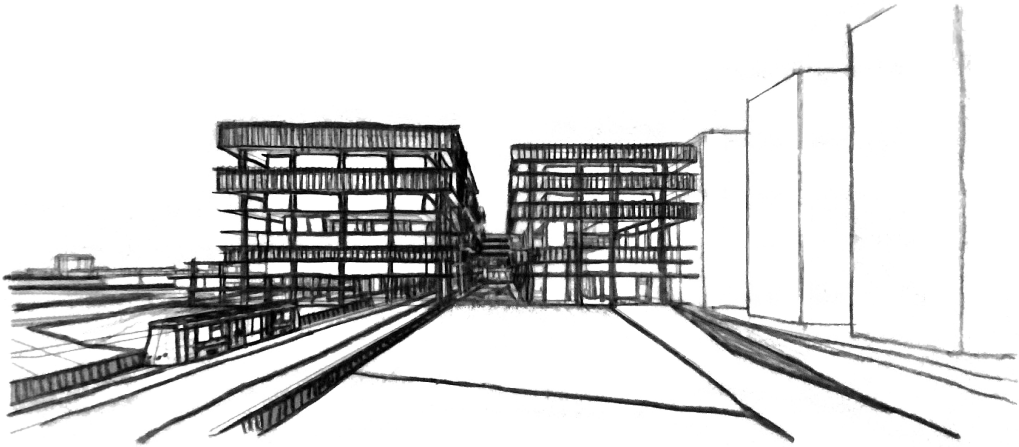
São Paulo Innovation District

an example of urban resilience



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an example of urban resilience

Thesis Project
Centro Universitário Belas Artes de São Paulo
Architecture and Urbanism

Giovanna Batizeli Giaquinto

Supervisor: Ivanir Reis Neves Abreu

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"Sustainability in architecture is about a love for nature — it means creating buildings that engage with it and exist in harmony with the environment, rather than fighting against it."

Renzo Piano, 2009.

Acknowledgements

The completion of this project represents a deeply meaningful milestone in my journey. I never imagined I would find something that would inspire as much passion and enthusiasm as Architecture and Urbanism, and bringing this chapter to a close through this project is undoubtedly one of my most significant achievements.

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Abstract

The Thesis Project “São Paulo Innovation District: an example of urban resilience” proposes the redevelopment of an area with potential for transformation in the Jaguaré neighborhood, articulating science, technology, nature and urban life within a single integrated environment. Inserted in a metropolitan context marked by socio-spatial inequalities and by the presence of significant green areas with potential for greater integration with the urban fabric, the project addresses contemporary urban challenges by combining innovation, sustainability and inclusion. The proposal is based on the guidelines of CITI II, established by the Government of the State of São Paulo, and reinterpreted through the lens of human scale, active mobility, functional diversity and the structuring role of public space. The methodology integrates theoretical research, urban analysis and design development, structuring the work around eight conceptual axes — innovation ecosystems, high population density, urban resilience, sustainable drainage, active mobility, urban vitality, green infrastructure, and energy efficiency — supported by international case studies and consolidated academic references. The master plan envisions an urban environment capable of reconnecting nature and city through sustainable drainage, productive landscapes, ecological networks and well-qualified public spaces, fostering continuous interactions among research, work and everyday life. The project highlights São Paulo’s potential as a living laboratory for urban experimentation, mobilizing its scientific and technological capacity to produce more resilient, collaborative and inclusive urban environments.

Contents

Introduction

Contemporary cities face increasingly complex challenges arising from the climatic, social, and technological transformations that characterize the twenty-first century. Uncontrolled urban growth, combined with the absence of integrated planning and extensive soil sealing, has compromised both environmental quality and everyday urban life in metropolitan areas. In this context, it becomes essential to rethink the role of cities and propose models capable of reconciling urban development, ecological balance, and quality of life. Architecture and urbanism, as instruments of social and environmental transformation, have a responsibility to develop solutions that integrate green infrastructure, technology, and inclusivity, fostering more sustainable urban environments.

The São Paulo Metropolitan Region, home to the country's largest economic and scientific hub, reflects the contradictions of contemporary metropolises with particular intensity. The city hosts leading institutions that constitute a significant center for knowledge production and innovation. Nevertheless, São Paulo still contains fragmented and environmentally degraded areas where urban infrastructure and natural systems remain disconnected. The project site, located in the Jaguaré district on the western side of the city, embodies these contrasts. Defined by its proximity to the Pinheiros River and the coexistence of former industrial areas with a powerful scientific ecosystem, the site presents a unique opportunity for redevelopment capable of generating new urban and social dynamics.

The "São Paulo Innovation District: an example of urban resilience" emerges as a response to the need to reconnect the city, research, and nature. The master plan proposes the creation of an integrated urban environment in which knowledge production and technological advancement are combined with environmental strategies and vibrant public life. Inspired by the guidelines of CITI II (International Center for Technology and Innovation), proposed by the Government of the State of São Paulo, the project reinterprets this model at a human scale, prioritizing public space, active mobility, and mixed-use development. More than a technology hub, the proposal promotes an innovative and inclusive urban culture aimed at creating new ways of living, working, and learning within the metropolitan context.

The adopted methodology combines theoretical research, urban analysis, and design development, enabling the construction of a comprehensive approach that integrates spatial concepts and sustainable strategies. The theoretical framework addresses themes such as innovation districts, urban economics, and smart cities, which guide the design concept and support project decision-making. The intervention area's strategic location, adjacent to Cidade Universitária and São Paulo's principal research institutions, reinforces its potential to foster collaboration among universities, government agencies, and the private sector, contributing to the development of a creative, collaborative, and sustainable urban environment.

This proposal seeks to redefine an underutilized area and transform it into a place that embodies innovation, environmental awareness, and urban quality. The Innovation District establishes a new relationship between nature and the city through natural stormwater management, productive landscapes, and public spaces designed for social interaction. Within this framework, the concept of smart cities expands this vision by integrating technology, energy efficiency, mobility, and social inclusion as fundamental principles of a more responsive urbanism. The project ultimately envisions a city capable of learning from its own flows, adapting to change, and evolving alongside its society, contributing to the creation of more resilient, innovative, and people-centered urban environments.

Figure 1. **Satellite Image of Brazil.** Source: Reddit, 2023.

01.

Innovation District

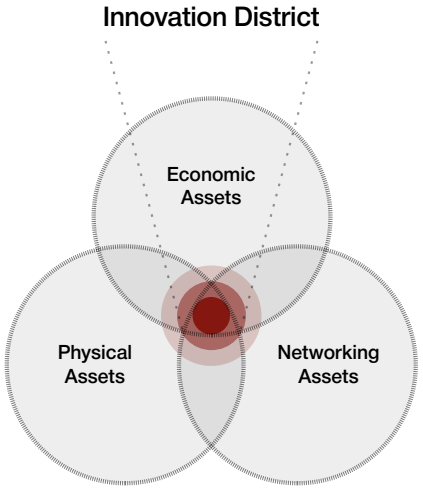
Figure 2. **Aerial view of the Cornell Tech Campus.** Source: Cornell Tech, 2018.

What Is an Innovation District?

Figure 3. **View of the Barcelona Innovation District.** Source: GA Barcelona, 2021.

An innovation district is defined as a planned concentration of scientific, technological, and business activities embedded within the urban fabric, designed to foster knowledge exchange, business development, and high-quality urban experiences. This type of environment emerges through the collaboration of universities, research centers, companies, startups, and public and private organizations, strategically connected to generate innovative solutions that address contemporary social and economic challenges.
Unlike traditional models such as technology parks, innovation hubs, or industrial clusters, an innovation district is not limited to technological development or sector-specific specialization. Its purpose is to promote cross-sector collaboration, cultivate a diversity of stakeholders, and strengthen the integration of research, entrepreneurship, the creative economy, and everyday urban life. By doing so, it brings together economic, social, environmental, and cultural dimensions within a unified urban framework.

The literature highlights that the success of this model depends on the balanced integration of three key assets:



Physical Assets

- Public and private infrastructure designed to foster interaction, collaboration, and experimentation (buildings, public spaces, laboratories, and community gathering areas).

- Architecture, environmental comfort, digital connectivity, and cultural facilities enhance attractiveness and stimulate creativity.

Economic Assets

- A diverse range of stakeholders: research institutions, large corporations, startups, small businesses, investment funds, accelerators, and development agencies.

- Support services such as legal consulting, prototyping facilities, co-creation spaces, and environments dedicated to technological development.

Networking Assets

- Connections among individuals, institutions, and companies that facilitate knowledge exchange, reduce transaction costs, and accelerate strategic partnerships, enabling interdisciplinary and cross-sector collaboration.

Based on these foundational elements, three predominant innovation district models can be identified:

Anchor-Plus: areas where anchor institutions play a central role in shaping the district's identity, development, and innovation ecosystem;

Reimagined Urban Areas: former industrial or warehouse districts that undergo significant physical and functional transformation through urban regeneration processes;

Urbanized Science Parks: peripheral areas originally characterized by isolated science parks that gradually attract new populations, activities, and urban development to their surroundings.

Location of Major Innovation Districts Worldwide

Although this model is still relatively uncommon in Brazil, several international examples provide valuable references. Among the most notable cases are 22@ Barcelona in Spain, recognized for its innovation-driven urban transformation; the Boston Innovation District in the United States, which integrates cutting-edge research, startups, and established companies; South Lake Union in Seattle, known for the close collaboration between technology firms and healthcare institutions; and the Cornell Tech Campus in New York City, which strengthens connections between academia and emerging businesses.

Beyond the United States and Europe, other significant examples include the MaRS Discovery District in Toronto, Canada, one of the world's leading centers for research, entrepreneurship, and technological innovation; and Ruta N in Medellín, Colombia, which has become a Latin American benchmark by successfully integrating innovation and social inclusion at the urban scale.

Porto Digital, located in Recife, is recognized as one of Brazil's most established innovation environments. Although it is not strictly classified as an innovation district—having originally been conceived as a technology park—it demonstrates the transformative potential of such initiatives. Over the years, it has contributed to the revitalization of the city's historic center, attracted companies, generated high-skilled jobs, and promoted social programs linked to the creative economy.

Taken together, these experiences demonstrate that innovation districts thrive when they successfully combine diverse stakeholders, high-quality infrastructure, collaborative networks, and governance models oriented toward experimentation. The result is the generation of economic and social impacts that extend far beyond their physical boundaries.

Figure 4. **Developing successful Innovation Districts.** Source: Veer, M., 2017.

Key Authors

BRUCE KATZ and JULIE WAGNER

Bruce Katz and Julie Wagner (2014) define innovation districts as geographically concentrated areas that bring together companies, academic institutions, investors, and government agencies to create collaborative ecosystems focused on innovation and entrepreneurship. These environments effectively integrate diverse sectors while fostering continuous interaction among universities, businesses, and the public sector. Katz and Wagner emphasize the importance of intelligent and sustainable urban infrastructure capable of encouraging knowledge exchange, technological advancement, and the creation of innovative businesses. In this sense, the innovation district concept represents a broader and more integrated approach to promoting technological progress within urban environments.

"*The rise of innovation districts aligns with the disruptive dynamics of our era and represents a clear path forward for cities and metropolitan areas. Local decision-makers—elected officials and leaders of large and small businesses, local universities, foundations, community colleges, neighborhood councils, and chambers of commerce—would be wise to champion them. Global firms and financial institutions would be smart to embrace them. States and the federal government should support and accelerate them. The result: a step toward building a stronger, more sustainable, and more inclusive economy in the early decades of this young century.***"** (**KATZ; WAGNER, 2014**).

RICHARD FLORIDA

Richard Florida (2002) argues that innovation districts are dynamic urban environments that function as centers of creativity, where the interaction between people, ideas, and technologies fosters the emergence of new businesses and innovative solutions. According to Florida, these areas are driven by a highly skilled workforce, particularly within the creative and technology sectors, and are most successful when they provide a high quality of life, accessible infrastructure, and collaborative spaces. He further emphasizes that these environments should attract not only companies and talent, but also artists, creative professionals, and young entrepreneurs, creating an ecosystem that supports innovation in a fluid and dynamic manner.

"*Many researchers, sociologists, and scholars have theorized about the continuing importance of place in economic and social life. An increasingly influential view suggests that place remains relevant as a locus of economic activity due to the tendency of firms to cluster together. This perspective builds upon the influential theories of economist Alfred Marshall, who argued that firms group themselves into 'clusters' in order to achieve gains in productive efficiency.***"** (**FLORIDA, 2002**).

JOSEP PIQUÉ

Josep Piqué (2022) views innovation districts as strategic areas where collaboration among businesses, universities, and research institutions is essential for economic and social development. These spaces extend beyond their physical dimension, functioning as dynamic ecosystems that foster continuous interaction among diverse stakeholders and generate synergies that drive innovation. According to Piqué, the key to the success of these districts lies in the integration of technological and scientific capabilities with strong business and institutional support networks, creating an environment conducive to knowledge transfer, the creation of new enterprises, and the enhancement of competitiveness and sustainability.

"*Innovation districts, innovation areas, technology parks, strategic clusters... these are different urban approaches to creating spaces dedicated to knowledge generation through the concentration of organizations and other stakeholders, including government, industry, and universities.***"** (**PIQUÉ, 2022**).

Bruce Katz, Julie Wagner, Richard Florida, and Josep Piqué converge in their understanding of innovation districts, defining them as strategic areas where collaboration among businesses, universities, government agencies, and research institutions is essential for the emergence of new ideas and technologies. For these authors, innovation districts extend beyond the mere provision of technological infrastructure, functioning instead as dynamic ecosystems that foster continuous knowledge exchange and innovation. Katz and Wagner emphasize the importance of an integrated urban environment, Florida highlights the attraction of creative talent and quality of life, while Piqué underscores the connection between scientific capabilities and entrepreneurial activity. Despite their different perspectives, all agree that the success of an innovation district depends on the existence of a collaborative and sustainable environment in which diverse sectors interact to drive technological and social progress.

02.

Urban Economics

Figure 5. **Aerial view of Marginal Pinheiros.**
Source: Real Drone Imagens Aéreas, 2020.

Why Does Urban Economics Matter?

Figure 6. **Corporate buildings.** Source: ADS TTC, 2023.

Urban economics is founded on the ability of cities to concentrate people, productive activities, and knowledge flows within the same space, creating environments where innovation can flourish (GLAESER, 2011; JACOBS, 1969). Urban economic dynamism depends on continuous interactions among firms, universities, workers, and services, generating collective learning, new combinations of ideas, and effective responses to emerging challenges (STORPER, 2013). This dynamic is fundamental because it demonstrates that cities are not merely physical spaces, but engines of development capable of generating social and technological transformations that would be unlikely to occur in dispersed environments (ROMER, 1990).

This process is strengthened in areas that encourage physical proximity, mixed-use development, diverse economic activities, and the continuous movement of people—conditions that are essential for fostering spontaneous encounters and professional connections (JACOBS, 1969). Urban density is not only quantitative but also qualitative: the greater the diversity and complementarity among economic sectors, the greater the capacity to generate innovative solutions (FLORIDA, 2002). Complex urban environments create external economies, meaning benefits that arise not from individual firms but from the relationships established among multiple stakeholders (GLAESER, 2011). This logic helps explain why cities have become essential to contemporary economic growth: they concentrate the conditions that enhance productivity, creativity, and collaboration.

Innovation ecosystems benefit directly from this central principle of urban economics: growth driven by the accumulation and circulation of knowledge (ROMER, 1990). Rather than relying exclusively on natural resources or heavy infrastructure, innovative cities build their strength through their capacity to generate ideas and multiply productive connections. This process creates a self-reinforcing cycle: companies attract talent; talent attracts new companies; new ventures stimulate specialized services; these services enhance the urban environment; and, in turn, this environment attracts even more people and investment (FLORIDA, 2002).

Moreover, these environments function as urban laboratories where technologies, sustainable practices, and new productive models can be tested and refined. Their presence enhances urban competitiveness by connecting science, the creative economy, and entrepreneurship within a single area, generating positive effects that extend to other sectors of the city (STORPER, 2013). As a result, local economies tend to diversify, new value chains emerge, and traditional industries incorporate innovative methods. In this way, innovation districts increase productivity, expand economic opportunities, and foster social inclusion, contributing to a more balanced model of urban development.

Urban economics therefore demonstrates that innovation is not an isolated phenomenon, but rather the result of the interaction between density, diversity, and connectivity (JACOBS, 1969; GLAESER, 2011). Innovation districts embody these forces by transforming ideas into economic and social value. Understanding urban economics is therefore essential, as it provides the theoretical and practical foundation for explaining why these innovation hubs succeed, which conditions enhance their potential, and how they can generate lasting impacts within metropolitan regions.

Key Authors

JANE JACOBS

Jane Jacobs (1969) discusses the crucial role that cities play in economic, cultural, and social development. According to Jacobs, cities are the primary engines of innovation and growth, as they bring together a diverse range of talents and ideas that foster creativity and productivity. She highlights the importance of urban agglomeration for economic efficiency, arguing that the proximity of firms, workers, and markets facilitates knowledge exchange and collaboration. Furthermore, Jacobs emphasizes that the evolution of cities depends on their capacity to adapt and create conditions that encourage innovation, diversity, and integration among different economic sectors.

"*Innovative economies expand and develop. Economies that do not add new kinds of goods and services, but merely continue repeating old work, neither expand significantly nor, by definition, truly develop.***"** (**JACOBS, 1969**).

EDWARD GLAESER

Edward Glaeser (2011) highlights the fundamental role of cities in fostering economic growth and innovation, arguing that they serve as hubs for the concentration of people, ideas, and talent. Glaeser contends that physical proximity among individuals and businesses facilitates knowledge exchange, collaboration, and the creation of new economic opportunities. According to the author, cities provide an environment that is particularly conducive to creativity and productivity, as the social and intellectual interactions generated within urban settings are essential drivers of economic development. He also emphasizes the importance of efficient urban infrastructure, accessibility, and quality of life in attracting and retaining talent, factors that are considered crucial to the success of cities in the global economy.

"*Cities matter because they magnify humanity's greatest strengths. They help create the chains of collaboration and creativity that lie behind everything humanity has achieved. Our greatest asset is the ability to learn from one another, and we learn most deeply and effectively when we interact face to face.***"** (**GLAESER, 2011**).

PAUL ROMER

Paul Romer (1990) argues that urban economies are driven by the production and diffusion of ideas, processes that are most effective in dense urban environments where agglomeration and interaction among people are intensified. According to Romer, cities function as centers of innovation and economic growth because the proximity of individuals and firms facilitates knowledge sharing, the generation of new ideas, and the resolution of collective challenges. The author further emphasizes that cities promote the accumulation of human capital and encourage the diffusion of technologies, resulting in sustained economic growth. Within this framework, cities become engines of the knowledge economy, where creativity and innovation play central roles in long-term economic development.

"*The reason cities are humanity's greatest invention is that they facilitate cooperation. Without cities, we would not be able to collaborate with large groups of people like ourselves. It is this capacity for large-scale cooperation that explains much of humanity's success.***"** (**ROMER, 1990**).

Jane Jacobs, Edward Glaeser, and Paul Romer share the view that urban economies are fundamentally driven by human interaction and the capacity of individuals to exchange ideas and innovate. Jacobs emphasizes the importance of urban diversity and vitality as catalysts for creativity and economic development, while Glaeser sees cities as centers of productivity and innovation that foster collaboration among individuals and firms. Romer, in turn, highlights the central role of ideas and knowledge in urban economies, arguing that cities facilitate innovation by concentrating talent and resources. Together, these authors contend that physical proximity and social interaction are crucial drivers of economic growth and innovation, each emphasizing different aspects of urban dynamics that support the creation, exchange, and diffusion of new ideas.

03.

Smart Cities

Figure 7. **Aerial view of Singapore.**
Source: Rockwell Branding Agency, 2018.

What Are Smart Cities?

Figure 8. **Nighttime aerial view of Hong Kong.** Source: Kwok, Matthew, 2020.

The rise of smart cities stems from the convergence of digital technologies, data-driven governance, and new approaches to organizing urban life (TOWNSEND, 2013; KITCHIN, 2014). In this context, high-tech solutions—such as sensors distributed throughout the urban fabric, Internet of Things (IoT) systems, Artificial Intelligence (AI), and Information and Communication Technology (ICT) platforms—enable the collection of data related to mobility, energy consumption, public safety, climate conditions, and the use of collective spaces (BATTY, 2013). The vast amount of data generated by contemporary cities becomes a strategic asset when analyzed in real time, enabling accurate diagnoses and informed actions that improve the efficiency of public services, enhance sustainability, and contribute to a higher quality of life (OECD, 2020).

This connected infrastructure creates an ecosystem capable of monitoring urban flows, anticipating demands, and adjusting operations accordingly. Integrated control centers, algorithms, and data visualization systems allow decision-makers to identify patterns and respond rapidly to traffic congestion, power outages, extreme weather events, or failures in urban infrastructure (KITCHIN; LAURIAULT; MCARDLE, 2015). However, technological potential is fully realized only when combined with participatory dynamics that engage citizens, universities, technology companies, and public institutions. Urban intelligence depends not only on connectivity but also on the capacity to transform information into collective action (UN-HABITAT, 2020).

Within this framework, innovation environments play a crucial role. These hubs bring together scientific infrastructure, urban living labs, startups, research institutions, and specialized companies, creating ideal conditions for testing digital solutions at a real-world scale. The proximity among diverse stakeholders facilitates prototype development, operational model validation, and the experimentation of technologies focused on electric mobility, water management, smart lighting, energy efficiency, and green infrastructure (TOWNSEND, 2013; OECD, 2020). As a result, these environments function as experimental platforms where IoT, AI, and ICT technologies can be tested, refined, and implemented.

The collaboration fostered within these ecosystems strengthens multifunctional networks that combine technical expertise, creativity, and urban vision. The presence of highly skilled professionals, rapid prototyping facilities, automation systems, and integrated databases encourages the emergence of applied solutions capable of reshaping both public and private processes. These hubs also attract investment, cultivate specialized talent, promote digital inclusion, and enhance urban competitiveness by ensuring that cities remain aligned with global technological transformations (HOLLANDS, 2015).

The relationship between smart cities and innovation environments demonstrates that urban intelligence emerges from the convergence of science, technology, urban design, social participation, and institutional capacity. These hubs embody such principles by functioning as open laboratories that connect digital systems, sustainable infrastructure, and collaborative processes. From this integration emerges an urban model that transforms data into knowledge, knowledge into policy, and policy into tangible improvements in everyday life (KITCHIN, 2014; UN-HABITAT, 2020). In this sense, the smart city can be understood as a collective project that combines technological innovation, operational efficiency, and a commitment to a more resilient, sustainable, and inclusive future.

Key Authors

ANTHONY TOWNSEND

Anthony Townsend (2013) argues that smart cities are urban environments that leverage digital technologies and data to improve urban management, enhance the efficiency of public services, and promote sustainability. According to Townsend, by integrating sensors, networks, and information systems, smart cities can optimize areas such as transportation, energy, public safety, and healthcare, creating a more efficient, connected, and inclusive urban environment. He further emphasizes that the implementation of smart technologies must be accompanied by citizen participation and social equity in order to ensure that the benefits of innovation are broadly distributed and accessible to all. In this sense, smart cities are not defined solely by the use of technology, but by their ability to transform urban environments into more livable, connected, and resilient places.

"*Smart cities are places where information technology is used to address both old and new challenges. Cities use this information technology to adapt in real time, collecting data from sensors and transmitting it to software systems that provide insights into how specific problems can be solved.***"** (**TOWNSEND, 2013**).

CARLO RATTI and MATTHEW CLAUDEL

Carlo Ratti and Matthew Claudel (2016) argue that smart cities should be designed as dynamic and adaptable environments that leverage emerging technologies to improve urban life in a sustainable and inclusive manner. According to Ratti and Claudel, the integration of real-time data and intelligent sensing systems enables the creation of more interactive cities, where citizens actively participate in urban governance and decisions are informed by continuously updated information. The authors emphasize the importance of flexible infrastructures capable of responding rapidly to the evolving needs of urban populations, promoting smart mobility, energy efficiency, and an improved quality of life. From their perspective, the cities of the future should be more human-centered and interconnected, using technology as a tool to transform urban environments in ways that benefit both people and the planet.

"*What matters is not starting with technology, but understanding how technology can impact people's lives. When you begin with the human experience, you are able to better understand mobility, social connections, and many other aspects of urban life.***"** (**RATTI; CLAUDEL, 2016**).

SASKIA SASSEN

Saskia Sassen (2012) views smart cities as a concept that extends far beyond the mere implementation of technology. According to Sassen, smart cities should be understood as urban environments that integrate technological innovation with strong social and economic foundations, enabling citizen participation and promoting social equity. She argues that while technology has the potential to optimize urban services such as transportation and public safety, it is essential that smart cities also address social inequalities and ensure that the benefits of technological advancement are distributed fairly across all segments of society. Furthermore, Sassen emphasizes that cities should serve as spaces of human connection and collaboration at both local and global scales, prioritizing the development of infrastructure that responds to social needs while fostering digital inclusion.

"*The challenge for smart cities is to urbanize the technologies they deploy, making them responsive and accessible to the people whose lives they affect. Today, there is a tendency to make these technologies invisible, hiding them beneath platforms or behind walls—placing them in control rather than in dialogue with users. One consequence of this approach is the reduced potential for smart cities to foster an open-source urbanism, which is unfortunate. It shortens their lifespan and accelerates their obsolescence. Urbanizing smart technologies would enable cities to remain relevant for longer, as they would function as open systems, continuously shaped by change, adaptation, and innovation.***"** (**SASSEN, 2012**).

Anthony Townsend, Carlo Ratti, Matthew Claudel, and Saskia Sassen share a common understanding of smart cities, emphasizing that, to be truly effective, they must be dynamic, inclusive, and human-centered. These authors argue that technology has the potential to transform urban environments and should not be viewed merely as a technical solution, but rather as a strategic tool for improving urban quality of life in a sustainable manner. Townsend highlights the importance of integrating data and sensing technologies to optimize urban services and enhance efficiency. Ratti and Claudel advocate for urban environments that are adaptable to the constantly evolving needs of citizens. Sassen, in turn, reinforces the idea that smart cities must promote social equity, citizen participation, and democratic access to urban opportunities. Together, these authors contend that the cities of the future must be connected, resilient, and responsible, where technology serves as an enabler of collaboration, innovation, and equitable access to urban benefits.

04.

High-Tech Innovation in São Paulo

Figure 9. **São Paulo Cable-Stayed Bridge.**
Source: Ecrie70, 2023.

Why Does São Paulo Need an Innovation District?

The São Paulo Metropolitan Region concentrates the country's most significant scientific and technological ecosystem, bringing together leading universities and research institutions that produce high-impact research and educate highly qualified professionals.

Figure 10. **City lights of São Paulo.**
Source: NASA Johnson, 2022.

The presence of the University of São Paulo (USP), the Technological Research Institute (IPT), the Institute for Energy and Nuclear Research (IPEN), and the Butantan Institute creates a unique environment for the development of new ideas, technologies, and applied solutions. Despite this well-established potential, the city still lacks a space capable of bringing these institutions together within a continuous, open, and interaction-driven ecosystem.

The creation of an innovation environment is therefore essential, as it brings together science, entrepreneurship, and urban life within a framework that encourages collaboration and the circulation of knowledge. International experiences demonstrate that when academic institutions, companies, and emerging ventures share infrastructure, programs, and social spaces, stronger creative networks emerge, generating products, services, and research with greater impact and reach. In São Paulo, such integration would enhance the city's ability to transform academic discoveries into real-world applications, stimulating new value chains and strengthening the knowledge-based economy.

Although São Paulo possesses a highly significant scientific ecosystem, its institutions often operate in relative isolation, with limited opportunities for spontaneous interaction among researchers, students, entrepreneurs, and local communities. Furthermore, areas surrounding these centers frequently remain underutilized, characterized by dispersed land uses and a limited supply of shared spaces. While these conditions are not necessarily restrictive, they reinforce the opportunity to establish an environment that encourages movement, encounters, collaborative projects, and multidisciplinary activities—attributes that are fundamental to contemporary innovation ecosystems.

The urban complexity of São Paulo creates a unique environment for experimenting with new approaches to planning, innovation, and sustainability. The city combines high population density, sociocultural diversity, extensive infrastructure, and a constantly evolving economy, creating a context in which challenges and opportunities coexist in an intense and dynamic manner. This multiplicity of layers allows the metropolis to function as a living laboratory, where urban solutions can be tested, refined, and replicated across different scales.

The concentration of universities, research centers, and technological institutions further strengthens this experimental vocation. The proximity between scientific knowledge, social demands, and entrepreneurial initiatives creates favorable conditions for the development of innovative projects capable of integrating applied science, technology, and everyday urban life. The interaction among these actors fosters data generation, urban prototyping, and the implementation of strategies aimed at environmental performance, mobility, and the enhancement of public spaces.

At the same time, the metropolitan region faces challenges that reflect the structural issues common to globalized cities, including sociospatial inequality, a deficit of green infrastructure, vulnerabilities in urban drainage systems, and increasing pressures associated with climate change. These conditions reinforce the need for solutions capable of improving environmental quality, reducing vulnerabilities, and promoting social inclusion. Due to its scale and heterogeneity, the metropolis provides a realistic context for studying and implementing more resilient urban practices.

This combination of scientific capacity, demand for innovation, and tangible urban challenges makes São Paulo a particularly favorable environment for the development of urban models that integrate technology, sustainability, and everyday life. The city thus emerges as a living laboratory where design strategies and public policies can be tested, refined, and adapted, bridging academic research, practical implementation, and urban transformation.

Figure 12. InovaUSP – **Research and Innovation Center of the University of São Paulo.** Source: Pucci, Guilherme, 2024.

Figure 11. **CoronaVac production facility.** Source: Butantan Institute, 2020.

Urban Challenges

The São Paulo metropolis faces a range of challenges that highlight the urgent need to rethink traditional models of urban development. Rapid urban expansion, combined with extensive soil sealing and the loss of green areas, intensifies flooding, urban heat waves, and environmental imbalances that compromise both public safety and quality of life (SÃO PAULO, 2020; IPCC, 2022). These issues become even more critical in the context of climate change, which is increasing the frequency and unpredictability of extreme weather events (IPCC, 2022). As a result, urban environments require solutions capable of mitigating impacts while strengthening the adaptive capacity of cities (UN-HABITAT, 2020).

In addition to environmental pressures, urban centers face structural challenges that directly affect everyday life, including sociospatial inequality, a limited supply of high-quality public spaces, weaknesses in daily mobility, and a longstanding dependence on private automobiles (GEHL, 2010; JACOBS, 1969; NEWMAN; KENWORTHY, 1999). Poor walkability, discontinuous sidewalks, and fragmented cycling infrastructure hinder sustainable mobility and discourage the active use of urban spaces (GEHL, 2010).

Another critical challenge lies in the integration of natural systems and urban infrastructure. Conventional drainage approaches, based on channelization and the rapid conveyance of stormwater, have proven insufficient in the face of contemporary climate variability (C40 CITIES, 2019). The lack of infiltration, retention, and shading strategies contributes to the creation of harsher urban environments that are more vulnerable to flooding and environmental stress. Furthermore, the absence of mitigation measures such as green infrastructure, stormwater parks, and continuous ecological networks increases the vulnerability of urbanized areas and exacerbates environmental impacts (BEATLEY, 2011; BENEDICT; MCMAHON, 2006).

At the same time, technological transformations and emerging patterns of production and work demand urban environments that are more flexible and better equipped to accommodate innovative activities. Nevertheless, many cities continue to exhibit limited integration among research institutions, learning environments, productive sectors, and residential areas, restricting economic potential and hindering the formation of collaborative networks (FLORIDA, 2002). This fragmentation reduces opportunities and prevents urban development from advancing in a more integrated and sustainable manner.

Taken together, these challenges highlight the need for urban models capable of combining environmental sustainability, active mobility, social inclusion, and innovation. Cities increasingly require solutions guided by the principles of resilience, participation, functional diversity, and spatial quality—foundations that shape contemporary urbanism and support the development of new urban ecosystems centered on knowledge, well-being, and environmental balance (UN-HABITAT, 2020; IPCC, 2022).

Brazil's Greenhouse Gas Emissions in 2024

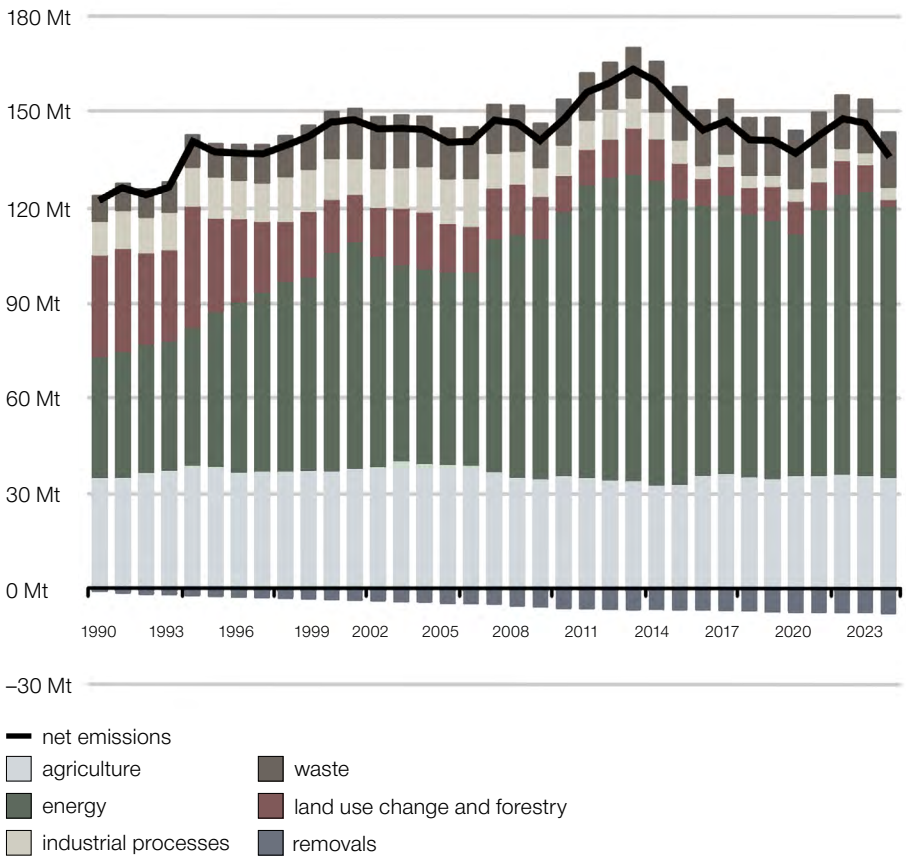
"**Removals**" refer to the carbon dioxide absorbed from the atmosphere by plants during their growth process (ex. trees and algae), this CO_2 becomes part of the plant's biomass (C). More growing vegetation means less CO_2 in the atmosphere.

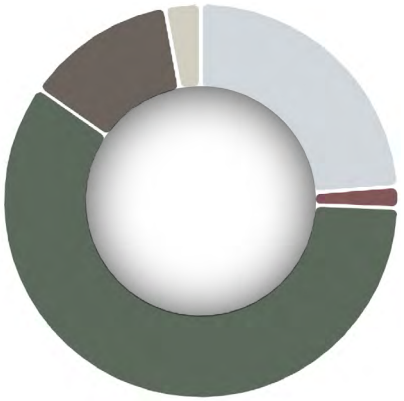
*$MtCO_2e$ = Million tons of carbon dioxide equivalent

Source: SEEG Brasil – SEEG Platform, São Paulo.

Figure 13. **Air pollution in São Paulo.** Source: Estadão, 2024.

GHG Emissions and Removals in the State of São Paulo





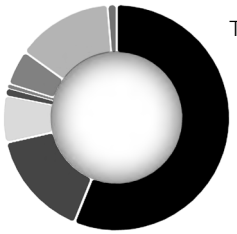
Based on data from SEEG (2025), the chart illustrates the evolution of Greenhouse Gas (GHG) emissions and removals in the State of São Paulo over time, categorized by sector, including energy, agriculture, waste, industrial processes, land use change and forestry, and net emissions. The distribution highlights the contribution of each sector to total emissions, making it possible to identify the activities with the highest carbon intensity and the sectors where the greatest challenges for GHG reduction are concentrated.

Source: SEEG (2025). Prepared by the author based on data from the SEEG Platform.

Energy Sector Emissions by Source Category

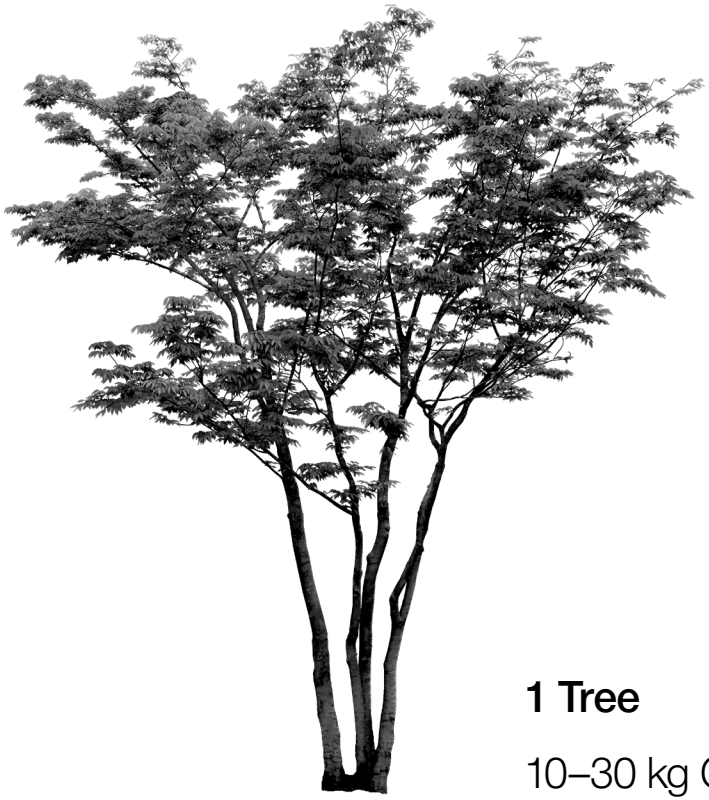
In 2024, the transportation category was the largest source of emissions within the Energy sector, accounting for 48.16 $MtCO_2e$ (56.1%) of total emissions. It was followed by industry, with 13.21 $MtCO_2e$ (15.4%), and fuel production, with 11.81 $MtCO_2e$ (13.8%).

Therefore, any strategy aimed at reducing the environmental impact of the Energy sector must focus on addressing emissions from transportation. Prioritizing clean and low-carbon mobility solutions is therefore essential to achieving significant reductions in overall greenhouse gas emissions.



Transportation
56,1 %

Source: SEEG (2025). Prepared by the author based on data from the SEEG Platform.



1 Tree

10–30 kg CO_2/year

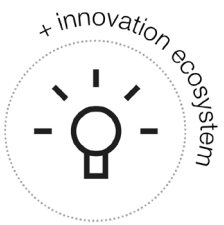
Over 40 years, a single tree can remove 0.4–1.2 tonnes of CO_2 from the atmosphere.

05.

Fundamentals

Figure 13 – **View of corporate office buildings along Marginal Pinheiros.**
Source: Folha de S.Paulo, 2024.

1. + innovation ecosystem



Integrates universities, businesses, and research institutions to foster technological innovation and continuous collaboration.

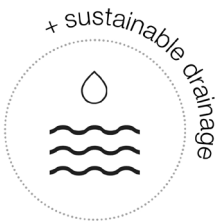
2. + high population density

UN-Habitat: 350 inhabitants/ha as a benchmark for efficient and sustainable urban planning.

3. + urban resilience

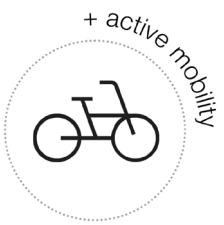
Strengthens climate resilience by integrating water management strategies and the restoration of native ecosystems.

4. + sustainable drainage



Manages stormwater through infiltration, retention, and natural treatment strategies, reducing flood risks.

5. + active mobility

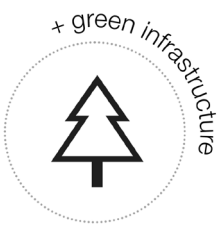


Prioritizes active mobility by promoting walking and cycling, enhancing accessibility and reducing emissions.

6. + urban vitality

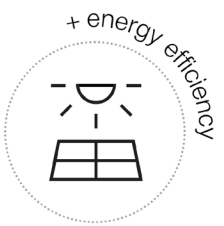
Promotes vibrant urban life through mixed uses and the continuous presence of people.

7. + green infrastructure



Connects green spaces, parks, and permeable landscapes to enhance urban climate and biodiversity.

8. + energy efficiency



Adopts solutions that reduce energy consumption, enhance performance, and encourage the use of renewable energy sources.

Fundamental Principles

The creation of more equitable, inclusive, and environmentally balanced cities requires approaches capable of integrating technology, sustainability, and quality of life. In this context, the Sustainable Development Goals (SDGs) established by the United Nations provide an essential framework for the formulation of urban policies and projects (UN, 2015). Their principles—focused on education, efficient water management, clean energy, innovation, economic growth, sustainable cities, responsible consumption, climate action, environmental protection, and the strengthening of partnerships—guide agendas that seek to address the multiple challenges of contemporary society in an integrated manner (UN-Habitat, 2020).

Drawing upon this global framework, the present Thesis Project organizes its conceptual structure around eight principles that synthesize fundamental urban practices for the creation of more balanced and innovative environments: an innovation ecosystem and high productive density, which values research, creativity, and collaborative networks (Katz & Wagner, 2014); urban resilience associated with sustainable drainage, integrating responsible water management, climate adaptation, and the preservation of natural systems (IPCC, 2022; C40 Cities, 2019); active mobility linked to urban vitality, encouraging sustainable modes of transportation while enhancing everyday experiences through walkable and accessible spaces (Gehl, 2010); and green infrastructure combined with energy efficiency, promoting architectural and environmental solutions aimed at reducing emissions, improving thermal comfort, and fostering healthier urban climates (Beatley, 2011).

These principles form the conceptual foundation of the project, guiding both the urban analysis and the development of the master plan proposed herein. Together, they establish an integrated vision that connects innovation, sustainability, and quality of life, providing a coherent framework for the development of the São Paulo Innovation District (UN-Habitat, 2020).

1. Innovation Ecosystem

2. High Population Density

Innovation ecosystems thrive in urban environments capable of concentrating people, services, and productive activities within short distances. High population density plays a central role in this process by intensifying flows, fostering diversity, and stimulating the continuous circulation of knowledge. When combined with high-quality infrastructure, mixed-use development, and active public spaces, density ceases to represent urban overcrowding and instead becomes a catalyst for economic dynamism, innovation, and collaboration among individuals, institutions, and businesses. From this perspective, innovation is not merely the result of technological buildings or advanced infrastructure, but rather of the urban vitality generated through everyday interactions, spontaneous encounters, and the intensity of daily life, which foster network-building, knowledge exchange, and the emergence of new ideas and solutions. This understanding is exemplified by the MIND – Milano Innovation District, where the concentration of diverse uses and urban activities creates an environment conducive to experimentation, collaboration, and technological development.

Figure 15. **Gateway Square, MIND Milano.**
Source: MIND Milano, 2022.

Milan Innovation District

Author
MARIO CUCINELLA ARCHITECTS
Location
MILAN, ITALY
Year
2022 – ongoing
Area
1.100.000 m²

The Milan Innovation District (MIND), developed by Mario Cucinella Architects in collaboration with LAND, Systematica, and ARUP, is a large-scale urban regeneration project located on the former site of Expo 2015 in Milan. The proposal builds upon the existing infrastructure of the exhibition grounds, particularly the Cardo and Decumano axes, to establish a new master plan focused on innovation, sustainability, and urban vitality. The district is emerging as an international hub for research and development, bringing together universities, hospitals, research centers, housing, and services within a compact and mixed-use urban model.

One of the project's most distinctive features is the concept of the "Common Ground," which designates the first ten meters of every building as a continuous public realm. This strategy creates an interconnected network of squares, parks, and pedestrian routes that link different functions while prioritizing human-scale design and active mobility. The vision of a car-light city is further reinforced through an extensive cycling network and strong integration with public transportation, reducing environmental impacts and encouraging more sustainable modes of movement.

Sustainability is also expressed through the integration of nature and architecture. The master plan alternates built corridors with green spaces and water features, enhancing biodiversity, improving microclimatic comfort, and supporting natural stormwater management. In addition, the project adopts circular economy principles and pursues urban-scale environmental certifications, such as LEED for Communities. The use of methodologies such as Design for Manufacturing and Assembly (DfMA) helps reduce carbon emissions throughout the building life cycle, positioning the district as a benchmark for low-impact construction solutions.

MIND therefore stands out as an innovative model of contemporary urbanism. By combining scientific development, housing, commercial activities, and high-quality public spaces, it creates an urban ecosystem capable of fostering innovation while promoting social and environmental well-being. Its significance lies in its ability to transform an area originally designed for a temporary event into a vibrant, resilient, and globally competitive district, serving as a reference for innovation-driven developments in metropolitan contexts around the world.

"*"The MIND project is not merely an architectural and urban development; it is also an experiment in a new way of living and working together, where innovation, sustainability, and quality of life serve as the driving forces.*" (**CUCINELLA, 2022**).

Figure 16. **Aerial view of the Milan Innovation District (MIND).** Source: Mario Cucinella Architects, 2022.

Figure 17. **Perspective view of the Milan Innovation District (MIND).** Source: Mario Cucinella Architects, 2022.

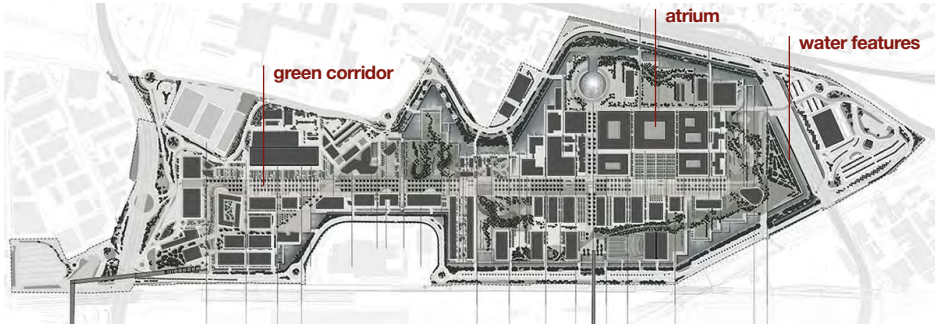


Figure 18. **Site plan of the Milan Innovation District (MIND).** Source: Mario Cucinella Architects, 2022.

The district prioritizes the connection between buildings and shared public spaces, promoting pedestrian routes, interconnected plazas, and green corridors that encourage social interaction and active movement. The urban fabric integrates research, residential, and commercial uses, enabling access without reliance on private vehicles and strengthening interaction among users.

Mobility prioritizes transportation modes that minimize environmental impacts, including cycling infrastructure, integrated public transit, and autonomous electric vehicles. These strategies are complemented by green spaces and permeable surfaces that help regulate the microclimate and enhance biodiversity. The project transforms everyday journeys into opportunities for comfort, quality of life, and environmental performance.

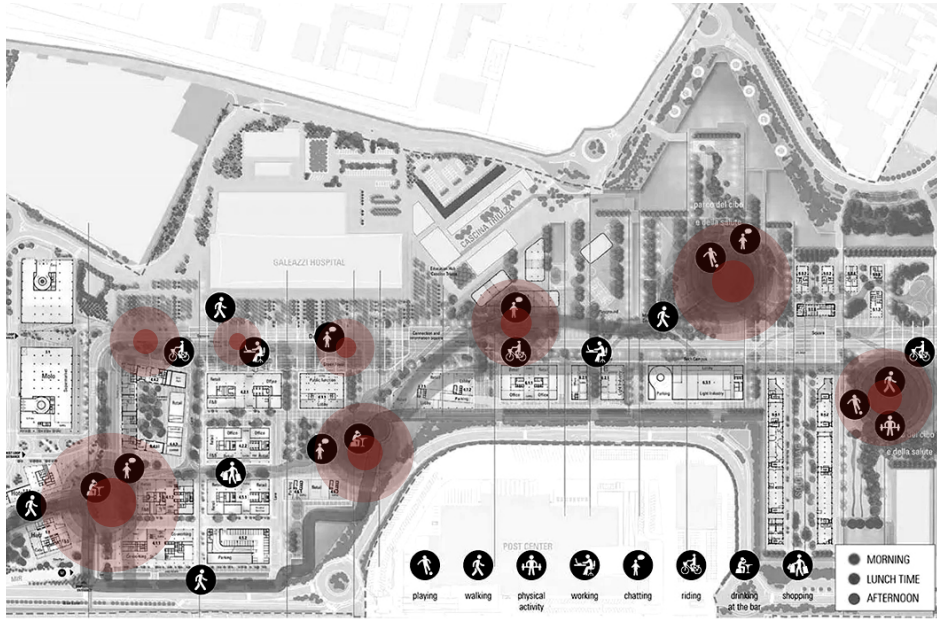


Figure 19. **Circulation and urban functions diagram of MIND.** Source: Mario Cucinella Architects, 2022.

The Horizon Building stands as a landmark of hybrid architecture and engineering, integrating laboratories, offices, and collaborative spaces within a structure designed to accommodate multiple uses. Its structural system combines reinforced concrete, employed in the basement levels and central core to provide stability and structural resistance, with engineered timber, including Cross-Laminated Timber (CLT) floor slabs on the upper levels. The rigid central cores act as the primary lateral bracing system, ensuring structural stability and resistance to horizontal loads. This construction approach contributes to reducing embodied carbon emissions while combining durability, flexibility, and sustainability within a low-impact environmental strategy.

The project also incorporates advanced environmental systems, including active chilled beams—ceiling-mounted units that circulate chilled water to provide energy-efficient cooling—mechanical ventilation, DALI-controlled LED lighting, which allows digital adjustment of light intensity and scheduling, and photovoltaic panels integrated into the roof. The absence of suspended ceilings exposes the building's technical systems, highlighting the industrial aesthetic of the timber structure while facilitating future maintenance and adaptability. This integrated approach reinforces the concept of a life-cycle-positive building, delivering high levels of energy efficiency, thermal and acoustic comfort, and environmental performance. As a result, the building has become a landmark within MIND, embodying through its materiality the principles of technological innovation and sustainable engineering.

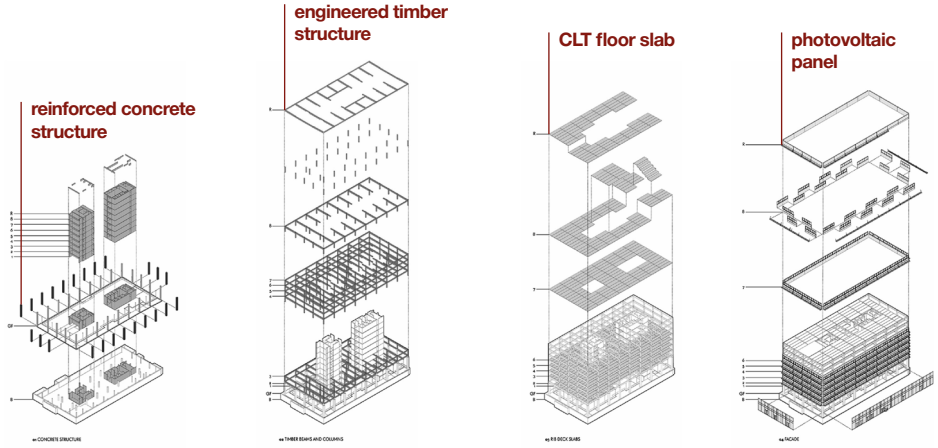


Figure 20. **Structural isometric diagram of the Horizon building.** Source: MIND Westgate, 2023.

Figure 22. **Perspective view of the MIND Buildings, highlighting the Horizon building.** Source: MIND Westgate, 2023.

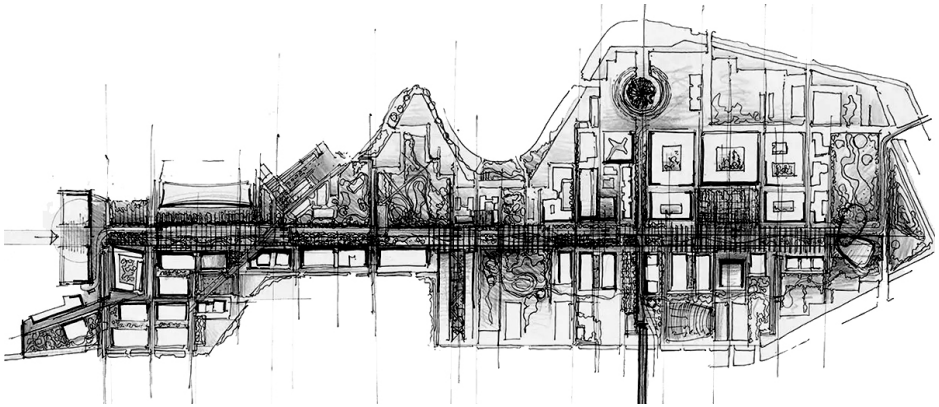


Figure 23. **Sketch of the Milan Innovation District (MIND).** Source: Mario Cucinella Architects, 2022.

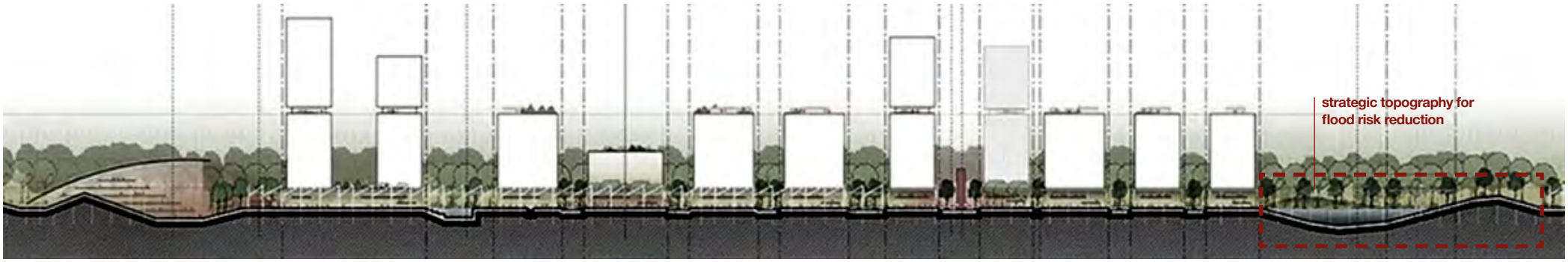


Figure 21. **Longitudinal section of the Milan Innovation District (MIND).** Source: Mario Cucinella Architects, 2022.

3. Urban Resilience

4. Sustainable Drainage

Urban resilience refers to a city's ability to respond, adapt, and regenerate in the face of extreme climate events and growing environmental pressures. In this context, sustainable drainage plays a fundamental role by integrating solutions that mimic natural water cycles and mitigate the impacts of soil impermeabilization. Systems such as rain gardens, retention basins, permeable pavements, and infiltration channels transform water management into an urban strategy, enabling sites to absorb, store, and gradually return water to the environment in a balanced manner. When integrated with public space, this infrastructure moves beyond a purely technical function and contributes to thermal comfort, biodiversity, and quality of life. By reducing flood risks, expanding areas for recreation and social interaction, and restoring the relationship between the city and nature, sustainable drainage becomes a key component of resilient urban development. This approach is exemplified by Benjakitti Forest Park in Bangkok, where nature-based drainage solutions structure the project and demonstrate how sustainable water management can become a catalyst for environmental and social regeneration in dense urban areas.

Figure 24. **Benjakitti Forest Park, Bangkok.**
Source: Srirath Somsawat, 2023.

Benjakitti Forest Park

Author
TURENSCAPE + ARSOMSILP
Location
BANGKOK, THAILAND
Year
2022
Area
414.400 m²

Benjakitti Forest Park in Bangkok is one of Thailand's most significant urban and environmental regeneration projects. Developed on the site of a former tobacco factory, the project transformed an industrial area into a large public green space that combines recreation, natural ecosystems, and sustainable drainage infrastructure. The initiative forms part of a broader governmental effort to expand open spaces in Bangkok, a densely populated city that faces recurring seasonal flooding.

The park was conceived according to the "sponge city" concept, functioning as a large-scale natural system for water retention and purification. Lakes, floodable zones, filtration gardens, and constructed wetlands were designed to capture monsoon rainfall, store excess stormwater, and gradually release it during the dry season. In addition, bioremediation techniques help restore nearby canals by improving water quality and strengthening the city's environmental resilience.

Another key aspect of the project is the restoration of biodiversity. Existing trees were preserved, while more than five thousand native seedlings were introduced, creating a true urban forest. This strategy not only provides shade and improves thermal comfort but also restores habitats for birds, insects, and other species, reinforcing the park's role as an ecological corridor within the metropolitan landscape. The design incorporates elevated walkways, cycling paths, and themed gardens, allowing visitors to experience nature from multiple perspectives.

Benjakitti Forest Park is widely regarded as a benchmark for the integration of sustainability, social inclusion, and recreation. Beyond providing green infrastructure to mitigate flooding, it enhances urban quality of life by offering accessible spaces for relaxation, sports, and contemplation. Its integrated approach demonstrates how degraded areas can be transformed into environmental and social assets, making it one of the most innovative and internationally recognized urban parks in Southeast Asia.

Figure 25. **Aerial view of Benjakitti Forest Park.**
Source: Srirath Somsawat, 2023.

"*The project transforms the pre-existing hard clay soil into a sponge-like wetland habitat, enabling the replanting of a rich community of native vegetation while preserving existing trees on the site. This creates a sustainable ecosystem where a wide range of species can find refuge within the dense urban environment.***"** (**TURENSCAPE; ARSOMSILP, 2024**).

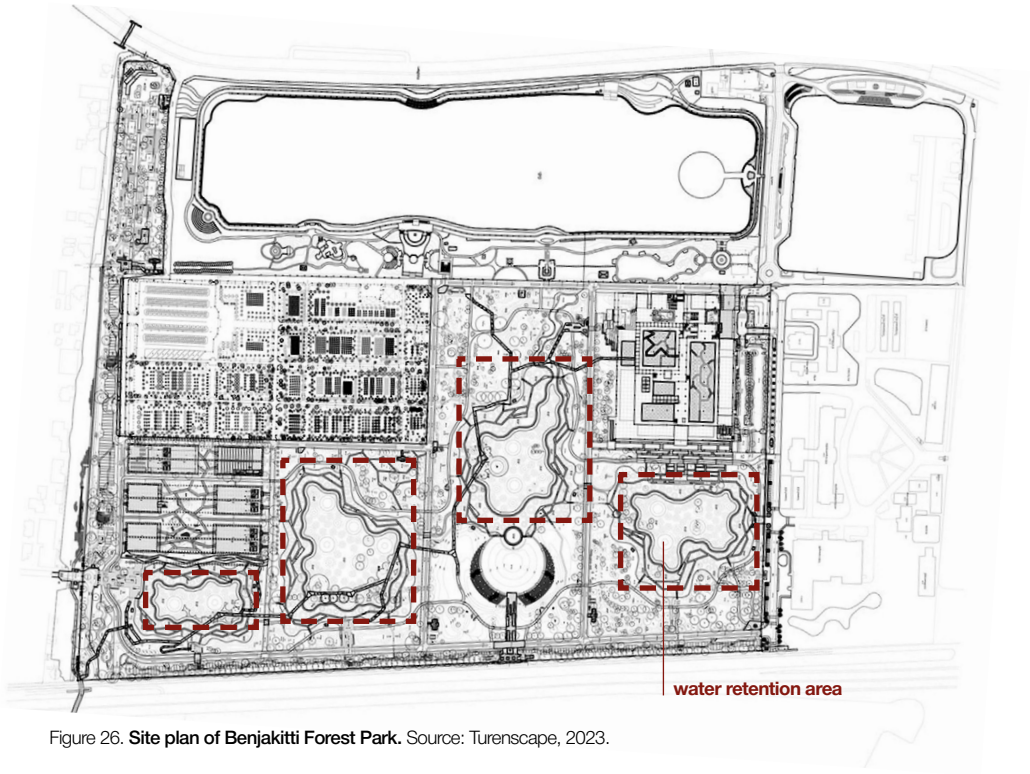
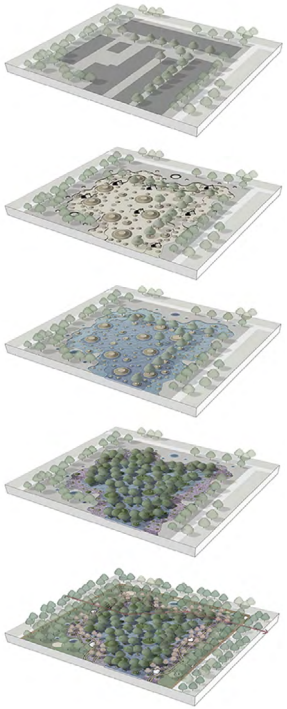


Figure 26. **Site plan of Benjakitti Forest Park.** Source: Turenscape, 2023.

Figure 27. **View of the park walkways.** Source: Srirath Somsawat, 2023.

The transformation of Benjakitti Forest Park followed four main stages. First, the former industrial site was remediated and prepared for new strategic functions. Next, constructed wetlands were introduced to create urban ecosystems and enhance environmental resilience. The third stage established trails, elevated walkways, and public gathering spaces, enabling fluid circulation and direct interaction with nature. Finally, the process consolidated the park as a benchmark for integrated urban planning, combining green infrastructure, biodiversity, and public space through an innovative and sustainable approach.



Pre-existing:
Tabaco factory.

Earthworks:
Cut and fill and recycle the debris to create islets in the wetland with a terraced ecotone at the edge.

Water:
Retain the wetland with monsoon storm.

Vegetation:
Let the evolution of semi-natural plant communities take place.

Acess:
Boardwalks at the edge and a skywalk above.

Figure 28. **Diagram of the development stages of Benjakitti Forest Park.** Source: Turenscape, 2023.

Figure 29. **Perspective view of Benjakitti Forest Park.** Source: Srirath Somsawat, 2023.

Before the implementation of Benjakitti Forest Park, the central area of Bangkok was characterized by a degraded urban environment marked by abandoned industrial sites, extensive impermeable surfaces, and limited vegetation cover. The existing urban infrastructure failed to meet the needs of the population, restricting opportunities for social interaction and access to nature. The creation of the park represented a significant transformation, reversing longstanding environmental degradation and promoting urban regeneration. The introduction of constructed wetlands—engineered systems that function as water filters, habitats for flora and fauna, and microclimate regulators—transformed degraded land into functioning ecosystems, enhancing urban biodiversity and significantly increasing the availability of green space. As a result, the project not only restored the physical environment but also improved quality of life and social well-being, establishing Benjakitti Forest Park as a landmark of sustainable urban development and strategic environmental planning.

Topographic variations and elevated walkways play a central role in the visitor experience, connecting different terrain levels while providing continuous and interactive routes for pedestrians and cyclists. These elements create observation points, contemplative spaces, and opportunities for engagement with the park's wetland ecosystems, making the landscape both educational and dynamic. The elevated walkways allow close interaction with vegetation and aquatic wildlife without causing environmental disturbance, acting as mediators between users and the ecosystem. Furthermore, the carefully designed topography and circulation network encourage exploration in a playful and inclusive manner, fostering diverse sensory experiences. Together, these landscape and infrastructural interventions have consolidated the area as a model of urban and environmental regeneration, demonstrating how integrated solutions that combine topography, green infrastructure, and people-centered design can generate lasting benefits for environmental quality and human well-being.

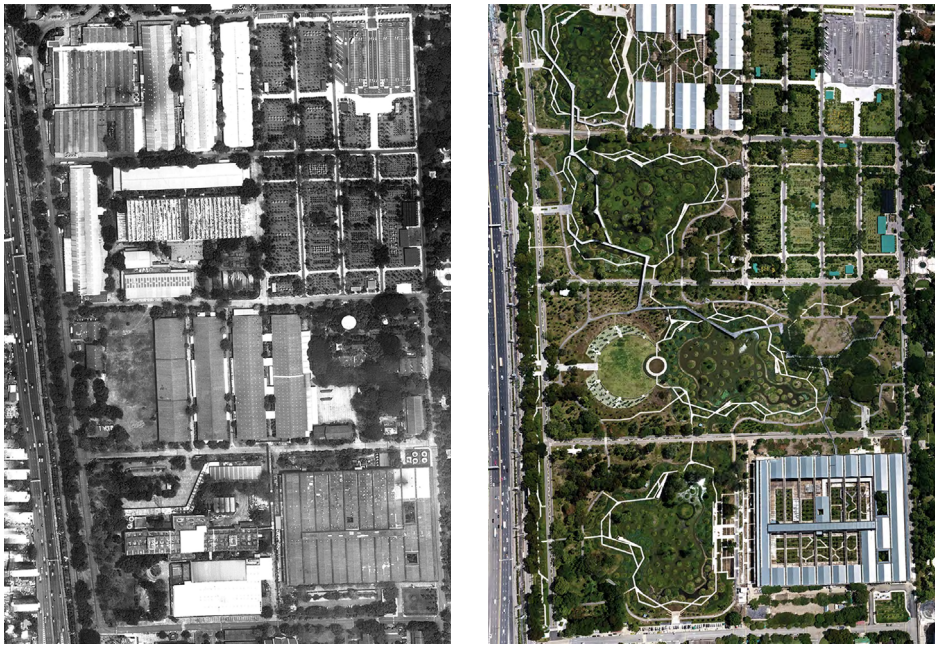


Figure 32. **Before and after aerial view of Benjakitti Forest Park.** Source: Srirath Somsawat, 2023.

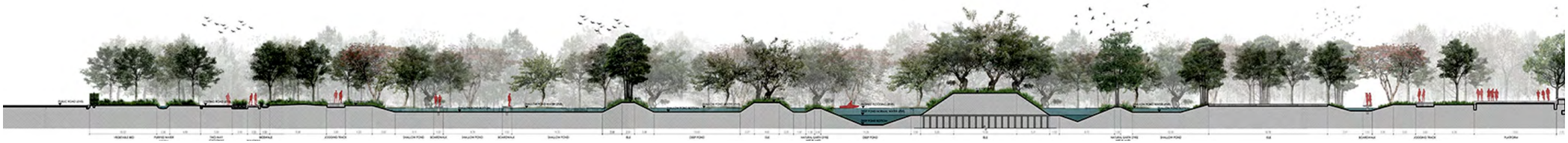


Figure 30. **Cross section of Benjakitti Forest Park.** Source: Turenscape, 2023.

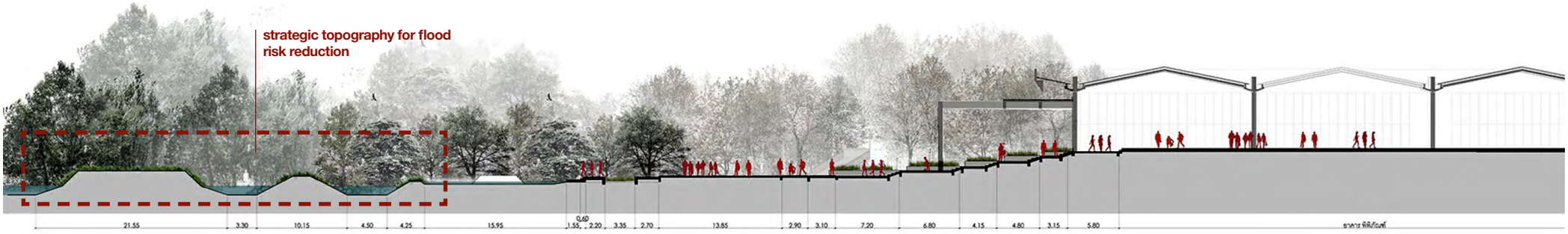


Figure 31 – **Cross section of Benjakitti Forest Park.** Source: Turenscape, 2023.

5. Active Mobility

6. Urban Vitality

Active mobility is one of the fundamental pillars of the contemporary city, prioritizing walking and cycling as sustainable modes of transportation while reinforcing the human scale and enhancing the quality of the urban environment. By promoting continuous, accessible, and safe routes, this approach encourages the occupation of public space, increases the presence of people in the streets, and creates favorable conditions for social interaction, safety, and diversity of uses. Urban vitality emerges from this dynamic, as it depends on the relationship between movement, permanence, and functional diversity, resulting in environments that foster encounters, spontaneous interactions, and social appropriation. When combined, active mobility and urban vitality transform everyday life, making cities more inclusive, healthy, and efficient by integrating sustainable transportation modes with vibrant, mixed-use, and inviting public spaces. This understanding is reflected in the proposal for the Água Branca Urban Operation, where mobility strategies and public space improvements seek to reconnect pedestrians with the urban fabric and collective life, reinforcing the role of the street as a fundamental element of urbanity.

Figure 33. **Perspective view of the active mobility corridor and tree-lined public space.** Source: Estúdio 41, 2015.

Affordable Housing Proposal for the Água Branca Urban Operation

Author
ESTÚDIO 41
Location
SÃO PAULO, BRAZIL
Year
2015
Area
145.233 m²

The Água Branca Urban Operation (OUCAB), established by Municipal Law No. 15,893/2013 and revised by Municipal Law No. 17,561/2021, is one of São Paulo's most important urban regeneration instruments. Located in a strategic area of the city's West Zone, close to the expanded city center, the operation seeks to transform a territory historically characterized by informal settlements, housing shortages, and inadequate infrastructure into a more balanced, inclusive, and sustainable urban environment.

The project establishes a comprehensive set of interventions involving mobility, sustainable drainage, affordable housing, and the provision of public facilities. Key strategies include the rehabilitation of the Água Preta and Sumaré streams, the creation and extension of major urban corridors, the upgrading of informal settlements, and the construction of schools, healthcare facilities, and cultural centers. The overall objective is to promote urban renewal that reduces inequalities, improves accessibility, and expands opportunities for the collective use of public space.

A key aspect of the project is the mandatory allocation of a significant portion of the revenue generated through the sale of Additional Construction Potential Certificates (CEPACs) to Affordable Housing (HIS). Following the 2021 revision, this share was increased to 30% of the total revenue, reinforcing the project's commitment to social inclusion and to ensuring that low-income families can remain within the area. This distinguishes the operation from other urban densification processes, which often result primarily in rising property values and the displacement of existing residents.

As a result, the Água Branca Urban Operation has become a reference for urban policy in São Paulo, combining innovative financing mechanisms with a strong social focus. By integrating infrastructure, environmental preservation, affordable housing, and public services, the operation seeks to create a more equitable and sustainable urban center, demonstrating that large-scale urban transformations can be implemented through social participation, clear public benefits, and tangible improvements for local communities.

"*The plan for the urbanization of Subsector A1 within the Água Branca Urban Operation presents an opportunity to reflect on the city of São Paulo, on the kind of metropolitan environments we aspire to create, and on how we can design spaces for people to live, inhabit, work, and enjoy. Designing spaces that have the potential to become places of shelter, encounter, and enjoyment of urban life in its broadest sense appears to be the task entrusted to architects throughout this process.***"** (**ESTÚDIO 41, 2018**).

Figure 34. **View of the winning Affordable Housing proposal for the Água Branca Urban Operation.** Source: Estúdio 41, 2015.

The Água Branca Urban Operation was strategically designed to integrate with the existing urban fabric and surrounding neighborhoods, connecting residential, commercial, and service areas. The project prioritizes accessibility and mobility, ensuring that the intervention functions as an active component of the city while maximizing positive impacts for local communities. Its integration with major streets, cycling infrastructure, and public transportation networks not only enables more efficient and sustainable mobility but also helps reduce traffic congestion and encourages active modes of transportation. This attention to the surrounding context contributes to the enhancement of public spaces and the creation of a more coherent, dynamic, and functional urban network.

In addition, the plan establishes continuity with existing green spaces and cultural facilities through the implementation of interconnected plazas, pedestrian promenades, and recreational areas that encourage movement and social interaction. This integration strengthens safety, sociability, and community engagement while also stimulating local economic development and supporting urban regeneration. By balancing urban planning, quality of life, and sustainability, the Água Branca Urban Operation demonstrates how context-sensitive interventions can generate lasting benefits and transform urban territory into a more inclusive, connected, and resilient environment.

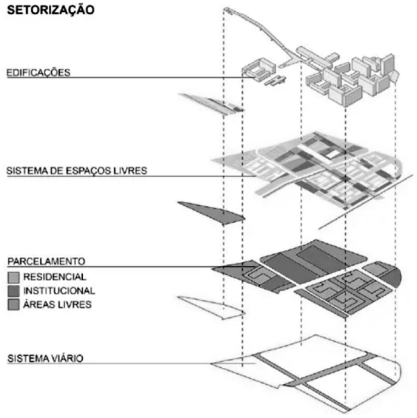


Figure 35. **Contextual analysis diagrams and maps of the Água Branca Urban Operation surroundings.** Source: Estúdio 41, 2015.

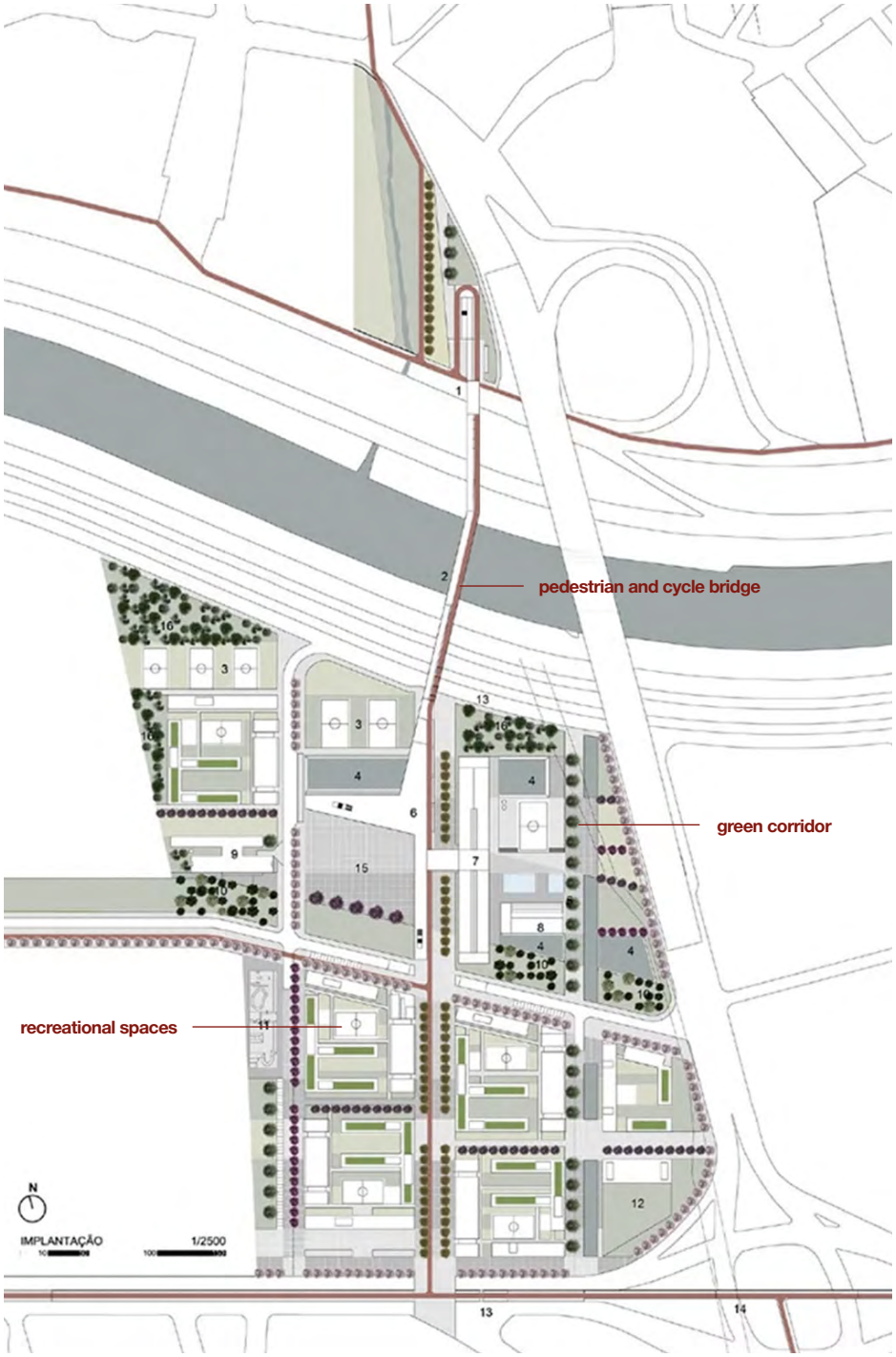


Figure 36. **Site plan of the Água Branca Urban Operation project.** Source: Estúdio 41, 2015.

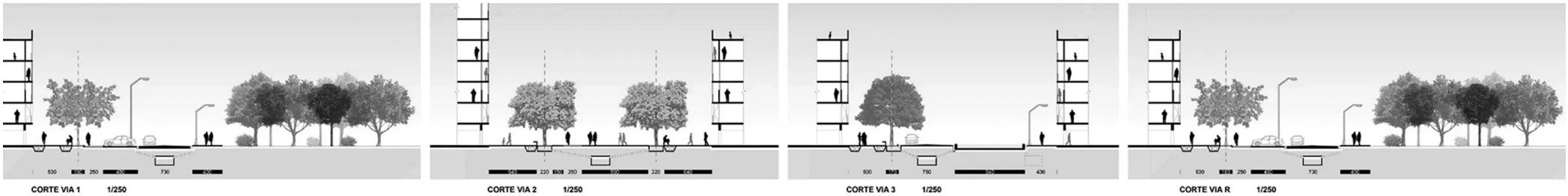


Figure 37. **Cross sections of the Água Branca Urban Operation project.** Source: Estúdio 41, 2015.

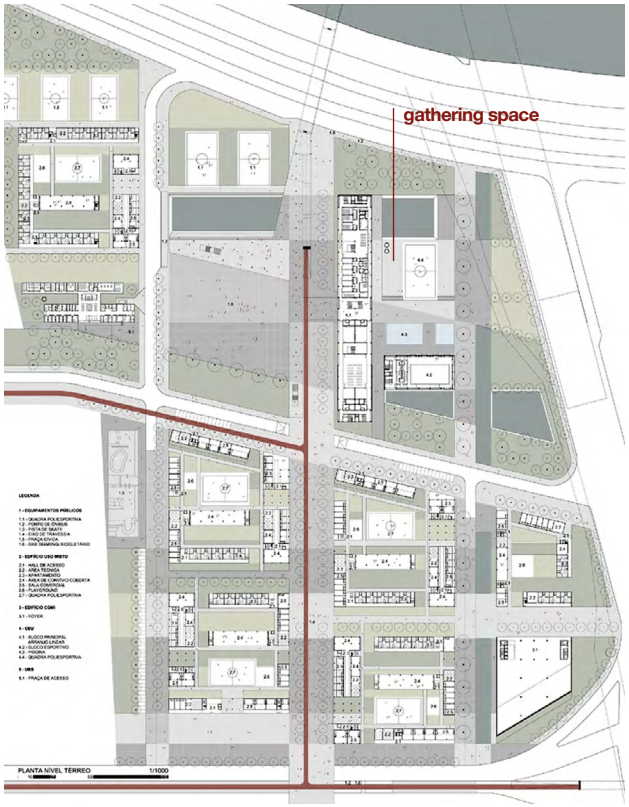


Figure 38. **Ground floor plan of the Água Branca Urban Operation project.** Source: Estúdio 41, 2015.

The three proposed phases establish a process of progressive transformation that combines housing development, the temporary preservation of existing facilities, and the introduction of new urban services. The first phase includes 808 housing units while maintaining the operation of facilities such as CET and Águia de Ouro; the second phase strengthens urban integration through the implementation of public facilities, plazas, and pedestrian bridges; and the third phase consolidates the area with an additional 915 housing units and the gradual relocation of the existing structures. By integrating housing planning, infrastructure, and public spaces, this strategic process also reinforces the importance of active ground floors as places for social interaction and urban vitality, fostering stronger connections between the community and the city.

Figure 40. **Perspective view of the Affordable Housing project for the Água Branca Urban Operation.** Source: Estúdio 41, 2015.

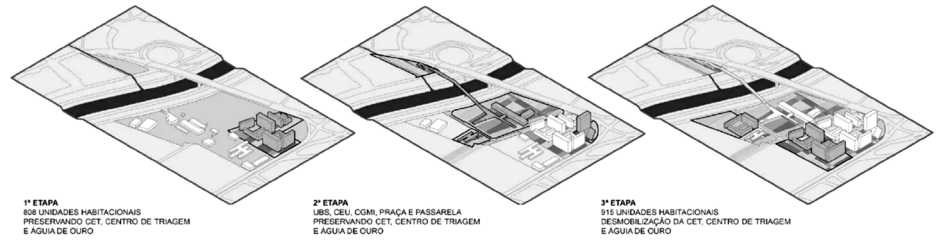


Figure 41. **Phases of the Affordable Housing project for the Água Branca Urban Operation.** Source: Estúdio 41, 2015.

Figure 39. **Longitudinal section of the Água Branca Urban Operation project.** Source: Estúdio 41, 2015.

7. Green Infrastructure

8. Energy Efficiency

Green infrastructure constitutes an urban system that combines vegetation, permeability, and ecosystem services to improve environmental performance, reducing urban heat island effects, increasing water infiltration, and promoting biodiversity within the built environment. When integrated into architectural design, it enables buildings and public spaces to become more climate-responsive by enhancing natural ventilation, providing effective shading, and reducing energy demand. Energy efficiency, in turn, relies on the ability to design environments that minimize resource consumption while ensuring comfort, environmental quality, and optimal performance, incorporating strategies such as high-performance façades, shading devices, vegetation, and hybrid lighting and cooling systems. The convergence of green infrastructure and energy efficiency transforms architecture into an active agent of environmental balance, creating spaces that are more comfortable, healthy, and adaptable to climatic variations. This principle is exemplified by the Solaris building in Singapore, where continuous sky gardens, bioclimatic design strategies, and heat-load reduction measures demonstrate how nature and technology can work together to enhance the quality of the urban environment.

Figure 42. **Facade of the Solaris building.**
Source: T.R. Hamzah & Yeang, 2017.

Solaris

Author
T. R. HAMZAH & YEANG
Location
ONE-NORTH, SINGAPORE
Year
2010
Area
7.734 m²

The Solaris Building, designed by Ken Yeang and Tengku Robert Hamzah and located within Singapore's one-north district, is a landmark of bioclimatic and sustainable architecture. The project brings together concepts developed throughout the architects' careers, seeking to integrate large-scale buildings with nature and the local climate. From its conception, the building was designed to minimize environmental impacts, improve energy performance, and provide healthier spaces for social interaction, becoming an international reference in ecological design.

One of its most distinctive features is the continuous green ramp that spirals along the height of the tower, functioning as an ecological corridor. This strategy connects different levels of the building, promotes natural airflow, provides recreational spaces, and creates habitats for plant and animal species, reinforcing the idea that architecture can become an active component of the urban ecosystem. The extensive use of vegetation also contributes to shading, thermal insulation, and improved indoor environmental quality.

From an energy-performance perspective, the project was designed to reduce energy consumption by more than 30% compared to conventional buildings in Singapore. Strategies such as daylighting, cross-ventilation systems, open atriums, and shaded façades contribute significantly to its efficiency. In addition, the tower achieved Green Mark Platinum certification, the highest environmental rating in Singapore, recognizing its performance in energy efficiency, indoor air quality, thermal comfort, and environmental integration.

The project demonstrates how architecture can be more than functional and aesthetic—it can also be regenerative. By combining bioclimatic design, technological innovation, and ecological responsibility, the building establishes itself as a global benchmark for sustainable architecture. It not only reduces environmental impacts but also proposes new ways of coexisting with nature in dense urban environments, serving as an inspiration for mixed-use developments in tropical and high-density cities.

Figure 43. **View of the Solaris building.**
Source: Ecofriendly Architecture, 2014.

"*The Solaris Building is a compelling example of the possibilities inherent in an ecological approach to architectural design. It incorporates elements such as continuous landscaped ramps, sky gardens, and naturally ventilated façades, creating an environment that promotes biodiversity and urban sustainability.***"** (**HAMZAH; YEANG, 2020**).

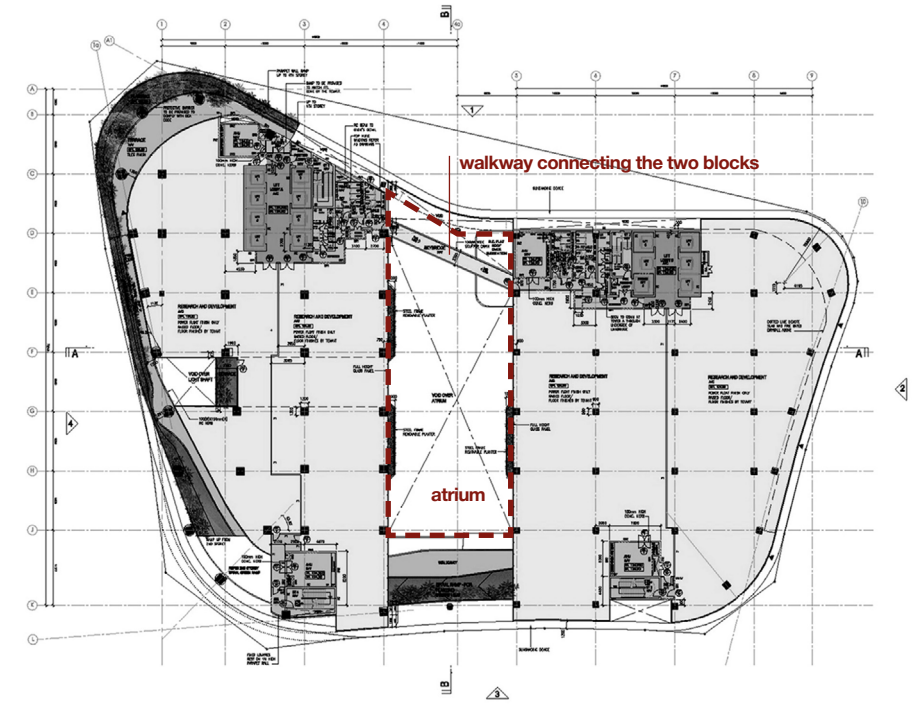


Figure 44. **Third-floor plan of the Solaris building.** Source: T.R. Hamzah & Yeang, 2014.

The building's central atrium is conceived as a vertical void structured by walkways, platforms, and sky gardens that organically connect all levels, creating a high degree of visual and spatial permeability throughout the building. This configuration transforms the space into a true architectural organism, in which each component contributes to structural coherence, circulation efficiency, and functional integration. The combination of a lightweight steel structure and high-performance glazing ensures durability, transparency, and thermal control, while the interior vegetation and irrigation systems function as a "green lung," enhancing air filtration and environmental comfort. Beyond its technical role, the atrium organizes user flows and connects research and development areas, offices, and collaborative spaces, serving as the building's central social spine and fostering interaction, knowledge exchange, and a strong sense of community.

From an environmental perspective, the space enhances cross-ventilation and natural airflow, reducing the need for mechanical cooling and lowering overall energy consumption. The translucent roof and the strategic arrangement of sky gardens maximize the penetration of diffused daylight, ensuring visual comfort, lighting efficiency, and reduced reliance on artificial illumination. This approach helps maintain more stable indoor temperatures while creating a healthy and pleasant environment for occupants, reinforcing the integration between different levels and enhancing the perception of vertical openness. Together, these strategies contribute to the building's climatic balance and overall sustainability performance. By combining bioclimatic design, technological innovation, and regenerative principles, the atrium is established as a multifunctional device that connects nature and architecture, promotes social interaction and well-being, and reinforces the building's role as a benchmark for responsible and inspiring architecture.

Figure 45. **View of the Solaris atrium.** Source: Charles Moxham, 2011.

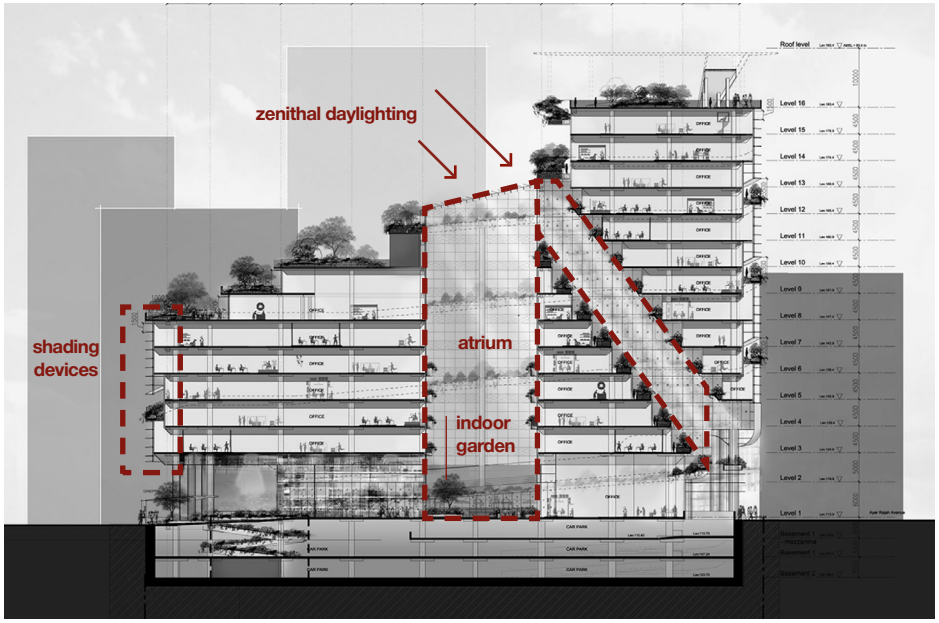


Figure 46. **Cross section of the Solaris building.** Source: T.R. Hamzah & Yeang, 2014.

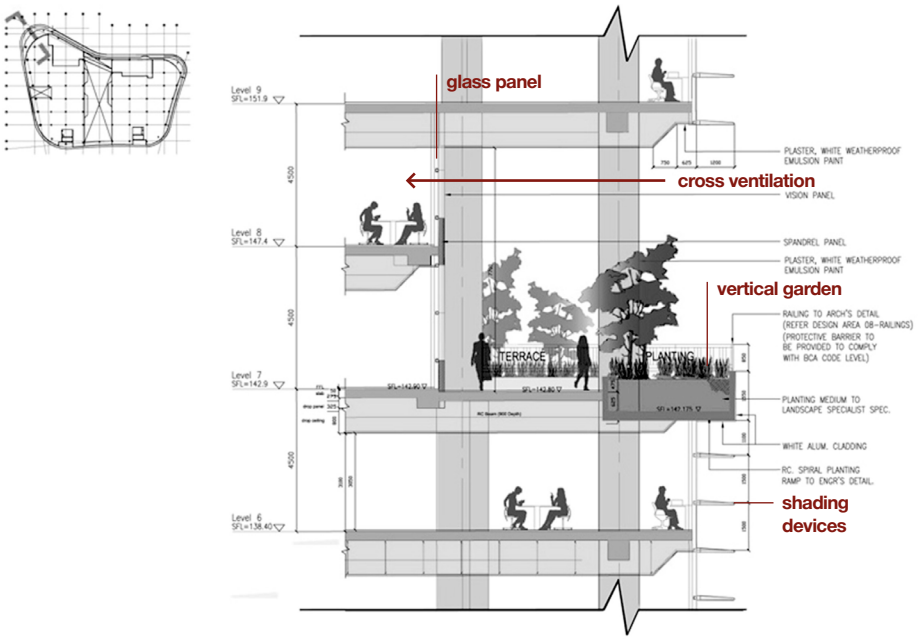


Figure 47. **Detailed section of the Solaris building.** Source: T.R. Hamzah & Yeang, 2014.

The façades of the Solaris Building play a fundamental role in its energy efficiency, environmental comfort, and bioclimatic performance. Designed with high-performance glazing and a system of vertical and horizontal shading devices, they regulate the penetration of natural daylight, reducing excessive solar heat gain and minimizing the need for mechanical cooling. The orientation of the façades optimizes diffused daylight and natural ventilation, while the glazed surfaces reflect the interior vegetation, reinforcing the visual continuity between the building envelope and the central atrium. Beyond their environmental function, the façades contribute significantly to the building's architectural identity by combining transparency, texture, and modularity, while accommodating vertical gardens and integrated irrigation systems that reinforce the concept of a living architectural organism. As a result, they enhance the building's sustainability, climatic performance, and user experience, consolidating its status as a benchmark of technologically advanced and environmentally responsive architecture.

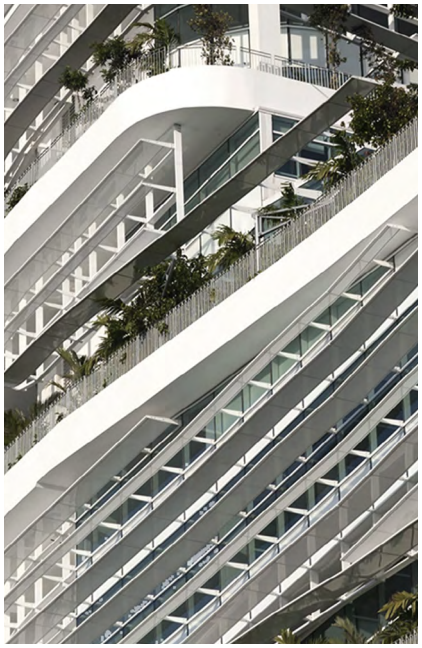


Figure 49. **Facade detail of the Solaris building.** Source: Charles Moxham, 2011.

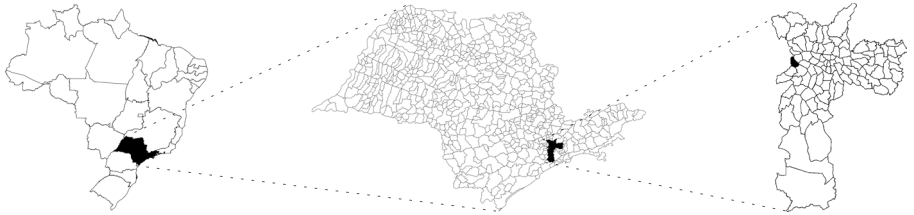
Figure 47. **View highlighting the roof of the Solaris building.** Source: Charles Moxham, 2011.

06.

Urban Transformation Over Time

Figure 50. **Aerial image of the Jaguaré neighborhood and its immediate surroundings.** Source: Google Earth, 2025.

Site History



State of São Paulo | Municipality of São Paulo | Jaguaré District

The Jaguaré district, located in the western zone of São Paulo, underwent significant transformations throughout the twentieth century. Originally characterized by large farms and rural estates, including the historic Jaguaré Farm, the area retained its predominantly rural character until the early stages of industrialization. Driven by the expansion of the railway network—particularly the construction of the Sorocabana Railway in 1875—the district began to attract industries and workers, fostering urban development during the first decades of the twentieth century.

The establishment of the University of São Paulo (USP) in 1934, in the nearby Butantã district, and the subsequent development of academic institutions in the surrounding area reinforced the region's scientific and technological vocation. This process intensified with the growth of the Technological Research Institute (IPT), which originated from the Materials Testing Laboratory of the Polytechnic School and was officially founded in 1899. In 1944, the institute was relocated to the newly planned Armando de Salles Oliveira University City (CUASO), further strengthening the area's role as a strategic hub for science, technology, and innovation.

Figure 51. **Aerial photograph of Butantã, 1950.** Source: Veja SP, 2016.

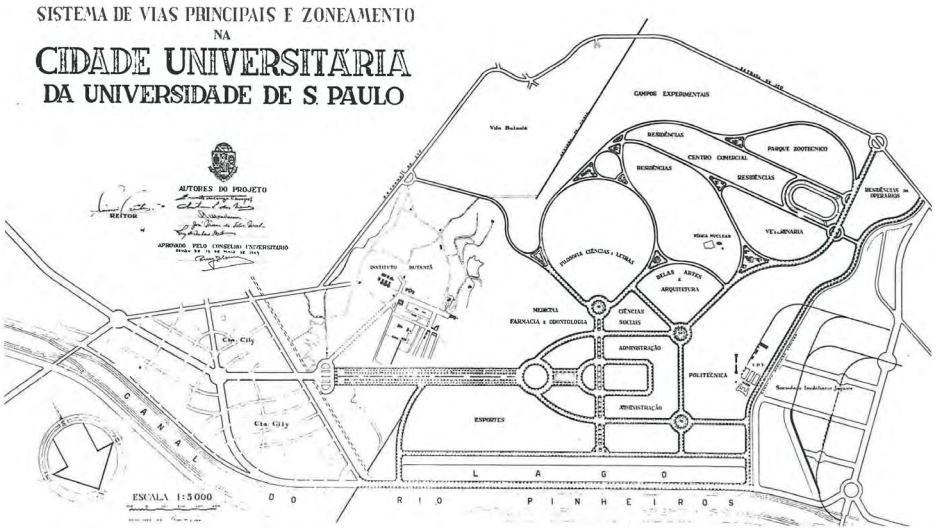


Figure 52. **Zoning map of the Armando de Salles Oliveira University City (CUASO/USP), 1949.** Source: USP Capital Butantã Campus Administration, 2017.

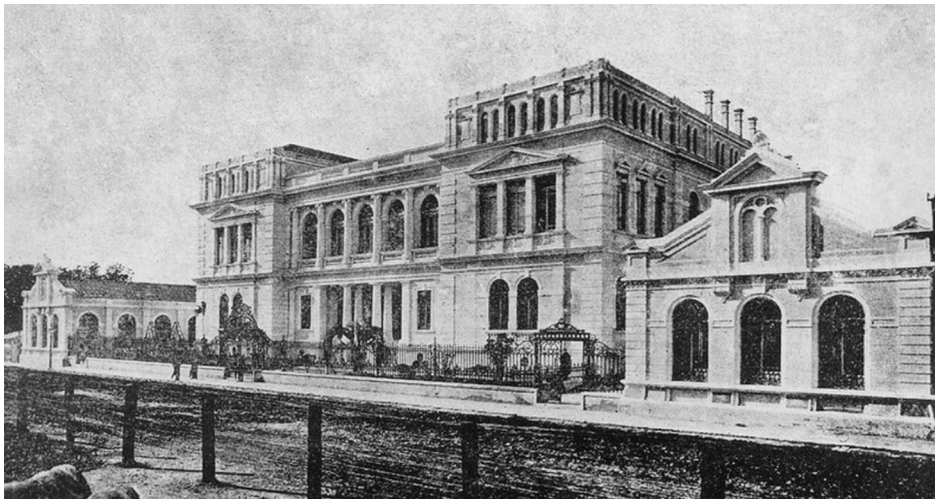


Figure 53. **Materials Testing Laboratory (GRM), 1899.** Source: IPT – Institute for Technological Research, 2012.

Figure 54. **Experimental Foundry Plant, 1940.**
Source: IPT – Institute for Technological Research, 2011.

HISTORICAL MAP OF JAGUARÉ, 1930
0 50 100 200

HISTORICAL MAP OF JAGUARÉ, 1988
0 50 100 200

The growth of Jaguaré and its surrounding areas accompanied the industrialization process that transformed São Paulo in the post–World War II period. The district received new residential developments for industrial workers and middle-class families, while major infrastructure projects, such as the Pinheiros Marginal Expressway (1970) and the Jaguaré–Villa-Lobos commuter rail station, reshaped local mobility patterns. The establishment of the University of São Paulo (USP) campus and the Technological Research Institute (IPT) further transformed the urban profile of Butantã and Jaguaré, fostering the development of research centers, innovation activities, and specialized services.

The Armando de Salles Oliveira University City (CUASO) originated from the consolidation of two land parcels—one belonging to the former Butantan Farm (1941) and another expropriated between the Itu roads in 1944—totaling approximately 4.7 million square meters. Developed through successive phases over several decades, the campus has played a fundamental role in shaping the territory through its strong academic, scientific, and institutional presence. In recent decades, the surrounding area has experienced increasing real estate appreciation and urban regeneration, driven by investments in research, technology, and innovation, despite ongoing challenges related to social vulnerability and urban fragmentation.

Figure 55. **Historical photograph of the Pinheiros River.** Source: Sesc, 2023.

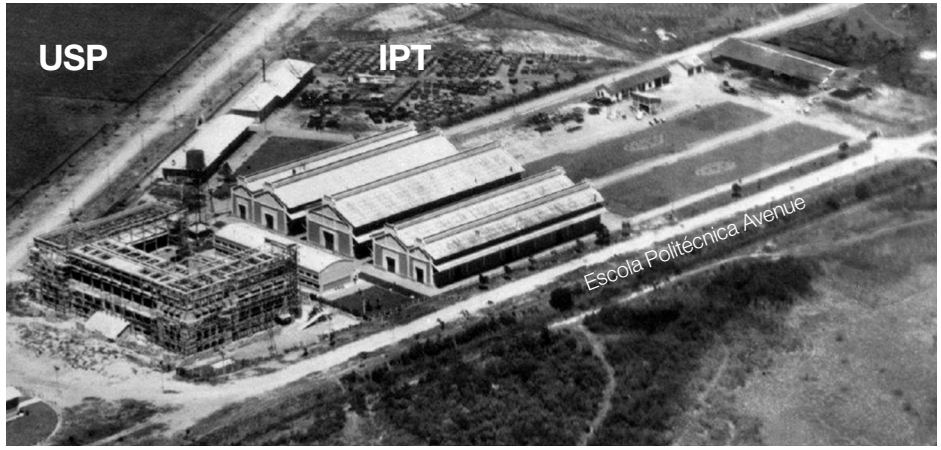


Figure 56. **Technological Research Institute (IPT), 1949.** Source: USP Capital Butantã Campus Administration, 2017.

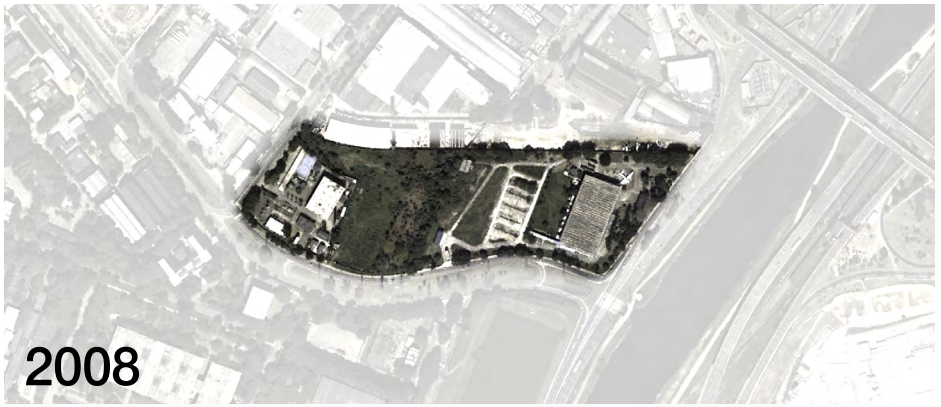


Figure 57 – **Project site.** Source: Google Earth, 2008.

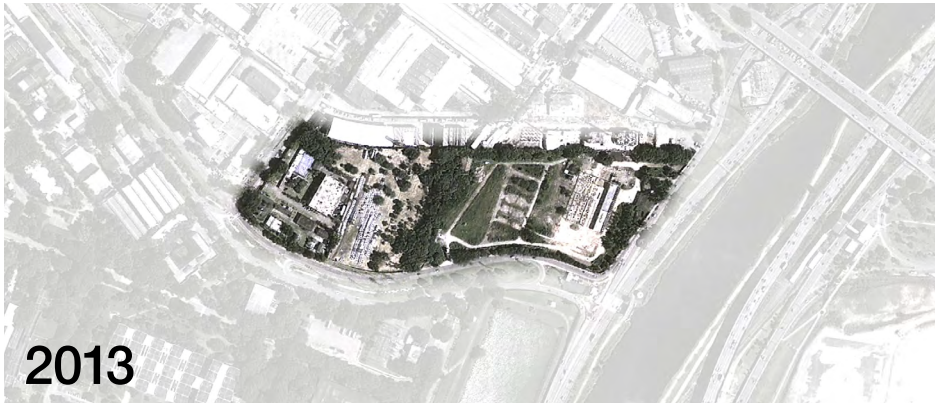


Figure 58 – **Project site.** Source: Google Earth, 2013.

Figure 59 – **Project site.** Source: Google Earth, 2015.

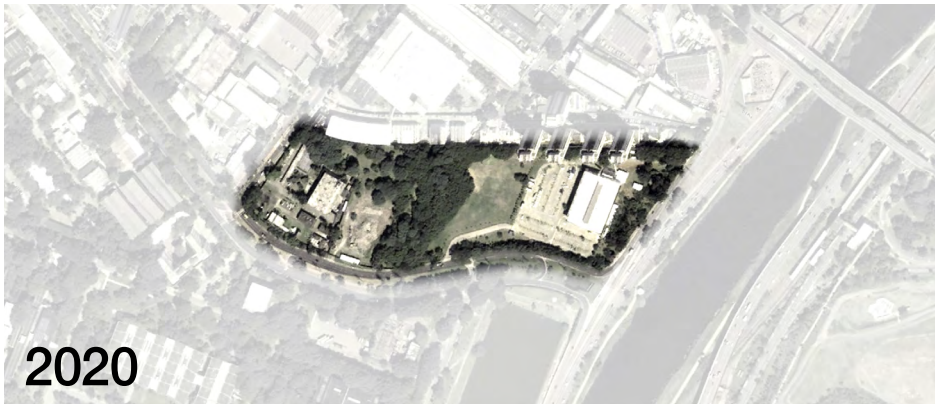


Figure 60 – **Project site.** Source: Google Earth, 2020.

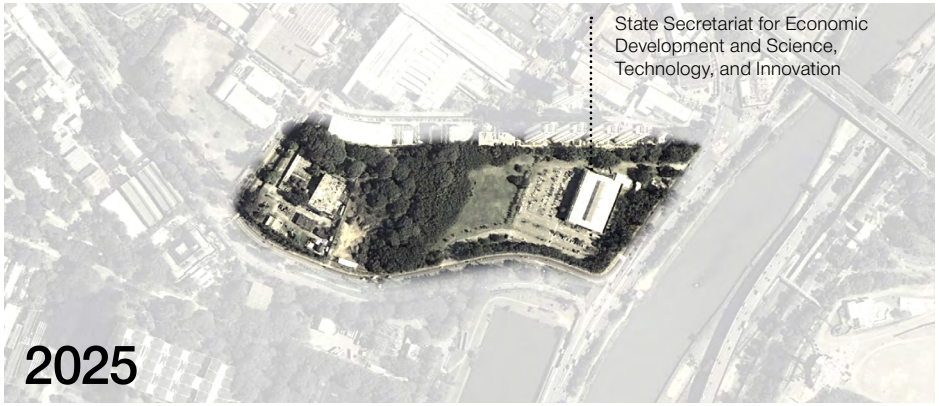
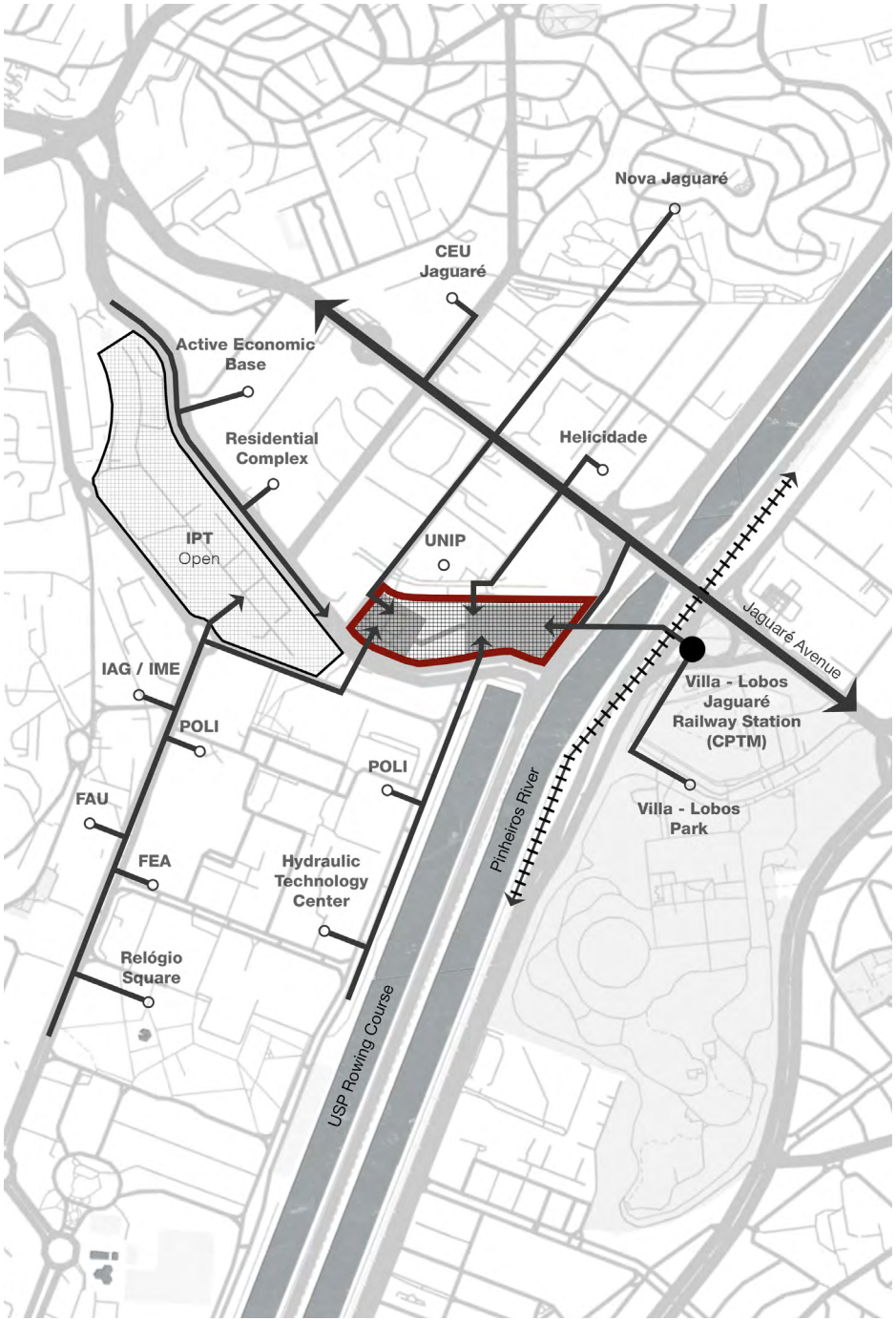


Figure 61 – **Project site.** Source: Google Earth, 2025.

Today, the project site occupies a strategic position within São Paulo's urban development landscape, combining a strong academic and scientific legacy with emerging urban dynamics. The presence of the university campus and public research institutions enhances the region's potential as a hub for innovation, entrepreneurship, and knowledge-based activities. Among the key challenges identified are the integration of different land uses, the improvement of mobility systems—which remain heavily dependent on private vehicles—and the need to promote environmentally responsible and socially inclusive urban development. Addressing these issues is essential to strengthening the area's role as a sustainable innovation district capable of generating long-term economic, social, and environmental benefits. Conversely, the area presents significant opportunities, including underutilized public land, close proximity to major research institutions, and a strong capacity to attract investments related to the knowledge economy. In this context, the intervention site—which currently hosts the State Secretariat for Economic Development and the Secretariat for Science, Technology, and Innovation—symbolizes the convergence of past, present, and future, consolidating its role as a strategic location for the development of an internationally competitive innovation ecosystem.

Figure 62. **Perspective view of the State Secretariat for Economic Development and Science, Technology, and Innovation building.** Source: Author, 2025.



CONTEXT INTEGRATION MAP

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Urban Structure

The project site, located in the Jaguaré district, is situated within an urban context characterized by the coexistence of institutional, industrial, and residential uses, resulting from a historical urbanization process that combined former industrial activities with the expansion of the University City campus. This condition gives the area a distinctive character, where the daily presence of students, researchers, and workers intersects with commercial activities and a diverse range of services. Despite this functional diversity, the urban fabric remains fragmented, characterized by large urban blocks and limited permeability, which restrict walkability and reduce integration among different land uses.

Local dynamics are strongly influenced by metropolitan-scale infrastructure that shapes movement patterns, including the Pinheiros Marginal Expressway, Avenida Escola Politécnica, and Villa-Lobos–Jaguaré Station. While these elements provide high levels of regional accessibility, they also create barriers to everyday mobility at the local scale. Pedestrian routes are often discontinuous and unattractive, limiting connections between existing facilities and reducing opportunities for interaction among scientific institutions, residents, and workers. At the same time, underutilized areas and former industrial sites continue to define the urban morphology of Jaguaré, revealing both the legacy of its productive past and opportunities for future transformation.

The daily functioning of the area is characterized by intense activity during specific periods, particularly those associated with academic and business-related operations. However, the lack of high-quality public spaces and uses oriented toward social interaction limits opportunities for staying and gathering, resulting in low levels of urban vitality outside peak hours. Although the presence of large institutional campuses is a strategic asset, it does not necessarily translate into a continuous presence of people within the public realm. This condition highlights the need to strengthen connections, diversify land uses, and promote greater integration among different activities and user groups.

This analysis of the urban structure and local dynamics reveals a landscape of contrasts: an area with significant scientific and institutional potential, connected by major transportation corridors, yet characterized by spatial discontinuities, limited local mobility, and reduced urban vitality during certain periods of the day. Understanding these conditions makes it possible to identify opportunities to improve circulation patterns, bring complementary uses closer together, and strengthen the human presence within the urban environment, ultimately contributing to a more vibrant, connected, and inclusive district.

Figure 63. **Armando de Salles Oliveira (CUASO/USP).** Source: Carvalho, H., 2005.

Environmental and Hydrological Conditions

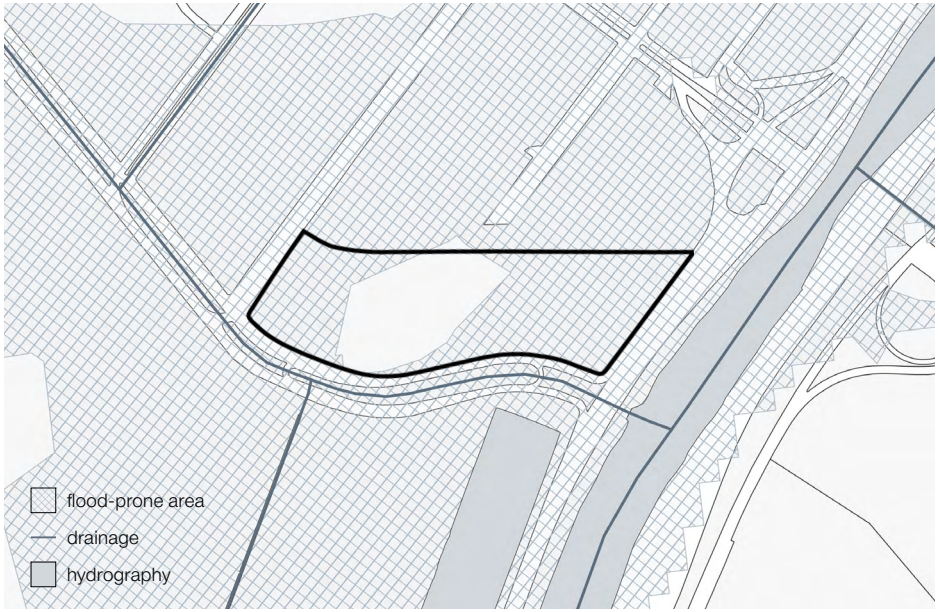
The environmental conditions of the study area are strongly influenced by its proximity to the Pinheiros River and by the presence of Permanent Preservation Areas (APPs) associated with watercourses and remnant vegetation corridors. These natural elements play a fundamental role in climate regulation and in maintaining ecological processes that still persist within the surrounding urban landscape. However, decades of channelization, landfilling, and impervious development have weakened the relationship between the city and its hydrological system, reducing infiltration capacity and increasing the risk of flooding during periods of intense rainfall.

The environmental assessment of the surrounding area reveals low soil permeability, particularly within former industrial sites that continue to occupy extensive portions of the territory with limited integration into natural systems. This condition intensifies surface runoff—especially within the project site, which is predominantly flat—and restricts groundwater recharge, creating vulnerabilities that are becoming increasingly critical under the effects of climate change. The thermal performance of the area is also affected by this configuration, as limited vegetation cover and a lack of shading contribute to higher temperatures and the formation of uncomfortable urban environments.

The Permanent Preservation Areas present significant potential for ecological restoration, the creation of green corridors, and the implementation of nature-based solutions. Nevertheless, several sections remain degraded, with insufficient maintenance and limited integration into everyday mobility networks. Although the existing vegetation plays an important environmental role, it currently functions as isolated fragments rather than as a continuous ecological network capable of connecting green spaces, enhancing environmental quality, and supporting local biodiversity.

Another important aspect concerns the drainage system, which operates predominantly through conventional engineering solutions focused on the rapid conveyance of stormwater through channels and underground drainage infrastructure. This model, historically adopted throughout São Paulo, has shown significant limitations in the face of increasingly frequent extreme weather events, highlighting the need for strategies that promote water retention, infiltration, and runoff attenuation. Such measures may include rain gardens, bioswales, detention ponds, and permeable public spaces integrated into the urban landscape.

The environmental and hydrological conditions identified in the study area therefore reveal both challenges and opportunities. On one hand, there are ongoing processes of environmental degradation, soil sealing, and ecological fragmentation; on the other, there is considerable potential for ecological regeneration, improved stormwater management, and the creation of resilient urban spaces. This context reinforces the need for integrated strategies that combine responsible water management, environmental restoration, and stronger connections between natural systems and urban life.



HYDROGRAPHY AND DRAINAGE MAP
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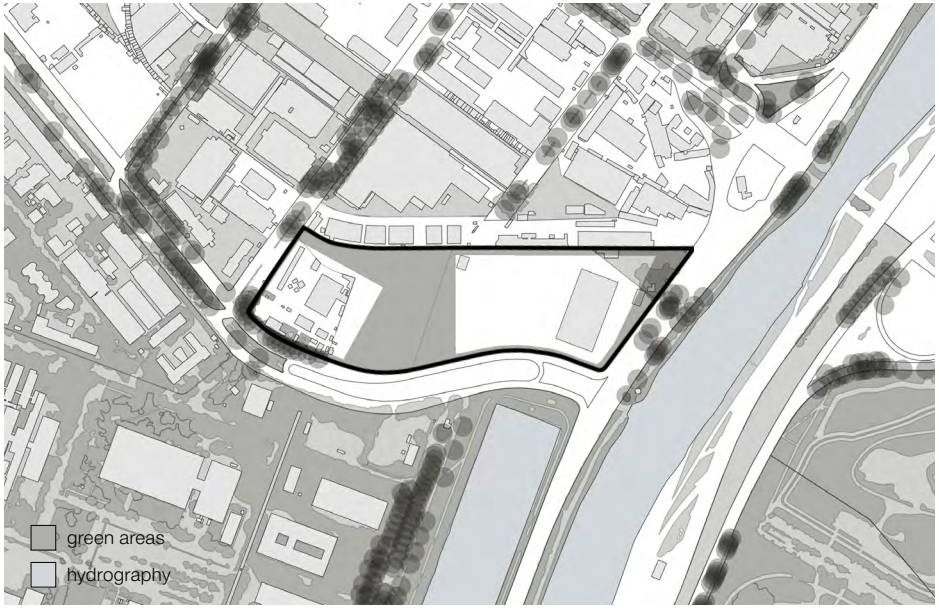

VEGETATION COVER AND GREEN AREAS MAP
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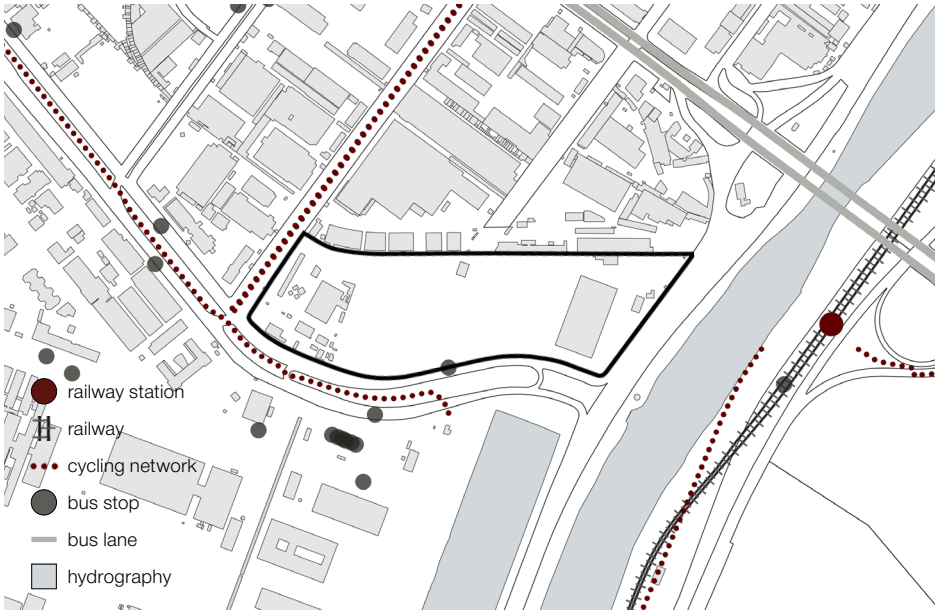
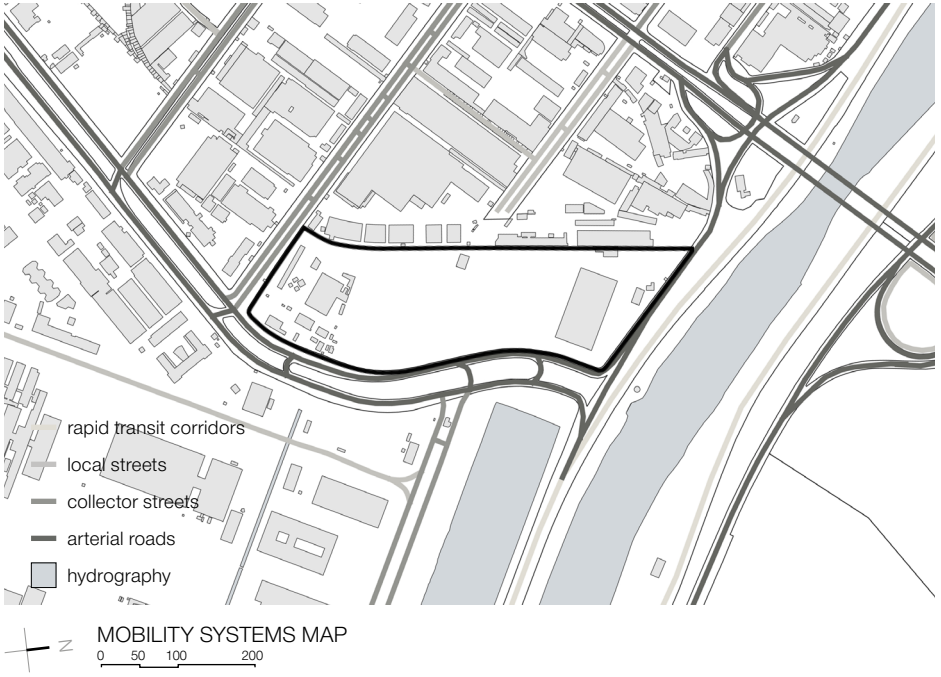




Mobility and Access

Mobility and access in the study area reveal significant contrasts between the metropolitan and local scales. The region is served by major transportation corridors, such as the Pinheiros Marginal Expressway and Avenida Escola Politécnica, which provide connections to other parts of the city and accommodate intense flows of private vehicles, public transportation, and freight traffic. In addition, the USP–Cidade Universitária Station on Line 9–Emerald offers strategic rail access, strengthening integration with the metropolitan transit network and improving connectivity to major employment centers. However, this large-scale accessibility is not fully reflected in everyday mobility, which remains characterized by fragmentation, discontinuity, and conditions that are often unfavorable for pedestrians and cyclists.

Pedestrian routes are marked by narrow sidewalks, uneven pavements, and interrupted pathways, making simple journeys between institutions, residential areas, and public transport stops more difficult. In several segments, the presence of extensive perimeter walls, large land parcels, and underutilized sites results in long and indirect routes that could be shortened through safer and more direct connections. The lack of public spaces for rest and social interaction further reduces the attractiveness of walking, particularly during periods of high temperatures, making pedestrian mobility less inviting.

Cycling mobility in the area is relatively well developed, supported by a network of bicycle paths and cycle lanes that provide good levels of connectivity and accessibility. Nevertheless, some sections still present discontinuities and less evident signage, limiting seamless integration across all local routes. The proximity to the Pinheiros River Cycleway further reinforces the area's cycling potential, although more direct and better-designed access points could significantly improve its connection with the surrounding neighborhood.

The public transportation system also faces challenges related to stop infrastructure, the quality of bus facilities, and the difficulty of crossing high-traffic roads. The presence of major avenues with multiple traffic lanes and high vehicle speeds creates physical barriers that hinder connections between different parts of the district and reduce safety for both pedestrians and cyclists. The limited provision of well-distributed crossings and adequate wayfinding further reinforces the perception of fragmentation between nearby areas that could otherwise be more effectively connected.

Overall, the mobility and access assessment highlights the coexistence of a well-established metropolitan transportation infrastructure with constrained local mobility conditions. This scenario underscores the need for more continuous pedestrian and cycling routes, structured access points, safe crossings, and circulation spaces capable of strengthening integration among existing urban uses. These challenges reinforce the role of active mobility as a key organizing principle for future design interventions, guiding strategies that enhance connectivity, reduce travel distances, and improve the quality of everyday urban experiences.

Weaknesses and Opportunities

The analysis of the surrounding area reveals a set of challenges that directly affect urban quality and the daily functioning of the district, while also highlighting significant opportunities capable of guiding meaningful transformation strategies. Among the main challenges is the fragmentation of the urban fabric, characterized by large land parcels, interrupted routes, extensive frontages, and limited spatial permeability. This configuration reduces connectivity between different areas and restricts pedestrian and cycling mobility, resulting in long and often uncomfortable journeys. The presence of large-scale transportation infrastructure, while essential for metropolitan mobility, also acts as a physical barrier, limiting access and reducing integration between institutions, residential areas, and public transport facilities.

The environmental system also presents important vulnerabilities. The predominance of impervious surfaces, combined with conventional drainage systems and the degradation of existing vegetation, intensifies surface runoff, increases local temperatures, and weakens the relationship between the urban environment and the Pinheiros River. Although Permanent Preservation Areas (APPs) are present, they remain disconnected, reducing their ecological function and contributing to the formation of less comfortable urban environments. These conditions reinforce the need for resilience strategies that increase infiltration, enhance vegetation cover, and integrate nature-based solutions into the urban landscape.

Despite these limitations, the region possesses strategic assets that significantly enhance its transformation potential. The presence of institutions such as the University of São Paulo (USP), the Technological Research Institute (IPT), the Nuclear and Energy Research Institute (IPEN), and the Butantan Institute provides a strong scientific foundation and a unique capacity to connect education, research, and innovation. This concentration of knowledge creates ideal conditions for the development of a collaborative urban environment capable of fostering exchanges, supporting joint initiatives, and strengthening activities related to science, technology, and innovation.

Another key opportunity lies in the proximity to the Pinheiros River and its green corridors, which, despite their current limitations, offer significant potential for environmental reconnection and the creation of public spaces integrated with the natural landscape. Likewise, the presence of metropolitan transportation infrastructure—such as CPTM's Line 9–Emerald—enhances accessibility, facilitating the integration of new urban functions and encouraging more sustainable mobility patterns. Underutilized sites and former industrial areas also provide opportunities for adaptive reuse, enabling the introduction of new programs, the diversification of activities, and the strengthening of urban vitality.

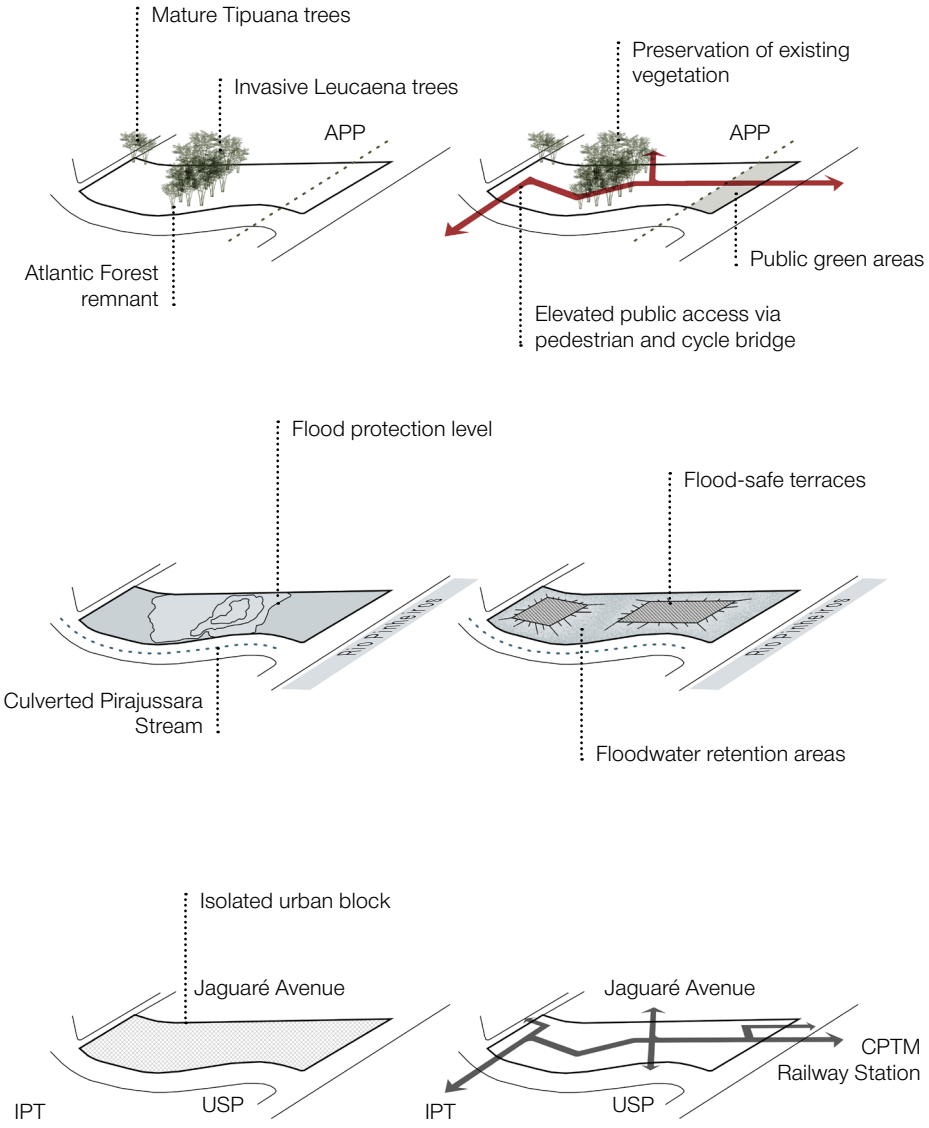
The challenges and opportunities identified through this analysis demonstrate that the region possesses a unique combination of characteristics: on one hand, issues related to mobility, connectivity, and environmental conditions; on the other, a consolidated scientific ecosystem, areas suitable for regeneration, and opportunities for integration with both natural and transportation systems. Together, these guidelines establish the foundation for a transformation process that values innovation, strengthens urban and environmental integration, and creates a more connected, resilient, and socially vibrant urban environment.

Figure 64. **University City - USP.** Source: Stankuns, F., 2013.

Figure 65. **Aerial view of the immediate surroundings of the project site.** Source: Google Earth, 2025.

Existing Conditions

Proposed Strategy



Guidelines for Urban Transformation

The guidelines for the urban transformation of the study area are directly derived from the integrated site analysis, encompassing environmental, mobility, urban structure, and social dynamics considerations. They provide the framework for strategies aimed at enhancing urban quality, strengthening connectivity, leveraging the presence of scientific institutions, and creating more balanced conditions for everyday life.
The first guideline focuses on promoting active mobility through the creation of continuous, accessible, and shaded routes that connect different urban functions and reduce perceived travel distances. The improvement of existing pathways and the introduction of new connections seek to enhance the pedestrian experience and encourage sustainable modes of transportation.

Another key guideline involves reorganizing local circulation patterns and establishing a structured cycling network that connects institutions, residential areas, public facilities, and public transportation systems. This approach aims to overcome the barriers created by large-scale transportation infrastructure by providing safe crossings, well-distributed access points, and greater continuity between different sectors of the area. The integration with Villa-Lobos–Jaguaré Station and the Pinheiros River Cycleway is particularly strategic, as it expands the reach of sustainable mobility routes and contributes to a more efficient and interconnected transportation system.

The incorporation of integrated environmental solutions represents a central component of the transformation strategy. Key recommendations include increasing soil permeability, restoring Permanent Preservation Areas (APPs), creating continuous green spaces, and implementing sustainable drainage measures such as rain gardens, bioswales, and detention areas. These actions strengthen the relationship with the Pinheiros River, contribute to local climate regulation, reduce surface runoff, and improve the environmental quality of the urban landscape.

The diversification of land uses and the activation of underutilized areas also constitute fundamental guidelines. The introduction of new programs related to social interaction, housing, culture, education, and innovation promotes urban vitality throughout the day and attracts diverse user groups, reinforcing the role of the area as a dynamic urban environment. Strategically distributed programs can strengthen connections between scientific institutions and the local community, generate opportunities for interaction, and encourage the exchange of knowledge between research activities and everyday urban life.

Finally, the creation of high-quality public spaces is recommended to function as connectors between the different existing urban clusters, promoting stronger integration among USP, IPT, residential neighborhoods, and economic activities. The introduction of plazas, parks, green corridors, and gathering spaces reinforces the collective character of the area and encourages greater appropriation of public space by students, workers, and residents. Together, these guidelines establish the foundation for a transformation that values innovation, strengthens urban and environmental integration, and creates more balanced and connected conditions.

07.

Master Plan (CITI II)

CITI Purpose

The International Center for Technology and Innovation (CITI) was conceived as a strategic initiative of the State Government of São Paulo aimed at transforming the relationship between science, technology, the economy, and the urban environment of the metropolitan region. Rather than a standalone intervention, the program proposes the creation of an integrated ecosystem that connects research institutions, universities, companies, living laboratories, public facilities, and digital networks, with the primary goal of catalyzing innovative businesses and strengthening the state's international position in the fields of Science, Technology, and Innovation (ST&I) (SÃO PAULO, 2023a). The project goes beyond the provision of physical infrastructure; it functions as a collaborative network and a continuous interface between knowledge production and society, designed to foster innovation, competitiveness, and economic development (SÃO PAULO, 2023b).

The proposal draws upon international experiences of innovation districts, particularly the anchor-plus model, in which leading institutions drive the formation of technology clusters and attract complementary activities (KATZ; WAGNER, 2014). At the same time, CITI incorporates principles observed in regenerated industrial areas and science parks with a strong urban character, reinforcing its capacity to integrate production, research, and experimentation. This approach explains why the initiative leverages the existing concentration of universities and research institutes while simultaneously promoting the transformation of pre-existing productive structures and their integration into a new innovation ecosystem (SÃO PAULO, 2023c).

The essential components of this structure combine a set of interdependent elements:

a productive and human capital base (universities, research institutes, laboratories, companies, and startups);

high-quality physical infrastructure (laboratory facilities, digital connectivity, specialized equipment, and urban amenities);

governance mechanisms designed to foster cooperation (interaction programs, digital platforms, and collaboration incentives);

and **public and environmental spaces** capable of promoting quality of life and socio-environmental integration.

Together, these dimensions enable the fundamental processes of **sharing**, **matching**, and **learning**, which are widely recognized as key drivers of contemporary innovation.

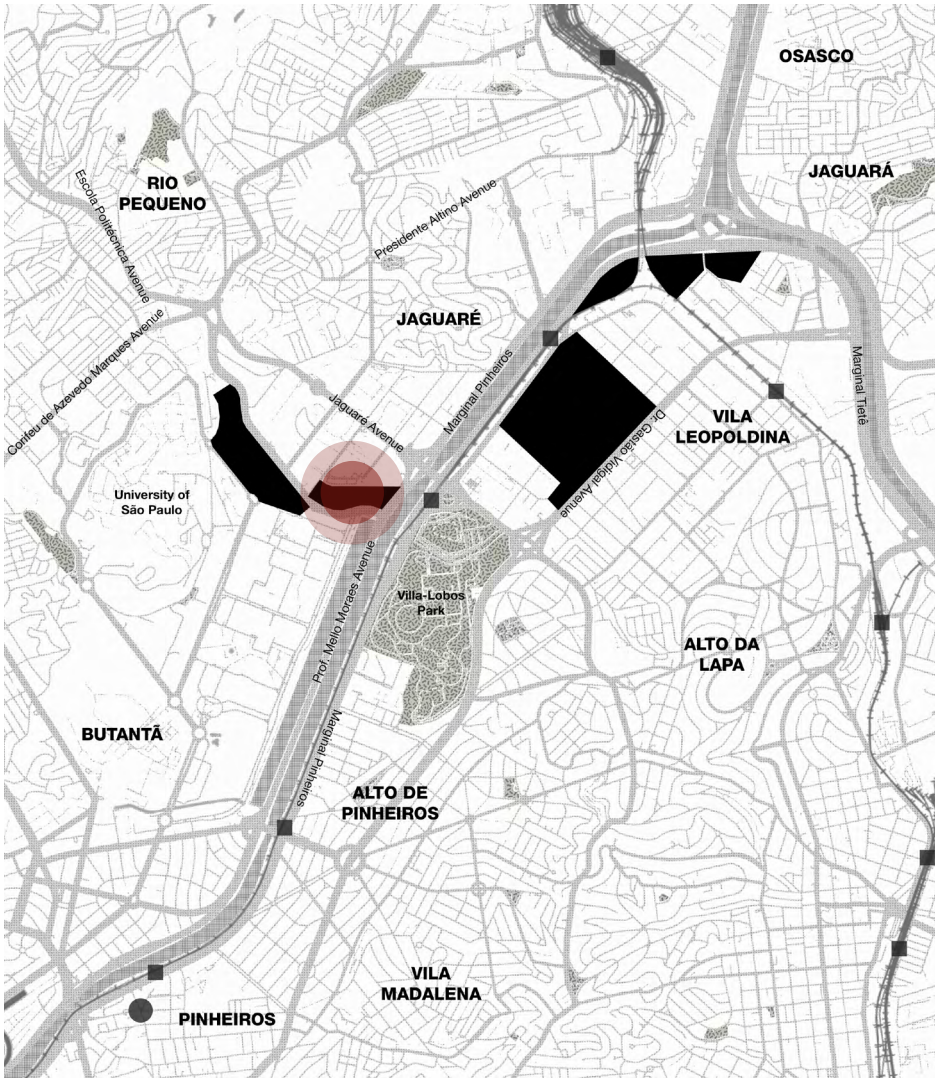
The physical implementation of CITI is structured through four progressive phases:

1. initial deployment and the establishment of governance structures;

2. expansion of collaborative spaces and research laboratories;

3. diversification of urban functions to promote continuous vitality and activity throughout the day;

4. consolidation of the innovation ecosystem through the full integration of public spaces, green infrastructure, and innovation networks.



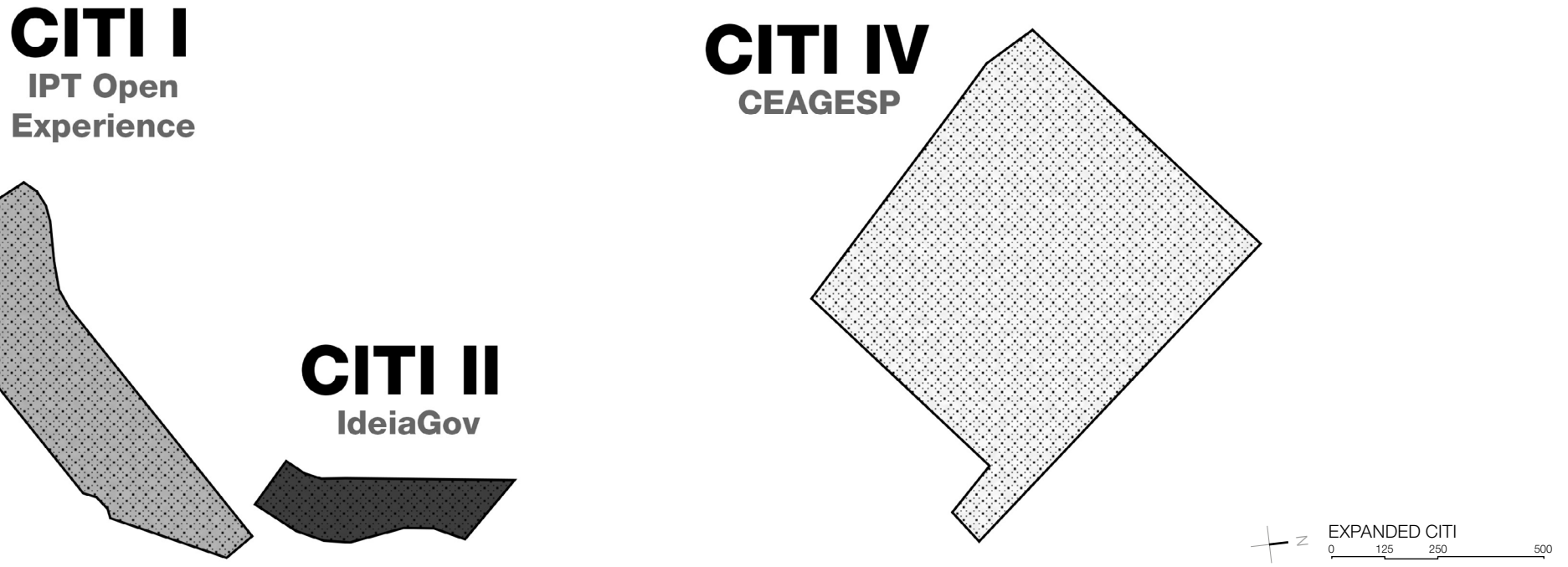
Beyond the organization of its physical development, the CITI project was also structured into **four distinct phases**, each corresponding to specific strategies for implementation, infrastructure expansion, and institutional integration:

CITI I - anchored by the IPT Open Experience (IPTO), a model through which the Technological Research Institute (IPT) makes areas of its campus available to companies and startups interested in developing technological solutions in collaboration with its research teams. The institute provides infrastructure, laboratories, and technical support, while participating organizations contribute through applied research, experimental development, and knowledge transfer. This collaborative framework strengthens innovation by bringing together specialists, expanding strategic partnerships, and accelerating the development of new technologies and prototypes. As the first stage of the initiative, IPTO serves as the gateway to the transformation of CITI into an advanced hub for science, technology, and innovation - **in progress.**

CITI II - constitutes the focus of this thesis project and corresponds to the area currently occupied by the State Secretariat for Economic Development, the Secretariat for Science, Technology, and Innovation (IdeiaGov), and a site belonging to the University of São Paulo (USP) - **under study.**

CITI III - comprises the site currently occupied by the Pinheiros IV Provisional Detention Center (CDP IV) and the Metropolitan Water and Energy Company (EMAE) - **future development phase.**

CITI IV - corresponds to the site occupied by the General Warehouses and Centers Company of São Paulo (CEAGESP) - **future development phase.**



Governance and Operational Models

The proposed governance model combines public and private stakeholders, playing a central role in enabling not only the physical infrastructure of the district but also Science, Technology, and Innovation (ST&I) programs, investment attraction mechanisms, and digital platforms. The model promotes coordination between local initiatives—such as business incubation, talent development, and research laboratories—and networked connections with national and international institutions, creating an integrated ecosystem capable of fostering innovation, strengthening strategic partnerships, accelerating knowledge exchange, and enhancing the district's long-term competitiveness and global reach.

Local Integration and Expected Impacts

The initiative builds upon the strategic presence of the University of São Paulo (USP), the Technological Research Institute (IPT), the Nuclear and Energy Research Institute (IPEN), and the Butantan Institute, recognizing this concentration of institutions as a powerful driver of innovation. The proposal acknowledges existing challenges—particularly those related to local connectivity and urban integration—while highlighting opportunities for economic development, the creation of high-skilled jobs, and the expansion of educational programs aimed at benefiting surrounding communities. By leveraging the region's scientific and technological assets, the initiative seeks to strengthen knowledge exchange, stimulate entrepreneurship, and generate positive social and economic impacts at both the local and metropolitan scales.

Products and Services

Among the instruments envisioned for the CITI ecosystem are digital collaboration platforms, business development programs, incubation and acceleration initiatives, innovation-driven projects, internationalization strategies, and educational programs aimed at young talent development. The proposal also includes communication and strategic positioning initiatives designed to attract institutional and corporate partnerships, strengthen the district's visibility, and reinforce its role as a leading hub for science, technology, innovation, and entrepreneurship.

Final Remarks

The set of strategies presented herein serves as a general framework rather than a fixed scope, having been conceived as a dynamic instrument subject to periodic review and adaptation. The combination of infrastructure, programs, and governance mechanisms is intended to consolidate the initiative as a globally connected innovation hub while simultaneously acting as a catalyst for local urban, social, and economic transformation.

Furthermore, in accordance with Resolution SPI No. 002-2024, dated January 30, 2024, which provides for the inclusion of projects within the São Paulo State Investment Partnerships Program (PPI-SP), the São Paulo Innovation District Core has been incorporated into the Administrative Concession (Public-Private Partnership – PPP) program. This measure reinforces the strategic importance of the initiative and establishes an institutional framework capable of supporting its implementation, long-term management, and future expansion.

CITI II Science, Technology and Innovation (ST&I) Management Strategy

Based on the Public Consultation Document

CITI II Purpose

To catalyze collaboration among the actors of São Paulo's innovation ecosystem, generating innovative businesses that address real-world challenges and contribute to global innovation efforts.

Future Vision

GLOBAL CHALLENGES
To strengthen international leadership in addressing global challenges such as climate change, health, food production, and other Life Sciences-related issues.

MISSION
To promote innovation aimed at solving relevant societal challenges while enhancing the competitiveness and productivity of the Brazilian economy.

LIVING INNOVATION HUB
A space for intense interaction among people, companies, universities, technology organizations, funding and investment institutions, capable of fostering innovation and accelerating new ventures.

A place where entrepreneurs want to be, companies seek proximity, young talents aspire to belong, and local communities take pride in their surroundings.

Target Audiences

- National and international companies
- National and international universities and research institutions
- Funding, investment, regulatory, and development organizations
- Entrepreneurs and startups
- National and international researchers
- Young talent
- Local communities

Strategic Objectives

01. Promote the creation of innovation-driven businesses

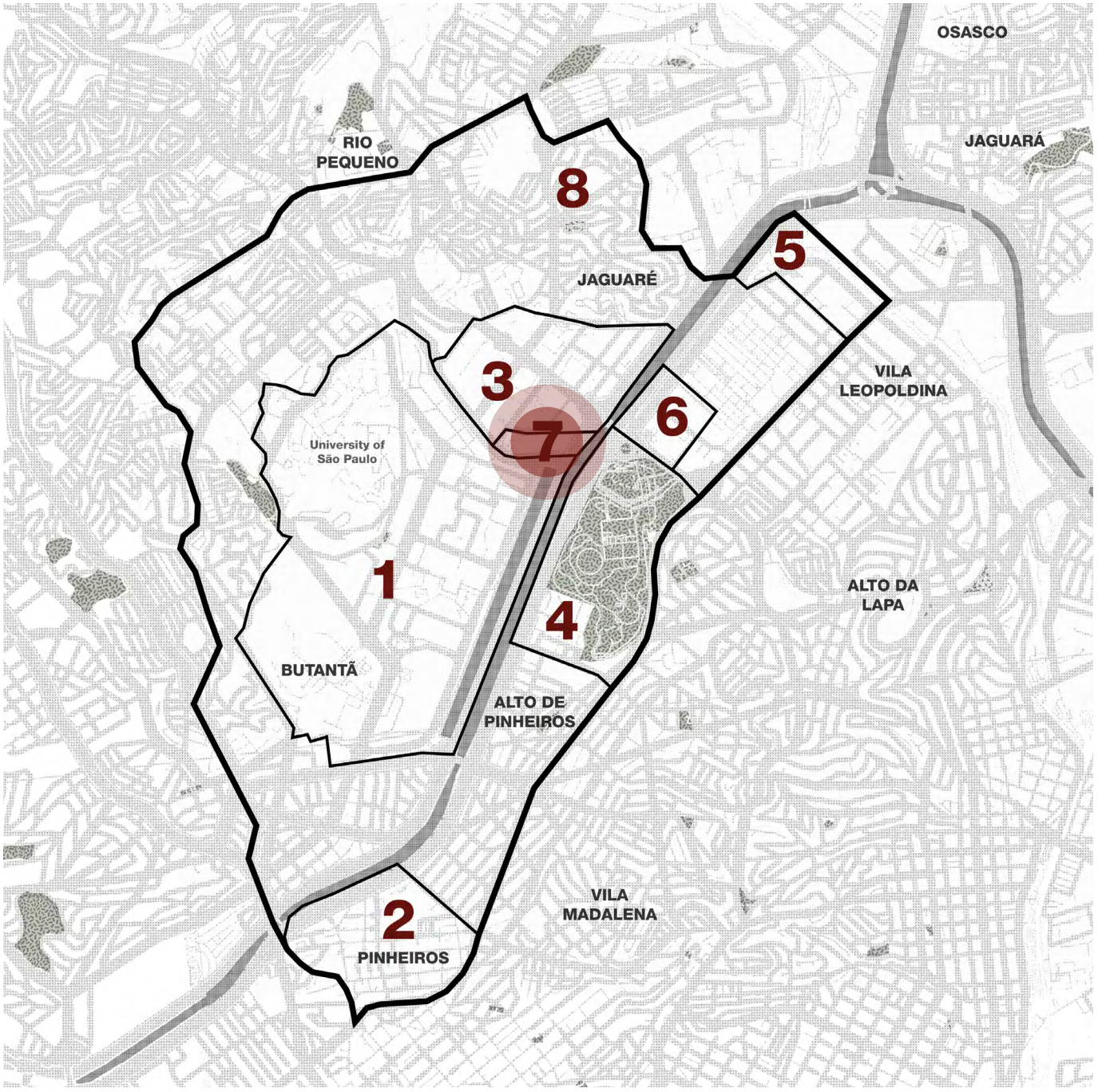
02. Expand innovation efforts among medium and large companies through collaboration with technology-based startups

03. Support the development and growth of startups

04. Strengthen São Paulo's participation in global innovation networks and strategic international agendas

05. Promote innovation-driven initiatives and collaborative programs

06. Support talent development initiatives for children and young people



INNOVATION DISTRICT EXTENT MAP

0 500 m 1 km 2 km

Innovation District Components

1. University City Area (5,02 km²)

2. Victor Civita Area (0,98 km²)

3. Jaguaré Area (1,27 km²)

4. Villa-Lobos Area (1,4 km²)

5. Leopoldina Area (0,42 km²)

6. CPTM Rail Yard Area (0,27 km²)

7. Innovation District Core (0,07 km²)

8. Innovation District Extent (20 km²)

CITI II Guiding Principles

The parameters proposed for the development of CITI II were defined through a Public Consultation conducted by the Government of the State of São Paulo, with the objective of guiding the future concession of the site and establishing requirements for urban, environmental, and programmatic interventions. The conceptual and spatial framework made available through the consultation was developed by the architectural firm Stuchi & Leite, responsible for the reference physical-spatial proposal restricted to the concession area; the inclusion of the University of São Paulo (USP) site was illustrative in nature and intended solely to demonstrate a possible integrated vision for the district. Nevertheless, the document presents quantitative data referring to both properties, namely those belonging to the University of São Paulo (USP) and the Government of the State of São Paulo (GESP). The process was coordinated by the São Paulo Partnerships Company (CPP), the Secretariat for Economic Development, and the Secretariat for Investment Partnerships, which were responsible for organizing the consultation and consolidating the reference documents.

The concession area is currently occupied by the State Secretariats for Economic Development and for Science, Technology, and Innovation and is characterized by extensive paved surfaces used for parking, as well as vegetated areas associated with Permanent Preservation Areas (APPs). This physical configuration, defined by a large urban parcel and isolated occupation pattern, highlights the need to promote greater connectivity, diversify land uses, and implement environmental management strategies capable of improving the climatic and hydrological performance of the site.

The proposed guidelines establish that future development should be structured through an open and permeable urban framework, achieved by subdividing large blocks and creating public routes that encourage continuous movement throughout the area. The document emphasizes the importance of ensuring public accessibility, walkability, universal access, and a network of social spaces distributed across the site. Within this framework, particular emphasis is placed on the Spine, a structuring axis conceived as the central element of the spatial organization, responsible for integrating different uses, guiding movement patterns, enhancing the pedestrian experience, and concentrating green infrastructure strategies. Connected to this main corridor, the Hearts function as gathering and social spaces that strengthen the vitality and attractiveness of the public realm.

The environmental requirements established by the consultation reinforce the need to increase soil permeability and adopt sustainable drainage systems. Measures such as the preservation of Permanent Preservation Areas, vegetation restoration, bioswales, rain gardens, and ecological corridors are intended to reduce surface runoff, improve environmental performance, and strengthen the relationship between built areas and natural systems. The integration of drainage, vegetation, and urban design is treated as a guiding principle, ensuring a balance between technological innovation and environmental responsibility.

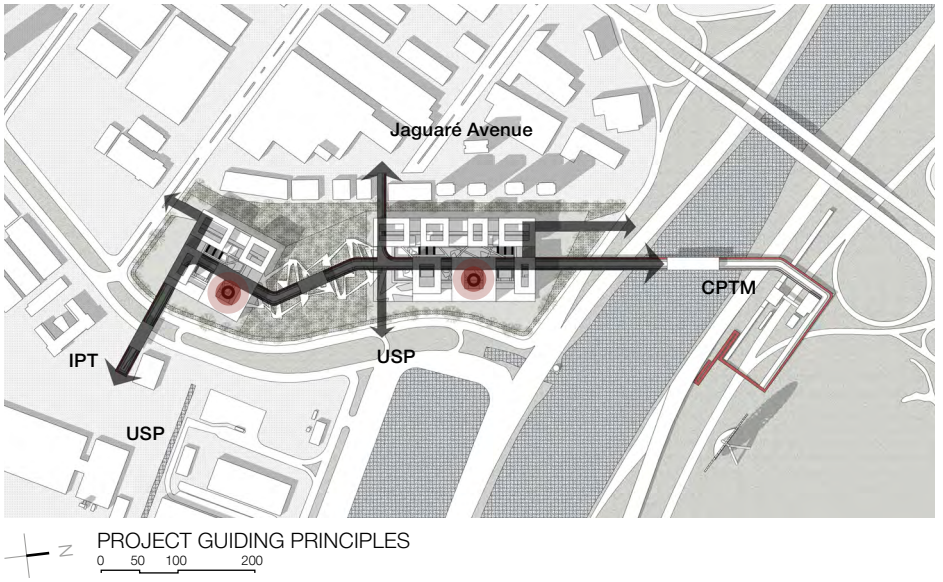


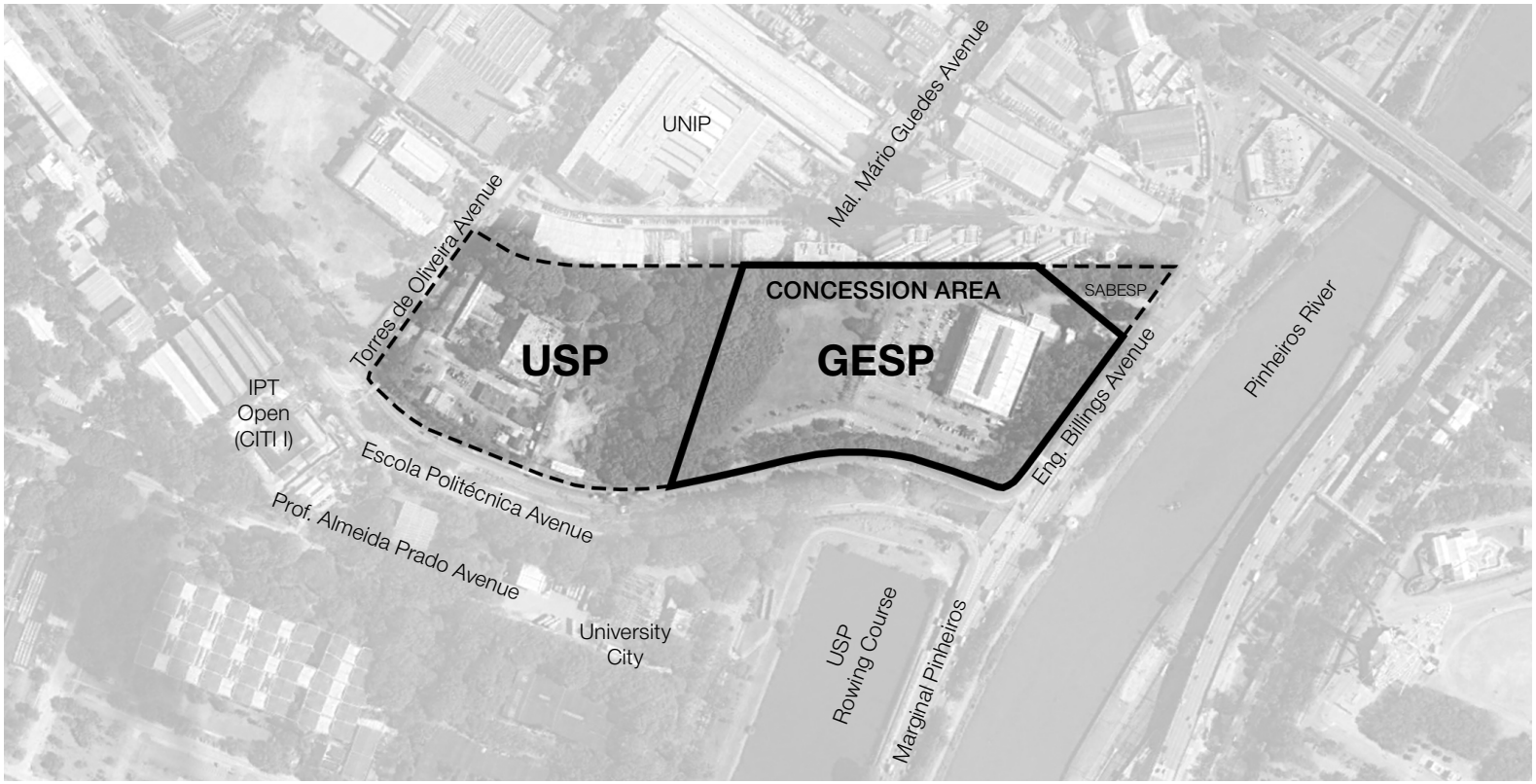
Figure 66. **Current conditions of the site.** Source: Google Earth, 2025.

Although the proposal presented in the Public Consultation focuses on the concession area currently occupied by the State Secretariats for Economic Development and for Science, Technology, and Innovation, this thesis expands the scope of intervention by developing proposals for both sites—the concession area owned by the Government of the State of São Paulo (GESP) and the adjacent University of São Paulo (USP) property—thereby proposing a comprehensive redevelopment strategy for CITI II. This broader approach increases the capacity to coordinate land uses, mobility systems, and environmental solutions, resulting in a more coherent vision capable of consolidating an efficient innovation environment aligned with the specific needs and opportunities of the area.

The functional organization of the proposal is structured around activity clusters that bring together research facilities, technological development spaces, collaborative environments, support services, administrative functions, and social areas. The project promotes mixed-use development, provided that it remains compatible with the operational requirements of laboratories and research centers, while emphasizing the importance of programs that support urban vitality through services, cultural activities, educational facilities, and accessible public spaces.

Mobility is treated as a fundamental structuring element of the proposal. The guidelines emphasize the implementation of integrated cycling infrastructure, wide and accessible sidewalks, safe crossings, and strategically located access points. Furthermore, strong connections with public transportation systems and existing urban facilities are considered essential for enhancing connectivity and consolidating a sustainable mobility network.

The urban planning framework guiding the analysis and development of CITI II is based on a coordinated set of legal and regulatory instruments formally adopted within the Public Consultation process. The Strategic Master Plan of the Municipality of São Paulo (PDE – Law No. 16,050/2014) classifies the area as Economic Development Zone 2 (ZDE-2), establishes specific guidelines for science, technology, and innovation



CITI II AND CONCESSION AREA BOUNDARIES

0 25 50 100

activities, regulates mechanisms such as Additional Building Rights Charges (Outorga Onerosa) and the Solidarity Quota, and incorporates Jaguaré into the Metropolitan Structuring Macroarea, a territorial designation intended to support large-scale metropolitan transformation.

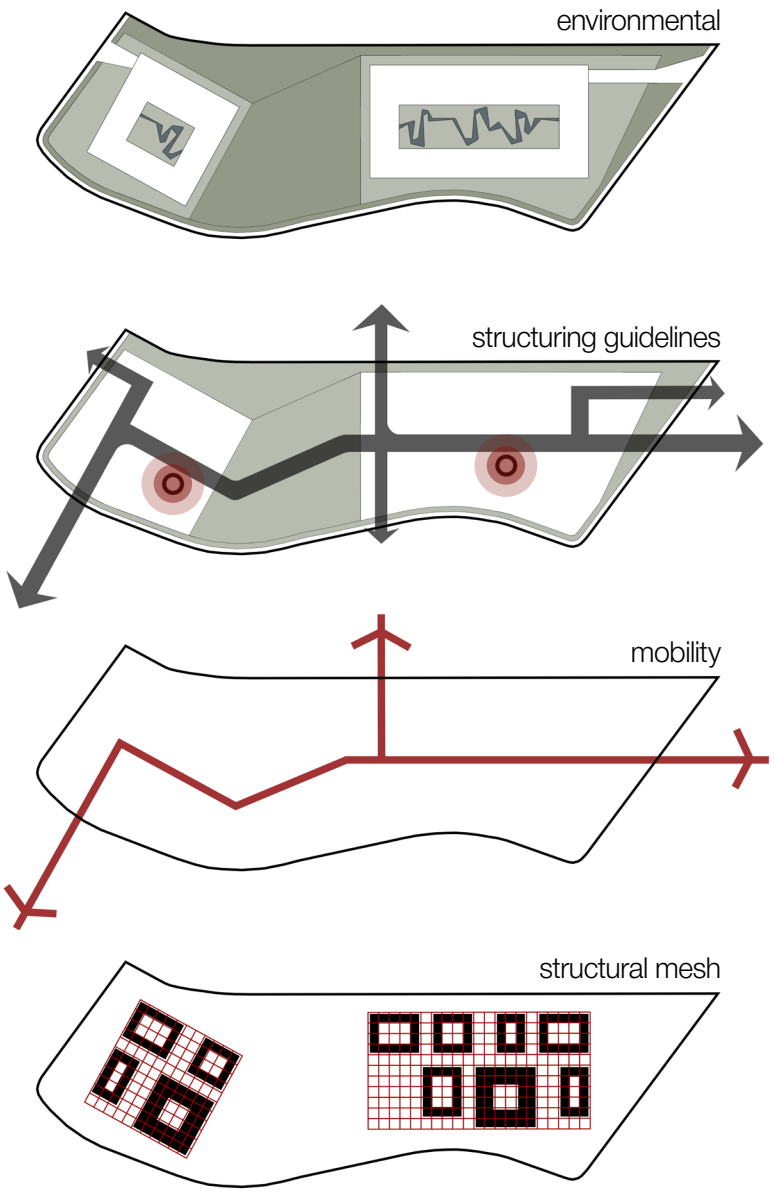
The Land Subdivision, Land Use, and Occupancy Law (LPUOS – Law No. 16,402/2016) further defines the applicable urban parameters, including floor area ratios, site coverage, height limits, permeability requirements, setbacks, and subdivision rules for plots exceeding 20,000 m². For social housing developments located within ZDE-2, Decree No. 59,885/2020 establishes specific regulations for Social Interest Housing Developments (EHIS) and Affordable Market Housing Developments (EHMP), allowing greater development potential when compared to the general zoning framework.

At the federal level, land subdivision is governed by Law No. 6,766/1979, which establishes general guidelines for the subdivision of large land parcels, the allocation of public areas, and compliance with municipal planning regulations. This regulatory framework is further complemented by the requirements of the Pinheiros Arc Urban Intervention Project (PIU Arco Pinheiros), which guides the redevelopment and densification of large industrial sites in Jaguaré, the improvement of the road network, the diversification of land uses, and the reorganization of urban infrastructure along the Pinheiros River corridor.

In addition, the Strategic Master Plan (PDE) defines the reference land values per square meter used in the calculation of the Additional Building Rights Charge (Outorga Onerosa do Direito de Construir), an instrument considered essential to the urban and economic feasibility of new developments. Together, these legal and planning instruments form the regulatory framework that supports both the territorial analysis and the design strategies proposed for the São Paulo Innovation District.

Within this context, the guidelines established through the Public Consultation operate as a bridge between regulatory requirements and design decisions. These principles synthesize environmental, urban, functional, and mobility parameters, translating the regulatory framework into spatial strategies that structure the design approach adopted in this thesis.

Master Plan Concept



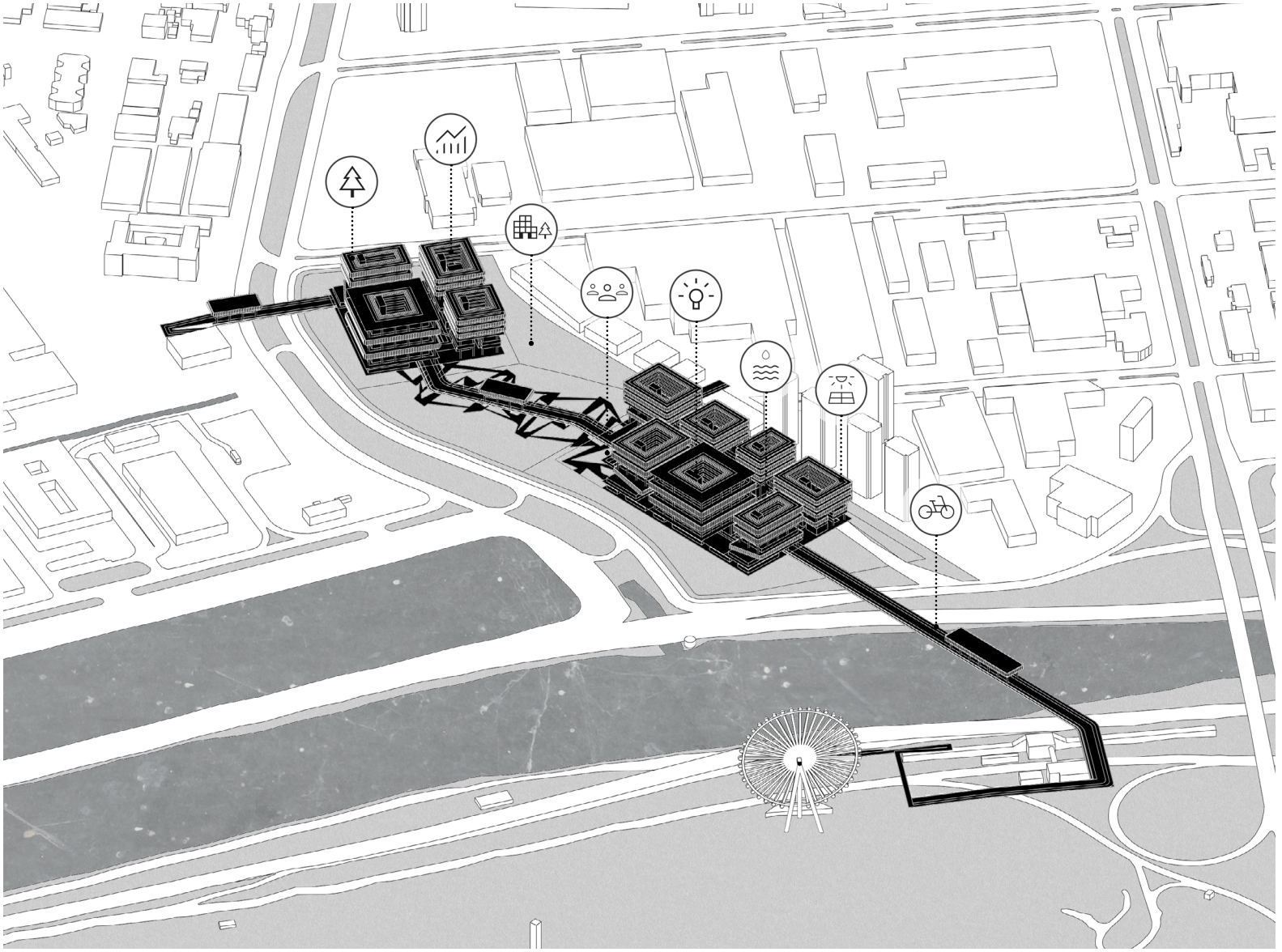
The overall master plan strategy was developed through an integrated understanding of the site's environmental conditions, the official planning guidelines, and the scientific potential that characterizes the area. The proposal is based on the premise that innovation can only thrive when supported by high-quality, accessible, and environmentally responsible urban spaces. Accordingly, the master plan combines active mobility, green infrastructure, mixed-use development, and social spaces to create an environment capable of fostering interaction, strengthening knowledge networks, and promoting a continuous urban experience.

The design concept emerges directly from the relationship between the site and its hydrological dynamics. The proximity to the Pinheiros River, the history of flooding events, and the site's gentle topography informed the creation of an elevated urban platform, which serves as the central organizing element of the proposal. This elevated plane ensures safety and uninterrupted use throughout the year while extending beyond its technical function to structure circulation, organize the landscape, and accommodate the project's principal public spaces. At its base, green slopes, permeable surfaces, and water features form an environmental system capable of retaining, infiltrating, and conveying stormwater, transforming water management into a fundamental component of both urban design and climate resilience.

The arrangement of buildings, parks, and social spaces is guided by the objective of transforming a currently fragmented area into an open, permeable, and connected environment. The design reorganizes movement patterns and creates new connections that bring different activities closer together, ensuring continuous pedestrian circulation and direct integration with neighboring institutional facilities. The presence of USP, IPT, IPEN, and the Butantan Institute provides the foundation for the creation of an integrated innovation ecosystem in which research, technological development, entrepreneurship, and culture coexist in a complementary and mutually reinforcing manner.

Mobility plays a structuring role within the overall strategy. The master plan establishes generous pedestrian routes, continuous cycling paths, and enhanced crossings designed to improve accessibility and encourage sustainable modes of transportation. Elevated connections associated with the urban platform ensure safe circulation during periods of intense rainfall, while a network of shaded pathways provides thermal comfort and transforms everyday movement into an integral part of the urban experience. The inclusion of a Light Rail Transit (LRT) system further reinforces this mobility framework by offering an efficient and low-impact mode of transport capable of connecting different sectors of the district and improving access to surrounding institutions. In addition, integration with public transportation networks and nearby institutional areas contributes to consolidating the district as a vibrant, accessible, and highly connected urban environment.

Landscape is conceived as an integrating element of the proposal. Infiltration gardens, vegetated corridors, reforested areas, and the central woodland form an ecological system that regulates environmental conditions, enhances biodiversity, and creates sensory pathways between buildings. Strategies such as green roofs, shaded terraces, and vegetated façades strengthen the relationship between architecture and nature, resulting in comfortable, sustainable, and visually distinctive environments. Together, these landscape elements contribute to the environmental performance of the district while reinforcing its identity as an innovation ecosystem closely connected to natural systems.



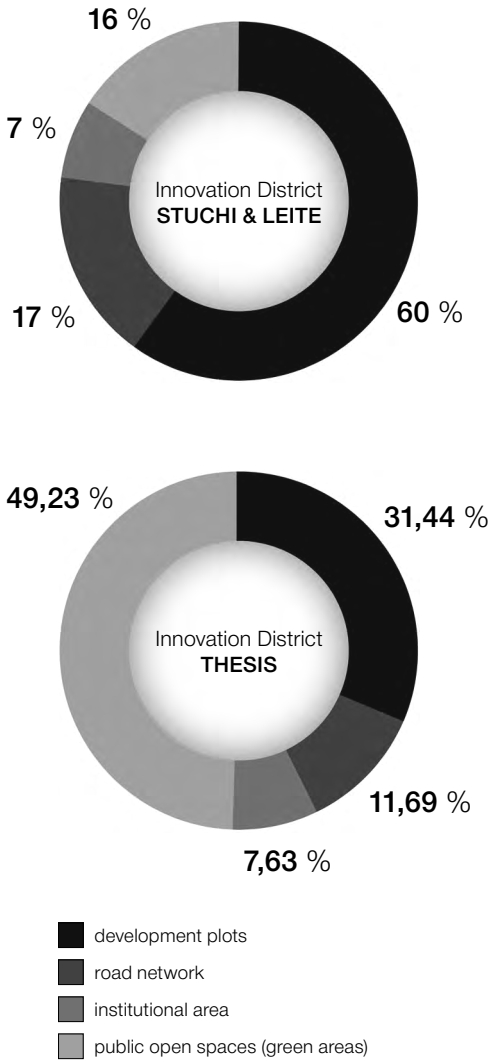
The buildings are designed to accommodate different programs and evolving needs over time. Balanced building volumes, bioclimatic strategies, low-impact materials, and efficient internal organization ensure environmental comfort and high levels of energy performance. Uses are strategically distributed throughout the district, bringing together laboratories, research centers, offices, educational facilities, collaborative workspaces, and everyday services in order to foster interaction, encourage knowledge exchange, and promote synergies among users.

Functional diversity is established as a fundamental component of the overall strategy. The integration of housing, hospitality, retail, cultural facilities, and public spaces creates an environment of continuous use, with activities distributed throughout the day and evening to support urban vitality. This approach operates according to the principles of the “15-minute city,” enabling daily needs to be met within short walking or cycling distances while promoting well-being, safety, and social interaction.

The master plan is therefore conceived as a living laboratory for sustainable urbanism. The integration of water management, active mobility, green infrastructure, adaptable architecture, a knowledge-based ecosystem, and social vitality synthesizes a proposal that responds to identified challenges while anticipating future demands. This strategy provides the foundation for the solutions presented in the final design proposals, demonstrating how each design decision emerges directly from the ambition to create an exemplary innovation district that is environmentally responsible, socially vibrant, and resilient over time.

Program

The proposed program brings together research, education, applied innovation, public services, housing, and supporting activities, creating an integrated environment capable of operating as a cohesive ecosystem. The science and technology sector concentrates laboratories, research centers, office spaces, collaborative environments, prototyping facilities, and dedicated hubs for startups and science-based companies. This core is complemented by institutional facilities focused on education, culture, and healthcare, integrated with everyday services such as retail, food and beverage establishments, accommodation, and administrative support functions. High-quality green spaces, social gathering areas, sociocultural facilities, and environmental awareness programs—including an Environmental Education Center—are distributed throughout the master plan to strengthen connections with the surrounding community and promote a diverse mix of uses. The inclusion of housing, comprising both Social Interest Housing (EHIS) and Affordable Market Housing (EHMP), as well as academic accommodation and long-stay facilities, ensures continuous activity and urban vitality. At the same time, plazas, pedestrian-oriented routes, and tree-lined public spaces reinforce the integration between knowledge production, urban life, and collective well-being.



With regard to Economic Development Zone 2 (ZDE-2), the following urban planning parameters established by Municipal Law No. 16,402/2016 should be highlighted:

- Floor Area Ratio (FAR) – indicating the amount of buildable floor area permitted on the site:

Minimum FAR	**0,5**
Basic FAR	**1,0**
Maximum FAR	**2,0**

- Site Coverage Ratio (SCR) – indicating the maximum horizontal footprint occupied by buildings on the plot:

SCR (plots up to 500 m²)	**0,7**
SCR (plots equal to or greater than 500 m²)	**0,5**

- Maximum Building Height – establishing the maximum height permitted for new developments:

Maximum Building Height	**28 meters**

- Minimum Setbacks – defining the minimum distance required between buildings and plot boundaries:

Front Setback	**5 meters**
Rear Setback	**3 meters**
Side Setbacks	**3 meters**

Although the regulations applicable to ZDE-2 establish a maximum Floor Area Ratio (FAR) of 2.0, a maximum Site Coverage Ratio (SCR) of 50% for plots equal to or larger than 500 m², and a height limit of 28 m, these parameters apply to the individual plots resulting from the subdivision process, as defined by the Land Subdivision, Land Use, and Occupancy Law (SÃO PAULO, 2016) and the CITI II Public Consultation documents (SÃO PAULO, 2023a). While the reference proposal adopts a FAR of 2.5 for the study plots, this thesis also applies the same coefficient but develops a built solution reaching a maximum height of 46 m. Although this value exceeds the height limits established for ZDE-2, it remains compatible with the maximum height of 48 m permitted by the PIU Arco Pinheiros for Qualification Areas Q1, the category in which the project site is located (SÃO PAULO, 2016; SÃO PAULO, 2020).

This difference results, in part, from a deliberate design decision adopted in this thesis to fully preserve the existing vegetation, whereas the public consultation proposal considered the removal of part of the trees classified as invasive species, allowing greater flexibility for building footprints and massing strategies (SÃO PAULO, 2023b). Consequently, preserving the existing vegetation required a greater degree of verticalization in order to accommodate the proposed program. This approach is consistent with the strategic objectives established for the Arco Pinheiros Urban Intervention Project, which identifies the area as a zone for urban transformation and productive restructuring, requiring higher densities and greater programmatic capacity to support Science, Technology, and Innovation (ST&I) activities. In this context, the proposed building heights remain aligned with the transformative ambitions of the district and with the conceptual nature of the reference studies that guide its development (SÃO PAULO, 2020).

Urban Framework

	Innovation District **STUCHI & LEITE**		Innovation District **THESIS**	
Site area	84.404,57 m²		84.404,57 m²	
Built area	140.654 m²		157.758 m²	
Land Subdivision	%		%	m²
Development plots	60		31,44	33.203
Road network	17		11,69	12.344
Institutional area	7		7,63	8.057
Public open spaces (green areas)	16		49,23	52.018
Total	100		100	105.622
Private Development Uses	%		%	m²
Innovation Ecosystem*	36,4		37,8	42.878
Residential	28,5		26,6	34.560
Offices / Long-Stay Accommodation	23,4		24,1	27.373
Retail / Commercial	11,7		11,3	12.862
Total	100		100	113.281
Parking	1.606 parking spaces		1.388 parking spaces	
Housing units - 2,8 inhabitants/unit	1.384 units		1.056 units	
Gross Population Density - 350 inhabitants/ha	3.875 inhabitants		2.957 inhabitants	

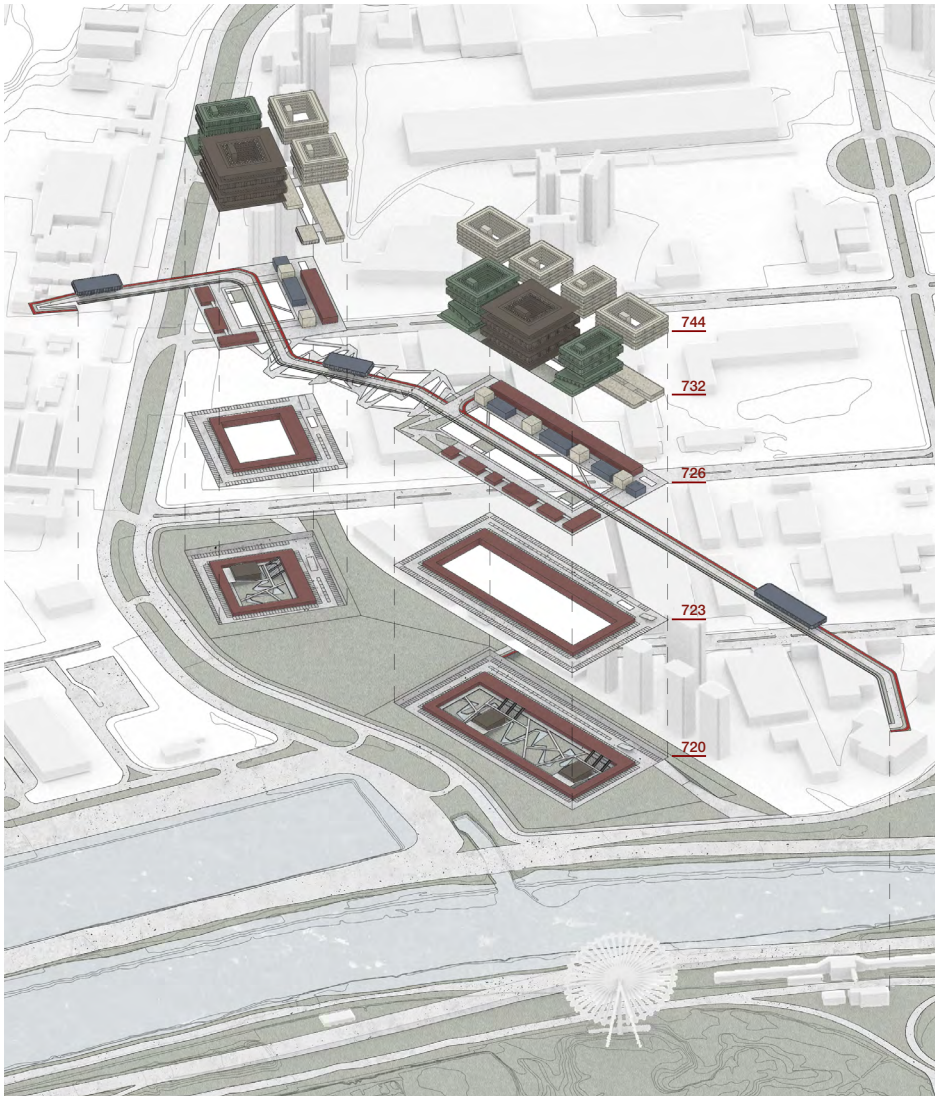
General Parameters and Notes

The residential population parameters were established based on UNESCO recommendations for sustainable cities, adopting an average occupancy rate of 2,8 inhabitants per housing unit and a gross population density of 350 inhabitants per hectare. These values ensure consistency with international standards for high-density housing and efficient urban planning, while supporting a compact, walkable, and socially diverse urban environment.

The PIU Arco Pinheiros allows for an increase in the maximum building height to up to 48 meters, a provision considered compatible with the area's urban planning framework. This measure enables greater vertical development, optimizing land use efficiency while providing increased flexibility in building design and programmatic organization.

***Innovation Ecosystem**

Social Spaces
Auditorium / Multipurpose Rooms
Laboratories / Prototyping Facilities
Incubator / Accelerator
Educational Facilities
Corporate Offices
Public Agencies



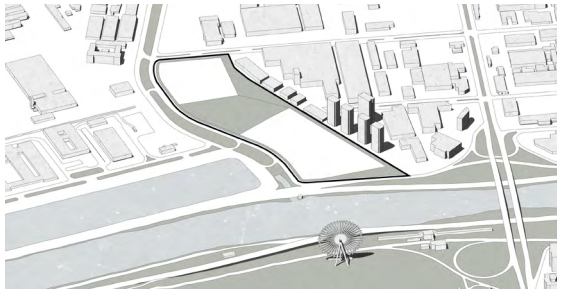
ZONING DIAGRAM

- innovation ecosystem
- commercial / retail
- offices / long-stay
- institutional
- residential

Master Plan Phases

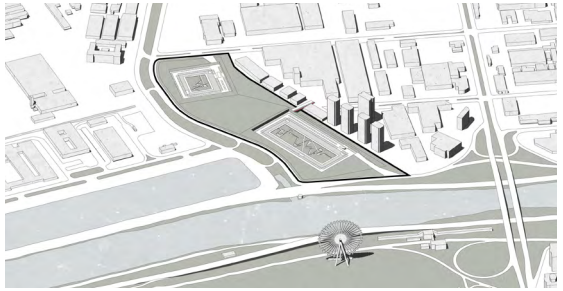
01. Environmental Preservation

Preservation of existing green areas within the Atlantic Forest biome, ensuring the maintenance of vegetation cover and the protection of sensitive ecosystems throughout the site.



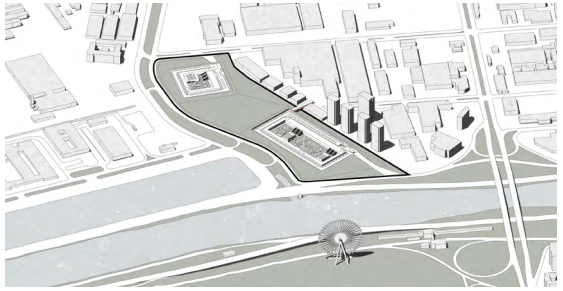
02. Foundational Infrastructure

Implementation of the ground level at elevation 720, incorporating parking areas, retail spaces, water features, and integrated green areas. This phase includes the formation of slopes to mitigate flood risks and establish the foundation of the resilient drainage system.



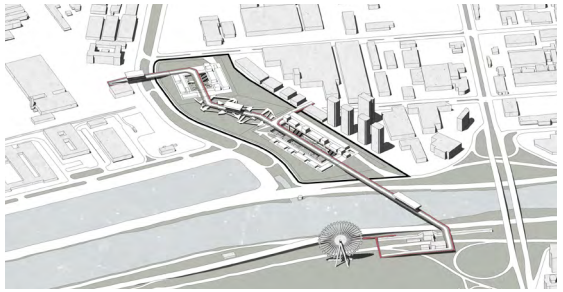
03. Mixed-Use Areas and Activities

Development of the second level at elevation 723, accommodating retail, service, and auditorium functions, structuring the transition between the ground level and the upper terraces while enhancing urban vitality.



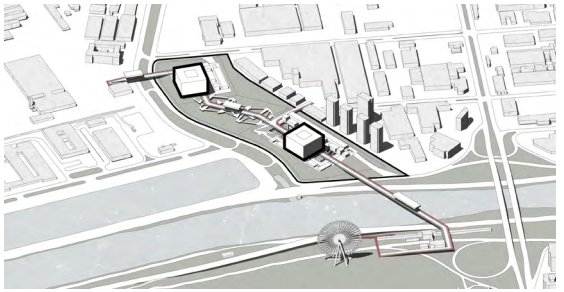
04. Connectivity and Public Space

Development of the cycle pedestrian bridge at elevation 726 and the elevated connections for the Light Rail Transit (LRT) system, public plazas, and recreational spaces. Integration of institutional, commercial, and residential common areas, establishing the district's active mobility corridor.



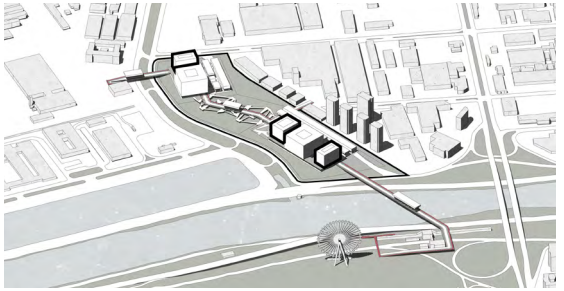
05. Innovation Ecosystem

Implementation of the buildings dedicated to the innovation ecosystem, bringing together laboratories, research centers, maker spaces, and collaborative environments focused on science, technology, and entrepreneurship.



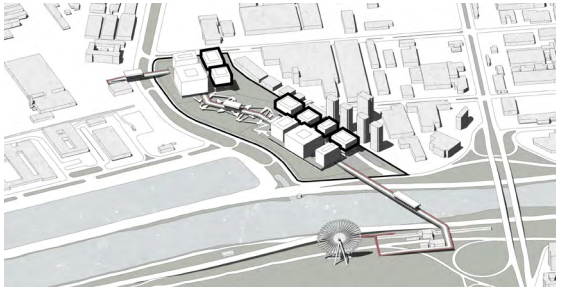
06. Offices and Long-Stay

Implementation of office buildings and long-stay accommodation units, reinforcing the district's multifunctionality and bringing temporary housing, work, and research closer together.



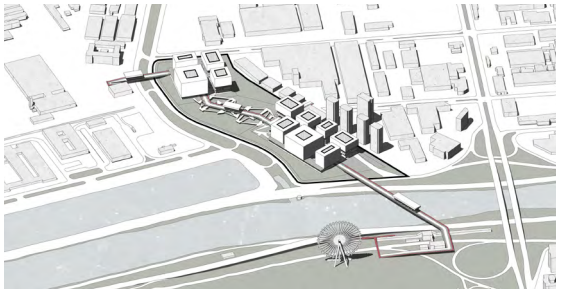
07. Housing Complex

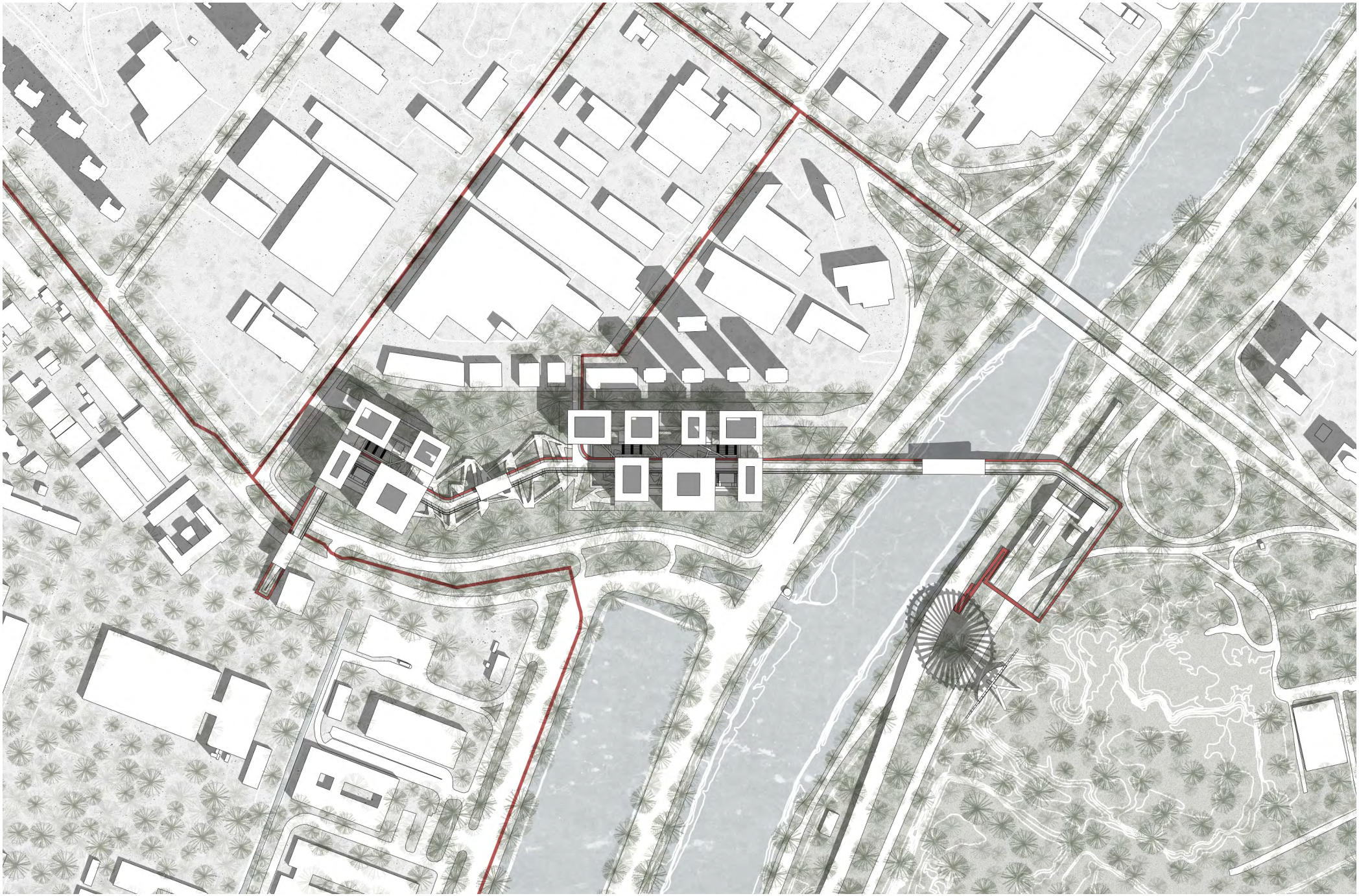
Development of residential buildings, promoting a diverse mix of uses and ensuring continuous vitality throughout the district, with integrated common areas and direct connections to public plazas.



08. Volumetric Composition

Final composition of the built environment, integrating all programmatic typologies—innovation, corporate, accommodation, and residential uses—into a cohesive urban system connected to green areas and mobility infrastructure.

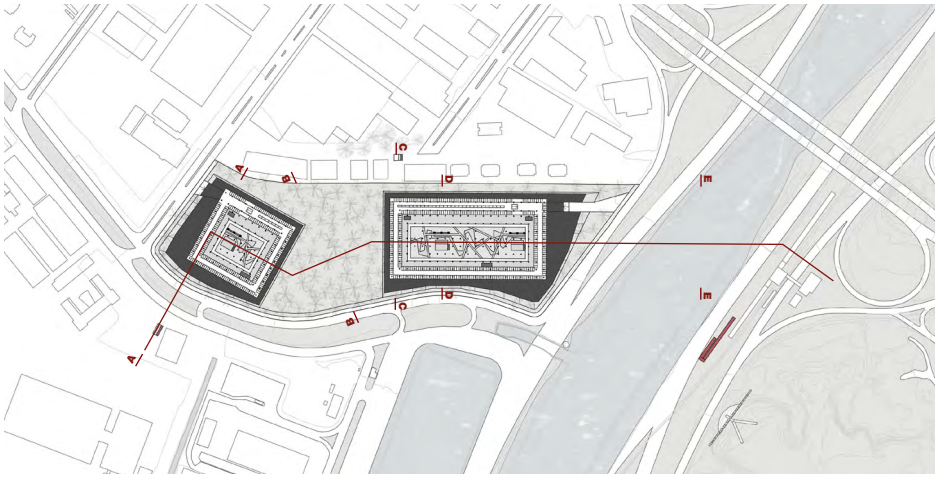




SITE PLAN

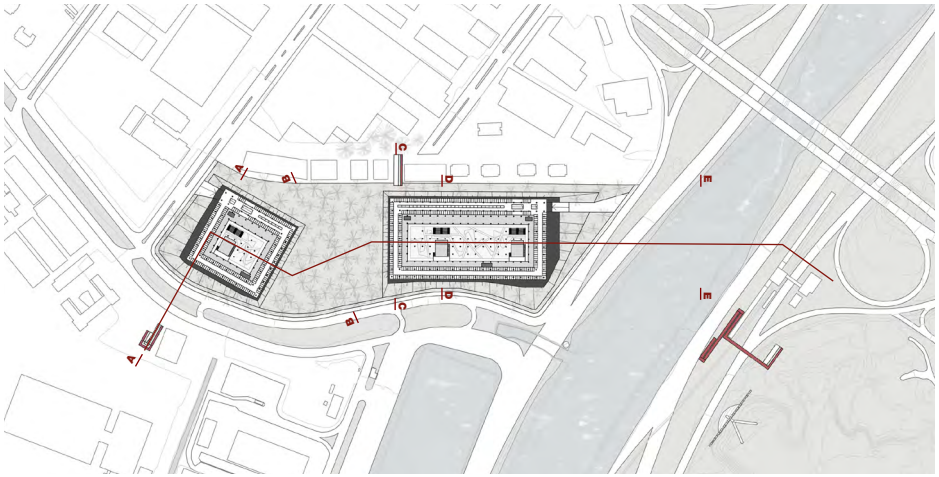
0 50 100 200

Site Plans



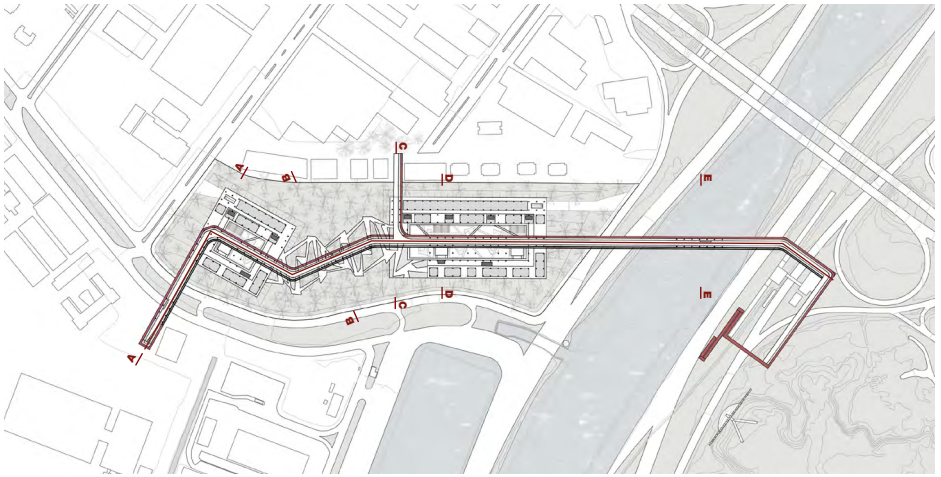
SITE PLAN – ELEVATION 720

0 50 100 200



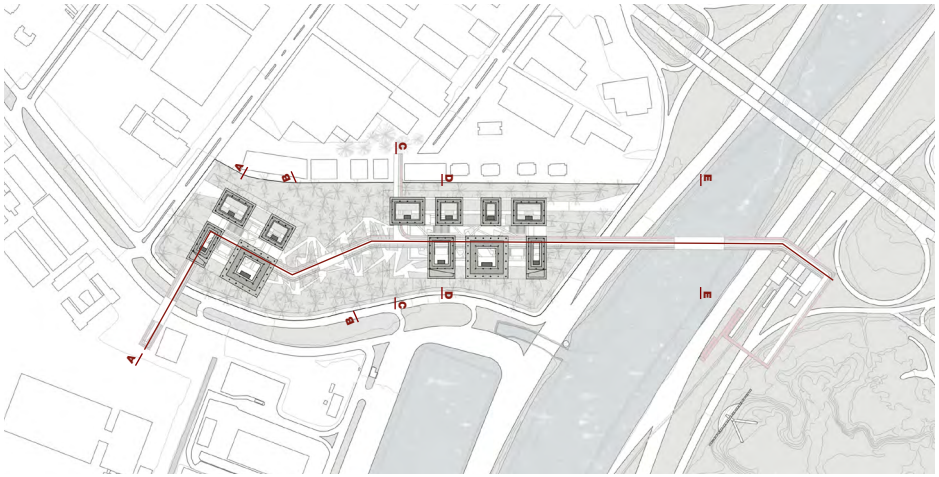
SITE PLAN – ELEVATION 723

0 50 100 200



SITE PLAN – ELEVATION 726

0 50 100 200

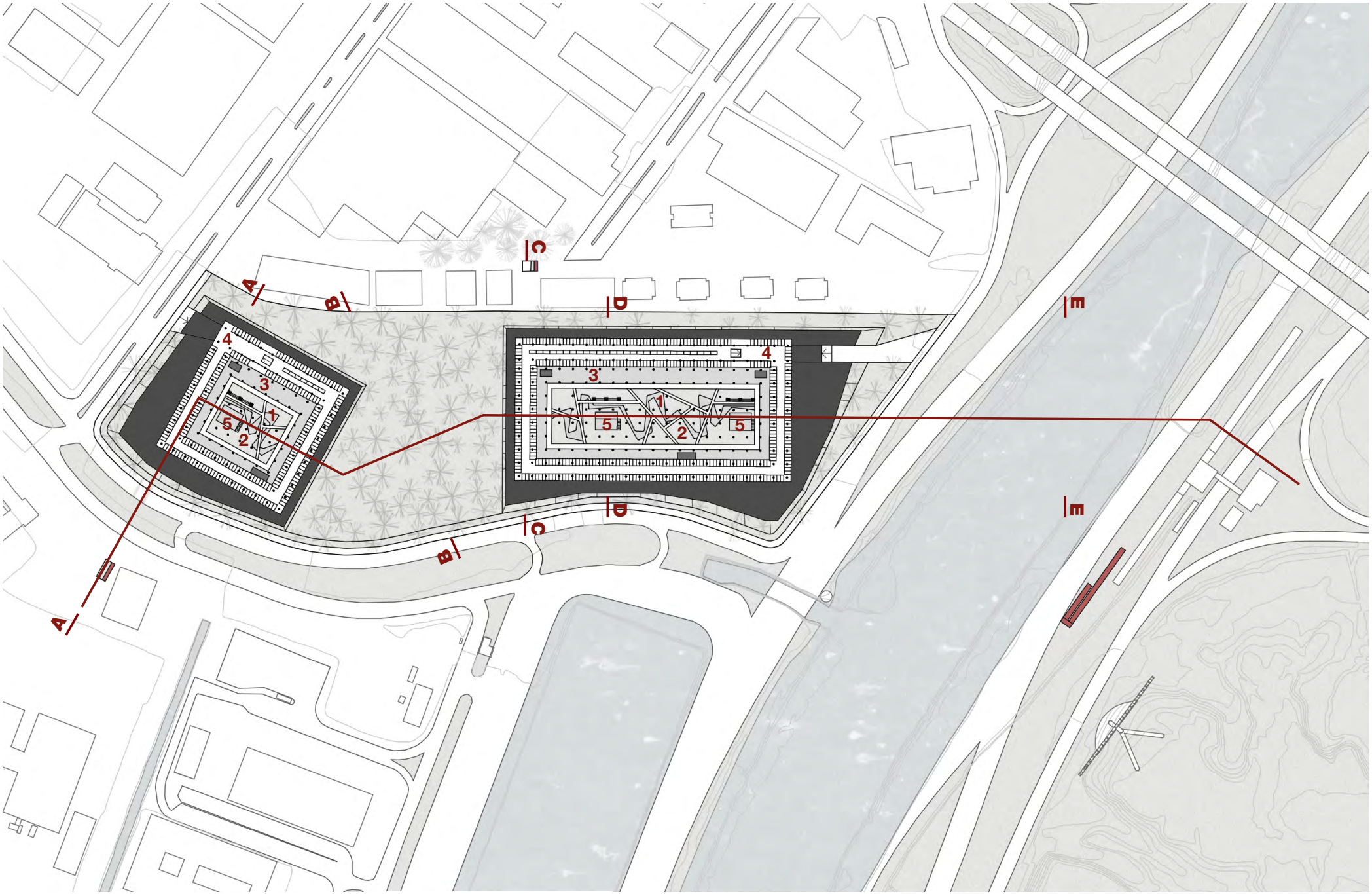


SITE PLAN – ELEVATION 747 - TYPICAL FLOOR PLAN

0 50 100 200

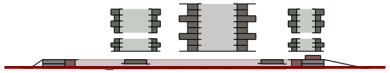
LONGITUDINAL PERSPECTIVE SECTION

0 40 80 160

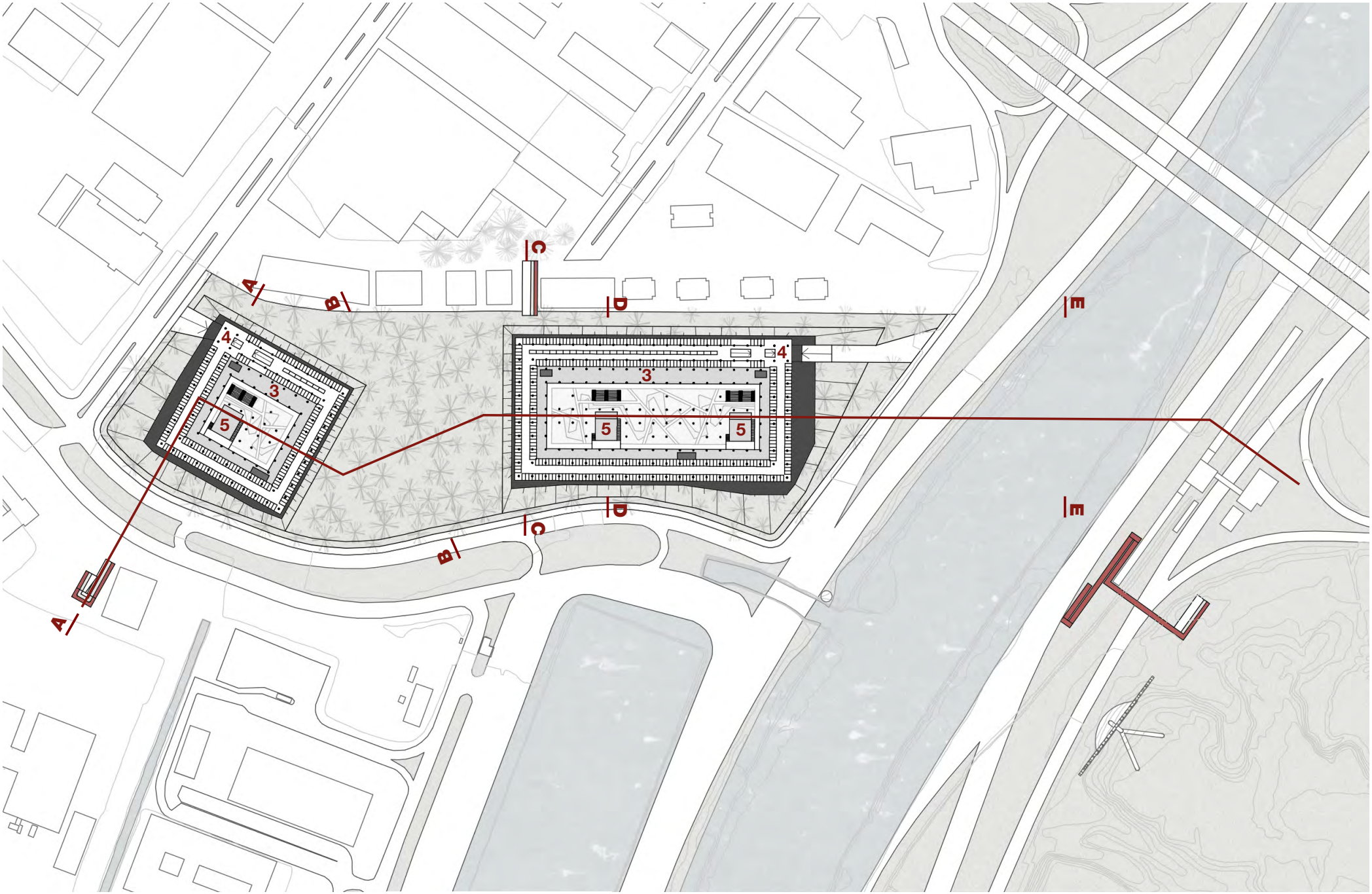


SITE PLAN – ELEVATION 720

0 50 100 200



1. water feature
2. green areas
3. retail
4. parking
5. auditorium
6. institutional
7. residential
8. commercial
9. offices / long-stay
10. innovation ecosystem



SITE PLAN – ELEVATION 723

0 50 100 200

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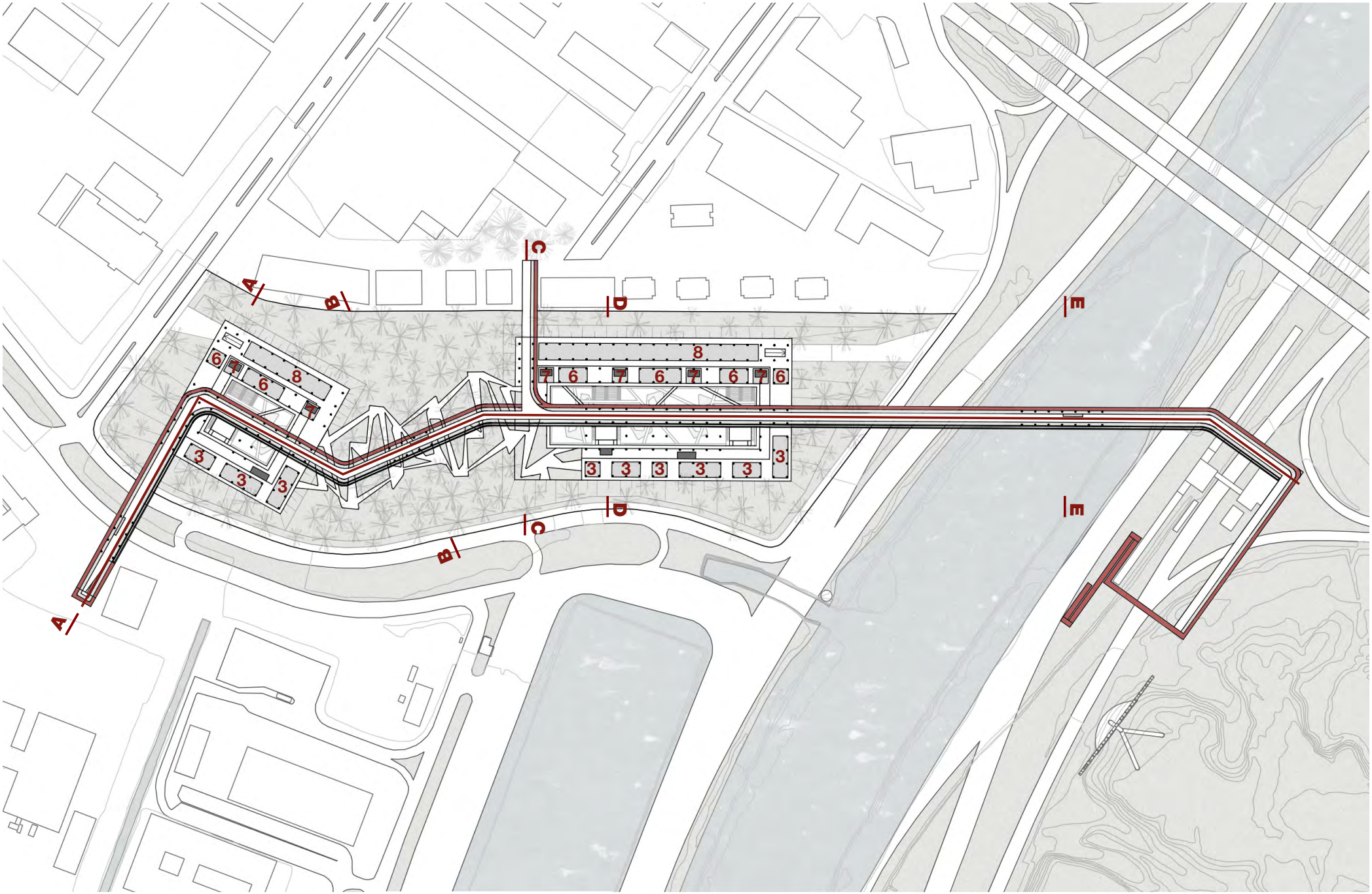
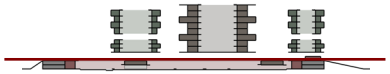


SITE PLAN – ELEVATION 726

0 50 100 200



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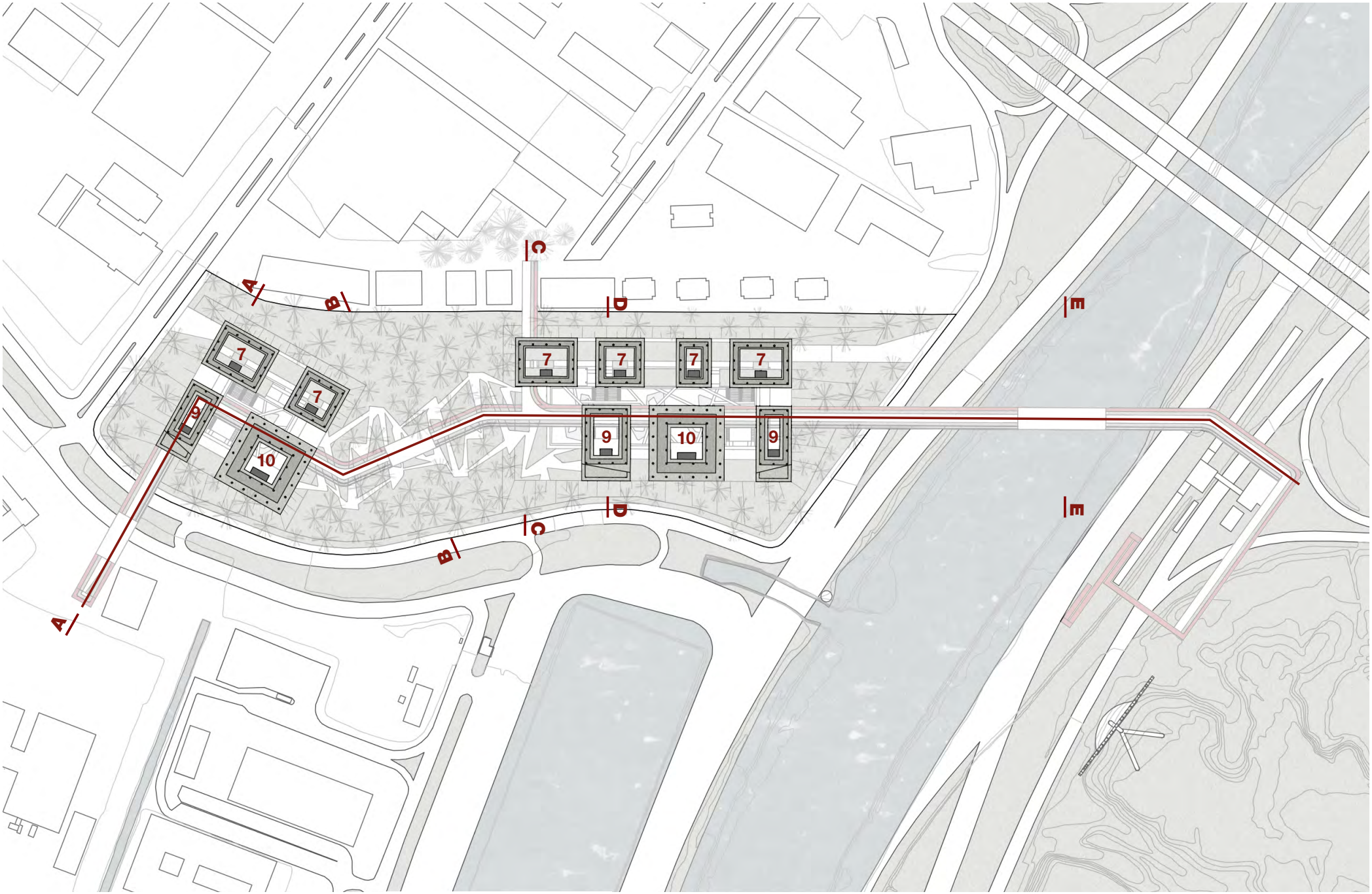
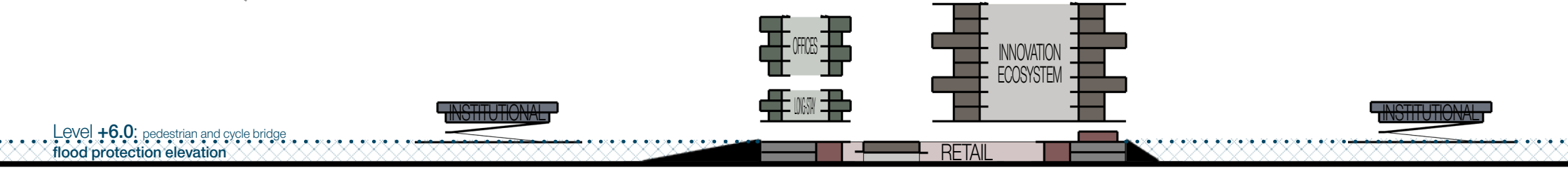


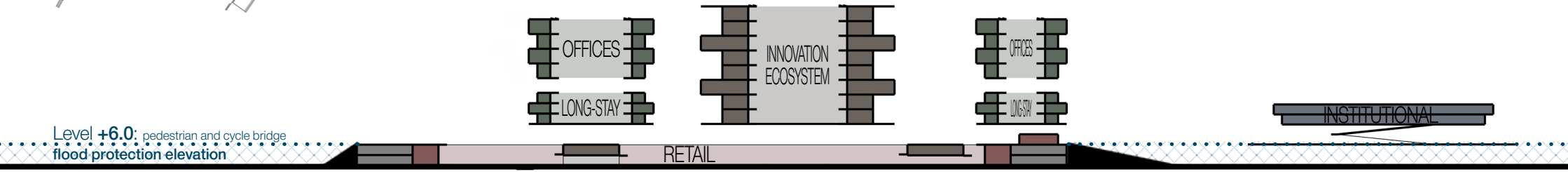
SITE PLAN – ELEVATION 747 - TYPICAL FLOOR PLAN

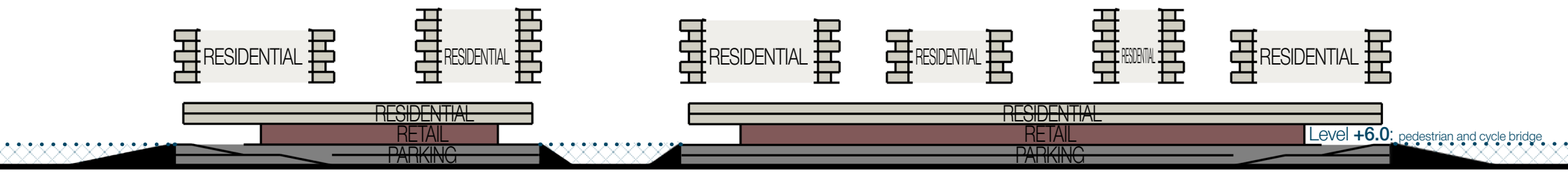
0 50 100 200

1. water feature
2. green areas
3. retail
4. parking
5. auditorium
6. institutional
7. residential
8. commercial
9. offices / long-stay
10. innovation ecosystem

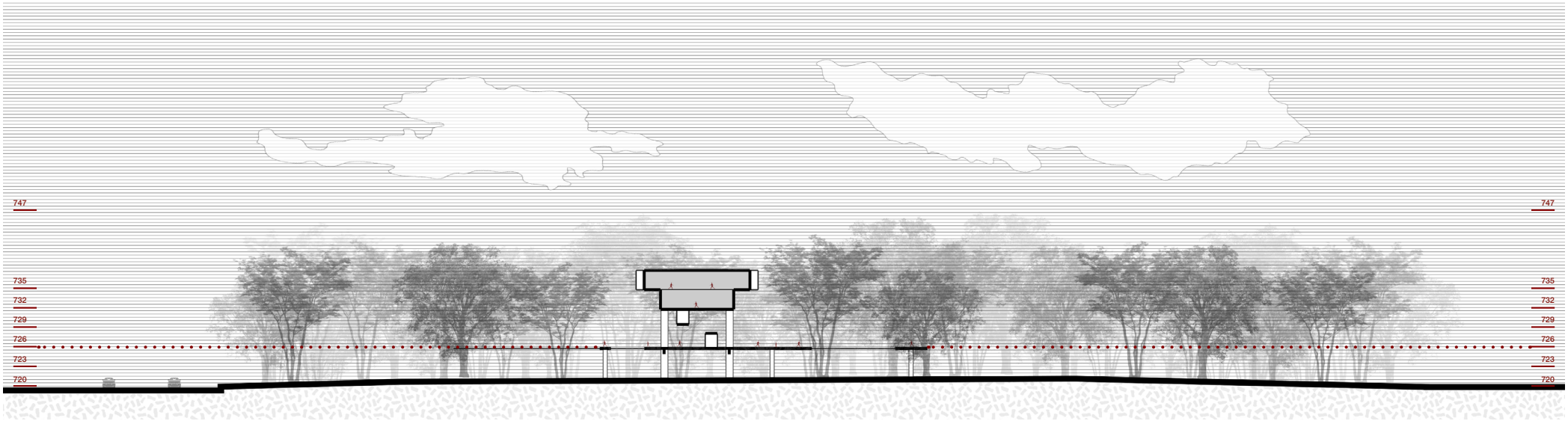
Section Diagram - program organization







Sections

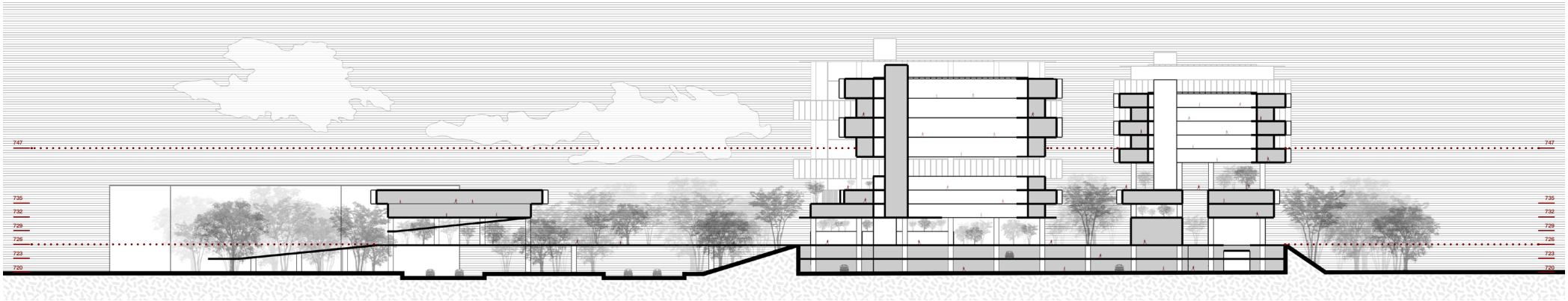


SECTION B-B | LRT STATION - WOODLAND

0 10 20 40

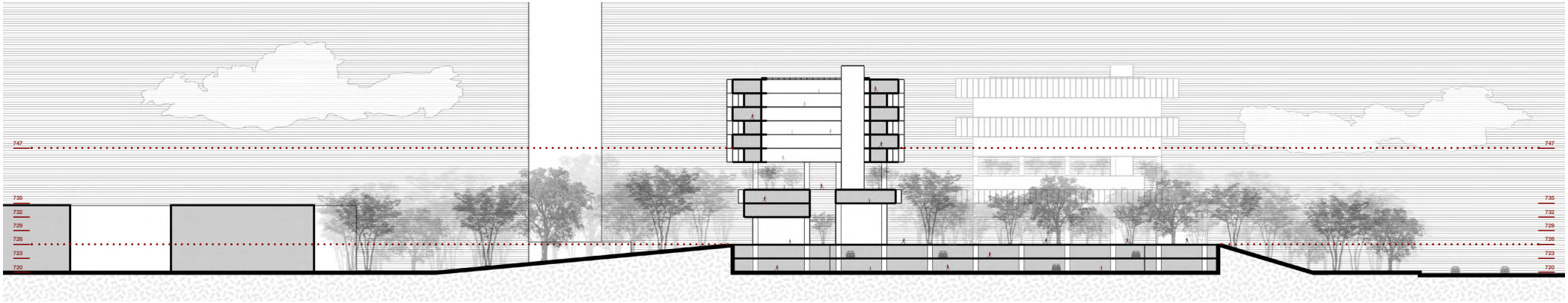
SECTION D-D | AUDITORIUM

0 10 20 40



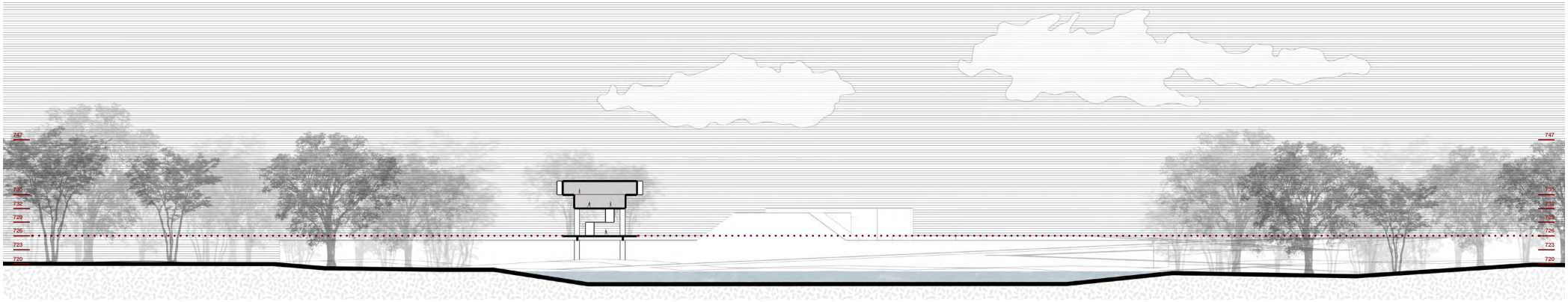
SECTION A-A | UNIVERSITY CITY CONNECTION

0 10 20 40



SECTION C-C | UNIP CONNECTION AND PLAZA

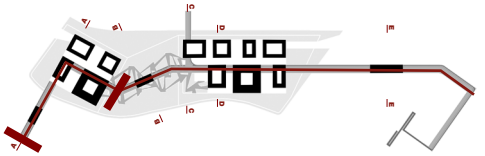
0 10 20 40

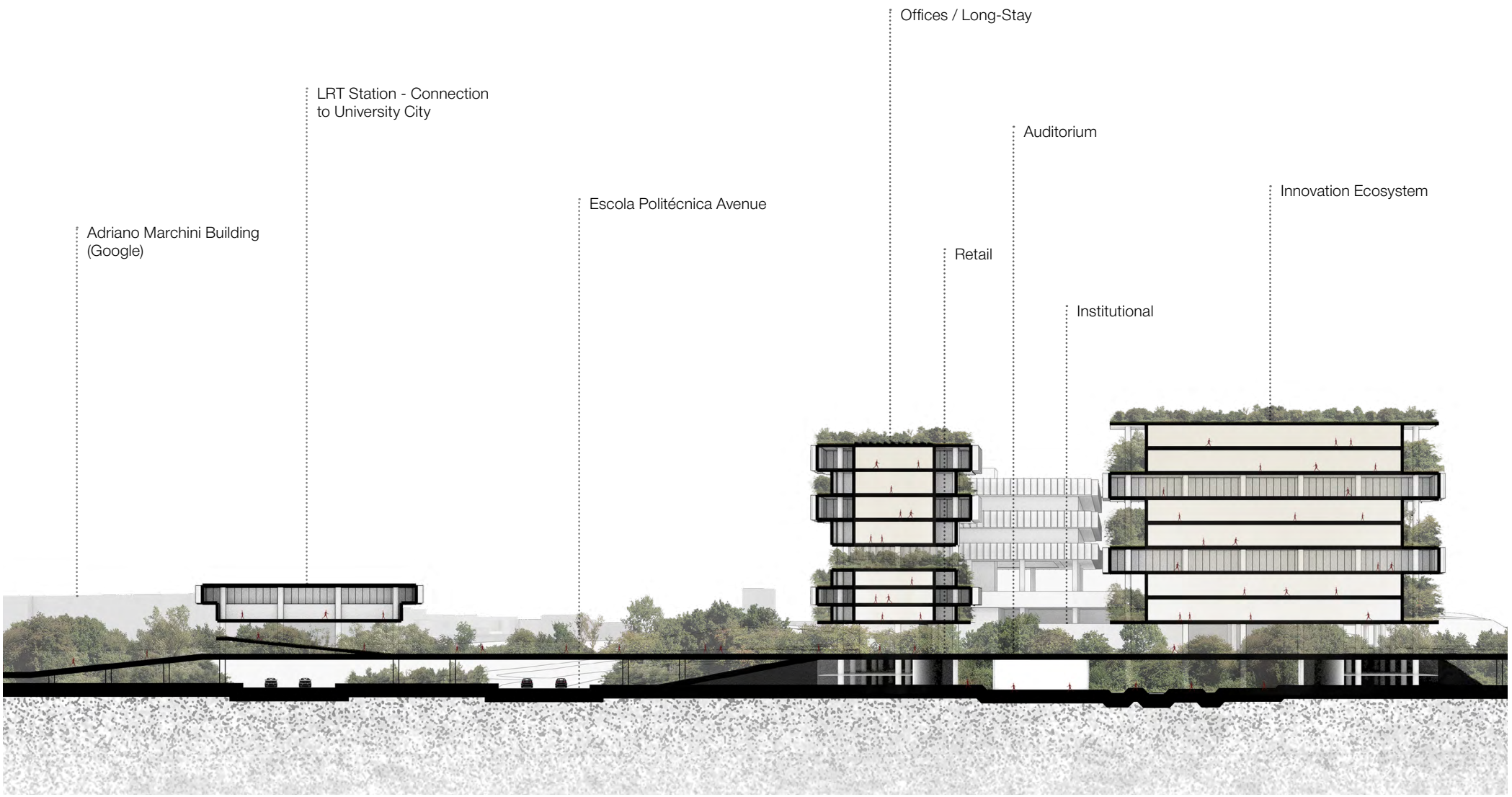


SECTION E-E | LRT STATION - ENVIRONMENTAL EDUCATION CENTER

0 10 20 40

Longitudinal Section

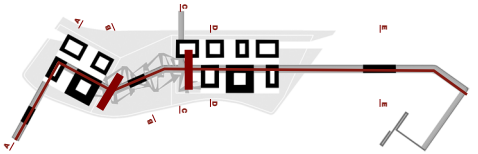


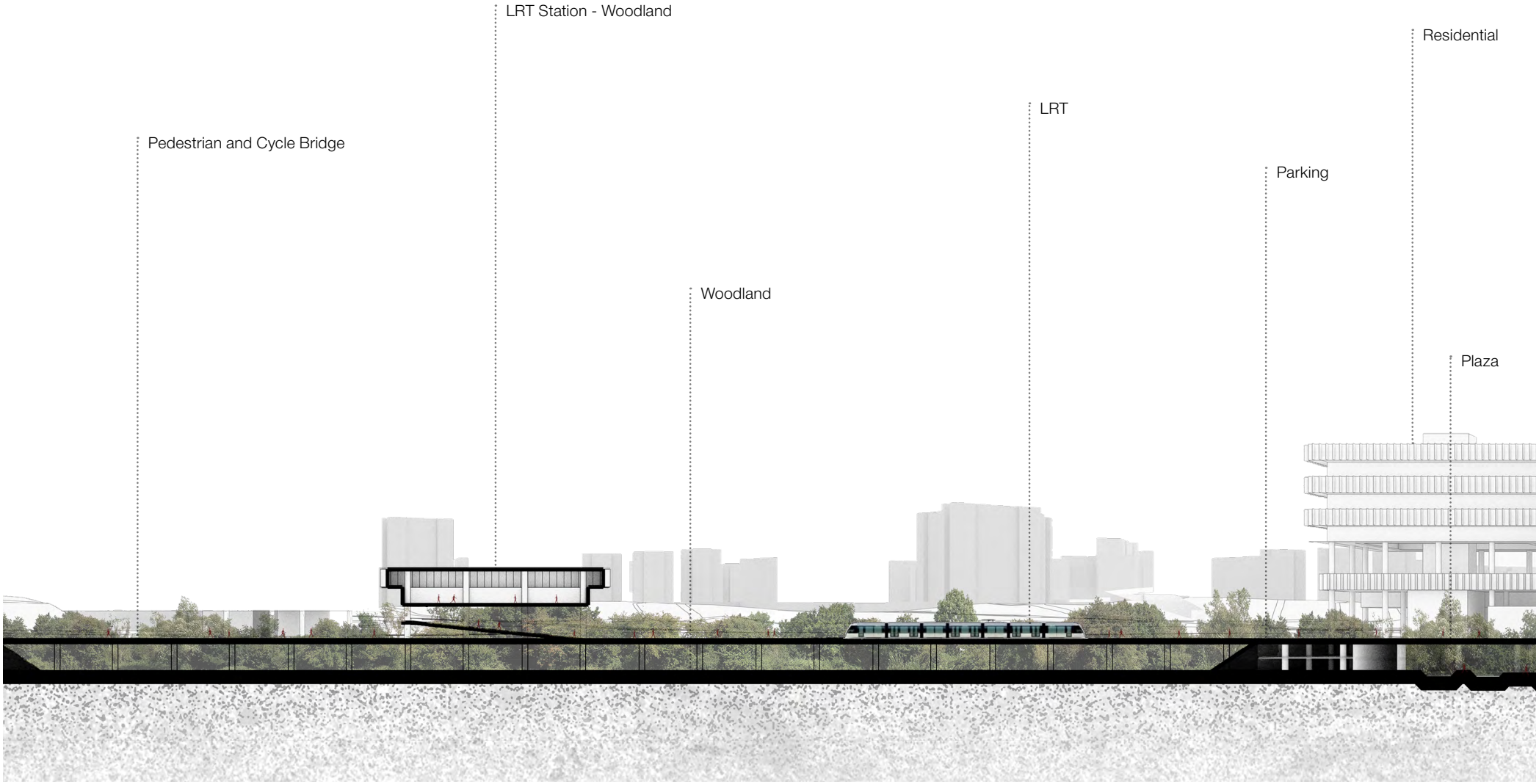


LONGITUDINAL PERSPECTIVE SECTION

0 10 20 40

Longitudinal Section

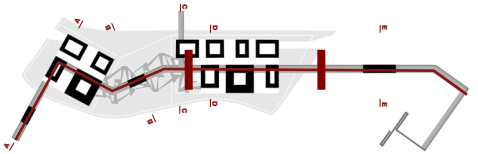


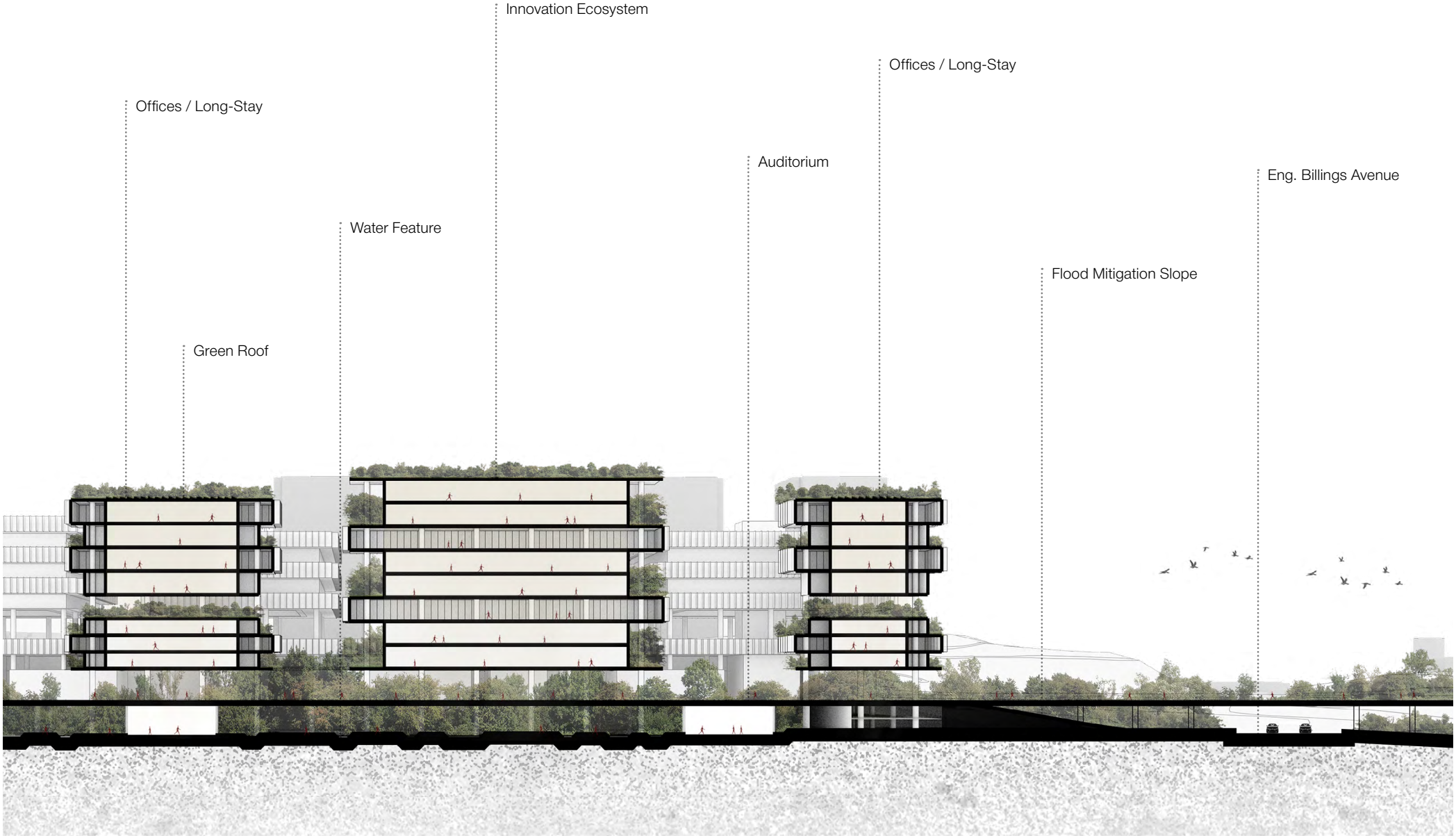


LONGITUDINAL PERSPECTIVE SECTION

0 10 20 40

Longitudinal Section

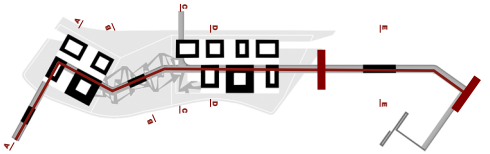


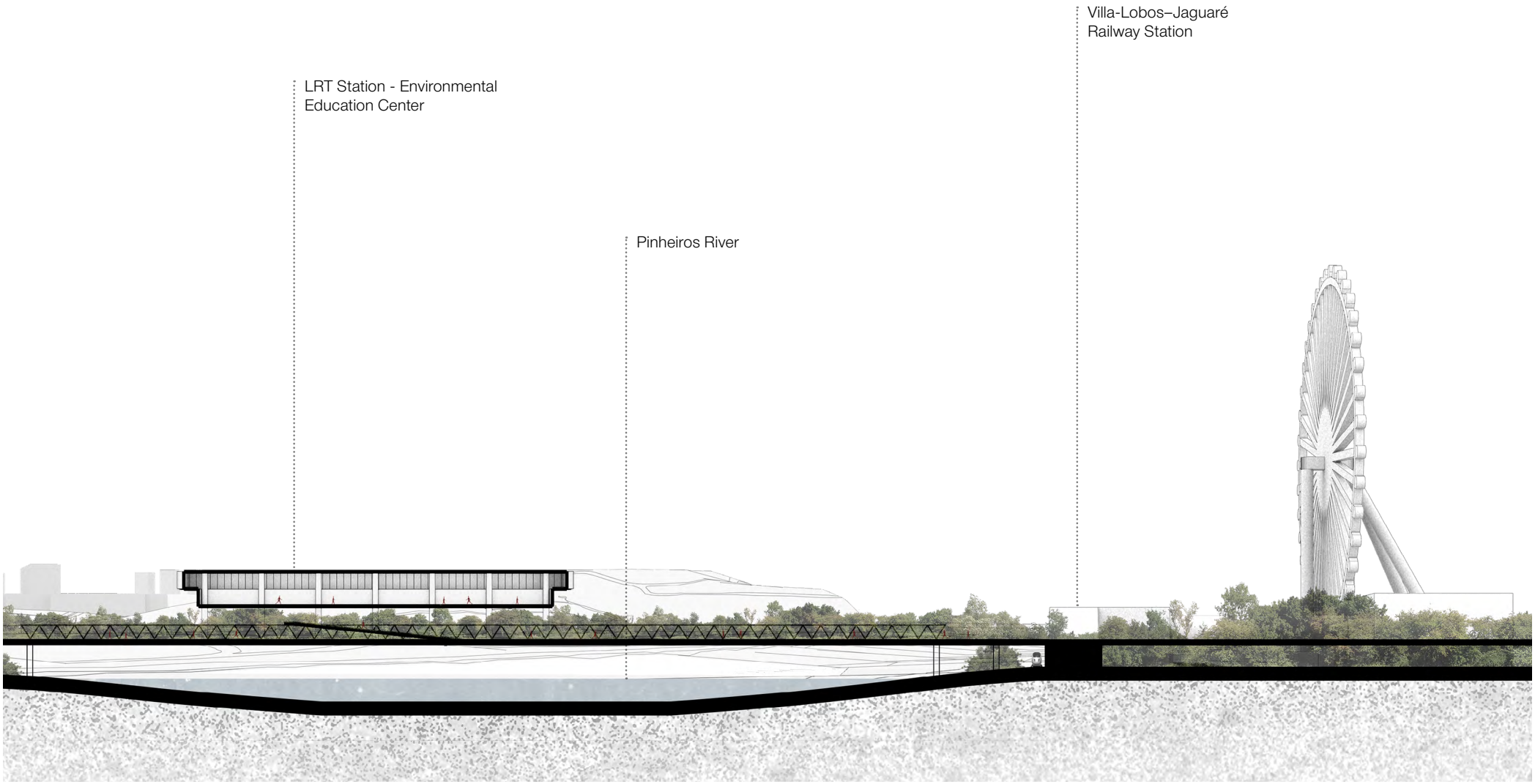


LONGITUDINAL PERSPECTIVE SECTION

0 10 20 40

Longitudinal Section





LONGITUDINAL PERSPECTIVE SECTION

0 10 20 40

Perspective Section
SECTION D-D

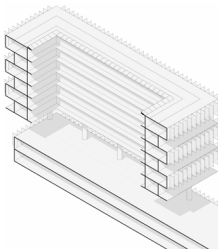
Building Typologies

Residential

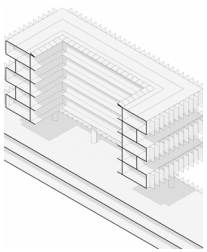
1.056 units
2.957 inhabitants

*UNESCO recommendations for sustainable cities, adopting an average occupancy rate of 2,8 inhabitants per housing unit and a gross population density of 350 inhabitants per hectare.

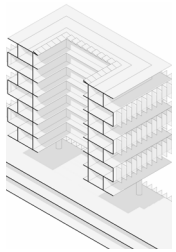
4.

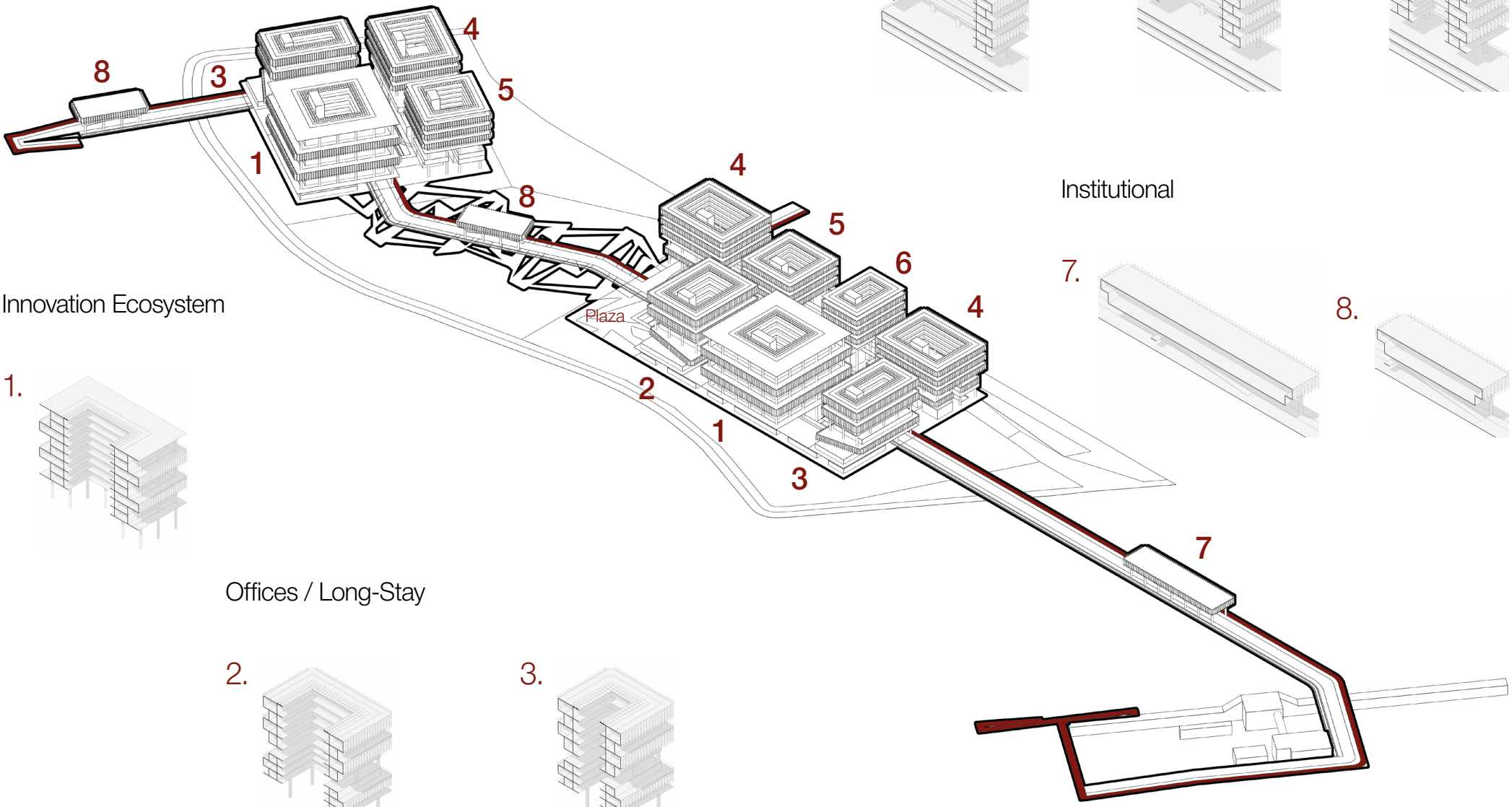


5.



6.





Institutional

7.

8.

Innovation Ecosystem

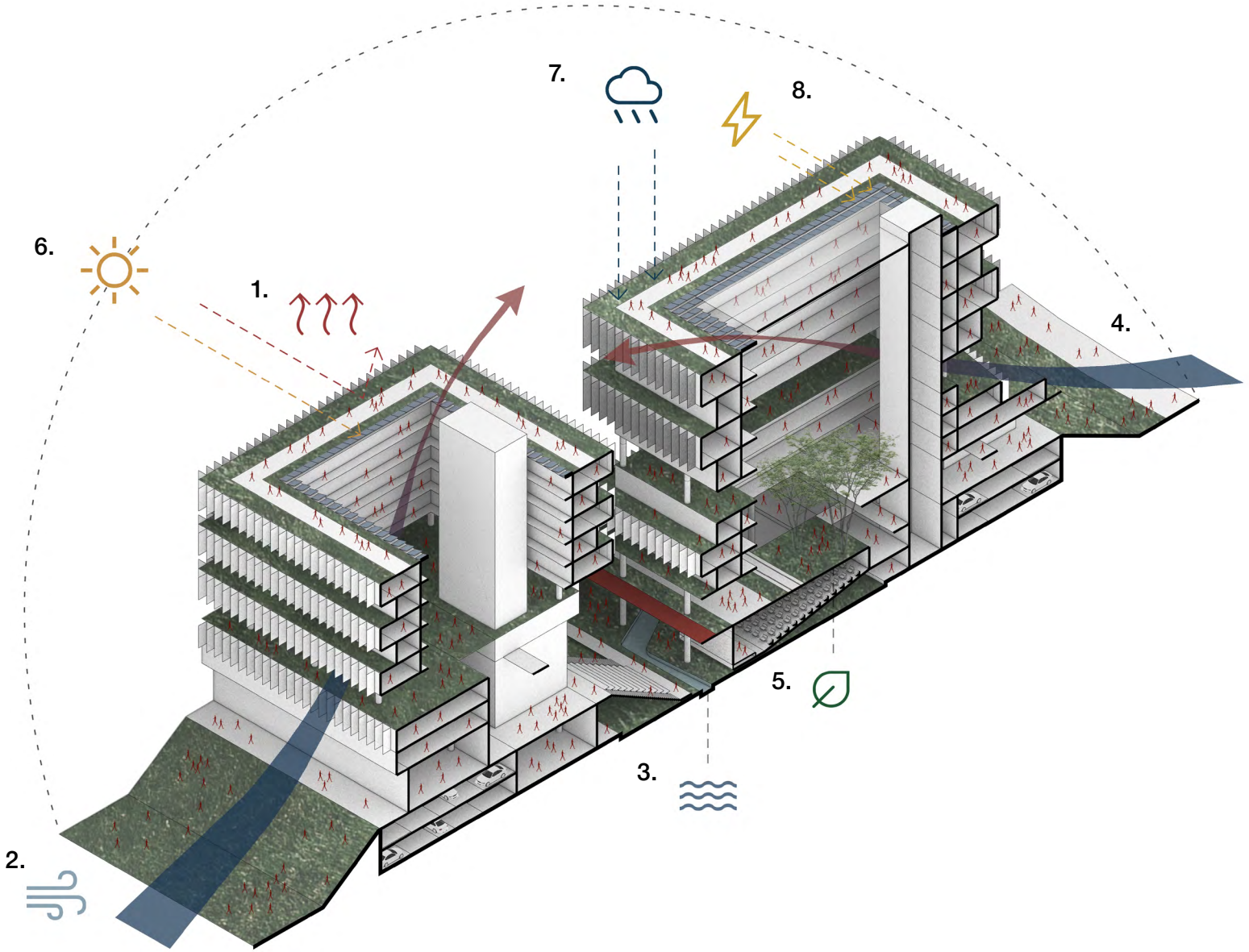
1.

Offices / Long-Stay

2.

3.

Bioclimatic Isometric Section



1. **SOLAR RADIATION CONTROL**
Shading elements and rooftop vegetation reduce direct solar exposure, minimizing heat gain and ensuring indoor comfort.

2. **CROSS VENTILATION**
The open building morphology, combined with central voids, allows continuous airflow, providing natural cooling and reducing the demand for mechanical systems.

3. **STORMWATER HARVESTING AND DRAINAGE**
Permeable surfaces, green roofs, and the elevated platform promote infiltration, retention, and proper stormwater management, reducing flood risks.

4. **HEAT DISSIPATION THROUGH THE CENTRAL COURTYARD**
Large atriums facilitate the upward movement of warm air through convection, functioning as thermal chimneys that stabilize indoor temperatures throughout the day.

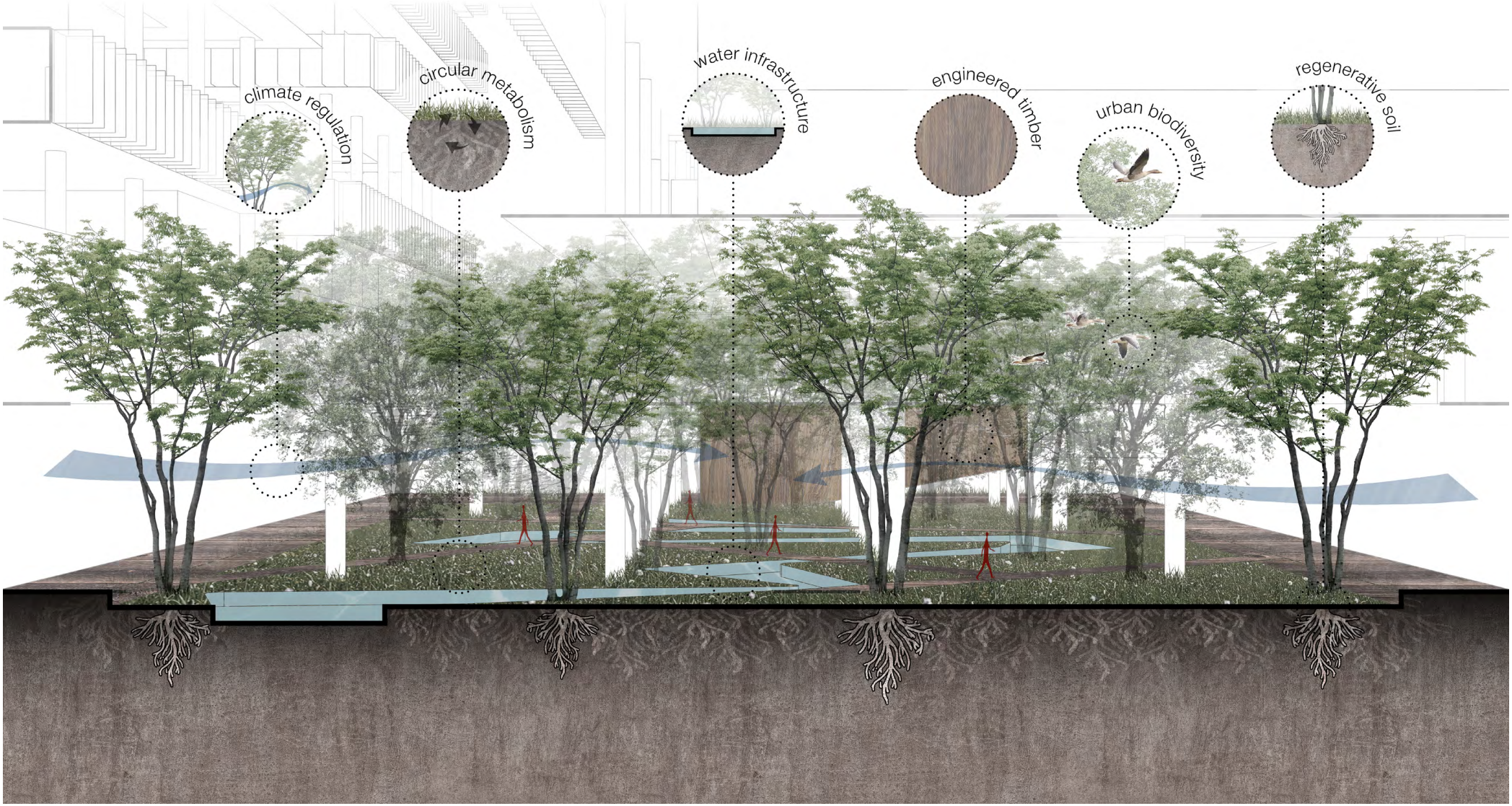
5. **COOLING AND FILTRATION THROUGH LANDSCAPING**
Elevated gardens, green slopes, and tree-lined perimeters regulate the microclimate, filter airborne particles, and contribute to thermal and acoustic comfort.

6. **DIFFUSED NATURAL DAYLIGHTING**
The building configuration optimizes daylight penetration without overheating, reducing energy consumption and ensuring visual comfort within interior spaces.

7. **ECOLOGICAL AND PERMEABLE SURFACES**
Permeable pavements and vegetated areas increase water absorption, reduce surface runoff, and mitigate the urban heat island effect.

8. **PHOTOVOLTAIC SOLAR ENERGY GENERATION**
Photovoltaic panels installed on rooftops harness solar radiation and contribute to the energy autonomy of the development.

Resilient Urban Ecosystem



Final Considerations

The development of the São Paulo Innovation District originated from the need to expand the concept of innovation by integrating technology, the environment, and urban life within a single system. This study sought to understand how scientific advances and social transformations can converge to create cities that are more adaptable, inclusive, and sustainable. In this context, the proposal extends beyond technical guidelines, positioning innovation as a driver of urban and social regeneration, intrinsically linked to public space and everyday life.

Based on the analysis of the CITI II parameters, the project aimed to complement the planning framework developed by Stuchi & Leite. Through concepts such as active mobility, resilience, and green infrastructure, the proposal envisions the district as a living organism capable of learning, evolving, and generating knowledge through the interaction between people, spaces, and nature. This approach guided both urban and architectural design decisions, resulting in a model that integrates ecology, social life, and technology within an experimental and inclusive environment.

The work highlights the responsibility of architecture and urbanism in addressing collective challenges related to social inequality and climate change. Designing cities requires rethinking how urban environments are produced and inhabited, valuing more integrated, collaborative, and sensitive approaches to development. By engaging with the Sustainable Development Goals and broader global agendas, the proposal reinforces the idea that the future of metropolitan regions depends on the convergence of science, nature, and well-being. In this sense, the São Paulo Innovation District represents an urban vision that is more conscious, balanced, and human-centered.

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