Complexity: the ease of understanding and using the innovation

-Trialability: the ability to experiment with the innovation on a limited basis.

-Observability: the clarity of the innovation's results and benefits to others.

Nelson & Winter
An Evolutionary Theory of Economic Change

Some decades later, another important contribution arrived: Nelson & Winter extended the vision of innovation into a more dynamic and nuanced model, analyzing all the components of the evolutionary process.

In their book An Evolutionary Theory of Economic Change (1982) they argue that: "Organizational routines are to an economic system what genes are to a biological population."

Organizational routines, the coded set of behaviors and processes, are, for the authors, the very foundation of the economic system. Innovations consist of variations in these routines, which are then selected by the market.

Moreover, innovations are not mere "leaps," but the result of small adjustments that grow through the accumulation of modifications and learned competences (an evolutionary learning process).

Finally, those variants that fail are also an integral part of the process: they help clear the landscape of less suitable forms, making space for new innovations to emerge.

Bengt-Åke Lundvall
National Systems of Innovation

Some years later, Bengt-Åke Lundvall published "National Systems of Innovation" (1992), introducing a new concept of innovation within a more interactive system.

The innovation phenomenon indeed generates a broader national context that the author defines as: "the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies." This network is composed of firms, universities, research centres, public agencies, and other institutions; the interactions within it determine the ability to generate and diffuse innovations.

Lundvall also analyses the interactive learning model, meaning the continual interactions between users (who provide feedback) and producers (who develop technologies), from which the innovation process originates.

In this development model, the main constitutive factors of the system come into play, influencing its speed and direction:

-Human capital: skills and training

-Infrastructure: laboratories, communication networks, production facilities

-Support institutions: regulations, public policies, funding

Other key factors are the international flows of knowledge and capital, which make the system more resilient and dynamic.

Finally, Lundvall emphasizes the selective character of the system: organizational routines form a true "selection environment" in which only the fittest innovations succeed, while less effective variants are discarded, freeing space for more effective solutions.

Henry Etzkowitz & Loet Leydesdorff
Triple Helix

During the same years, Henry Etzkowitz and Loet Leydesdorff conducted research on the innovation ecosystem and presented their vision in the academic article published in EASST Review, "The Triple Helix -- University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development" (1995). In it, they introduce for the first time the concept of the "Triple Helix" to describe the continuous interaction of three institutional spheres, university, industry, and government, whose co-evolution generates the innovation ecosystem.

The modern university, which integrates teaching and research, underwent a true revolution in the late nineteenth century: from an institution with a predominantly cultural function to the fulcrum of the "industrial research laboratory" and the "scientification of production."

The authors then propose a non-linear evolutionary model, in which traditional "technology push" or "market pull" logics give way to co-evolutionary, networked dynamics founded on the Triple Helix structure. To capture the multiple reciprocal links at different stages of knowledge valorization, they also introduce a spiral model of innovation: a dynamic framework in which information and resources circulate among universities, enterprises, and government, generating new forms of interdependence.

At the operational level, the article explicitly cites hybrid organizational forms, incubators and science parks, as key instruments of the new innovation policy. These structures constitute true physical clusters of the Triple Helix theory, places of collaboration where the three institutions jointly foster research and development.

Clayton M. Christensen
The Innovator's Dilemma

At the beginning of the 1990s, Harvard Business School professor Clayton Christensen coined the concept of "Disruptive Innovation", today widely adopted by leaders and entrepreneurs, as explained in his book The Innovator's Dilemma (1997).

In this work, Christensen explains why large companies, considered examples of good management, can lose market leadership in the face of certain technological innovations. It is not a matter of poorly managed firms, but of companies that, despite listening to their customers and investing in the requested technologies, fail in the long term.

Christensen introduces the paradox of the "innovator's dilemma": the logical and prudent decisions, investing in technologies desired by customers, maximizing margins and revenues, can prove to be precisely those that doom a company when "uncomfortable" technologies emerge.

To explain why even the best companies can fail, he distinguishes two categories of innovations:

-Sustaining technologies: improve performance in line with existing customers' demands and rarely cause the decline of market leaders.

-Disruptive technologies: initially deliver lower performance than dominant products, but offer a different bundle of advantages, lower price, ease of use, compactness, appreciated by niche segments. These are the innovations that trigger the decline of leaders.

Disruptive innovations arise "from the bottom": a product or service takes root in simple applications in underserved segments, thanks to lower cost and greater accessibility, and then relentlessly moves upmarket, eventually displacing established competitors.

To demonstrate his theory, Christensen provides concrete examples from the disk-drive industry: the 8", 5.25", and 3.5" architectures, initially serving peripheral markets (minicomputers, desktop PCs, laptops), evolved rapidly and cannibalized the "mainstream" 14"-drive market, ousting the incumbent manufacturers.

Henry W. Chesbrough
Open Innovation: The New Imperative for Creating and Profiting from Technology

In his book Open Innovation: The New Imperative for Creating and Profiting from Technology (2003), Henry W. Chesbrough presents a new paradigm for innovation processes. He suggests a change in perspective: shifting from a closed approach, where firms protect their ideas, to a system built on a wide network of internal and external actors to enhance the value of technologies.

Chesbrough departs from the traditional Closed Innovation model, built on a single internal R&D "ivory tower," and instead presents Open Innovation as a system in which valuable ideas can originate both inside and outside the company and be brought to market internally or externally. Consequently, Open Innovation recognizes and leverages the bidirectional flows of knowledge between the firm, universities, external partners, and start-ups.

External knowledge sources include customers, suppliers, universities, public research labs, consortia, consultants, and emerging ventures. In this model, there is no longer a single internal channel; rather, multiple external channels exist to "rapidly move technologies out of the lab."

Additionally, Chesbrough highlights that effective innovation relies not just on a new product but also on a suitable business model that can link internal and external innovation sources and extract value from new technologies. Companies must therefore learn to experiment quickly in uncertain contexts while still planning with reliable data.

This theory was then further developed by other scholars, including Gassmann & Enkel, who in Open Innovation: Researching a New Paradigm (2006) expand and deepen the concept by classifying the key processes, analyzing over 120 case studies, and defining specific methodologies. In subsequent years, others have also contributed to the theory, including Dahlander & Gann (2010) and Bogers, Chesbrough & Moedas (2018).

Armand Hatchuel
Les nouvelles fondations des sciences de gestion

Many other theories have been introduced in recent decades, and one that deserves particular attention is the Concept–Knowledge Theory (C–K), developed by Armand Hatchuel and Benoît Weil in the early 2000s, later expanded by other scholars and applied in various industrial sectors.

In their paper "La théorie C-K: Fondements et usages d'une théorie unifiée de la conception", the two scholars introduce an extensive theoretical model for examining innovation and discovery, founded on a design framework organized into two separate spaces:

Concept Space (C-space): made up of propositions that do not possess a clear logical status within the realm of knowledge; it embodies concepts that are not yet anchored in recognized knowledge and acts as the initial phase for the design process

Knowledge Space (K-space): composed of propositions with a defined logical status (facts, theories, data) already accepted; it provides the building blocks for developing and validating new ideas.

The design process, according to this theory, is described through the alternation of four fundamental operators:

K → C: using existing knowledge to define or partition a concept;

C → C: generating new concepts from existing ones;

C → K: transforming a concept into knowledge when it is validated or concretized;

K → K: expanding the knowledge space through newly validated propositions.

The C–K model allows not only for solving known problems but also for creating new problems and exploring original design paths, including radical or "seemingly crazy" concepts that push beyond the limits of current knowledge.

Modern implementation
ai-based innovation

Even more recent developments in the concept of innovation have occurred in the past few years, strongly influenced by a disruptive innovation itself: artificial intelligence. Although the term AI was already coined in 1956, it was in 2020, with the introduction of GPT (Generative Pretrained Transformer) by OpenAI, that a real turning point took place. Its capability to analyze and generate large amounts of data in an increasingly fast and accurate way opens up new technological and innovative possibilities.

As several scholars point out, "The collaboration between artificial intelligence and humans is emerging as a transformative force in innovation" (Johann Füller, 2024); innovation is becoming an increasingly integrated process, in which AI contributes to generating ideas, selecting them, prototyping them, and launching them to market (Zeljko Tekic, 2023).

In conclusion, the concept of innovation, in just over a century, has been born, has evolved, has been interpreted, applied, rethought, and will continue to transform. Its evolution will involve industry, new technologies, and the entire economic system even more deeply.

Innovation will increasingly spread also through spaces dedicated to its development: innovation clusters and new technological platforms, where the main actors of the innovation process, universities, industry, and government, collaborate actively.

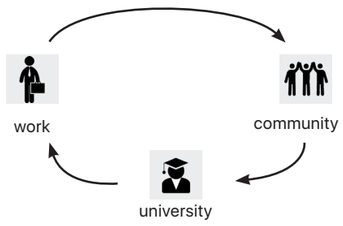
WHERE INNOVATION GATHERS
Innovation cluster typologies

Innovation clusters

Disruptive technologies and new developments, such as robotics, virtual reality, and artificial intelligence, are transforming the ways in which individuals live and work. These innovation processes have highlighted the importance of geographical areas of innovation, where industries and institutions find the right conditions to be creative and to attract the workforce they are looking for. These places are based on spatial clustering, facilitating access to information, enhancing collaboration, and fostering an atmosphere that promotes creativity and well-being.

They are clusters of companies, entrepreneurs, startups, incubators, and accelerators. These areas take on different names and vary depending on their scale and the functions they host: they are called AOIs (Areas of Innovation), STPs (Science and Technology Parks), or IPs (Industrial Parks).

Areas of Innovation
AOIs



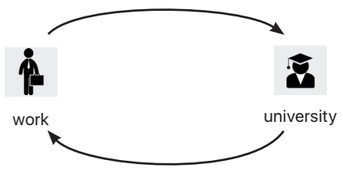
"Areas of Innovation" include all those places designed to attract entrepreneurs, talent, tech and knowledge-intensive businesses within a stimulating environment coordinated by infrastructure, universities, industries, and communities. These projects are based on the Triple Helix model, where university, industry, and government are the three main pillars for the development of these places.

This group of innovation clusters brings together all those places that share the same concept, even if they take on different names depending on scale, from broader regional areas to more specific and compact zones: innovation districts, knowledge quarters, innovation hubs, innovation corridors, innovation miles.

Definitions of these places worldwide:

"Areas of innovation are places designed and curated to attract entrepreneurial-minded people, skilled talent, knowledge-intensive businesses and investments, by developing and combining a set of infrastructural, institutional, scientific, technological, educational and social assets, together with value-added services, thus enhancing sustainable economic development and prosperity with and for the community." (IASP)

Science and Technology Parks
STPs



Science and Technology Parks, on the other hand, promote the exchange and growth of knowledge and technologies between universities, companies, and the market, through areas rich in services and high-quality spaces. They facilitate the birth and growth of innovation-based startups.

These areas do not include residential zones and are often perceived as "closed", either literally, for privacy reasons (e.g., security-restricted areas), or in a more abstract way (e.g., limited accessibility or exclusivity).

They are referred to by different names: technology park, technopole, research park, science park.

How they are defined by international institutions:

"STPs are facility areas established with the purpose to facilitate innovation and knowledge-based economies, by promoting technological development, including through research and attracting technology-based companies." (UNIDO)

"A science park is an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions." (IASP)

"A science and technology park stimulates and manages the flow of knowledge and technology among universities, R&D institutions, companies and markets." (UNESCO, Science Report 2021)

Finally, there are the Industrial Parks, which can combine a mix of production, transportation, and storage facilities within the same area. These may include chemical plants, plastics manufacturers, airports, food and beverage processors, and steel manufacturers. The main goal is economic development, since industrial parks are designed to bring together complementary services and features that benefit the companies operating there.

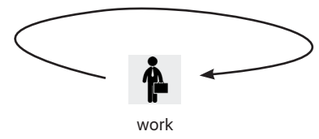
Unlike the other two models, industrial parks bring together only one type of institution: industries.

Global definition:

"An industrial park is a tract of land developed and subdivided into plots according to a comprehensive plan with the provision of roads, transportation and public utilities, sometimes also with common facilities, for use by a group of manufacturers." (UNIDO).

In conclusion these three models differ primarily in the functions and institutions they include, but also in their historical origin: Industrial parks were the first to appear, at the end of the 19th century, followed by science parks in the mid-20th century and then Areas of Innovation in 21st-century.

Industrial Parks
IPs



WHERE INNOVATION GATHERS
Industrial Park

Industrial Park
Overview

In the early decades of the twentieth century, in Europe, concentrated industrial areas that had developed spontaneously began to emerge. New industries, in search of places to build their plants, tended to settle in areas already occupied by other companies, which could offer essential services and infrastructure for their growth. These were areas already connected by railways or ports, which made it possible to minimize transport costs and maximize production.

As Alfred Weber also explained in his Theory of Industrial Location (1929), the formation of industrial zones was based precisely on the principle of minimizing transportation costs within the total production cost, in order to maximize profitability for investors. This theory explains why industries tend to develop and concentrate in the same place.

In this context of "spontaneous industrial agglomerations", the first Industrial Parks began to appear, which from a spatial point of view could seem similar, but were radically different from an organizational perspective.

Industrial Parks are delimited, urbanized, and specially designed areas for the settlement of industrial plants, located near strategic infrastructures such as ports, airports, highways, and railway lines. Before companies move in, the area is equipped with basic urban services (water, electricity, data and telephone networks) and a central administration responsible for security, maintenance of infrastructure, and management of relations with the authorities. This preventive planning allows for cost reduction and resource optimization for investors, while at the same time promoting regional economic growth.

An industrial park can combine within the same area production, transportation, and storage facilities, hosting very different types of businesses: chemical plants, plastics manufacturers, airport complexes, food and beverage industries, steel manufacturers, and more.

Trafford Park
1896 Manchester,UK

The first industrial park in the world is Trafford Park, inaugurated in 1896. The area of the future park, in Manchester (UK), before the Industrial Revolution was the noble estate of the de Trafford family. Like many other families at the time, the de Traffords opposed the construction of the Manchester Ship Canal, completed in 1893, because they feared it would make the area uninhabitable and bring polluted water to their residences.

In 1896, 479 hectares of land were sold to financier Ernest Terah Hooley, who founded Trafford Park Estates Ltd. and transformed the area into a park for industries. Once the basic infrastructure to attract investors was in place, the company, owner of the land, began leasing plots to businesses.

In 1898, the Manchester Patent Fuel Company opened, attracting many other companies in the following years, including the Westinghouse Electric Corporation and the Ford Motor Company. A power plant was also built to serve the industrial area.

At the same time, in 1899, Trafford Park Dwellings Ltd was established to create a residential village for workers, the Trafford Park Village: the company acquired 50 hectares of land and built around 1,100 dwellings. In 1904, the village population reached 3,060 people. However, the area was soon criticised for its narrow streets, lack of green spaces, and proximity to the pollution of neighbouring industries, and was considered a slum area.

In 1903, about 6,000 workers were employed there; by 1940, the number had risen to an estimated 75,000 workers.

Circulation inside the park was mainly for company vehicles and heavy goods transport: although it was not closed off by gates, it was not designed as a public space.

During the Second World War, Trafford Park industries were converted to produce military equipment. The area was heavily bombed and damaged by Nazi forces in 1940.

From the 1960s onwards, decline began: more and more companies relocated, and thousands of jobs were lost. In 1987, with the creation of the Trafford Park Urban Development Corporation, the park was revitalised, bringing back hundreds of companies and thousands of workers.

Today, part of the area has been transformed and modernised as the Trafford Centre, dedicated to retail and leisure activities, with most visitors arriving by car or via the Metrolink line (opened in 2020). The centre's website presents it as a place to "eat, play and shop".

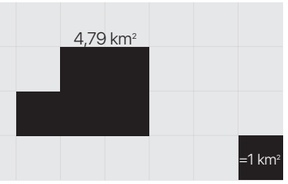
The Trafford Park industrial area still exists, hosting over 1,400 companies (including Kellogg's, Unilever, Amazon, and DHL) and remaining entirely industrial and logistical in nature. There are no public services or shops; the streets are designed for heavy vehicle transport, not pedestrians. The only people in circulation are company workers.

Trafford Park (UK)

NO LOGO

Type	Reference year
Industrial park	1940

Area



Key anchor	Land organization
Trafford Park Estates Ltd	leased to industries

Facilities

industries	services for industries	workers houses

Numbers

200+ companies	75 000 employees

Entrance	Website
Open to access but not designed for public use	only for the new commercial area, Trafford Centre

Industrial parks
Environmental problems

Then different terminologies began to appear, used for these "special territories" equipped with the necessary infrastructure but differing in objectives: free-trade zones (FTZs), export processing zones (EPZs), special economic zones (SEZs), high-tech zones, free ports, enterprise zones, etc. The term industrial park is also used with prefixes like eco-, sustainable-, agro-, and techno-.

These last eco-industrial parks started to appear when the world began to realize the environmental problems caused by traditional industrial parks. Pollution can be magnified by the close proximity of manufacturing facilities, machinery, and heavy transportation. Moreover, it is common for lower-income housing to be located adjacent to industrial parks, worsening social impact.

As a consequence of these problems, ecological industrial parks were born to correct the negative aspects of traditional industrial parks.

Another challenge industrial parks face today is the relocation of manufacturing and the transformation of the economy toward the tertiary and quaternary sectors: industrial parks are called to evolve and even reinvent themselves. Social and environmental dimensions are now fundamental for companies.

Jafza
Dubai, UAE

One of the examples of a successful modern industrial park, which has evolved from the old, unsustainable and poorly organized model into a new sustainable and well-structured model, is Jebel Ali Free Zone in Dubai, United Arab Emirates.

The vision of Jafza (Jebel Ali Free Zone) was set in motion with the opening of Jebel Ali Port in 1979, leading to the creation of a free economic trade zone by decree of the Ruler of Dubai. According to the website, there are no corporate taxes, no import or re-export duties, and no currency restrictions.

With the growing demand for office space in 1986, Jafza developed its first office buildings within the free zone. In the following years, more office buildings were added, along with onsite residential projects for Jafza-registered businesses. Increasingly, industries also established operations in the area.

The free zone has evolved into a trade catalyst and a smart business community, offering unprecedented growth opportunities and market access. From just 19 companies in 1985, it grew to over 500 businesses by 1995, and today Jafza is home to more than 11,000 companies supporting 160,000 jobs.

Its goal is to attract, retain, and develop trade customers by providing high-quality logistics and industrial solutions, enhanced by innovative and differentiated services. The area is well connected thanks to an extensive street network and two metro stations within the zone. It also features 490 restaurants and cafes, enhancing workers' quality of life and creating a lively work environment. Jafza hosts events such as business networking sessions and trade shows.

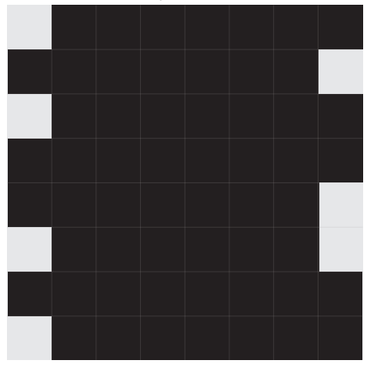
The website is very clear, especially for potential investors. Their vision is strongly communicated, and technical information is detailed and readily available. For example, they offer a comprehensive investor guide explaining the different types of licenses required and the kinds of activities and companies permitted in the zone. From a leasing perspective, they are well organized, offering entire plots for development or fully equipped spaces including offices, co-working areas, warehouses, and more.

Jafza

fig. 2 Jafza icon

Type	Reference year
Modern industrial park	2025

Area: 57 km²



Key anchor	Land organization
Government of Dubai	leased to industries

Facilities

industries | services for industries | retail | hospitality

Numbers

11 000 companies	160 000 employees

Entrance	Website
Open and restricted areas, vehicle access	effective and organized

WHERE INNOVATION GATHERS
Science and Technology Parks

Science and Technology Parks
Overview

Also known as "technology park", "technopole", "research park" and "science park", science parks born in the mid-20th century with the idea of creating clusters of businesses to stimulate the economy. The main purpose of these projects is economic development through the collaboration of the main stakeholders: the "triple helix," which focuses on the production and use of knowledge in the context of "university-industry-government relations" (Etzkowitz & Leydesdorff, 2000).

They were born after the crises of World War II and the explosion of interest in new technological solutions. Science Parks are an effective way to stimulate a culture of innovation and to grow knowledge-based businesses. To develop a knowledge-based economy, the Science Park also requires additional services and amenities to meet the needs of many businesses, employees, and students all in one place.

The economic benefits extend to local cafes, shops, gyms, childcare facilities, and accommodation providers, thereby improving employment opportunities in the local area. Their main focus is research, innovation, and technology.

Stanford Research Park
Silicon Valley, USA

One of the first projects to appear in the USA was the Stanford Research Park, established in 1951 and originally called the Stanford Industrial Park, located in Silicon Valley. Before the 1950s, the area surrounding Stanford was mainly hectares of fruit orchards.

Stanford's Provost, Frederick Terman, and the Dean of Engineering saw the potential of this project to provide jobs for university graduates and stimulate regional economic development. Therefore, in 1951, in a pioneering partnership with the City of Palo Alto, the Stanford Research Park was created under an agreement to annex 283 hectares of Stanford land into the City of Palo Alto, in order to generate significant tax revenues.

Thanks to careful planning and tenant selection, the industrial area was designed to look and feel like the Stanford campus, making it a pleasant place to work. One of the main tools used to attract companies was the creation of the Honors Cooperative Program (HCP), which allowed employees of companies in the Park to take classes at Stanford, leading to Master's and PhD degrees. This innovative program was highly successful. Another major attraction for Park tenants was the close access to consulting services provided by Stanford faculty. Professors were granted one day per week of release time for consulting work (a policy still in place today), and the Park was located close to their on-campus offices. This gave tenants access to the problem-solving expertise of Stanford professors while providing additional income for the faculty. Other programs were created to involve industry further and foster collaboration, such as Industrial Affiliate Programs. Today, over 40 such programs thrive at Stanford, contributing over $10 million in gift income.

Thus, the project is focused on clustering tech companies and research labs with a strong economic goal. The Park is coordinated by the university in collaboration with companies and the City of Palo Alto. The main strategy is to create a cluster of high-tech businesses (including Tesla, HP, and others) while also creating a vibrant place to work, supported by restaurants, commercial activities and university facilities.

By 2004, the Park, with almost 1 million square meters of developed buildings and facilities, was hosting 23,000 employees across 150 companies.

They have actively promoted the vision of the Park through programs, manifestos, and even a brochure in the 2000s to increase its attractiveness.

The brochure states: "Companies may, for example:
(a) Sponsor joint research projects with Stanford faculty and students;
(b) Recruit Stanford graduates;
(c) Conduct seminars and workshops that encourage the exchange of technical information;
(d) Offer internships to students;
(e) Invite faculty to join corporate boards;
(f) Retain faculty as consultants; and
(g) Consult with Stanford's Office of Technology Licensing."

Even their website strongly reflects this vision, as soon as you open it, you can see the variety of activities provided there, creating a spectacular place to work. On the website there is a page specifically dedicated to leasing for investors, where all their proposals are clearly presented: variable spaces/ floors in newly constructed buildings, entire buildings, multi-tenant spaces already equipped, all accompanied by floor plans and detailed information.

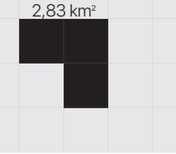
Stanford research park (USA)

Stanford Research Park

fig. 3 Stanford research park icon

Type	Reference year
Research park	2004

Area



Key anchor	Land organization
Stanford University City of Palo Alto	leased to investors

Facilities

Numbers

150 companies	23 000 employees

Entrance	Website
Open area, free vehicle access	effective and evocative

Research Triangle Park
North Carolina, USA

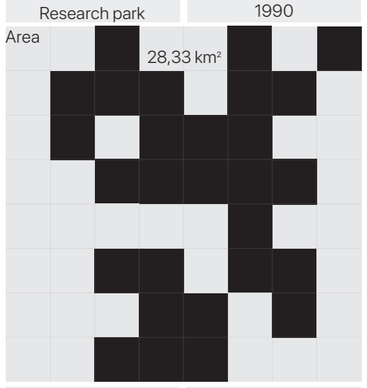
Research Triangle park (USA)

fig. 4 RTP icon

Type
Research park

Reference year
1990

Area
28,33 km²



Key anchor
3 universities (UNC, NC,Duke)
RTF
North Carolina

Land organization
leased or sell to investors

Facilities

industries | services for industries | R&D | retail

hospitality | university campus | green spaces | sports facilities

Numbers
300 companies
45 000 employees

Entrance
Open area, free vehicle access

Website
effective and evocative

Another notable example of a research park, although significantly larger in size, is the Research Triangle Park (USA), the largest research park in the United States with 2833 hectares. The idea to create this park originated from Robert Hanes, president of Wachovia Bank and Trust Company, and Romeo Guest, a contractor from Greensboro, aiming to attract modern industries to an area that, at the time, faced economic challenges but was ideal for research-oriented industries that increasingly preferred to locate near universities. In the 1950s, business and government leaders were concerned about the economic situation in North Carolina: the average income was among the lowest in the nation, and the state economy relied mainly on manufacturing jobs in agriculture, forestry, furniture, and textile industries.

The main obstacle the park had to overcome to succeed was to revolutionize the state's image to attract investors.

RTP is a private endeavor with cooperation from the universities (UNC-Chapel Hill, North Carolina State, and Duke University) rather than a government-sponsored project.

Since 1959, Research Triangle Park has been managed by the nonprofit Research Triangle Foundation (RTF) of North Carolina, and by the 1960s public confidence in the park's long-term success was solidified.

The idea of this park revolutionized North Carolina's situation. According to historian Numan V. Bartley, RTP was the "South's most successful high-technology venture." As Charles W. Wessner writes in Best Practices in State and Regional Innovation Initiatives, "North Carolina's Research Triangle Park (RTP) stands as something of a counterpoise to Silicon Valley as well as to conventional wisdom about how to foster innovation."

Unlike Silicon Valley and Route 128, which evolved through informal networks of spin-offs and emerging companies, RTP was developed through a centralized process led by major firms and a coordinating body that actively recruited universities and investors.

The main objectives of the park are: Facilitate collaboration between the Triangle universities; promote cooperation between universities and industry; create an economic impact for North Carolina residents. The park also positively impacts university students, who can benefit from the proximity of high-tech companies and stay to work in the area.

Programs such as the Triangle Universities Center for Advanced Studies Inc. (TUCASI), established in 1975 to serve the three founding universities and other organizations, were created. The RTP Owners and Tenants Association was also founded to bring companies together through regular meetings where members discuss business matters, share insights, and contribute to a thriving community with security and sustainability committees.

Thus, RTP became a large area of high-tech industries with spaces for workers, students, and tourists, creating a hub of activities. From the park's official website: "This iconic park isn't just a place to work anymore; it's a destination to live among game changers, celebrate milestones over dinner, or get fresh air on a nature trail. Here, you enjoy – on your terms."

During the technological boom of the 1990s, RTP's employment reached a peak of approximately 45,000.

In 2012, following the crisis caused by the new trend of workers preferring "live-work-play" environments, a new Master Plan for RTP (Geolas) was designed, featuring a mix of uses including retail and residential options. Today, the entire park is lively and vibrant, hosting events, publishing newsletters, offering opportunities for workers and students, and providing spaces for companies to collaborate, develop ideas, and create research tools. It includes a hub of activities, open green spaces, art workshops, shops, restaurants.

Due to its large size, the park is divided into distinct areas: Hub RTP (community spaces), Boxyard RTP (shops and retail), and Frontier RTP (business network).

Today it counts 385 companies and 55,000 workers.

Also the website fully expresses the park's vision, always updated with scheduled events, news from the research world, and many evocative images.

Sophia Antipolis Technopole

Antibes, France

Sophia Antipolis Technopole (France)

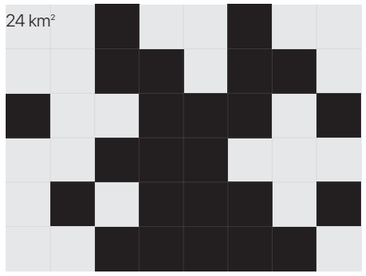
SOPHIA ANTIPOLIS

fig. 5 Sophia Antipolis icon

Type	Reference year
Technopole	2024

Area

24 km²



Key anchor	Land organization
SYMISA the French State	sell to investors

Facilities

industries, services for industries, retail, hospitality, university campus, student residences, R&D, green spaces, sports facilities, entertainment

Numbers	
2 650 companies	44 500 employees

Entrance	Website
Open isolated area, free vehicle access	effective and evocative

The idea of the Sophia Antipolis technopole was born in 1960 when Pierre Laffitte published an article in the national daily Le Monde calling for decentralization, to ease the grey matter in Paris by creating a "rural branch of the capital." The concept, like the name, has an etymological explanation: Sophia means knowledge or wisdom, and Antipolis means "the city opposite" (the ancient name of Antibes, which was opposite Nikaia, the Greek name of Nice).

In 1969 the Sophia Antipolis Association was founded, and the following year the private, non-profit Economic Interest Group SAVALOR (Sophia Antipolis Valorisation) was set up to acquire land on the Valbonne plateau. The park was built on a vast, arid plateau, 90% of which was planted with vegetation.

Thanks to the State, which created a 2 400 hectare Future Development Zone in 1974, the first companies began to appear, such as L'Oréal, which established its dermatological research center here, Air France-KLM's data center, and many others in the following years. The MINES ParisTech school also opened research centers at the heart of the technology park.

The creation of associations contributed to the park's success, such as the Sophia Antipolis Foundation, which promotes research and innovation projects; Sophia Antipolis Games, which organizes sporting events and brings people together; the Accenture Sophia Antipolis Technology Lab; the Sophia Antipolis Urban Community (CASA); and the Sophia-Antipolis Joint Association (SYMISA), which supports economic growth by creating office and residential areas and manages the sale of public plots to encourage the development of the technology park and business establishmen.

Following its success, new stakeholders joined, and in 2015 the Université Côte d'Azur was established.

Today, the technopole hosts 44,500 workers, 2,650 companies, 5,500 international researchers, and 7,500 students, in an environment that fosters development and innovation in several sectors (vehicles, health, and biotechnologies) and integrates with the natural environment, a fundamental part of the park. In fact, buildings are never taller than the surrounding hills to minimize impact on the natural surroundings.

The park also enables conviviality and a high quality of life, including opportunities for sport and services, attracting talents, researchers, and entrepreneurs.

Science parks crisis

Overview

Around the years 2010-2012, science parks experienced a crisis due to the fact that large companies began moving towards big cities, like New York City, San Francisco, and Washington D.C., abandoning isolated places without residences. This was partly a consequence of the growing trend of American workers no longer commuting to work but working directly from home in smart working.

As Lydia DePillis states in the New Republic article of October 12, 2012: "The current generation of tech workers doesn't want to toil in the soulless Office Space complexes surrounded by moats of parking, they want a different kind of experience." Workers no longer want to commute far from home; they prefer to have everything closer: to walk to the office, work, take a break in a bar or an open green space, shop, all within walking distance from home.

This new mindset highlighted the limits of traditional science parks and encouraged the shift towards more complete areas that include residential buildings and the concept of "live-work-play environment." Research parks had been built as spatially isolated corporate campuses, accessible almost exclusively by car.

To respond to workers' new needs, urban development projects began inside these parks to transform them into genuine "urban knowledge parks" (George Bugliarello).

WHERE INNOVATION GATHERS
Areas of innovation

Innovation districts
Overview

The emergence of "live-work-play environment" led to the so-called Innovation Districts, one of the most used terms to indicate areas of innovation.

Innovation districts retain some elements of previous models but represent a new combination of form and function necessary for the modern innovation economy. The concept of "open innovation" (Henry W. Chesbrough) has transformed the way companies operate and locate themselves, promoting broad collaborations among large companies, startups, universities, and other actors. Demographic changes are increasing the demand for more livable and walkable neighborhoods, where housing, work, and services are close to each other. More and more people prefer metropolitan areas, and young graduates show a strong preference for living near urban centers with multiple services. Physical proximity is therefore fundamental to generating knowledge spillovers, especially over short distances, and it also contributes to labor flexibility and productivity.

Bruce Katz and Julie Wagner
The Rise of Innovation Districts: A New Geography of Innovation in America

As explained by Bruce Katz and Julie Wagner in the article "The Rise of Innovation Districts: A New Geography of Innovation in America," innovation districts contain three categories of assets: economic, physical, and networking.

Economic assets are the companies, institutions, and organizations that lead, nurture, or support an environment rich in innovation. They are divided into: Innovation drivers, that create imaginative and advanced technologies, goods, and services; Innovation cultivators, that foster the growth of people, businesses, and concepts; and Neighborhood-building amenities, facilities for residents and employees.

Physical assets are public and private spaces designed to stimulate connectivity, collaboration, and innovation, as well as elements that connect the district to the rest of the city. They include public spaces (parks, squares, and streets), private spaces (buildings), and connections that remove physical barriers and improve accessibility.

Networking assets are the relationships between actors (individuals, companies, institutions) that encourage the generation and diffusion of ideas. They are distinguished into strong ties, between subjects in the same sector, and weak ties between different sectors, useful to acquire new information.

The article also defines five strategies that innovation districts follow.

Build a collaborative leadership network: a group of leaders from institutions, businesses, and sectors who formally cooperate to design, implement, promote, and govern the district. It is necessary to overcome organizational boundaries to share ideas and transform the territory in a multidimensional way. Key models include the "Triple Helix" (interactions between industry, university, and government) and the presence of "facilitator" or "catalyst" figures who keep the process alive and resolve conflicts. In the USA, the role of mayors is often decisive in catalyzing and advancing the districts.

Define a growth vision: a clear and operational orientation on how the district should develop in the short, medium, and long term, taking into account economic, physical, and social aspects. Each district bases its vision on local economic and cultural strengths and data analyses to select industrial or research clusters to strengthen. Some adopt a "bottom-up" approach to discover new growth areas, like in Stockholm and Eindhoven, with open innovation processes and collaboration between businesses, universities, and the public sector.

Chase talent and technology: talent and technology are the main levers of innovation. It is necessary to attract, retain, and grow people with specialized skills, often through targeted campaigns at local and global levels. Talent growth is central: it also means supporting start-ups, spin-offs, and entrepreneurship support programs. Technology, furthermore, must be integrated into the territory as a base for research and development, prototyping, and production.

Promoting inclusive growth means using innovation districts as platforms to regenerate neighboring distressed neighborhoods, creating educational, employment, and other opportunities for low-income city residents. Over the last ten years, many cities have seen an increase in poverty due to economic restructuring, weak employment growth, and wage stagnation. Innovation districts offer multiple opportunities for neighborhood revitalization, quality jobs, and poverty reduction, helping ease tensions between innovative and inclusive growth.

Capital is essential for the growth and expansion of districts: it is needed to finance research, commercialization, start-ups, real estate, infrastructure, training, and intermediaries. An integrated district strategy increases the likelihood that different sources of capital will appreciate and support this type of development.

22@Barcelona
Barcelona, Spain

The concept of an innovation district was born with 22@Barcelona which began as a project to partially transform Poblenou, a former textile industrial district of Barcelona, into an international platform for innovation and the knowledge economy. The long-used nickname of the neighborhood was the "Catalan Manchester," due to the presence of industries and the political activism of the workers. In the 1960s, the process of deindustrialization began to affect the factories. This process was accompanied by the continuous decay of the factories and the urban fabric as a whole.

The Olympic Games, held in Barcelona in 1992, gave a decisive boost to the renewal of the former industrial area. On that occasion, the area was better connected to the business center, the airport, and the port, gaining great potential for future international development.

In 1998, after a political debate on how to regenerate 200 hectares of obsolete industrial land, the city decided to preserve the productive profile of the area while at the same time introducing residential uses. The goal was a long-term transformation, balancing conservation and renewal, improving architecture and public space without completely replacing the existing urban fabric. Thus, in July 2000, the amendment to the Metropolitan Master Plan for the redevelopment of the Poblenou industrial area, the 22@ Plan, was adopted.

The process began with urban restructuring and high-quality infrastructure; non-polluting and non-nuisance activities were planned within the framework of the district's urban, economic, and social regeneration. The 22@ area aims at the "strategic concentration of knowledge-intensive activities." The three main objectives of the plan are: urban regeneration, for better living conditions; economic regeneration, with the development of a relevant technology center; and social regeneration, by intensifying relations among professionals.

The project developed in several phases: in 2000 the master plan was created; in 2001 the urban planning phase; in 2004 the infrastructures, constructions, and the arrival of the first Urban Clusters of Innovation in the media, ICT, medical technology, and energy sectors; and finally, in 2008, public works were completed and the compact city was finalized. This entire process was managed by the municipal company 22 ARROBA BCN, S.A.U., which oversaw the whole district, promoting economic development and international projection.

The 22@ Plan also foresaw the recovery of over 4,600 homes built during the industrial era, which had been largely neglected by public authorities in the 1950s. The plan promoted a model of a compact, diversified, and sustainable city, where economic activities coexist with research, training, housing, commerce, and public spaces. Incentives supported urban renewal, modernization of infrastructure (streets, waste collection, electricity, etc.), preservation and enhancement of industrial heritage, improvement of mobility (reducing the number of main roads for private traffic), and transformation of private land into public spaces.

Another strategy of the plan was the networking platforms of the clusters, such as the 22@Network Association of companies and institutions, which also offers business consulting services; the 22@ Update Breakfast, a meeting point for professionals to exchange ideas and innovations; and the 22@ Voluntariat, aimed at creating greater solidarity between companies, institutions, and residents of the cluster.

The cluster strategies improved the innovative ecosystem, creating sector-specific technology transfer centers such as Barcelona Media (audiovisual), Barcelona Digital (ICT), BCD (design), and IREC (energy). The 22@PLUS initiative offered a complete package of services for companies moving into the district.

Talent management involved attracting universities (now 10 universities), promoting scientific and entrepreneurial vocations in schools, and creating connections between education and businesses. International talent was welcomed with dedicated services, while social programs such as Digital District included local residents in the transformation.

By 2015, 70% of Poblenou's industrial areas had been renewed through 150 urban planning projects (mostly private), delivering over 3 million m² of floor space, public spaces, green areas, and social housing. Today, the district hosts universities, R&D centers, more than 8,200 companies, and over 93,000 jobs.

Governance was based on public leadership with strong collaboration between investors, companies, universities, and civil society. This governance model ensured long-term alignment and supported the district's growth.

22@Barcelona (Spain)

fig. 6 22@Barcelona icon

Type	Reference year
Innovation district	2025

Area: 1,98 km²

Key anchor	Land organization
City of Barcelona	sell to investors

Facilities

industries, services for industries, retail, R&D, hospitality, residential, services for residents, green spaces, university campus, student residences, sports facilities, entertainment

Numbers

4 500 companies	90 000 employees

Entrance	Website
Open, integrated urban area	only "Oficina 22" on the municipal website

MIND
Milan, Italy

After Expo Milano 2015, the exhibition that attracted over 21 million visitors, the site was left largely unused, with no permanent residents and surrounded by former industrial areas. Established in 2011 to acquire and prepare the grounds for Expo 2015, Arexpo has since been responsible for post-Expo infrastructure and land use, overseeing the management and coordination of institutional initiatives for the area.

On January 3, 2017, Arexpo launched an international integrated design competition for MIND – Milano Innovation District, awarding Lendlease both the masterplan and its implementation. Acting as promoter and investor, Lendlease also assumed the role of operator when it was granted a 99-year concession for the site.

Between 2018 and 2019, Lendlease developed a masterplan that set forth a clear vision: MIND as a hub for research, collaboration, technology, sustainability, community, and the future. A wide range of stakeholders are involved in the project, including the Università degli Studi di Milano, Politecnico di Milano, Life Sciences Human technopole, Regione Lombardia, banks, tech companies, and healthcare institutions (Galeazzi hospital centre).

Designed by MCArchitects in collaboration with LAND, the MIND masterplan follows a live–work–play paradigm, combining buildings and open spaces. Dedicated zones accommodate residential function (also student accomodations), hospitality sector, productive sector, tertiary and office sectors, commercial space with neighborhood businesses and medium-sized sales structures. All the buildings are interconnected by continuous slow-mobility corridors and a car-free approach. The ground floors, the first 10 metres of every building, are activated as a "Common Ground", hosting lobbies, workshops, cafés, bars, meeting rooms, co-working spaces and public piazzas.

MIND like a carbon-free neighborhood: rethinking construction techniques, minimizing resources, and enhancing nature and its power. Parks are everywhere: between buildings and on the faces of buildings. Bicycles and electric vehicles move along the green Decumano. There is a vision in general, connected with global aims on the climate emergency, and a local vision, connected with the generated well-being of the generated areas.

The strategies encompass every element of the district, taking its whole life cycle into account: from building materials to energy efficiency, from mobility to resource management via digital intelligence. The district is powered solely from renewables, with on-site solar energy production. Low-carbon material selection and sustainable wood are equally significant. Lastly, mobility is sustainable, with an all-electric transport system with walkability and cycling.

MIND is a welcoming environment for the local population as well and healthy for inhabitants and workers. It is based on full, easily accessible services: healthy food, agile mobility, sports facilities, and doctor's assistance. Additionally, the neighborhood is socially inclusive with a wide variety of programs to join. It presents itself as a shared platform, both in labs and public environments, with chances for cross-disciplinary interaction and continuous transfer between science and industry.

Some of the activities provided by MIND are: MIND Education, with Lombardy primary, middle, and high schools collaborating to create innovative and creative projects typical of the district; T-Factor, a research project on the short-term effects of use in major regeneration projects, consisting of 14 model experiences from "Advanced Research case studies" and "Local Pilots" in thirteen cities worldwide in which MIND is a pilot project and has the task of developing prototypes and piloting new models; District Toponymy, promoted in partnership with the City of Milan, naming streets in the neighborhood after scientists and innovators, at least half of whom must be in honor of women scientists and innovators; MIND FoodS Hub, meeting place for networking and knowledge sharing and innovation in direction of cutting-edge solutions in the agri-food sector.

The target is to host 60,000 people living and working (students, teachers, researchers, entrepreneurs, service operators, citizens, and tourists) by 2031 and is divided into different areas, some already operational: Mind Village, operational from 2022 (Commercial Workspace, Laboratories, Retail, Amenities and Marketing Suite), Innovation Hub Village Pavilion and Galeazzi Sant'Ambrogio Hospital are operational, West Gate completion by 2028 (Commercial Workspace, Build-to-Rent, Light Industrial, Hotel and Placemaking Retail), Mixed-Use Zones completion by 2031 (Commercial Workspace, Build-to-Rent, Light Industrial, Hotel and Placemaking Retail), University of Milan's Science Campus completion by 2027, Life Sciences Research Centre Human Technopole completion by 2028.

MIND (Italy)

fig. 7 Mind icon

Type	Reference year
Innovation district	2031

Area: 1 km²

Key anchor	Land organization
Regione Lombardia Arexpo, Lendlease	leased or sell to investors

Facilities

industries, services for industries, retail, hospitality, R&D, residential, services for residents, green spaces, university campus, student residences, healthcare, sports facilities, entertainment

Numbers	
70+ companies	60 000 employees/residents

Entrance	Website
Open area	effective and evocative

King's Cross knowledge quarters
London, UK

King's Cross is an urban regeneration plan which began in 2001, in London. It transformed an ageing post-industrial setting into one of the city's most vibrant and economically significant locations. Following WWII, the area became de-popular as a Victorian freight transit hub and was gradually abandoned by investors.

In the 1970s and 1980s, the region was filled with the remains of its industrial past: empty buildings, disused railway sidings, decrepit warehouses, and the disused gas holders that once powered the city. Several attempts to regenerate the area by the government in the 1980s and 1990s failed. The moment of transformation arrived in 1996, when the UK government took a deliberate decision to relocate the terminus of the Channel Tunnel Rail Link, now High Speed 1 (HS1), to King's Cross. The relocation transformed the district from a remote and forgotten backwater into one of the best-connected transport interchanges in Europe, setting the stage for future investment and large-scale regeneration. Over the next twenty years, billions of euros were invested in the project.

The over-all governing authority is the King's Cross Central Limited Partnership (KCCLP), established in 2008 as sole proprietor. Originally, the ownership was shared by a range of different public and private organizations, primarily London & Continental Railways (LCR) and Exel (now DHL). In 2000, following completion of a competitive selection process, Argent LLP was appointed as master developer. Rather than imposing rigid codes, Argent designed a value-based manifesto that provided more than 30 different architectural practices on the site with freedom.

These were the guiding principles: creating a permanent street pattern and public space; planning for quality and durability; maximizing access for all; having a productive and diverse mixed-use community; respecting industrial and historic heritage; providing returns for investors and the community; being long-term focused; engaging residents in planning; and being communicative and transparent.

KCCLP also provided the public realm and infrastructure required ahead of vertical build, including new roads, public squares like the now-iconic Granary Square, canal bridges over Regent's Canal, and a district energy centre on site. Allies and Morrison, partnered with Porphyrios Associates, spearheaded the masterplanning to get the area to the very centre of contemporary London, while 40% of the 67-acre site was designed as public realm by Townshend Landscape Architects, paving the way for private investment.

In addition to Granary Square, complete with iconic fountains and the cultural hub, the regeneration includes Lewis Cubitt Park, Lewis Cubitt Square, and the Gasholder Park, the latter of which converts one of the cast-iron buildings from historic times into garden scenery. Pedestrianized paths and bridges across the Regent's Canal improve connectivity alongside the formation of new areas of public leisure space.

Macroscale, the venture has also proved economic. Over 800 businesses relocated between 2010 and 2021, such as Google's UK base, Meta (Facebook), Nike, Universal Music, and Sony Music. Commercial rents rose from being 48% below the average for central London in 2010 to 19% higher in 2021. Approximately 1,750 new homes are being built, 40% of which will be affordable housing (social rent and shared ownership).

Aside from economic importance, King's Cross is currently a social and cultural hub. The area hosts world-class institutions such as the University of the Arts London (Central Saint Martins) within the redeveloped Granary Building, which makes it a creative and innovative hub. Public artworks, festive celebrations, and a revolving schedule of cultural activities all contribute to its position as a vibrant city destination.

Its shopping aspect is also under the spotlight. King's Cross has been divided into tailored retail districts, each with its own personality: Heatherwick Studio's Coal Drops Yard combines historic viaduct arches and new construction to house independent boutiques and global brands; Stable Street and York Way offer restaurant, lifestyle, and neighborhood facilities; and Pancras Square and King's Boulevard unify everyday services with anchor stores. Such diversity distinguishes the district from just serving locals to also receive foreign travelers.

In urban language, innovation and sustainability have been woven throughout the development. The site itself is powered by a district heating and cooling system, with added green infrastructure, high environmental building ratings, and green transport connections that make it more resilient. King's Cross has become a model to be emulated for sustainable regeneration schemes across Europe.

Currently, KCCLP is a joint venture between Related Argent (the successor to Argent LLP) and AustralianSuper, which acquired the UK government's 36.5% share in 2016.

King's Cross (UK)

KINGS CROSS

fig. 8 King's Cross icon

Type	Reference year
Knowledge quarters	2031

Area: 0,27 km²

Key anchor	Land organization
Regione Lombardia Arexpo, Lendlease	leased or sell to investors

Facilities

industries	services for industries	retail	hospitality
R&D	residential	services for residents	green spaces
student residences	university campus	sports facilities	entertainment

Numbers

70+	60 000
companies	employees/residents

Entrance	Website
Open, integrated urban area	effective and evocative

T-Hub
Hyderabad, India

T-Hub (India)

fig. 9 T-Hub icon

Type	Reference year
Innovation hub	2025

Area: 0,054 km²

Key anchor	Land organization
Government of Telangana Universities (IIIT, ISB, NALSAR)	leased to investors

Facilities: industries, services for industries

Numbers: 2000+ companies; - employees

Entrance	Website
Indoor spaces and restricted areas	effective and evocative

The T-Hub initiative was entrusted in 2015 by the joint effort of the Government of Telangana, International Institute of Information Technology, Hyderabad (IIIT Hyderabad), Indian School of Business (ISB), and the National Academy of Legal Studies and Research (NALSAR). The largest innovation hub of the world, it covers a floor space of approximately 54,000 square meters and has space for more than 2,000 national and global startups. The company has implemented over 100 innovation projects, which have enabled the startups to expand both locally and abroad, with projects having helped the companies reach out to prospective investors, the corporate world, and the national and international government agencies.

The tone of this innovation center is to provide support, infrastructure, and opportunities to create a startup-friendly ecosystem, empowering them throughout every phase of their entrepreneurial journey, from ideation to acceleration to scaling.

T-Hub offers a life-altering experience for investors because of its configuration, including access to investable opportunities, resources and tactics for startups, network relationships, industry expert mentorship, a stimulating atmosphere, exposure to professional talent, and facilitation of strategic collaboration.

The hub provides a vibrant setting to work and grow, also because of numerous activities in the community, such as community clubs with events focused on uniting people around shared interests and interest-driven events. The entire community is structured in accordance with the project and supported by over 200 mentors with experience who provide guidance and support to students, start-ups, and schools.

Also, there are several startup programs, coworking spaces that are community-driven, as well as other public resources that individuals can actively interact with in the life of the hub through podcasts, case studies, videos, blogs, conferences, newsletters, and articles.

The innovation hub has the primary function of supporting the creation and growth of startups by providing physical spaces such as coworking areas and private offices, but generally the entrepreneurs who are part of T-Hub are based elsewhere while leveraging T-Hub's spaces and programs to grow. For this reason, this case study, in terms of workers, cannot be compared on the same level with others.

Medicon Valley
Denmark-Sweden

Medicon Valley (Denmark-Sweden)

fig. 10 Medicon Valley icon

Type	Reference year
Innovation corridor	2025

Area: 21 000 km²

Key anchor	Land organization
Medicon Valley Alliance	No land management

Facilities: industries, services for industries, science parks, R&D, university campus, healthcare

Numbers: 1100+ life science companies; 85 000 life science employees

Entrance	Website
Open and restricted areas	effective and evocative

Medicon Valley was founded in 1997 on the vision of cross-border collaboration in life sciences between Sweden and Denmark. Medicon Valley Academy was first initiated, funded by Lund and Copenhagen Universities and principal pharmaceutical companies, with the objective of building a platform that would allow the universities, industry, and hospitals to meet and interface.

Now, Medicon Valley Alliance, as a manifestation of a wider purpose, is one of Europe's main biotechnology clusters. Spanning two regions, it covers eastern Denmark and southern Sweden. Characterized by a high share of activities in the life sciences sector, it is supported by world-class research infrastructure and a pool of public and private stakeholders dedicated to innovation.

Medicon Valley is enabled by the Medicon Valley Alliance, which is a non-profit collaboration organization that acts as an accelerator of collaboration among universities, hospitals, pharma and biotech companies, research institutions, and regional government. The Alliance stimulates the exchange of knowledge, formation of strategic projects, and subject-related events to develop the life sciences community in the region.

There are over 85,000 professionals in the life sciences working for more than 1,100 companies in the region. There are 12 universities with 5 of them that have life sciences programs and 32 hospitals with 11 that are academic. The mix of academic institutions, healthcare facilities, and businesses provides a conducive setting for research and development in the industry. The Alliance is an opportunity for networking, allowing its members to share learning, share experiences, and collaborate on common projects, which sparks innovation and growth in the sector.

Through the incorporation of educational, health, and industrial capital, the area has developed into a vibrant hub that fosters development and innovation within the life sciences sector.

G60 Innovation Corridor
Cina

G60 (Cina)

NO LOGO

Type	Reference year
Innovation corridor	2025

Area
76 200 km²

Key anchor	Land organization
Chinese government	No land management

Facilities

industries, services for industries, science parks, R&D, university campus

Numbers

36 500	-
high-techcompanies	employees

Entrance	Website
Open and restricted areas	not existing

The G60 Science and Technology Innovation Corridor is a strategic policy launched in 2016 by Songjiang city, Shanghai, to promote regional integration and technological innovation in the Yangtze River Delta. The corridor spans the nine cities along the G60 highway: Shanghai, Jiaxing, Hangzhou, Huzhou, and Jinhua in Zhejiang Province; Suzhou in Jiangsu Province; and Hefei, Wuhu, and Xuancheng in Anhui Province.

This project aims to transform the region into a non-traditional industrial mode of production to a mode of creation and innovation through the combination of industry, science, and technology. Two essential issues are of concern to the corridor: integration and high quality.

In order to address problems of ineffective organizational forms and low motivation for collaboration between local governments, the G60 has created a multi-level governance network. Interactions between central government and local governments form multi-level coordination. The corridor and the local governments take a "top-down interactive" style in coordinating with related ministries, which enhances the political advantages of the corridor.

Besides, to help coordinate across regions and governments, the nine cities have coordinated and integrated their administrative systems and dismantled administrative barriers. Key ministries, such as the Ministry of Science and Technology, the National Development and Reform Commission, the Ministry of Industry and Information Technology, the People's Bank of China, and the China Banking and Insurance Regulatory Commission, have set up a special working group to ensure the corridor's development.

The G60 has also implemented the "Joint Action Plan for Key Technology Challenges" along the corridor, such as strategic cooperation projects. Such innovation bases like the Songjiang Smart Science and Innovation Base and labs like Cohen and Uto have been constructed into innovation centers to facilitate sharing of resources and collaborative advantage.

Financial instruments to support the investors are technology park loans, talent loans, and quality loans. An auction platform for technology products generated within the corridor has also been established to welcome private and institutional investors and facilitate commercialization and development of local inventions.

Noblesville Innovation mile
USA

Noblesville Innovation mile (USA)

fig. 11 Noblesville Innovation Mile icon

Type	Reference year
Innovation mile	2025+

Area
2,4 km²

Key anchor	Land organization
City of Noblesville	sell to investors

Facilities

industries, services for industries, R&D, hospitality, retail, residential, services for residents, green spaces, university campus, sports facilities, entertainment

Numbers

–	–
companies	employees

Entrance	Website
Open area	effective and usefull

Innovation Mile is a master-planned district opened by the City of Noblesville in 2021, Indiana, as an integrated ecosystem where people would live, work, engage, and learn. It covers approximately 2.4 km² (almost one square mile) in the city's southeastern corner.

The master plan goal is to develop a vibrant business and technology hub, designed to attract in investment and talent. Over the course of about a decade, it will feature commercial, residential, and light industrial areas, along with spaces for social interaction, education, and entertainment. The district is a "work, live, engage & learn" community, wherein work, living, social life, and learning co-exist, with a design focusing on walkability, quality connectivity, and integrating technological and sustainable resources.

The development includes green spaces, public spaces, and smart buildings incorporating solar panels, intelligent kiosks, fiber-optic connectivity, and sustainable materials such as green roofs, permeable pavements, and compact, efficient architecture. Target industry sectors include life sciences, healthcare technologies, advanced manufacturing, wholesale trade, and professional, technical, and financial services.

To attract businesses and investors, the district utilizes an robust framework of fiscal and financial incentives, including property tax abatements for up to ten years and other investment facilitation tools. Among the attractive elements is the Arena at Innovation Mile, completed in 2025, a new indoor arena , house of the Noblesville Boom, an NBA G League basketball team. The arena also hosts sporting events, conferences, performances, and community initiatives.

The master plan provides flexible standards for land use, combining mixed-use areas and including residential structures, offices, retail, hospitality, and extensive green areas. Moreover, a novelty aspect of the project is the achievement of smart infrastructure: cutting-edge technologies for smart urban furniture, technologically advanced parking, and integrated digital systems, an avant-garde environment ready to support the growth of the innovation district. The Indiana orthopedic institute is the district's initial tenant, that will house sophisticated orthopedic surgery.

From the website, it is also possible to consult the real estate section to purchase the available land lots. As of today, all eight lots have not yet been sold; consequently, it is not possible to estimate the future number of companies and employees.

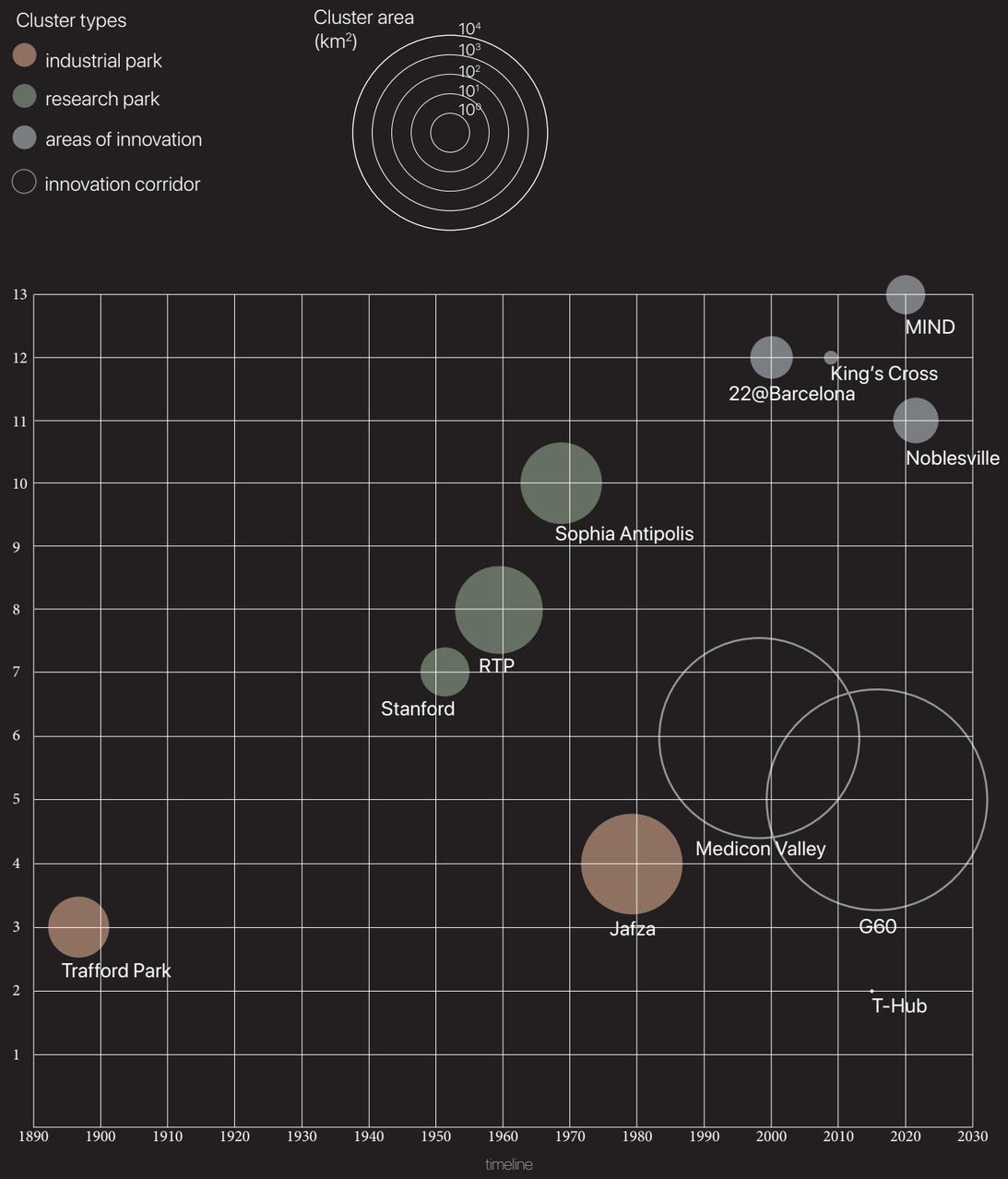


Fig.12 Innovation clusters diagram

After a careful analysis of some of the numerous case studies present worldwide, divided according to the three categories of innovation clusters, it emerges that the main differences concern the services promoted and available for the communities they host. From the graph, it is immediately noticeable that the differences between the categories follow an evolution over time, linked to the increase in services offered within the park.

This leads from a purely industrial park concept, with essential services for the operation and development of companies, to fully integrated districts within the urban fabric of a city, almost "a city within a city."

Another evident element concerns the size of the different clusters: areas of innovation are more compact and smaller, while industrial parks appear larger and more dispersed. This difference is also related to the type of activities hosted: large manufacturing industries require extensive areas, while the high-tech sector, mainly present in modern areas of innovation, requires much less space.

Furthermore, it is worth noting the particularity of innovation corridors within the category of areas of innovation. They stand out from the clusters in the same category in several aspects: firstly, dimensionally, as they cover entire regions and multiple cities; secondly, for their approach, which does not focus on individual services for communities but more generally promotes research and industrial activities, incorporating other innovation clusters within them.

In the context of turin
From the buzzword

Torino has undergone many successive, large-scale transformations: From the dismantling of the medieval walls to the establishment of the Fiat Lingotto plant in 1923, and then the change in its context; each of these interventions has re-shaped the urban fabric on a grand scale. Today however, the Innovation mile is that big change that's happening. Not only is the project actively affecting the urban fabric of the city, but the effect is so vast that the city came up with a committee, consisting of key institutional public and private stakeholders, to direct and guide its development and determine strategic outcomes, and to attract and choose the right stakeholders to invest and get involved in the development of the city.

Innovation Mile
a buzzword

The appearance of the wording of "innovation mile" has been officially followed through the media and it can be divided in two major phases before and after the formation of this committee. This formation marks a division in the usage of the word itself, because before it was just a buzzword, circulating freely.After the formation of the committee however, the effect was put in to turn into a defined project following certain criteria.

The reason the "Innovation Mile" is considered a buzzword is because it tries to include more complex concepts and projects into one appealing label.Like other trendy terms, it is aimed to be used by urban planners, deciding authorities, and developers to brand projects, attract the attention of the media and possible developers, and demonstrate a modernistic change taking place. Also, the vagueness allows it to fit many agendas, which helps it gain popularity easier.

Innovation Mile
first appearance of the word

Before the official formation of the committee on the 15 th of Feb. of 2024, The buzzword "Innovation Mile" had already been in circulation, dating back to an article published in April of 2016. The first article pointed out the rise in interest among investors and initial development process regarding the environmental park site and the zones surrounding it.

The first surge of the buzzword was on the 20 april 2016 La Repubblica published an article entitled "Dall'Envi Park al Politecnico, ecco il miglio dell'innovazione" Davide Canavesio, CEO Environment Park, argued that : "Le città e i territori che vogliono competere su scala globale ed essere attrattivi per investimenti ed innovazione, devono dotarsi di luoghi che siano caratterizzati dalla densità della ricerca, del personale qualificato e delle infrastrutture tecnologiche. Questi luoghi non sono solo la Silicon Valley di San Francisco o la Route 128 di Boston, ma può a pari dignità esserlo anche l'Innovation Mile di Torino"; In which the CEO stresses the need for a dense research-and-technology ecosystem for torino to compete on a global scale.

Also, Turin's Mayor Piero Fassino notably said that: "Questo asse diventerà uno dei centri dove attirare aziende, start up, centri di ricerca" this axis is a magnet for companies, start-ups, and research centers.

Through the use of this buzzword, they aimed at emphasizing the strategic importance of the developmental project.Then number of the mentions rose in the context; and after there were many other mentions of the topic.

Attracting The Public
workshops and other objectives

More initiatives were proposed and developed following the idea to attract more focus and try to get people involved to see how this new notion would be beneficial for the city, including workshops, or social events. Including:

9 October 2017-"ToWalkabout lungo l'Innovation Mile", Urban Experience e Acmos. promoted by SaoPaolo
20-21 September 2018- OIS, Open Innovation Summit
9 July 2018- Road to the Future Smart Cities & Smart Communities, Sistema Poli della Regione Piemonte
26-27 October 2018 - Climathon Torino

20 Aprile 2016
Dall'Envi Park al Politecnico, ecco il miglio dell'innovazione

16 June 2016
Environmental Park & Corriere della Sera: "A Torino nasce il miglio dedicato alle start-up"

19 June 2016
Sole 24ore: A Torino il "miglio dell'innovazione"

In the context of turin
To the project

Innovation Mile
the formation of the committee

After years this idea became true, more solid and key cognitive stakeholder decided finally to translate this idea into reality, attracting investors and coordinating the project and development of the area.So, these all led to a more defined objective and solidification of the phrase and the formation of the committee.

With the formation of committee there was a manifesto that followed; reshaping the target and adding new core values and guidelines to the new project.The Importance of it comes from the fact that the committee was initially made to attract and organize the investors because there were so many of them initially flooded in the environmental park and then expanded. But, the main purpose was to guide these investments and sort them out in a way that would benefit the city the most, through limiting or encouraging a certain direction.

The official formation of the committee happened on February 15, 2024 with Official Launch and Press Coverage announced the partners and goals and numbers which consisted of:

Politecnico di Torino
Environment Park
OGR (Officine Grandi Riparazioni)
NewCleo
Liftt
Nexto
Planet Smart City
Infra.To (la società di infrastrutture della Città di Torino)

The press release announcing the formation was grand enough to be covered by major news outlets, not just local ones including Rai News.Andalso a day after by the Poliflash, news outlet of (Politecnico di Torino).

The manifesto mentioned the goals and targets of this committee a part worth highlighting is:

Also worth noting that Benedetto Camarena was appointed as the initial architect of the project to design a sample to attract investors.

The public had some backlash regarding the choice of the members of the committee, as it consisted of all white european male members. That was discussed in a forum on this site following the news on urban file on march 15 th 2024 .

And then at the building convention that took place in Milan in May 2024 – Tall buildings Convention the appointed architect, Camarena, did a presentation on the topic of innovation mile aiming for international space of recognition.

Finally to this day of writing this the most relevant news regarding this matter is the one mentioned in March 2025 – Lo Spiffero stating that Polito took a share of the environmental park :

the participation of 1% of the share capital, equal to 170,186 euros which further solidifies this partnership and ceremonially gives polito acting power not just cognitional in the matter.

So reading all these articles and this news regarding the matter, an effort was put into answering questions that initiated this dive, so what does the term innovation mile mean in the context of torino for Turin? is it just a branding tool?

Innovation Mile
a attempt towards a definition

Historically “innovation” involved many different definitions and goals from the generic innovative solutions to sustainable ones

It is a network based on collaboration of institutions and individuals, promoting the involvement of start ups and investors to regenerate/ give value to the mixed use area and guide the development.

The goal of this project at its core is socio-economical, and its to attract investors to the site to help the city prosper but the committee at times of need will help guide this growth through the defined majors of: ”environmental sustainability, decarbonization , social inclusion and innovation, digital and technological integration”

Intial News

Dall'Envi Park al Politecnico, ecco il miglio dell'innovazione

di DIEGO LONGHIN

Il sindaco punta sull'asse nato lungo il viale della Spina per attrarre a Torino altamente tecnologiche

O APRILE 20 ... PUBBLICATO PIÙ DI UN ANNO FA

la Repubblica

Torino

Piero Fassino, Mayor: "Questo asse diventerà uno dei centri dove attirare aziende, star up, centri di ricerca"

Davide Canavesio, CEO Environment Park : "Le città e i territori che vogliono competere su scala globale ed essere attrattivi per investimenti ed innovazione, devono dotarsi di luoghi che siano caratterizzati dalla densità della ricerca, del personale qualificato e delle infrastrutture tecnologiche. Questi luoghi non sono solo la Silicon Valley di San Francisco o la Route 128 di Boston, ma può a pari dignità esserlo anche l'Innovation Mile di Torino"

A Torino il "miglio dell'innovazione"

–di Francesco Antonioli | 19 giugno 2016

Torino il maxi progetto per trasformare la vasta area da Porta Susa alle OGR: "200 mila metri quadri per l'Innovazione". Ecco il piano

15/02/2024

A Torino il maxi progetto per trsfor... area da Porta Susa alle OGR: "20... per l'Innovazione". Ecco il pian... Parte a Torino il pro... a riqualificare l...

TORINO INNOVATION MILE

Comunicato stampa

TORINO INNOVATION MILE, 200 MILA METRI QUADRI PER L'INNOVAZIONE TRA PORTA SUSA ED ENVIRONMENT PARK

Un Comitato Promotore con una decina di organizzazioni pubbliche e private per riqualificare due aree di Torino seguendo i principi di sostenibilità ambientale, decarbonizzazione, innovazione e inclusione sociale, integrazione tecnologica e digitale

Manifest of The Committee

Comune di Torino

Home › PON Metro Torino › OIS, OPEN INNOVATION SUMMIT, 20-21 SETTEMBRE 2018

OIS, OPEN INNOVATION SUMMIT, 20-21 SETTEMBRE 2018

PIEDI ... E TESTA NEL CLOUD

ToWalkabout lungo l'Innovation Mile

017 - 16:30 / 9 Ott 201

WORKSHOPS

ENVIRONMENT PARK TORINO

NEWS PARTNER

LIMATHON 2018: TORINO CAPITALE MONDI/

ROAD TO THE FUTURE II EDIZIONE

NUOVO FORMAT!

VERSO LE CITT... DEL FUTURO

SMART CITIES & SMART COMM...

TORINO (Environment Park) | 9 luglio 2025 | 14:00

FILIERA | FARE IMPRESA | MAC

Home » Tall Buildings 2024 in Triennale a Milano

Convegno | Triennale di Milano, 20 giugno

Tall Buildings 2024 in Triennale a Milano

22 Maggio 2024 | Red...

...gs organizzato da Guamari, a Milano in Triennale il prossimo 20 giugno. Come gli edifici alti ...bana. Spunti, risposte puntuali e confronti sulle scelte progettuali nei contesti urbani

...nnale Milano – 20 giugno), ideato e animato dall'autore, è in questo ...minciato a Genova nel 1940 con la Torre Piacentini e molto dopo ...i domanda quanti edifici alti si aggiungeranno nel prossimo ...ari. Infatti, a partire proprio dal capoluogo lombardo, ...aggior impatto urbano che si spera saranno

...contribuiscono alla ...ttutto concentrando in ...questo punto di vista ...ervizi ha

...miglio verde": le aree del passante ferroviario pe...
...un polo dell'innovazione
...resentato il progetto Torino Innovation Mile, che interessa 200 mila metri quadrati di are...
...bbandonate: previsti un edificio da quindici piani e un polo di ricerca su sostenibilità
...Il dialogo con Rfi per la cessione de... spazi

urbanfile
LA VOCE DELLE CITTÀ
"Anche le città hanno una voce" | Segnalazioni, bellezze, arc...

ARCHITETTURA | STORIA | EVENTI | MOBILITÀ | SPAZIO ...

Benedetto Camerana
Studio

Politec... di Torino

...Il Politecnico tra i promotori del progetto "Torino Innovation Mile"

Una sfida, quella di "Torino Innovation Mile", ha cui anche il Politec...

Recent News

Un gruppo di soli maschi bianchi di mezza età (ad andar bene) a cui si affida la riqualificazione di una porzione di città, in bocca al lupo!!

Ho pensato la stessa cosa. Come se la città fosse vissuta da solo una categoria di persone. Andiamo bene.

LoSpiffero
diretto da BRUNO BABANDO | OSTINATAMENTE CONTROCORRENTE

GrifoFinance
Via Statuto, 4
12100 Cuneo CN
info@grifofinance.com

Politecnico di Torino diventa socio di Environment Park

13:58 Venerdì 21 Marzo 2025

fig. 13 Newspapers collage

From railway to spine

This chapter analyses the evolution of the Innovation Mile area, retracing the transformations that led it to become the industrial void it represents today. To fully understand the changes and origins of this area, it is necessary to investigate its development starting from 1845, a period in which Turin underwent profound functional transformations, with a sharp downsizing of employment in the tertiary sector and, at the same time, the expansion of the railway transport network (Turin as an industrial capital). In the second half of the 19th century, the area that today includes the Innovation Mile developed, mainly occupied by industries and the railway line with its stations. The analysis continues up to 1995, when a radical change was proposed that led to the formation of the Central Spine of Turin and the regeneration of the two project areas included in Spine 2 and Spine 3. The Spines are also analysed in detail to understand their industrial past, historic significance, and the subsequent transformations up to today, highlighting in particular the areas that are still incomplete: those of the Innovation Mile, the missing piece to complete the largest construction site in Turin.

THE RAILWAY IN TURIN: A HISTORICAL OVERVIEW

Origins of the transport system

First public transportation system
omnibus and trams

In 2003, ATM and another municipal company, SATTI (Società per Azioni Torinese Trasporti Intercomunali), merged into the Gruppo Torinese Trasporti (GTT).

Following the Unification of Italy (1861), Turin became the capital until 1864, then transformed from a noble city to an industrial capital after the crisis caused by the relocation of the capital itself. In those years, the population underwent rapid growth, with the construction of new neighborhoods, the expansion of the city, the birth of numerous industries, and the growth of the working-class population. With the demographic increase, a public transport network became increasingly necessary; it was in this period that the first means of transport were introduced.

In 1845, the first public transport means was introduced, the omnibus (horse-drawn urban carriage), managed by private operators and operating along the main axes of Turin, crossing the city from east to west and from north to south, forming almost a cross in Piazza Castello. Subsequently, the population requested extensions of the lines to connect the center to the suburbs, particularly San Donato (separated from the city since 1856 by the railway line to Novara). In the following decades, the network developed toward other suburbs, until the complete disappearance of the omnibuses in 1891, replaced by a more modern transport network: the trams, launched in 1870 (from Piazza Castello to via La Grange) and developed by several companies. In 1897, the Società Anonima Elettricità Alta Italia introduced electric trams, a technological advancement compared to horse-drawn trams.

However, the suburban areas remained poorly connected, since the tram companies, driven by their economic interests, mainly developed the network in the city center. In 1907, the tram networks were partially municipalized, creating the Azienda Tramvie Municipali (ATM)[1].

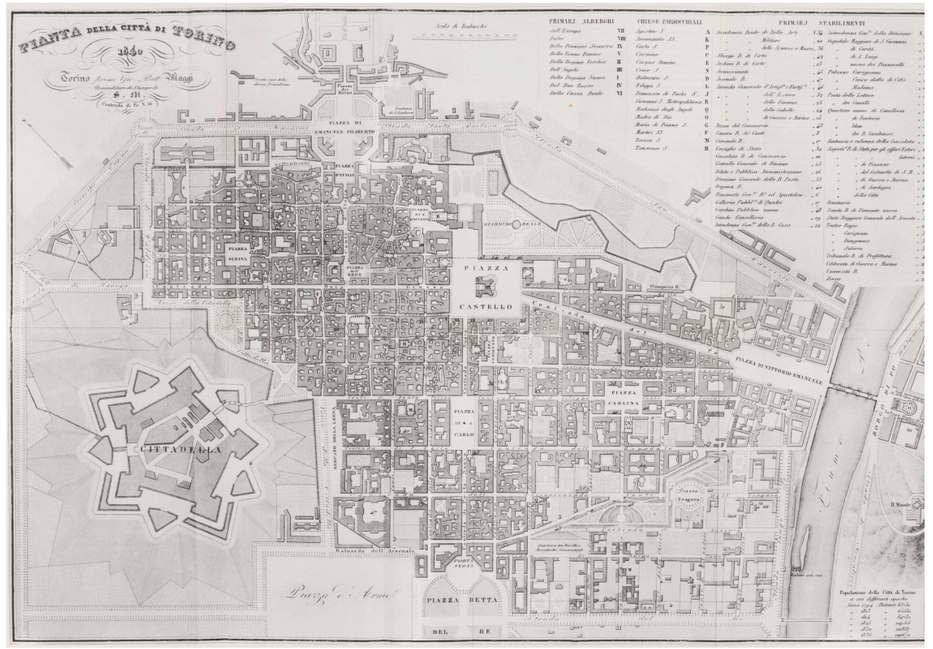


Fig.14 Turin 1840. Source: "Descrizione di Torino", Davide Bertolotti, Torino, 1840

Turin-Genoa railway line
Porta Nuova station

The definition of the route of the first railway network and the choices concerning the positioning of the stations took place in a relatively short time (1845-1853). In those years, structures were formed in a city that until then had always been compact, configurations that in the following centuries proved difficult to modify.

The proposal for the first railway line in Turin was officially introduced by Carlo Alberto, King of Sardinia, on February 13, 1845, when he approved the projects for two state-funded railway lines: the Turin–Genoa and the Alessandria–Lake Maggiore. By connecting Turin to the port of Genoa, the railway played a crucial role in strengthening commercial exchanges in the Mediterranean area.

In-depth studies then began to define the project for the Turin railway station, but a central issue immediately emerged: the choice of its location. The station necessarily had to be located south of the city, outside Porta Nuova, and have the configuration of a terminal station. The main options were two: a location close to the historic core, easily accessible, or a more distant one, but strategically advantageous in view of future expansion toward the south.

The first proposal, made by the engineer in charge Luigi Barbavara, was the location to the south, far from the center, in the San Salvario area, then an agricultural zone. Shortly after, it was replaced by the proposal of the Belgian engineer Michael-Henri-Joseph Maus, who suggested a location as close as possible to the city core, at the intersection of Via Roma (then Contrada Nuova) and Corso Vittorio Emanuele (then Viale del Re). However, this proposal was rejected by the Turin Building Council, which in 1847 proposed a variant (a setback of 100 meters and the creation of a square in front of the station), a proposal rejected by Carlo Alberto.

In the same year, alongside the controversies against the proposals made, other ones emerged, advanced by the interested landowners (such as that of Bartolomeo Marocco, proposing a station far from the city to allow the urbanization process). Finally, Carlo Alberto, accommodating the proposals, allowed a slight setback that did not interrupt the Viale dei Re.

The line entered service on its first section, Turin–Moncalieri, on September 24, 1848, with a temporary wooden station. In 1849, a new masonry structure was built, while the railway connection with Genoa was completed in 1853.

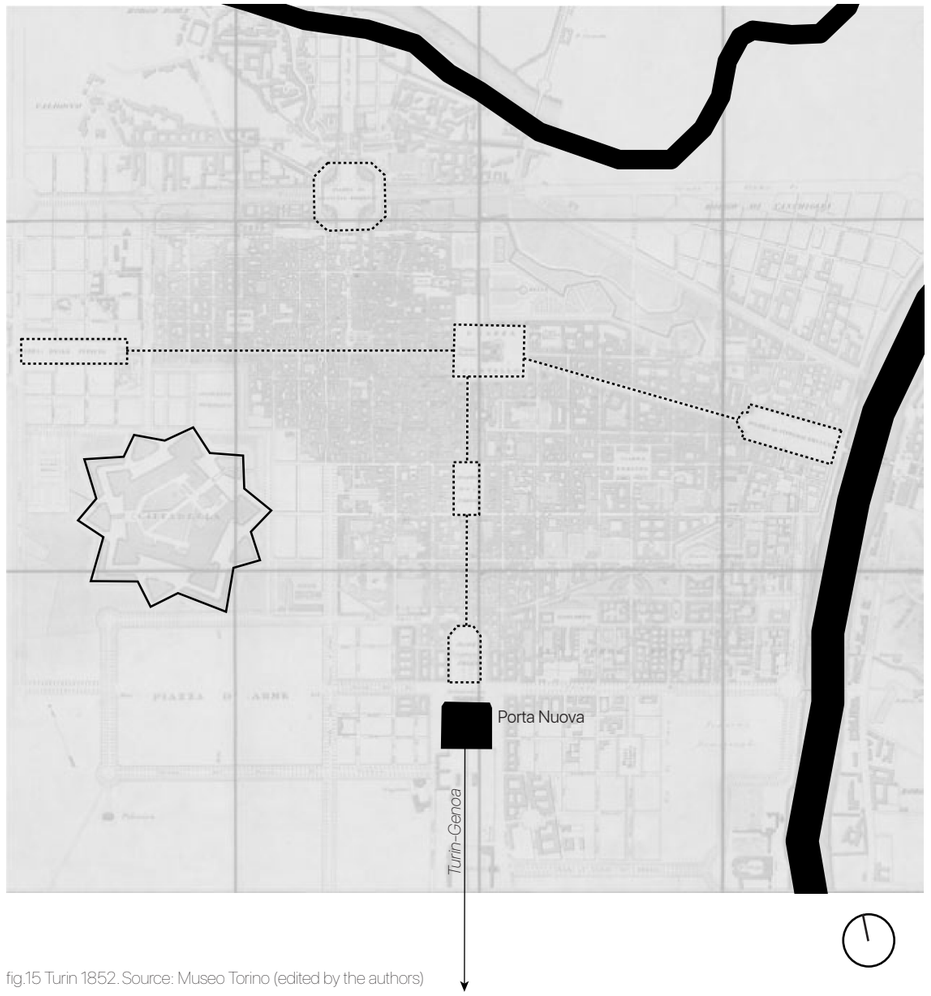


fig.15 Turin 1852. Source: Museo Torino (edited by the authors)

Turin-Novara railway line
Porta Susa station

In 1851, the government began studies for two new railway lines: Turin–Susa and Turin–Novara. Unlike the Turin–Genoa line, however, these were not financed by the State. In 1852, the government granted the design of both routes to Thomas Brassey, but only the Turin–Novara line allowed for the construction of a new station. From the outset, both routes were conceived with the intention of future extensions—toward France for the Susa line, and toward Milan for the Novara line.

The government aimed for rapid design and execution of the Turin–Novara project, but the selection of the new station's location turned out to be more complicated than expected. The project was developed by Thomas J. Woodhouse, who, however, did not prioritize the issue of the station's placement. He proposed a terminal station, symmetrical to Porta Nuova, located north of the city beyond the Dora River, in Piazza della Repubblica (then called Porta Italia). This proposal was immediately rejected, as the concept of transit was essential for this project: the station could not be a terminal station like Porta Nuova, since it needed to allow a future connection with the Genoa line.

The city council then urged for a location on the western side of the city. A proposal came from deputy Alessandro Rocci, suggesting a site in the northwest, in the Valdocco area. In these years (1852–1853), several debates emerged between Turin's capitalists and the city council, revealing different visions regarding the city's expansion process linked to the fundamental role of the railway.

In July 1852, the matter became the responsibility of the government, which had to determine the location based on the results of an administrative inquiry and the opinion of the Turin municipality. The commission began its studies and opened up to new proposals. In addition to the two original proposals for Valdocco and Porta Italia, new ones emerged: one in San Donato (proposed by Ignazio Michela, along the extension of Via Dora Grossa) and one in Vanchiglia (in front of the Royal Gardens, proposed by Alessandro Antonelli).

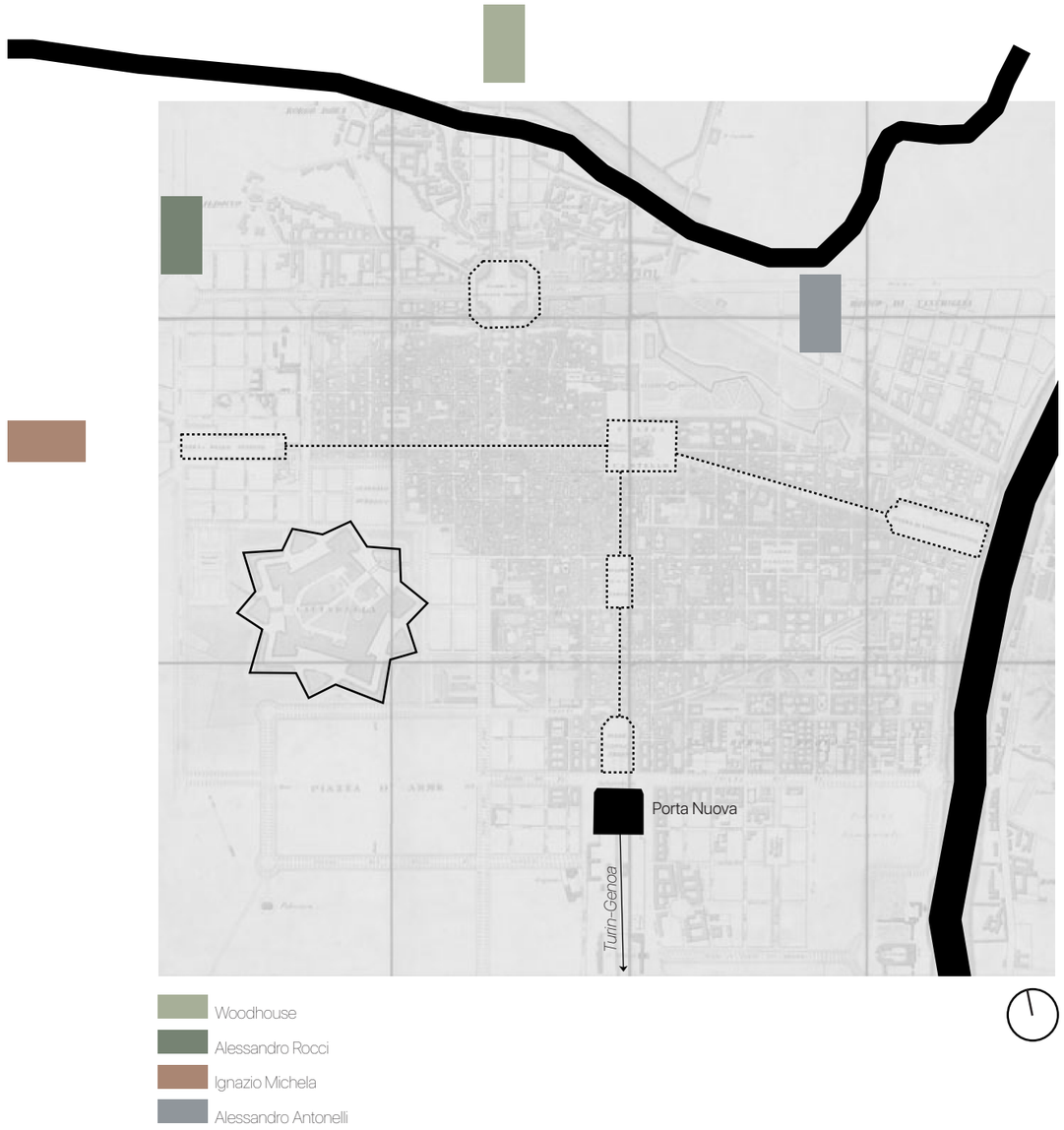


fig.16 Proposal for Porta Nuova station. Source: Museo Torino (edited by the authors)

Porta Susa station

The inquiry commission collected the opinions of three institutions—the Municipality, the Chamber of Commerce, and the Provincial Health Council—which all agreed on the area of the Cittadella as the most suitable location, also recommending its dismantling, by then considered inevitable. However, the proposal was blocked by the Ministry of War, which refused to demolish the military wall and to relinquish the land.

The debate continued until engineer Giovanni Negretti was designated to conduct an in-depth study in order to reach an optimal decision. His studies confirmed the Cittadella area as the best option. Thanks to successful negotiations, the Cittadella was demolished and the subsequent construction of Porta Susa station became possible.

The station was built in 1855 and opened in 1856.

ALLUNGA

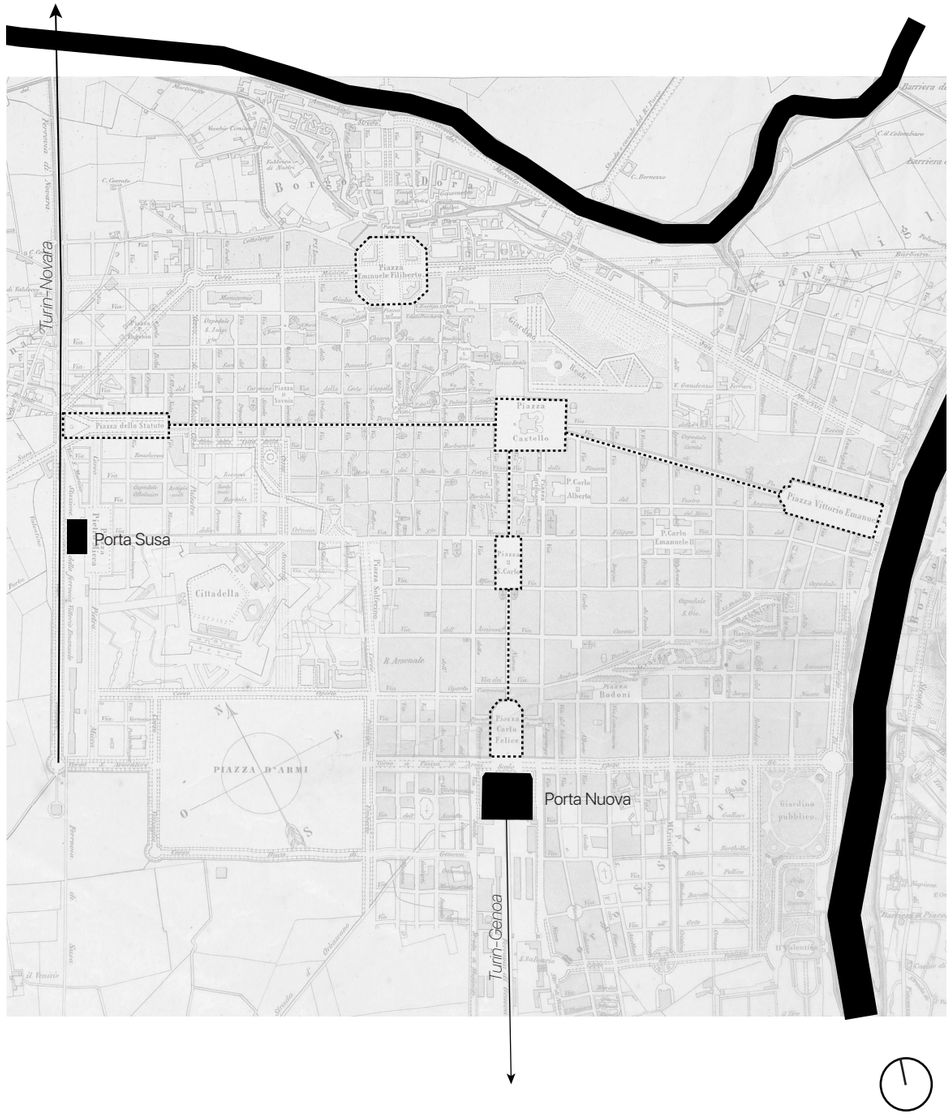


Fig. 17 Turin 1860. Source: Museo Torino (edited by the authors)

Railway network finalization

In the years following 1860, the Turin railway network expanded even more, reaching full functionality.

In 1864, the connection between Porta Nuova and Porta Susa was completed. In 1871, the opening of the Frejus tunnel and the international line towards France were added.

Secondary lines were also added: in 1862, the Turin-Ceres line was planned, and in 1866, the Porta Milano station (or Ponte Mosca), the terminus of the line, was built on Corso Giulio Cesare between the Dora River and Piazza della Repubblica, along with the branch station (Dora station, then a secondary stop) beyond the Dora. The line initially connected (in 1868) Turin with Venaria Reale, then was extended to Lanzo in 1876 and to Ceres in 1916. The building was then hit and severely damaged during World War II, and the function of the terminal station of the Turin-Ceres line was replaced by the existing branch station, which was enlarged.

In these years (1870–1890), several extra-urban tram lines were also completed (Rivoli, Moncalieri, Saluzzo, Settimo, Stupinigi, Orbassano, Volpiano, Druento, Venaria).

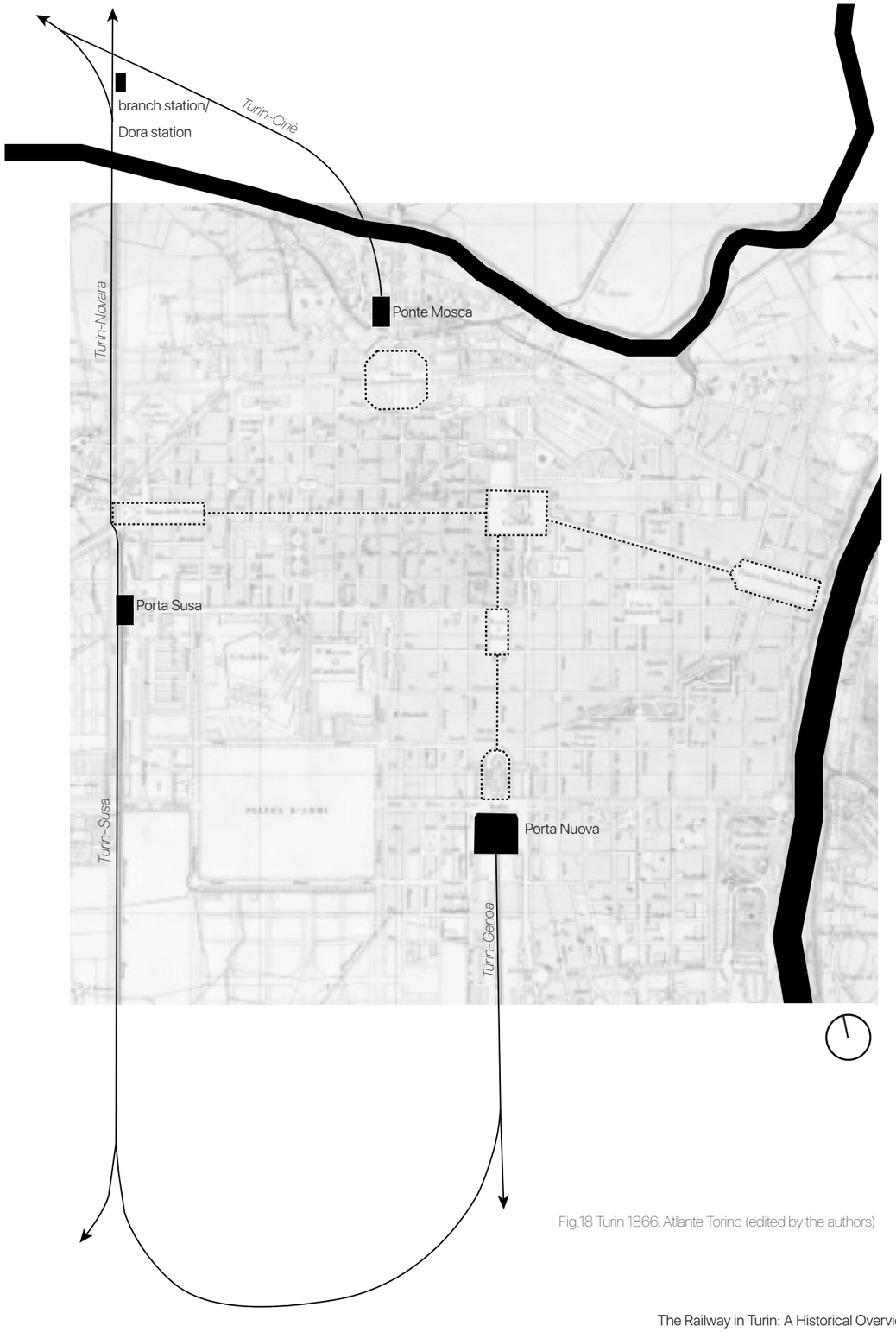


Fig.18 Turin 1866. Atlante Torino (edited by the authors)

THE RAILWAY IN TURIN: A HISTORICAL OVERVIEW
Development and challenges

Management of railway network proposal
Valdocco station

2.Classification yard is a railway facility where incoming and outgoing freight trains are disassembled and reassembled to sort the wagons

Turin continued to expand its transport network, but already in the 1880s some limits began to emerge. While the city grew toward the suburbs, alongside industrial development and infrastructure expansion, the problem of level crossings or overpasses became increasingly evident, interfering with urbanization. The report of the municipal commission for the reorganization of stations (1887–1888) highlighted how the Porta Nuova station divided the city in two and did not foresee expansions, despite urban growth toward the south, both east and west of the line. At the same time, growth toward the west was putting pressure on Porta Susa station, now "choked" by the urban fabric.

In these years, a debate opened on the management of railway flows. In 1887, engineer Angelo Tonso proposed the construction of two new yards, one north (Valdocco) and one south of Porta Nuova (west of the Genoa line), to lighten the railway traffic. Also in 1887, the management of the Turin railway hub was entrusted to the Mediterranean Railway Company, which obtained authorization for the construction of the Valdocco yard (for goods and passengers), near the subsidiary station (Dora Station). In 1888, it also obtained permission for the sorting yard south of Porta Nuova.

The Valdocco yard became the center of an ambitious project: the lowering of the railway between Valdocco and Porta Nuova and the suppression of Porta Susa. The municipal council expressed a favorable opinion on the construction of a large station in Valdocco and the partial undergrounding of the line, despite the long time expected for completion. In 1889, the city plan included a design for the Valdocco yard, with an access square and two diagonal streets.

Works on the classification yard[2] south of Porta Nuova began immediately. However, the project of the central Valdocco station remained on paper: ten years after the city plan, the expropriation constraints had expired, and a simpler solution was preferred uniting the Valdocco station with the subsidiary station into a single enlarged Dora Station. Thus, the undergrounding of the line was also abandoned, though it remained a possible future option by the municipality, in the stretch between Ponte Dora and Porta Nuova.

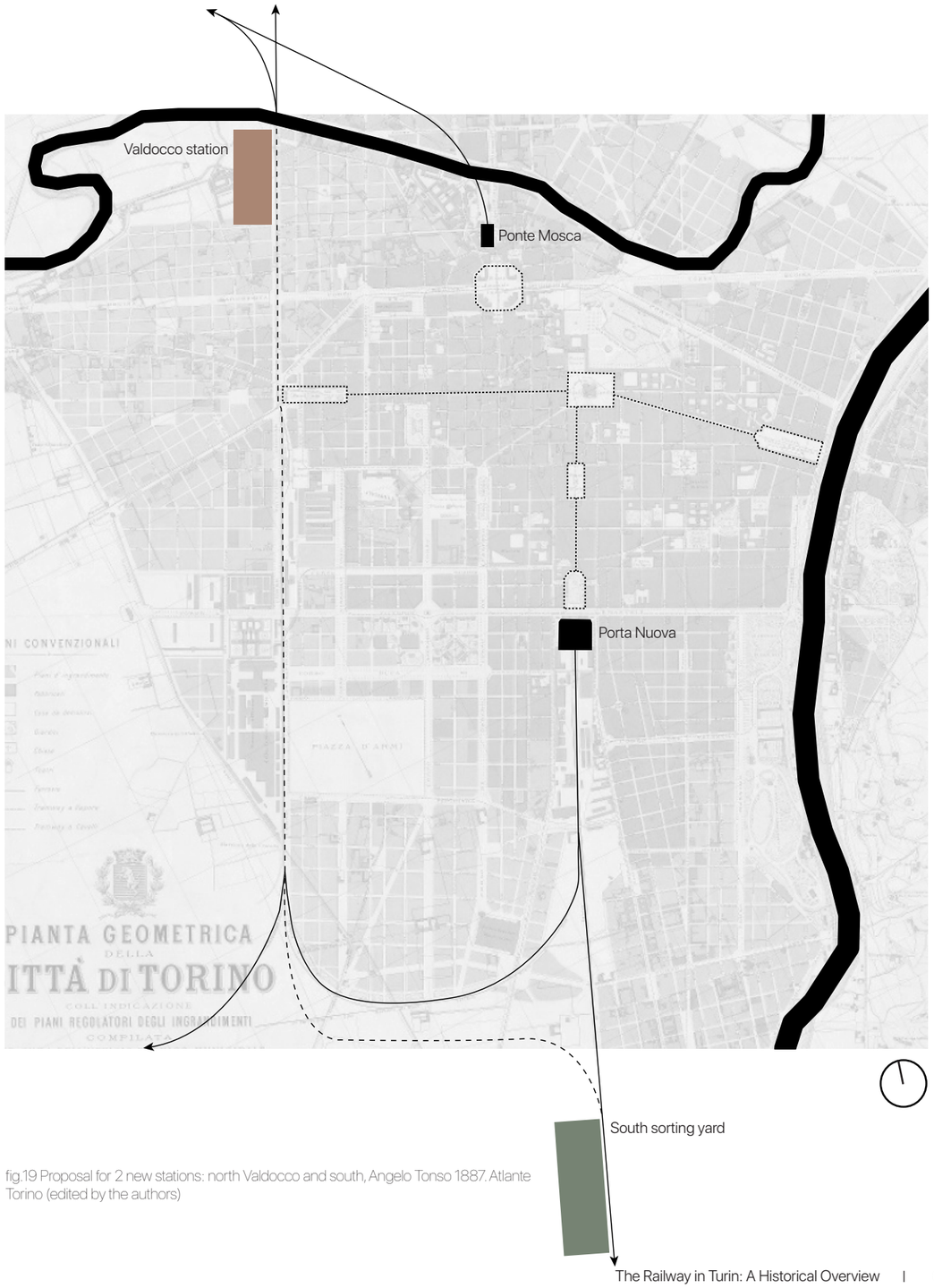


fig.19 Proposal for 2 new stations: north Valdocco and south, Angelo Tonso 1887. Atlante Torino (edited by the authors)

Given the unresolved problems, projects for reorganizing railway flows multiplied in the following years.

In 1901, engineer Michele Fenolio, commissioned by the administration, proposed two alternatives: the first included lowering the line from Porta Nuova to Valdocco, with Porta Susa underground and used only for passengers; the second a more limited lowering (from Porta Nuova to Corso Peschiera), keeping Porta Susa operational. In 1903, Fenolio presented a new project with the relocation of Porta Nuova and full undergrounding of the southern line, but the municipal commission opposed the station's relocation, which had to remain central and terminal.

Giuseppe Lanino, appointed by the commission, advanced an even more radical proposal: the suppression of both main stations and the construction of a single large freight and passenger yard between Piazza Statuto and Corso Peschiera. Luigi Lampugnani also presented four proposals, including the lowering of the entire city railway network, keeping Porta Susa only for fast passengers and freight, and transferring the sorting yard to the other side of the Genoa line.

The debate continued until the foundation of the State Railways (FS) and the nationalization of the network in 1905. Previous proposals were set aside in favor of new ones, some more ambitious (A), others more conservative (B).

After examining all options, the municipal commission initially adopted a cautious approach, adhering to Plan B proposed by the FS in 1907, which included the undergrounding of Porta Susa for fast passengers and goods and new yards. Later, all radical transformation plans were abandoned, focusing instead on the modernization and lowering of the railway section between the two existing stations.

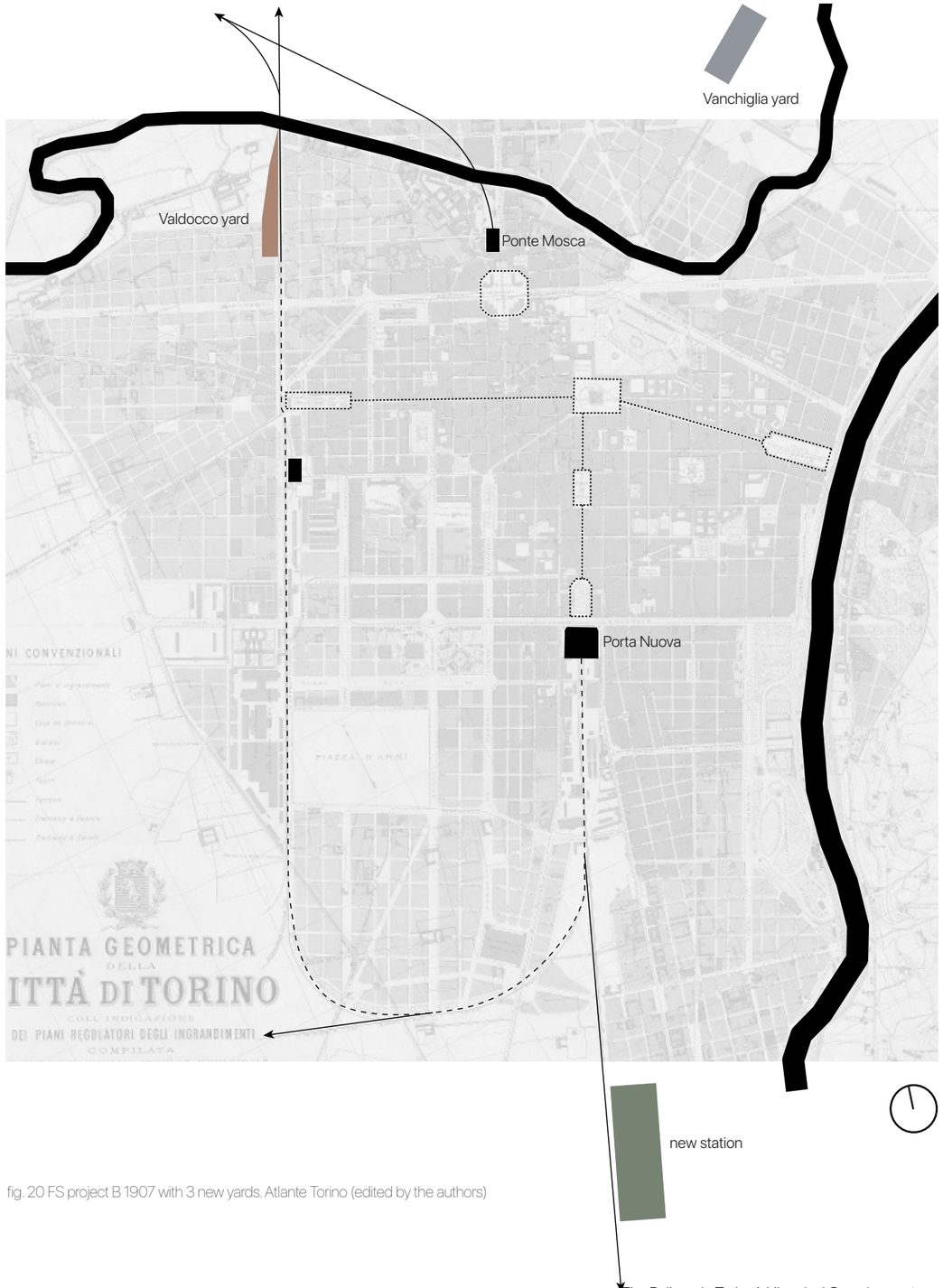


fig. 20 FS project B 1907 with 3 new yards. Atlante Torino (edited by the authors)

Management of railway network
Conservative solution

In 1911, the Municipality and the FS signed an agreement: the FS committed to carrying out some selected works at their own expense, while for others they reserved the right for future execution without immediate obligation. The set of included works corresponded, in fact, to Plan B of 1907.

The works that FS committed to carry out in 4 years starting from June 9, 1991, are:
-The lowering of the Genoa line between kilometers 2 and 3 (+616), and the construction of the overpass at the ring road (now Corso Sommelier);
-The installation of the new freight line, with lowered tracks, connecting the marshalling yard to the Modane and Milan lines;
-The lowering of the Genoa line in the section between the San Salvario overpass and kilometer 2, and the construction of the overpass at Corso Dante;
-The new Vanchiglia yard and its connecting line to Torino Dora station;
-The lowering of the Milan line between the San Salvario overpass and Porta Susa station, with the construction of overpasses at the extension of Corso Dante and at Corso Vittorio Emanuele II.

In 1926, the freight yards at Lingotto and Dora Station were also built, and in 1928 the underpass at Corso Regina was built to compensate for the lack of railway lowering between Porta Susa and Dora.

The rest of the planned works was never completed, especially the undergrounding of Porta Susa and the Milan line. One had to wait until 1995 for the conditions to align for systematically addressing the critical issues caused by the railway network's presence.

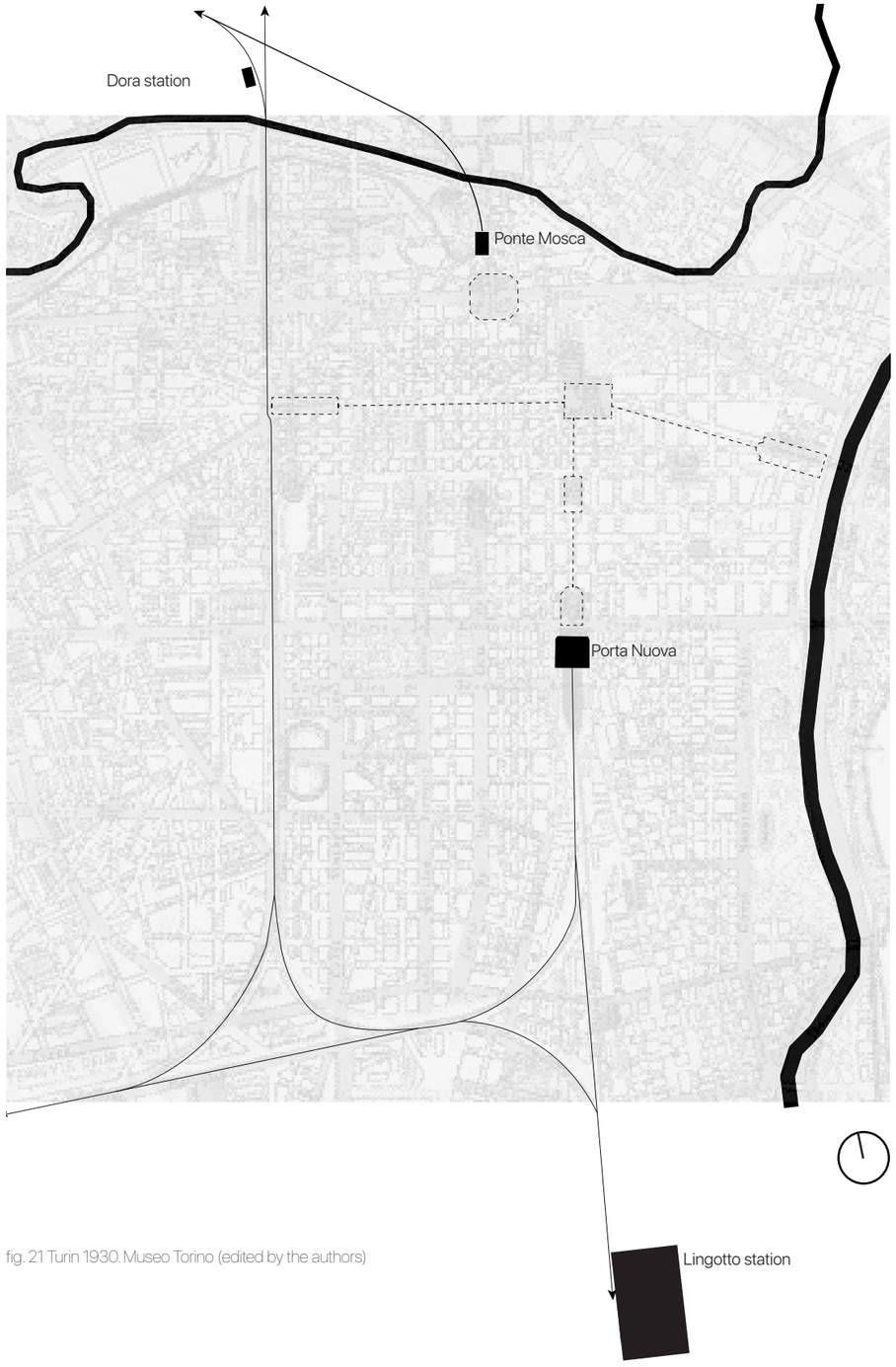


fig. 21 Turin 1930. Museo Torino (edited by the authors)

THE RAILWAY IN TURIN: A HISTORICAL OVERVIEW

From railway to spine

Ma si doveva aspettare una sciagura mortale?

Non basta porre qualche rattoppo alla decrepita ferrovia di Lanzo

Ha cent'anni, le carrozze sono antiquate, va ai 30 chilometri all'ora, ha perso gran parte dei viaggiatori - I passaggi a livello sono un pericolo in provincia e in città - Anni fa il Governo aveva nominato un commissario perché l'azienda privata non dava garanzie E ora che cosa si è fatto? Nulla o ben poco - Urge una riorganizzazione radicale

fig. 22 La Stampa Sera, 25 august 1967

La ferrovia è come una cintura d'acciaio (e crea ingorghi)

Uno dei «nodi» del quartiere è senza dubbio la ferrovia. Essa, come una colossale cintura d'acciaio, in pratica ne circonda tutto il perimetro, condizionando non poco la vita dei cittadini.

Gli ingorghi di traffico terribili che soffocano l'imboccatura di corso Dante ed il cavalcavia di corso Sommeiller ne sono un esempio.

Eppure, un giorno, il problema ferrovia venne affrontato: si trattava di coprire tutta la parte di linea che fiancheggia corso Castelfidardo ed allargare la strada.

Progetto bocciato dalle ferrovie, che devono quadruplicare la linea stessa sul medesimo piano del ferro.

Dal quartiere era partita anche una seconda proposta: prolunghiamo corso Stati Uniti sotto Porta Nuova fino a corso Marconi e da qui al Valentino: proposta bocciata in partenza: il consiglio fu accusato di megalomania.

Eppure il problema, in un modo o nell'altro, va affrontato; le strozzature rappresentate dai due cavalcavia ci sono, e sono reali.

Non sarà certamente con la sistematica bocciatura di ogni idea proveniente dal quartiere che si potranno eliminare. Né il fatto di essere il «quartiere cavia» per la prima linea (la 10) di supertram, rende il quartiere meno bisognoso di interventi sul piano della viabilità, che non è solo pubblica.

fig.24 La Stampa Sera, 25 november 1981

Un ragazzo di 16 anni è stato ucciso da un treno della Ciriè-Lanzo perché il casellante, che aveva l'orologio in ritardo, non ha chiuso in tempo il passaggio a livello. I carabinieri hanno denunciato il custode per omicidio colposo; tra casellante e direzione della Torino-Nord si è accesa una polemica a proposito dell'orologio. Comincia la battaglia della carta bollata, dell'interpretazione dei regolamenti, dell'accertamento delle responsabilità. Come purtroppo succede sempre, la vicenda si trascinerà per mesi, fino al processo. Resta la tragedia di una giovane vita stroncata.

fig.23 La Stampa Sera, 25 august 1967

Post WWII

overview

The railway network of Turin remained more or less unchanged until the Second World War, when the bombings partly destroyed and damaged the railway network and the stations, as well as many residential buildings.

Precisely for this reason, in the post-war period, the discussion about the reorganization of the network and the stations reopened. Several proposals were made for the reconstruction of the railway junctions, some of which suggested the complete demolition of the damaged structures and their relocation to other areas. It is in this period that the idea of an infrastructural axis as the backbone of the city of Turin emerged. But all these ideas and proposals remained suspended and were not implemented, since the city of Turin once again preferred a conservative approach, rebuilding and improving the existing stations and lines instead of revolutionizing the railway network. Moreover, in the postwar period, attention was increasingly shifting towards private transport. The Municipality, in fact, proceeded with the widening of roads and the construction of new highways (also the turin ring road).

Later, during 1960s, the tendency of people and industries to move to the suburban areas rather than the city center became increasingly common. The increasing development of the suburbs highlighted the railway network inefficiency, it was consider outdated and in need of significant modernization. Turin was strongly criticized for its transport network, for the traffic and disorganization, and for the presence of freight yards too close to the city center, while industries were moving towards the outskirts.

Even urban theorists like Pierre Gabert, after observing Turin very critically ("Turin ville industrielle", 1964), commented negatively on the railway system, stating that it had been designed for a capital city, not for an industrial city. Therefore, after the construction of the historical network, any change became expensive and difficult, which is why it had remained mostly unmodified until then.

PRG 1995
Spina Centrale

3.memorandum of understanding is a formal, non-binding agreement that outlines shared goals without legal obligations

The turning point of this discussion came in 1982 with the signing of a memorandum of understanding between the Municipality, the Region, and the State Railways, which marked the beginning of one of the most important transformation works of contemporary Turin. The works, which began in 1986, included:

-the construction of the underground railway link (passante), connecting Porta Susa to Lingotto and allowing a north-south connection;

-the quadrupling of the tracks;

-the modernization of Moncalieri and Lingotto stations;

-the undergrounding of 7 km of railway line;

-the construction of new freight yards: Zappata (between Porta Susa and Lingotto) and Rebaudengo (between Dora and Stura).

Between 1986 and 1995, Cagnardi and Gregotti developed the studies that led to the 1993 project, more formally to the 1995 Master Plan (PRG). This project marks, along the railway axis (Turin–Milan), all the disused industrial areas, which are shown in the plan as strategic for the redesign of the city. It is here that the idea of the "Spina Centrale" (Central Spine) is outlined, the main organizing principle of the plan, which defines and coordinates the reorganization of the entire area (of the Turin–Milan railway line) and the disused industrial areas along this line, which were numerous.

The "spine" is created through the undergrounding of the railway line from the connection with Porta Nuova to the Rebaudengo station and is divided into 4 parts, 4 spines. A total of 2,100,000 square meters of land is made available for investment, and the concept of "spina" becomes the tool that drives real estate investment.

Ambitious objectives were set: to imagine the city with new forms of spatial organization and to build tools capable of guiding large-scale transformation. Today, the way people access the mobility network constitutes a form of inclusion or exclusion, therefore it becomes essential to design strategically and not randomly.

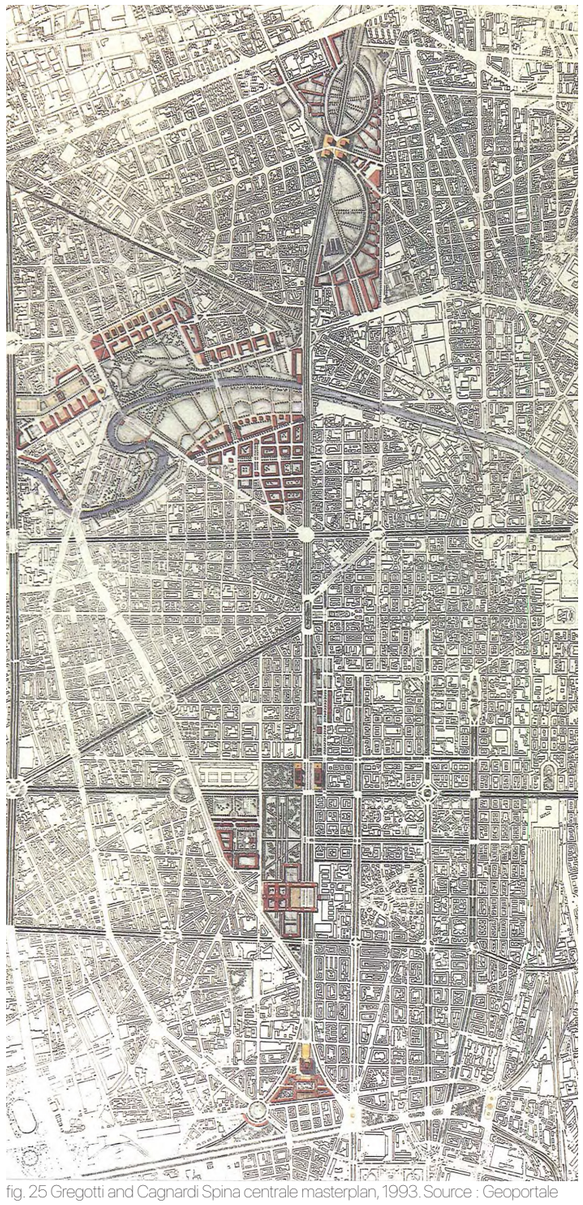


fig. 25 Gregotti and Cagnardi Spina centrale masterplan, 1993. Source : Geoportale

PRG 1995
plan

The image promoted by the PRG conquered everyone, the idea of trasforming a city full of abandoned areas, symbols of a painful past (economically and socially painful closures), to green areas fascinated the population. Concerns and doubts were not lacking because it was still an ambitious project; it had to face the difficulty of coordinating all these projects in a few years, and also the difficulty of finding the resources to realize these transformations. The Viale della Spina is designed as a boulevard marking the transition from the railway tracks, symbol of rupture and urban fragmentation, to a true tool for controlling urban development.

In the PRG, the entire Central Spine is included within the ZUT (Urban Transformation Zones) and is therefore subject to development plans based on constraints regarding functions, buildable areas, height limits, and other urban regulations. The ZUTs describe in detail each of the four parts of the Spine:

Spine 1: The first section of the Central Spine is probably the simplest from an urban planning point of view, and it is from this point that the railway undergrounding begins. The works started in 1995 and were completed in 2000.

Spine 2 : This project is more complex: the initial PRG foresaw the demolition of some historic structures such as the OGR and the former prisons, which were later preserved. The area is closely connected to Porta Susa station, and it is here that the new city center begins to take shape. In this area is located the first lot of the Innovation Mile project (UMI II), called Lotto Torre.

Spine 3: This is the largest of the four areas. The project mostly involves the demolition of disused industrial buildings and the construction of new structures from scratch. Here is located the second, larger lot of the Innovation Mile (Spina 3–Oddone).

Spine 4: SCRIVIII

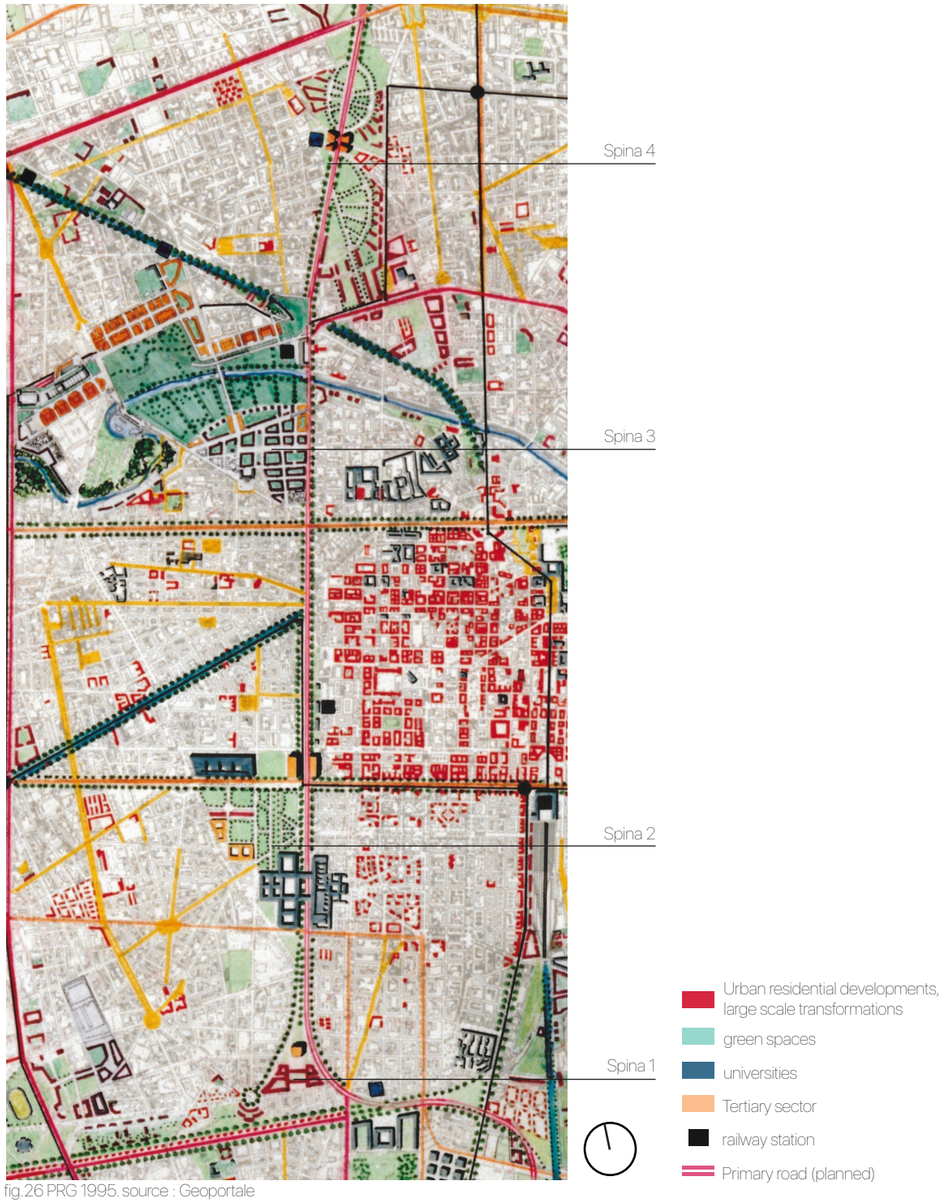


fig.26 PRG 1995. source : Geoportale

PRG 1995
Spina trasformation

From the 1993/95 project to the works actually realized, there are multiple small and large variations. One of the main changes made during the implementation of the Turin Master Plan concerns the structural shift in focus from tertiary to residential use: compared to the initial forecast of a 70% tertiary – 30% residential ratio, modification after modification this gradually changed, reaching in 2008 a ratio of 52% residential and 48% tertiary (source: City of Turin, 2008). Other differences between the PRG and the works actually carried out concern the green areas: the Spina was supposed to be dominated by numerous green spaces, but some were postponed and never realized.

The timeline for the construction of the railway tunnel became increasingly "unclear": the original project dates back to 1982, with the start of the first real construction sites four years later, and an initial expected completion in 2006; the deadline was then postponed repeatedly, while an actual information blackout fell over the fate of the project: info-boxes were closed, the website deactivated, and newsletters and all other information materials disappeared. (Rota Report, 2009).

Projects of the plan that have been carried out (2025):

-The construction of the boulevard (viale della spina), composed of two central lanes separated by a row of trees, with service roads for cars on the sides, then another tree-lined section that separates the service road from parkings, bike lane, and sidewalk.

-Doubling of the underground high-speed Turin–Milan line.

-The construction of the metro line connecting the two stations (started in 2000 and completed in 2011, with the final Lingotto–Bengasi section in 2021). Later, with the Variante 200 approved in 2010, the construction of the second metro line was planned, reusing existing but unused railway corridors such as the Vanchiglia yard.

-The construction of the new underground Porta Susa railway station in 2008, as a consequence the previous 19th-century building was abandoned.

-Development of the four areas of the Spina and reuse or demolition and replacement of the old abandoned industrial structures. (not completed)

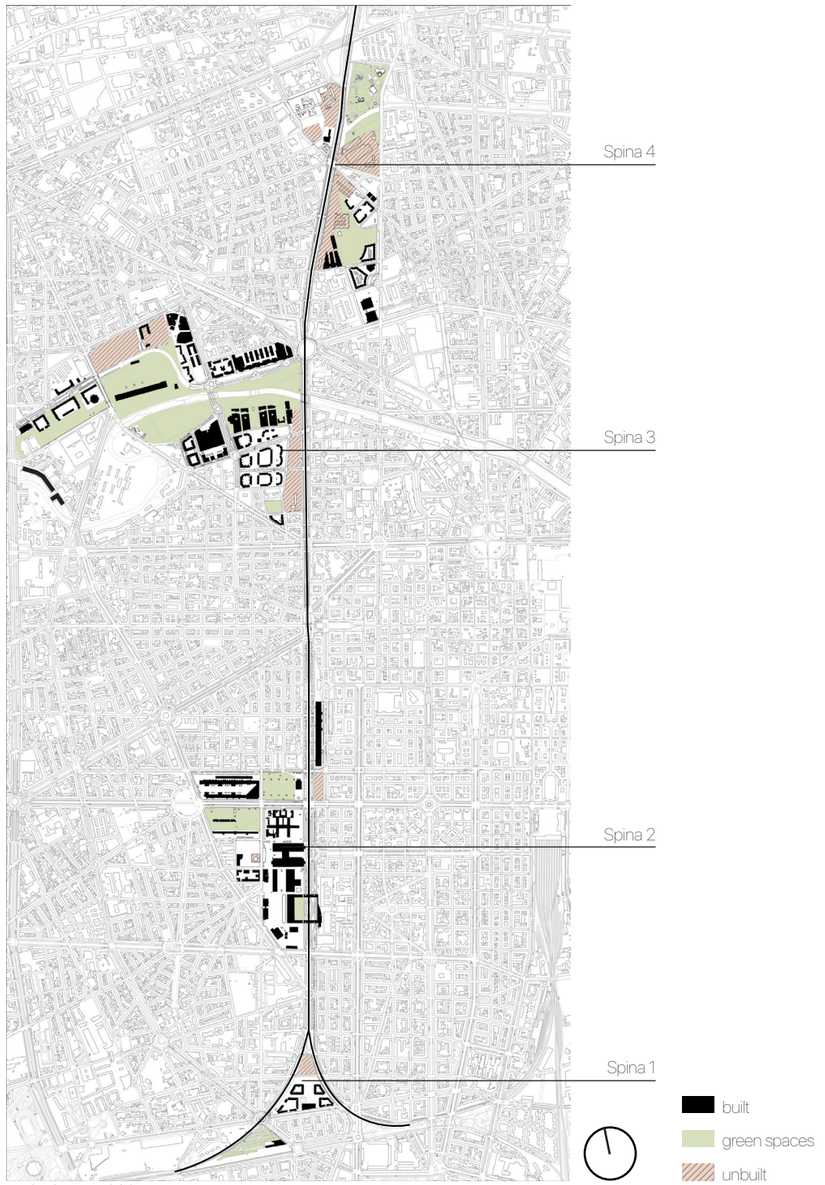


fig. 27 Spina in 2025 . By the authors

SPINA 2
Develop-
ment

Monviso & The Citadel
overview

The current area of Spina 2, until the mid 19th century was an area divided into two main parts one being the cittadella, and the othe part outside of the city walls of Turin in a rural zone was called Monviso.
In 19th century, with important events such as the Italian unification, Turin becoming the capital, and the intial development of the railway network, caused a huge surge in the neccassity of rapid devolpment of the infrastructure and sprawl of the city.
The monviso area, before the rapid change, was mostly a military based zone with some agriculturale lands scatered in the ouskirts of the old city that some residences and some commercial services.

The western perimeter of the city and was completely dominated by the old Cittadella fort and military site. Then in 1852, the city counsel authorized its destruction freeing up cheap unencumbered land for the new residential area of Piazzo Statuto and Porta Susa, and the Novara railway station. For example, the site of the former western gate was now Piazzo Statuto, made in 1865 by Giuseppe Bollati, and the first Porta Susa railway station (by Carlo Promis) opened in 1858. These zones became a joint connecting Turin's historic core and its new industrial edge that was forming.

Another area that had defined the region, first monviso and then the porta susa region has been the piazza d'armi, due to the reasons mentioned above, they had to divide, transfer and reuse that land a multiple number of times. The piazza d'armi demonstrated on the map is after the first relocation 1817 and this was piazza d'armi san secondo, which was used mostly for military prades and marches.

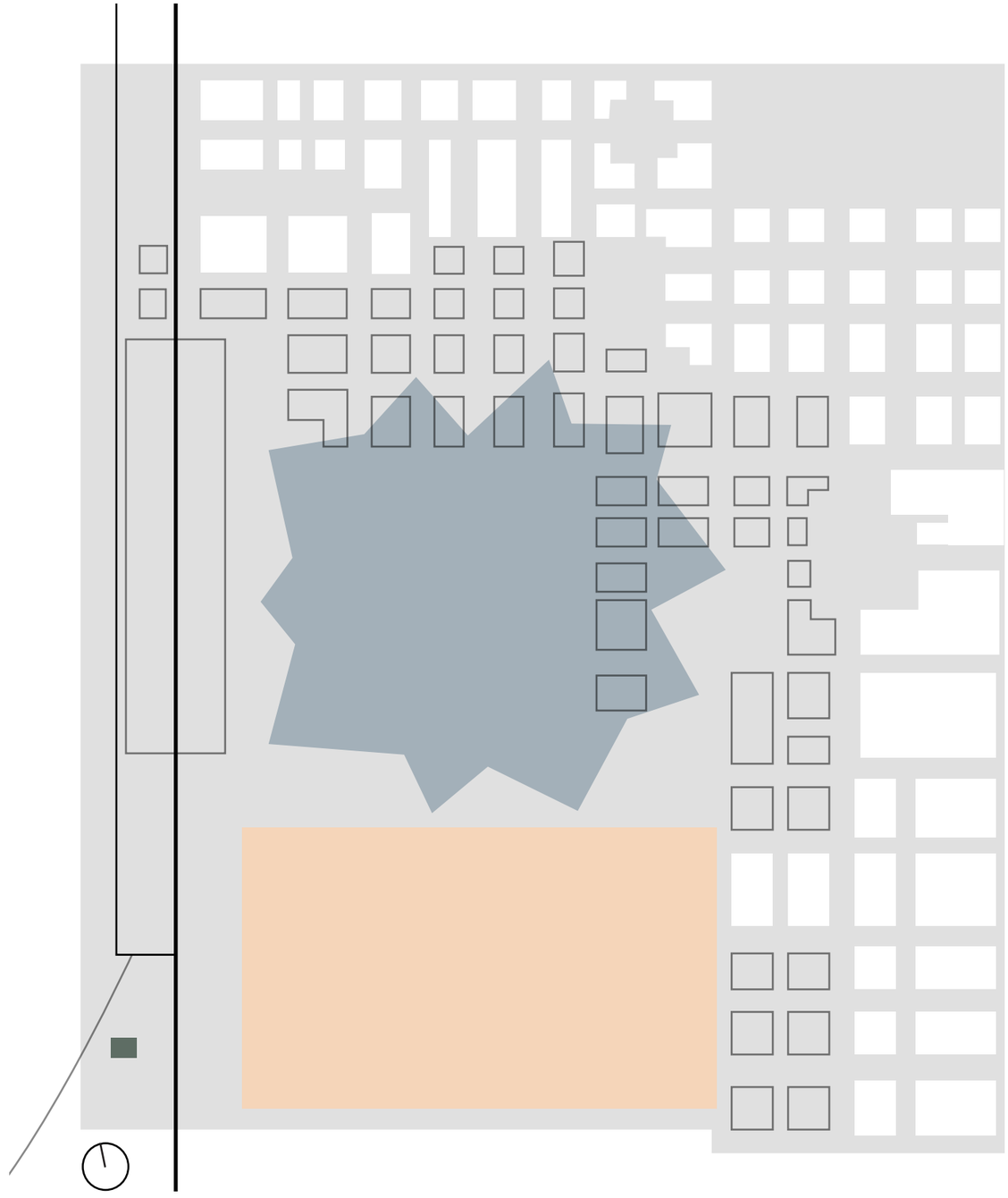


fig.28 Spina 2 1840's transformations. By the authors

Pre Industrial Era
Porta susa

Torino Porta Susa station opened on 20 October 1856 as part of the new line to Milan, and the large passenger building was completed in 1868. The station was on what is now Piazza XVIII Dicembre (on the northern side of the Spina 2 boulevard). In front of the station were the Magazzini Generali di Dogana (customs warehouses), located to the right (west) side of the track, which was later the location of the RAI tower and served goods traffic from the cattle market and from factories. The new railway increased urban growth at an astonishing rate, as by the 1860s-70s the area started to become filled with workers housing and services, for the industries that were locationed there.

Pre Industrial Era
le Nuove Prison

Le Nuove Prison was built in the second from1862-1870 to replace the numerous insufficient and tiny prisons in Turin;It was Planned and waiting approval from 1857-1861, and the complex was put into use from 1870. It was created by Piedmontese architect Giuseppe Polani. In the same "service belt" of the city that housed the military installations, the slaughterhouse, and the rail workshops (OGR).
The criminal prison at Via S. Domenico 13, the correctional facility at Via Stampatori 3, the prison for convicts at Via S. Domenico 32, and the prison for convicted women in the Palatine Towers were all replaced by the "Le Nuove" prison, which was constructed on Corso di Sant'Avventore (Vittorio Emanuele II) between 1857 and 1869.

Pre Industrial Era
civic slaughterhouse

One of the centralized services established in Turin from 1867-1867 was the Civic Slaughterhouse. Its goal was to ensure hygienic control over meat production while removing unsightly and unhygienic activities from the city center. The City Council decided to create a municipal facility under direct public management instead of using private operators due to the city's rapid population growth, rising land values in the vicinity of the center, and growing public concern for health standards.

The chosen location was across from the then-under-construction "Le Nuove" prison on Corso San Avventore (now Corso Vittorio Emanuele II). Antonio Debernardi, an architect and engineer, created the project by referencing the most sophisticated French technical models available at the time. A livestock market was also established close by shortly after it was finished.

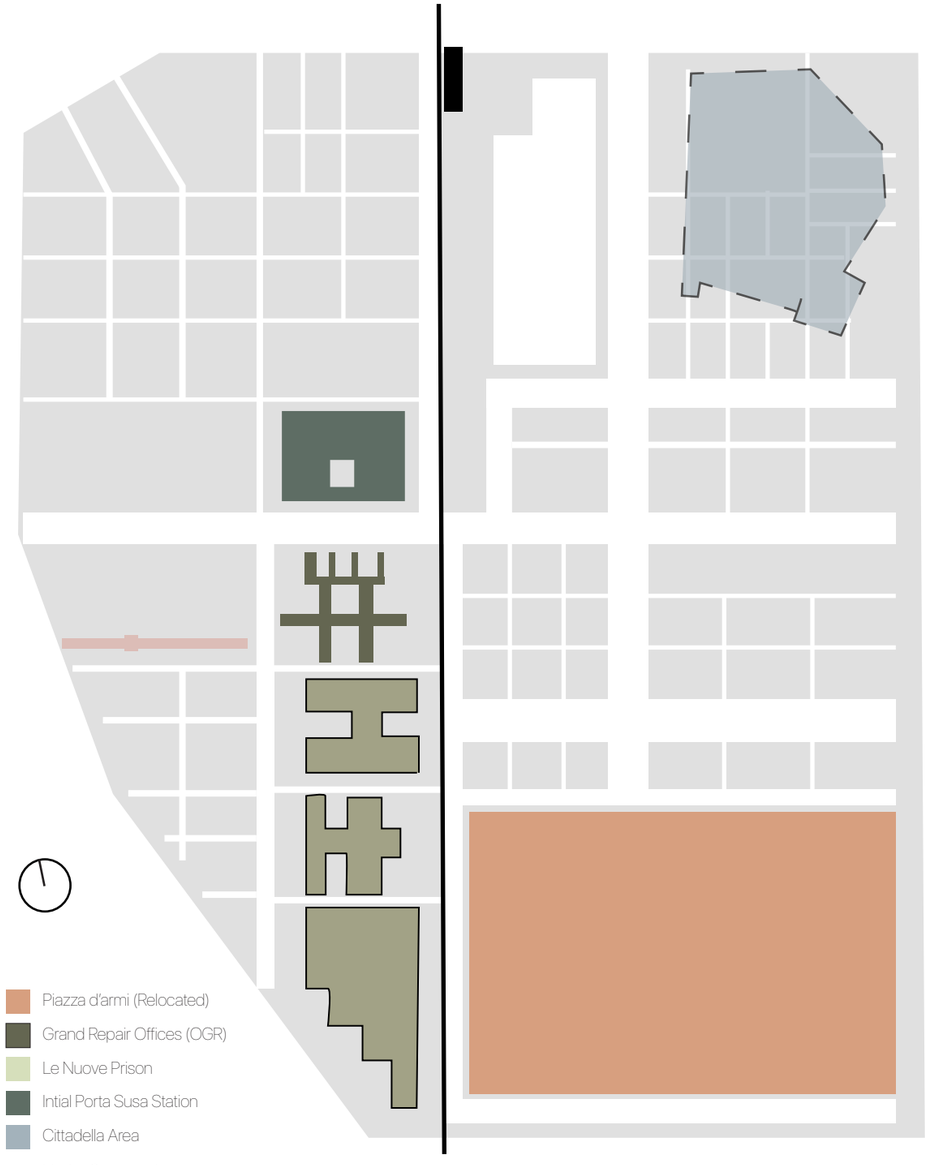


fig.29 Spina 2 1886 Map. By the authors

Pre Industrial Era
OGR

One of Turin's finest surviving examples of 19th-century industrial architecture is the Officine Grandi Riparazioni (OGR). Constructed in the middle of the 1800s, soon after the Turin–Genoa (1853) and Turin–Novara (1856) lines opened, it housed the city's first railway workshops, which had grown claustrophobic and encircled by residential areas close to Porta Nuova and Porta Susa. Ferrovie Alta Italia combined those disparate facilities into a single, purpose-built complex between the railway and today's Via Boggio in order to meet expanding production demands. When construction started, this location was on the outskirts, but by the time the massive masonry hall (about 130 × 140 m) opened, new residential streets had by then surrounded it.

Pre Industrial Era
casarma lamarmoa complex

Another building worth noting is the Comala building is a part of the former Casarma La Marmora complex, which was constructed in the late 19th century (1870–1871). It was first used as a cattle market and then, shortly after, as military facilities (cavalry and artillery quarters) before being reused in the 20th century.

Pre Industrial Era
piazza d'armi

The piazza d'armi was once more relocated to a more outlying area by 1910. The reasoning was the same: military drills required a more sedate, isolated area as new boulevards, residential areas, and stadiums crowded the central-west sectors. Where the Santa Rita district later grew (development accelerated in the 1930s and again in the 1950s–70s), the new drill ground was established. This move represents the last significant transfer because the old piazza locations were rapidly urbanized after the military function left.

Pre Industrial Era
stadium

The stadium constructed where the Polytechnic University now stands on the site of the former Piazza d'Armi, it was the biggest stadium in Italy. It was supposed to be bigger than the ones in London and Athens. Known as the Stadium, it had 40,000 seats and 30,000 standing spaces spread across 100,000 square meters. On April 30, 1911, it was officially opened in front of 70,000 people and the monarchs. The oval was roughly twice as large as the "Stadio Comunale," measuring 361 meters long by 204 meters wide. A large 730-meter outdoor track for cycling competitions, a horse racing track, and a 500-meter runner's track surrounded the field. Built in less than a year, the project was fully funded by private donations.

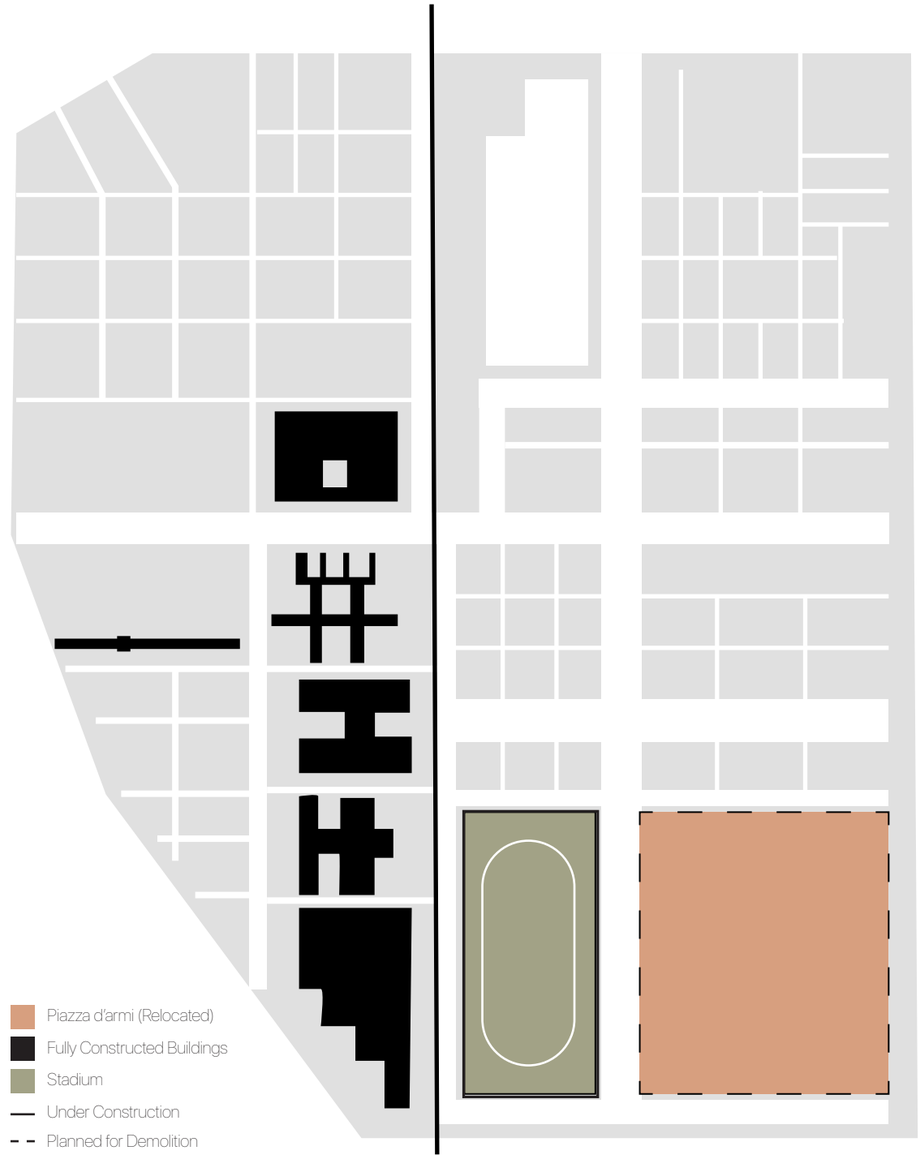


fig.30 Spina 2 1911 Map. By the authors

WWII and Industrial Boom
overview

The Spina 2 neighborhood of Turin, was severely damaged by Allied raids during World War II that were intended to destroy industry and transportation. Along with surrounding residential blocks, rail facilities, repair sheds, and nearby warehouses (including the sizable Officine Grandi Riparazioni complex) were heavily struck. As a result, Spina 2's physical structure was left in pieces after the war; some buildings were reduced to shells, others were severely damaged but still standing, and some survived with only minor damage.

Reconstruction took a mixed course in the early postwar years. Many working-class housing blocks were rebuilt in a straightforward, practical manner to meet urgent housing needs; strategic industrial sites were swiftly repaired or rebuilt. At the same time, several abandoned or dilapidated industrial halls were abandoned for decades before being destroyed or incorporated into urban renewal initiatives.

WWII and Industrial Boom
OGR

The Officine Grandi Riparazioni (OGR) was heavily targeted during World War II and was bombed three times, twice by the RAF in 1942 and once by the USAAF in 1944. The offices, warehouses, and workshops on Via Pier Carlo Boggio 19 were severely damaged during these raids. The facility was promptly put back into operation in spite of the damage. Ferrovie dello Stato restored the bombed pavilions in the early postwar years, and by the late 1940s, the majority of the damaged buildings had been rebuilt, allowing the OGR to resume full operations.

The workshops were modified to perform heavy maintenance on diesel and electric trains instead of steam locomotive overhauls, which were phased out following the war. The OGR continued to play a crucial role in Italy's rail system well into the late 20th century thanks to this reorganization, which made sure it remained a major railway repair hub throughout the 1950s and 1960s.

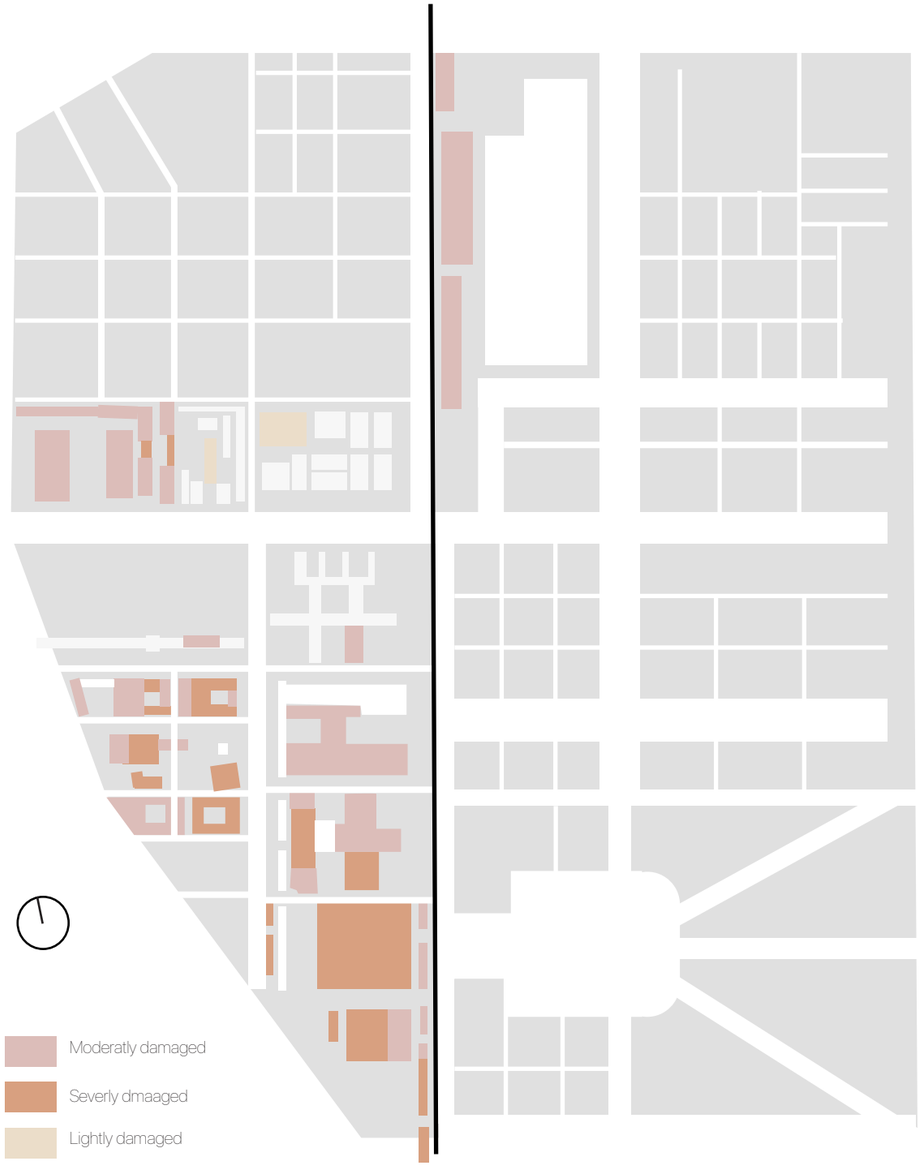


fig.31 Spina 2 1945 Map indicating the bombing in the zone. By the authors

WWII and Industrial Boom
stadium & polito

The stadium was commandeered by military authorities during World War I, and it wasn't until March 1920 that residents demanded its return in the hopes of resuming athletic events. Yet the facility was rarely used: one of its main shortcomings was its poor visibility, which discouraged major teams such as Torino and Juventus from adopting it as their home ground, preferring instead the newer parade grounds. The enormous building was abandoned in a matter of years.

After the facility was eventually demolished, the land was left empty for many years. In 1951, the Polytechnic of Turin's own Technical Office selected the site for the new headquarters of its engineering faculties.

The stadium was divided into lots awaiting construction but then, On the location of the old Stadium, work on the new Polytechnic University building started in 1950. The Fiat design office and the university's Technical Office, led by a committee of professors, especially Milanese architect Giovanni Muzio, who was the chair of architectural composition at the Faculty of Architecture, designed the project. A "scholastically functionalist" complex with an axial layout, rigid circulation route articulation, and hierarchical space distribution is the end result.

WWII & Industrial Boom
westinghouse

The structure at Via Boggio 20 (now Via Paolo Borsellino) was once the headquarters of the automaker Rapid. In 1906, Westinghouse purchased it. The site became one of the company's primary Italian plants after significant structural changes were made. The factory became a major industrial center in Turin during the interwar period by specializing in the manufacture of brakes and replacement parts for railroad cars and locomotives.

The Westinghouse Brakes and Signals Company complex, which was located across the block between Corso Ferrucci, Via Avezzana, Via Boggio, and Via Bixio, was frequently targeted by Allied air raids during World War II. High-explosive and incendiary bombs caused widespread structural failure during the most destructive attacks in late 1942 and the summer of 1943. Throughout the eastern sector of the block, windows were shattered, stairways gave way, walls and columns collapsed, and roofs and vaults collapsed.

By December 1944, production had gradually resumed despite the destruction, with partial restoration already under way. But the plant lost its main function in the decades following World War II, and eventually the entire complex was destroyed, leaving only a faint remnant of one of Spina 2's most notable industrial landmarks.

WWII and Industrial Boom
le nuove prison

The prison suffered significant damage from the RAF's 1942 nighttime bombing, which used large and very large caliber bombs. A high-explosive bomb damaged the interior, a wing was severely damaged, and a portion of the building was destroyed. By November 1945, the restoration process was finished.

WWII and Industrial Boom
nebiolo factory

Originally purchased from the former Dubosc works, the location was used as the primary production center for the Nebiolo Machine Factory in 1922. It was renowned for its state-of-the-art equipment and well-organized production process. The expansive complex is topped by a sophisticated Art Nouveau façade that was created in 191 by engineer Santané. The technical office, archives, training school, and warehouses are located on the first floor, while the entire production is centralized in a single ground-floor hall. The plant produced over 900 machines that were rigorously tested before being released, and at its height, it employed about 600 people.

The XIV Urban Planning and Statistics Division documented a mixed-masonry block (three, two, and one above-ground floors) with 53 rooms and seven 23-room apartments, two one-story warehouses completely destroyed by a high-explosive bomb, and partial collapse or floor damage across three buildings from blast and incendiary debris. The factory was converted to war production (bombs and armaments) during World War II and sustained significant damage. As early as January 1945, partial restoration got underway.

WWII and Industrial Boom
civic slaughterhouse

The slaughterhouse complex, as well as veterinary and administrative offices, the Butchers' Mutual Society, the local tax office, and the mandatory butchers' consortium, was heavily bombed during World War II. Two buildings (one facing Corso Vittorio and the other inside the block) were destroyed by incendiary and high-explosive bombs on November 20, 1942, while a third building experienced internal structure burning and roof and wall collapses. During the raid on November 28, 1942. No restoration work had been completed by June 1945. After the war.

SPINA 2
Trasformation

PRG 1995

The PRG introduced a dedicated ZUT (Urban Transformation Zone) sheet to enforce Technical Implementation Norms (NTA), require remediation and infrastructure works (notably burying the rail "spine"), and steer coordinated redevelopment because, prior to the 1995 PRG, Spina 2 was essentially cut off by an open rail trench and clogged by derelict industrial brownfields and fragmented ownership, which together prevented east-west connections and large-scale investment. The zone covers a territorial surface (TS) of 634,877 m² and allows a gross floor area (GFA) of 444,414 m² (GFA/TS ≈ 0.70), providing the regulatory certainty needed to reconnect, remediate, and reactivate the district.

The project for Spina 2 by Gregotti and Cagnardi practically eliminates all the pre-existing structures (Carceri Nuove, railway workshops, and the Westinghouse and Nebiolo industrial plants). Instead, it proposes the expansion of the Politecnico on the area of the former OGR, a section intended for offices and housing to the west of via Boggio, while at the intersection between the Spina Centrale and corso Vittorio two towers are planned. North of the towers, along the Spina, the construction of the new underground Porta Susa station is also planned. However, this plan will be implemented only partially, since already in the years following its approval, a complex process of reconsideration begins, driven by a general tendency towards conservation. This tendency, common throughout the Spina, arises from concerns about the fate of the city's industrial architectural heritage, which risked being erased.

Variation

Soprindendenza heritage protection

A first change concerns the Carceri Nuove, which were protected by the Sopritendenza through decree D.M. 26/07/1986: the building is therefore preserved and designated for judicial offices. A further decision is the preservation of the large H-shaped volume of the Officine Grandi Riparazioni, protected by the Superintendency in 2002 through decree D.S.R. 02/07/2002. Due to this decree, the Politecnico decides to maintain and reuse the buildings of the Tornerie and Fucine from the former railway workshops for the expansion project.

8.18/1-PRIN Spina 2	
residential	24%
ASPI	76%

Variation

PRIN 1998

On December 10, 1998, the Integrated Intervention Programs (PRIN) were established to redevelop the urban, building, and environmental fabric of areas with a strong presence of disused industrial settlements. The PRIN

Variation notice: n.A20 - Spina 2 Approvata il 21/12/1998 n. mecc. 9811115/009

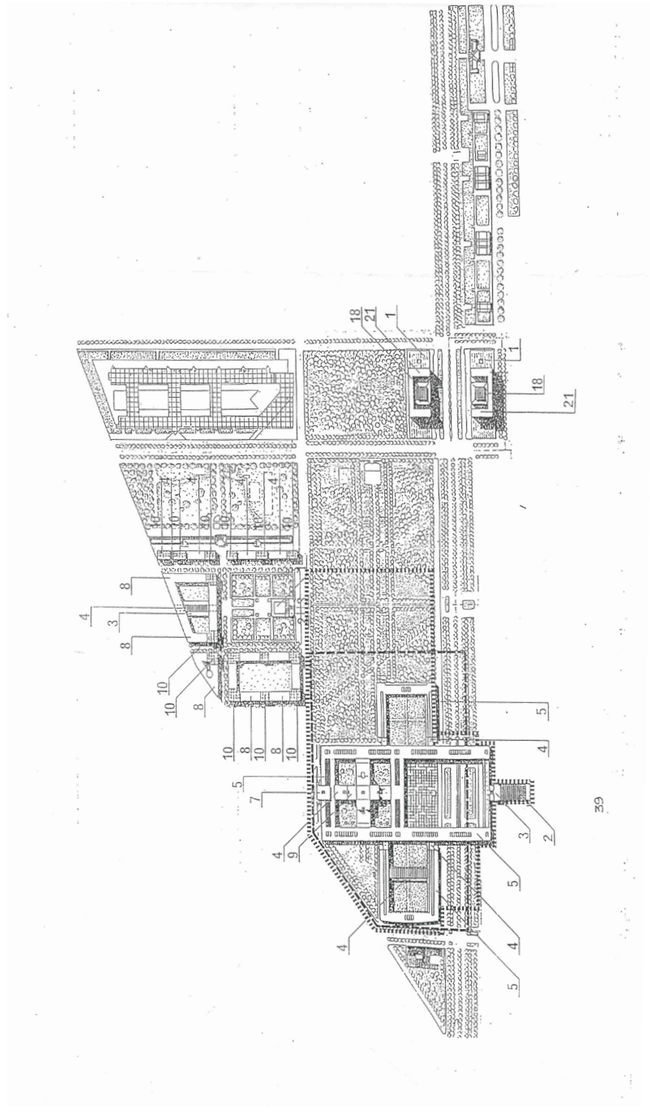


fig.32 PRG 1995. source: Geoportale

8.18 Spina 2 1995	
residential	max 25%
ASPI	max 10%
tertiary	max 32%
Facilities of general interest	max 33%

4. UMI, Minimum Intervention Unit: refers to building aggregates or portions of aggregates that require a unified and coordinated intervention, through a single building operation.
5. SEA, in italian VAR: The environmental assessment of plans and programs that may have a significant impact on the environment aims to ensure a high level of environmental protection and to contribute to the integration of environmental considerations into decision-making processes.

proposals, already approved by the City Council with resolution dated June 8, 1995 (mecc. 9504266/47), will include, according to program agreements, the Spina 2 areas with the related amendments to the PRG in this context. The program covers an area of 133,030 sqm, currently occupied by disused industrial plants and municipal areas designated for roads and public green spaces. Within this PRIN area 79,818 sqm of gross floor area will be developed, of which allocated to residential use and to ASPI.

Variation
2002

Variation notice: n.35 - Spina centrale Approvata il 18/03/2002 n. mecc. 0111054/009

With the partial amendment no. 35 of the PRG dated March 18, 2002, the 8.18 Spina 2 area was cancelled and the following areas were introduced: 8.18/1 Spina 2 PRIN, 8.18/2 Spina 2 Le Nuove, 8.18/3 Spina 2 Porta Susa. Furthermore, the GFA related to UMI[4] no. IV was modified and the increase of setbacks and projections up to 30% was authorized. The possibility to transfer building rights totaling 3,565 sqm from area 8.18/3 Spina 2 Porta Susa was also integrated. Finally, a minimum intervention unit was identified concerning the two multi-story buildings facing Corso Vittorio Emanuele II.

Variation
8.18/1 PR.IN.

Variation notice: n.A36 - Modifica Accordo di Programma PRIN Spina2 Approvata 19/05/2011 n. mecc. 1101614/009

Variation notice: n.A49 - ambito 8.18/1 spina 2 prin - centro congressi ex westinghouse nell'ambito 8.18/1 PRIN

Regarding area 8.18/1 Spina 2 – PR.IN., further variations were approved: in 2011, the variation modifying the perimeter of the area and of the related Units of Intervention 2 and 4, further divided into two Intervention Areas named A and B; finally, on July 24, 2014, the partial variation of area 8.18/1 PRIN was approved, concerning the modification of the perimeter of the intervention area (former Westinghouse site), the increase in the building volume for Public Utility Facilities, and the inclusion of new hospitality and ASPI uses.

Variation
8.18/3 Le Nuove

Variation notice: n.181 - ambito 8.18 / 2 spina 2 Approvata il 29/06/2009 n. mecc. 0903242/009

In 2009, partial variation no. 181 was approved concerning area 8.18/2 Le Nuove, which provided for the use of the existing Gross Floor Area (GFA) for Public Utility Facilities and a set of services. Moreover, the portion of regulated housing was removed from the regulatory sheet.

Variation
8.18/3 Porta Susa

Variation notice: n.124 - spina2 ambito 8.18/3 porta susa Approvata il 13/02/2006 n. mecc. 0512148/009

Variation notice: n.164 - variante parziale. spina 2 8.18/3. Porta susa Approvata 0/09/2008 n. mecc. 0803474/009

Variation notice: n.0515 - ambito 8.18/3 Spina 2 Porta Susa - Parcheggio pubblico n nezzanino del Passante Ferroviario. Approvata il 21/01/2013 n. mecc. 1207732/00

Variations concerning the area 8.18/3 Porta Susa were also approved: no. 124 on February 13, 2006, following adjustment requests by the San Paolo IMI Institute; the partial variation dated September 10, 2008, which required the integration of the SEA (Strategic Environmental Assessment) document; and the one from 2013 concerning the location of the station parking lot in the mezzanine of the railway underpass.

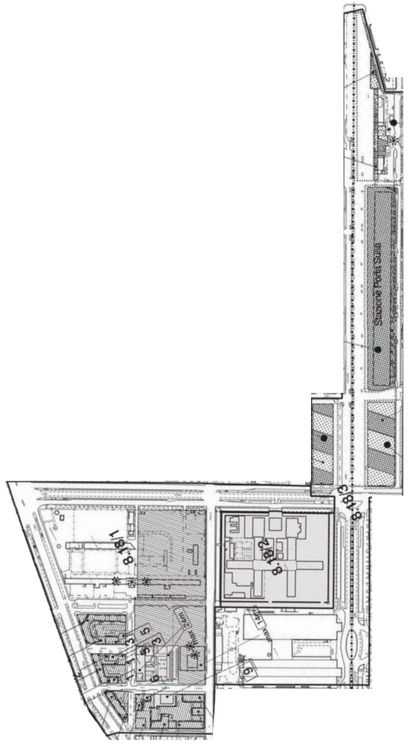


fig.33 PRG 2025. source: Geoportale

8.18/1-PRIN Spina 2	
ASPI	8%
Facilities of general interest	36%
services	35%
residential	18%
tertiary	3%

8.18/2-Le Nuove Spina 2	
ASPI	20%
Facilities of general interest	80%

8.18/3-Porta Susa Spina 2	
ASPI	10%
Tertiary	90%

Post-Industrial
ogr

As railway repair work slowed down and portions of the complex were reduced to storage and partial abandonment, OGR started its long decline in the 1970s.

Post-Industrial
civic slaughterhouse

The slaughterhouse continued to operate for many years until it was finally destroyed in 1973.

Post-Industrial
nebiolo factory

After the downfall of the sales of the Nebolio factory strikes and disputes in the 1950s later helped to form the 1971 Factory Council, one of Italy's first factory councils. The site was notable in the postwar decades for having a reasonably skilled and strongly unionized workforce (stronger than Nebiolo's Ghisa and Caratteri foundries). The region is now a part of larger urban renew al projects. The company soon start failing and the buildings were left behind.

Post-Industrial
polito

In the 1980s and 1990s, to obtain new spaces that were now urgently needed, the expansion towards Corso Castelfidardo (Sisto Giriodi, Pier Giuseppe Bardelli, Renato Piramide, 1984-1992) and the "urban window" along the wing on Via Peano (Lorenzo Mamino, Pier Giuseppe Bardelli, Piero Amore, Luciano Luciani, 1984-1994) were built, a transparent volume vertically connecting the floors. The 1995 General Master Plan began the process of doubling the size of the Polytechnic, designing its expansion beyond the railway tract that had become Viale della Spina (master plan by the Gregotti Associati studio): the historic site on Corso Duca degli Abruzzi became part of a true urban campus, the Cittadella Politecnica. The construction has ever since 1971 began and it is still on going even to this day.

Post-Industrial
Caserma Lamarmora

It was home to the Army's School of Application for several years in the post-war era. As its purpose developed further, it was modified in the 1970s to house a trial against some of the Red Brigades' past leaders.

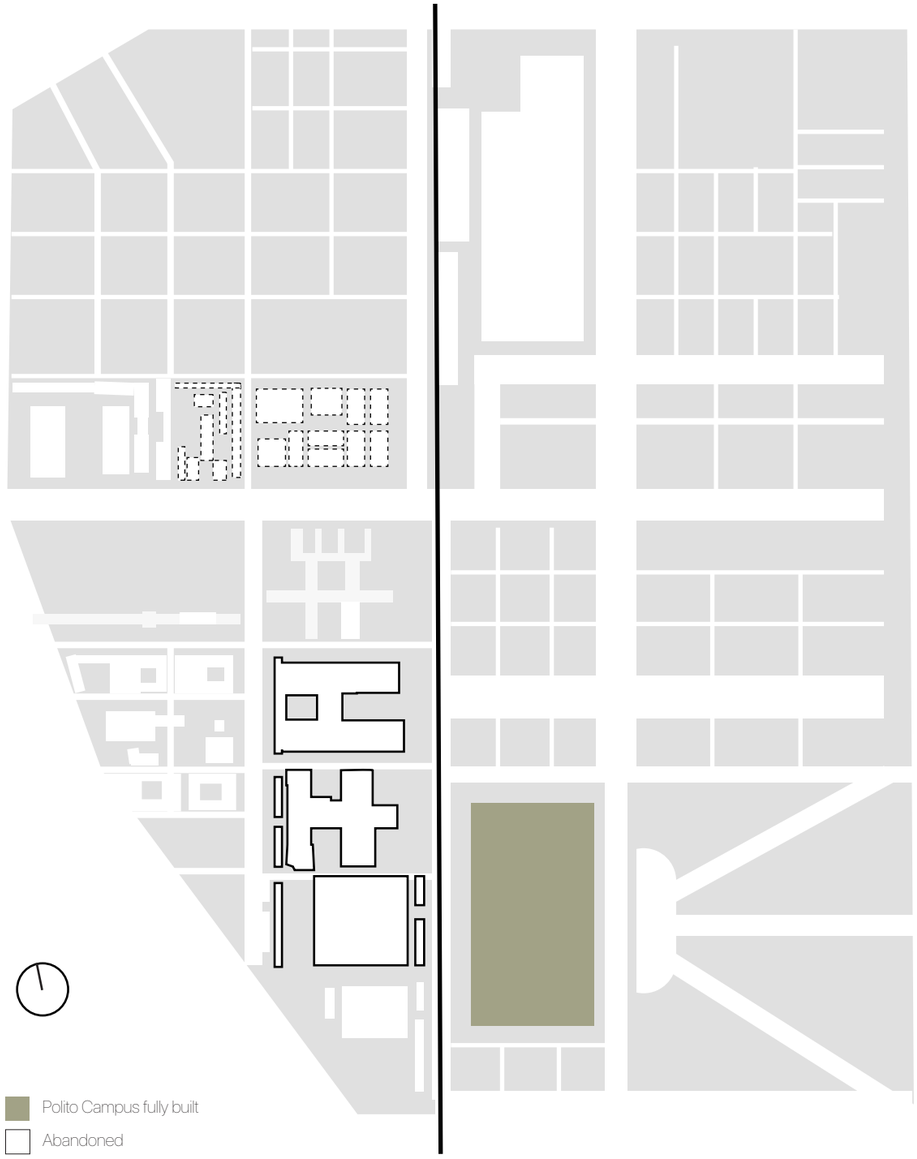


fig.34 Spina 2 1970s Map. By the authors

Modern Day
overview

Spina 2 transformed from a disjointed, rail-dominated backwater to one of Turin's most vibrant urban renewal frontiers between the 1980s and the present. Large rail yards and underutilized industrial lots hindered connectivity and investment in the late 20th century, and the city was still divided in two by the long open railway trench. These issues were formalized in the PRG/Spina Centrale planning work and a series of Politecnico studies that called for a covered pase and coordinated redevelopment.The covering of the rails projects started on 1987 and with PRG, this zones changes started taking shape.

Modern Day
ogr

By the early 1990s, operations had all but stopped and the site was abandoned, which led to a municipal zoning debate in 1995 that even permitted demolition. The Politecnico's 1997 occupation of some of the workshops marked the first instance of partial reuse, but extensive renovations didn't resume until after a number of cultural activations that maintained the buildings' structural viability and visibility, most notably exhibitions in 2008 and interventions in advance of Italy's 150th anniversary in 2011. Fondazione CRT purchased the property in 2013 and began a thorough restoration; After emergency repairs and structural consolidation, a formal Phase 1 restoration took place from 2014 to 2016, and Phase 2 finishing work, which cost about €100 million, took place from 2016 to 2019. With the "Big Bang" inauguration on September 30, 2017, the complex reopened to the public. It soon became a cultural destination, drawing hundreds of thousands of visitors by 2018. By the summer of 2019, the remaining parts, most notably the southern "Tech" wing, were operational, turning OGR from a collection of abandoned workshops into a single location for events, exhibitions, research, and innovation

Modern Day
intesa sanpaolo

The Passante/Porta Susa works (c. 2004–2011) increased the lot's strategic value, and in 2007 Intesa Sanpaolo presented Renzo Piano's headquarters project (later reduced in height from ~200 m to ~167 m). During the 1980s and 1990s, the vacant lot was largely ignored as municipal plans for Spina 2 stalled. The tower's structural erection, façade, and bioclimatic systems were completed between 2011 and 2014, after major site work and piling started around 2010. The building was formally inaugurated on April 10, 2015, after the first employees moved into the completed floors in late 2014.
The 166–167 m tower, designed by Renzo Piano, has been further integrated into Spina 2 as Intesa Sanpaolo's active, publicly oriented headquarters since 2019 through sporadic public art and urban furnishings.

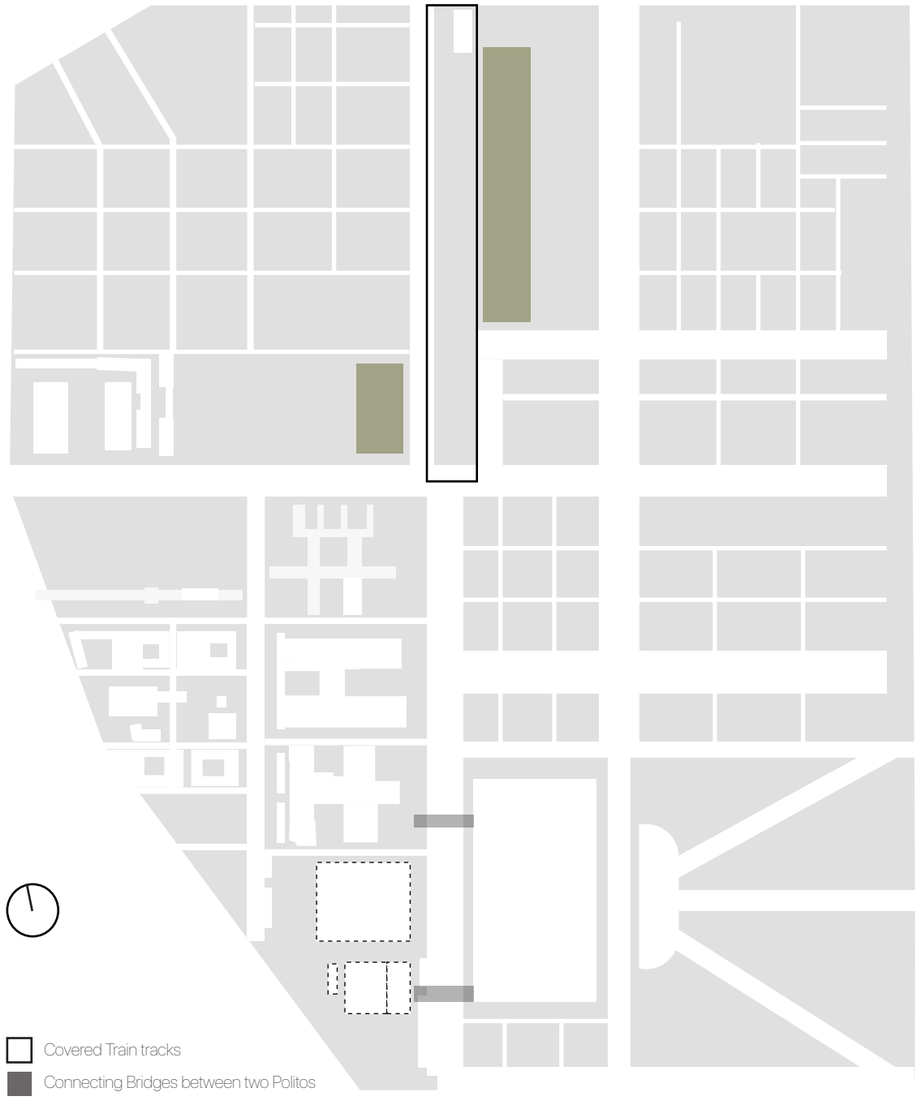


fig. 35 Spina 2 2004 Map. By the authors

Modern Day
palazzo di giutuzia

In the late 19th century, the Foro Boario and the nearby caserme occupied the western service belt—slaughterhouse, stables, and livestock market—which later made the area available for a large civic project. Realizing the practical issues caused by more than twenty scattered judicial offices, the City Council decided in 1985 to consolidate them into a single Palazzo di Giustizia, choosing the former caserme Pugnani and Sani as the site. Throughout the 19th and 20th centuries, judicial functions were spread out across a number of sites and historic palaces, creating a patchwork that reflected the lack of a single large plot and the growing litigation in an industrializing city. Beginning with the opening of construction on June 8, 1990, and the complex (called Palazzo di Giustizia "Bruno Caccia," designed by Ezio Ingaramo and Enzo Zacchiroli) that began to physically and administratively centralize dozens of functions in the early 2000s, the long, L-shaped brick complex has about 90 courtrooms, administrative offices for about 1,700 staff, underground parking, a large aula magna, and a high level of security with segregated flows for judges, defendants, the public, and detainees. These features reduced procedural fragmentation, improved detainee logistics, and freed many historic palaces for archival, library, and cultural reuse. This was a 20th-century transition that reorganized urban function and heritage use in the city.

Modern Day
portasusa

In the 1980s, Turin's master plans suggested burying the through-tracks to mend the city's north-south divide and free up valuable land for urban use, which marked the beginning of Porta Susa's transformation. The first two underground passante tracks opened on December 14, 2008, after decades of phased engineering work. Other sections were put into service throughout 2009, enabling the gradual relocation of surface operations underground.

Completed and formally opened on January 14, 2013, the station's new intermodal concourse and glazed gallery was intended to read as an urban public space rather than just a transit shed. In September 2011, the Turin Metro Line 1 interchange opened, connecting high-speed, regional, and metro services and making Porta Susa a true mobility hub. In addition to transportation, the project restored broken streets, made it possible to redevelop former railyards (the so-called "lotto torre" and FS-owned plots), and prepared the way for the adaptive reuse of adjacent industrial sites, including the OGR and Lamarmora barracks. In summary, Porta Susa changed from being a physical barrier to an urban catalyst that changed the planning and land-use trajectory of Spina 2 between the 1980s vision and the 2008–2013 construction phase.

Modern Day
le nuove prison

The Le Nuove prison in Turin underwent a gradual transformation from an operational prison to a multipurpose institutional and museum complex between the 1980s and the present. Its main operations were formally moved to Vallette's recently opened Casa Circondariale Lorusso e Cutugno in 1986. Despite this, Le Nuove was not immediately decommissioned; instead, it continued to have limited uses, including as a staff training center and a women's prison, until it was completely decommissioned in 2003–2005.

Increased civic and volunteer activity as a result of this gradual decline produced important historical and archaeological discoveries, such as the 2010 re-discovery of an anti-aircraft shelter. The municipality started organized restoration and museum-making activities in the early to mid-2010s. The former prison began to open to the public in March 2013 with guided tours and planned museum itineraries. Some wings were converted into judicial and administrative offices as part of the ongoing restoration and adaptive reuse projects in the late 2010s and early 2020s. The location is still the subject of ongoing conservation efforts, but it now functions as a hybrid entity that combines a museum.

Modern Day
ex-portasusa station

From 2015 to 2016, the Mercato Metropolitano was housed in the historic ex-station building before it was abandoned and fell into disuse.

Future development
lotto torre

The Spina 2 "Lotto Torre" site, which is designated for a new skyscraper, is located directly north of Porta Susa. When the old railyard was buried by the 1980s passante works, this rectangular 7,370 m² plot became available.It faces the 166-meter-tall Intesa Sanpaolo tower, which was finished in 1998 by Renzo Piano. FS Sistemi Urbani claims that a 160-meter-tall, mixed-use tower (approximately 45,000 square meters of floor area, 90% office) is permitted by the PRG zoning. The city and FS decided to update and implement these plans in 2018–19. Even though there isn't a building yet, this "tower lot" perfectly captures Spina 2's transformation: new commercial space in place of rail yards.

Future development
Polito

Politecnico still has on going projects and many construction sites on the newer campus that has placed ogr to complete that site.

Future development
ex-statzione susa

A real estate company(vastington hospitality) has purchased the old Porta Susa station building, which is currently undergoing restoration and being turned into a hotel. The historic structure will serve as the main entrance and common areas. The aforementioned plans demonstrate an ongoing endeavor to incorporate the station into the urban landscape and leverage its growth as a driving force behind urban revitalization.

Future development
comala & westinghouse & nebiolo

In 2021, Esselunga entails building two lots that will renovate a number of existing structures and locations. It encompasses the restoration of the former Fabbrica Nebiolo building, the former Caserma Lamarmora building, and the surrounding gardens in addition to the former Westinghouse site. A new 21,000-square-meter structure with event spaces, dining areas, exhibition halls, underground parking, and meeting rooms is part of the proposed Congress Center. A hotel is also planned for the former Fabbrica Nebiolo site, which will be constructed by partially expanding the existing industrial building to create approximately 8,000 square meters with 180 rooms and common areas.

The supermarket has received the most criticism for being a private commercial enterprise with little public benefit, despite having the smallest area. 20% of the site will be occupied by the new complex, which will house an Esselunga store and underground parking. This will drastically reduce the amount of public green space and cause residents to become irate, which prompted the creation of a protest committee. The main issue is the construction over the existing 17,000-square-meter public green space, Giardini della Caserma park. In 2023, the "EsseNon" committee plans to stage protests and take over portions of the site and adjacent barracks. but after many postpones and court dates the people have won and projects for the site so far have been canceled.

Spina 3
industrial age

Valdocco region
overview

The area of Spina 3, also known as the Valdocco region, until the mid 19th century was an agricultural area, favored by its position along the Dora river. In 19th century, with important events such as the Italian unification, Turin becoming the capital, and the development of the railway network, there were significant investments to increase industrial activities in this area. This area, precisely due to its favorable position, for the proximity to the Dora river and its canals, and the closeness to the Succursale railway stop (Torino Dora), experienced significant industrial development.

In the mid 19th century, the only existing building in the area (besides the farmhouses) was the weapons factory "Regia Fabbrica d'Armi". It was a forge for gun barrels and provided work for many workshops in the territory. Built in 1715 and expanded in the following years, the factory's activity consisted in fusing the barrels, which were then drilled, cleaned, and polished. It already represented at that time one of the largest industrial plants in Turin, both for the size of the establishment and especially for the production volume and the number of workers employed.

Already in the pre-industrial era (18th century), canals were built to exploit hydraulic energy in the Valdocco area (for the weapons factory) and in Borgo Dora (for the Royal Gunpowder Factory). In particular, the Martinetto canal was built in 1707 and the Meana canal in 1754 (now partially diverted and used by the Environmental Park). These canals were upgraded during the industrial era precisely in view of future development, to supply hydraulic energy to all the future industries in the area. In 1868, the Ceronda canal was built to the north of the Dora River.

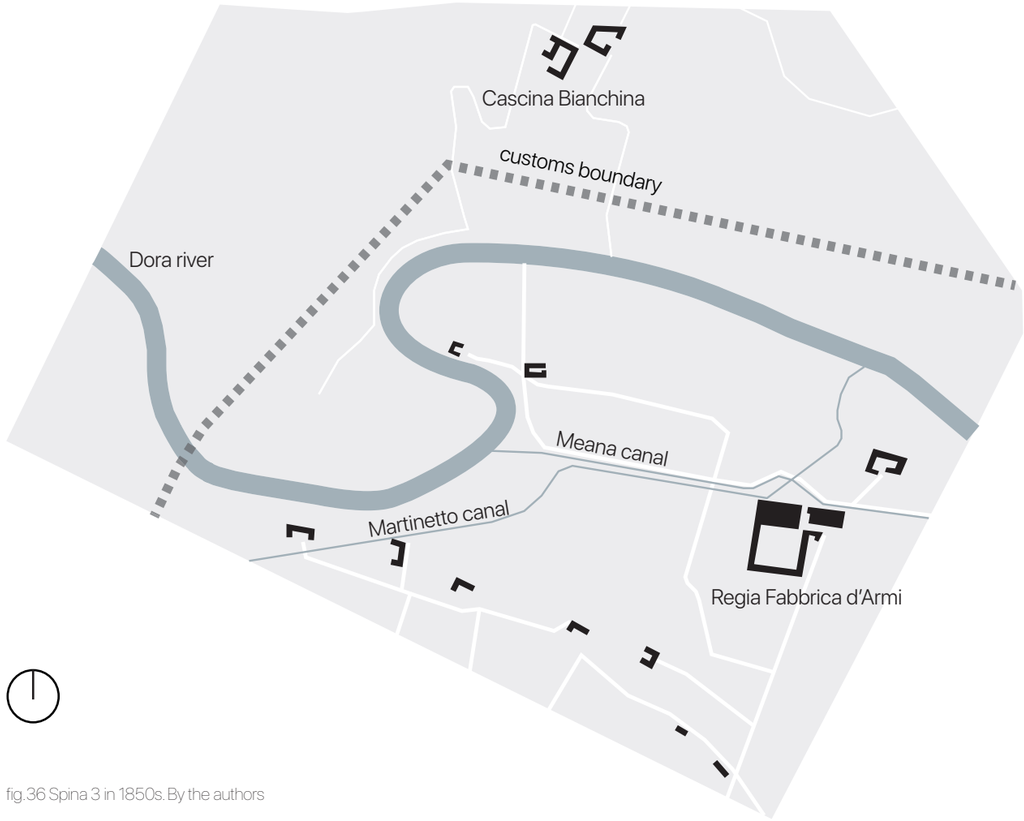


fig.36 Spina 3 in 1850s. By the authors

Industrial Prosperity

From the mid-19th century, the Valdocco area began to develop exponentially, reaching by the mid-20th century a cluster of successful industries that employed thousands of Turin residents. Already equipped with canals that provided hydraulic energy, with the construction of the Turin-Novara railway line and the positioning of the secondary station (Dora Station) just north of the Dora River, connected to the line to Ceres, this area became strategic for industries, which began building factories starting from the 1890s.

The multiplication of industrial plants contributed to the construction of a railway yard to allow a direct connection between the factories and the railway network, right in this area, the Valdocco Yard. Already during the studies for the construction of Porta Susa station, there had been discussion (in more professional terms: "consideration had already been given") of a station precisely in this location. In fact, one of the proposals for the location of the second Turin station was in the Valdocco area, corresponding to what would later become the Valdocco Yard.

The development of the Valdocco Yard began in 1905 and was designed essentially to serve the steel, textile, and rubber industries established in the area, to which it was connected by an extensive network that ran through the industrial zone and, in some points, crossed the city streets.

This industrial area was for a long period an important productive center that offered numerous jobs, contributing significantly to the development of Turin as an industrial capital. In the 1970s, the industries of the area provided approximately the following jobs:
FIAT ferriere - 11 500
Michelin- 9 500
Paracchi - 1 000
SNOS - 1 000

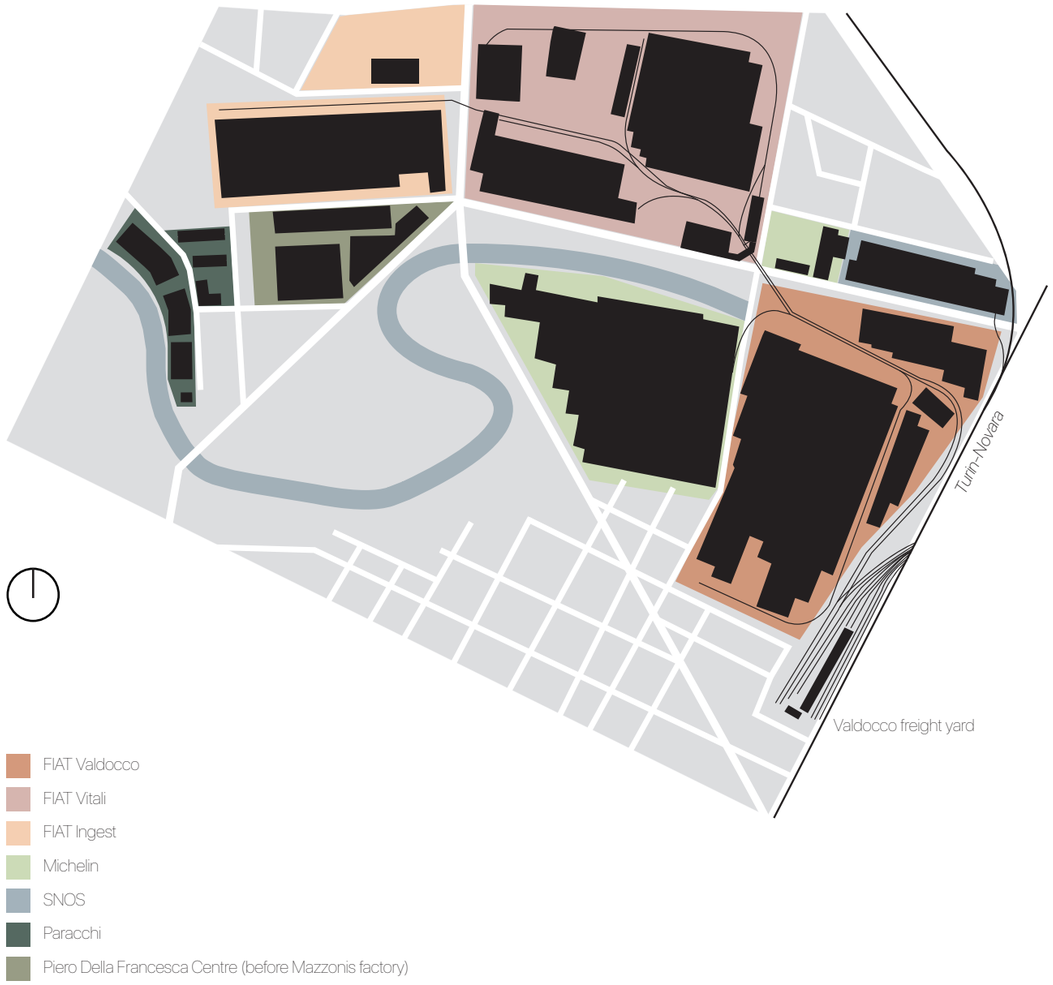


fig.37 Spina 3 in 1970s. By the authors

Industry
Mazzonis cotton mill

The first industrial plant born in this era (19th century) was the Mazzonis cotton mill, which in 1896 purchased a portion of Cascina Bianchina, located along the northern customs wall (cinta daziaria nord) of Turin.
At the end of the 1800s, the factory employed thousands of workers in the Turin area, thanks to its strategic position near the Valdocco sorting station and the Ceronda canal, which was used as a driving force by the industry for the cotton scouring. The industry was divided into two main departments: weaving and spinning. Founded as the company "Paolo Mazzonis fu G.B.", it later passed to the heirs, who founded the "Società Manifattura Mazzonis S.p.A.", opening other factories in the suburbs.
It was an important industry that gave work to many female workers.
Between 1925 and 1936, a boarding house was opened inside the factory to host young immigrant female workers. During the Second World War, the factory was damaged by bombings, but within a couple of years the structure was restored.

But between 1959 and 1963, the industry began to decline, like many other industries, due to the growing foreign competition, which highlighted the limits of the Italian cotton sector.
The production of the factory was decreasing more and more, in 1964 just over 200 workers remained, until the final closure on January 18, 1965.

In 1978, the Piero della Francesca Center was built in the cotton mil area, providing spaces and services for the establishment of industrial enterprises.

Industry
Paracchi carpet factory

In 1901, in Via Pianezza, the Paracchi carpet factory was established, founded by Giovanni Paracchi. After the First World War, it became one of the most important textile industries in Italy, as well as the first industrial carpet factory in the country, and the plant was expanded. The continuous expansion made it a top company in the sector, exporting more than half of its production.

In the 1940s, at its peak expansion, it employed over 2,000 employees.
Despite the strong growth, the company remaining completely in the hands of the Paracchi family members, maintaining a family character, .
Hit by bombings during the Second World War, it later resumed operations until the economic crisis of the mid-1970s, when, due to serious difficulties, it was forced to abandon factories and production.

Finally, in the 1990s, it definitively ceased activity in the large plant on Via Pianezza, which remained abandoned.

Industry
Ferrerie Fiat

Vandel & C. was founded in 1891, a French company based in Ferrière-sous-Jougne, specialized in the production of shoe nails and iron wire. The growing demand for processing by the Piedmontese industry pushed the company, in 1906, to open a new plant in Turin, replacing the former weapons factory "Regia Fabbrica d'Armi".

Inaugurated in 1907 under the name Ferriere Piemontesi, the plant already employed around 550 workers during the First World War. In addition to the production of special steels, it also manufactured steels for weapon parts and projectiles, and starting from 1915, it hosted a Fiat department dedicated to projectile manufacturing.
In 1917, in the middle of the war period, Fiat decided to enter the steel sector and acquired Ferriere Piemontesi. Ferriere Fiat became a company specialized in foundry and steel production, as well as in the manufacturing of machine tools, car parts (wheels and rims), electrical equipment, engines, and bodywork components. The plant in Corso Mortara was expanded: in addition to acquiring new land and buildings, electric furnaces and modern equipment were installed.

This expansion plan brought the Ferriere, in 1920, to cover an area of 400,000 square meters, employing about 3,000 workers, and made it fully capable of meeting all the production needs of the Fiat workshops.

In 1937, the plant was divided into four production groups: steelworks, profile rolling mills, tube and sheet rolling mills, auxiliary and maintenance workshops, and a spring workshop. It then employed around 3,500 workers. The number of employees grew to 4,788 in 1942, 4,792 in 1943, 4,577 in 1944, and 4,800 in 1945.

During the Second World War, one of the main anti-fascist resistance groups in Turin developed within the factory. In april 1945, the Ferriere also had to face the Liberation struggle against the Germans. Despite difficulties in defense, the resistance managed to repel the German attacks, and the plant was eventually liberated, with the help of partisan groups entering the city.

The FIAT steel plants, by then after the Second World War, covered an area of 6,000,000 square meters and were divided into three main plants:

Valdocco: The area that included the already existing plant hosted Steelworks 1, the rolling mills, and the finishing department.

Vitali: Built in the 1930s, removing some pre-existing structures such as the factory of the Società Anonima Bedarida e C. and the Scaravella and Bianchina farmhouses, the plant extended between Borgaro, Verolengo, Orvieto streets and Corso Mortara. It was the heart of the steel production and consisted of the steelworks with blast furnaces, sheet rolling mills, and the spring and pipe factories.

Ingest: The plant, built in 1939 and operational since 1950, housed the Wide Strip department, in the area enclosed by Borgaro, Valdellatorre, Thouar, and Nole streets. It was managed by the Ingest company of the Fiat group.

The Ferriere Fiat continued operating under this name until 1978, when Teksid was established, grouping together all the metallurgical and steel activities of the Fiat group. During these years, the Ceronda canal, no longer used for energy production, was employed for cooling purposes inside the factory. To accommodate the requests for progressive expansions, they also decided to cover the Dora River in order to extend the rolling mill sheds of the Valdocco complex and to link all the plants. In 1982, it was absorbed by Finsider, a company controlled by the State Holdings. The steelworks was definitively closed in 1992, following the deep crisis that affected the Italian steel industry.

Industry
SNOS

In 1899, the Società Nazionale Officine di Savigliano (SNOS) absorbed the "Società Anonima Italiana Ausiliare di Strade Ferrate, tramvie e lavori pubblici", inheriting its properties and workforce in Corso Mortara.
The plant extended over an area of 30,000 square meters and employed around 700 workers. The SNOS workshops were involved in metal constructions for railways and tramways. The company quickly gained recognition from the local population, especially for its highly specialized workforce.

In the first decades of the 20th century, the industry continued to grow, even more during World War I, thanks to numerous military contracts. The number of workerforce grew to 1,069 in 1914. Precisely during these years of expansion, plans were made to enlarge the plant and to build a reinforced concrete building along Corso Mortara (1917–1918).
The post-war period further boosted the company's production due to the many requests for reconstruction and repair of works, bridges, metal structures, and locomotives damaged by the bombings. Between 1920 and 1930, the Corso Mortara complex carried out important work in the field of metal carpentry, such as the steel arch for the roof of Milan Central Station and the Public Market of Porta Palazzo in Turin.
In those years, railway production also expanded with the construction of a wide range of locomotives intended not only for railway use but also for material transport inside industrial plants. On the eve of World War II, the plant employed 300 clerks and 1,300 workers.

During the World War II, the factory experienced repeated strikes caused by the hardships of war, hunger, and the presence of military forces in the area.
The plant became a center of worker unrest, but also an important outpost of the anti-fascist resistance with partisan cells operating secretly inside the factory.
In April 1945, the factory was occupied by partisan formations who began armed defense of the plant, fighting against Nazi-fascist forces, until the final liberation a few days later with the arrival of other partisan groups.
The building was heavily damaged during these clashes, but operations resumed within a few months.

In the 1970s, the plant entered a period of crisis, mainly due to the growing energy crisis and the increasingly aggressive competition from Japanese companies. In 1976, the majority stake was sold to General Electric, until 1999, when the plant was permanently closed and sold.

Industry
Michelin tire factory

In 1906, the french company Michelin opened a new italian tire factory in Via Livorno (then called Via Schina), due to its proximity to the Valdocco railway yard and the power plant. In the early decades of the 20th century, the work at the factory was almost entirely manual (mixing, pressing the rubber onto the fabric, and extracting the tires from the molds) and was carried out in a plant consisting of just two buildings on Via Livorno and a few internal sheds.

This factory quickly became the most important in Italy for the production of all types of tires. Starting in 1915, the site began to expand, reaching a surface area of about 150,000 square meters by 1938. By then, Michelin was a well-established company and began further construction work, even outside the production scope. In 1937, it built the Michelin Sport Club, a multipurpose recreational facility. In 1938, a residential complex for employees was built near the factory, equipped with services for workers' families, such as a nursery and a medical clinic. Among the expansion works, a direct connection to the railway line inside the plant was also constructed.

With the outbreak of World War II, the regime seized the plant and assigned its management to Pirelli. Thee production suffered a sharp decline: mainly bicycle tires (since bicycles were the only available means of transportation due to bombed railways) and military vehicle tires were produced. The drop in production forced many workers into inactivity, and many of them began doing whatever was necessary to support their families, as wages were reduced to a minimum by the government during wartime. Like the Fiat steelworks and SNOS factories, this plant was also occupied and defended by its workers in April 1945 against Nazi-Fascist attacks. At the end of the war, Michelin had to completely reorganize both its production and workforce. Director Daubrée made an agreement with the Casa di Carità Arti e Mestieri, an institute that trained new workers for the plant. During these years, Michelin continued to grow and, in 1951, incorporated the building previously owned by the Valle Susa Cotton Mill on Corso Umbria.

By 1970, the factory had reached 6,000 employees. However, in the 1970s, the French company built new plants outside Turin, equipped with modern machinery and systems that gradually made the production of the old Torino Dora plant less and less competitive. The decline became inevitable in 1982, when a new 10,000-square-meter facility was built in Torino Stura. All production activities were gradually moved to Stura, and the old plant was progressively abandoned.

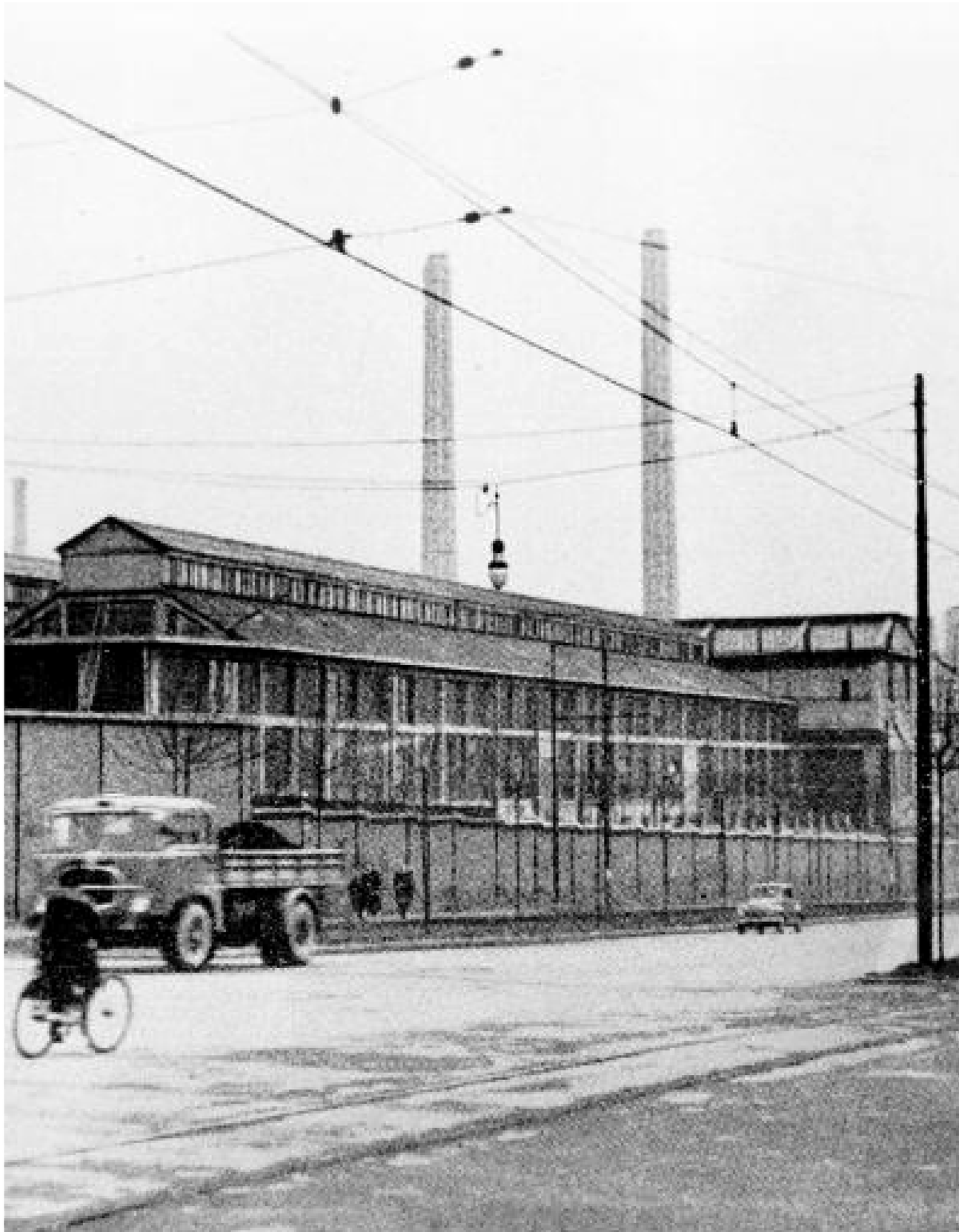


fig.38 Ferriere Dora 1950. source: Archivi Polo del 900. photo by Giuseppe Garelli

SPINA 3
PRG

PRG 1995

At the end of the 20th century, "industrial voids" began to appear: abandoned factories spread throughout the area.
In the PRG of 1995 the "Spina 3" transformation area represents one of the most complex operations due to its large size, the nature of a former industrial site that posed significant issues of remediation and environmental recovery, as well as the presence of numerous stakeholders and landowners involved in the redevelopment.
Spina 3, like the other "spines," has its own ZUT (Urban Transformation Zone) sheet, which defines the Technical Implementation Norms (NTA) for each area, setting constraints on functions, building indices, and land uses.
The TS(erritorial surface) is 1 284 218 m² and GFA 898 953 m².

Variation 1998

Nota variante: n.3 - C.so Umbria Approvata il 20/07/1998 n. mecc. 9805303/009

On June 30, 1998, the first partial amendment to the regulatory sheet of the transformation area "4.13 - Spina 3" was approved, with the aim of reducing, in relation to the planned residential settlements, the surface area of commercial settlements, with a redefinition of the areas allocated to leading activities and small specialized shops.

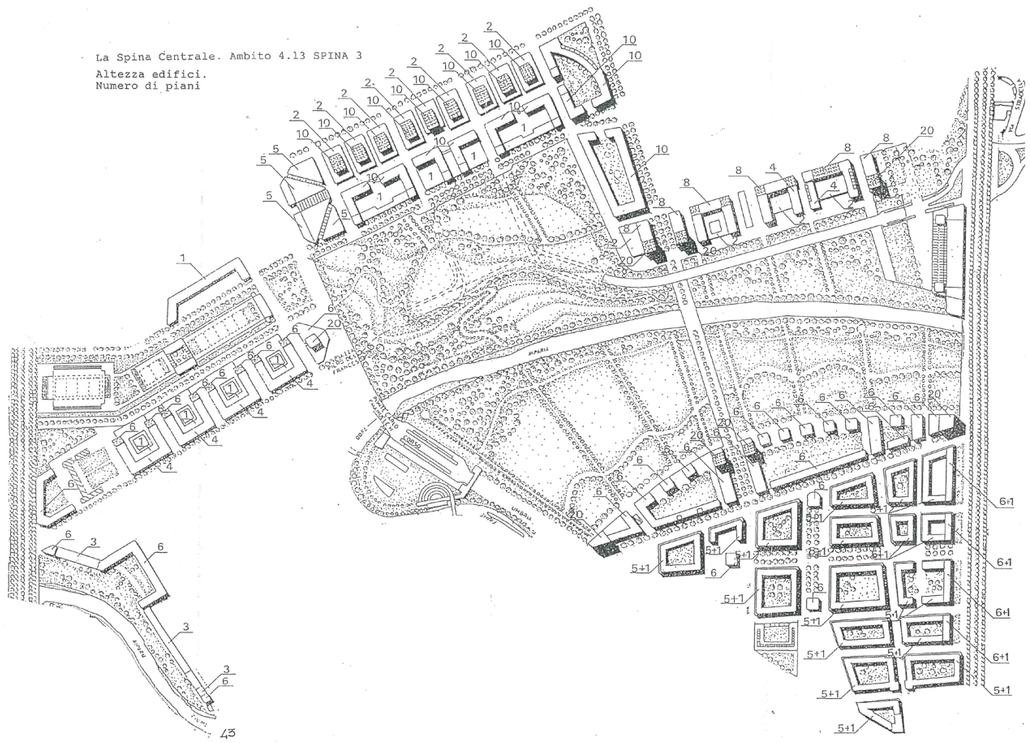
Variation PRiU-1999

Nota variante: n.A13 - Spina 3 Approvata il 27/01/1999 n. mecc. 9900150/009

The area of Spina 3 also falls under redevelopment programs that financed and accelerated its transformation. Already in 1994, the Ministry of Public Works had issued a call for the implementation of Urban Redevelopment Programs (PRiU), making financial resources available.
The aim of the PRiU was the building and functional recovery of urban areas, through residential and non-residential construction interventions, contributing to the improvement of quality of life. This program also made it possible to address the complex operation of decontamination of former industrial areas.
On January 27 1999, an agreement was signed between the Ministry, the Piedmont Region and the City of Turin for the implementation and financing of the PRiU "Spina 3," as a variation to the General Urban Plan. The main variations proposed by the program, concerning a limited territorial surface (ST)of 1,010,748 m² with SLP 586.054 m² (is assigned the code 4.13/1 in PRG) , indicate a significant change in the SLP percentages of the land use destinations. The division into districts is also defined, with names that reflect the historical industrial properties.

Variation PRiU-2001

On July 24 2001 the first amendment to the Urban Redevelopment Program Spina 3 was approved, introducing dimensional and quantitative changes.



4.13 Spina 3 1995	
residential	min 28%
ASPI	max 5%
tertiary	max 9%
commercial	max 3%
Eurotorino	55%

fig. 39 PRG 1995. source: Geoportale

Nota variante: n.A28 - Spina 3 - 1° modifica Approvata il 09/08/2001 n. mecc. 0105823/009

Following cadastral verifications, some areas were found not to be owned by the proposing parties and were therefore removed from the plan. The Territorial Surface (ST) thus decreased to 1,001,966 sqm and the Gross Floor Area (SLP) to 584,948 sqm. The amendment also provides for different land uses and a redistribution of building rights, within the same Spina 3 area. For the Ingest sector, a new Religious Complex is planned, with functions as a Diocesan Pastoral Center and two residential lots. For the Savigliano sector, the existing gallery (SNOS) facing Corso Mortara will be redeveloped for public use, partly by reusing existing listed buildings to be preserved, and partly with new buildings.

Variation 2002

Nota variante: n.35 - Spina centrale Approvata il 18/03/2002 n. mecc. 0111054/009

On March 18, 2002, the variant concerning the entire Central Spine was approved. This resolution introduces the possibility of using, within the area, additional municipal building capacity generated in other areas of the Central Spine. Furthermore, regarding the transferred development rights, only the standard requirements must be met in the area where they are implemented, while the additional requirements must be guaranteed in the area where the rights are generated.

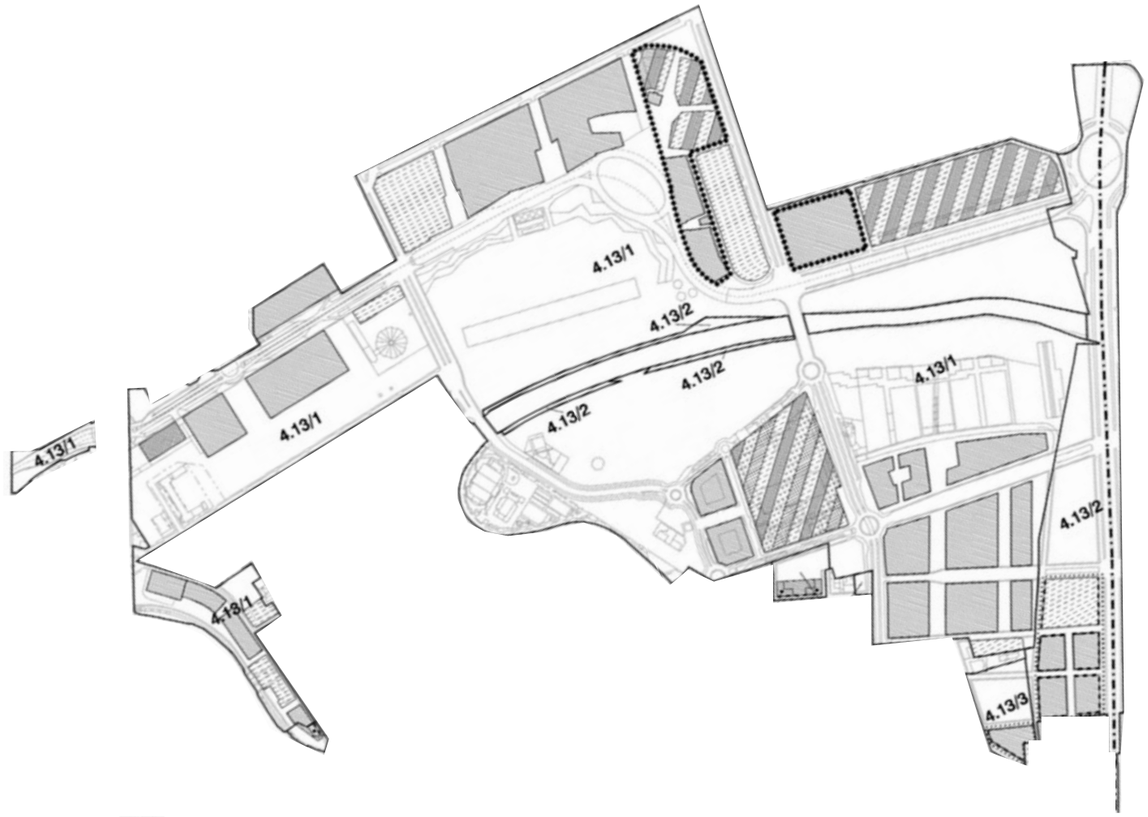
Variation PRiU-2003

Nota variante: n.A29 - Spina 3 - 2° modifica Approvata il 04/08/2003 n. mecc. 0305389/009

On July 22, 2003, Variant 2 of the PRIU Spina 3 was approved. The resolution included the adjustment of the planivolumetric configuration of some districts, the modification of the route of certain road infrastructures, the revision of some preliminary projects, as well as changes in building concentrations and, in some cases, the functional mix, to allow for the construction of the 2006 Winter Olympics Media Villages and the structures intended for artisanal activities (villages for journalists totaling 85,000 sqm, located in the Vitali and Michelin Nord districts). The signing of the Memorandum of Understanding between RFI, the Piedmont Region, and the City of Turin, which provides for the passage of the railway tunnel under the Dora river, also required the revision of the layout of Viale della Spina and its intersections with the planned road network. Moreover, the variant highlights how the adoption (May 2001) of the Hydrogeological Structure Plan involves an integration of the technical regulations and a different design of the Dora Park.

PRG 2025

All these amendments, some confirmed and others annulled, are eventually incorporated into the ZUT sheet 4.13 Spina 3 of the current General Regulatory Plan of 2025. As can be seen in the image on the right, this version shows significant differences compared to the PRG of 1995.



4.13/1 PRIU	
residential	min 60%
ASPI	max 5%
tertiary	max 2%
commercial	max 3%
Eurotorino	30%

4.13/2 Oddone	
residential	min 40%
ASPI	max 20%
Eurotorino	max 40%
4.13/3 Metec	
residential	min 80%
ASPI	max 20%

4.13/4 Treviso	
residential	min 80%
ASPI	max 20%
4.13/5 Pianezza	
residential	min 80%
ASPI	max 20%

fig.40 PRG 2025. source: Geoportale

SPINA 3
Transformation

Environmental Park
1998 - 2000

(1)The Environment Park, the scientific and technological park for the environment, is the first intervention realized in Spina 3, particularly in the Valdocco area. The idea was conceived in 1996 on the initiative of the Piedmont Region and the City of Turin. Based on a masterplan defined by the Department of Architectural Design of the Politecnico di Torino, the project, winner of the competition in 1998, designs an architecture with low visual impact, in which the construction is integrated with nature, realized with green building technologies and sustainable architectures. The works were completed in 2000.

Dora commercial Park
1999-2003

(2)Between 1999 and 2003, the works for the Dora Commercial Park, in the former Michelin South area, took place. The project of the commercial space, with attached multiplex and office spaces, is dedicated to entertainment, with the presence of stores ranging from fashion to lifestyle and food & beverage. The project transforms the area into an "organism" of different buildings but with mutual references in the pure design of the volumes and in the materials, such as glass, terracotta, and aluminum.

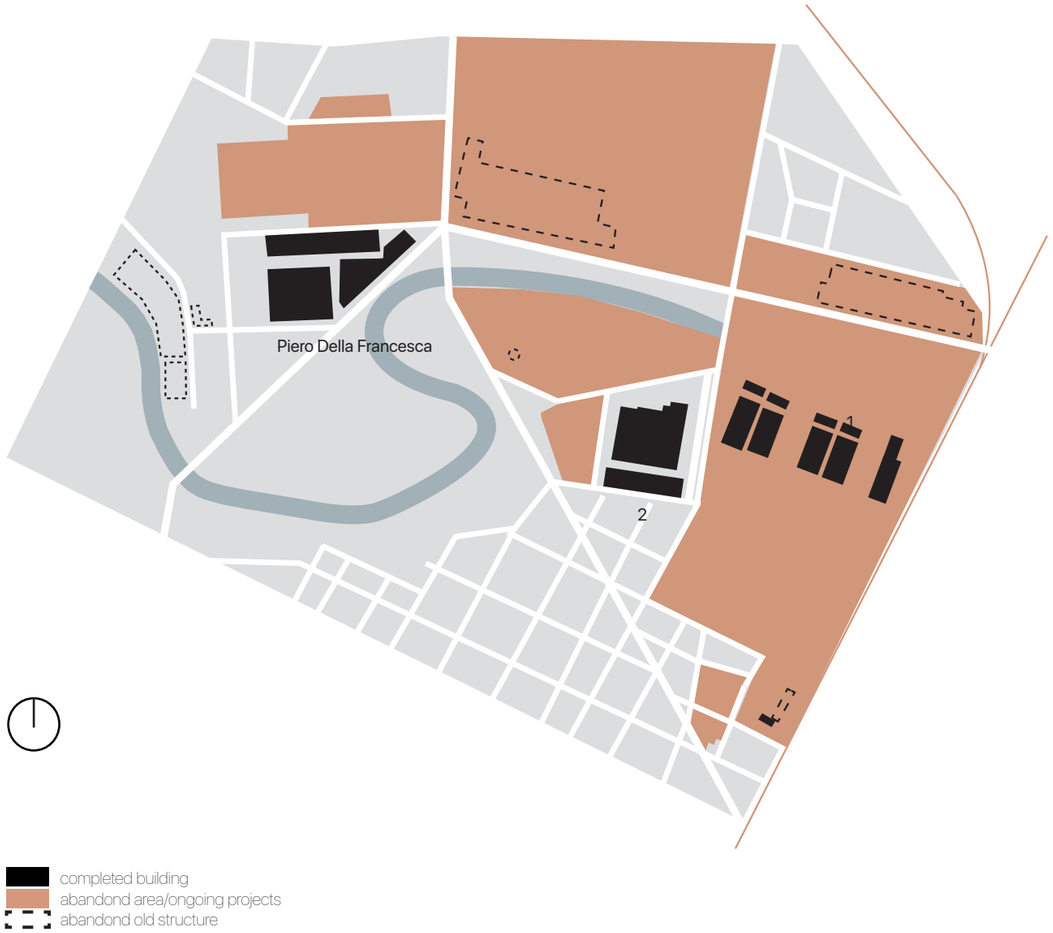


fig.41 Spina 3 2003. By authors

Valdocco residential buildings
2001-ongoing

In the Valdocco area, south of the new technological park, in 2001 the project for a complex of detached residential buildings, arranged around courtyards according to the general coordination masterplan by Gabetti & Isola, was developed. The study foresees a unified design with several residential blocks to coordinate the interventions of individual designers. The complex features buildings with heights ranging from five to twelve floors, with pitched roofs in green sheet metal enclosing private equipped courtyards; the only exception is the tower to the north of the lot, 70 meters high. The construction of this complex follows several phases:
(7)first the realization of the five western courtyard complexes (2005).
(9)Then the completion of the tower and adjacent buildings (2006).
(19)Finally the completion of the eastern complex, overlooking the former Valdocco Yard (2010); the last buildings east of the tower are still under construction today.

Santo Volto church
2004-2006

(8)In the Ingest area, the new parish complex was built, inaugurated in 2006 and designed by Mario Botta. The project arose from the need to provide religious services to the new neighborhood. The complex consists, in the northeast, of two aligned buildings: one along via Val della Torre and the other on via Borgaro, housing the offices of the Metropolitan Curia and the parish. A chimney was preserved, today symbolically wrapped by a steel spiral and renovated so that it functions as the flue for the entire building complex. Natural materials were used: terracotta brick alternated with Verona red stone for the exterior cladding and the flooring.

Micheling south residential
2004-2006

(10)Between 2004 and 2006, the Michelin Sud residential complex, called "Le Terrazze", was built. It includes 340 housing units and consists of two blocks of buildings arranged along the perimeter of two internal courtyards used as condominium gardens. The height varies between nine and fifteen floors, rising at the corners and allowing the creation of large terraces.

Micheling north Media village
2003-2005

On the occasion of the XX Winter Olympic Games, held in Turin in 2006, six media villages were designed and built, two of which in Spina 3, intended to host journalists, media, and communication operators, with the aim of providing accommodation and workspaces during the event.

(3)The Michelin Nord complex is one of the Media Villages, able to accommodate 1,464 beds. Already in 2003, construction of the complex began, which consists of three tall towers, composed of several sections reaching twenty-one floors, and six lower buildings of six/eight floors. The design of the individual buildings was entrusted to different professionals, unified through a podium that houses tertiary and commercial activities. After the Olympics, the internal layout of the buildings was modified to create 440 apartments, of which 117 were acquired by the City of Turin and designated for public housing.

Vitali Media village
2003-2008

The other Media Village of Spina 3 was built in the Vitali area, with residences, accommodation, commercial and tertiary activities, and pedestrian squares.

(4)The residential complex, built between 2003 and 2006, includes four L-shaped buildings with alternating heights, between 8 and 10 floors. The buildings were later converted in 2008 into subsidized housing apartments.

(5)In the same years (2003–2006), a rectangular-plan tower of 17 floors was built, with tertiary use on the first 4 floors and residential on the others.

(6)The commercial area adjacent to the tower was also built, which today hosts supermarkets.

(17)Finally, next to the L-shaped residential buildings, the VitaliPark was built, a complex of four buildings arranged in pairs on the sides of a central gallery covered by a steel and glass structure and crossed by walkways. The complex, whose longitudinal façades are covered with terracotta brise-soleil, includes large spaces intended for craft, advanced production, and tertiary activities. It was designed in 2003 by various studios and completed in 2007.

Ingest residential buildings
2004-2006

In the Ingest lot, in addition to the church, between 2004 and 2006 three residential complexes were built, composed of building blocks ranging from three to fourteen floors.
(12)The largest is the Olimpo Center, consisting of 386 residences.
(11)To the west of this, the second development, the Gran Paradiso complex, was built, consisting of 196 apartments under subsidized housing.
(13)On the opposite side of via Val della Torre, the Grenadier complex hosts 204 dwellings, of which 70 are subsidized housing.

Paracchi complex
2003-ongoing

The Paracchi complex underwent its transformation from 2003.
(14)First, a long linear building was constructed, located in the central part of the lot, which houses residential functions with 122 apartments and heights varying from five to nine floors. (2006)

(15)To the north of this building, a low structure was built that houses a supermarket. (2006)

(16)For the southern complex, instead, the renovation of the old office building was initiated, today housing offices, residences, and commercial activities. (2007)

Among the remains of the industrial era, in addition to the office building in via Pianezza, persist the chimney integrated into the parking lot in front of the new residences and the building at via Pessinetto 36, still awaiting transformation.

fig.42 Spina 3 2006. By authors

SNOS
2002-2009

(18)The SNOS complex underwent its transformation between 2002 and 2009. Commissioned by SNOS S.p.A., the historic wing of the complex, subject to Superintendence protection, was renovated, and six pavilions intended for tertiary activities were built. The regenerated industrial complex today hosts a shopping gallery on the ground floor, offices on the intermediate floors, and loft residences on the top floors. Behind the historic building, towards via Tesso, six newly built wings rise, with comb-shaped buildings clad in modular aluminum panels and glass slabs.

Dora Park
2007-2021

The largest and most significant regeneration of Spina 3 is that of Parco Dora, a post-industrial park that represents one of the city's largest green lungs. The idea of this regeneration was already present in the 1995 PRG; in 2003 the feasibility study was carried out, and in 2004 the City of Turin launched an international open competition. The final project of the 5 lots (divided according to the pre-existing industrial plants: Michelin, Ingest, Vitali, Valdocco, and Mortara) was approved in 2007. In the same year, the park project was included among the works to be carried out for the celebration of the 150th anniversary of the Unification of Italy. The project envisaged the preservation and regeneration of some industrial structures integrated into the greenery of the park: the Michelin cooling tower, the large stripping structure, and the thermal power station of the Fiat steelworks. The park was thus built in different phases across the various lots:
for the anniversary of the Unification of Italy, in 2011, (20)the Vitali lot, the largest and most central, with the regeneration of the stripping shed, (21)Valdocco, and (22)Ingest were completed; (24)the Michelin lot was completed in 2016;
(25)the Valdocco Nord/Mortara lot in 2021, including the complex and long uncovering works of the Dora river, completed in 2018.

fig.43 Spina 3 2011. By authors

Vitali north
2000-ongoing

Among the construction sites still open is the Vitali Nord lot. The design of the area, defined by the 2000 coordination scheme, provides for the development of a compact building along Via Verolengo, composed of four residential blocks open towards the south, interspersed with pedestrian and vehicular paths arranged as a continuation of the existing axes. At the western end of the lot, a complex with commercial and tertiary functions is planned, including a tower about 20 stories high and a pedestrian square. To the south of these residential and commercial buildings, in the area adjacent to the park, seven 14-story towers are planned, while at the eastern end a building intended to house a nursery and a kindergarten is foreseen.

(23)The only building constructed to date is one of the four residential blocks with the tower to its south, however less than 20 stories high, completed in 2012.

Paracchi residential
ongoing

Also the last building left abandoned of the Paracchi complex is about to undergo transformation. The complex of 1,600 square meters on 4 floors was purchased in 2024 by the company Olivero Impianti Srl of Fossano. The property is intended to host residential housing.

Dora Station
ongoing

Also Dora station is part of the project for the undergrounding of the railway link, which foresees the completion of the underground railway station of Dora, at the moment planned for 2028. In 2009, due to financial constraints and changes in infrastructural priorities, the works for the completion of Dora station were suspended and the structure, already excavated and with the entrances prepared, remained in a state of incompleteness for over a decade. Today, thanks to the arrival of funds from the National Recovery and Resilience Plan (NRRP), there is the possibility to resume the works interrupted years before.

Scalo Valdocco
ongoing

Also remains unfinished the area of the former Valdocco Yard, property of RFI, currently at the center of an analysis for its redevelopment.

fig.44 Spina 3 2025. By authors

URBAN ANALYSIS

In this chapter we go into detail in the urban analysis of the two areas and of the surrounding zones, highlighting how the Innovation Mile is a strategic area for the regeneration of Turin. Several aspects are analyzed, fundamental for understanding the current situation of this part of the Spina of Turin: an analysis of the circulation network that underlines how the two lots, and more generally all the areas adjacent to the "Viale della Spina", present an intensified transport axis (vehicular, cycling, railway, bus and tram, and pedestrian) and promote development along this axis; a strong study of the functions (land uses) and services that highlights a strong residential presence in one case (Spina 3) and a strong presence of services and tertiary activities in the other (Spina 2), together with the respective lack of some essential services for the two different urban fabrics. Finally, the environmental conditions of the whole area: on one hand the negative aspect of noise pollution caused by the busy roads, especially that of the Central Spina, to be taken into account in the design phase, on the other hand the presence of green areas that enhance the Turin territory. These analyses are fundamental to fully understand how the two different urban fabrics of which the sites of the Innovation Mile are part are structured.

Circulation Network

Public transportation map

0 0.25km 0.5km 1.0km

fig.45 Public transport map. Source: openstreet maps (edited by the authors)

Legend

- Site areas
- Funcionting train tracks
- Out-of-service train tracks
- Tram/Bus lines
- Tram stops
- Bus stops
- Metro Line
- Metro stops

This map demonstrates the diverse typology of public transportation present in our site areas. This depiction helps us detect the potentials, strengths, and issues that have arisen from the high concentrations of all these different modes of access in a very specific area, and to further understand the importance of this area.

Circulation Network

Circulation map

0 0.25 km 0.5 km 1.0 km

fig.46 Circulation map. Source: Geoportale (edited by the authors)

Legend

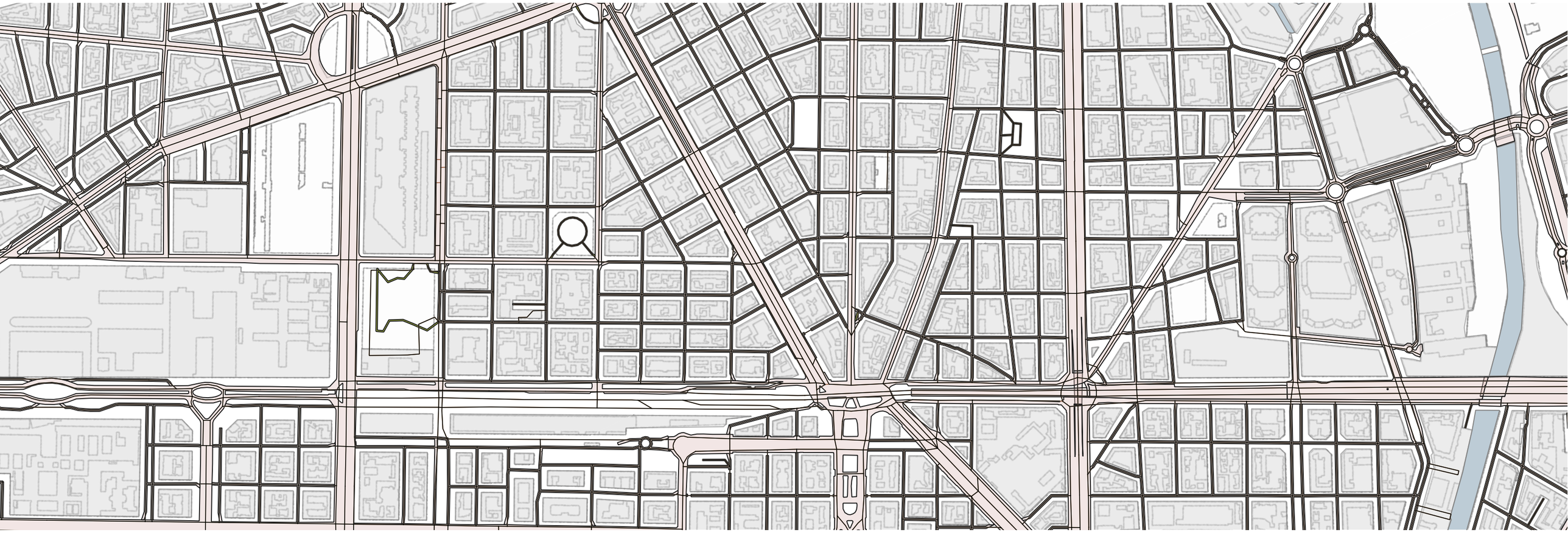
- Pedestrian Areas
- Cycle path on lane from the roadway
- Dedicated cycle path
- Shared cycle and vehicle route
- Cycle path on lane from sidewalk
- Shared cycle and pedestrian paths
- Cycle paths in areas
- Bike sharing stations

This map demonstrates the diverse typology of bike lines and the pedestrian areas. This depiction helps us detect the shortcomings of bike lines and connections in both Spinas, creating space for improvement. The pedestrian areas and how they connect the park with the neighborhood could be reproducible and inspiring.

Circulation Network
Road map

0 0.25km 0.5km 1.0km

fig.47 Roadmap. Source: Geoportale (edited by the authors)



Legend

Road element

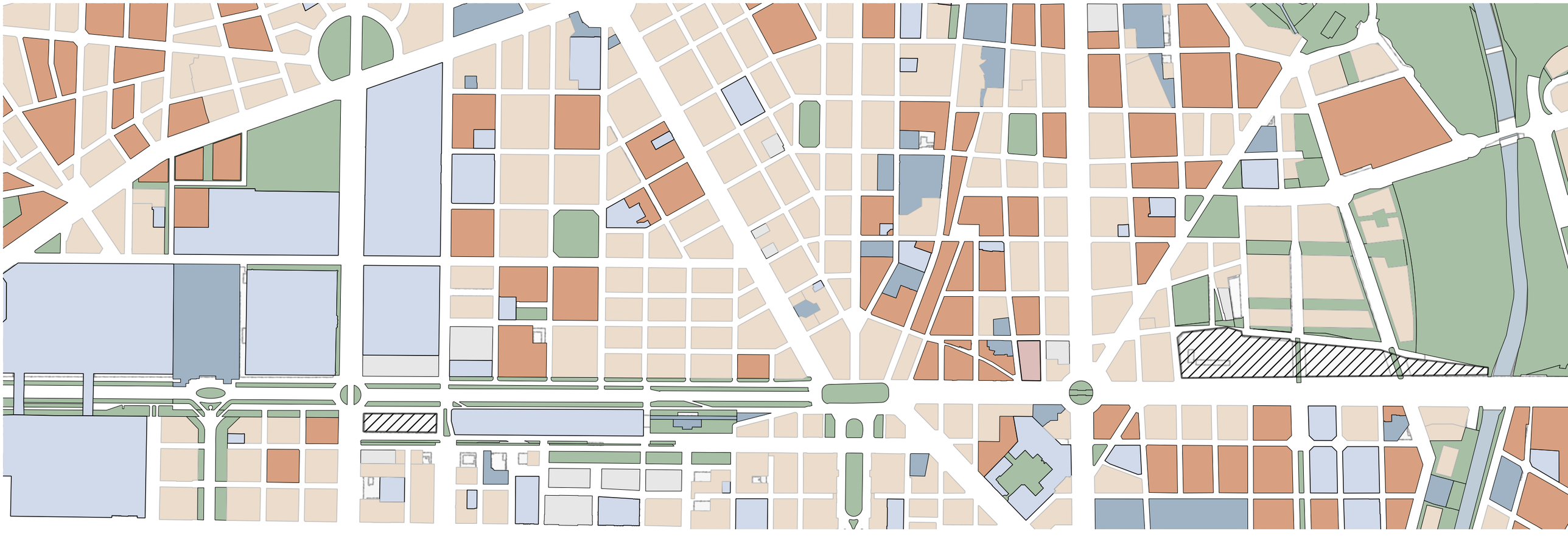
Vehicle Circulation Area

This map demonstrates the existing vehicular streets network. This depiction helps understand the crucial importance of the Spina Centrale and why it is called the "backbone," not only from the point of view of public transportation but also from that of one of the most used means of transport in Turin, cars.

BUILT INFRASTUCTURE
Land-use map

0 0.25km 0.5km 1.0km

fig.48 Land-use map. Source: Geoportale (edited by the authors)



Legend

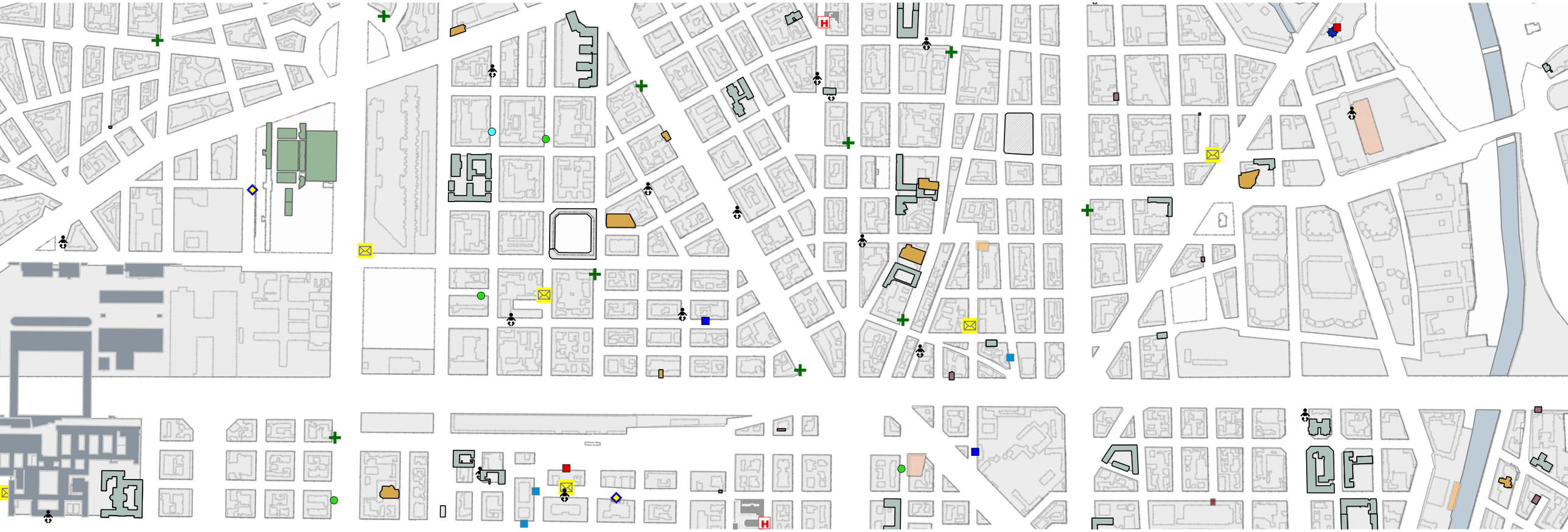
- Project site
- Residential
- Residential with commercial
- Ressidential with manufactoring
- Tertiary section
- Green areas
- Public services zone
- Private services (public interest) zone

This map demonstrates current land-use zonings. This depiction helps us understand the different urban fabrics appearing in the two Spinas, hence attracting different users to each zone as a result. This depiction can help recognize the necessary typology of land uses needed in each site, emphasizing the difference in the approach needed.

BUILT INFRASTUCTURE
Main services map

0 0.25km 0.5km 1.0km

fig.49 Main services map. Source: Geoportale (edited by the authors)



Legend

- Theaters
- Museums
- Sport facilites
- Cinema
- Libraries
- Local markets
- Childcare facilities
- Universities
- Schools
- Churchs
- Other places of worship
- Official post-offices
- Administrative buildings
- Consulates
- Police stations and headquarters
- Carabinieri
- Municipality Police
- Social and welfare services
- Hospitals
- Community health centers
- Pharmacies

This map demonstrates the existing services and their kinds. This depiction helps us see the obvious lack of necessary services in both the Spinas, more evidently in Spina 3, emphasizing the need for a change in the urban point of view for Spina 3 future developments.

ENVIRONMENTAL CONDITIONS
Acoustic pollution map

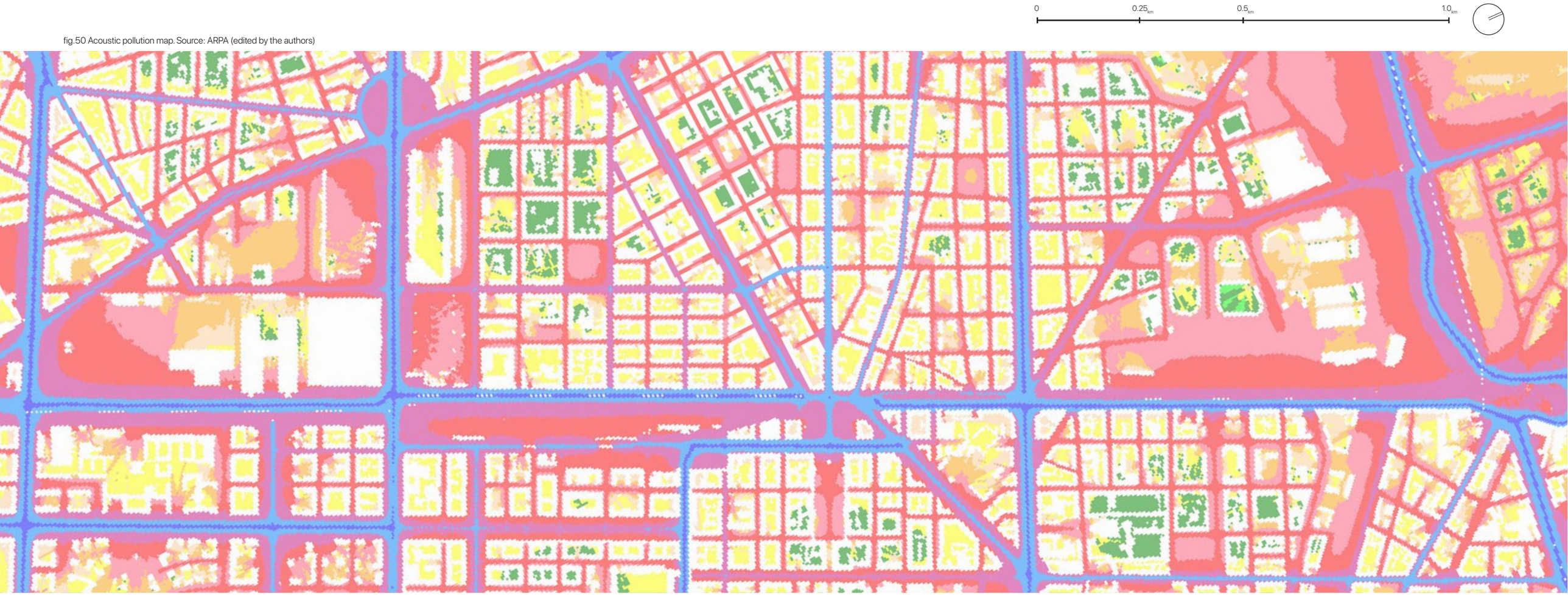


fig.50 Acoustic pollution map. Source: ARPA (edited by the authors)

Legend

- <35 dB
- 35-39 dB
- 40-44 dB
- 45-49 dB
- 50-54 dB
- 55-59 dB
- 60-64 dB very noisy
- 70-74 dB
- 75-80 dB
- >80 dB extremely noisy

This map demonstrates the levels of noise pollution. This depiction helps us understand that the project area faces a road that causes discomfort for the users. By extracting these data, the design step could be taken with more aware choices.

Environmental Conditions

Green areas map

0 0.25km 0.5km 1.0km

fig.51 Green areas map. Source: Geoportale (edited by the authors)

Legend

- Trees and vegitation
- Green areas
- River
- Building parcels

This map demonstrates the greenery density and individual tree-lines in both areas. This depiction suggests a shortage of tree-lined streets in Spina 3 comparatively and also demonstrates the potential of the Parco Dora and the local green zones yearning a connection.

SOCIO-ECONOMIC FRAMEWORK

In this chapter, the objective is to deepen the knowledge of the socio-economic aspects of the two project areas and their impact, useful for the design phase. Initially, a detailed analysis was conducted on the demographic and economic aspects of the populations that form the societies of the two areas. Following this in-depth societal analysis, the main actors of Innovation Mile were identified and classified. The analysis of the two areas was then carried out, highlighting the positive and negative aspects using a multi-aspect approach to ensure a multidimensional reading of the contexts. Based on this accurate research, effective strategies for the project were defined in close relation to the analysis conducted. It was also demonstrated how these strategies, specific to the two areas, align with the main objectives of Innovation Mile, providing a broader and more complete vision. The outcome of this study lays the foundations for a strategic redevelopment of the areas, with the effectiveness highlighted by comparing three possible scenarios: the inertial scenario where nothing changes from the current situation, the tendential scenario foreseen by the Municipality, and a strategic scenario.

Community Insights
Demographic composition

Foregneirs
In the context of Turin

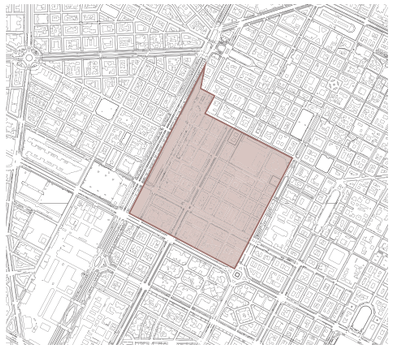


fig.52 Zone 08: 0.72 km²

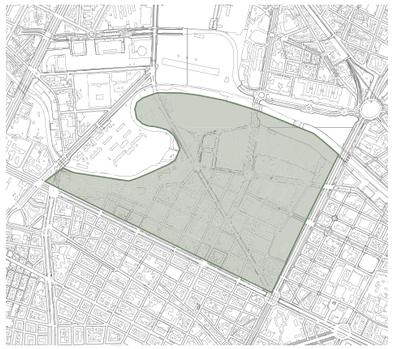


fig 53 Zone 25: 0.88 km²

1. Zone statistiche: aggregations of multiple census sections and represent one of the sub-municipal territorial units into which the territory of the City of Turin is divided; in total, there are 92 zones. (Comune di Torino Open data)

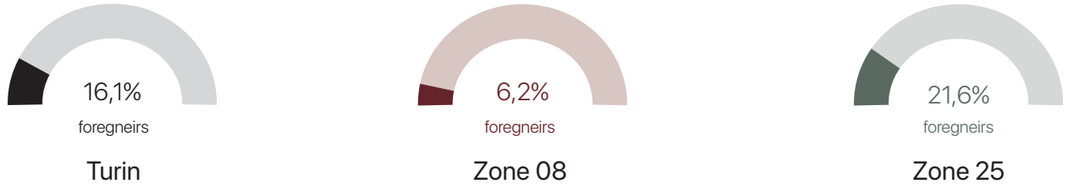
The first step of the methodology adopted in this research involves the extraction and analysis of the data on the demographic trends and on the socio-cultural compositions, carried out at the scale of the Statistical Zones ("zone statistiche[1]") and compared to the city level. The choice of selecting these data by statistical zones, which represent the smallest area for which the data are calculated, is based on the will to capture with greater precision the localized variations.

All the data have been gathered at the date of 31 December of each year, ensuring in this way temporal coherence in the historical series analyzed, necessary for identifying trends on an annual basis. The areas taken in analysis include both the project areas and the surrounding area significant for the purposes of this analysis. The data used for Statistical Zone 08 (Comandi Militari - Stazione Porta Susa) and Statistical Zone 25 (Piazzale Umbria - Scalo Valdocco) have been obtained directly through the Geoportal and the Statistical Office of the Municipality of Turin, which guarantee reliable and updated data.

The analysis in *fig. ?* immediately shows a significant difference in the percentage of foreign residents between the city of Turin and the two statistical zones. The two areas are positioned at the opposite extremes, highlighting two profoundly different demographic dynamics: the central area (Zone 08) has one of the lowest percentages of foreigners in the city, while the more peripheral area (Zone 25) shows one of the highest percentages.

The analysis proceeds by comparing these percentage datas observing their variation over time, always based on the data provided by the Municipality of Turin. This analysis reveals that the foreign population in Turin has been progressively increasing since 2013, confirming a constant trend of growth. This population tends to settle in areas like Zone 25, which, although it has recently recorded a slight decrease of foreign residents, is characterises as a more peripheral area, densely populated and with a younger population, preferred compared to more central zones like Zone 08, where the population is generally older.

fig.54 Percentage of foregneirs in 2024



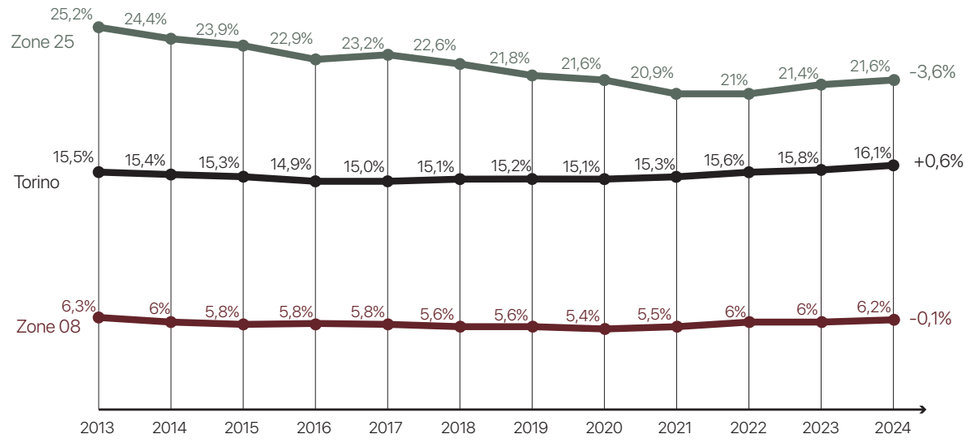


fig.55 Percentage of foregneirs from 2013 to 2024. Data from the City of Turin Geoportal and Statistical Office (2025)

Foregneirs

From the analysis of the data, it emerges that Statistical Zone 08, situated in the historic core of the city, continues to record a constant growth of the resident population. Concerning instead the socio-cultural component, the area configures itself as a zone with prevalent Italian composition with a small percentage of foreign residents (6.2%).

Statistical Zone 25, located in a district of more recent development and peripheral character, shows instead a progressive decrease of the resident population, resulting however more densely populated compared to Statistical Zone 08. Instead, the data on foreign citizens show how this zone presents a significantly higher percentage of residents born abroad compared to Zone 08. Despite this share showing a progressive decrease starting from 2013, the data confirm the nature of Zone 25 as a populous and multicultural district, characterized by a consolidated presence of non-Italian communities which contribute to defining the social fabric of the area.

The divergences recorded in terms of demographic density and percentage incidence of foreign citizens reflect the different identity of the two urban contexts and are fundamental for understanding how the demographic composition influences housing needs and the demand for services.

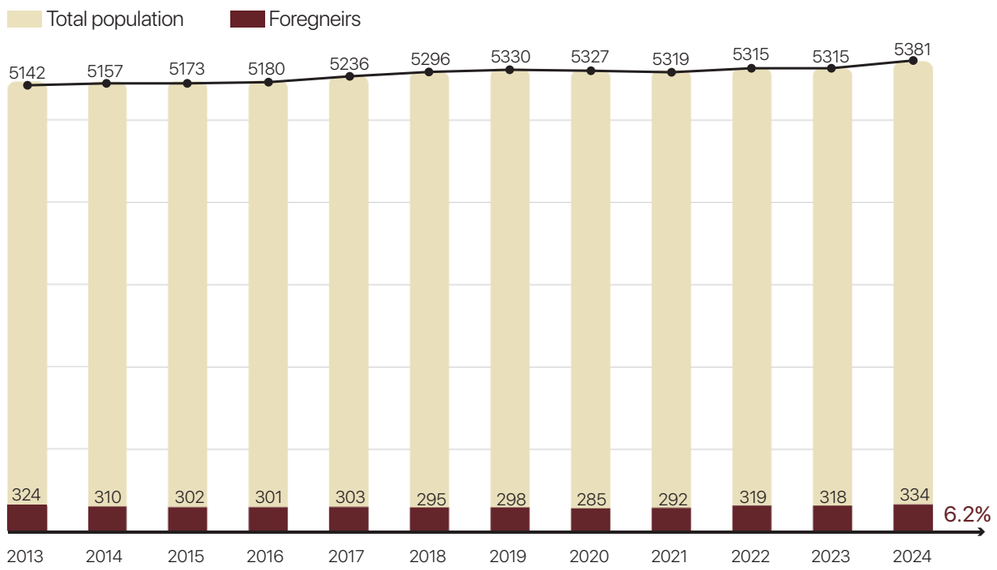


fig.56 Diagram of the total population and foreigneirs from 2013 to 2024 (zone 08). Data from City of Turin Geoportal (2025)

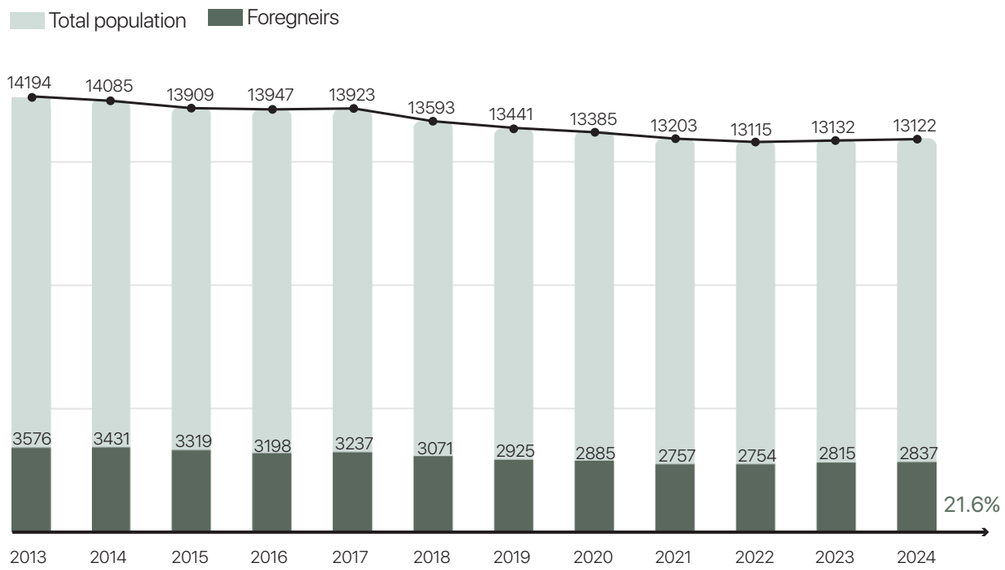


fig.57 Diagram of the total population and foreigneirs from 2013 to 2024 (zone 25). Data from City of Turin Geoportal (2025)

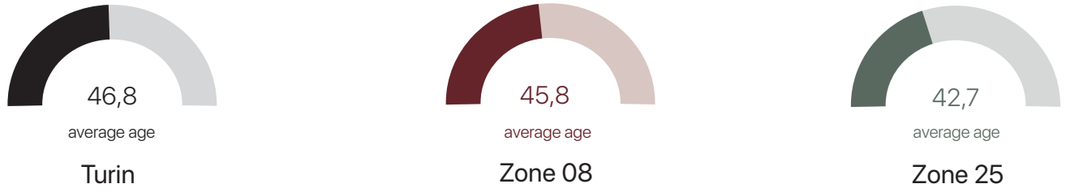
Average age
In the context of Turin

The following step of the analysis delves deeply into the resident population, with the objective of comprehending its composition in relation to the age groups, investigating whether the examined areas are predominantly populated by young people, workers, or elderly people. First the investigation was carried out for the two Statistical Zones 08 and 25, compared to the city average, with the use of the data provided by the Municipality of Turin.

The comparison between the average age of the resident population in the two areas and the city average of Turin present a significantly difference, both have an average age lower than that of the entire city. In particular, Zone 25 confirms itself as characterised by a population that is, on average, much younger than that of the broader urban context, while Zone 08, despite having an older population than Zone 25, still has an average age lower than that of Turin.

This analysis shows that both zones, although having an average age lower than that of the city, are registering a progressive ageing of the population, especially Zone 25, which is getting closer and closer to the Turin average. This trend highlights how these areas are also following the demographic trend of the city, with a share of elderly population in constant increase.

fig.58 Average age in 2020



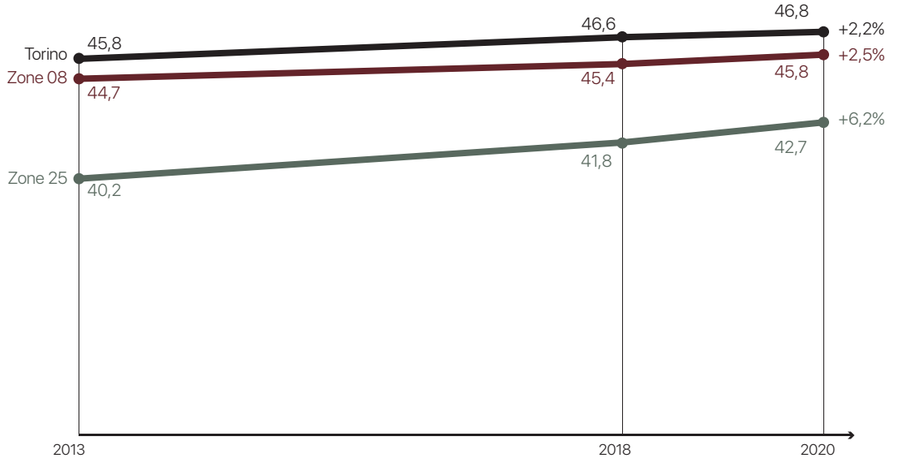


fig. 59 Average age from 2013 to 2020. Data from Open Data Portal, City of Turin (2018)

Average age

Then the detailed age datas of the two zones have been aggregated into age groups to make the analysis clearer and more meaningful. The data provided by the Municipality for the statistical zones refer to the years 2013, 2018, and 2020, with no specific data available for these areas after this period. However, these data already allow the population trends to be highlighted, which is the main aspect of interest for this analysis. The choice to group the population into homogeneous age ranges, each composed of the same number of years (17), allows a real comparison between the different age groups, avoiding possible distortions deriving from non-homogeneous intervals. In this way, the age groups are comparable to each other, enabling a more precise identification of the weight of different components within the population. The following age groups were therefore identified: 0-17 years, non-workers minors and children; 18-34 years, young workers; 35-51 years, workers; 52-68 years, older workers and early retirees; and over 69 years, retirees.

The data analysis shows that in Statistical Zone 08, the population is becoming increasingly elderly: almost half (44%) of the population is over 52 years old, a figure that has increased since 2013. On the contrary, the younger population, under 35, has been decreasing since 2013. It is also notable that the percentage of elderly people, over 69, is higher, even if slightly, than that of young workers aged 18-34, configuring Zone 08 as an area with a prevalence of an elderly population, that is steadily increasing, with a presence of workers, but to a lesser extent.

Statistical Zone 25, instead, is less populated by elderly residents, even if has been gradually increasing since 2013. The under 35 group, while showing a slight decrease over time, continues to represent a significant share (36%) of the resident population, resulting higher than the over 52 group (34%). Moreover, the data show that the central group of workers aged 35-51 years is the largest and has remained stable since 2013, without significant variations. It emerges that Zone 25 is characterised by a population predominantly composed of workers, with a youthful component still consistent, while the share of the elderly population is increasing but not predominant.

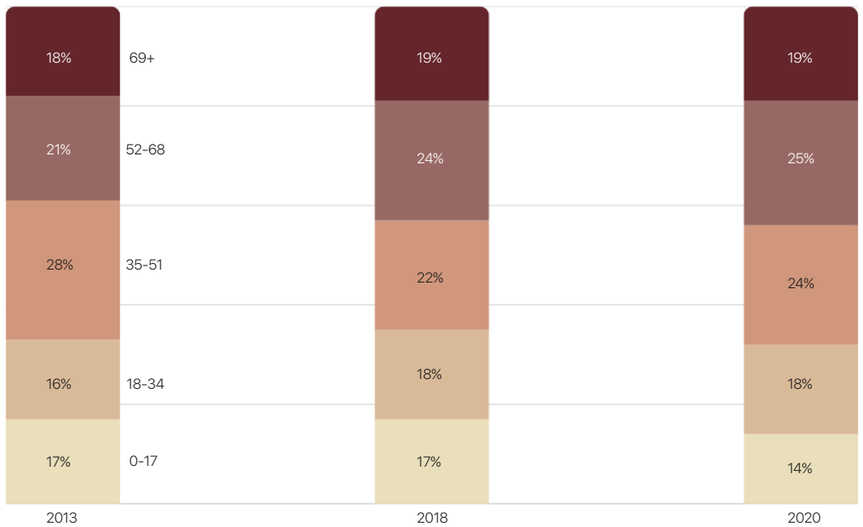


fig. 60 Demographic distribution by age from 2013 to 2020 (zone 08). Data from Open Data Portal, City of Turin (2013,2018,2020)

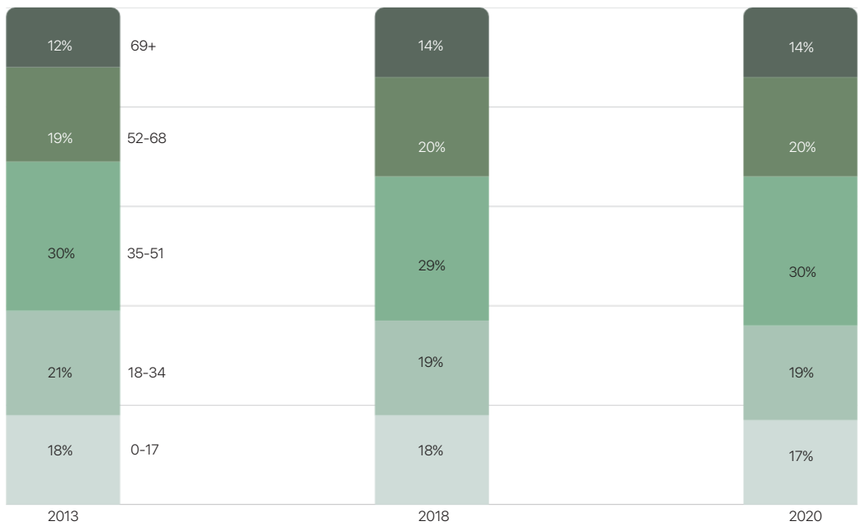


fig.61 Demographic distribution by age from 2013 to 2020 (zone 25). Data from Open Data Portal, City of Turin (2013,2018,2020)

Community Insights
Income overview

Population income over time

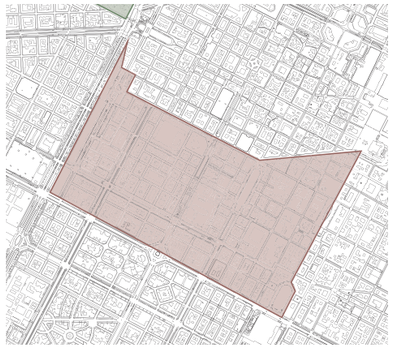


fig.62 CAP 10121

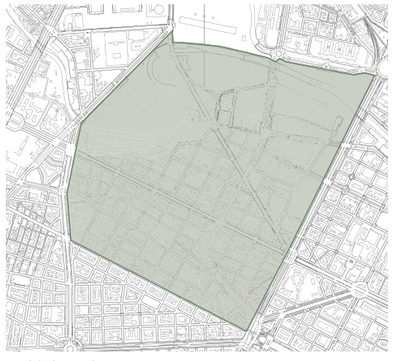


fig.63 CAP 10144

A fundamental aspect to explore for understanding the compositions and trends of the resident population in the two areas is the analysis of incomes. Indeed, it is essential to know not only the amount of residents' earnings with a broader vision over time. The data used in this investigation come from the Ministry of Economy and Finance (MEF). In particular, the analysis and subsequent graphic elaboration are based on the file "Redditi e principali variabili Irpef su base comunale, classificazione Sub-Comunale(CAP)" (incomes and main Irpef variables at sub-municipal level".

The two sub-municipal areas considered are identified by postal codes 10121 (which includes the area from Porta Susa station to Via Roma) and 10144 (from the Dora River to Piazza Statuto). Although they are larger than the corresponding Statistical Zones, they represent the most detailed territorial units for which income data are available, thus providing adequate information for our analysis.

By reprocessing the data provided by the MEF, the graphs show how the total average income of the two areas varied over time (2015-2023). Since there were no further data between 2015 and 2019, a temporal gap appears in the graphs.

Firstly, the trend of the total annual average income of the two areas and the annual average income of employees is shown, considering that it is the most common type of work/income source in both areas and therefore it is useful to observe its trend.

From this comparison, it emerges that the total average of the area with CAP 10121 has slightly decreased since 2015, while the average income of employees has decreased by more than 10%. On the contrary, in the area with CAP 10144, the average has gradually increased since 2015 in both cases (total and employees), even if slightly less for employees.

fig.64 Average Annual Income of Residents 2015-2023 (10144). Data from italian MEF (Ministero dell'Economia e delle Finanze)

Population income over time

2: Ordinary-accounting entrepreneur: any business (including all corporations and those exceeding the simplified-accounting limits) must follow Article 2214 of the Civil Code and DPR 600/1973 by maintaining double-entry records with journal, inventory, VAT and auxiliary ledgers.

3: Simplified-accounting entrepreneur: under Article 18 of DPR 600/1973, an individual, partnership or non-commercial entity with annual revenues less than €700 000 (goods) or €400 000 (services) that may keep only the VAT journals and a fixed-asset register.

To better see the trend of the average over time, graphs have been made showing the trend of the average for each different employment categories: employees, pensioners, self-employees, entrepreneurs under ordinary accounting (enterprises)[2], and entrepreneurs under simplified accounting[3] (small enterprises).

From the graph it is possible to see the differences between the categories of work occupation and how they vary over time, also in comparison with the trend of the average annual income of the area. It can immediately be noticed that in both areas the trend of certain categories, such as that of Entrepreneur under ordinary accounting, does not follow the general average, while it is the Employee category that has more effect on the mean.

It can also be seen the difference in the trend of the same categories in the two areas, in some cases even showing opposite patterns, which highlight a profound social identity difference between the two contexts.

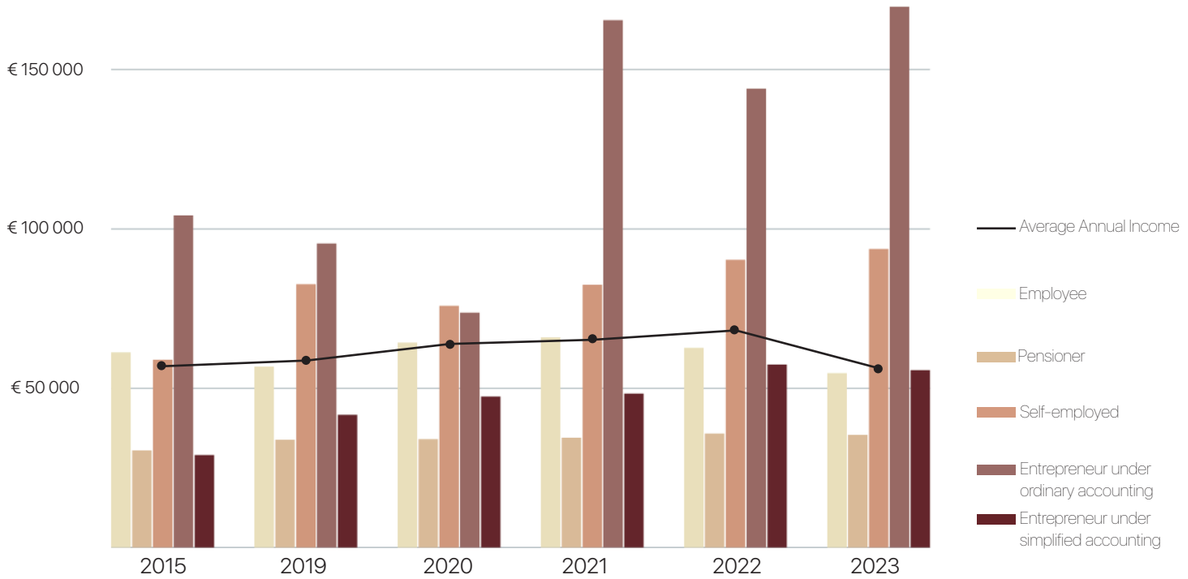


fig. 65 Average Annual Income of Residents by Job Type 2015-2023 (10121). Data from italian MEF (Ministero dell'Economia e delle Finanze)

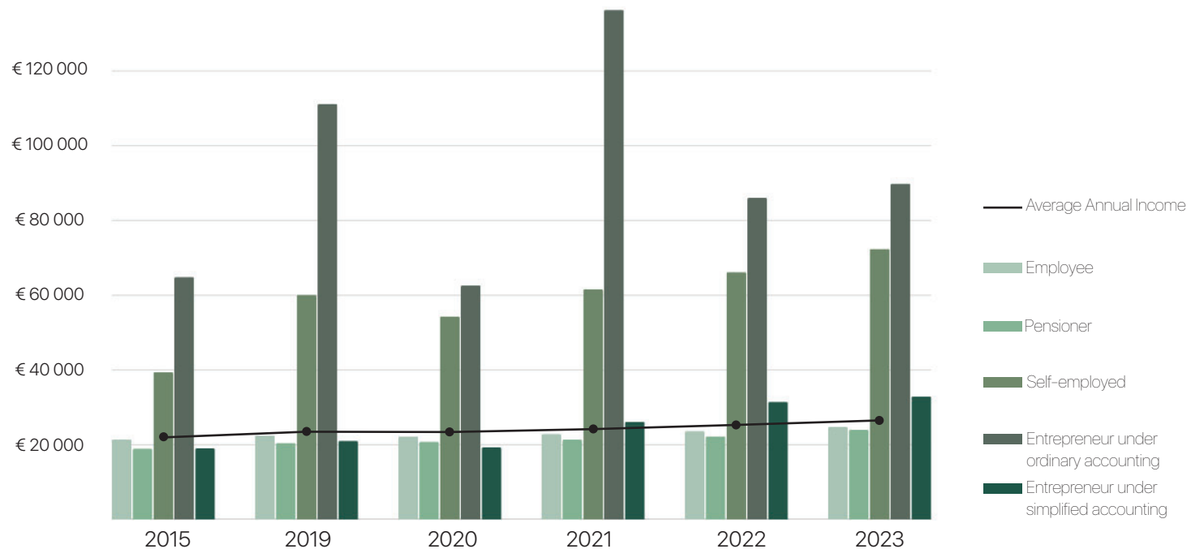


fig. 66 Average Annual Income of Residents by Job Type 2015-2023 (10144). Data from italian MEF (Ministero dell'Economia e delle Finanze)

Population income

Another fundamental assessment concerns the distribution of the population according to different employment categories for the most recent year with available data (2023). For each category, the average income was calculated, useful for highlighting internal economic differences and comparing the two areas.

In the area with postal code 10121, a good percentage of employees and a smaller but significant share of self-employees emerge. Moreover, the average income of enterprises is markedly higher than that of all other categories.

Conversely, in the area with postal code 10144 the average incomes appear overall lower: the average income of an employee, who represents 64.9 % of the resident population, is less than half that of an employee in the more central area. The share of employees is also higher in this area, while the percentages of enterprises and self-employees are lower. Although the presence of small enterprises is similar in percentage terms, the main difference concerns self-employees, who are far fewer than in area 10121.

From these data it can be deduced that in area 10121 there is a clear predominance of residents with higher incomes, thanks to a combination of high-income employees and self-employees, whereas in area 10144 the income structure is concentrated primarily on lower-income employees and a smaller presence of enterprises and freelancers.

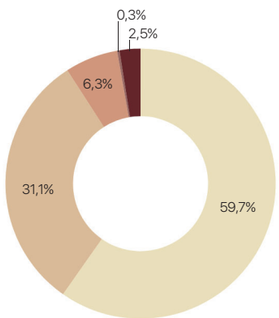


fig. 67 Residents by employment type chart (10121)

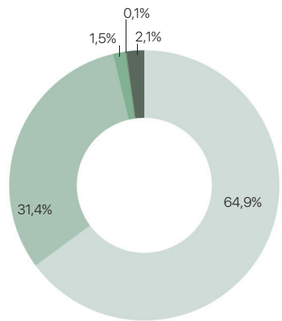


fig.69 Residents by employment type chart (10144)

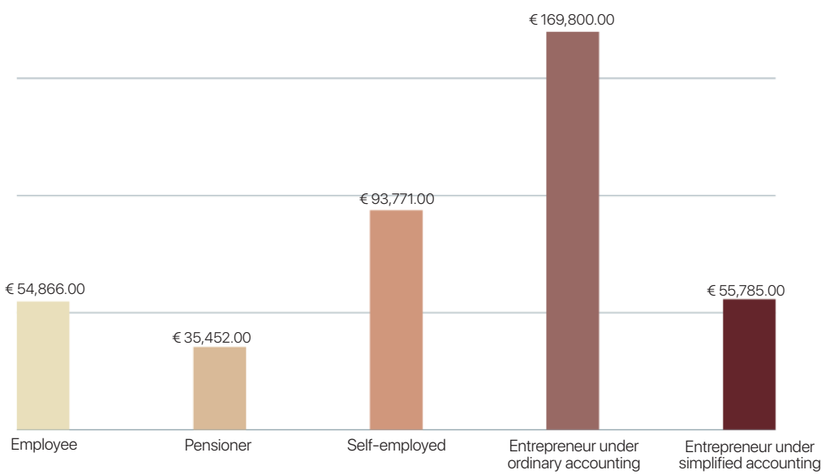


fig.68 Residents annual average income for type of job in 2023 (10121). Data from italian MEF (Ministero dell'Economia e delle Finanze) (2023)

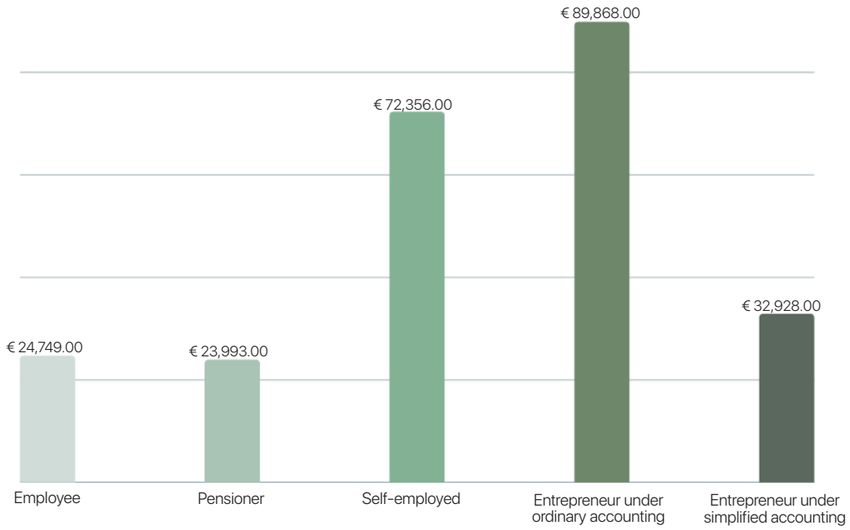


fig.70 Residents annual average income for type of job in 2023 (10144). Data from italian MEF (Ministero dell'Economia e delle Finanze)

Income classes

The next step in the analysis of incomes is the identification of the income classes and of the distribution of the population within these classes. After the analysis of the types of work and the related average incomes, it is indeed fundamental to know the income of the total resident population. To analyse this aspect in the best way, it is necessary to look at the annual income classes, which have variable ranges defined by MEF, and to see the number of people who are part of that class to know their income, even before looking at the average income of the entire population, an important data but not specific enough for this analysis (it will be used later).

Basing on the average household income of the city of Turin for the year 2023, equal to €57,216 (data calculated on the base of the data always provided by MEF for the Municipality of Turin), the classes are defined as follows: less than €10,000 (very low or null income), €10,000-€15,000 (very low income), €15,000-€26,000 (low income), €26,000-€55,000 (medium/medium-low), €55,000-€75,000 (medium/medium-high income), €75,000-€120,000 (high income), more than €120,000 (very high income/wealth).

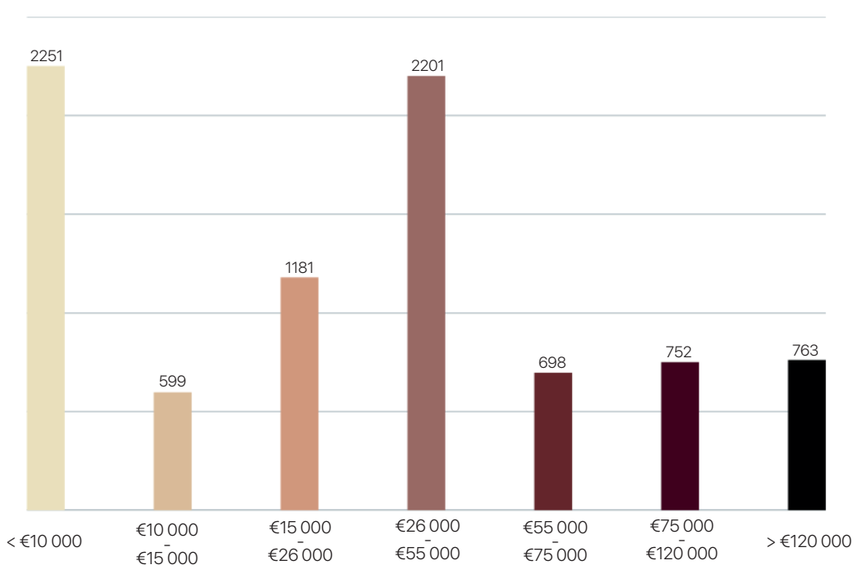


fig. 71 Population distribution by official income brackets in 2023 (10121). Data from italian MEF (Ministero dell'Economia e delle

In the area with ZIP code 10121 it is immediately noted how the most populated class is the one with null or negative income. It is also seen how the medium/medium-low class is also very populated. A data that must be underlined is instead the high number of people who are part of the classes with higher incomes. The population of this area is identified for the most part with medium-high income and a large part with almost null income (students, unemployed, pensioners with minimum pensions, occasional workers).

The area with ZIP code 10144 instead shows that the most frequent classes are those with medium-low income (€26,000-€55,000) and low income (€15,000-€26,000). Few people fall into the higher income classes above €55,000. Also here the lowest or null class is populated, not as much as in the area with ZIP code 10121. Therefore, this area is identified as an area with a population with medium-low income, with also some very high income but few people fall into it.

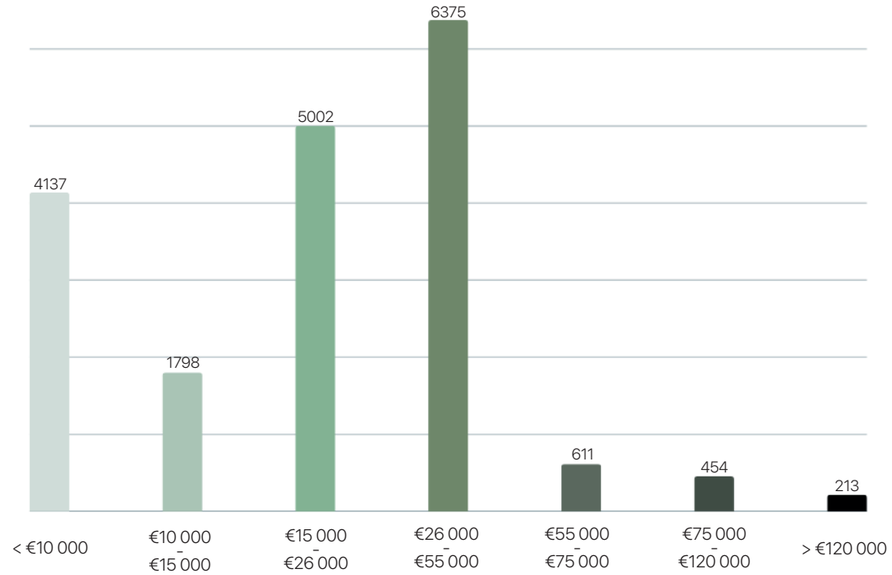


fig.72 Population distribution by official income bracketsin 2023 (10144). Data from italian MEF (Ministero dell'Economia e delle

Community Insights
Real estate market

Real estate market analysis over time

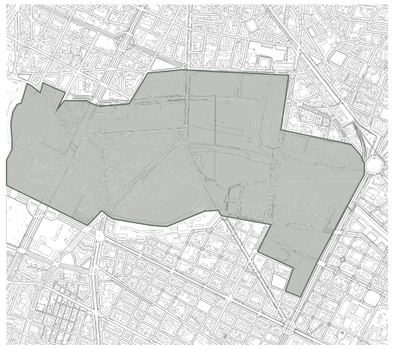


fig.73 Zone D9 Eurotorino-spina 3

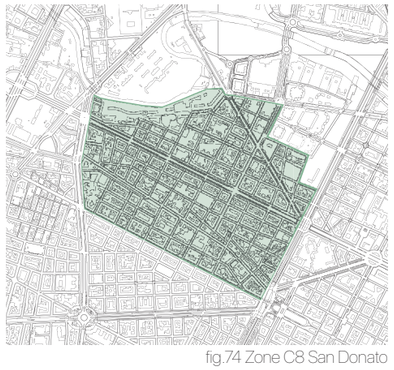


fig.74 Zone C8 San Donato

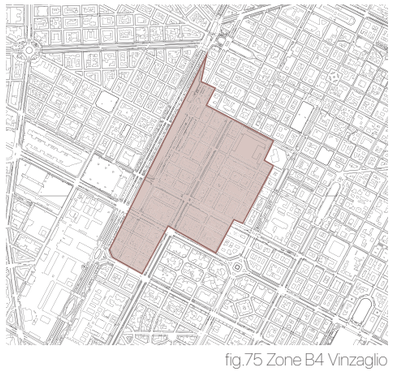


fig.75 Zone B4 Vinzaglio

Another fundamental analysis to do to understand the dynamics of the population in the two areas is the analysis of the real estate market. The OMI (Real Estate Market Observatory) of the Italian Revenue Agency makes a first subdivision of the data by building type (residential, commercial, and offices); secondly, the residential houses are classified by type (civil, prestigious, economic, and villas) and by state of conservation (normal, excellent, and poor).

From these data, those relating to residential civil houses in normal state of conservation are selected, in order to make a more precise comparison between the areas under analysis and also within the same areas over time. The areas defined by OMI are again different from the statistical areas and the postal code areas, therefore, in order to conduct an accurate analysis, the areas that cover the previously analysed population were selected. The three areas analysed are therefore: D9 Eurotorino-Spina 3 (which includes the project area and also the area north of the river), C8 San Donato (which includes the area adjacent south of the project site), and B4 Vinzaglio (smaller area that includes the houses adjacent to the project site and Porta Susa station). The graphs show how the ranges (minimum and maximum price) of prices per square meter of civil houses change over the years from 2014 to 2024. As a premise, it is necessary to consider the trend of the Italian real estate market, which saw in 2013-2014 a crisis of demand and supply that lowered the price of real estate quotations, while from 2016, thanks to the reduction of mortgage rates and building bonuses (such as the Superbonus 110%), the demand started to increase again, causing prices to rise.

From the graphs, it is immediately evident that the two areas D9 and C8, very similar in range in 2024, are very different from B4, the more central area. The minimum of B4 in 2024 turns out to be well above the minimum of the other two areas. However, observing the trend over the last 10 years, it is seen that D9 and B4 have increased since 2014 with a similar trend, while for the C8 area the prices have decreased from 2014 until 2020 and since then have been increasing, so much that 2024 shows the same range as in 2014.

Regarding this area (San Donato), it should be considered that it had a negative reputation, but in recent years it is recovering thanks to interventions such as the construction of the Piazza Statuto vehicular underpass opened in 2016, which has improved pedestrian accessibility and has made the area more attractive.

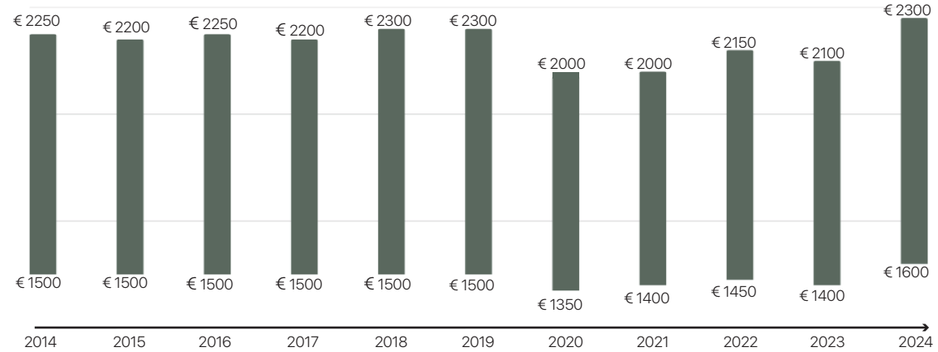


fig.76 Trends in Residential Price Range for mq (D9). Data from OMI, Agenzia delle Entrate (2025)

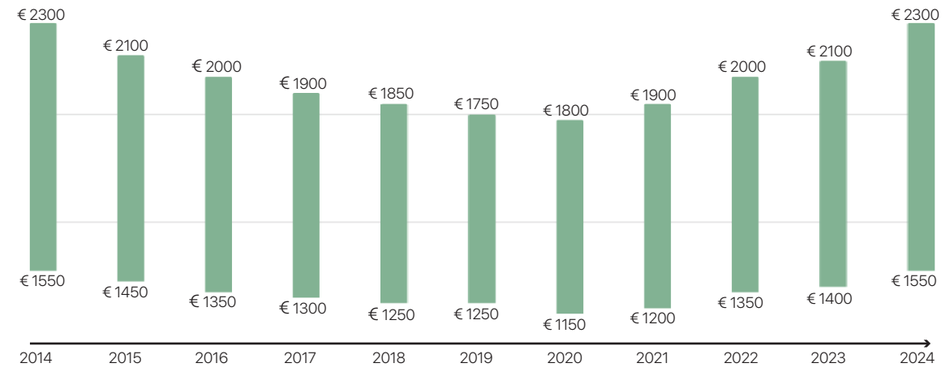


fig.77 Trends in Residential Price Range for mq (C8). Data from OMI, Agenzia delle Entrate (2025)

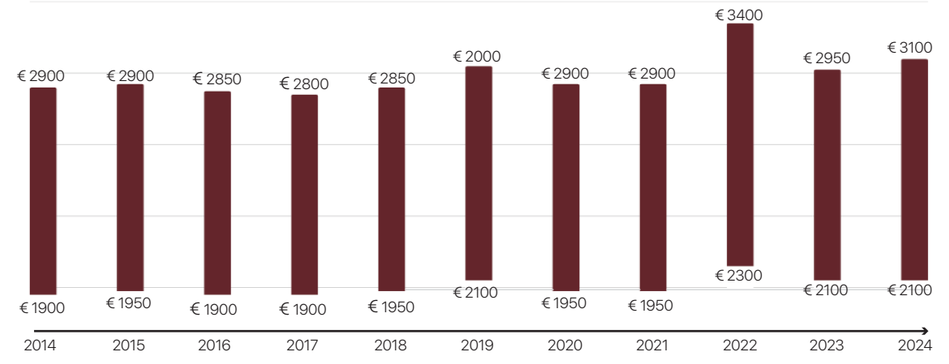


fig.78 Trends in Residential Price Range for mq (B4). Data from OMI, Agenzia delle Entrate (2025)

Population and real estate analysis
conclusions

The area that surrounds the first portion of the project (UMI II) constitutes a central urban context characterized by constant demographic growth and by a prevalence of Italian residents, with a progressive aging of the population. On the economic front, the area presents mostly medium-high incomes, thanks to a mix of well-paid employees and self-employed workers, however flanked by a significant share of very low incomes (students, minimal pensioners, unemployed). The real estate market also confirms this dynamic, with high average prices that reflect the high average income of the residents and a gradual increase in valuations in recent years.

The area that surrounds the second portion of the project (Spina 3–Oddone) is instead a district of recent development, denser and more multicultural, which, while maintaining a relatively young average age, is progressively aging. Here incomes concentrate especially in the medium-low brackets, with few high-income positions and a reduced presence of enterprises and freelancers. On the real estate front, in recent years a growth in prices has been recorded, also supported by infrastructural interventions that have improved its accessibility and attractiveness.

STAKEHOLDERS MAPPING
Classification

Stakeholders and actors
importance

After gathering all these data, and sorting them out; the next helpful step for a complicated decision in our case is the identification of the powers at play through defining the actors and stakeholders. The sociologist Bruno Dente deemed it necessary to differentiate between actors and stakeholders, since the actors directly influence the decision-making process, while the stakeholders include all subjects who are influenced by and involved in the process, without necessarily being able to make decisions.
In the case of our project, the analysis of actors and their relationships is fundamental to organizing the outcome of the design and its effects, cause they can directly affect the process; meanwhile the stakeholders can be affected by the choices and as designers we have a responsibility to uphold on their side.
The analysis highlights exactly how each actor they will act, becoming a support tool for the development and formulation of strategies.

Regarding our project since there exists two different zones we should start by defining which zone they affect, Spina 2 or Spina 3.

Stakeholders
resources

Following that, to understand the dynamics among actors, it is important to analyze the resources they have at their disposal. Their resources comprise of these 4 types:
Political – Economical – Legal – Cognitive

Political resources represent the amount of consensus that an actor is able to obtain, cause inherently the number of the masses is effective.

Economic and financial resources consist of the capacity to influence the behavior of the means of finance and lead to the feasibility of the project.

Legal resources define the advantages and disadvantages attributed to subjects by the law and administrative authorities. As an example, prohibitions and restrictions related to certain activities that violate public rights or the PRG could be mentioned. Cognitive resources define the availability of information related to the decision-making process. Knowledge is fundamentally important in order to make the most appropriate choices in the design phase, and the possibility to choose among various alternatives depends greatly on the information regarding project proposals, associated costs, and benefits.

Actors
types

At its fundamental to the existence of the stakeholders could be divided into five different categories based on the points of view, which is also very important to the decision-making step: political actors – bureaucratic actors – actors with special interests – actors with general interests – experts.

Political actors are at their core based on the decision-making process on the fact that they represent the masses. So their source is democratically based, decisions cannot be made without popular consent.

Bureaucratic actors are at their core based on intervention on the understanding that legal norms assign them a specific capability within the decision-making procedure, therefore having formal and legal competence to intervene. The rules determine who has the right to make certain decisions, which procedures must be followed, and the constraints to which the public decision-maker must adhere when defining the content of the decision.

The special Interest actors instead justify their involvement by pointing out that the decision among various alternatives directly affects their interest either by imposing costs or offering potential benefits. Whether they are companies, individuals, category-based organizations, or residents of a particular area, these actors often engage in the decision-making process to steer outcomes in accordance with their power.

General interests are those actors that have no political or legal legitimation and that base their claim of intervention in the decisional process on the fact they represent subjects and/or interests that cannot defend themselves, that are not structurally able to act in first person hence why they are considered general.

And finally Experts claim the right to intervene based on having the expertise to define the problem and identify the best solutions. The idea is that only professionals who work with these issues have the proper knowledge to make sound judgments; so they should be involved as much as possible in decision-making. Naturally, their approach is rooted in a specific logic: relying on the scientific method, gathering and analyzing solid evidence, staying open to debate and peer review, and rejecting ideological bias or anything that seems unscientific or irrational.

Stakeholders level

The different groups of stakeholders have also been classified by level of impact and relationship type as **Local-National-International-Regional-Municipal**

Local actors comprise individuals or organizations who live or work in the area of intervention; they will have the most immediate impact of the outcomes.

Regional stakeholders, are those who will operate at a higher territorial scale(i.e. Piemonte region), can influence infrastructure and socio-economic strategic plans.

National stakeholders define the state-level authorities responsible for the legislation and frameworks for funding, and the priority of development and investment.

International actors involve cross-border actors (EU, global investors) whose policies, funds, or agendas can affect some aspect of any direction or standard of the project.

Municipal actors are equivalent to city-level institutions for urban management, planning permission, and enforcement of local policy.

Stakeholders breakdown

In order to be able to fully comprehend the stakerholders and better clarify their goals, a decent division of stakeholder based on their sector and short briefing is required which goes as followed.

Public Sector

Italian Republic, As the national government, it provides foundational financial support for significant regional and urban development projects, but on a macro level.

Regione Piemonte, this regional government body is also a key financier, directing funds towards development projects that enhance the region.

metropolitan city of Turin, a metropolitan-level authority, it is focused on the strategic improvement and management of the wider Turin metropolitan area. It influences the project's integration with the surrounding territory.

Comune di Torino, the city's municipal government is directly responsible for the administrative and political management of the urban area, aiming to enhance its functionality. It is the primary public-sector decision-maker for the project.

FS (Ferrovie dello Stato), the national railway company, acting as a major landowner, plays a pivotal role in promoting the development of the land it owns within the project area. Its land-use decisions are fundamental to the project's layout.

GTT (Gruppo Torinese Trasporti), the municipal public transport operator, whose interest is to improve transportation systems and ensure mass public accessibility to the revitalized areas. Its actions determine one of the site's connectivity.

Ministero della Cultura, this national ministry is tasked with promoting Italian culture, which can influence preservation and heritage aspects of the development, also they are in charge of tourism so indirectly tieing them to the project.

Sovrintendenza, a national heritage authority, it works to protect culturally valuable buildings, directly impacting which structures can be altered or demolished within the project zone.And in one of our sites, exists a building with these constraints.

European Council, this international body influences the project by promoting policies and providing potential funding aimed at fostering economic growth and improving urban conditions across Europe.

ARPA Piemonte, as the regional environmental protection agency, it ensures the preservation of environmental resources during the development process. It enforces environmental regulations that the project must adhere to.

MASE project of Torino Citta d'Acque, this is a national-level environmental initiative focused on the protection and enhancement of the local environment within the project's footprint. It directly shapes the project's green and blue infrastructure.

Agenzia Piemonte di Lavoro,a regional agency dedicated to fostering social inclusion by promoting job opportunities that may arise from the new development. which an our case can correlate with the job oppurtunities in spina 3.

adbPo, an expert national body that provides planning and coordination counsel,regarding the river Po, specifically assisting the MASE environmental project.

Private Sector

Developers, these are local, national, and international real estate investors whose primary goal is to achieve the highest possible financial return from property development in the area. They are the main drivers of the project's construction and physical realization.

Intesa Sanpaolo, an international financial institution that supports the project through direct investment, sustaining the urban development of the area.

Stakeholders overview

Vastint Hospitality Italy, an international investment group with a special interest in the project, aiming to capitalize on the development for its own investment growth. They currently hold ownership of a significant site near the spina 2 zone.
Business-owners, local entrepreneurs whose primary objective is the improvement of their own commercial activities and cash-flow as a result of the area's regeneration.
Civil Society and Local Representatives
Promoting Committee (8 Parties),a coalition of municipal-level expert groups advocating for a sustainable, inclusive, and innovative urban model for Turin's development. It acts as an influential advisory body shaping the project's core vision.
Residents, the local inhabitants of the area, who are primarily concerned with improving their general quality of life. Their support or opposition is crucial for the project's social license to operate.
Circoscrizione 1-3-4-5, these are local district councils that act as political representatives for the citizens in their respective areas, voicing their interests and values. They are a formal channel for community feedback.
Comitato Spina 3, a local committee with a specific political interest in improving the quality of life for the residents and users of the Spina 3 area. It represents a focused, grassroots advocacy effort.
Architects & Urban Planner, these professionals act as experts to guide the project's design and planning, aiming for rational and effective urban solutions. They translate the project's goals into a physical design.
Workers, a local group representing the workforce, which seeks an increase in services and an improvement in the quality and safety of the area.
Students, this local group is interested in the improvement of services and quality of life that are relevant to their academic and daily lives. Their presence influences the demand for specific amenities and housing.
Chiesa del Santo Volto, a local church that functions to promote and solidify a sense of community identity within the redeveloped area. Its location in parco dora and the regiolous power might indirectly affect the people.

Site	Stakeholder	Level	Type of Actor	Actor Resources	Goal
Spina 2-3	Regione Piemonte	Regional	Political-Bureaucratical-General Interest	Political-Economical-Legal	Financing projects of development of region and Turin
Spina 2-3	Comune di Torino	Municipal	Political-Bureaucratical-General Interest	Political-Legal	Improving management of metropolitan area
Spina 2-3	Promoting Committee (8 Parties)	Municipal	Political - Special Interest-Experts	Economical- Cognitive	Promoting and financing a sustainable, inclusive, and innovative urban model for Turin
Spina 2-3	FS	National	Special Interest	Economical-Political-Cognitive	landowner that is promoting the development of the area
Spina 2-3	GTT	Municipal	Special Interest	Economical-Cognitive	To improve the public transport systems and accessibility for the mass public
Spina 2	Intesa Sanpaolo	International	Special Interest-Experts	Economical-Cognitive	Sustaining the urban development of the urban area through investments
Spina 2-3	MASE project of torino d'acque	National	Experts-Bureaucratical-General Interest	Economical-Cognitive-Political-Legal	To protect and improve the environment
Spina 2-3	European counsel	International	Political-Bureaucratical	Economical-Political-Legal	Growth in the economic and general condition of the cities
Spina 2	Vastint Hospitality Italy	International	Special Interest	Economical-Cognitive	Growth for their own investments
Spina 2-3	ARPA piemonte	Regional	Political-Bureaucratical-General -Experts	Cognitive-Political-Legal	Preserving safekeeping all the environmental resources
Spina 2-3	Ministero della cultura	National	Political-Bureaucratical-General -Experts	Cognitive-Political-Legal	Promoting and bringing value to the italian culture
Spina 2-3	Developers	Local-National-International	Special Interest-Experts	Cognitive-Economical	Investing aiming for the highest return on property growth
Spina 3	Sovrintendenza	National	Experts-Bureaucratical-Special Interest	Cognitive-Political-Legal	Promoting and bringing value to the italian culture through protecting valuable buildings
Spina 2-3	Architects Urban planners	Local-National-International	Experts	Cognitive	Guiding the design and planning in a rational direction
Spina 2-3	Residents	Local	Special Interest	Cognitive - Economical	Improving the general quality of life in that area
Spina 2-3	Business-owners	Local	Special Interest	Economical	Improving their businesses and cash-flow
Spina 2	Students	Local	Special Interest	Cognitive	Improving services and quality of life in accordance to their studies
Spina 2-3	Worker	Local	Special Interest	Cognitive	Increase in services and quality and safety of the area
Spina 2-3	Circoscrizione 1-3-4-5	Local	Political-General Interest	Political-Cognitive	Representing people interests and values
Spina 2-3	Citta Metropolitana di Torino	Metropolitan	Political-Bureaucratical	Political-Legal	Improving the metropolitan area
Spina 2	Agenzia Piemonte di Lavoro	Regional	Political-Bureaucratical-General Interests	Economical-Political-Legal	Promoting job opportunities and social inclusion
Spina 3	Comitato Spina 3	Local	Political-Special Interest	Cognitive-Political	Improving the life quality of the residents and users
Spina 3	adbPo	National	Experts-Special Interest	Cognitive-Political	Help MASE with smart council with planing and coordination
Spina 3	Chiesa del Santo Volto	Local	Political-General Interest	Cognitive-Political	Promoting community identity
Spina 2-3	Italian Republic	National	Political-Bureaucratical-General Interests	Political-Economical-Legal	Financing projects of development of region and Torino

STAKEHOLDERS MAPPING
Power/interest matrix

Stakeholders
power/matrixanalysis

Stakeholder analysis also uses tools like the Power/Interest Matrix and Social Network Analysis. One unique qualitative method is the Mendelow power/interest matrix, in which each actor is plotted on a four-quadrant grid that is defined by the actors' level of decision–making power and interest. This offers a dynamic approach to understanding communication priorities and dynamic tension in relationships across a project period because it provides stakeholders an opportunity to re-evaluate and reposition as the project unfolds.

The Power/Interest Matrix is a two-dimensional chart that plots each stakeholder according to the level of power (the level of influence they can exert) and interest (the degree of care in the ultimate outcomes of the project). Dividing the chart into four quadrants, "Manage Closely" (high power, high interest), "Keep Satisfied" (high power, low interest), "Keep Informed" (low power, high interest), and "Monitor" (low power, low interest), provides the project team further range of reference for what should be prioritized in terms of communication efforts and how to develop engagement strategies as the initiative evolves.

In the case of Turin's Innovation Mile (Spina 2 & 3), we recalibrated the matrix using our stakeholder inventory.

The actors with the most power and interest, which fall into the Keep Satisfied quadrant, for both areas are the Municipality of Turin, the Metropolitan City of Turin and FS, owner of the two sites, which is also the actor with the greatest power and interest in both cases. The Districts also fall into this quadrant because they represent the resident community in the areas adjacent to the sites, obviously with less power than the other three actors. In this quadrant, for both spinas, developers also appear among the actors to Keep Satisfied, and they hold all this power because they are the ones who make the concrete final realization of the project economically possible. The stakeholder Superintendence, present only in Spina 3 for the protected building, is also one of the key actors, since it has the power to approve or not the project concerning the protected building. The Monitor quadrant gathers all those actors physically closer and directly influenced by the project, and for this reason it is the one that shows the most differences between the two areas. It includes residents, business owners in the area, the architects involved in the project, etc. The Manage Closely quadrant instead gathers those actors who are not physically present in the project sites but have much power because they are government bodies such as MASE, the Piedmont Region and the Ministry of Culture, with slightly different positions between the two areas. Finally, the last quadrant Keep Informed gathers government bodies more distant from the site, such as the Italian Republic and the European Union and others, as well as individual actors partly influenced by the project, such as workers in the surrounding areas.

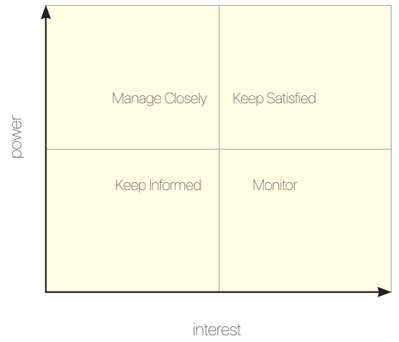
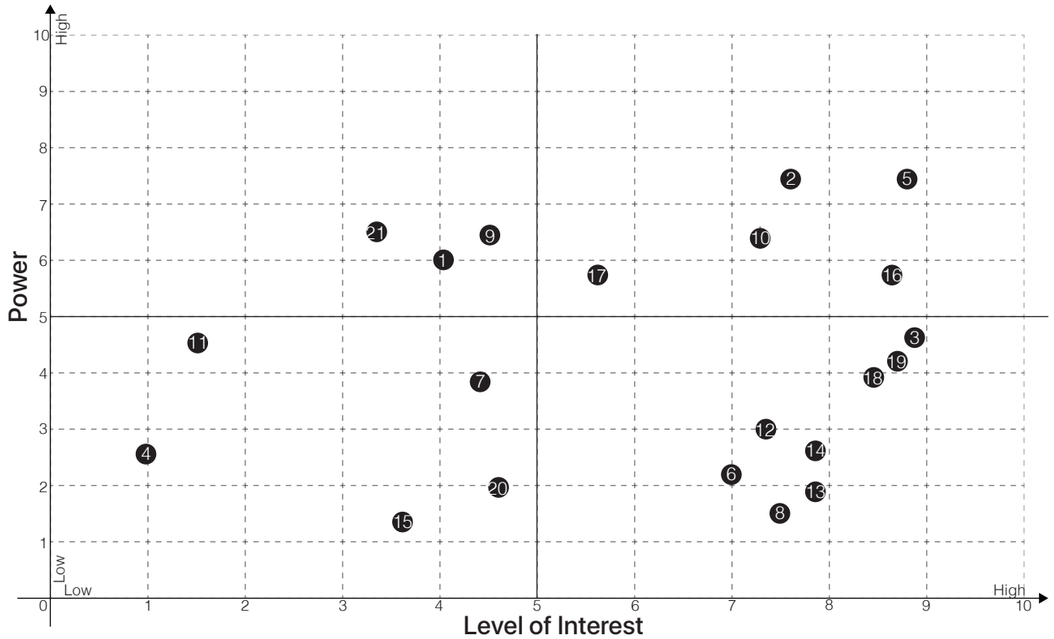
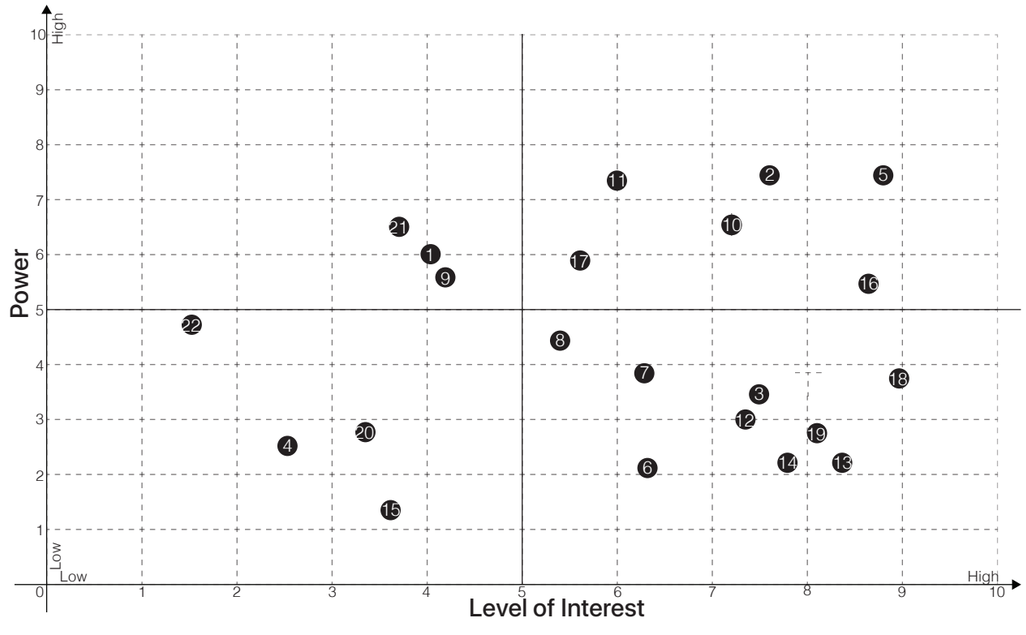


fig. 79 power/interest matrix guide



1 Regione Piemonte
2 Comune di Torino
3 Promoting Commitee
4 European counsel
5 FS
6 GTT
7 ARPA
8 Students
9 Ministero della cultura
10 Developers
11 Repulica Italiana
12 Architects/Urban Planners
13 Residents
14 Business Owners
15 Workers
16 Circoscrizioni
17 Metropolitan City of Turin
18 Intesa Sanpaolo
19 Vastint Hospitality Italy
20 Agencia del lavoro Piemonte
21 MASE

fig.80 Stakeholder power matrix diagram spina 2



1 Regione Piemonte
2 Comune di Torino
3 Promoting comitee
4 European counsel
5 FS
6 GTT
7 ARPA
8 adbPo
9 Ministero della cultura
10 Developers
11 sovrintendenza
12 Architects/Urban Planners
13 Residents
14 Business Owners
15 Workers
16 Circoscrizioni
17 Metropolitan City of Turin
18 Comitato della Spina 3
19 Santo Volto Chiesa
20 Agencia del lavoro Piemonte
21 MASE
22 Repulica Italiana

fig. 81 Stakeholder power matrix diagrampina 3

STAKEHOLDERS MAPPING
Social network analysis

Stakeholders
social network analysis

Social Network Analysis is powerful, since it identifies the underlying mesh of relationships -- revealing, in addition to who is involved, the flow of resources and information and influence -- enabling decision-making about who is in the important relationships or bottlenecks in the flow of resources, dissipating the network support with the concomitant identification of the actors who matter most, the biggest nodes. In our network graph, stakeholders are represented as different sized nodes (hues represent political, bureaucratic, expert, special-interest, and general-interest) and links are each a specific resource exchange. Arrowheads tell us whether the ties are bi-directional (mutual collaboration) or uni-directional (hierarchical command), and provide insight into dependencies chains or gradients of power across the network.

Node size encodes degree centrality - e.g., the simple count of each actor's direct connections - and adds depth with more sophisticated measures of connection - for example, betweenness (how frequently a node lies on the shortest paths) or eigenvector centrality (how well connected one's neighbors are). Nodes with high centrality will most likely be key nodes of communication or resource flow and therefore will be high priority for further engagement plans or observation.
The density index considers the overall cohesion of the network through the connection of actual ties to the total number of possible ties, with a formula specified by Yang R.J. A dense network indicates quick information diffusion and strong collaboration. Low density suggests silos or bottlenecks in collaboration. If you monitor density over time you can determine whether stakeholder alignment is strengthening or fracturing as well as identify where you may try to bridge the gap.

The Density Index is calculated for both sites and represents the intensity of the relations between the actors involved in a decision-making process. Network density is measured as the proportion of actual actor relations out of the total possible number. The higher the index, the denser the network of connections between the project actors. The network of Spina 2 appears less dense than that of Spina 3, particularly because of the number of links to and from the Spina 3 Committee, which is deeply intertwined within the network.

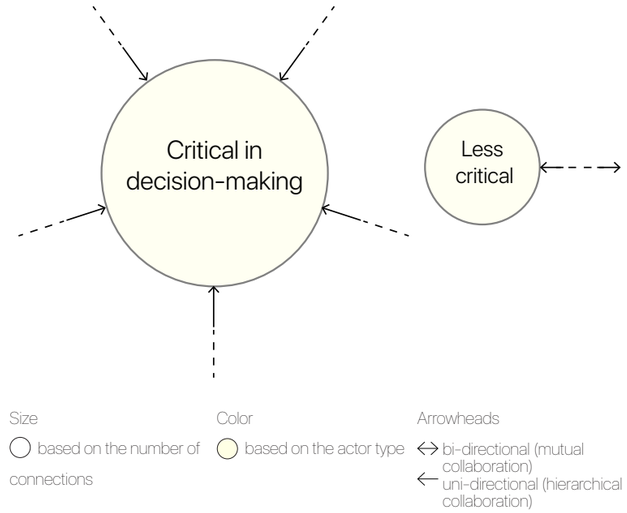


fig. 82 social network guide

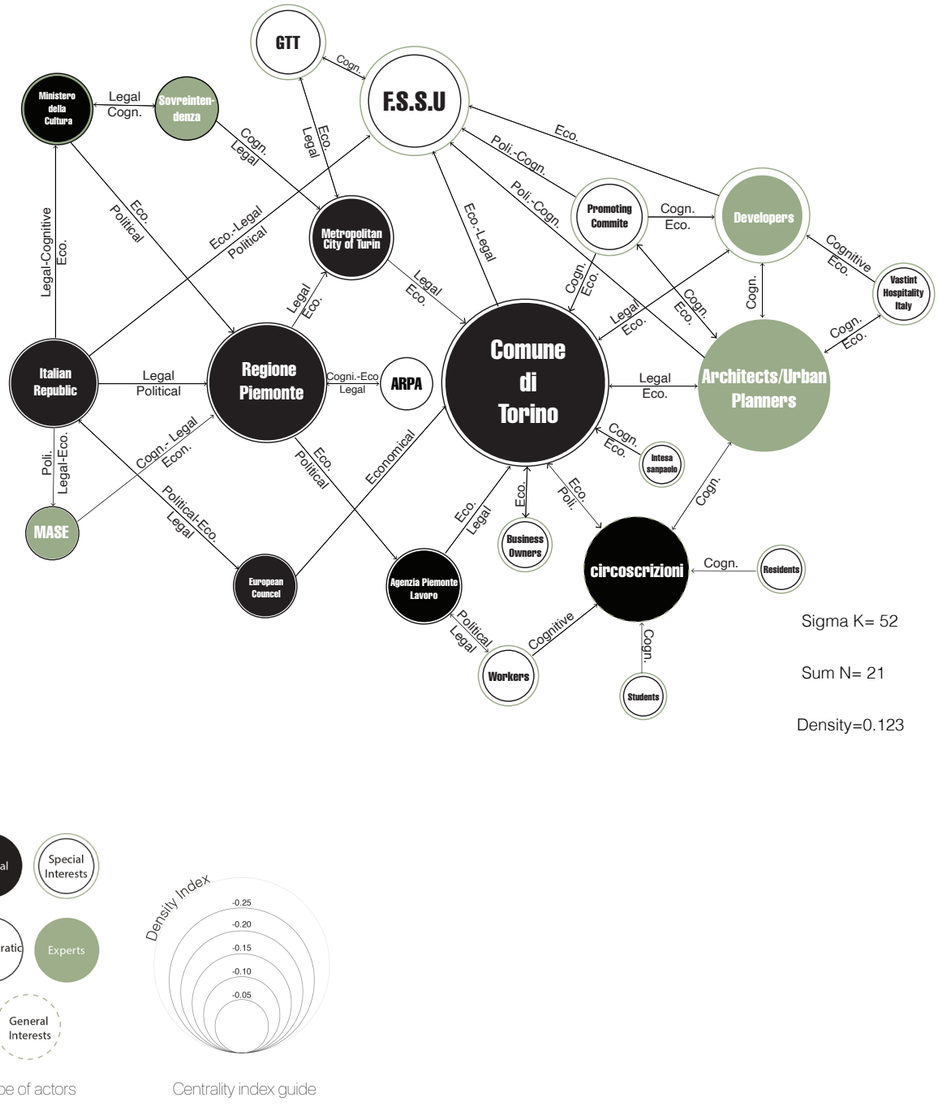


fig.83 Stakeholder social nextwork diagram spina 2

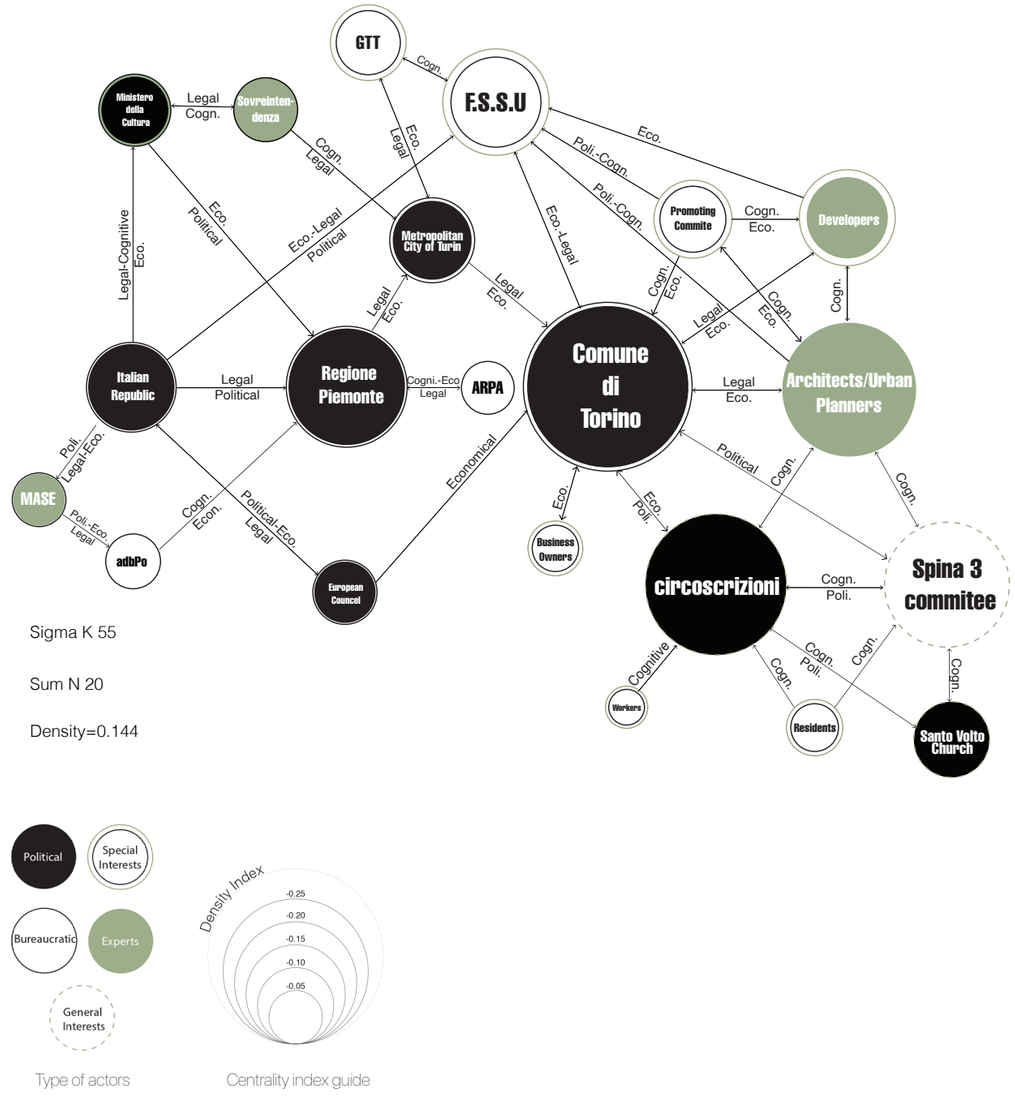


fig.84 Stakeholder social nextwork diagram spina 3

STAKEHOLDERS MAPPING
Complexity index

Stakeholders
complexity index

Another important aspect to observe and calculate concerns the complexity of the stakeholder network. Complexity is defined as the existence of a plurality of points of view within processes. This complexity is observed through a table with, on one side, the types of actors (from politicians to general interest), and on the other side, the level dimension, from international to local. The chart is completed by placing the stakeholders in the correct boxes.

	TYPES OF ACTORS				
DIMENSION	Politicians	Bureaucrats	Experts	Special Interest	General Interest
International	European counsel	European counsel Italian Republic	Developers	Intesa Sanpaolo Vastint Hospitality Italy	
National		Ministero della cultura	MASE project of torino d'acque	FS	
Regional		Regione Piemonte	ARPA piemonte		Agenzia Piemonte di Lavoro
Local	Circoscrizione 1-3	Comune di Torino Citta Metropolitana di Torino	Architects Urban planners	Promoting Committee (8 Parties) GTT Residents Business-owners Students Worker	

complexity index: 14/20= 0.7

fig.85 Stakeholder complexity diagram spina 2

At the end, the complexity index is calculated, ranging from 0 to 1: 0 corresponds to the lowest complexity of the network, with stakeholders present in only one box, while 1 corresponds to the maximum complexity, with all boxes filled. Spina 2 shows a higher index, with more stakeholders of different types at higher levels, international and national, while Spina 3 shows a lower index, with more actors placed in the lower part of the chart, at a more local level.

	TYPES OF ACTORS				
DIMENSION	Politicians	Bureaucrats	Experts	Special Interest	General Interest
International	European counsel	European counsel Italian Republic	Developers		
National		Ministero della cultura Sovrintendenza	MASE project of torino d'acque adbPo	FS	
Regional		Regione Piemonte	ARPA piemonte		
Local	Circoscrizione 4-5 Comitato Spina 3	Comune di Torino Citta Metropolitana di Torino	Architects Urban planners	Promoting Committee (8 Parties) GTT Residents Business-owners Worker	Chiesa del Santo Volto

complexity index: 13/20= 0.65

fig.86 Stakeholder complexity diagram spina 3

SWOT ANALYSIS
Classification

SWOT
overview

SWOT analysis provides systematic mapping of trust or distrust of internal and external factors present in a programme intervention. SWOT was designed by Albert Humphrey in the 1960s for a corporate strategy undertaken by companies when greater competition made it necessary, and was extended to public policy planning in the 1980s (theoretical framework), and today typically extends to the planning of urban and regional programmes. By analysis of data focused on a specific topic, SWOT enables policy and an intervention focused on the four-dimensions of Strengths, Weaknesses, Opportunities and Threats.

Strengths and Weaknesses represent endogenous factors—existing internal capability or limitations—whereas Opportunities and Threats incorporate existing exogenous risks or openings. The process of comparing the four quadrants enables evidence-based testing of each alternative course of action with regression being evident when threats iclude opportunities as opposed to extremes where weaknesses might be expressed distinctly as strengths. The process of systematically comparing and testing iterations can refine alternative solutions, clarify a relationship between plans, projects and programmes, and contribute the contextualisation of a final course of action or project.

Some of the benefits of SWOT are a thorough diagnosis of the area of intervention that allows for the maximisation of strategies, the generation of alternatives which can extend to the innovation strategies that have a better chance of succeeding, and as for the legal considerations it actually provides an opportunity to maximise the value for ex ante, in-itínere and ex post evaluations with the added clarity that will assist to ensure strategies are viable for use across differing intervals and contexts.

STEEP-M
overview

Building upon SWOT's structured mapping of internal and external factors, the STEEP-M framework expands environmental scanning. The macro-level influences are grouped into social, technological, economic, environmental, political—and mobility. STEEP-M was initially popularised in the 1970s by the strategic-foresight community as a development of Harvard's earlier PEST analysis from the 1960s. STEEP-M has been adopted by scenario-planning pioneer Royal Dutch Shell, UN Habitat, as part of urban resilience studies, and commercial consultancies (e.g. McKinsey) for regional development. By plotting these six dimensions in relation to each other we can arrive at a snapshot of the larger context before we examine SWOT's internal/external granularity.

Social – changes to demographics, trends in culture, attitudes of the public, these social factors help us anticipate community needs and customize outreach in the Innovation Mile.

Technological – innovation-related tools, digital infrastructure, R&D pathways these technological factors help inform smart-city intervention strategies and platform investments.

Economic – large scale indicators (e.g. GDP growth) and funding cycles, labour markets these economic factors help us paint assumptions surrounding our spending and risk-analysis.

Environmental – climate change, resource constraints, sustainability regulations theseenvironmental factors help inform green-infrastructure choices.

Political – governance structures, shifts in policy, and regulatory requirements these political factors alert us to changes in permits, and funding.

Mobility – transportation networks, traffic flows, and last-mile solutions:an emerging pillar of urban-planning literature since the 2000s thesemobility factors provides the critical foundation for our transit-oriented design and accessibility approaches.

STEEP-M & SWOT
the integration

A comprehensive STEEP-M SWOT diagram simultaneously presents any external drivers and organization capabilities in a visual way, stress-testing strategic options application to both external shocks, and internal vulnerabilities, clarifying strengths are leveraged for the future opportunities, or proactively acting where threats meet weaknesses. This comprehensive approach positions resource to focus on the greatest interventions, reducing risk, aligning long-term environmental scans to operational project plans, increasing resilience and adaptability with a focus on the Torino Innovation Mile.

also worth stating the mechanisms of sorting and coding we implemneted contributed to an organizational system in the data, whether through spinas, or connection to maps, or whatever to the outcomes reached.

	S	W	O	T
S	2SS1-A dynamic social fabric (students, researchers, young creatives) 2SS2-young users 2SS3-Several Multi lingual cultural hubs	2SW1-The sense of not belonging to temporary workers and students (no Community) 2SW2-The gap between social fabric 2SW3-Limited Residential Bases	2SO1-a wide range of audience to target for a design 2SO2-the need for a social hub	2ST1-Risk of gentrification 2ST2-Risk of identity loss
T	2TS1-Mixed and diverse architecture 2TS2-R&D and incubators	2TW1-Structural and renovational complexities entangled with the zone	2TO1-Can catalyze tech startups and applied research 2TO2-International collaborations that can attract talent and funding	2TT1-Rapid tech obsolescence could leave spaces underutilized
E	2CS1-Major public/private investments 2CS2-strategic for offices and innovation firms	2CW1-Dependence on real estate cycles and FS strategies; 2CW2-high redevelopment costs cause of conditions	2CO1-Could be a decent investment 2CO2-Could create more jobs and centrality 2CO3-EU and national Fund	2CT1-has to keep up with other centers (lingotto, dora,...) 2CT2-economic downturns could stall ambitious projects 2CT3-Danger of having unsafe unused spaces
E	2ES1-existence of the green spaces and sport-center	2EW1-Limited available land for new public parks 2EW2-Hard to maintain (due to high num. people) 2EW3-polluted air and noise	2EO1-Creating a continuous "green corridor" along the Spina 2EO2-Green Roof and area on the air	2ET1-Construction and vehicle emissions remain concerning 2ET2-Risk of destroying the greens for more official functions
P	2PS1-Strong institutional support redevelopment priority 2PS2- public-private colab	2PW1-Bureaucratic complexity and lengthy approval 2PW2-Public Intervention	2PO1-EU and national programs	2PT1-administrative changes could unsettle existing agreements
M	2MS1-Location and Connectivity:This is a node in the city's mobility network.	2MW1-An existing Traffic Knot	2MO1-pedestrian links and better circulation though the spina	2MT1-High traffic Could be even worse

fig.87 SWOT-STEEP table spina 2

	S	W	O	T
S	3SS1-Neighbourhood in expansion 3SS2-young residents (students and workers) and families with kids 3SS3-Diverse social mix	3SW1-lack of public facilities and meeting point like plazas and "casa di quartiere" 3SW2-lack of basic servicies for inhabitants like farmacy, schools, library, asl 3SW3-criminality	3SO1-real estate with good price- mq relation 3SO2-residential units for edilizia convenzionata	3ST1-Lack of memory focused significant project, of past workers history (only iron valley 2021) 3ST2-risk of gentrification, no for low classes
T	3TS1-surrounded by one of the newest built neighborhood in Torino	3TW1-friction in the design space(pop. houses and high tech design)	3TO1-close to cultural & technological-environment like envi park 3TO2-substain by PRiU and PRUSST program, FESR	3TT1-challenging design for edilizia convenzionata high tech
E	3CS1-area full of commercial activities, shops, cinema, supermarket 3CS2-Affordable housing for the public	3CW1- edilizia convenzionata conventionally devaluing surrounding buildings for the investors	3CO1-gaining Interest of private investors like Nexto, foundig by .. 3CO2-Creating jobs for the masses	3CT1-polluted area, need of expensive and long remediation (phase 2 of river remediation 2021-2028)
E	3ES1-parco dora as green space attractive point and huge remediation programs	3EW1-noise and air, envi pollution for car way corso oddone current 3EW2-challenging remediation for the abandoned area	3EO1-Huge green open spaces 3EO2-close to river 3EO3-possibility to be ecological model 3EO4-torino città d'acque program for remediation river banks	3ET1- noise and air, enviroment pollution for car way corso oddone chance of getting worse
P	3PS1-well established comitato spina 3	3PW1-comitato spina 3 not powerfull 3PW2-Having to deal with adbPo ecc.(harder path)	3PO1-strong national programme for the area: PRiU, PRUSST, PRG, european programs (DOCUP, Resider II, FESR) , PNRR Torino Cambia	3PT1-building constraint by Sovrintendenza
M	3MS1-Close to city center	3MW1-Lack of good public link to city center and bike line, just car roods	3MO1-Next opening of stazione Dora 3MO2-bike line on Corso Oddone 3MO3-Torino città d'acque program for bike mobility	3MT1-High traffic on Corso Oddone and Piazza Baldissira

fig.88 SWOT-STEEP table spina 3

SWOT ANALYSIS
Mapping

SWOT maps
Strategic Approach

Our SWOT maps spatially depicts Strengths, Weaknesses, Opportunities and Threats across the Turin Innovation Mile,In both the zones, offering a clear visual overview of where internal capabilities,and deficiencies are and where they align with external conditions. This geographic demonstration highlights prioritisation, strategic hotspots, and makes it easy to compare zones,helping focus interventions where they'll deliver the greatest impact.

By projecting each SWOT aspect onto its a different existing layer, we can focus and analyse individual factors without visual clutter and confusion. A standalone Strengths map reveals asset concentrations and infrastructure synergies. For example, a separate Weaknesses map pinpoints service gaps or regulatory bottlenecks; the Opportunities layer uncovers untapped zones for innovation or funding; and the Threats map shows where external risks, environmental, financial or social, require proactive mitigation. Layering these in turn supports side-by-side comparison, guiding targeted strategies and improving stakeholder communication.

We intentionally stripped away any "noise," including additional streets, unnecessary connectors, and unnecessary data points, to leave decision-makers with the most important landmarks, main arteries and roadways, and core points for the SWOT.By deleting these superfluous elements, our final maps for Spina 2 and Spina 3 remain minimalist and highly legible, ensuring that planners can instantly grasp the spatial relationships and inter-zone connections critical for informed decision-making.

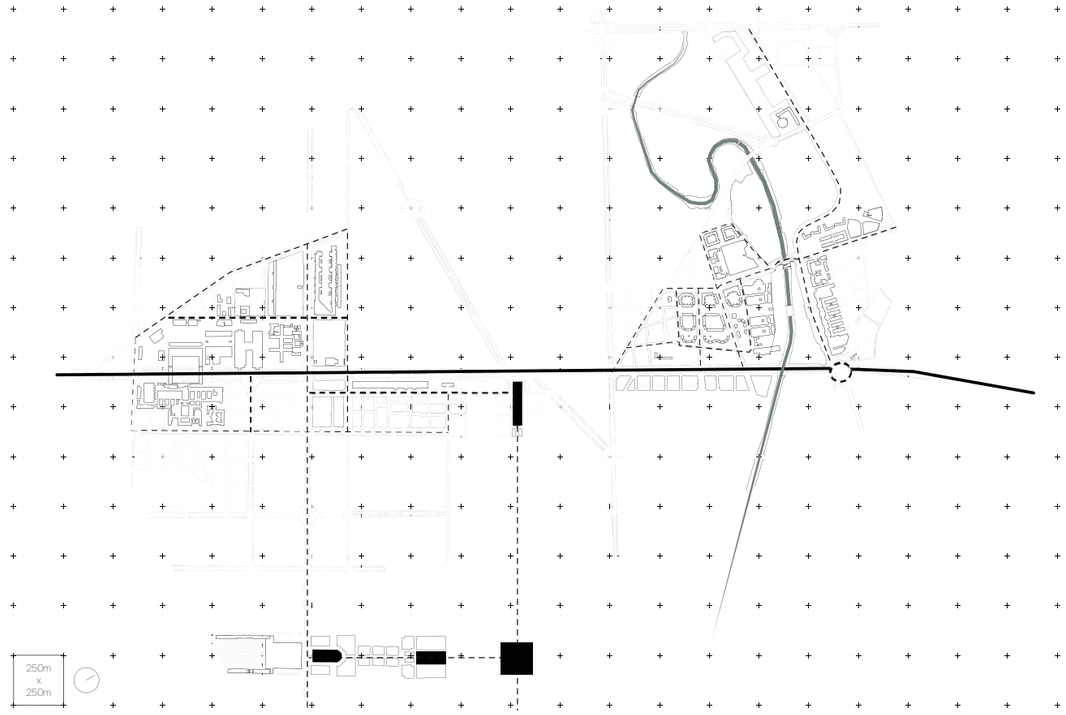


fig.89 Functional base map

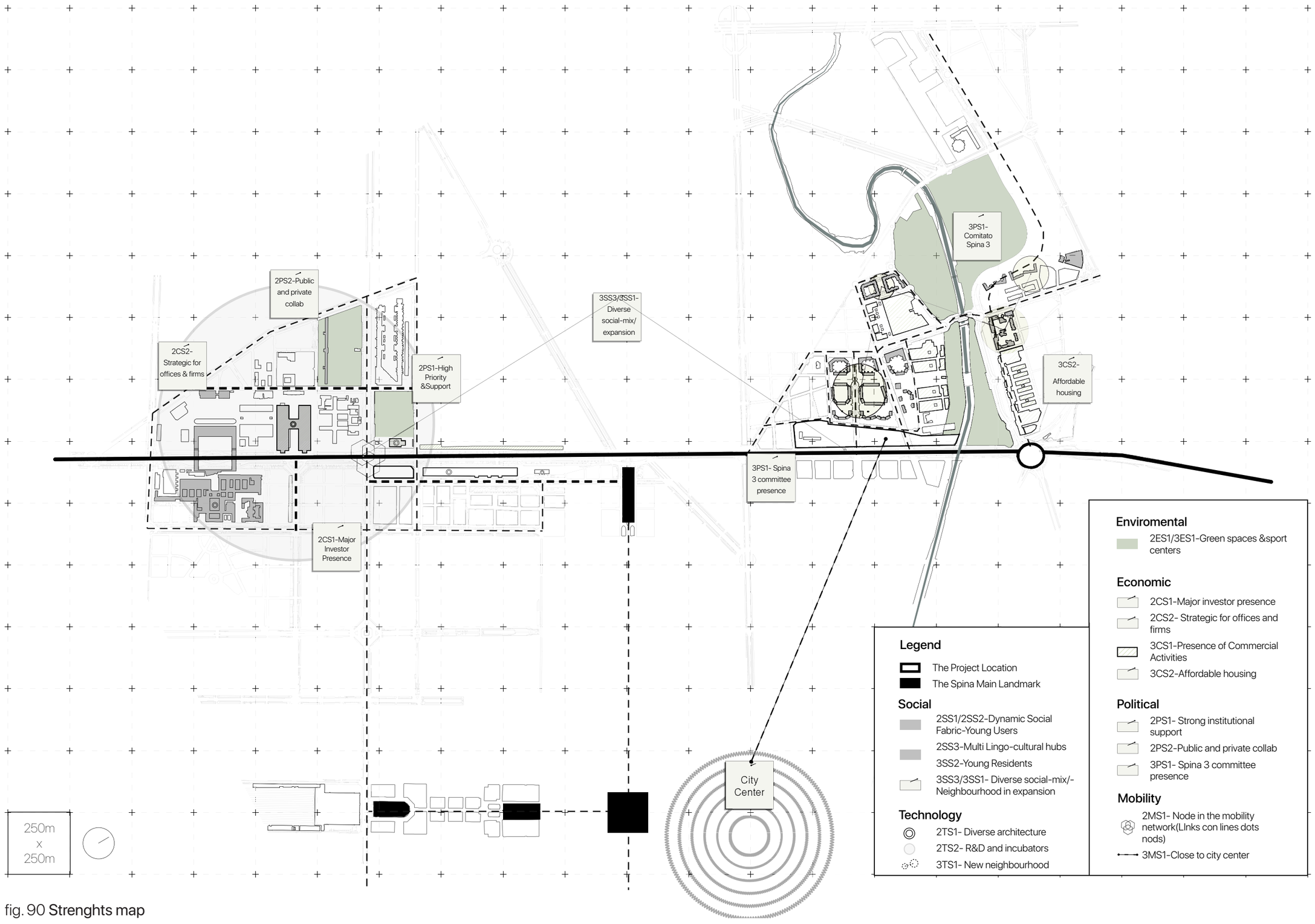


fig. 90 Strenghts map

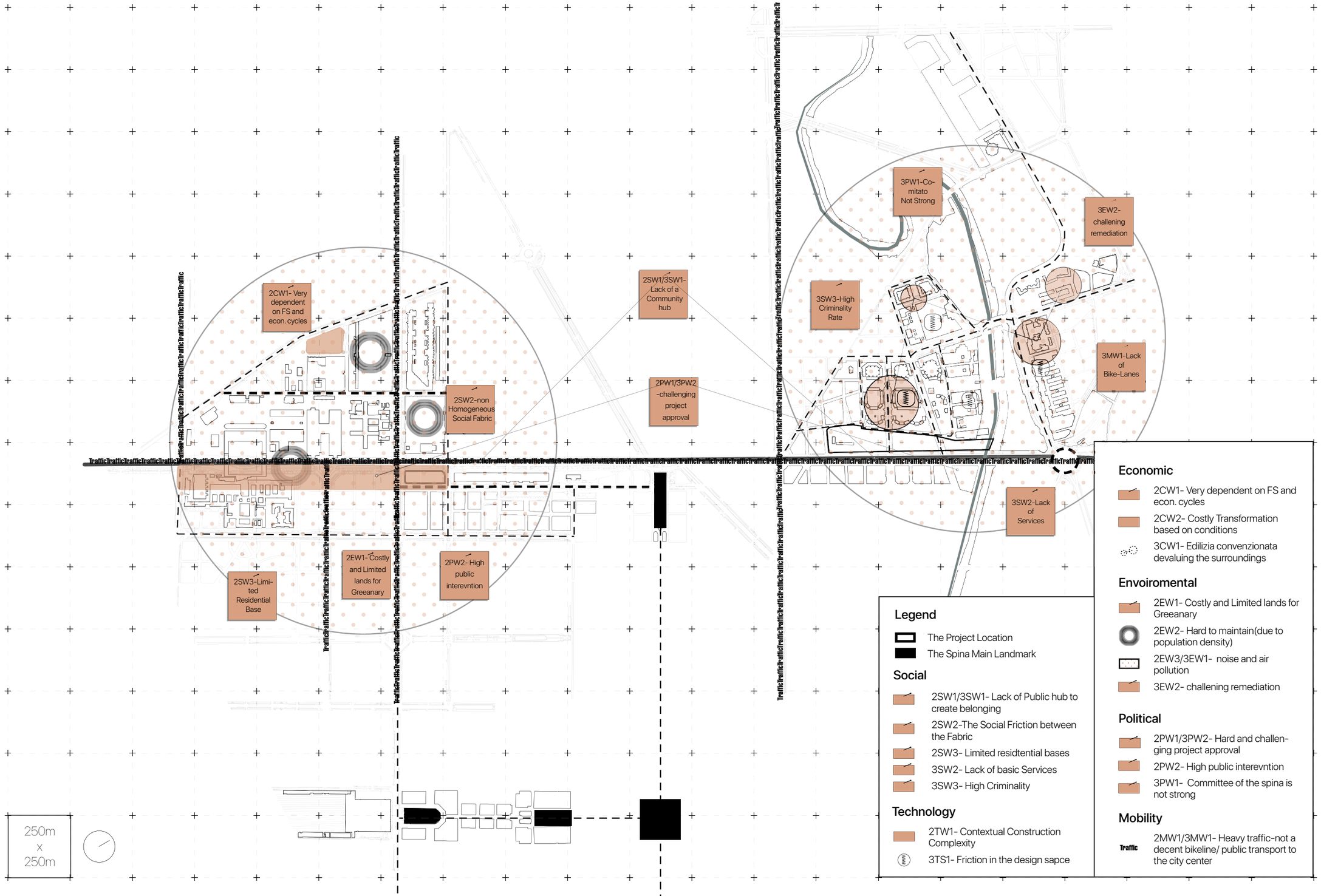


fig. 91 Weaknesses map

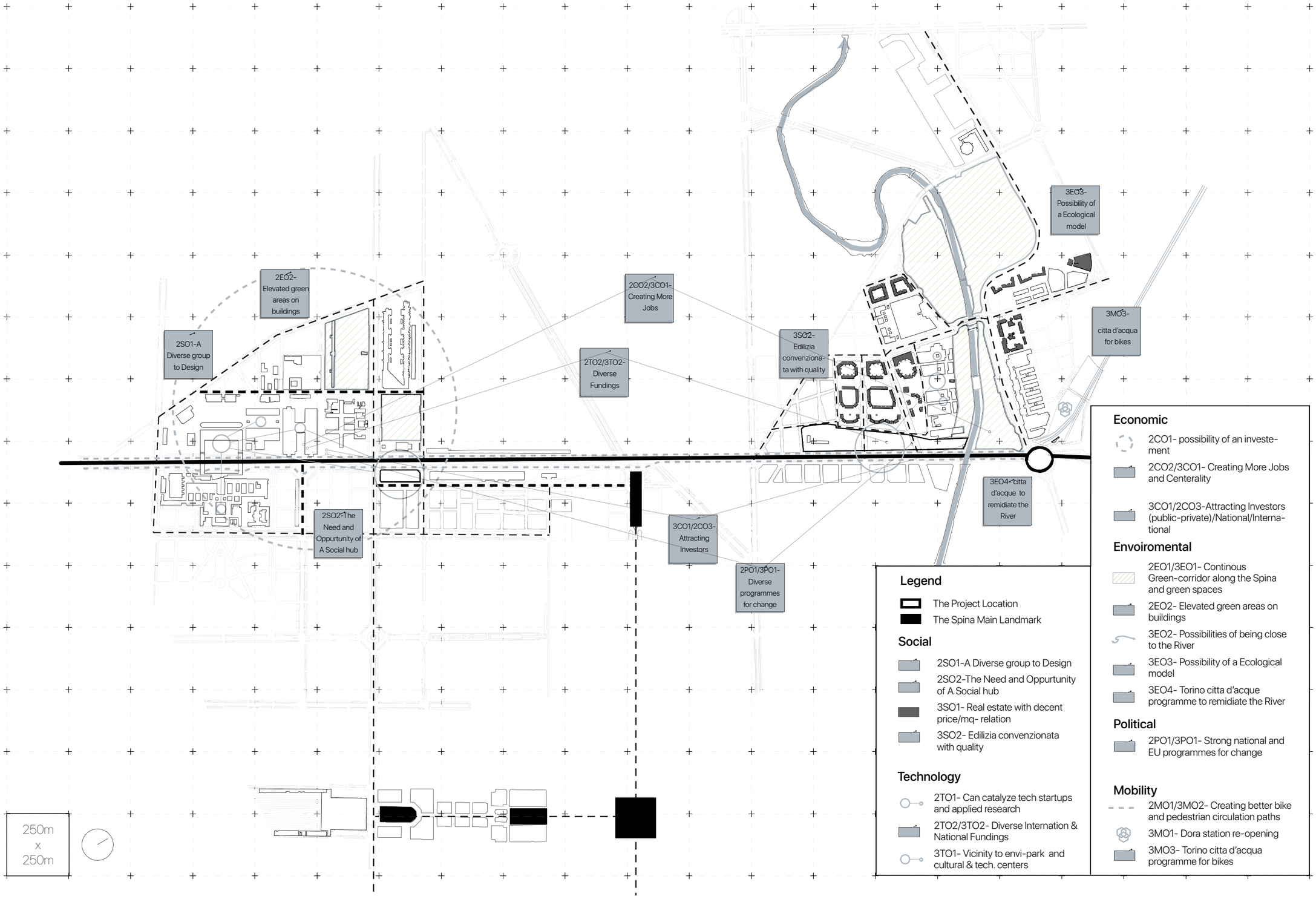


fig. 92 **Opportunities map**

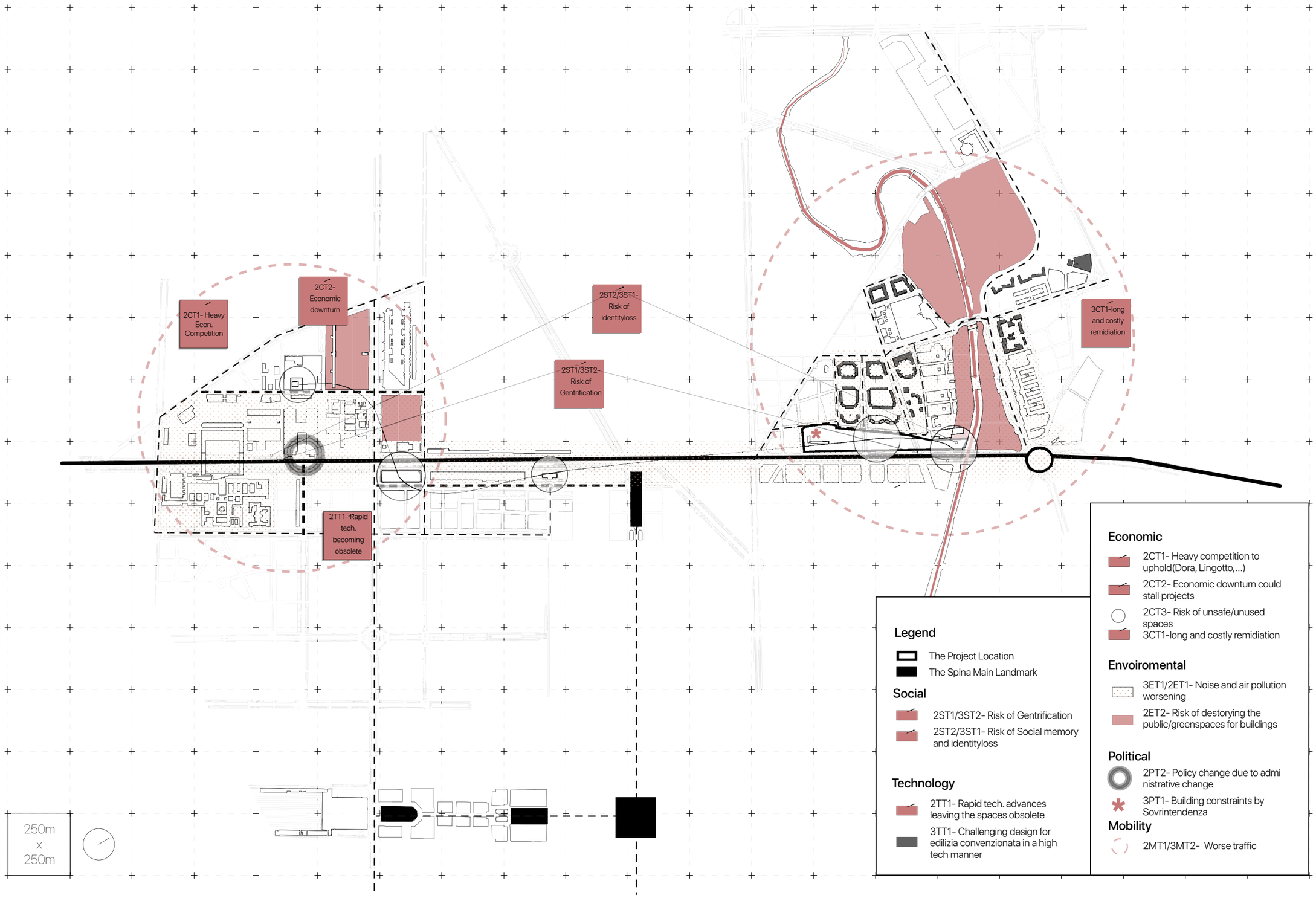


fig. 93 Threats map

THE STRATEGIES
Principles

fig. 94 Strategies map

Based on the preceding socio-economic analyses, five integrated strategic objectives have been articulated to guide the redevelopment of the project areas.

A. A new chance being offered

Focusing on the economical development of the project, creating a business hub. Whilst, bringing forward a sense of belonging.

A1.Creating hot-spots for business practices cause of vicinity to Polito and many important company headquarters.
A2.Easily accessible open-spaces with social-local interactions to encourage people with the lively hood
A3.Focusing on night-life through businesses in the city and increasing the safety of the zone.
A4.Creating gardens and public spaces on different levels(Roofs) for the masses.
A5.Arranging a new meeting monthly or biweekly for the workers students and residents to communicate their difficulties

B.Technological infrastructural advacement

Supporting the current tech. and digital developments taking place and integrating them into the future of the site

B1.Involving the existing investors and attracting new ones using virtual visions and initial designs.
B2.Improving monitoring objects and IoT to the better manage traffic.
B3.Improving bike access paths
B4.leveraging the student and worker community investing on research and development(like a research to creation hub)
B5.Pedestrian circulation inside the designated site (circulation hubs, plazas ect.)
B6.Using sustainability techniques to design the site

C. A building integrating with the surrounding

creating a building well melt in the diverse surrounding buildings

C1.integration of the lot UMI II with the station
C2.connection to Intesa sanpaolo
C3.possibility of a connection to porta susa
C4.integrating the east and south facades of the residential units
C5.There are friction spaces that could be resolved with communal spaces inside the area
C6.Intergrating the diverse fabric of the society throught strategic design

A'.A community being rebuild

Creating a strong community by actively involving local residents in the decision-making process, responding to their needs in terms of services, and reinforcing their local identity.

A'1.Inclusion of the spina 3 committee's ideas and feedback in the project
A'2.creating functional open spaces integrated in the surroundings : plazas with social kiosks and industrial design which remember the industrial past, community co-designed spaces
A'3.Integration with essential neighborhood services, such as a pharmacy, school, library, and healthcare facilities
A'4.indoor space as community hub with a large flexible room with movable panels, extendable to an outdoor space for assemblies, workshops, and courses involving schools and local associations; a coworking area with PC stations and Wi-Fi; and a recreational area for youth and children. Taking advantage and enhancing of the existing constrained building as a social hub.

B'.An environment being revived

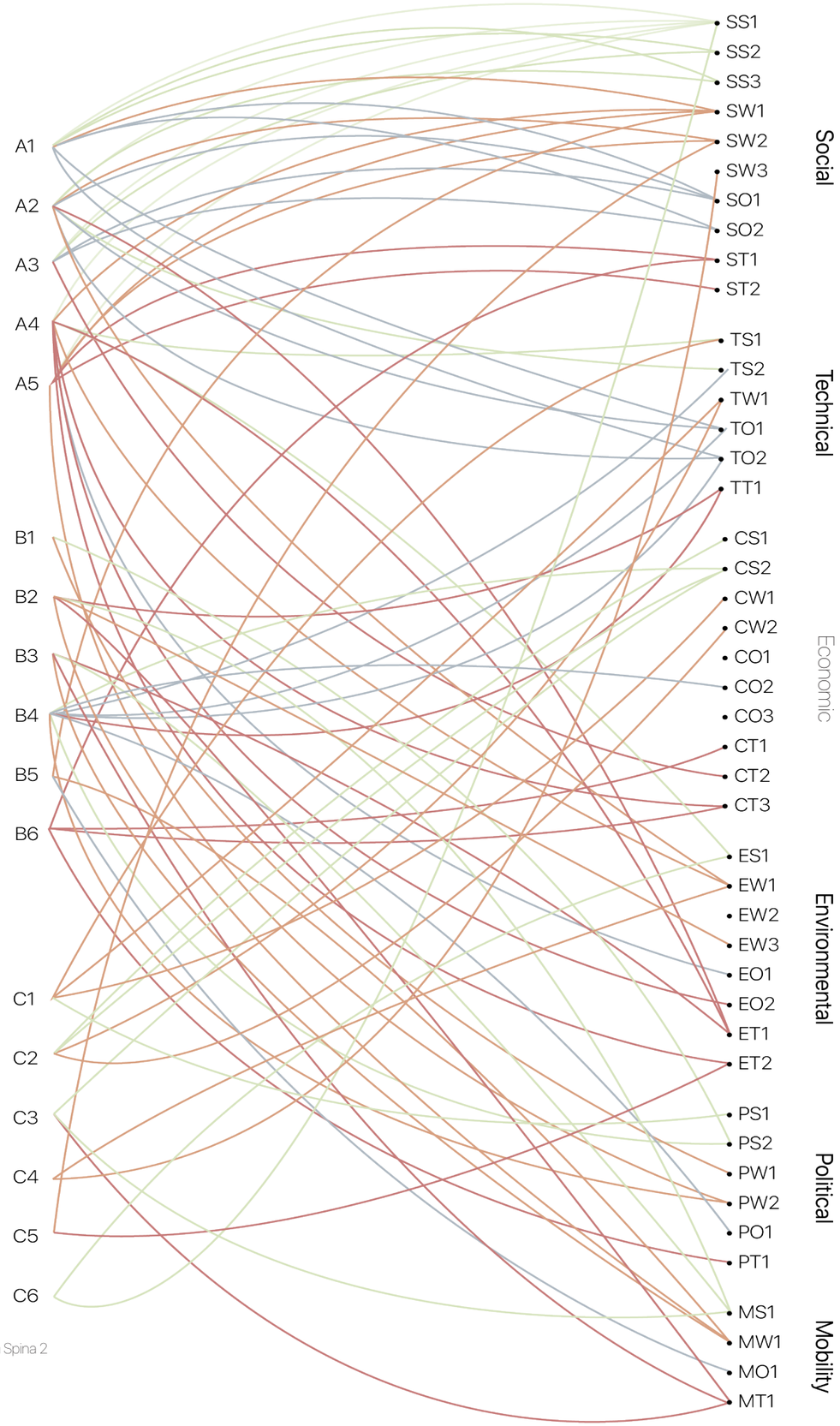
Improving the environment quality(air, land, noise,....) and enhancing green spaces, bike mobility and riverfront

B'1.fast and full remediation of the abandoned land
B'2.decreasing the noise/air pollution from Corso Oddone through green barriers (space for vegetation),permeable pavement and other tech solutions
B'3.valorization of existing green spaces through welcoming entrance/ plaza linked to services in the south and linked to industrial history and info point of the park
B'4.bike line continuation from corso Oddone with permeable pavement and well signaleted
B'5.inviting people to enter the park through clear signage and artistic lighting and installations
B'6.valorization of the river through re-naturalization of the riverbanks, with planting of native species, creation of wetlands, and installation of structures for riverfront viewing

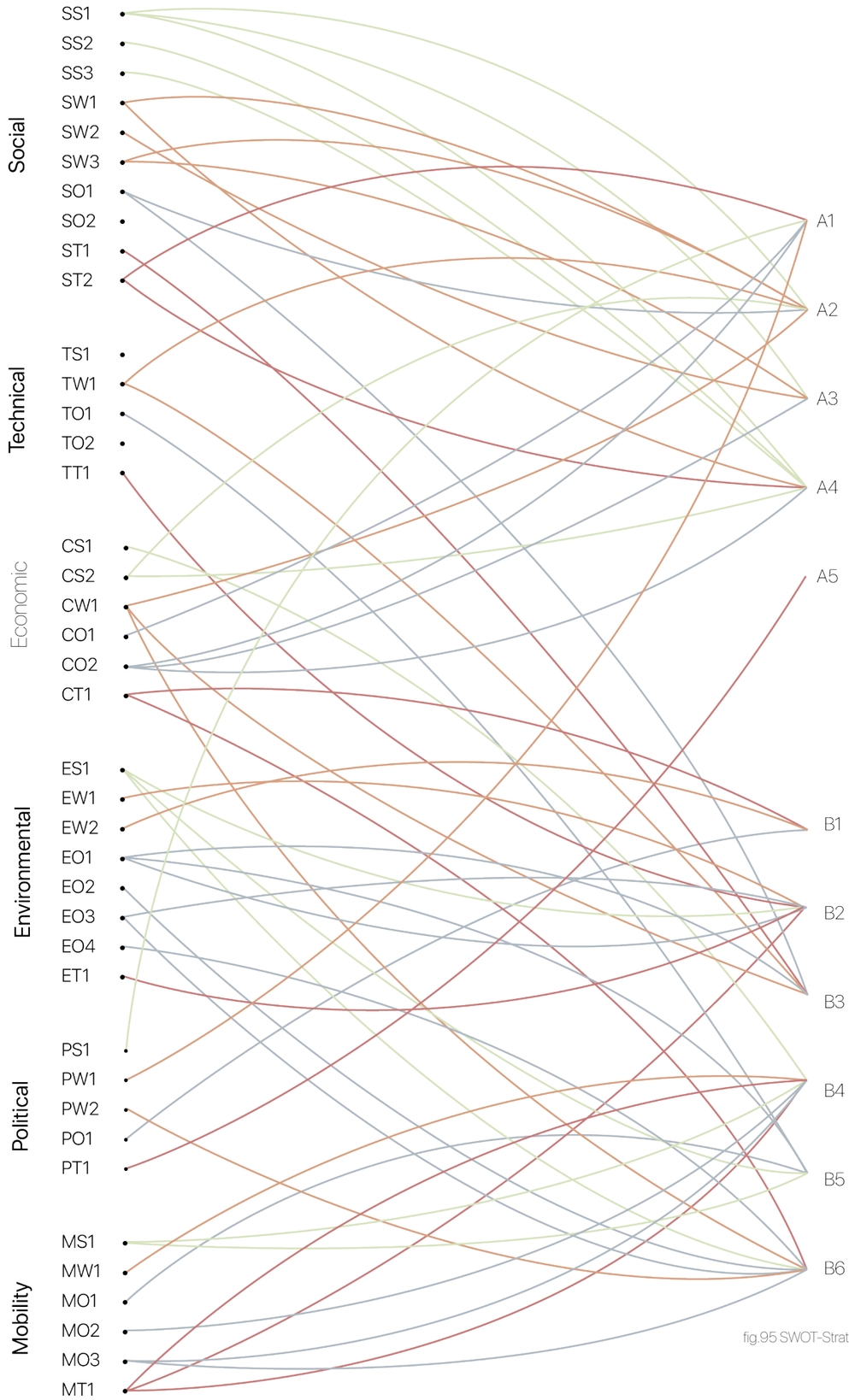
A.A new chance being offered

B.Technological -infrastructural advancements

C.A building integrating with the surrounding



SWOT-Strategies diagram Spina 2



A'.A new chance being offered

B'.Technological -infrastructural advancements

fig.95 SWOT-Strategies diagram Spina 3

THE STRATEGIES
Mapping

Strategies
Innovation vision framework

Radar graphs, also known as spider or star plots, became quite popular for visualising multivariate data upon a two-dimensional plane. Each axis radiates out from a common centre and maps a different attribute, and because of this the resulting "web" instantly reveals strengths and weaknesses across dimensions. This format is of value in a calculated plan because it turns complex assessments into an intuitive visual. Goals are being met more evenly, the more balanced and larger the polygon is.

This type of graphic is useful to show how the formulated strategies are aligned with the 5 values of the Innovation Mile. These values represent the synthesis of the Committee's explicit goals, which include environmental sustainability and decarbonization, innovation and social inclusion, technology and digitalization, as well as the core concept of the Innovation Mile analyzed in the first chapter.
We defined five core values: sustainability, technology, social impact, economic viability, also infrastructure readiness.

Each of the five strategies defined for the project is placed within the diagram and takes shape at each of the five corners (which correspond to the five values) following a precise calculation that assigns a score for each value: this score is calculated as the sum of the links (shown in Fig. X) directed to the SWOT category (social, technological, economic, environmental, political, mobility) corresponding to one of the five values (social, technological, economic, sustainability, infrastructure), divided by the total sum of the links. The political category of the SWOT is considered within the social value of the radar diagram. Thus, for example, the score for the technology value is given by how many connections a strategy has toward the technology category of the SWOT, divided by the total number of links to the SWOT.
This visual proof supports the fact that the Innovation Mile strategy addresses every value pillar holistically.

Radar graph complements SWOT maps thus changing perceptions into quantitative evidence. It shows all of our planned goals form up into a balanced plan for cohesion because no single axis falls down below the minimum target of the committee, and this confirms that the projects inside of Spina 2 and 3 uphold together the full spectrum for innovation-mile priorities.

Formulas (links to STEEPM) 0-1
Social score= links to S-P/ Sum. links
Technology score= links to T/ Sum. links
Economic score = links to E/ Sum. links
Sustainability score= links to E/ Sum. links
Infrastructure score= links to M/ Sum. links

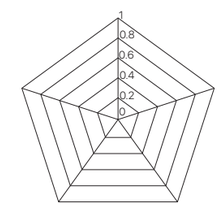


fig.96 Radar map 5 strategies - 5 innovation principles

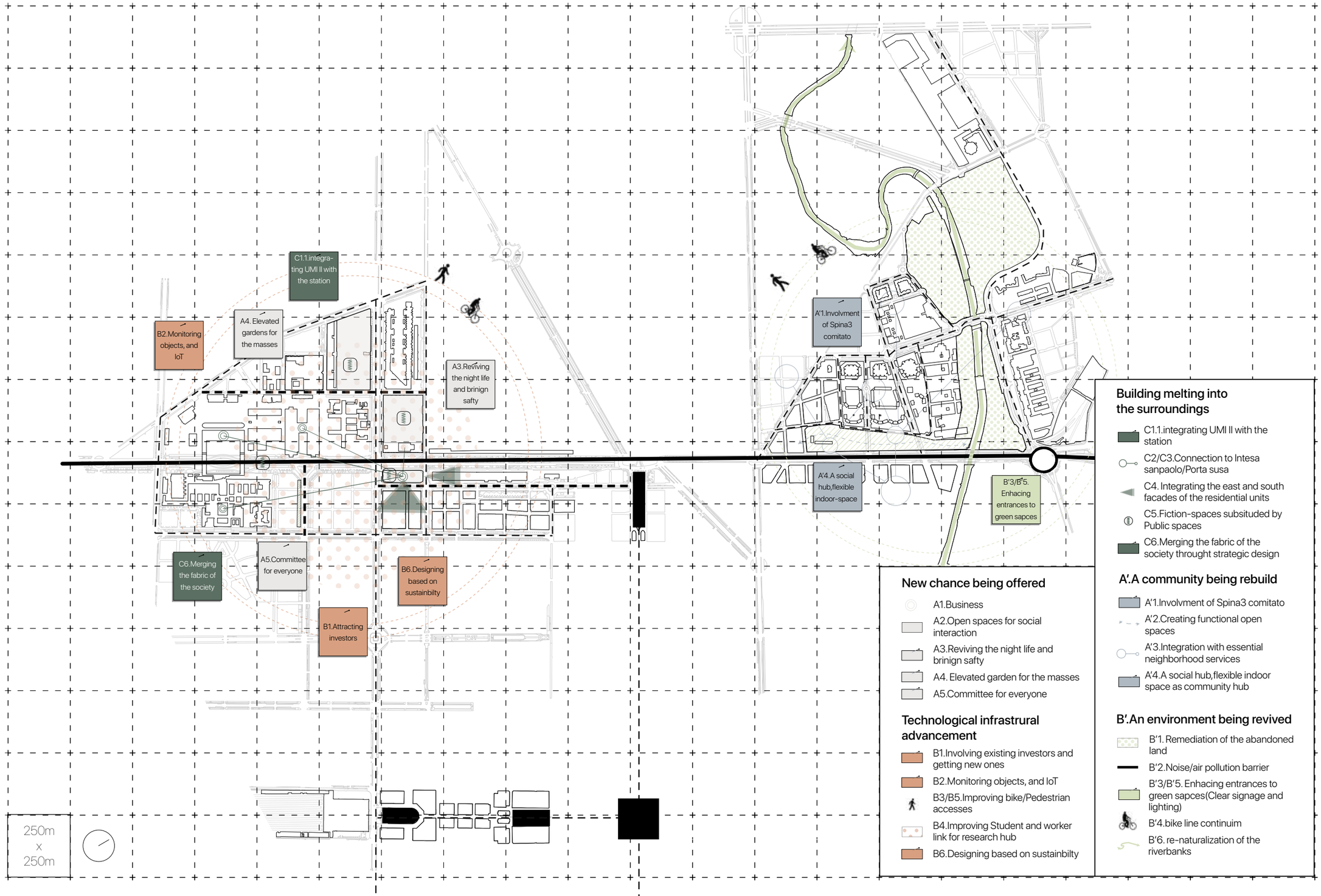


fig.97 Strategies map

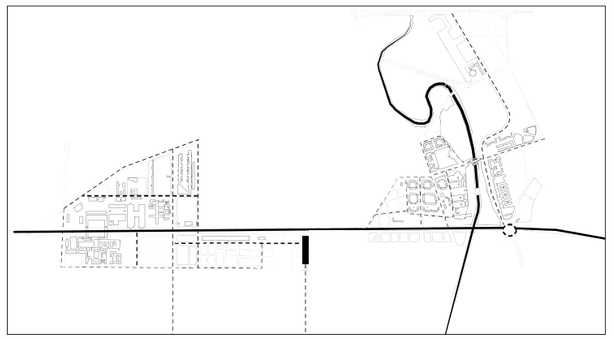
Scenarios Framework
Overview

Scenarios
Strategic Approach

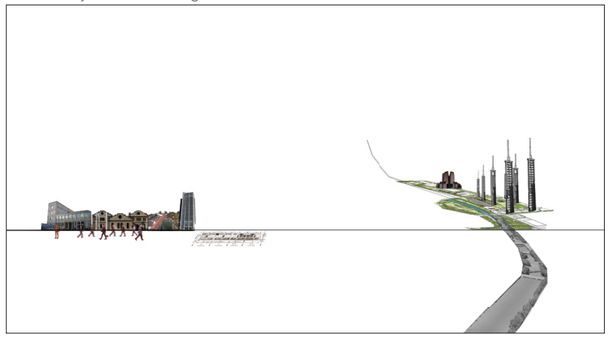
Based on the analyses previously conducted, it is now possible to propose a potential strategic and optimal transformation scenario specific to this project. However, a comparison with other possible scenarios is necessary to fully understand differences and similarities. In this case, three scenarios have been formulated for the Innovation Mile, in the following order: Scenario 1 hypothesises how the area would appear if no transformation occurred, maintaining the current conditions (inertial); Scenario 2 illustrates how the area would evolve following the guidelines and projects established by the Municipality and other entities, in line with regulations and the planned directions for the area (tendential); Scenario 3 represents the configuration of the area if specific strategies, developed on the basis of an in-depth analysis of the urban framework were applied (strategic).

These three scenarios have been graphically represented following the same base scheme to allow direct comparison, immediately highlighting the differences, benefits, and potential critical aspects of each hypothesis. The base scheme used results from the combination of two languages: the plan map, providing a technical reading with measurements, positions, and main road connections, and the perspective view, offering a perceptual reading that highlights the key elements of the Turin Innovation Mile. Through this intentionally impactful graphic language, the priority elements immediately stand out, allowing a clear distinction of the two project areas, their main characteristics, and their respective landmarks. The sites, highlighted in red, show different conditions and visions depending on the scenario considered, providing a clear reading of the potential and outcomes for each transformation hypothesis.

1 STEP: 2d functional base



2 STEP: key elements collage



FINAL BASE:

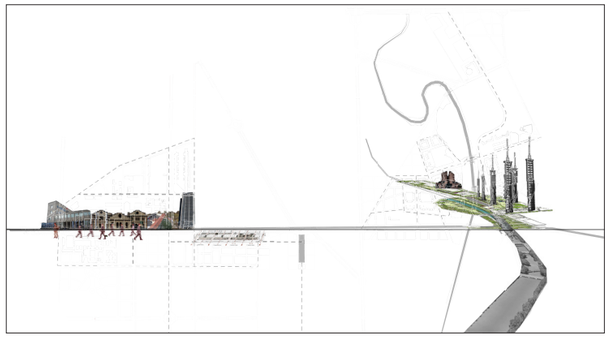


fig.98 Collage process diagram

Scenarios Framework
Inertial

The two sites remain empty, as they are today, so problems related to pollution, lack of social identity, and lack of infrastructure persist. The two areas remain isolated and do not contribute to improving the surrounding urban context. In the backbone of Turin, valuable zones remain incomplete, with unused areas for years that interrupt the continuity of the central Spina, creating a fragmented and unattractive urban space. In the absence of interventions, the innovation potential is wasted, and the areas continue to contribute neither to the quality of urban life nor to the image of Turin as a city of innovation.

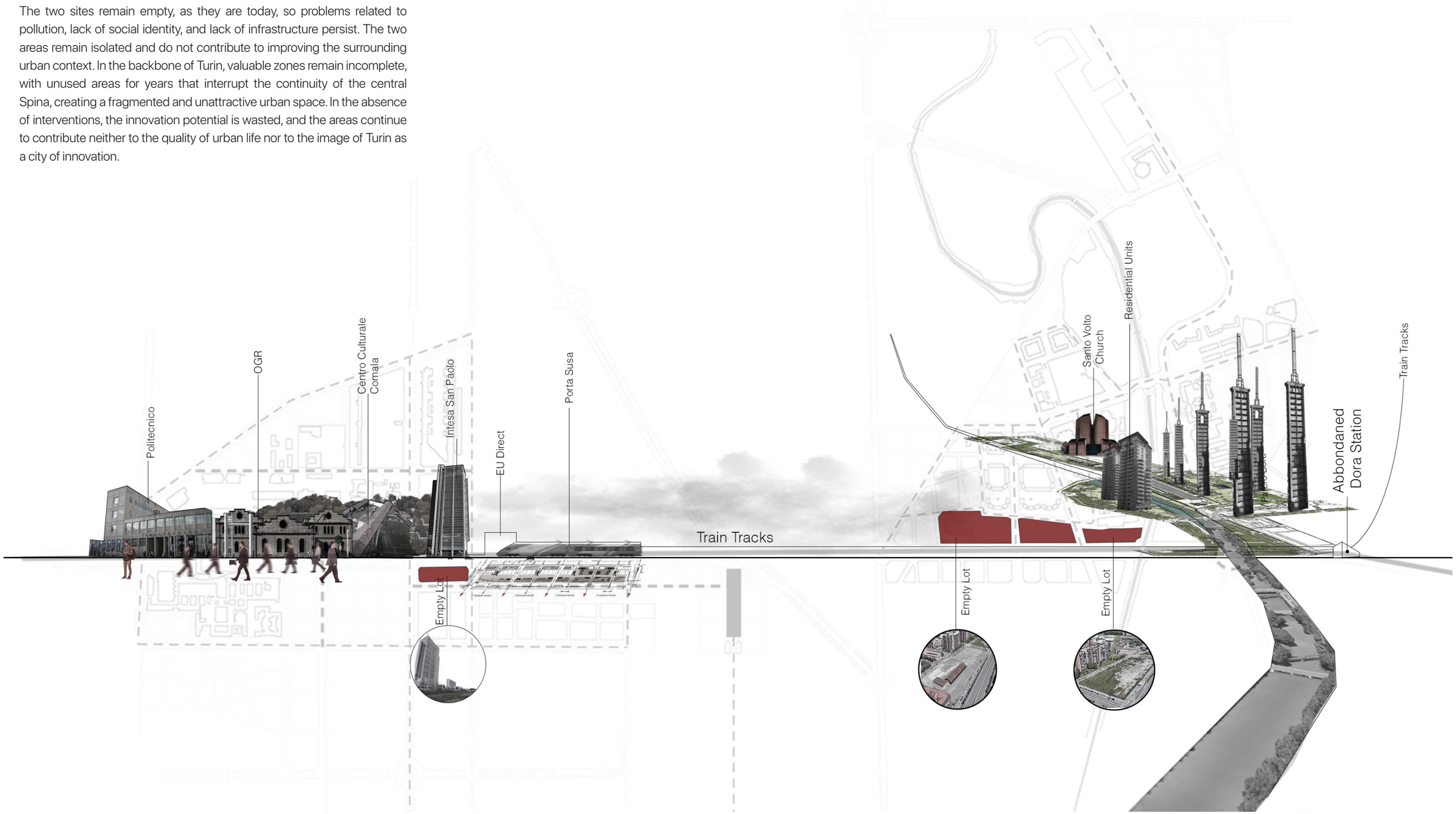


Fig.99 Inertial scenario collage.

Scenarios Framework
Tendential

The two sites are transformed following the current planning rules and the proposed measures, strictly adhering to these guidelines. The two sites are designed individually and show no connection. They thus become two areas that improve innovation but remain isolated, with a vision limited to their boundaries. The citizens of Turin benefit only partially, since the two areas are developed separately, strictly following the indications of an older Master Plan.

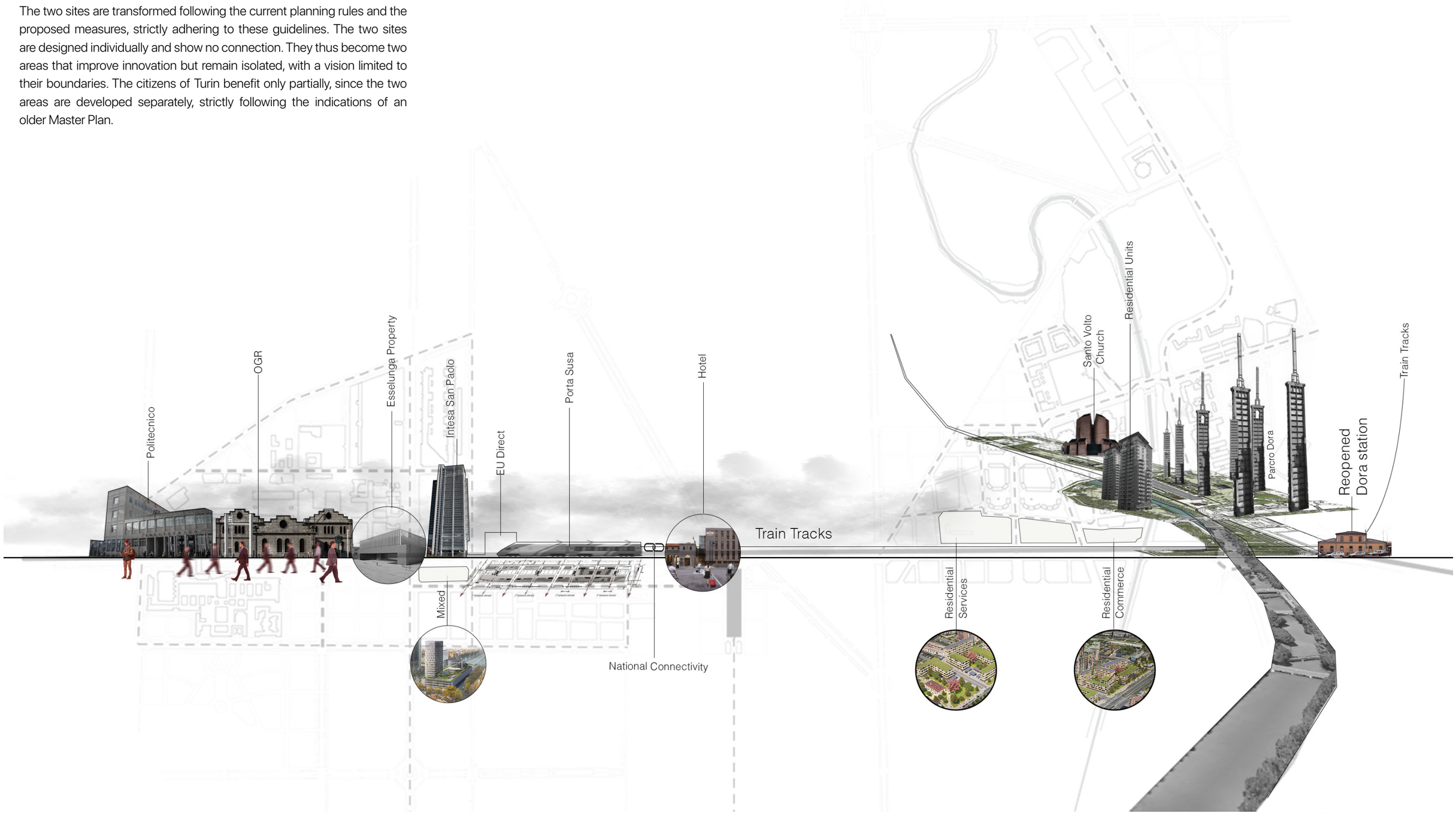


Fig.100 Tendetial scenario collage.

Scenario 2: Tendential
Regulations

The rules on which the tendential scenario is based are those defined by the PRG, further detailed in the ZUT (Urban Transformation Zones).
For the two areas, the rules described in the PRG maps and the percentages of land uses illustrated in the ZUT are reported, including data concerning the territorial surface and the GFA of the area named UMI II in the case of Spina 2, and Spina 3 - Oddone in the case of Spina 3. Further limitations and regulations established by the ZUT are also reported, such as the maximum building height and additional constraints, like those of the Soprintendenza. From the maps, it is also set, especially in the case of Spina 3, the internal road system of the lot, with the location of the zones designated for the different land uses.

In the ZUT sheet of Spina 3 is indicated the name EuroTorino Technologic Park, which groups together multiple functions. Eurotorino, already described in the Urban Building Implementation Rules of 1995, is the program proposed by the PRUSST and developed by the City, advanced jointly by several proposing entities (Cimimontubi SpA; Sviluppo Dora srl; Ingest SpA; Environment Park SpA; Consorzio Bonafous; AEM Torino SpA; Valdocco SpA), related to the territorial areas of Spina 3 and Castello di Lucento 2.

The program has the following objectives:
-to encourage and promote opportunities for sustainable development from the economic, environmental and social perspective, through the construction and completion of infrastructures, while safeguarding historical-architectural and environmental values;
-to redevelop urban areas characterized by phenomena of degradation and to implement an integrated system of diversified activities (productive, commercial, tertiary, tourist-accommodation settlements).

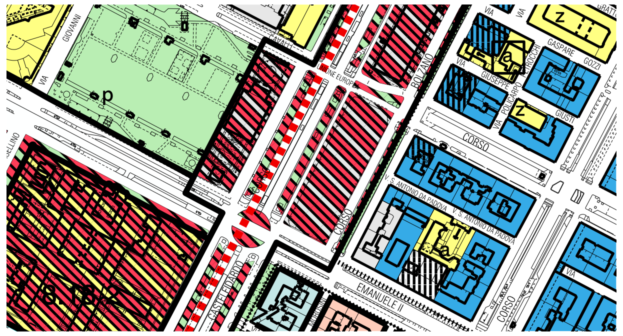


Fig.101 Prg 2025 source: Geoportale

UMI II
PRG regulations

Surface: 7.370 mq
GFA: 45.000 mq

Land use:
- 90% Tertiary functions and 10 % service facilities for individuals and businesses.
- \+ 7000 mq minimun of public parkings

Permitted maximum building height:
150 m

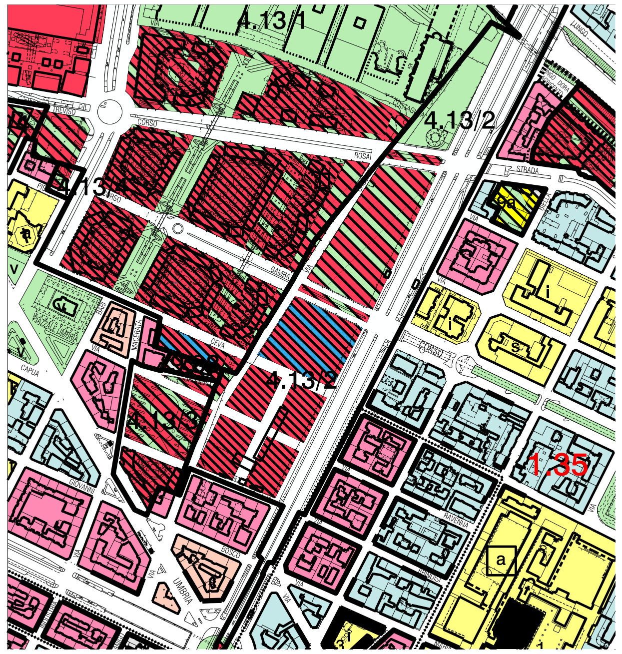


Fig.101 Prg 2025 source: Geoportale

Spina 3 - Oddone
PRG regulations

Surface: 48 500 mq
GFA: 49 647 mq

Land use:
- greenery
- 20 % services
- 40 % EuroTorino technologic park
- 40 % residencial

Maximum number of above-ground sto-reys permitted:

5 storeys for the facades facing the contin-uation of Via Ceva, the internal east-west axis, and Via Savigliano
7 storeys for the remaining facades

Other constraints: the former Valdocco railway yard office building is listed under heritage protection

Scenarios Framework
Strategic

After many data extractions towards an innovative approach matching the modern-day needs and shortcomings of the two sites, the sites, now regulated by new sets of guidelines, have undergone construction responding to the needs of the people and the investors and creating a space for the growth of the investors, residents, and the city as a whole through connections with the rest of the city and generating a mile that carries innovation.

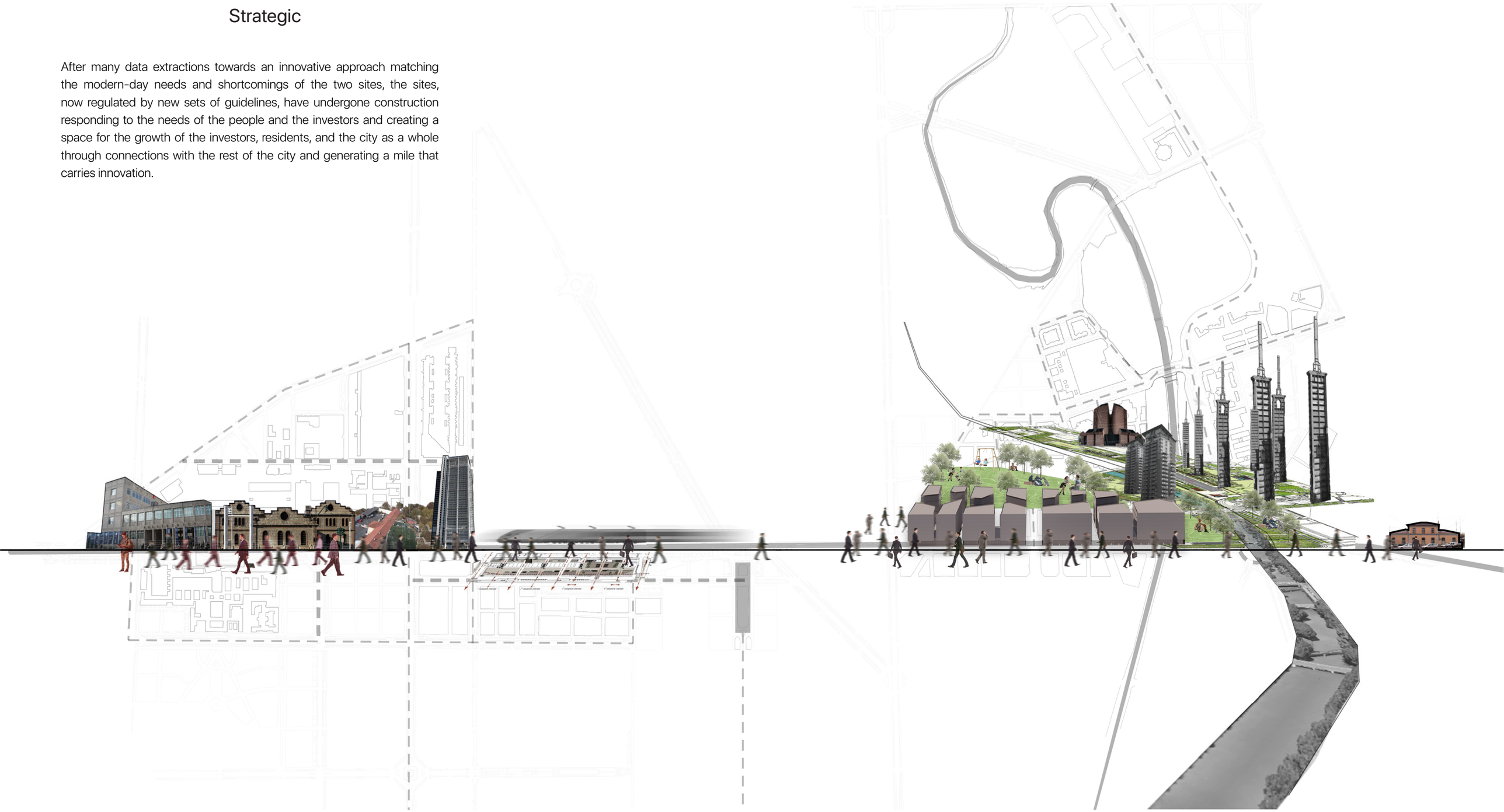


Fig.102 Strategic scenario collage.

DESIGN MODEL

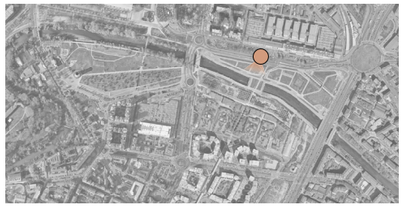
In this chapter a strategic design approach is developed for the Innovation Mile in the Spina 3 area. After a careful analysis of the context in which this area is located, supported by a photographic survey, a step-by-step strategic design is elaborated, divided into two macro areas, one of which is intended to be built by investors. The project intended for investors is made flexible to attract them and, at the same time, is regulated by established limits and rules. The design, starting from the arrangement of the axes, to the definition of circulation within the lot, to the design of the built environment, to the drawing of strategic choices and to the diversification of land uses, makes the Innovation Mile a dynamic, lively, and innovative space for the community, for companies, and for students and researchers.

STEPS TOWARDS THE PROJECT

Field observations

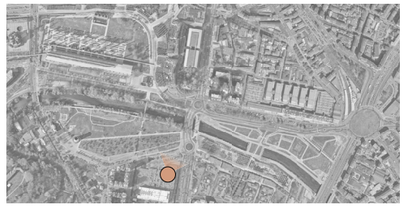
Green spaces blending with the remains of the industrial era

fig.103 On site photo 01



Green spaces that integrate with the residential towers, providing high quality spaces for the community

fig.104 On site photo 02



The residential towers overlooking the river, which does not act as a barrier but as an element integrated into the urban fabric

fig.105 On site photo 03

The residential towers overlooking the Dora shopping center

fig.106 On site photo 04

A neighborhood characterized by commercial activities, fostering a lively and dynamic community

fig.107 On site photo 05

The other side of the project site: residential buildings with a different architectural language from the towers on the opposite side

fig.108 On site photo 06

STEPS TOWARDS THE PROJECT
Concept development

Design process
Base

The project plot is enhanced step by step by a concept that intends to connect the two green areas, fundamental for the community and for collective well-being. The built part is instead placed along Corso Principe Oddone, a more chaotic area busy with cars, working almost as a barrier towards the large green area designed inside the plot. The first step therefore consists in the distinction of the two macro-areas through a dividing axis starting from the old Valdocco freight station, protected by the Superintendence and whose building is kept in the project. The creation of the green area acts as a continuous connection of the green spaces of the zone, making them more accessible and usable. The second step concerns the main axes of the project, with the continuation of some surrounding axes that cut across the project area. In the last diagram, instead, the basic distribution of the created areas can be seen: on one side the green area, on the other the blocks for the buildings. A functional process that makes the design strategic.

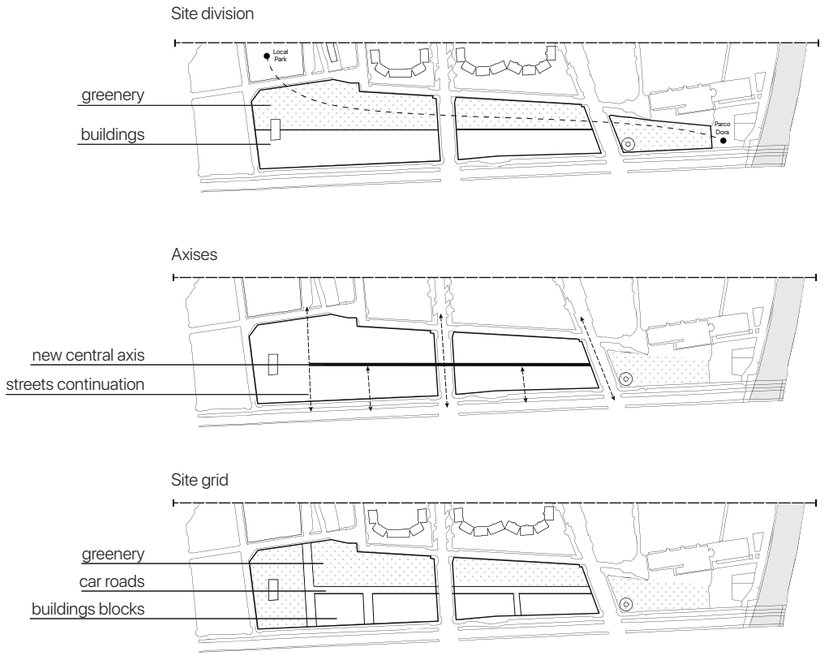


fig.109 Design process diagram

Design process
Buildings

Once the building blocks are established, the decomposition and cutting of these large volumes is carried out to obtain an alternation of building and open space. The first step is the identification of a first series of axes that align the plot with the surrounding buildings. The second step further cuts the blocks at the nodes fixed at the corners and at the midpoints of the sides, following this time the inclinations of the surrounding streets, as explained in figure. Finally, on this grid basis, the buildings are composed by creating alignments with the streets of the plot, openings towards the outside of the blocks (larger towards the park and smaller towards the corso), and an open space inside the block that continues until the end of the site.

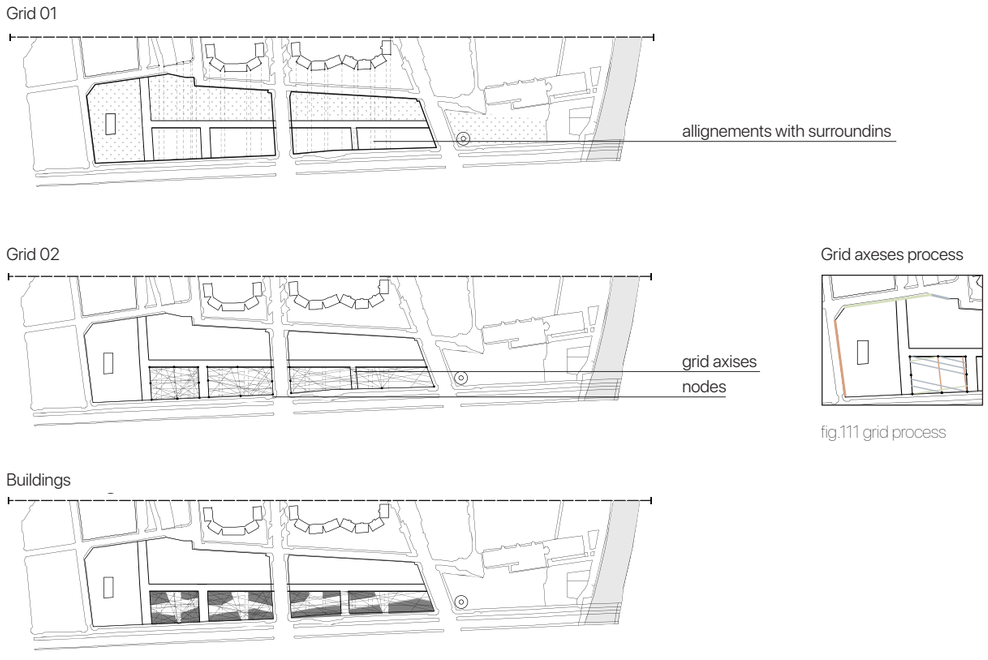


fig.111 grid process

fig.110 Buildings design process diagram

Design process
Landscape

Using the same procedure adopted to design the buildings, the design of the green area is carried out, composed in such a way as to accompany the passage through the plot. The first step is the identification of a first series of axes that align the plot with the surrounding buildings. The second step further divides the areas at the nodes fixed at the corners and at the midpoints of the sides, following the inclinations of the surrounding streets. Finally, on this grid basis, the green areas are composed (the remaining is paving), creating alignments with the streets of the plot, openings towards the outside and towards the building blocks.

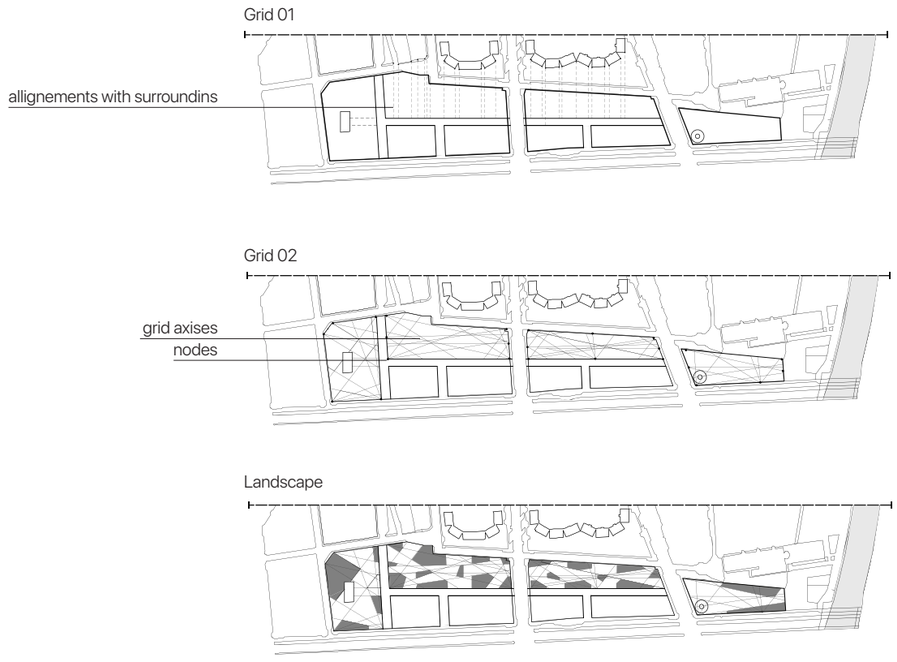


fig.112 Landscape design process diagram

Furthermore, the two macro-areas are designed for different types of mobility: on one side, the green area for the community, a place for relaxation; on the other, the more active blocks with workers and activities, also accessible via vehicular roads. To create continuity both in the green area and for vehicular mobility, a sustainable and cost-saving approach is adopted: the earth removed from the blocks area, to be leveled to the level of the main course Oddone, is relocated within the same project, in the green area, thus creating higher zones (4.5 m above street level) that allow a direct connection (without being cut by a vehicular road) to a block building. A "bridge" is therefore created that passes above the vehicular road that cuts through almost the entire lot, allowing better vehicular circulation, necessary for the correct and improved functioning of commercial activities and workshops, and better pedestrian mobility within the park.

Design process
Land ridistribution

Tot. land removed = 9 532 m^3

Tot. land added = 3 791 m^3

Tot. disposed soil = 5 741 m^3
instead of 9 532 m^3

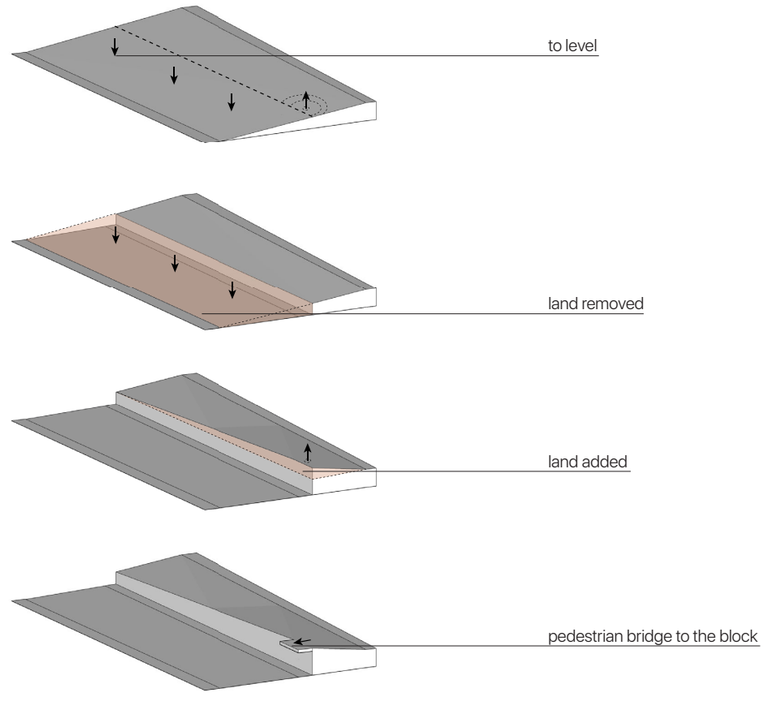


fig.113 Axonometric diagram of land ridistribution

Design strategic choices

blocks process

One of the strategic elements of the project is the composition of the building blocks. As illustrated in fig. 1 step by step, from an axonometric point of view, the four blocks, once extruded, are cut following the previously explained axes. The void area that is created inside each block is strategically conceived to accompany the passage of pedestrians from one side to the other of the plot, connecting all the building blocks, which in this way do not remain isolated even if cut by vehicular streets. This strategic design element allows the creation of a community inside the blocks that is dynamic, not intended only for the workers of the buildings but also for all the users of the area and the visitors, who distribute themselves in this lively, accessible and functional space. The last step of the built concept is dictated by the will to establish and fix a common language for all the blocks. Precisely because the blocks are conceived to be sold individually to future investors, who will have partial flexibility on their design, a unitary element is necessary to demonstrate a unique and coherent concept of the Innovation Mile. This unitary element is a double façade on the fronts facing the main corso.

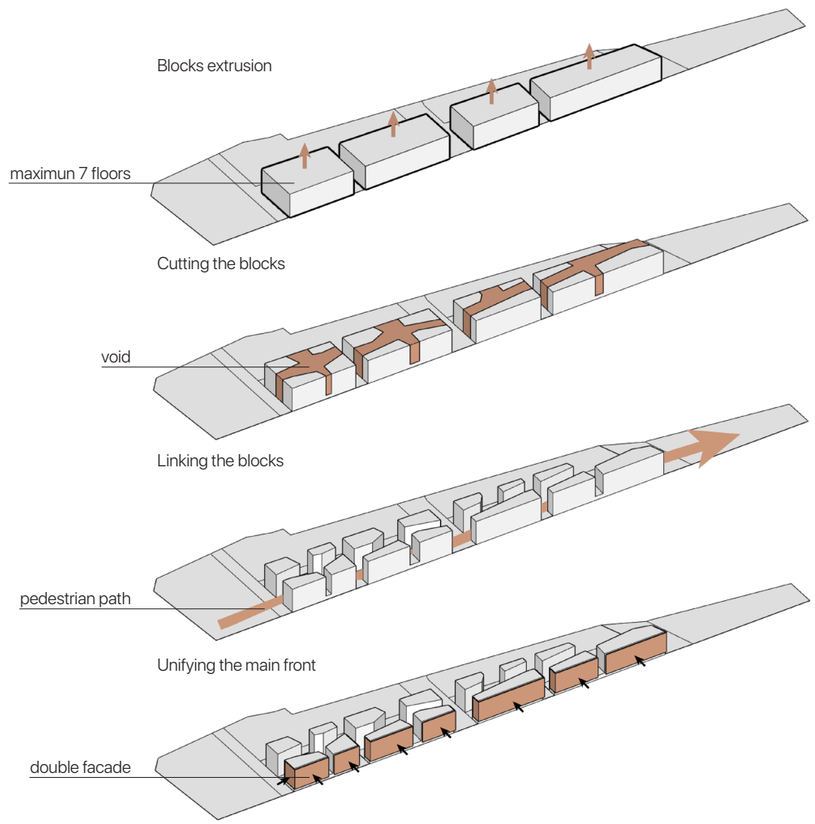


fig.114 axonometric diagram blocks design

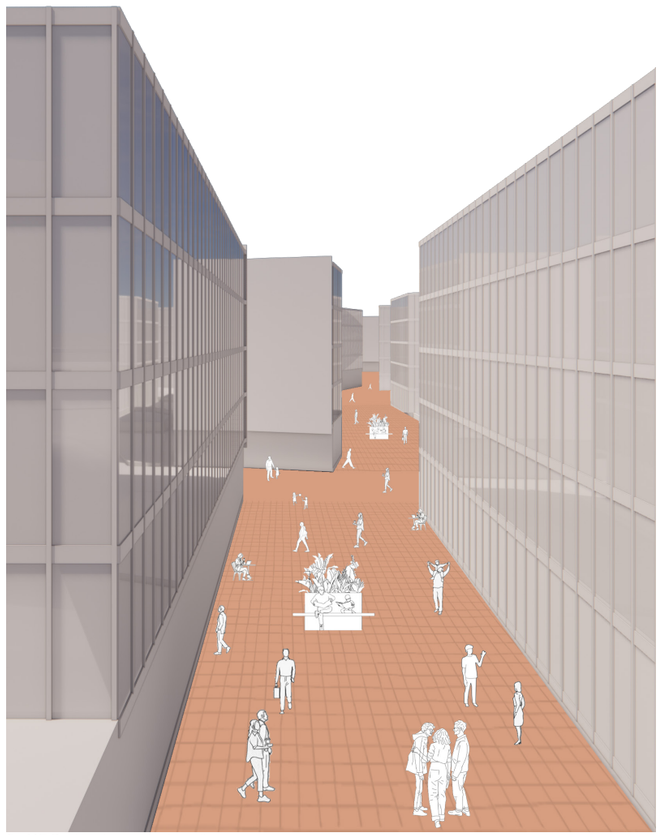


fig.115 Pedestrian path view diagram

One of the strengths of the design is the landscape planned for the community. It creates a green space accessible to residents of the adjacent areas, visitors, workers, students, and researchers: an open area dedicated to leisure and sports activities, but also providing a direct connection from one green area to another and from the areas adjacent to the blocks.

The connection with the blocks, in addition to the street-level connection via the classic sidewalk, is made possible by two bridges crossing the new vehicular road of the lot, necessary for the buildings' activities, offering direct access to the first floor, intended for retail or food services. This space is ideal for a community that wants to enjoy outdoor activities, have lunch breaks for workers, or study time for students.

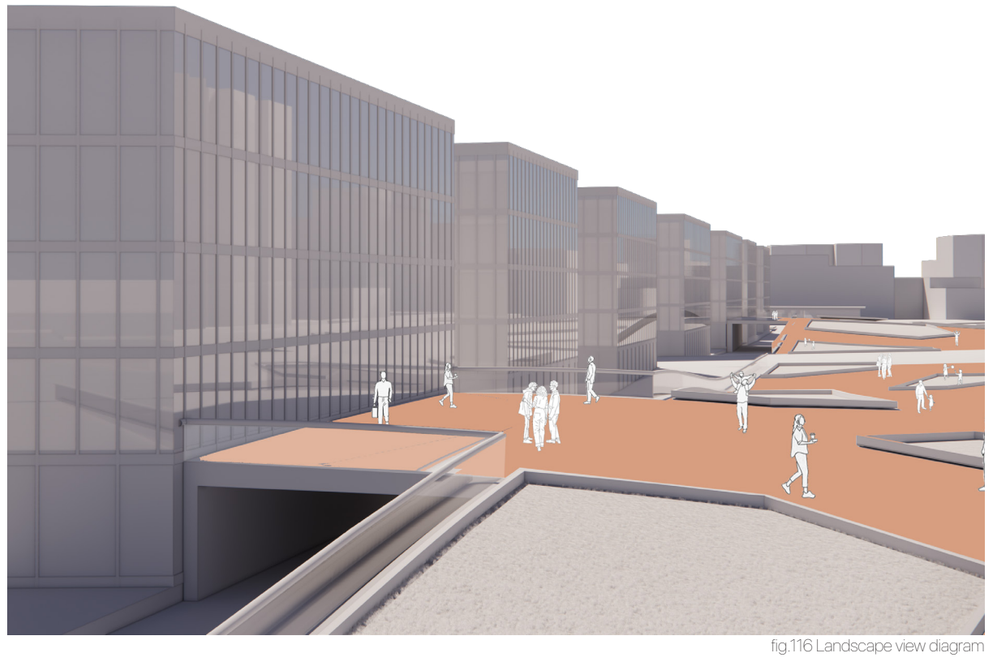


fig.116 Landscape view diagram

Another strategic element of the design concerns the perception of the entire district from the outside. In addition to creating a harmonious and functional project internally, the Innovation Mile must be recognizable and represent a unique and unified project. This design choice is also dictated by the need to standardize the entire lot, planned to be developed by multiple investors who will fund the construction of blocks independent in terms of aesthetics. Therefore, a unifying element is necessary, intended exclusively for the façade on Corso Principe Oddone, the avenue of the Spina of Turin, the connection axis to the rest of the Innovation Mile, and the main access to the site. This creates two opposite façades of the project: one more closed toward the avenue, acting as a barrier against the busy road, one of the main traffic axes of Turin; and one more open, with large windows facing the large green area.

The design element in question is a double façade identical for all buildings facing the avenue, which, in the space between building and façade,

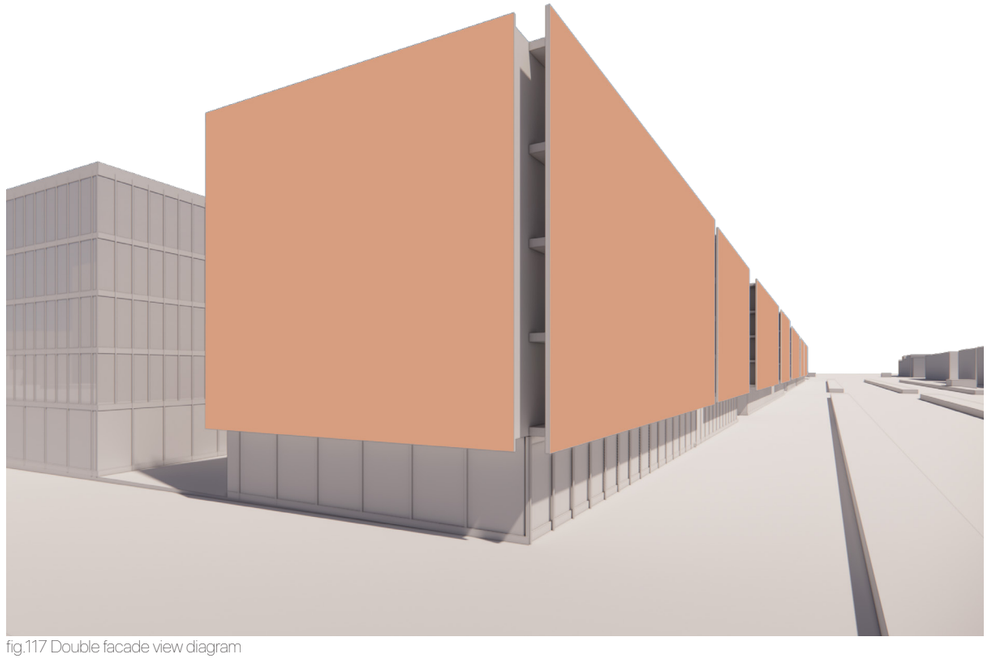


fig.117 Double facade view diagram

The project is designed to be flexible, also to achieve a result that improves the area and fosters a dynamic and innovative community, it is necessary to define parameters for the building use.

Firstly, the green area, not left in its natural state, is designed to provide the community with a functional space for leisure and outdoor sports, as well as to enable the reuse of the old buildings of the Valdocco yard for community purposes.

In the macro area of the blocks, two main zones are distinguished. One is located in the lower part, on the ground floor of all buildings and on the first floor of the two buildings directly connected to the landscape, intended for commercial activities, retail, food services, and amenities (to compensate for the lack of essential services in the Spina 3 residential neighborhood).
This fixed parameter allows for the creation of a dynamic environment within the blocks, which further benefits from the open pedestrian space.

Other functions:

-24% Residential Use (Civil housing , accommodations for student and researchers)

-36% Productive Activities (artisan production and service provision, research activities aimed at production)

-20% Tertiary Activities (Executive and non-executive offices) and conference activities

-20% Research Centers/University

Commercial activities (retail, food services) and service activities (social services, activities of general public interest, entertainment facilities)

Service activities (equipped recreational green areas, community center)

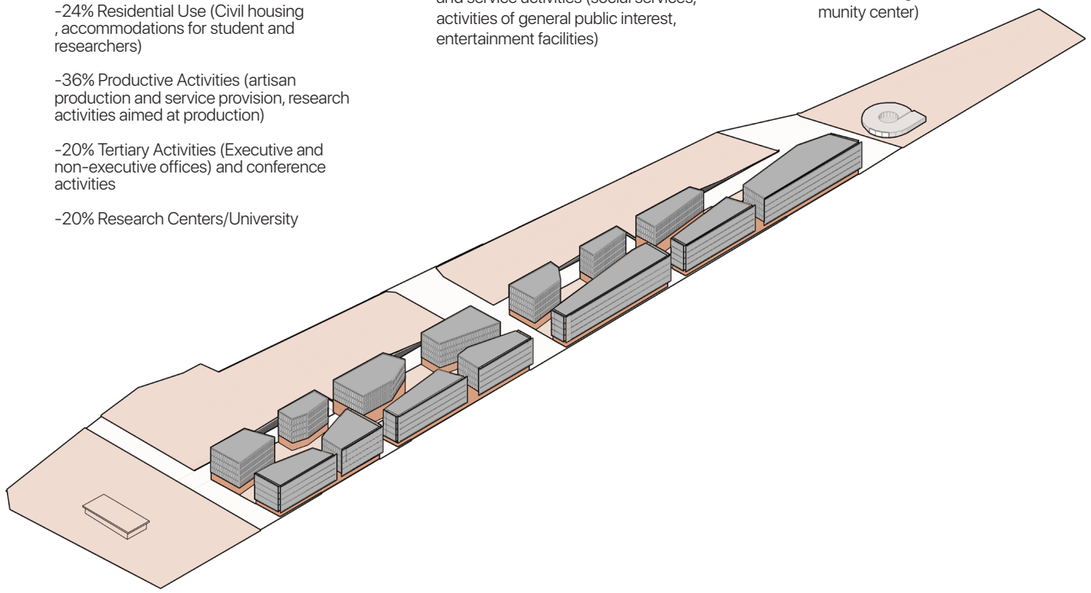


fig.118 axonometric functions diagram

The rest of the buildings is instead allocated to various functions: companies and start-ups, universities with students and researchers, and future residents. This distinction ensures greater privacy and compact spaces on the higher floors of the more private part, while the more public part, distributed and fragmented throughout the area, maintains direct access for the community.

The distribution of land uses resulting from this strategic design is different from the functional distribution established by the PRG in the ZUT, shown in the table, which still reflects the old Eurotorino project and a substantial residential allocation (as much as 40%). To justify this choice, different from what is indicated by the Municipality of Turin, there are several strategic reasons. Firstly, from the perspective of the definition and concept of Innovation Mile, which focuses on boosting the economy and innovation through companies, enterprises, and universities investing in the project, the residential allocation (necessary to keep the district dynamic and accessible) is already high. Moreover, considering the location of the project site, surrounded by residential towers housing a large number of inhabitants in the adjacent area, the addition of further residential buildings is not necessary. It is instead essential to provide all the services needed by the community, which the Spina 3 Committee has been requesting for several years: healthcare services, post offices, schools, pharmacies, libraries, and other community services.

4.13/2 Oddone	Strategic
Services	46%
Commercial and services	12%
Residential	max 10%
Production	min 8%
Tertiary	max 16%

fig.119 project table of functions

4.13/2 Oddone	PRG
residential	min 40%
ASPI -Hospitality -Small-scale production -Commercial -Tertiary -Services	max 20%
Eurotorino -Research Centers -Production -Hospitality -Tertiary -Conference Activities -Universities	max 40%

fig.120 PRG-ZUT table of functions. source: Geoportale

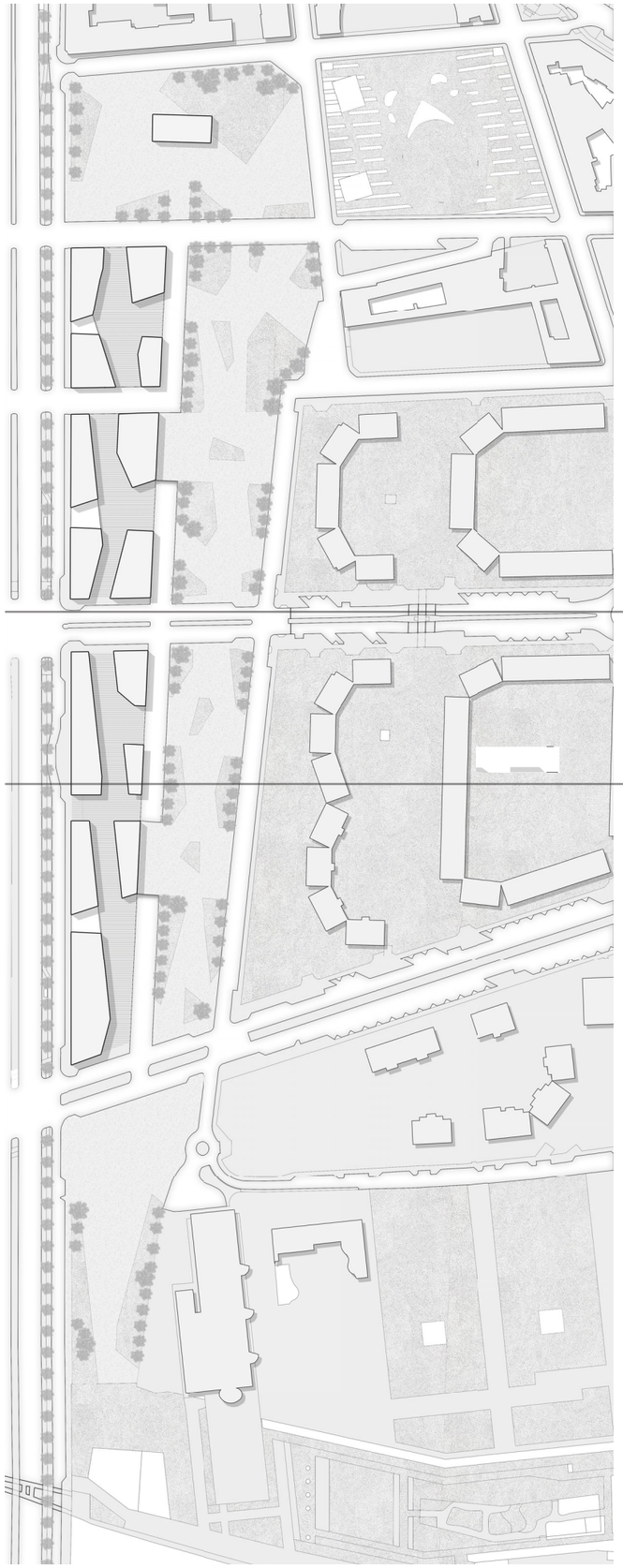


fig.121 Masterplan

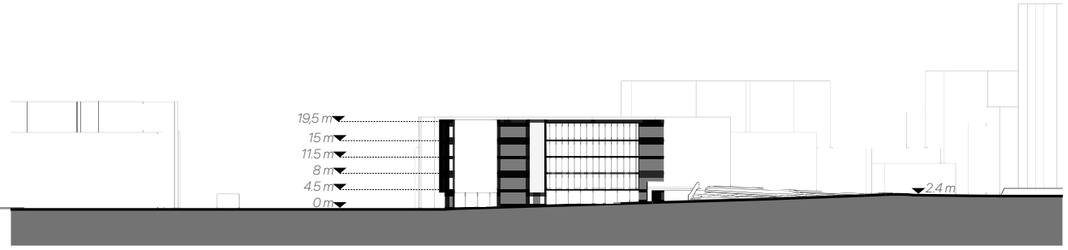
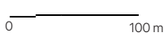


fig.122 Section 01

fig.123 Section 02



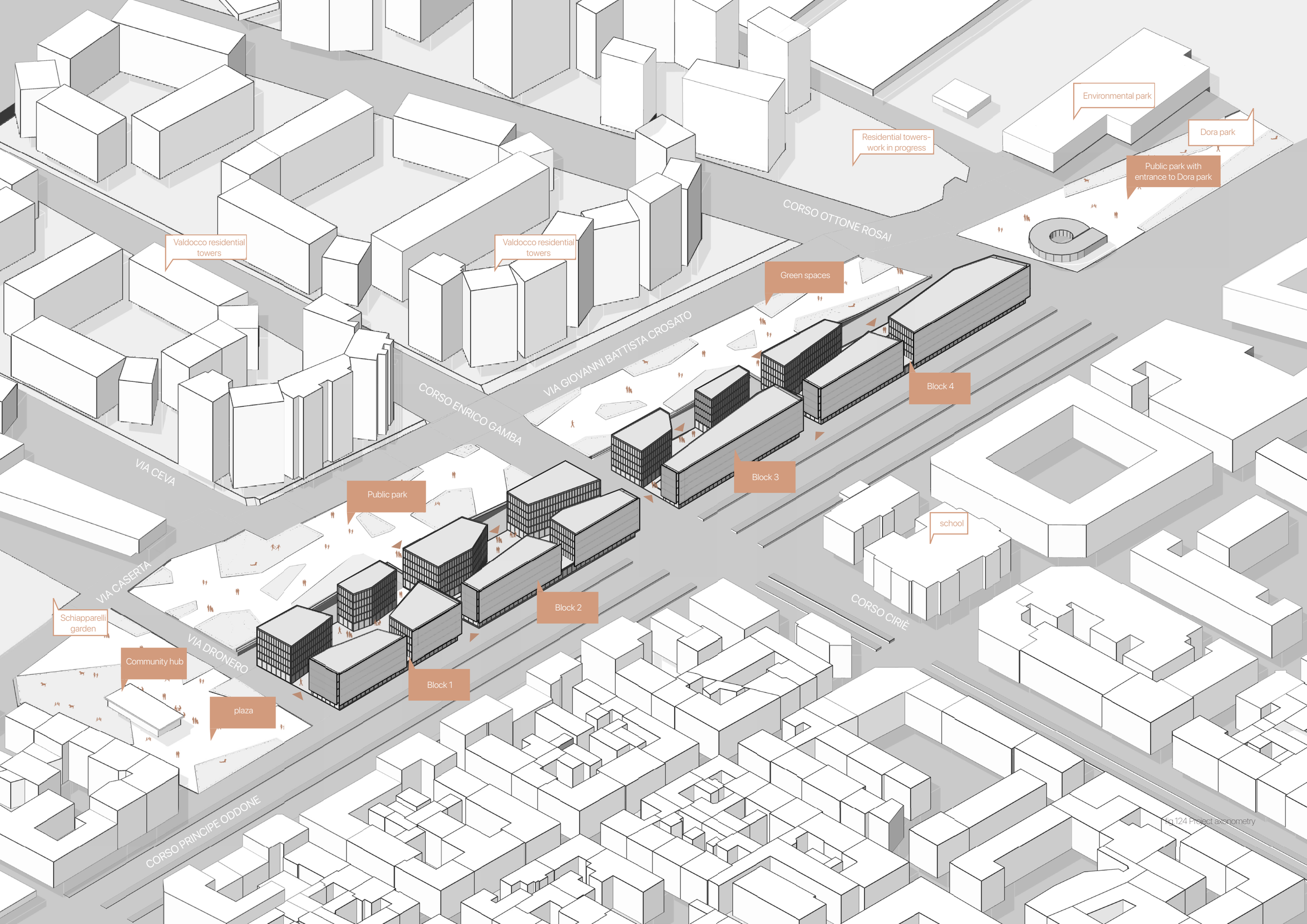


fig.124 Project axonometry

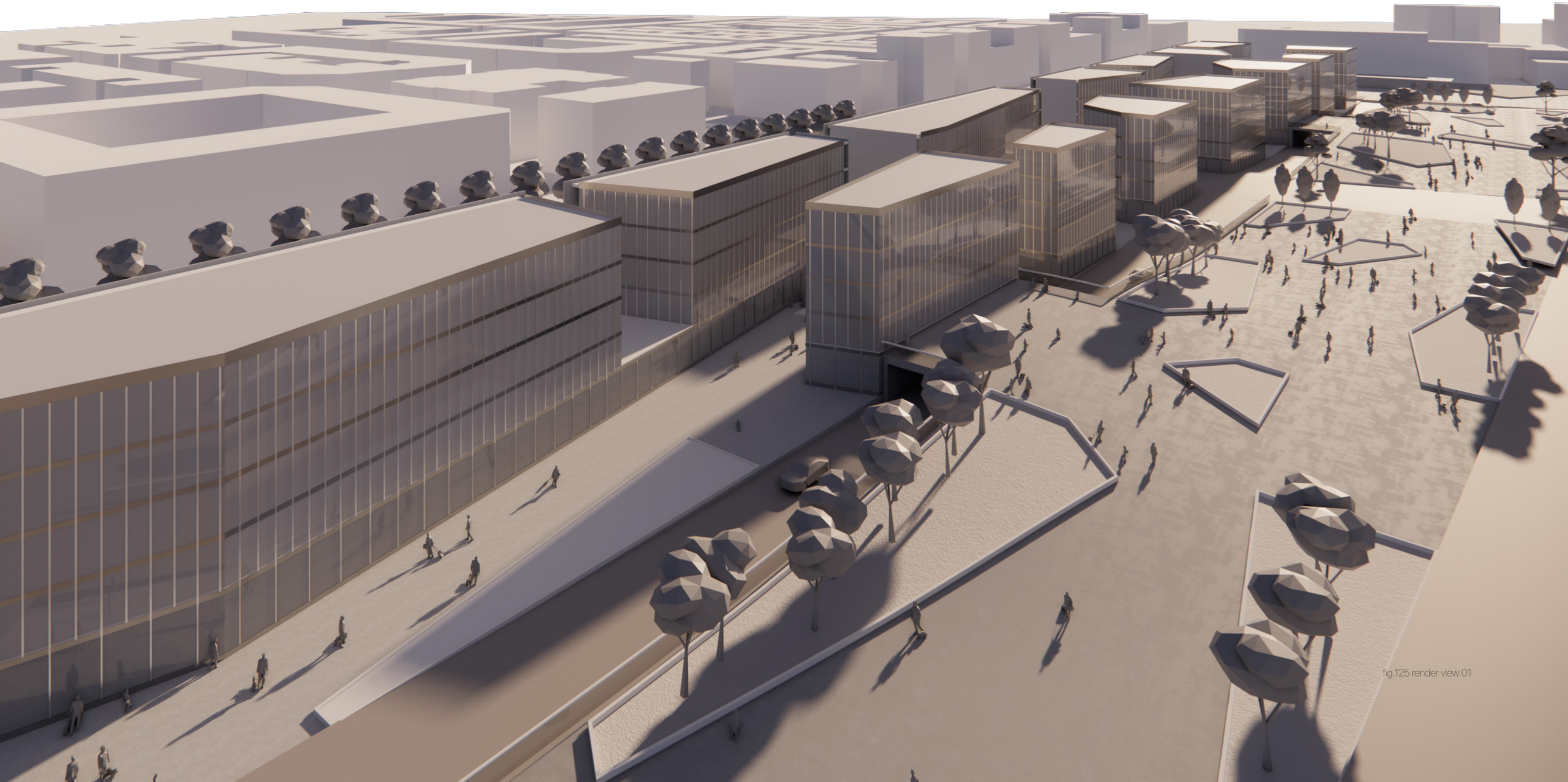


fig.125 render view 01

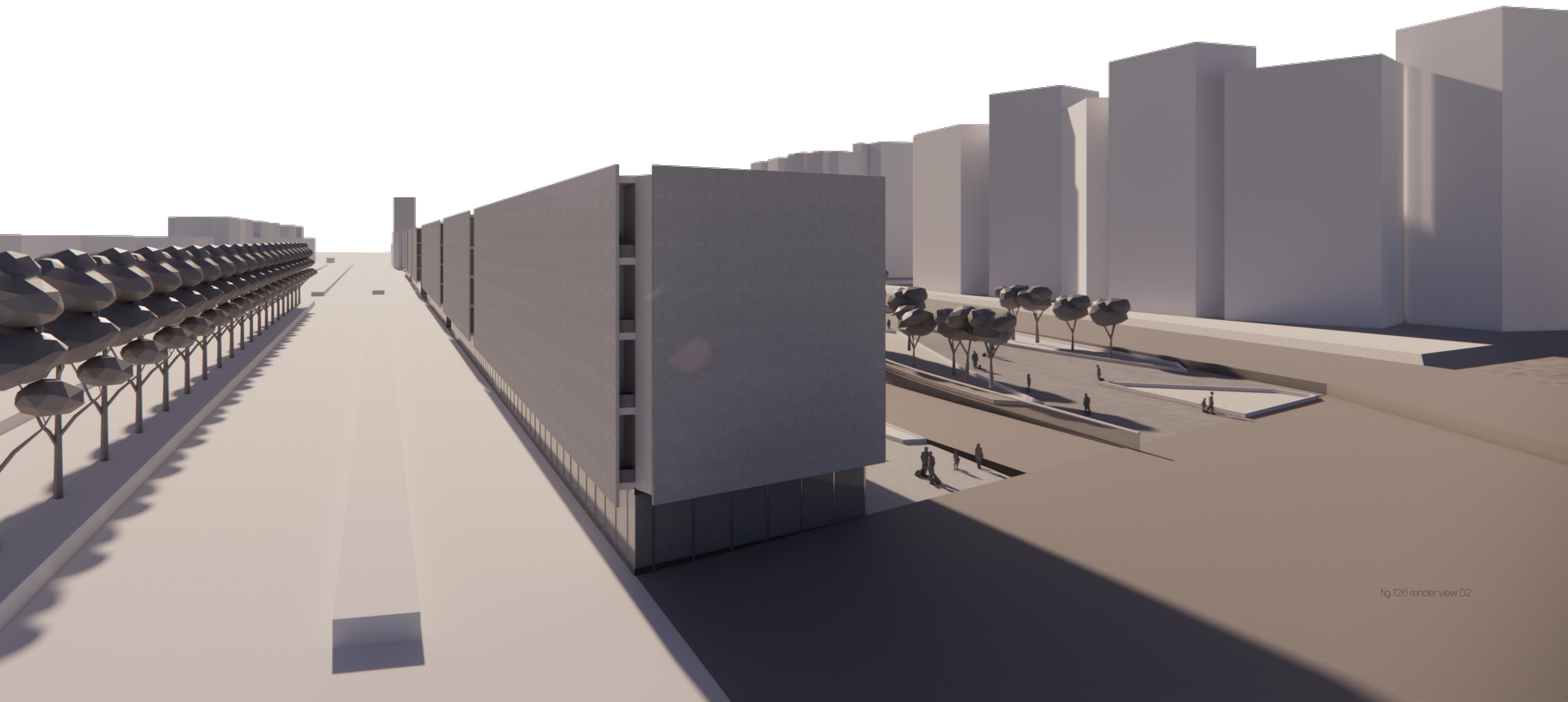


fig.126 render view 02

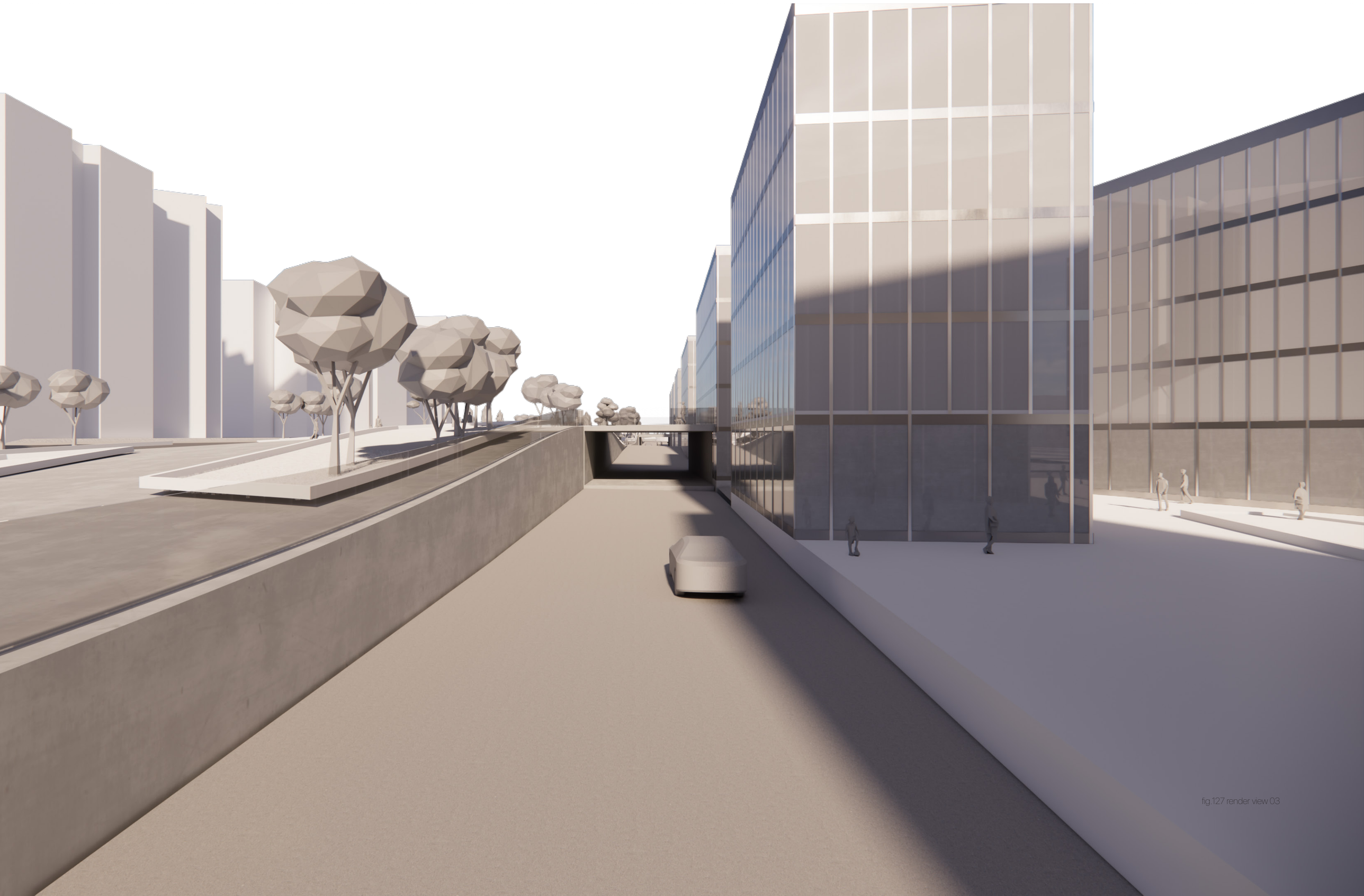


fig.127 render view 03

THE PROJECT
Regulations

Regulations

As already mentioned, the design of this project approach is flexible; once the fixed and invariable elements are established, such as the layout of the buildings, the double façade on Corso Principe Oddone, and the lower floors of the buildings intended for commercial and service functions, in order to make the project attractive and more easily fundable by investors, it is necessary to define a range of flexibility within which they can operate.

It is therefore necessary to establish precise rules for the development of the blocks, which the investors must strictly follow. This approach, flexible but at the same time unitary because managed and regulated by a single entity, allows the project to be realized more easily: being divided into 4 blocks that can be purchased and developed individually, the site does not therefore require a single large investor, more difficult to find, but multiple ones.

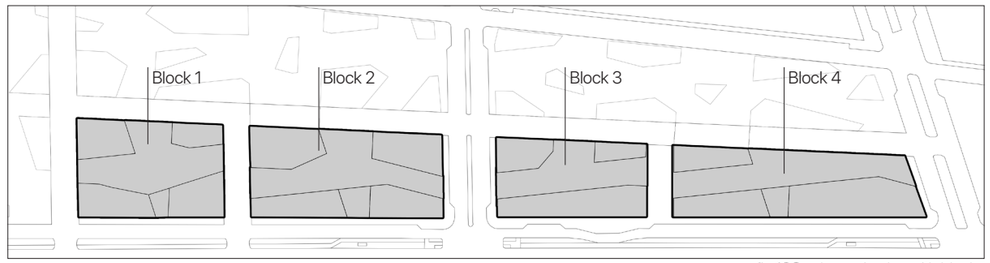


fig.128 schematic plan with blocks

Block 1

Territorial surface = 2611 m²	GFA = 9550 m²

Maximim floor area per floor (equal to the ground floor area)

Build. 1 = 366 m²	Build. 2 = 210 m²	Build. 3 = 868 m²

Number of storeys

Build. 1 = max. 6	Build. 2 = max. 6	Build. 3 = fixed 7 (attached to double façade)

The ground floor area is set for all buildings, with both the spatial configuration and commercial use being fixed

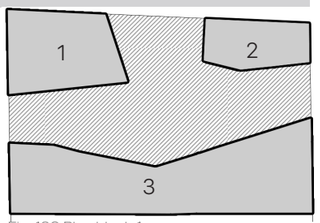


Fig. 129 Plan block 1

Non-buildable area
Buildable area

All building storeys are required to adhere to the perimeter of the block

Block 2

Territorial surface = 3141 m²	GFA = 12361 m²

Maximim floor area per floor (equal to the ground floor area)

Build. 1 = 517 m²	Build. 2 = 448 m²	Build. 3 = 937 m²

Number of storeys

Build. 1 = max. 6	Build. 2 = max. 6	Build. 3 = fixed 7 (attached to double façade)

The ground floor area is set for all buildings, with both the spatial configuration and commercial use being fixed. These rules also apply to the first floor of Building 1

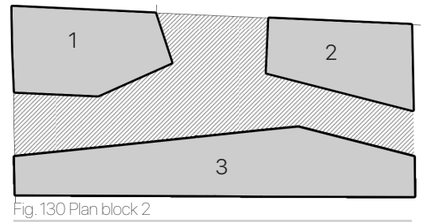


Fig. 130 Plan block 2

Non-buildable area
Buildable area

All building storeys are required to adhere to the perimeter of the block

Block 3

Territorial surface = 2138 m²	GFA = 7837 m²

Maximim floor area per floor (equal to the ground floor area)

Build. 1 = 308 m²	Build. 2 = 161 m²	Build. 3 = 715 m²

Number of storeys

Build. 1 = max. 6	Build. 2 = max. 6	Build. 3 = fixed 7 (attached to double façade)

The ground floor area is set for all buildings, with both the spatial configuration and commercial use being fixed

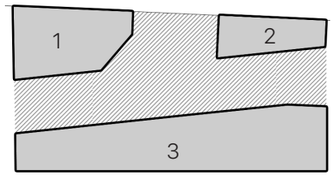


Fig. 131 Plan block 3

Non-buildable area
Buildable area

All building storeys are required to adhere to the perimeter of the block

Block 4

Territorial surface = 3024 m²	GFA = 1730 m²

Maximim floor area per floor (equal to the ground floor area)

Build. 1 = 306 m²	Build. 2 = 1424 m²

Number of storeys

Build. 1 = max. 6	Build. 2 = max. 6	Build. 3 = fixed 7 (attached to double façade)

The ground floor area is set for all buildings, with both the spatial configuration and commercial use being fixed. These rules also apply to the first floor of Building 1

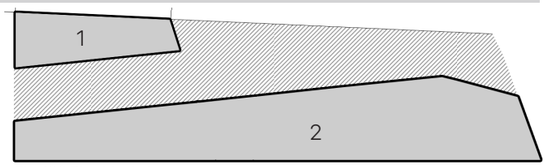


Fig. 132 Plan block 4

Non-buildable area
Buildable area

All building storeys are required to adhere to the perimeter of the block

THE WEBSITE

In this final chapter a prototype of the website of Turin Innovation Mile is realized. Once the flexible design and the strategies for the area are defined (in the case of this research limited to Spina 3), it is necessary that the project engages with both with the community, which is the recipient of the project, and with the investors who will develop it. It is illustrated on which strategic choices the successful development of the website is based, also relying on a careful analysis of the websites of innovation areas reported in Chapter 1, some more effective and useful than others. We also exploited the site in a functional way, with a page dedicated to investments, which can be implemented with additional information that we could not include due to the academic nature of this research, such as, for example, the price. The website still remains a prototype of an effective tool to illustrate and involve the investors.

The website

Website
Choices

The website is one of the best tools to attract the attention of investors, who are those who make the realization of the project possible, and it is used in many cases of innovation districts and research parks precisely for this purpose. The site, to be effective, must be attractive, evocative, and informative.

Firstly, it is necessary to communicate a strong and recognizable vision, a title for the project that reflects its general vision. The project takes the acronym INTO: IN stands for innovation and TO for Turin; together they form the word "into", which underlines how everyone is involved "into" the project. Innovation Mile is a vision that concerns everyone and is inserted into the city and the community of Turin. The creation of the acronym is also a tool to make the project more attractive and is used with rhetorical devices and the repetition of key words to express a clear idea that remains impressed in the reader's mind.

Images are also fundamental, as they guide the reader in the vision of the site and in the understanding of the project. The images, like the icons, must be evocative.

Finally, the site offers a tool to accompany the investor in the investment: a map that shows the available lots with the necessary information for their development.

Fig. 133 INTO website QR. Made by authors
Scan to see the website.
https://chiarabbertino.wixsite.com/into

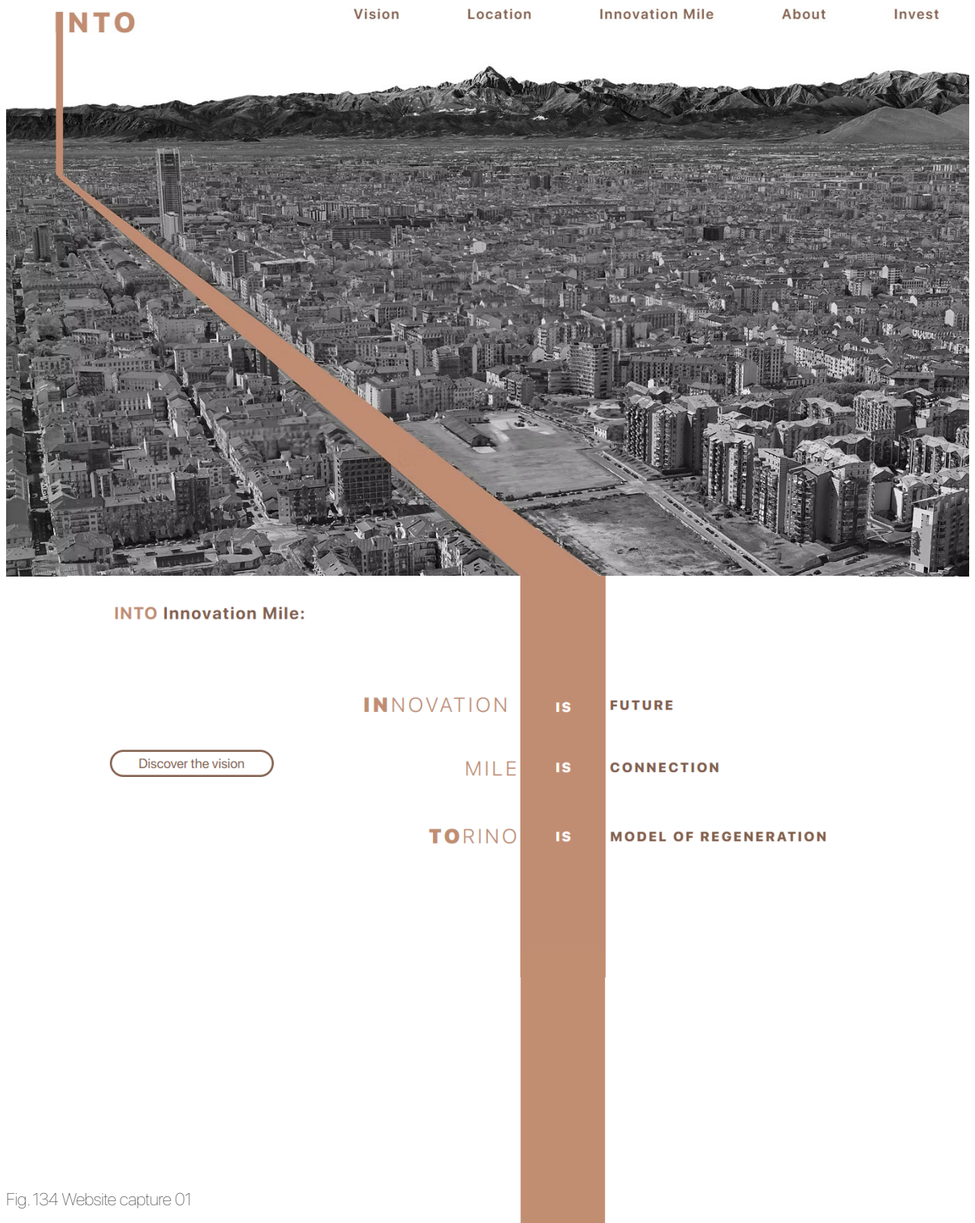
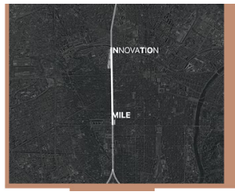


Fig. 134 Website capture 01

ALL ROADS BRING TO INNOVATION

Discover the location

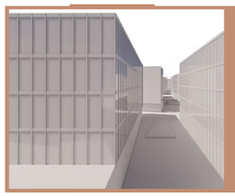


DESIGNING THE FUTURE OF INNOVATION ON TURIN'S MILE

Discover the Mile

CLOSING THE LOOP OF THE CENTRAL SPINE'S RENEWAL

Discover the history



BE MORE THAN AN OBSERVER, BECOME THE PART OF THE INNOVATION

Be part of the project

Where innovation becomes the way you live, work and play

INTO means being part of something greater: at Innovation Mile, innovation flows into everyday life and the whole community, directly or indirectly, is drawn into it. Everyone belongs, everyone shares, everyone lives innovation

The goal of this project at its core is socio-economical, and its to attract investors to the site to help the city prosper but the committee at times of need will help guide this growth through the defined majors of: "environmental sustainability, decarbonization , social inclusion and innovation, digital and technological integration"

Fig. 135 Website capture 02

A new chance being offered

The Mile offers businesses fertile ground to grow and citizens a wealth of opportunities, fostering a vibrant community where innovation inspires everyone.

Technological infrastructural advacement

The Mile builds a high-tech, innovative environment, constantly evolving to be the perfect place to live, study, and work.

A building integrating with the surrounding

The Mile creates a place open to everyone, fully integrated with the city, bridging innovation and Turin's historic charm.

A community being rebuild

The Mile fosters a strong, inclusive community by engaging local residents in decision-making, addressing their needs, and strengthening their sense of local identity.

An environment being revived

The Mile enhances environmental quality, improving air, land, and noise conditions, while expanding green spaces, promoting bike mobility, and revitalizing the riverfront.

Fig. 136 Website capture 03

The Beginning of the Railway Era

After the Unification of Italy (1861), Turin transformed from a noble city into an industrial capital, experiencing rapid population growth and urban expansion, which drove the introduction and evolution of public transport, particularly the railway system.

Main railway stations

Turin's railway network grew with Porta Nuova (1848) as the main hub and Porta Susa, on today's Innovation Mile, from where the railway system was gradually expanded.

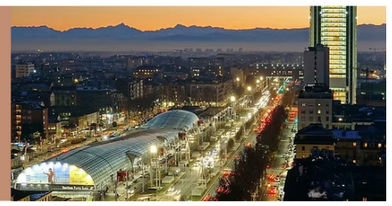
At that time, the Innovation Mile area was entirely occupied by the Turin–Novara railway, which cut through the city and acted as a physical barrier between neighborhoods.

Spina Centrale

The railway problem was largely ignored until the 1990s. Between 1986 and 1995, Cagnardi and Gregotti developed studies that culminated in the 1995 Master Plan (PRG), which proposed the Spina Centrale as the main vision for Turin's urban regeneration, transforming the disused industrial areas along the undergrounded railway into a strategic framework for the city's redevelopment.

Spina 2 trasformation

Spina 2 evolved from a rail-dominated, underused area into a key urban renewal frontier. The PRG/Spina Centrale plan and Politecnico studies guided the covering of the railway and coordinated redevelopment, starting in 1987, though one lot (part of innovation mile) remain undeveloped



Spina 3 trasformation

Spina 3 represents the largest transformation within the Spina Centrale project, turning a heavily polluted area of abandoned industrial sites—a remnant of Turin's industrial past—into a new residential and commercial neighborhood dominated by green spaces, with one remaining lot still vacant, preserving the old Valdocco freight building.

Fig. 137 Website capture 04

Invest in the future

Step INTO Innovation Mile, a vibrant district where innovation, community and opportunity come together, and shape the future of Turin.

Spina 2

check available sites ›

Spina 3

check available sites ›

Spina 3

Plan | General restrictions | Build.1 | Build.2 | Build.3

Block 1

Territorial surface = 2611 m2

GFA = 9550 m2

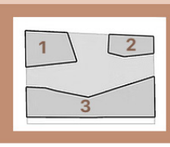


Fig. 138 Website capture 05

Torino Innovation Mile

As part of the larger Spina Centrale, one of the largest urban transformation projects in Turin, the Innovation Mile represents a missing piece in the city's ongoing evolution and expanding economy.

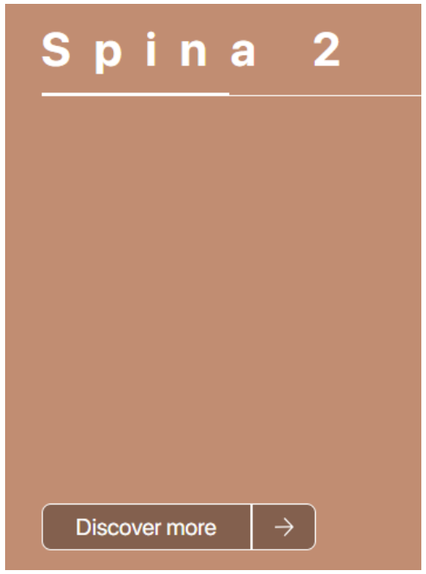
The areas:

Spina 2

the new tech hub

Spina 3

the new innovation district



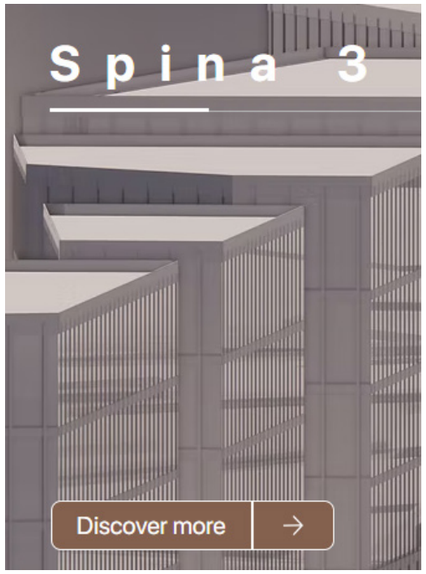
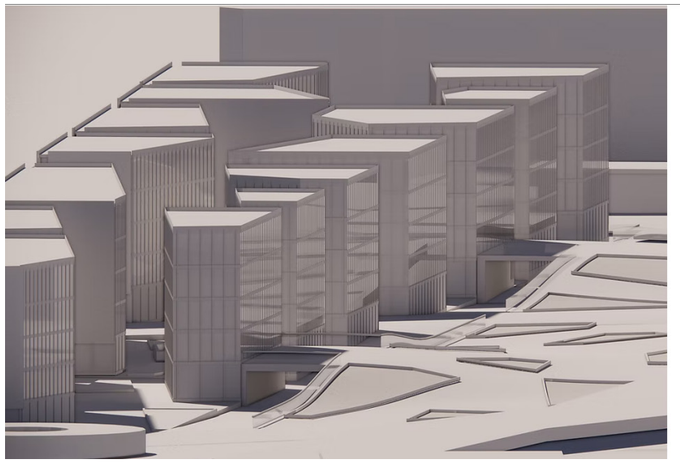


Fig. 139 Website capture 06



One Vision for Spina 3

Innovation Mile transforms Spina 3 into a vibrant link between city and nature. A green park flows through the site, while new building blocks along Corso Principe Oddone shape a dynamic urban edge. Inside, a lively mix of workers, residents and visitors meets in open spaces enriched by cafés, restaurants, shops and community services. Divided into four flexible areas for future development yet united by a common architectural language, Innovation Mile is designed as a true hub of innovation and everyday life.

The Masterplan

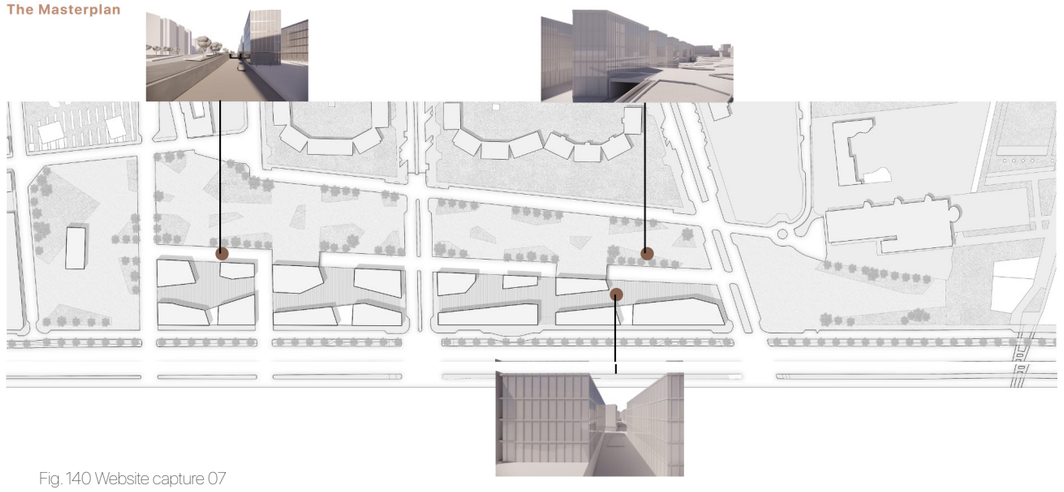


Fig. 140 Website capture 07

check available sites ›

Conclusion

This work initially began as a simple design project regarding the Innovation Mile from an economic perspective, but as the data gathering advanced and became more in-depth, it became clear that, in order to address the existing problems of the Innovation Mile, a different type of approach was needed, leading to a diverse type of outcome.

The development process of the thesis was not linear, and the final result turned out to be very different from the initial idea. At first, this research was conceived to outline a possible and functional transformation for the Innovation Mile project, for which the general objectives (sustainability, technological innovation, decarbonization...) had already been defined. The first topic addressed, in chronological order, was the socio-economic analysis, which made us realize how the two areas were profoundly different and how their future design would also necessarily have to be different, while still maintaining a single and coherent approach. By analyzing these aspects, and in particular by studying the stakeholders, we understood how dense and articulated their network was, and how many actors were directly or indirectly involved in the project. At this point, our idea of the project became increasingly complex, until we realized that proceeding with the design in the Spina 3 area it would not have been possible to define and realize a complete design, because the investors, the developers, hold the economic power to bring the project into reality. It is at this stage that the research shifted from a hypothesis of rigid and predefined design to a flexible approach, capable of adapting and remaining open, avoiding crystallization into an unchangeable final result.

The design approach for the Spina 3 area had to take a step back from what was established by the PRG of the Municipality of Turin, as this represented a fundamental choice to develop a strategic design specifically dedicated to this area. Doubts arose already during the analysis phase, particularly in the urban and socio-economic studies, since the land uses assigned by the PRG to the Spina 3 area already appeared insufficient to meet the needs of the urban fabric in which the project site is located. In approaching the design, another key lesson also emerged: an effective flexible design must be regulated by a clear set of rules; this set, formulated and articulated in the second part of the thesis, although basic and not exhaustive, provides the necessary foundation for a first step toward a realizable design, as controlled flexibility allows investors to propose different solutions within defined boundaries while still maintaining coherence with the overall strategic vision.

This work, by its nature, is an academic work. Despite the efforts to create a project that mimics the real restrictions of the actual site, not all the factors were considered, such as the presence of an actual fully estimated financial plan for the realization of the project or a detailed analysis of the binding and limiting contracts that could arise from the current landowners (F.S.S.U.). No actual detailed geotechnical calculations were carried out, or real estate market analyses set in place. Despite all of these shortcomings, the approach remains strong and viable because it recognizes a problem of the existing situation and aims to take a step towards a framework that could be implemented further and maybe one day become reality.

This alteration of the city's main urban plan highlights the doubts that arise: how far can we really go beyond the actual rules established by the PRG and still create a project that is beneficial for the community and feasible to implement? How far can we stray away from the regulations, since they are based on a solid and reasonable foundation? And finally, where is the boundary?

Therefore, we did not create a detailed design project, but rather a true strategic vision of the Innovation Mile.

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