GSAPP URBAN PLANNING STUDIO | SPRING 2023

EXPLORING & TRANSLATING RESILIENCE PLANNING IN BARCELONA

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COLUMBIA GSAPP

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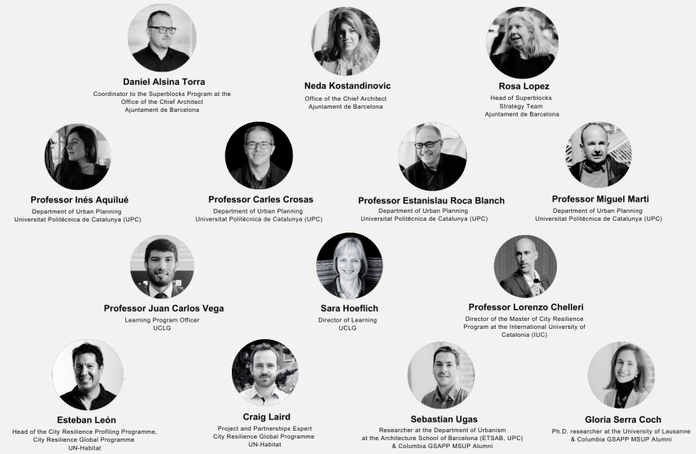

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Introduction to Studio

THE CLIENT

The client of this studio is the Barcelona Office of the Chief Architect of the Municipality, Daniel Alsina Torra. Special thanks to the broader Superblocks Team, Rosa Lopez and Neda Kostandinovic.

Daniel Alsina Torra

Coordinator to the Superblocks Program at the Office of the Chief Architect

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THE PROJECT

The office started the Superilles (Superblock) project in 2015, when the city's Urban Mobility Plan incorporated the plan. The purpose of the Superblocks is to reduce vehicle dependency, by restricting public automobile access to the outskirts of the grid, thereby reducing pollution and emissions.

STUDIO PURPOSE

There are three main goals for the studio. The first is to critically examine the Superblock model in Barcelona, exploring it within the larger concept of resilience. The second is to understand the opportunities and challenges brought by this urban model. The last goal is to develop recommendations on the applicability of the Superblocks model for other urban areas at large.

Source: Ajuntament de Barcelona

Client Questions

Our client tasked us to research the following three questions:

1

CLIENT QUESTION 1

What type of tools can the city use to prevent gentrification in the Superblocks?

2

CLIENT QUESTION 2

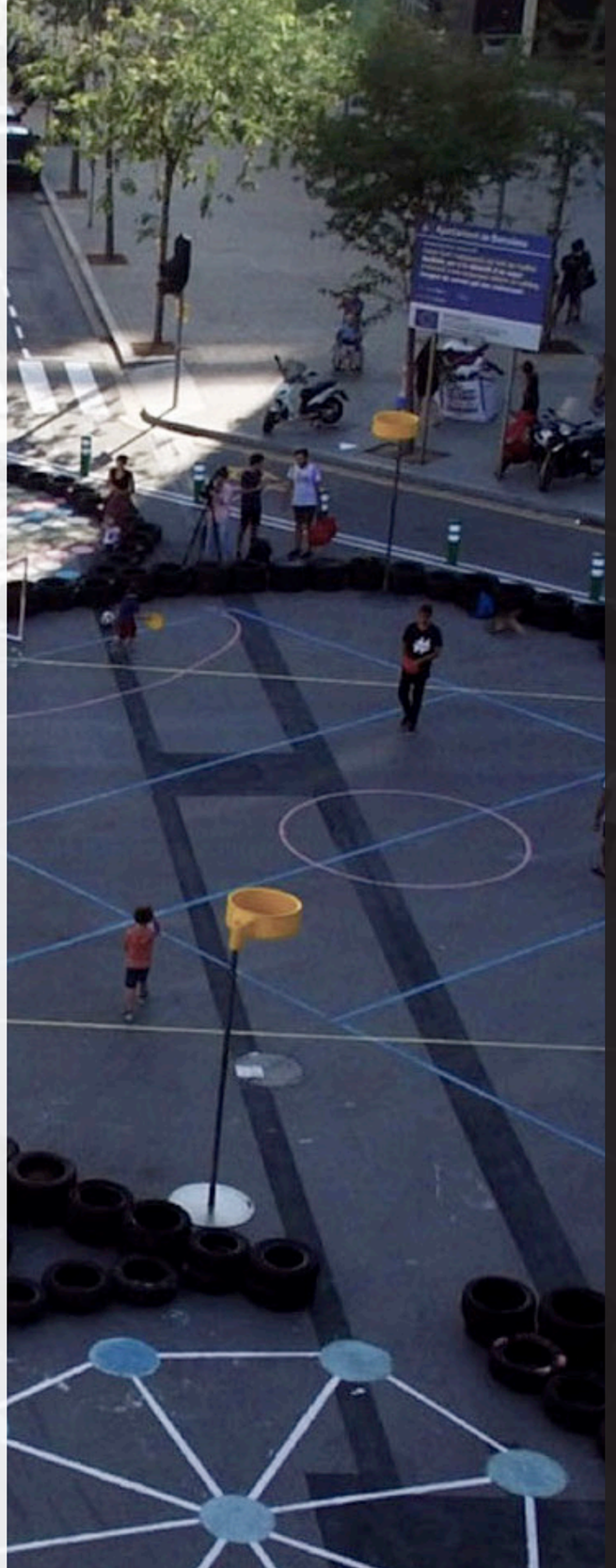
How can the city improve/take care of “green maintenance”?

3

CLIENT QUESTION 3

What can the city do to increase the quality of streets that are not “green streets"?

Source: BCN Ecologia



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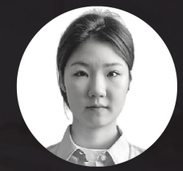

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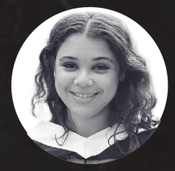

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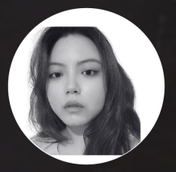


HAOXIANGYU ZHENG

ZEKUN ZHOU

Barcelona: History & Context

The territory of Barcelona was founded as an ancient walled Roman city. These walls were expanded many times during the Medieval Era to accommodate the growing city. In 1714, Catalonia, of which Barcelona is the capital, surrendered to Spain during their war with the English. The Spanish government quickly destroyed all of Catalan's key governmental and societal institutions. They transformed Barcelona into a military stronghold, building two forts, and restricted the city from growing outside of the walls. The walls and forts served as a military tactic against enemies, as well as a means of control over the Catalans and to stifle any whispers of rebellion or revolution.

The walls were finally demolished during 1854-1868, due to the rapidly growing population and unhygienic living conditions. In 1859, the engineer Ildefons Cerda won the competition for the design of the extension of the city of Barcelona. The goal of the expansion was to create a vernacular architecture for the city and connect the growing Poblenou, new towns that focused on public housing, to the center city. According to Aibar, "Cerda's building bylaws were considered very demanding: buildings could not exceed more than 50 percent of the block's surface (the other 50 percent should be set aside for gardens), they were allowed in only two of the four sides of the block, they should be less than 20 m high, and their maximum depth varied from 15 to 20" (Aibar 1997).

Cerda was very deliberate about every detail in his plan, down to the measurements of each block. He conducted many technological and social studies to determine the best use and design of the expansion. The main reason for his extensive investigation was to address the tragic state of hygiene in Barcelona. In this way, Cerda used planning as a tool to achieve resilience for public health hazards, which is the same issue that Barcelona is dealing with today. The Office of the Chief Architect's plan for the Superblocks, throughout the city, is aiming to address the pollution crisis in the very dense city center of Barcelona.

Source: Amos Chapple / Rex (2016)

To start our exploration of the three client questions, resiliency in Barcelona, and the studio purpose, it was important for us to understand the socio-economic, institutional and political, and environmental context within the city.

SOCIO-ECONOMIC CONTEXT

According to the latest available data from the National Institute of Statistics, Barcelona has a population of approximately 1.6 million people as of 2021. The city has seen steady population growth over the past few decades, with a significant increase in the number of immigrants from different parts of the world. Barcelona is a culturally diverse city, with a significant portion of the population consisting of immigrants and their descendants. According to the Barcelona City Council, around 17% of the city's population is made up of immigrants, with the largest groups coming from Pakistan, Morocco, Italy, and China.

Barcelona is a thriving business hub, with a strong economy that is primarily driven by the service sector. The city is home to many multinational companies and startups, and the tourism industry is also a significant contributor to the local economy. According to data from the Barcelona City Council, the city has over 155,000 registered companies, with a significant concentration of businesses in the fields of trade, hospitality, and construction.

Barcelona is one of the most economically active cities in Spain and Europe. Its location on the Mediterranean coast and its excellent transport infrastructure have helped it to become a hub for international trade and commerce. Barcelona is a popular tourist destination, attracting millions of visitors every year. Its rich history, cultural heritage, and Mediterranean climate make it an ideal place to visit for people from all over the world. According to the Barcelona City Council, the tourism sector accounts for around 14% of the city's GDP and employs around 100,000 people.

Barcelona also has a strong manufacturing industry, with a particular focus on textiles, chemicals, and pharmaceuticals. The city has a large number of industrial parks and factories, and its location on the Mediterranean coast makes it an important gateway for goods entering and leaving Europe. Barcelona has a growing technology industry, with a particular focus on startups and innovation. The city is home to a number of tech incubators and accelerators, as well as a growing number of technology companies. Barcelona has also hosted the Mobile World Congress, the world's largest mobile technology event, since 2006.

INSTITUTIONAL CONTEXT

The Institutional structure of Barcelona is very complex. Catalonia is a semi-autonomous state within Spain, meaning it controls much of their own administration but is still required to interact with and follow Spanish law and government. In 2017, there were efforts for Catalonia to gain independence from Spain, however, these efforts were not fruitful.

The Barcelona city government is made up of three bodies, the Mayor, the Municipal Council, and the Municipal Commission. Within these three institutions, there are many offices and groups, however the Mayor's office is responsible for urban planning. The Office of the Chief Architect is within the Second Deputy Mayor's Office of Ecology, Urban Planning, Infrastructures, and Mobility.

The city has a strong network of NGOs, universities, and community organizations that focus their efforts on urban development. To name a few, the UN-Habitat's Urban Resilience Hub, as well as the United Cities Local Governments are located in Barcelona.

ENVIRONMENTAL CONTEXT

Barcelona sits in a very unique landscape, with two sides of its border defined by rivers, one by a mountain range, and the other by the sea. Barcelona has a Mediterranean climate and suffers greatly from droughts, heat waves, and insufficient rain. However, the few times a year that it does rain in Barcelona, the city experiences intense flooding. Barcelona has a history of droughts without proper government intervention and adequate water systems, which led Spain's reservoir levels to shrink to 20.1 percent capacity in 2008. In the same year, Barcelona nearly ran out of water and had to import drinking water from France (Barcelona City Council, 2022).

Barcelona is currently facing a pollution crisis, which is only exacerbated by heat waves and insufficient green space. Vehicular emissions are a leading cause of pollution (Ajuntament de Barcelona, 2023).

Studio Sites

Nou Barris is the district of Barcelona at the northern end of the city, between the Sierra de Collserola and Avinguda Meridiana; it is a hilly district that borders Horta-Guinardó to the south and the Collserola mountain range to the west (Ajuntament de Barcelona, 2018). The streets are organic in nature, with curves and varying thicknesses. The district has more than 800 hectares and about 168,000 residents with various origins living there. Nou Barris has 174,012 of the population in 2021, and 20.3% of them are foreign population (Barcelona City Council, 2021). According to the Barcelona City Council's report on Nou Barris, from July 2022, in 2021 its population was 22% aged 65+, 22% (Informes Estadístics, 2022). While this percentage of elderly people may not seem out of the ordinary, it is important to note that the hilly terrain poses unique challenges for Nou Barris.

L'Eixample is the district of Barcelona where modern urban planning was created, as it was meticulously designed by an engineer and urban planner, Ildefons Cerdà (Ajuntament de Barcelona, 2018). L'Eixample was constructed immediately after the medieval walls were torn down, which is why it is commonly known as "the expansion". It has a uniform grid system of streets, with each block shaped like a hexagon. This unique structure of blocks creates more space for vehicles at the intersection, while making pedestrians walk a little longer on the diagonal corners. Each singular block has an interior courtyard, which was meant to counteract the density with more light, air, and green space readily available to residents. The superblocks are well-established here, with comprehensive social services. L'Eixample consists of 269,349 people, making it Barcelona's most populous district, and 25.3% of them are foreign population (Barcelona City Council, 2021). In 2022, L'Eixample had the same percentage of people aged 65+ as Nou Barris, 22% (Informes Estadístics, 2022).

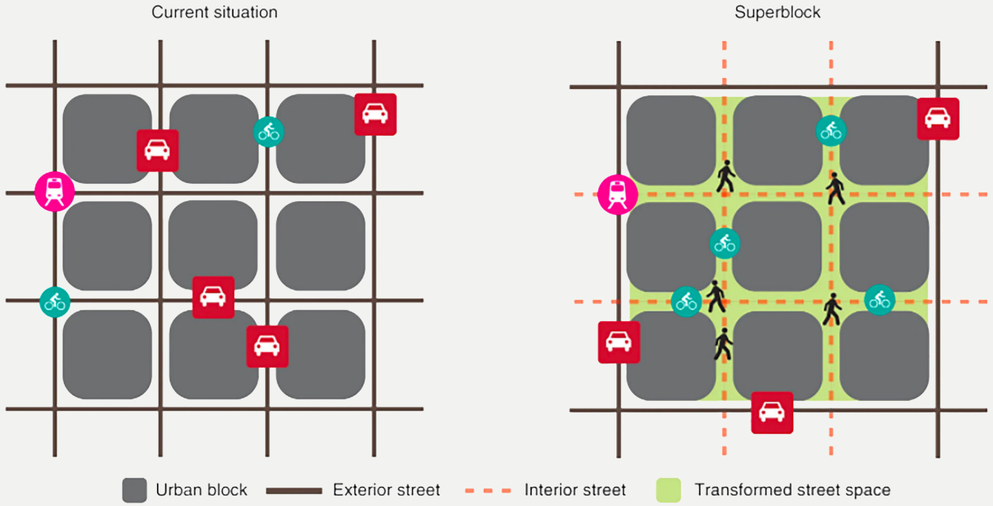
Map 1: Studio Sites

Source: Studio Team (2023)

Introduction to Superblocks

The Barcelona Superblocks project, also known as Superilles in Catalan, is an urban planning initiative aimed at creating car-free, pedestrian-friendly, and green spaces within the city by reconfiguring the existing street grid (Postaria, 2021). The concept was introduced in Barcelona in 2016 as a part of the city's efforts to improve urban sustainability, reduce pollution, increase public spaces, and promote sustainable mobility. The Superblocks are a relatively new urban planning initiative pioneered and initially designed by Architect and Planner Salvador Rudeda, Director of Barcelona's Urban Ecology Agency.

Figure 1: Previous Implementation



Source: Ajuntament de Barcelona

The Superblocks project originally involved grouping several existing city blocks (usually nine blocks) into a larger "Superblock" by closing some of the streets to motorized traffic and opening them up for pedestrians, cyclists, and green spaces. The primary idea was to create interconnected and accessible areas that prioritize active mobility, such as walking and cycling, and foster community interaction, social cohesion, and sustainability.

The first two sites of implementation were in San Antoni and Poblenou. San Antoni, a neighborhood in the L'Eixample district of Barcelona is known for its bustling market and commercial areas. Poblenou, and specifically the 22@ District which was the site of the first Superblocks implementation, is an urban renewal project site aimed at transforming the area into a hub for innovation and technology, already hosting companies such as Cisco, Yahoo, and Hewlett-Packard.

The Superblocks project in Barcelona is still in the process of early implementation and expansion, and the status of implementation varies across the different areas of the city. Some Superblocks have been fully implemented and are already in use, while others are in different stages of planning and development. As the project has continued on with the implementation, there the concept of the Superblocks has also evolved.

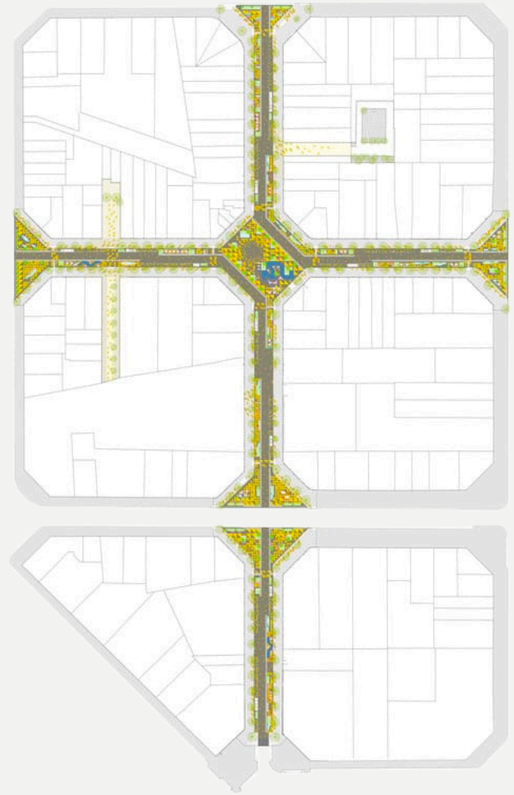
The current iteration of the Superblocks is not restricted to the creation and pacification of the 3x3 blocks. Instead, the Superblocks implementation vision prioritizes:

1. Pacification of streets from traffic flow (only residents and logistics allowed)
2. Greening of pacified streets (with temporary and permanent interventions)
3. Placemaking in pacified streets and connection points

Based on conversations with the Office of the Chief Architect, the studio learned that streets for conversion are chosen based on current flow of traffic (light vs heavy), possible connection points of green axes, available financial resources (easiest to convert). In non-grid neighborhoods, full neighborhoods will be considered "blocks" with outer arterial roads, inner neighborhood roads, and inner green axes.

The Superblocks project has faced both support and criticism from various stakeholders, including residents, businesses, and transportation advocates. Supporters highlight the potential benefits of improved public health, reduced pollution, increased green spaces, and enhanced quality of life. Critics raise concerns about potential disruptions to traffic flow, parking, and access to businesses, as well as issues related to displacement and gentrification.

Figure 2: Current Implementation



Source: Leku Studio (2019)

Studio Methodology

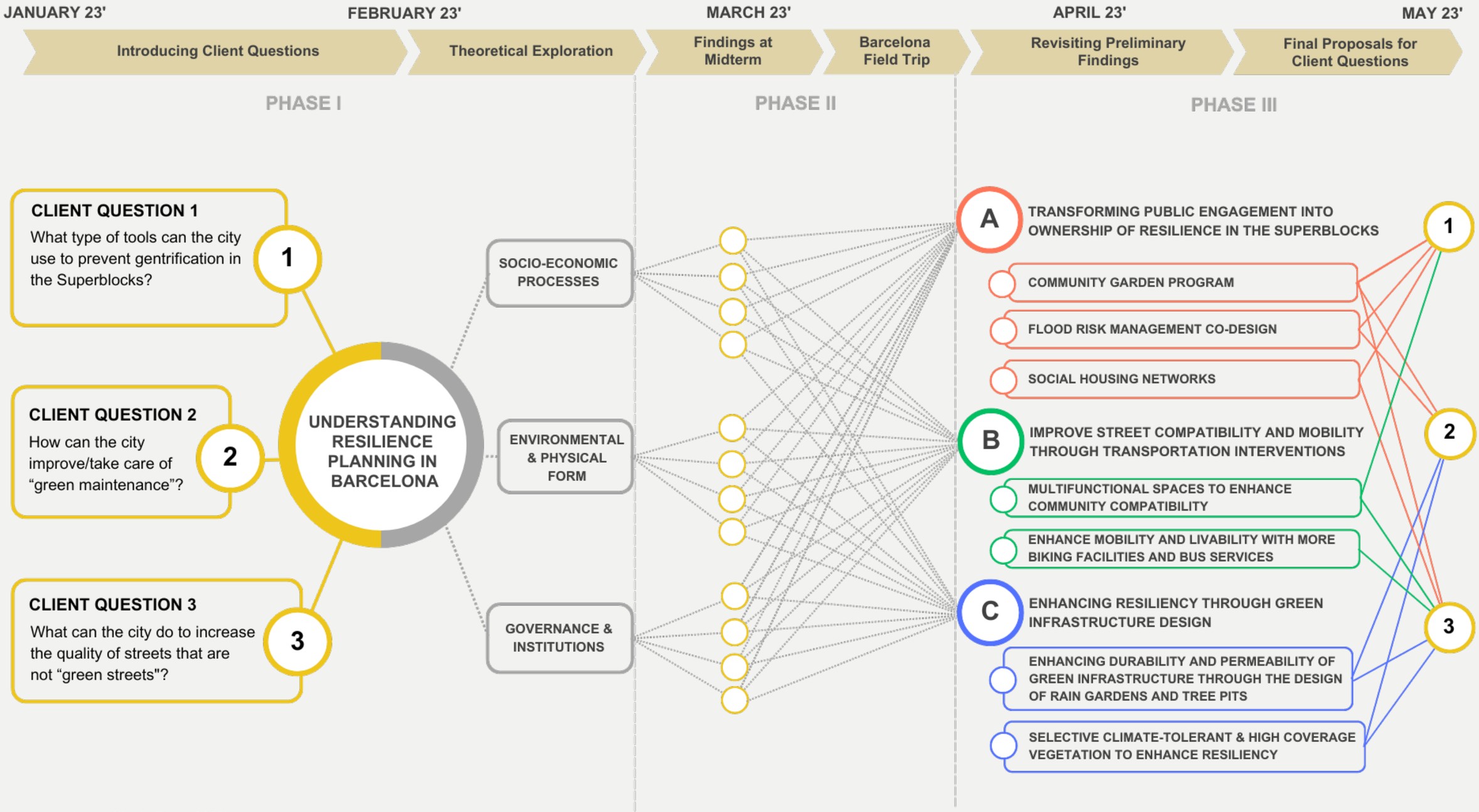


Diagram created by Studio Team (2023)


Source: Ajuntament de Barcelona

PHASE 1

The studio embarked on an exploratory journey of resilience planning in Barcelona Superblock, commencing with three fundamental questions posed by the client:

1. *What type of tools can the city use to prevent gentrification in Superblocks?*
2. *How can the city improve/take care of "green maintenance"?*
3. *What can the city do to increase the quality of streets that are not "green streets"?*

Subsequently, the studio adopted a holistic approach by investigating the concept of resilience and its applicability to the context of Barcelona. The studio divided the research into three primary domains: socio-economic processes, environmental and climatic trends, and governance and institutions. These groups collaboratively endeavored to comprehend the context of Barcelona, its historical background, and the Superblock plan. Furthermore, they sought to connect their understanding of resilience planning with the client's initial questions.

The New Urban Agenda characterizes a resilient city as one that possesses the ability to absorb, adapt, and recover from shocks and stresses that are likely to occur (UN-Habitat, 2018). Shocks refer to abrupt events such as infrastructure failures, earthquakes, and wildfires, while stresses denote chronic pressures that weaken a city's capacity for resilience, such as affordable housing crises and unemployment.

The concept of resilience encompasses absorptive, adaptive, and transformative capacities for cities. Enhancing these capacities can contribute to the realization of rights and wellbeing despite shocks, stresses, and uncertainty (Oxfam, 2018). In the context of resilience, adopting a systems-thinking perspective allows for viewing the city as a system, recognizing that environmental and climate trends, socio-economic processes, and political decisions and actions shape the evolution and interaction of various elements over time. Consequently, the team explored these three broad areas of inquiry to deepen their understanding of resilience in Barcelona.

From this perspective, the analysis of resilience within the Superblocks project is intertwined with the analysis of resilience in Barcelona as a whole. The Superblocks project influences the city's systems while being concurrently affected by the dynamic systems of the city.

PHASE 2

Following comprehensive research on the topics of Barcelona and the Superblock, the studio developed several proposals for the midterm review, seeking initial feedback from faculty members. The team then embarked on a week-long field trip to Barcelona, where they visited actual sites, interacted with clients, and engaged with local professors to gain a deeper understanding of the physical sites and contextual background. A crucial discovery was that the 3x3 Superblock plan is not rigid but rather a branded concept adaptable to various contexts, including areas without the Cerda plan. In this phase, the team acquired extensive on-site knowledge and understanding of the Barcelona Superblock, preparing them for the final proposal.

PHASE 3

After integrating the valuable insights from faculty members and on-site observations, the team's research on socio-economic processes, environmental and climate trends, and governance and institutions facilitated the identification of key challenges and opportunities. These findings pertain to the overarching theme of resilience and the implementation of the Superblocks.

The team revisited the studio's primary findings, interconnecting them with the initial proposals from the midterm review. We then addressed the client's questions using these integrated proposals. The first component focused on green maintenance through localized ownership, proposing a community garden program and youth engagement, which addressed the first and second client questions. The second component centered on socio-economic resilience through community-led regeneration, featuring three distinct proposals: local economic development (relevant to the first and third client questions), flood risk management co-design (pertinent to the first and second client questions), and a social housing network (applicable to the first and third client questions). The third component primarily aimed to enhance street compatibility and mobility through transportation interventions, presenting two proposals: multi-functional spaces to foster community compatibility (corresponding to the first and third client questions).

Challenges & Opportunities

GENTRIFICATION

1. Defining Gentrification
Gentrification is a powerful force for economic and social change in cities. However, it is also often accompanied by extreme and inequitable cultural displacement. While gentrification often follows an increase in value of property in areas that historically might have suffered from divestment, it also leads to rising rent and property tax prices, ultimately reducing the supply of affordable housing in the areas and displacing low-income and minority residents. Therefore, while gentrification is tied to economic activities in cities and neighborhoods, its effects and implications are also deeply rooted to the structure of local home ownership, and access to affordable housing in communities.

Gentrification is a comprehensive and controversial phenomenon that has been studied extensively in various fields, including sociology, urban studies, geography, and economics. The concept of Gentrification was proposed and introduced by Ruth Glass (1964) in the 1960s within her research about the housing situation of the working class in London. At that time, the urban gentry, a group of new immigrants with higher incomes, moved into specific neighborhoods, causing increased property prices and displacement. This process, she argued, was driven by a desire for urban amenities and a return to city living among the middle and upper classes.

In the decades that followed, gentrification became a more widespread phenomenon in cities worldwide, driven by various economic, social, and cultural factors. In the United States, for example, the decline of industrial and manufacturing jobs in the 1970s and 1980s led to the abandonment of many urban neighborhoods, which were subsequently targeted by developers and investors looking to take advantage of cheap property values (Smith, 1996). As a result, the process of gentrification became increasingly common in cities throughout the country.

Source: Studio Team, 2023

2. Gentrification Index
Measuring gentrification can be a complex task that involves identifying changes in population demographics, housing markets, and neighborhood amenities. Several different approaches to measuring gentrification have emerged in social science research, each with its own strengths and limitations.

One widely used method is the “relative deprivation” approach, which compares changes in neighborhood characteristics and housing prices to those in other areas of the city or region (Atkinson & Bridge, 2005). This method involves identifying changes in key indicators such as median household income, education levels, and housing values, and comparing them to changes in other areas over the same period. While this approach can provide a valuable snapshot of gentrification patterns over time, it may not capture the nuances of gentrification processes in specific neighborhoods.

Another approach is the “displacement” method, which focuses on the extent to which low-income residents are being pushed out of gentrifying neighborhoods due to rising rents and property values (Freeman, 2005). This method involves examining data on housing affordability in gentrifying areas and comparing it to other neighborhoods in the city. While this approach can represent the impact of gentrification, it may not

capture the changes occurring in gentrifying neighborhoods.

A third approach is the “cultural displacement” method, which focuses on changes in gentrifying neighborhoods’ cultural amenities and activities (Ley, 2003). This method involves examining changes in the availability of cultural institutions such as museums, theaters, and art galleries, as well as changes in the character of neighborhood businesses and public spaces. While this approach can help to identify the cultural effects of gentrification, it may not capture the broader social and economic changes occurring in gentrifying neighborhoods.

Overall, the measurement of gentrification is a complex task that requires careful consideration of various social, economic, and cultural indicators. Indeed, regarding the degree of gentrification of a small level of geographical reference, researchers have proposed a series of elements and models from census data to represent the degree and scale based on quantitative approaches (Barton, 2014). Usually, to measure this situation of potential inequality and displacement, the process of housing acquisition could be quantified with one model that consists of variables that reflect the demand side and the supply side. On the demand side, most studies simply choose one variable, for instance, the index of social-economic like SES or ISEI (Ley, 1986). However, conducting an analysis with more detailed and abundant data would also be feasible. On the supply side, a number of scholars choose the housing price within a specific period as the reflection of the changing housing market.

Regarding the methodology, a notable method is Primary Component Analysis (PCA), which is commonly used for exploratory analysis because of its ability to dimensional reduction, could be applied in this research and help with the process of finding a common tendency among abundant data. In urban studies, it is effective to make use of the PCA model to identify key variables that could represent the characteristics of all factors, especially for demographic factors which are usually manifold but also interrelated. With PCA, Xie and Meng (2023) effectively identified major components in each scheme and generated a Social Vulnerability Index (SVI) that insightfully reflects the potential effects that might be led by sea level rising in Tampa, Florida. Similarly, Satour et al. (2021) in Morocco and Abdrabo et al. (2023) in Egypt both made use of PCA to integrate a series of social-economical and urban data and construct an urban flood vulnerability index. In addition to urban environment-related issues, PCA is also applicable in settling problems about urban form and sprawl, (Dutta & Das, 2018), and economic development (Liu et al., 2021). In general, PCA method is a reliable approach to dealing with problems that need to integrate various potentially interrelated factors.
Within this research, considering the data availability and the necessity of research reliability, a number of variables that have been logically identified as factors related to gentrification will be combined and analyzed within the PCA model (Finio, 2021). In order to represent the potential change caused by the Superblock, data from two time periods (2015 and 2019) are selected and compared. *See Table 1.* All data are at the barrios (neighborhood) level and are collected from the Open Data BCN, an online dataset that provides abundant statistical data on Barcelona.

Value of 2019 will be subtracted by it of 2015, and the result will be analyzed in SPSS 22 (Statistical Product and Service Solutions 22). Variables that are identified as negatively related to gentrification, including the unemployment rate and pink card ownership, will be transformed into the opposite number before the analysis.

Table 1: Variables related to gentrification

Category	Factor	Variable
Demographic	Education	Rate of the educational level of “university or above “
	Income	Average disposable annual income per capita
	SEI	Average social-economic index
	Unemployment Rate	Rate of unemployment
	Anticipated Age	Average anticipated living age
Housing	Registered Housing Price	Average price of registered housing (€euro/m2)
	Second-hand Housing Price	Average price of second-hand housing (€euro/m2)
	Tourism Housing	Count of tourism housing
Miscellaneous	Pink Card Ownership[1]	Rate of pink card ownership
	Vehicle Parking	Count of vehicle parking
	Density of Culture Facility	Density of public culture facility (count/m2)

Result
The result of KMO and Barlett’s test proves that the result is reliable and significant. Usually, according to W Paul Vogt (2005, p. 167), 0.7 is considered a minimum for conducting factor analysis, and a result 0f 0.882 is received in this test. The significance of Barlett’s test of sphericity is 0.002, proving that the correlation matrix is not an identity matrix, meaning that the null hypothesis could be rejected, and this model is ideal for factor analysis.

The varimax rotation method with Kaiser normalization is selected for a comparatively “simple structure”. Usually, a structure with a readily explainable division of variables into

[1]Pink card is a transportation card assigned to registered Barcelona citizens with “disability equal to or greater than 33%” or over specific age for either free-riding or discount in public transit. (depends on the applicant’s actual situation) Grup TMB, n.d., https://www.tmb.cat/en/barcelona-fares-metro-bus/single-and-integrated/tarjeta-rosa

separate components, with a component loading onto at least three variables, is considered simple and idealized (Laerd Statistics, 2018). Consequently, four components, with a cumulative explanatory rate of 64.67%, are selected as the primary components of the variable composition related to the degree of gentrification. *See Figure 3 and Table 2.* Specifically, the factors of income, parking lot count, registered housing price, and unemployment rate are loaded on component 1. Second-hand housing price, SEI (Social-Economic Status Index), and culture facility density are loaded on component 2. Education level and tourism housing count are loaded on component 3. Moreover, estimated age and pink card ownership are loaded on component 4.

Based on this model, the index of gentrification can be generated. It could be visualized as the map as follows: *See Map 2.*

It is noticeable that the two research districts, Nou Barris and L'Eixample, demonstrate significantly different results in the degree of gentrification. Nou Barris is almost the area of the lowest value, while most Barrios in L'Eixample show high value in the index, and a number of them are even of the highest value among Barcelona.

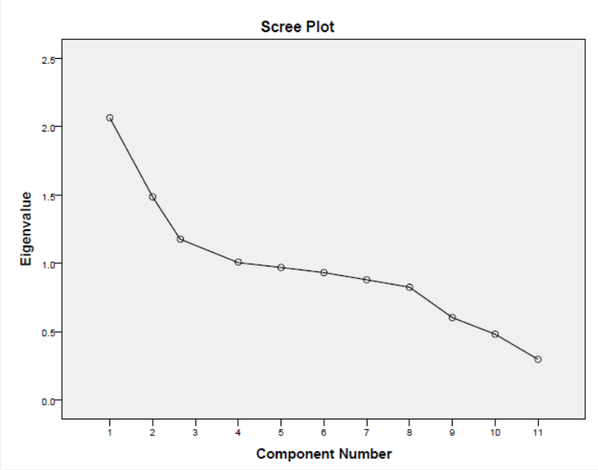
3. Housing in Barcelona

Institutional Structures

The national housing authority in Spain is incorporated in the Ministry of Transport, Mobility, and Urban Agenda. On April 4th, 2023, they increased the country's Affordable Rental Housing Plan by $260 million to become a total of $622 million. This plan works with local councils and autonomous regions to implement and acquire land for affordable housing.

However, the City Council of Barcelona has

Figure 3: Variables related to gentrification



Source: Studio Team (2023)

Table 2: Rotated Component Matrix

Rotated Component Matrix[a]

	Component			
	1	2	3	4
Income	.729			
Parking Lot	-.714			
Registered Housing	.614			
Unemployment	.414			
Secondary Housing		.803		
SEI		.771		
Culture Facility Density		.340		
Education			.852	
Tourism Housing			.737	
Estimated Age				-.755
Pink Card				.639

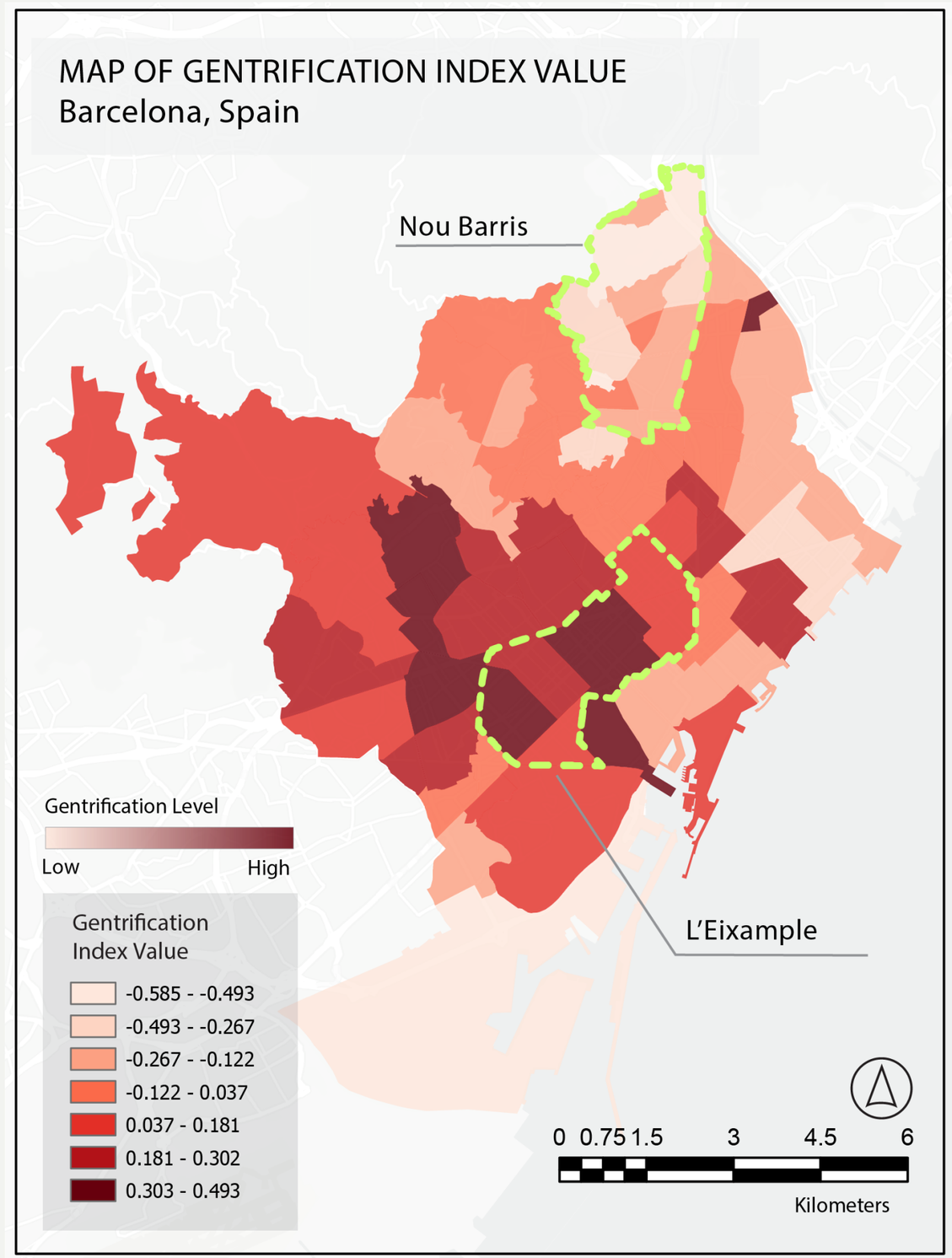
Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Source: Studio Team (2023)

Map 2: Gentrification Index Map



Source: Studio Team (2023)

its own housing plan, the Right to Housing Plan 2016-2025, which emphasizes public participation, creating more affordable units, and preventing housing emergencies.

Within the City Council of Barcelona, housing is regulated and protected by the Councilors Office of Housing and Renovations within the Fourth Deputy Mayor's Office of Social Rights, Global Justice, Feminism, and LGBTI Affairs. This office focuses on public housing, providing rent aid, and creating other forms of living, such as "co-housing" or cooperative housing. Separate from this office, within the City Council, there is the Municipal Institute of Housing and Renovation in the Municipal Council. This institute is responsible for constructing and acquiring privately owned buildings to create more public housing. The city also has the Barcelona Housing Consortium which is made up of the Barcelona City Council and the Catalonia Generalait, meaning there is shared responsibility with the Catalan Government for housing policy and restoration projects.

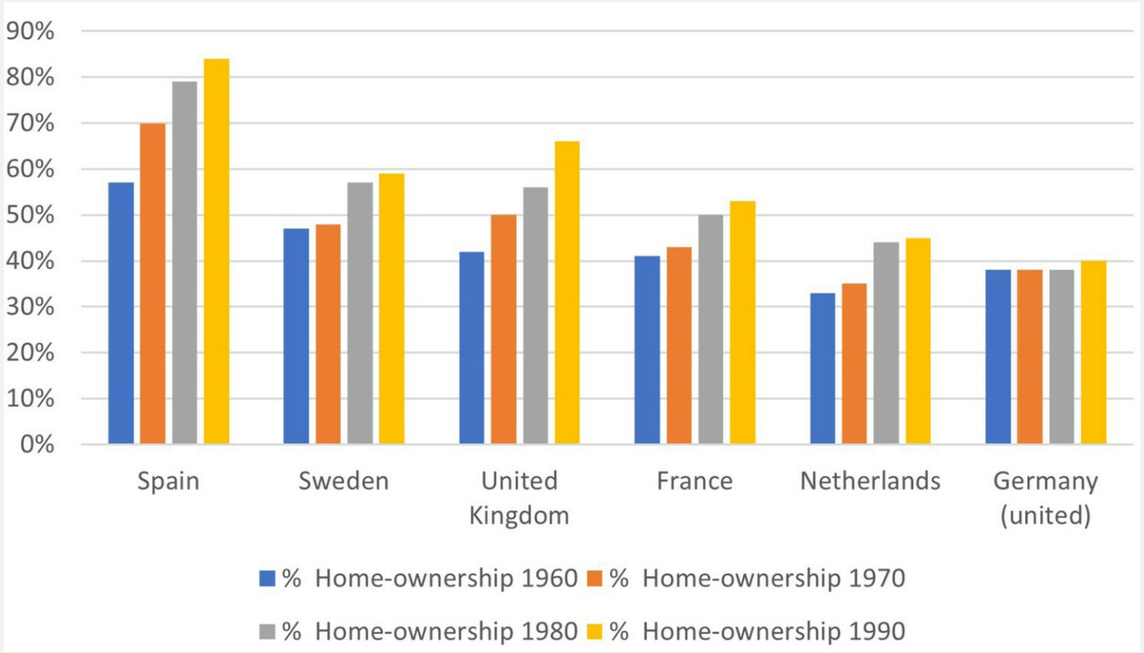
History of Housing

Our study of the history of homeownership in Spain revealed two significant historical contexts. Firstly, there was a rapid increase in homeownership in the 1950s, which distinguished Spain from other European countries. Scholars argue that this change was due to the interventionist policies of the first Franco regime. Specifically, the Protected Housing Law of 1939 played a crucial role in promoting homeownership as a means of framing and social pacification (Guardia et al., 2022). Secondly, the rise in homeownership in the 1950s was noteworthy as it primarily occurred among the working class. This is in contrast to other countries, where homeownership growth was mainly among the upper and middle classes. According to Guardia et al. (2022), between 1950 and 1975, "a new culture of ownership was imposed among the working classes who had been displaced to the suburbs. This situation would have a decisive impact on the housing issue in Spain."

Specifically in Barcelona, however, there was strong opposition to the housing-ownership movement of the Franco regime, as the city was also rooted in a separate context, was battling with a constant deterioration of living conditions and had an active informal housing market. This was followed by the tram strike of 1951, where a user boycott "became a real general strike at the hardest point of Franco's dictatorship," ultimately serving as a blow to the regime. Followed by a remodeling of the government and an entry of officials more favorable to economic liberalization, housing in Barcelona and in Spain broadly started to be considered as "the main national problem." This led to the institutionalization of II Plan de Vivienda (Second Housing Plan), where "the new Ley de renta limitada (Limited Income Law) offered exemptions, tax discounts, priority supply of materials, subsidies and credits. This completely redefined the regime of official protection for private promotion (Guardia et al., 2022).

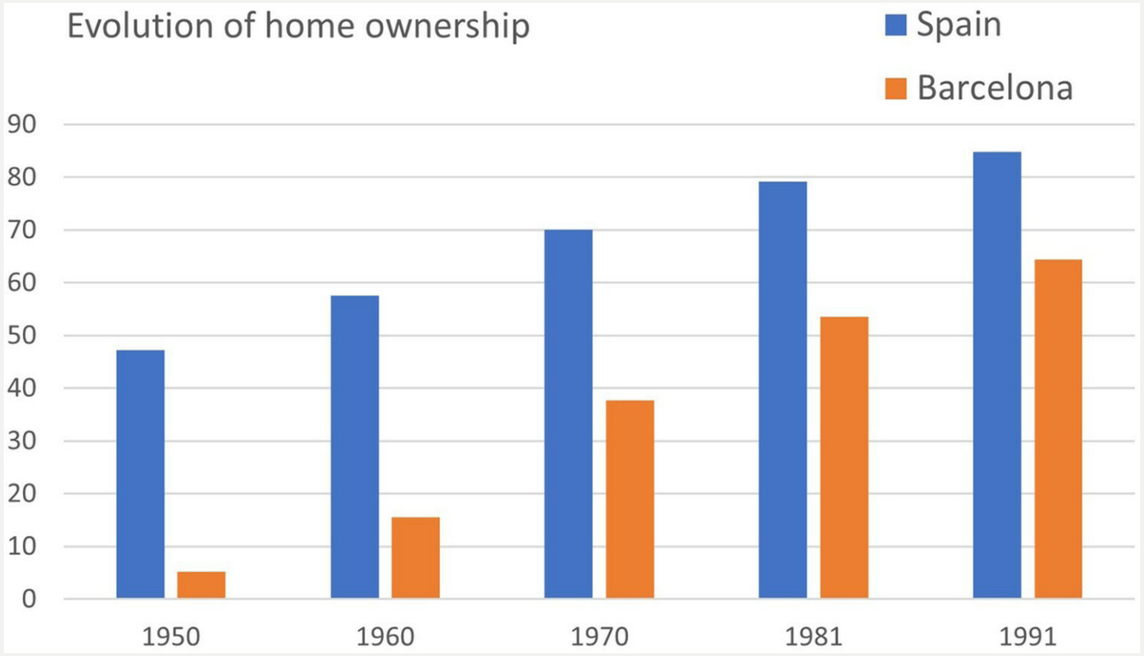
In the late 1900s, the price of housing in Europe skyrocketed, fueled primarily by expectations of sustained growth, the already shrinking rental market, and an expansion in the granting of mortgages through a series of neoliberal economic policies that deregulated credit. In Spain, the crisis was worsened due to "In Spain, the crisis was worsened by the consolidation of poor management of housing policies inherited from previous periods, such as the tax advantages offered for the purchase of homes or the definition of mechanisms to build mostly protected housing under a purchase-sale regime, without planning the production of a significant stock of social rental housing" (Guardia et al., 2022).

Figure 4: Percent Homeownership



Source: Guardia et al. (2022)

Figure 5: Evolution of home ownership



Source: Guardia et al. (2022)

Lacking the containment of social housing stock, with the privatization of many public housing institutions during this era, real estate speculation continued to grow in Barcelona disproportionately, ultimately bursting in the housing market crash in 2008. This incident, coupled with the large amounts of indebtedness of many of the families in an unstable economy in Barcelona, prompted a housing crisis that the city still suffers from. In fact, the current mayor of Barcelona was elected primarily based on her campaign for the Platform for People Affected by Mortgages (Plataforma de Afectados por la Hipoteca, PAH), which featured a strong role of housing stock rehabilitation policies, increasingly focused on the most vulnerable settlements in the city.

During Franco's regime in Spain, public housing projects were undertaken in Barcelona as a way to provide affordable housing for the working class. These projects were part of a broader national effort to modernize the country and bring economic development to underdeveloped areas. The goal was to provide basic housing for workers and their families in urban areas, where housing was scarce and expensive (Covifer, n.d.). One of the most significant public housing projects in Barcelona during this time was the "Ciutat Meridiana" project. This project was located on the outskirts of the city, in a hilly and undeveloped area. It was designed to house approximately 60,000 people and included the construction of more than 10,000 apartments in 25-story buildings (Garcia Lamarca & Sole-Olle, 2017). The project was intended to provide modern and affordable housing for workers and their families who could not afford to live in the city center.

The funding mechanism involved offering low-interest mortgages to encourage families to purchase homes in newly constructed public housing developments. The government provided subsidies to housing developers to reduce the cost of construction, which allowed for the sale of apartments at lower prices than in the private market. The mortgages were also subsidized by the government, and the interest rates were significantly lower than those offered by commercial banks. This mechanism was intended to increase homeownership and provide affordable housing for working-class families. The public housing developments were often located on the outskirts of cities, where land was cheaper and more readily available for large-scale construction projects. However, the developments were criticized for their poor quality construction, lack of amenities, and isolation from city centers, which made them less desirable places to live.

Despite these criticisms, the public housing program had a significant impact on homeownership rates in Spain. Between 1950 and 1975, the number of homeowners in Spain increased from 20% to 65%, and public housing accounted for a significant portion of this growth. The program was also credited with reducing the housing shortage that existed in Spain after the Spanish Civil War (Covifer, n.d.). However, the public housing program was not without its problems. Many of the public housing developments became overcrowded and suffered from poor maintenance, leading to a decline in their quality of life for residents. Additionally, the program was criticized for perpetuating the social and economic segregation of working-class families, who were often concentrated in the same developments.

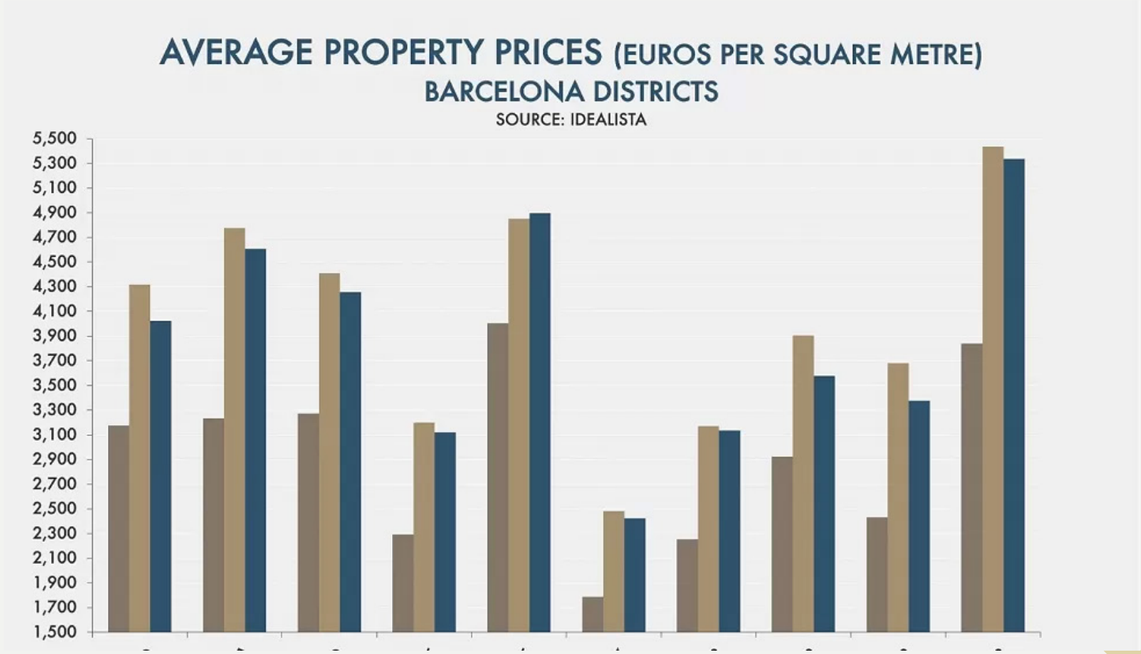
Given the low interest and mortgage rates, however, Franco's plans to increase home-ownership in Barcelona was certainly successful. Currently, 98% of housing in Barcelona is privately owned, which is a significant result of the affordable housing mechanisms used during Franco's regime (Schweid, 2022). This has now posed many challenges for the city, however, as housing rates and rent prices are controlled by the private market, and ultimately beyond the control of the public agencies.

Current Status of Homeownership in Barcelona

In December 2021, Barcelona emerged as the top destination for real estate investment in Spain, with about €3 billion in new investments in real estate in the city (Schweid, 2022). This was the first time that the Capital beat Madrid since 2013. Within the first six months of 2022, Barcelona received a record number of "€2 billion in property investments – a 23% increase on the first half of 2021, and higher than even the property bubble in 2007" (Schweid, 2022). The majority of this investment (96%), however, was dedicated to the 22@ tech hub in Poblenou, where companies like Meta, Amazon, Microsoft, Orange, HP, and more have set up their European hubs. The growing real estate investments and a return of travel to the city after COVID-19 have also seen rental prices break records in Barcelona.

Barcelona is also on its way to hosting the next America's Cup in 2024, becoming the first venue to stage both an Olympics (1992) and an America's Cup, contributing to the rising speculation in Barcelona's property rates. The city recorded one of its highest average property prices in the month of June 2007 before the onset of the financial crisis. The property prices then experienced a dramatic surge from 2014-2018, hitting its highest ever average housing prices in September 2018 (Schweid, 2022). *Figure 6*

Figure 6: Average Property Prices



Source: Schweid (2022)

highlights the average property price increase per neighborhood in Barcelona, with Citut Vella, L'Eixample, Garcia, and Sant Marti having the most dramatic increases between 2014 and 2022.

Mass privatization: Franco's regime of home ownership and public housing incentives, where the residents owned the homes once the subsidized mortgages were paid off. This has now led to Barcelona having 98% of privatized housing. Additionally, there was a heavy push to make Barcelona a tourism-attracting city, focused on incentivization of tourism businesses and urban renewal. This led to an increase in housing prices (Oakley & Ukpabi, 2015).

Barcelona has been attracting international investment and tourism, which has contributed to the process of gentrification in specific neighborhoods. The increase in demand for housing, coupled with rising property prices, has resulted in displacement and changes in the socio-economic dynamics of some areas in the city. Gentrification has been most prominent in neighborhoods such as El Raval, Poble Sec, Sant Antoni, Gracia, and Poblenou, among others. Factors driving gentrification in Barcelona include urban renewal projects, real estate speculation, tourism, and the growth of the creative economy.

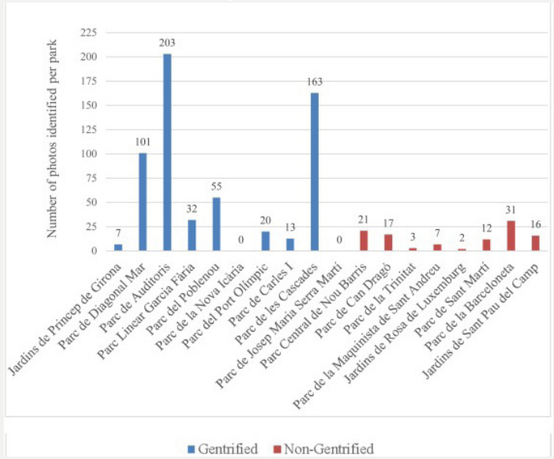
4. Green Gentrification

In densely populated urban areas, new green and blue infrastructure and investments can increase instances of livability, health, and resilience for local residents. These investments, however, can also trigger instances of property rate increases along with increases in rental prices, ultimately causing gentrification and displacement of local low-income and minority residents. With an increase and urgency for climate and resilience infrastructures and investments in cities now more than ever, therefore, "ecological gentrification" is an essential consideration in relation to socio-economic resilience, as unequal tangible and intangible "benefits obtainable from urban green spaces can be potential core drivers of social injustice in cities" (Maia et al., 2020).

A study conducted by Anguelovski et al. (2018), which assesses through a spatial and quantitative analysis of the green gentrification of 18 new parks built in Barcelona, Spain, over a 15-year period, examines the distributional outcomes of the city's greening strategies during the 1990s and early 2000s. These greening strategies primarily targeted under-served neighborhoods, and the results of the study had clear indications of green gentrification trends in several areas of Barcelona, primarily "revealing a circumstance where the impacts of creating parks in socially vulnerable and green space--under-served neighborhoods were not monolithic or uniform. Rather, they were assumed to depend on the context of creation (i.e. part of a broader neighborhood redevelopment effort), setting in the city (i.e., in closer proximity to the sea), and overall built environment (i.e., in areas with industrial or early 1900s older building stock). Nine parks were found to be associated with green gentrification and nine were not. (Maia et al., 2020). Additionally, further studies looked at green gentrification patterns in specific neighborhoods of Barcelona, revealing results highlighted in *Figure 7*.

In the study, it was found that community-focused features, such as communal spaces for recreation and social integration, "did not seem to engender as much social change as did aesthetic or artistic features" such as art installations and modern architecture, which had more noticeable impacts associated with gentrified parks. This relates to Mathews'

Figure 7: Green Gentrification in Barcelona Neighborhoods



Source: Maia et. al (2020)

(2010) description of green gentrification, which was described as the installation of artistic features carried out purposefully by city planners and private investors with the intention of catalyzing investments in declining, under-served and underdeveloped areas, ultimately contributing to economic growth and gentrification. "It also resonates with previous studies of Barcelona, indicating the role played by architecture and design in neighborhood upscaling and gentrification processes" (Maia et al., 2020).

The authors (Maia et al., 2020) of the study conclude that park and green infrastructure features play a significant role in determining whether green gentrification is a risk for specific communities following green infrastructure investments, especially in areas with historically under-served communities. Parks built in socially disadvantaged neighborhoods, the authors state, "which offered opportunities for socialization and recreation (i.e., sports facilities and urban gardens) seem to be less associated with green gentrification processes. Conversely, parks built in redeveloped industrial areas with an offer of landscaping, artistic and architectural features within or outside the park seem to be more associated with green gentrification" (Maia et al., 2020). This has clear policy implications for Barcelona on the necessity to look beyond the "greenness" of green infrastructure investments, and to consider the local context unique needs, uses and identities. "In order to minimize the effects of green gentrification and maximize the benefits of greening, urban green infrastructures should include places that, apart from being aesthetically pleasing, offer opportunities for social cohesion, place-making, and socialization, such as sports facilities, resting areas, and urban gardens. Such features have already been recognized as valuable and intensively used by residents of working-class neighborhoods such as the Parc de Nou Barris in Barcelona (del Pulgar et al., 2020)" (Maia et al., 2020).

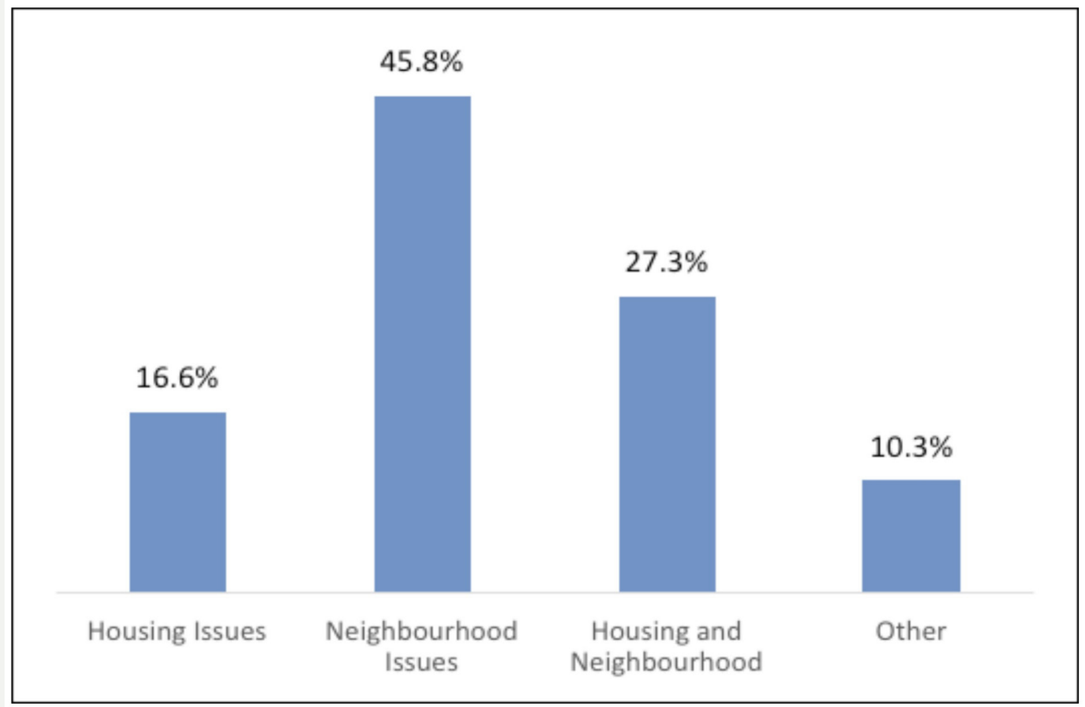
Commercial Gentrification & Tourism

Commercial and tourism gentrification can be defined as "a process of socio-spatial change in which neighborhoods are transformed according to the needs of affluent consumers, residents, and visitors alike" (Cocola-Gant, 2015). Residential displacement driven by tourism gentrification has been tied to the concern with quality of life and the provision of consumption facilities. In the processes of tourism gentrification, the transformation of neighborhood life tends to be commercial in nature, which entails not only the upgrading of commercial services but also the use of both private and public areas of the neighborhood as venues for consumption, including nightlife (Genç et al., 2022).

The survey on Barcelona's local resident's experience on housing displacement reported that 45% of the respondents blamed the neighborhood conditions as the leading cause of displacement. 27.3% reported housing and neighborhood issues, and 16.6% moved due to direct housing issues such as high rent prices. The research survey

shows that ‘direct displacement’ or the moment of the out-migration does not only depend on the housing market. There are changes and new conditions that affect the life of the entire neighborhood that is central to understanding why residents are moving out.

Figure 8: Reasons for Barcelona Residents Moving Out



Source: Cocola-Gant (2015)

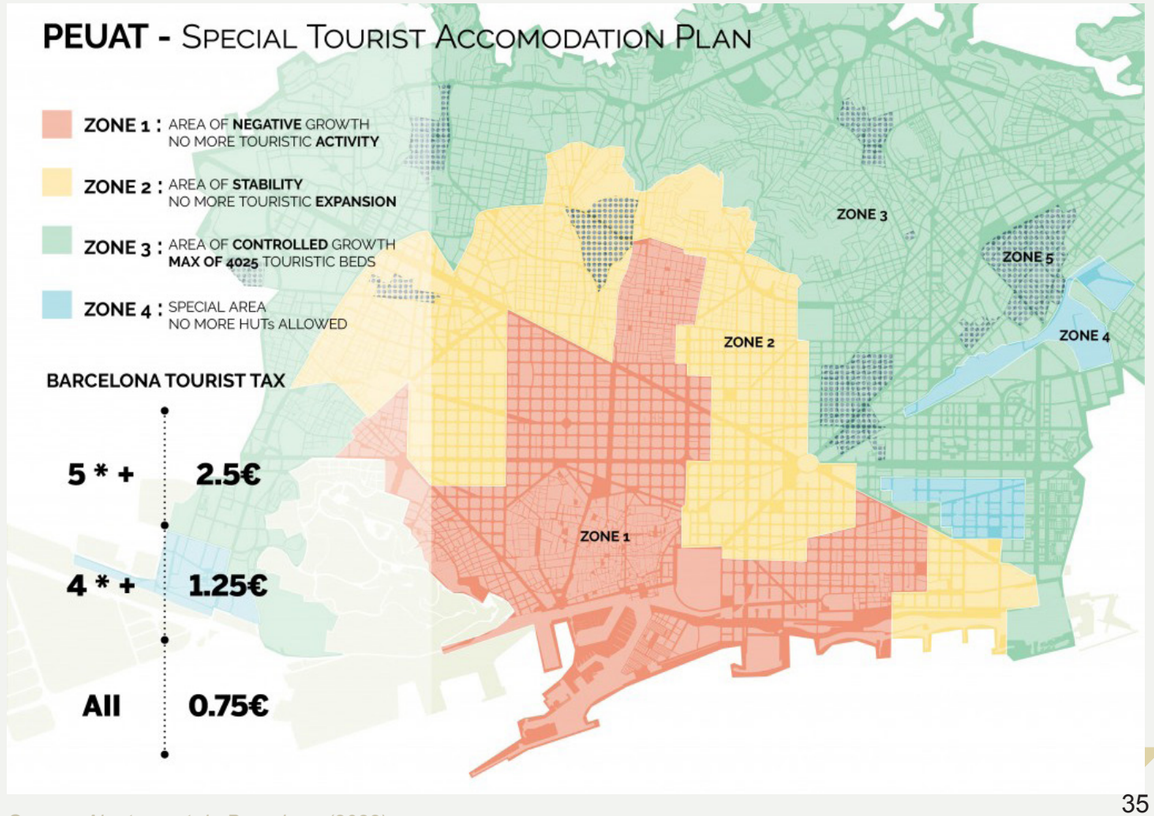
Residents also reported reasons for not continuing their lease and leaving the neighborhood are due to several other reasons:

- Reduction in local consumption facilities (such as pharmacies, and grocery stores) which were replaced by expensive restaurants, bars, and other tourist attractions. This causes locals to commute further to access local goods and services.
- The economic and affordability problems (such as increasing rent and price of goods). The increase in prices of consumption goods and increase in rents due to tourist rentals within the scope of the cost of living should be assessed. Sans & Domínguez (2016), found that the Barcelona neighborhoods with the most significant local population loss also had the greatest concentrations of Airbnb apartments.
- The shift in culture and lifestyle of the neighborhood, such as nightlife and chain restaurants which replace working-class corner cafes and food shops. The statements of many of those who take an opposing attitude towards tourism show that they are not satisfied with the changes that take place in the consumption areas where they live their daily lives.
- Public spaces are increasingly privatized, such as restaurants with outdoor seating. The lack of free communal spaces is considered an essential mechanism of exclusion as it provides a free meeting place for the community. The increasing number of visitors is also correlated with the need for more physical space due to the blockage of streets due to visitors.
- Acoustic pollution, hygiene, and air pollution. This poses a social equity barrier to adaptation as wealthier residents can afford double-glazed windows and air conditioning; however, lower-income residents are continuously exposed and forced to endure noise and smells from trash and kitchen streams.

These elements cause a snowball effect. The displacement of residents is brought on by the lack of necessary retail and facilities and the influx of new uses and users. Retailers are also under pressure because they do not have customers due to the lack of residents or neighborhood life.

In order to ease the pressure of tourism and guarantee the right to housing, the city of Barcelona has implemented the Barcelona Special Tourism Accommodation Plan (PEUAT) in 2022 to regulate the introduction of tourist-accommodation establishments. This regulation was enacted in response to the need to reconcile the city’s tourist accommodations with a sustainable urban model based on ensuring local residents’ fundamental rights and improving their quality of life (OTB, 2021a). The PEUAT distinguishes four distinct zones, each with its own regulations. Each zone is defined by the

Figure 9: Barcelona Special Tourism Accommodation Plan Zonings



Source: Ajuntament de Barcelona (2022)

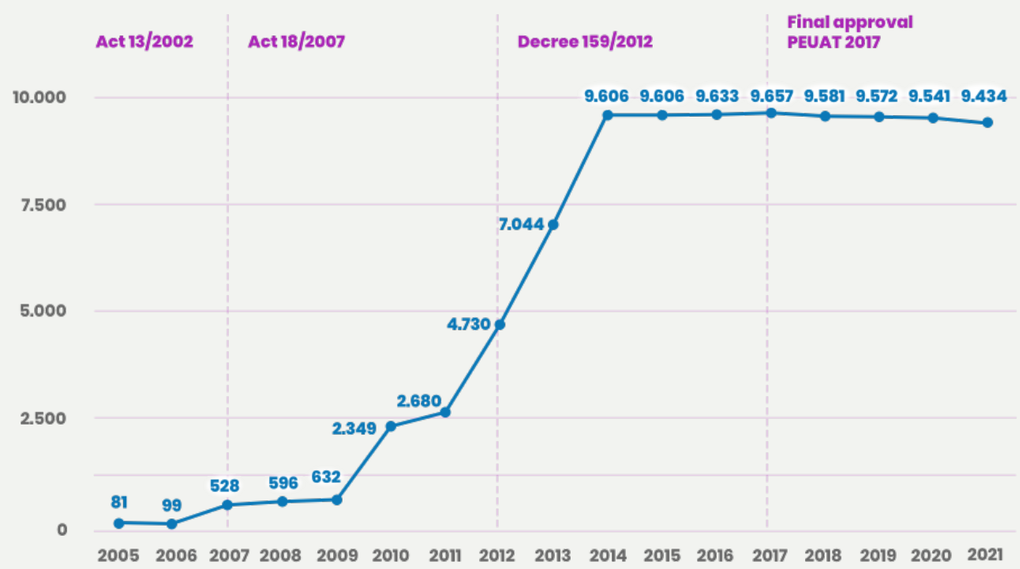
distribution of tourist accommodation on its territory, the proportion of tourist destinations to the population currently residing there, the extent and conditions of specific uses, the effects of these activities on public spaces, the presence of tourist attractions, and the morphological characteristics of the area's urban fabric (OTB, 2021a).

Zone 1: Negative-growth area. No new tourist accommodation is permitted.
Zone 2: Number of accommodations maintained, expansion of establishments allowed.
Zone 3: New establishments and expansion of existing establishments allowed.
Zone 4: Specifically Regulated Areas, New HUTs are not permitted.

The PEUAT establishes zero growth for HUTs (Apartments for tourist use) throughout the city. When a HUT ceases its activity in a saturated area, a new license can be issued, or the redistribution of the contained-growth area can occur. The impacts of PEAUT can be observed in the number of HUTs since the beginning of the policy trial.

Based on the current findings, suggestions for decision-makers in order to prevent the negativities related to tourism gentrification are as follows. Firstly, tourism-oriented restaurants and bars, among others. Workplace opening conditions should be regulated. In order to prevent such businesses from concentrating on specific areas, investment incentives should be offered to open up in different areas. In addition, the existence of traditional service businesses should be protected as an attraction for both local residents and tourists. The rise of real estate purchase and rental prices should be monitored and regulated. Lastly, efforts should be made to solve urban

Figure 10: Number of HUTs in Barcelona (2005 - 2021)



Source: CEAT and the Barcelona Tourism Observatory, Barcelona City Council (2021)

problems such as traffic infrastructure which are multiplied by tourism. The city should promote micro-mobility modes and provide accessible infrastructures and services.

5. Opportunities in Gentrification

Opportunities for Civic Participation and Localized Ownership

Studies have found that localized ownership and increasing civic capacities can work together to reduce the impact of gentrification to communities (Newman & Wyly, 2006; Romero & Jaramillo, 2022). Localized ownership can reduce gentrification by promoting economic development within a community and strengthening local businesses. When a significant portion of businesses and properties are owned by local residents, businesses and property values are less vulnerable to speculative investment, which can drive up property prices and lead to displacement (Brown, 2014). In addition, when the local community owns and operates businesses, it can also help create jobs that support the local economy and keep money circulating within the neighborhood. This can lead to greater economic stability and reduced reliance on outside investors.

Furthermore, localized ownership can promote community participation in the decision-making process regarding development projects, allowing community members to have greater control over the change happening in their neighborhood (Way & Martin, 2019). This can lead to a more equitable distribution of resources and help ensure that residents are not unfairly displaced or priced out of their homes. Therefore, the superblocks project may be able to prevent gentrification if local ownership and social cohesion within the community becomes heightened. Through this opportunity, the superblocks may integrate strategies and systems for enabling localized ownership to reduce the impact of gentrification which can further promote economic stability, create jobs, and foster community participation in the decision-making process. By working together, communities can build more equitable and sustainable neighborhoods that prioritize the needs and interests of all residents.

Opportunities for Housing

Following the continued extravagant increase in rent prices, lack of access to affordable housing, the financial market collapse, and harsh mortgage and foreclosure policies in Spain, in 2009, a small group of individuals formed the Platform for People Affected by Mortgages (PAH) (Lawton, 2015). Additionally, "unlike other cities with large non-profit housing sectors that supply affordable housing, for example, Zurich or Vienna, in Barcelona, 98% of housing is provided by the private sector" (Avilla-Royo et al., 2021). This instance further exacerbated equitable and affordable access to housing for residents of Barcelona, already competing with the use of housing for the popular and ever-growing tourism sector.

The PAH describes itself as a non-partisan citizen movement with 190 groups across the country to "help residents organize and collectively affect changes in the housing mortgage industry" (Lawton, 2015). Specifically, the PAH has been working to combat housing foreclosures, lobby legislators, and apply pressure on financial lending institutions. This citizen-led movement has kick-started a bottom-up strategy in Barcelona, now growing in popularity, of collective action and ownership of property assets and housing (Lawton, 2015).

While local activist groups such as the PAH tackled immediate housing problems, housing cooperatives also emerged around

that time, seeking “a more radical answer to the housing crisis by developing alternative non-commodifiable housing models distinct from existing private and public-sector ones” (Avilla-Royo et al., 2021). Housing cooperatives in Barcelona encompass community-led design, collective ownership, and management, as well as communal forms of living. The cooperatives are both defined by shared physical space, legal structures, economic responsibilities, as well as collective identity and values and mutual care, with the ultimate goal of realizing social, financial, and physical equity as autonomous organizations and communities (Avilla-Royo et al., 2021).

Housing cooperatives play a significant role in Barcelona’s housing landscape as a form of affordable, community-led housing. These cooperatives are driven by the principles of self-management, participatory decision-making, and social cohesion, and they provide an alternative model of housing provision that prioritizes the needs and interests of residents.

Examples of housing cooperatives in Barcelona include Sostre Civic, an umbrella organization with 900 members developing multiple projects, and La Borda, a smaller cooperative owning a single building. These cooperatives are directly managed by their members through regular assemblies and governing councils, with differences in governance and decision-making processes based on size. Larger cooperatives may have professionalized technical departments, while smaller ones often rely on voluntary organization and external interdisciplinary support.

Housing cooperatives in Spain are classified as “protected housing,” which imposes budget constraints, limits on dwelling floor areas, and eligibility criteria based on income and housing needs. However, cooperative housing allows for a higher degree of experimentation in form and materialization compared to public or private sector housing, as it is self-managed. This gives dwellers direct control and decision-making powers throughout all project phases and creates a horizontal relationship with technical consultants. Cooperative housing projects also prioritize social gathering and communal spaces, promoting shared activities and communal life as part of their ethos. While some of the projects analyzed in the article, including La Borda, are recognized as essential prototypes, they often result from the competition and have varying levels of project resolution and engagement with future dwellers. Despite contravening existing regulations, these projects were still awarded housing development sites, indicating the willingness of the administration to review regulations and redefine housing through transformative design projects.

La Borda, a Housing Cooperative in Barcelona

Source: Arquitecturaviva (2023)

QUALITY OF NON-GREEN STREETS

“Non-Green” streets are streets in Superblocks plans that still accommodate private car traffic after Superblocks reconfiguration. The majority of “Non-Green” streets are streets that are on the edges of 3x3 superblock grids. Transportation designs, urban design interventions, and institutional reforms are important in improving the quality of “Non-Green” streets. The Superblock idea periodically surfaced in Barcelona city planning, but it wasn’t until recently that it became a project for urban architecture. Le Corbusier and Josep Llus Sert designed the 400x400m modules for Barcelona’s Plan Macià in 1932. In order to apply modern transportation concepts, architect Oriol Bohigas proposed linking nine blocks in the urban fabric of L’Eixample in 1958. The Barcelona Agency of Urban Ecology then carried out the Ecosystem Urbanism paradigm and produced the Superblocks (Postaria, 2021).

1. Reflections from Field Trip

During the field trip, the urban design group defined a lot of issues that needs to be addressed by planners on different scales on streets.

In L’Eixample, the team observed that many streets lacked permanent structures, and the current designs on street scale are built discontinuously in different styles. The team believed that L’Eixample is more walkable since the well-established superblocks have already pushed a lot of private cars out of the districts.

Also, the district of Nou Barris has different design ideas compared to L’ Eixample due to the demographic and typological difference. Through walking in Nou Barris, the research group felt that streets are much more narrow than L’Eixample, and they are deficient in both curb parking and permanent parking spaces.
After the field trip, we came to consensus that

Observations from Site Visit

Source: Studio Team (2023)

the definition of green streets and non streets should be revised; the green corridors on a lot of streets should also be re-established. Moreover, we realized that widespread illegal parkings will cause a series of problems such as traffic congestion or accidents; thus, we decided to propose to build more bike parkings and motor vehicles parkings along the streets in both L’Eixample and Nou Barris.

2. Challenges

2.1 Transportation and Mobility

The design of Non-Green streets between superblocks is a great concept, but it brings a lot of inconvenience to people’s mobility. . Barcelona has poor connections for inter-superblocks transition. According to a technical coordinator at the Urban Ecology Agency of Barcelona, the problem is that “the public transportation connection from the rest of the metropolitan areas is poorly connected”. (Roberts, 2019)

The team summarized several problems we found on transportation and mobility. The first, heavier traffic flows on “non-green” streets may further cause a decrease in traffic speed. Furthermore, street intersections along the “non-green” streets will become hotspots for congestion and traffic accidents. Essential services and local logistic networks will rely heavily on “non-green” streets and infrastructure, and it will cause walking distances to public transportation stops.

With several characteristics on the Model De Superilles’ picture, the special design with non-green streets interweaved with superblocks cause the four problems listed above. The square-shaped blocks increase the number of crossroads, which raises the difficulties of street designs to avoid traffic accidents and lowers down the compatibility for human interactions to traffic. Also, since the superblocks are pushing cars away and encouraging their citizens to walk, there is a severe increment in walking distance especially for tourists. The poor connections for inter-superblocks transition make the walking distance more inappropriate for pedestrians, and the walking distance to public transit also becomes longer than expected.

Furthermore, the superblocks design caused a various number of difficulties to regulate the transportation in Barcelona. Currently, the metropolitan area is short of rapid road coverage and is in lack of high-capacity rapid road systems across the city center (Tomtom,

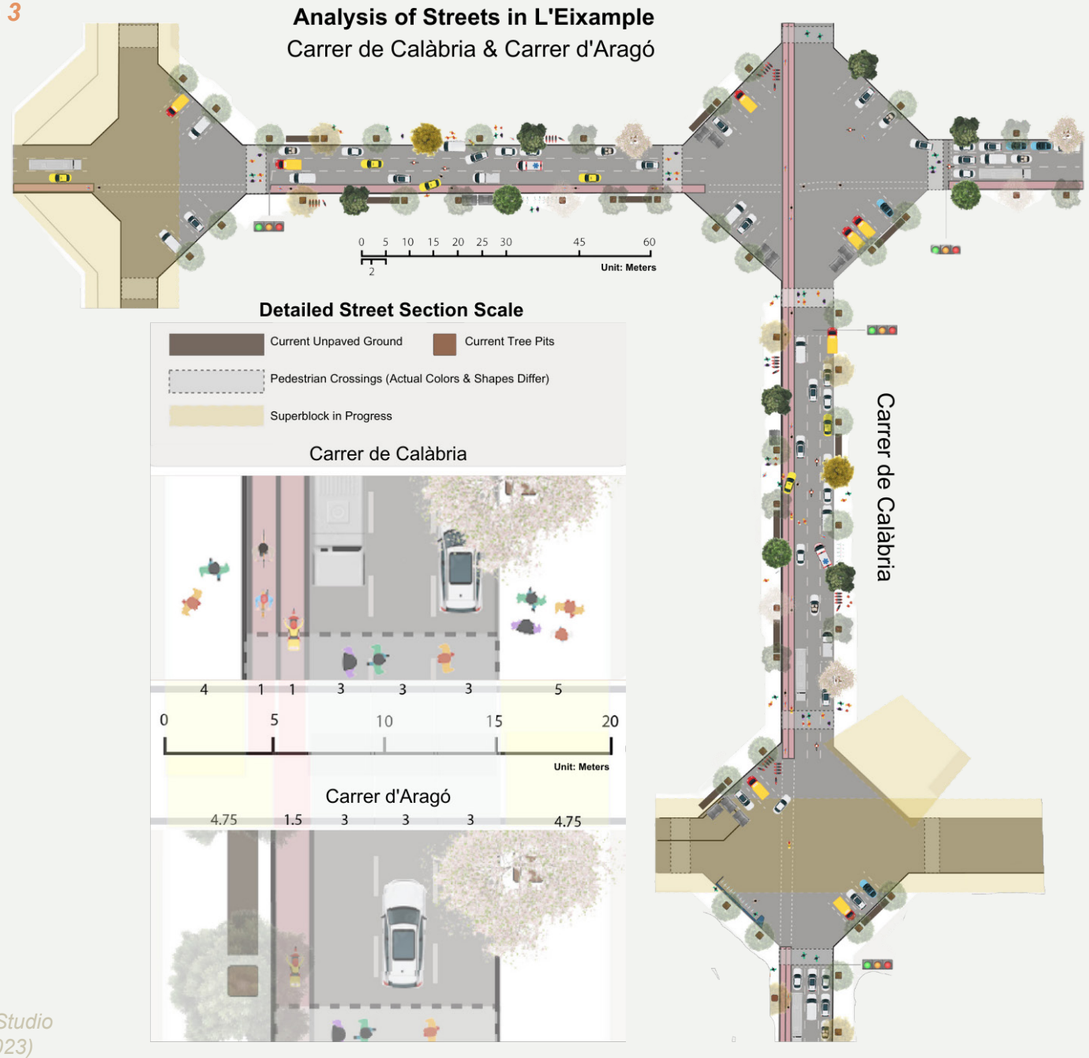
Source: Studio Team (2023)

2023; Barcelona Fields Study Center, n.d.). The increase of private car commute after the COVID-19, in addition to increase in traffic flows near the edge of superblock streets after the street reconfiguration, will further increase the stress of the current road network, leading to more congestion and more severe air pollution.

2.2. Street Issues in L'Eixample

Carrer de Calabria and Carrer d'Arago lack parking spaces and designated space for logistics/ emergency services cars. Also, at the intersection of the two streets, there are chaotic road networks in crossing driving lanes or biking lanes. The original designs of unplanned drive lanes caused a lot of automobiles to cross the bike lanes, causing safety problems to both bikers and drivers. Also, the intersection lacks a clear intersection lane for turns, causing low efficiency in traffic and congestion problems. In bike transportation, the two streets are lacking bike parking occupations and safe bike lanes for bikers. The street of Arago has only a single direction bike lane, bringing a lot of inconvenience; there is also no permanent protection for bike lanes. On street designs, the two streets originally only have under-decorated grassland or tree pits that cannot solve the impermeable problems. Trees that the city had previously planted are not ever-greens, so the winter season may cause the city to have fewer greenery.

Map 3

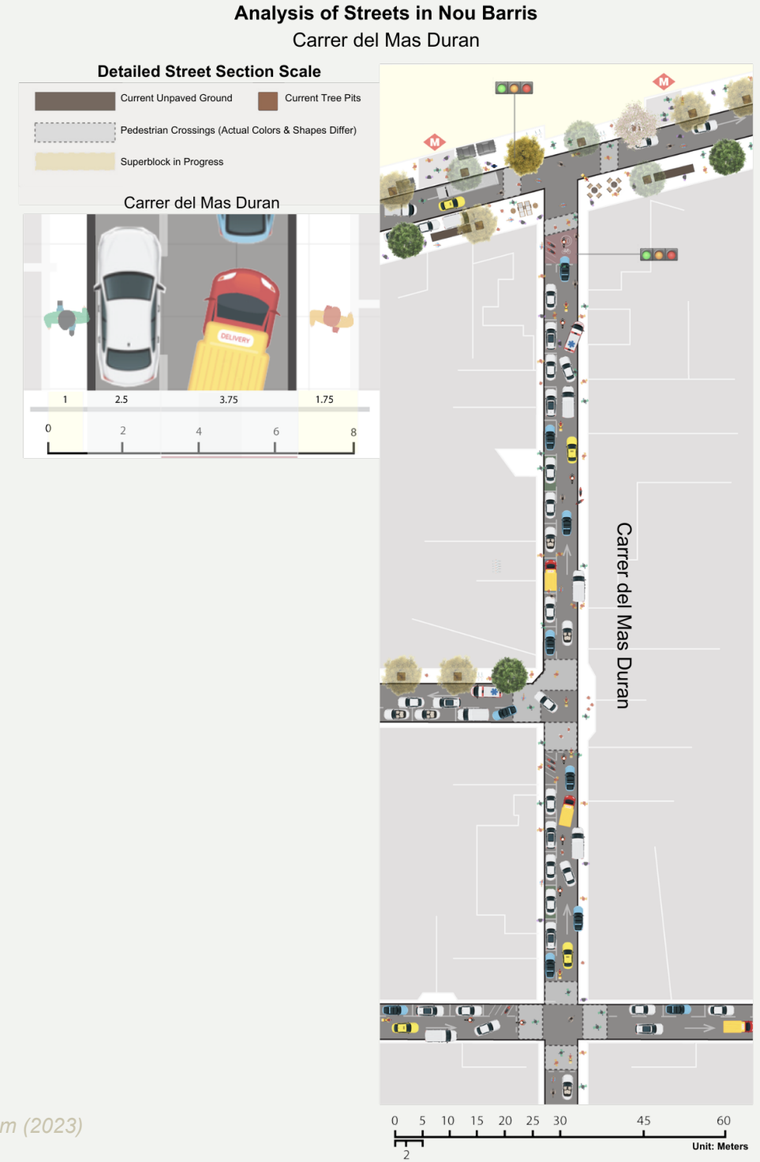


Source: Studio Team (2023)

2.3. Street Issues in Nou Barris

The team defined that the bus stops cause traffic jams, and there are no buses or shuttles' lanes within the community and realized that the design flows of pedestrian crossings are chaotic. Also, on the street level, west-side pedestrian lanes are too narrowed for parallel passerby or for pedestrians walking through the street. Since it is a street that only has nine meters in width, there are no planned bike lanes for bikers, and automobiles and bikes are sharing the same lane, which is very dangerous. There are not enough crossing lanes for pedestrians, so walkers are crossing the streets randomly; there are also some illegal parking on streets that cause congestion. The neighborhood also lacks trees or rain gardens or enough green spaces inside the community.

Map 4



Source: Studio Team (2023)

Map 5

Source: Studio Team (2023)

The problems on Pablo Iglesias are also lacking bus/shuttles all the way down and parking spaces are not well connected together without capacity in transportation level. In the environmental part, the street does not have rain gardens and permeable surfaces along the sidewalks. The unclear car lanes cause a lot of traffic congestion and dangerous situations like car crossings. The double-parking along the streets due to regulation misunderstanding and spot availability cause some illegal parking issues and chaos on the street. Also, the street does not have sufficient bike lanes and bike parking facilities, so bikes and private cars are sharing the same lane, which is very dangerous. Bike parkings is located in the private cars' parking spaces, which is chaotic and inconvenient for bikers. The absence of a crossing lane causes pedestrians to cross the street randomly, which is very alarming to their safety. In the intersections, there is limited shared space for residents' community life, which deteriorates the livability inside the community.

2.4. Issues on Transportation

While a large amount of bike ramps have been established along the streets, bike parking in Barcelona often ends in chaotic and unsafe patterns, where bikes are often locked with street lamps, billboards and tree pit frames, and bike thefts happen occasionally. Few car parking spaces have designated bike parking structures: two within the L'Eixample site and one within the Nou Barris site. The lack of covered bike parkings discourages commuters from regularly using bikes, and makes it harder for systematic urban design interventions to be executed.

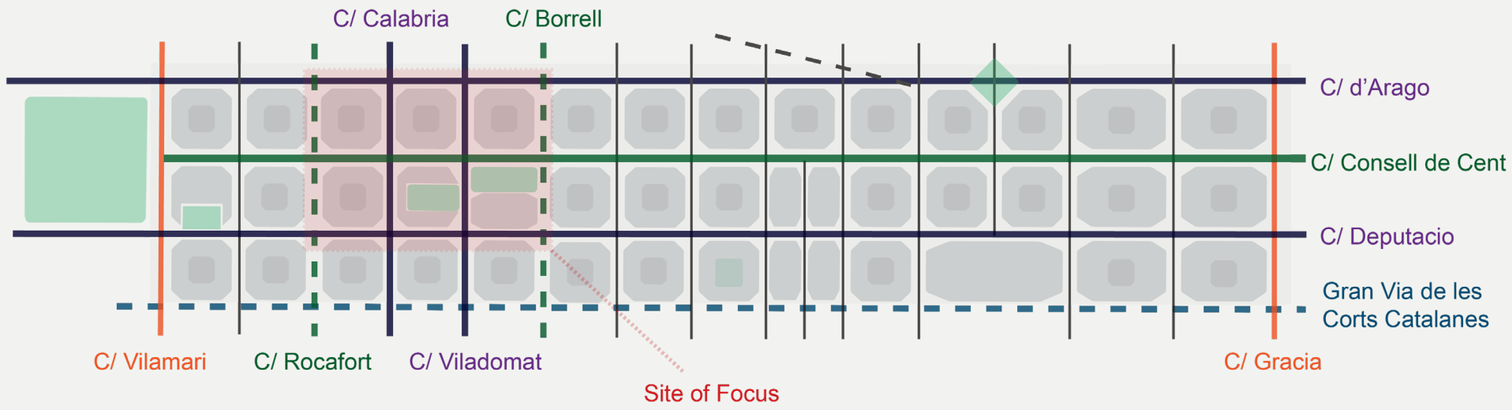
During the field observation, the team finds that existing bike lanes are often integrated with car lanes, while bike spaces are often occupied by cars in multiple scenarios when cars try to turn (left), make short stops, and during heavy congestions in peak hours. Along some of the two-directional lanes, only temporal barriers of very low height are placed in the middle. The lack of segregational barriers along bike lanes reduces biking efficiency and creates potential dangerous encounters between bikes and cars.

Similar to other European cities that have already initiated the service, community shuttles can enhance micro-scale mobility, encourage residents to choose transit during their travel, improve mobility equity, and partially reduce the operational pressure of mainline municipal buses.

While Barcelona owns an efficient and mature bike sharing network sponsored by the city government, coverage can still be improved to satisfy a more comprehensive bike transportation network in the future.

During the field observation, our team learns that the city-owned bike sharing services are only open to users with longer-term commitment and are not convenient for short-term users such as tourists and visitors.

Map 6: Original L'Eixample Transportation Map (pre-intervention)



Source: Studio Team (2023)

The Superblocks program has already been implemented in parts of L'Eixample , so there is a need to enhance the bike facility transportation or bus services. During the field trip, our team observed that this neighborhood lacks a well-established public transportation that contains bike stations, entrenched bike lanes, enough permanent bus stations, and a stable Community Shuttle system.

The original sites lack valid bus lanes, bike facilities, and parking space; those limitations cause the problems of inconvenience, which means when you take a subway to this district, you can only walk or drive. The inconvenience of public transport is discouraging people to visit Nou Barris, which is negatively affecting their economic growth.

Nou Barris Site: Public Space (Pre-intervention)

Source: Studio Team (2023)

Map 7: Original Nou Barris Site Transportation Map

Source: Studio Team (2023)

GREEN MAINTENANCE

Barcelona's built environment and natural topography makes the city vulnerable to climate hazards, which can lead to water insecurity, pose public health and safety concerns, and exacerbate socioeconomic inequalities. Through site observations, we have identified the following key issues:

1. Water Insecurity

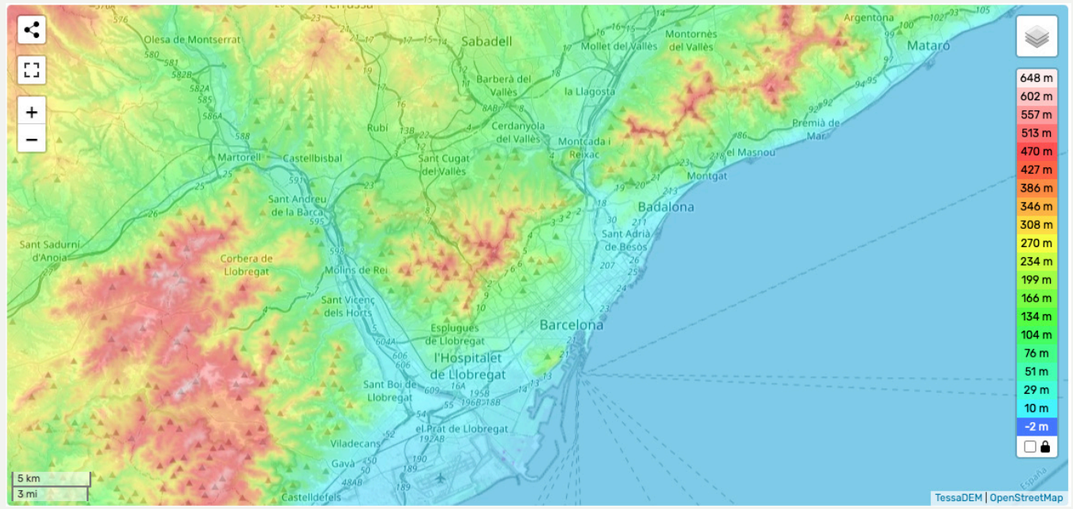
1.1. Vulnerability to flood risk

Flooding is a common weather event throughout the Mediterranean due to intense periods of rainfall. However, climate change has led to longer and more intense rainfall and the city's natural topography increases its vulnerabilities. First, Barcelona is located on a plain between two rivers and the sea. As a result, the city is located at lower elevations and naturally more prone to pluvial flooding (from intense rainfall). Its steepest inclines are up to 40%, which reclines as one reaches the shoreline (less than 0.1%) (Ajuntament de Barcelona, n.d.). *See Figure 11 below.*

Runoff from surrounding slopes also exposes the city center to run-off (Terrassa, 2022). Considering that Barcelona is the second most densely populated city in Spain, and that people and activities are most densely concentrated in the city center, a large number of the city's population will require protection from flooding. The Eixample District in particular has the city's highest population density and economic activity, and therefore, has the greatest vulnerability in terms of population and economic assets. Thus, the city implemented rainwater retention basins in 1996 following severe floods from runoff to prevent future flooding throughout the city (Barcelona City Council, 2023).

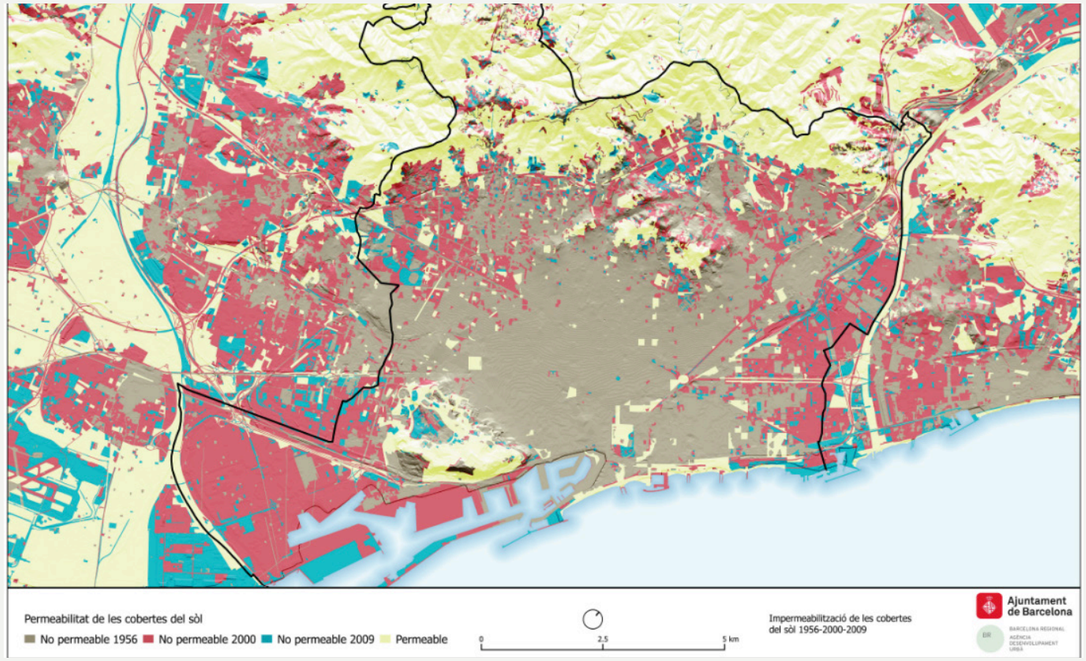
Despite Barcelona's adaptation efforts, the city continues to face the risk of urban flooding. Its built environment is vulnerable to urban flooding primarily due to the city's impermeable surfaces. Following its historical pattern of development, the city's impermeable surfaces increased from 45% of the landscape in 1959 to 72% in 2009 (Barcelona Regional, Agència Desenvolupament Urbà, 2018)

Figure 11: Barcelona's Topography



Source: Topographic-map.com, 2022

Figure 12: Barcelona's Topography



Source: Barcelona Regional, Agència Desenvolupament Urbà, 2018

See Figure 12.

Impermeable surfaces increase the city's vulnerability to the risk of urban flooding because they reduce the city's ability to drain flooding properly. Roads and pavements filter only 5 percent of rainwater compared to non-urbanized areas of 70 percent (Ajuntament de Barcelona, n.d.).

1.2. Urban flooding risk

Urban flooding poses risks to both residents and the built environment throughout the city. It was demonstrated in a study conducted by Russo et. al (2020) on urban flood resilience in Barcelona that increases in rainfall intensity of 12 to 16 percent can cause increments of more than 25 to 30 percent of social impact. For instance, residents can experience higher levels of hazardous conditions, social activity is disrupted in expanded areas, as well as other impacts (ibid). Gentrification exacerbates the issue by displacing more vulnerable communities into areas with less adaptation measures such as less green space. Beyond risks to its residents, activities, and properties, urban flooding can cause large economic losses. Barcelona's economic activity is largely dependent on tourism, with the city producing over 35% of Catalonia's regional output (ibid). Flooding can disrupt these activities. In fact, the same 2020 study found that the same increments of rainfall intensity could cause "increments of more than…42% of economic losses (including tangible direct and indirect damages)…Economic losses related to traffic disruption due to pluvial floods could also increase by 9%, while for the electric system, the increase of economic damage could be 70%" (ibid). Moreover, these hazards are not spatially equal as areas of high impervious surfaces, high socio-economic activity and assets, and lower elevation, such

as L'Eixample, experience high vulnerabilities (ibid).

1.3. Threats to water security

According to the Barcelona City Government (Ajuntament de Barcelona), "city drains make up an extensive underground network covering the whole urban area… The city of Barcelona has a length of more than 1,800,000 meters of drains, including pipelines, collectors, etc…The municipal drains network serves some 1,540,000 inhabitants in the city and the commercial and industrial establishments located on more than 81,500 properties covering the 98 km2 of the municipal area" (n.d.). Currently, these drains are maintained through rinse and extraction cleaning, hydrodynamic cleaning, and cleaning by pneumatic extraction to prevent sediment from accumulating and proper function of drainage. Accordingly, "the distinctive feature is that the waste water from the drains is itself used to shift the waste, thereby saving on the use of drinking water. It is calculated that some 100,000 m3 of drinking water is saved every year" (ibid).

However, storms and flood events can overwhelm the drainage system, leading to leakage and contamination. Barcelona currently has a combined sewer system (mixing rainwater and wastewater) that can cause combined sewer overflows and frequent urban floods during wet seasons due to impervious surfaces and sloped terrain. (Martínez-Gomariz, E., et al., 2021) Although overflows primarily occur by the coast, runoff washes off pollutants from spilled waste baskets and litter that leads to obstruction of drainage pathways and can cause contamination (ibid). For example, our field investigation revealed that pet waste is a pervasive issue affecting public space.

According to Wood (2017), "pet waste is a leading source of both nutrient and bacteria

Site Observation: Pet Waste

Source: Studio Team (2023)

pollution to urban streams and waterways," particularly in areas of higher density. Contamination can lead to severe intestinal diseases in humans upon ingestion as well as reduce water security (ibid),

Beyond flood events, water security is further threatened by existing vulnerabilities. Barcelona experienced a water crisis in 2008 when reservoirs dipped to 20.1 percent capacity when the city nearly ran out of water and was forced to import drinking water from France (Ritter, 2018). According to Ritter (2018), this crisis was a consequence of poor government intervention, outdated infrastructure, and overconsumption.
In fact, Barcelona's water system loses 800,000 liters of water each day due to leaks (ibid). Additionally, while improvement of Barcelona's wastewater treatment has significantly improved water quality over the years, wastewater is still untreated for 1 million people in the region. (Barcelona City Council, 2012) Lastly, 61% of water goes to domestic consumption, as there is a high demand for water from local residents (ibid).

2. "Green" Inequity

2.1.Urban Heat Island Effect

Climate change has not only exposed the city to more intense rainfall, it has also exposed it to higher average temperatures, and longer durations and frequency of heatwaves. The city's current consumption patterns i.e., pollution and density exacerbate the effect. This effect can lead to up to temperature of up to 8 °C higher in the city center relative to less urbanized surrounding areas (Moreno-Garcia, 1994). The lack of permeable pavement and insufficient greenery in Barcelona also worsen heat waves.

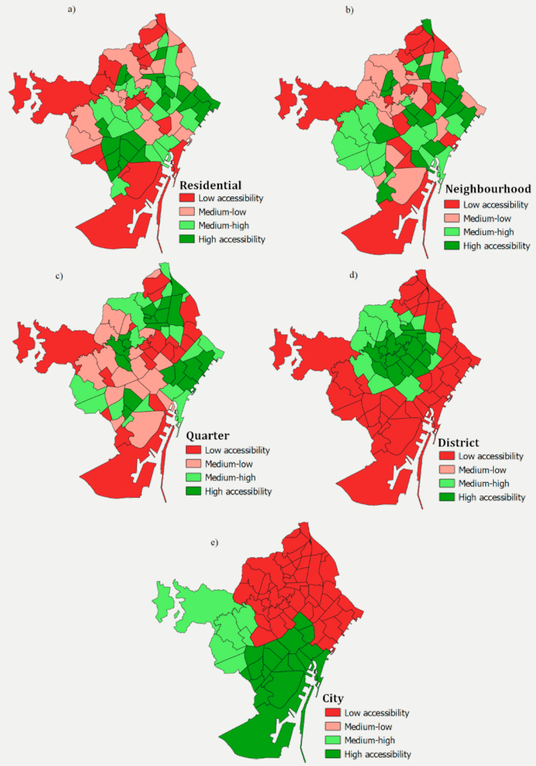
2.2. Green Equity

Like urban flooding, the vulnerabilities against heat waves are not equal. Areas with lower concentrations of street trees and higher levels of pollution and density such as L'Eixample are more vulnerable to the heat island effect. In particular, street trees not only increase permeable surfaces to help mitigate urban flooding, they also provide shading that help reduce temperatures for pedestrians. Moreover, a study conducted on the equity of accessible urban green spaces (UGS) revealed that UGS are insufficient and unequally distributed for targeted social groups (seniors, children and the less wealthy) across the city (Iraegui, 2020). *See Figure 13.* According to this study by Iraegui (2020), "only 11 places in Barcelona have more than 9 m2 of UGS per person, a small proportion when compared to the WHO's minimum criterion." In addition, according to Iraegui (2020), gentrification displaces less favorable communities within districts from streets where UGS are built or restored, increasing "green" inequity.

3. Green Maintenance Constraints

Like most governments, budgets are constrained by tax income and other available funding. While the City of Barcelona has made city-wide structural improvements to reduce the city's vulnerability to climate risk e.g., renovating its built infrastructure and increasing the amount of permeable surfaces, maintenance costs are expensive. The government spends 1.3 M €/year on improving soil and water management

Figure 13: Urban Green Space Accessibility at different scales



Source: Iraegui, 2020

Site Observation: Destroyed fencing

Source: Studio Team (2023)

(Barcelona City Council, 2023). For tree management, the government allocates 8.3M Euros / year (ibid). Yet, our site observations revealed key issues involving littering, uncollected dog waste, vandalization or destruction of public property, unmanaged foliage, rusted stormwater drains, and exposed, compact soils.

Key Opportunities
The Superilles and other existing programs have already begun to reduce the city's vulnerabilities to some of the issues identified (e.g., climate hazards and green inequity). Nevertheless, there is space for further improvement through the following opportunities:

1. Leverage existing networks and resources to expand societal capabilities and mitigate budgetary burdens
The Superilla program provides an opportunity to cooperate both horizontally within the city government and vertically between public and private stakeholders.

1.1. Leverage existing resources
Collaboration across programs can help pool resources and use funding more efficiently. Initiated by the city in 2013, the Barcelona Green Infrastructure and Biodiversity Plan (GIBP) is an umbrella strategy that intends to develop green infrastructure in order to fulfill social and environmental objectives. (Ajuntament de Barcelona, n.d.) This plan includes actions for improvement, such as increasing green space in the city by building new parks, gardens, and urban forests, and installing green walls and roofs to lessen the heat island effect, enhance biodiversity, and improve air quality. (Ajuntament de Barcelona, n.d.) The plan also aims to build green corridors that connect parks and other green areas to promote biological connectedness and animal habitats, as well as extensive tree-planting projects in both public and private locations. (Ajuntament de Barcelona, n.d.) Another essential component of this approach is the creation of integrated water management systems that will mitigate the impact of floods, enhancing water quality and saving water resources. (Ajuntament de Barcelona, n.d.) This plan was updated in 2021 as the Barcelona Nature Plan (2030) (Ajuntament de Barcelona, n.d.). "One key goal is to add an extra 1m² of greenery per resident by 2030, equivalent to 160 hectares of new green spaces" (Barcelona City Council, 2023). Another related program includes the Tree Master plan, which is responsible for the maintenance and enhancement of trees both in public and private areas (Barcelona City Council, 2023). Therefore, working across programs can help expand the Superilla program's budget of 37.8 M €.(Barcelona City Council, 2023)

1.2. Leverage existing networks
Leveraging existing networks can also help overcome resource restraints, but also identify and connect key stakeholders.

There are some existing networks that expand societal capabilities to adapt and implement adaptation against climate change. First, the More Sustainable Barcelona (B+S) network, established in 2002, is a network of schools, businesses, NGOs and universities who participate in collective action to develop "green" plans. This network operates through a council responsible for the management of the city's "green plans"(Barcelona City Council, 2023). There are also smaller programs that help facilitate the engagement of multiple stakeholders in building adaptation. For example, the "All Hands to Greenery" or "Mans al verd" program aims to increase the number of participants in activities on biodiversity protection or climate adaptation e.g., participating in the implementation of local green areas (Barcelona City Council,


Source: Ajuntament de Barcelona

2023).

Additionally, there are networks that themselves act as adaptation measures. For example, the Climate Shelters Project started in 2019 and funded by the Urban Innovation Actions (UIA) program of the European Commission converts schools, libraries, sport centers, parks and gardens, and museums into climate shelters that are open to city residents during hot periods (Barcelona City Council, 2023). These shelters were distributed across the city such that 95% of the population can reach a shelter within a 10 minute walk.

1.3. Leverage existing stakeholder expertise
Leveraging existing expertise and knowledge not only uses resources effectively, but is critical in developing solutions that meet specific needs of neighborhoods. For example, the EBro Observatory (URL-CSIC) is a city department in charge of drought management. (The University of Barcelona, 2022) It would be most efficient to leverage their existing research and data to inform areas of high risk and network to broadcast public mitigation actions. Depending on local expertise is also beneficial, particularly for local programs. Different members of the civic society e.g., nonprofits, housing cooperatives, landowners, schools, etc. can have different strengths that can overcome public budgetary constraints or knowledge gaps. However, unlike current engagement, the channel flows both ways such that local expertise and resources are directed to the government.

1.4. Enhance existing public space and green infrastructure
Implementing new infrastructure and sourcing public space can be a tedious and expensive process. Thus, enhancing existing public

space and green infrastructure can be a cost efficient way to implement adaptation measures and mitigate green gentrification.

2. Enhance existing public space
A 2020 study found that utilizing smaller urban green spaces (UGS) can help compact spatial injustices. (Iraegui, 2020) In Superillas specifically, inner courtyards are typically optimal public spaces among residents that can be built as UGS. These renewed spaces can increase the spatial equity of permeable spaces and protect residents from being displaced, since the courtyards are restricted to residents only and all residents will have access to their own green space (community garden).

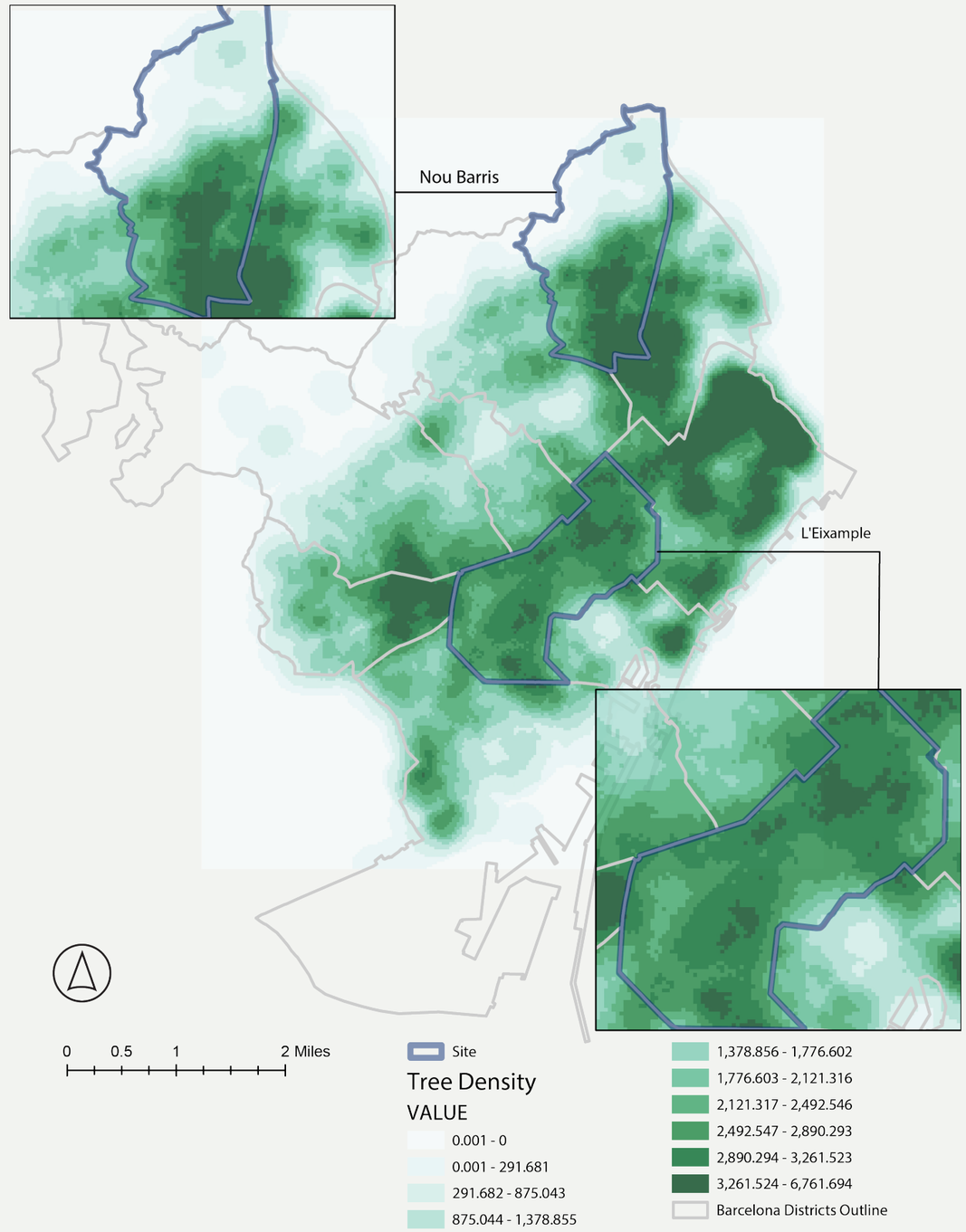
Additionally, adding amenities to public space can incentivize good behavior and improve community ownership. For example, installing pet waste stations equipped with biodegradable bags and lids to trash bins throughout the city can encourage residents to collect waste after their pets and ultimately partake in reducing water contamination.

3. Enhance existing green infrastructure
Site investigation and research revealed that green space and street trees are not spatially equal. Specifically, the tree density map shows that tree density is densest in the northeast region in L'Eixample and southern region of Nou Barris *See Map 8.*

Furthermore, depending on the season, many trees in open spaces along Superilla streets lack foliage, and therefore, fail to provide shade coverage. Additionally, many trees were planted in compact soil, which hampers vegetation growth and increases impervious surfaces. Nonetheless, these issues pose an opportunity to enhance the existing network of trees by encouraging planting of trees that keep their leaves longer and implementing Soil Area Provision (SAP) measures.

SAP includes enlarging the planting site, widening the tree strip, extending to curbside peninsulas, and connecting to nearby green patches via soil connectors or subsurface soil connectors (Ferrini, 2017). Additionally, switching to porous paving and incorporating underground connectors would create healthier urban green spaces with better access to nutrients and oxygen for trees and vegetation, improving the city's aesthetics, air quality, and overall environmental health.

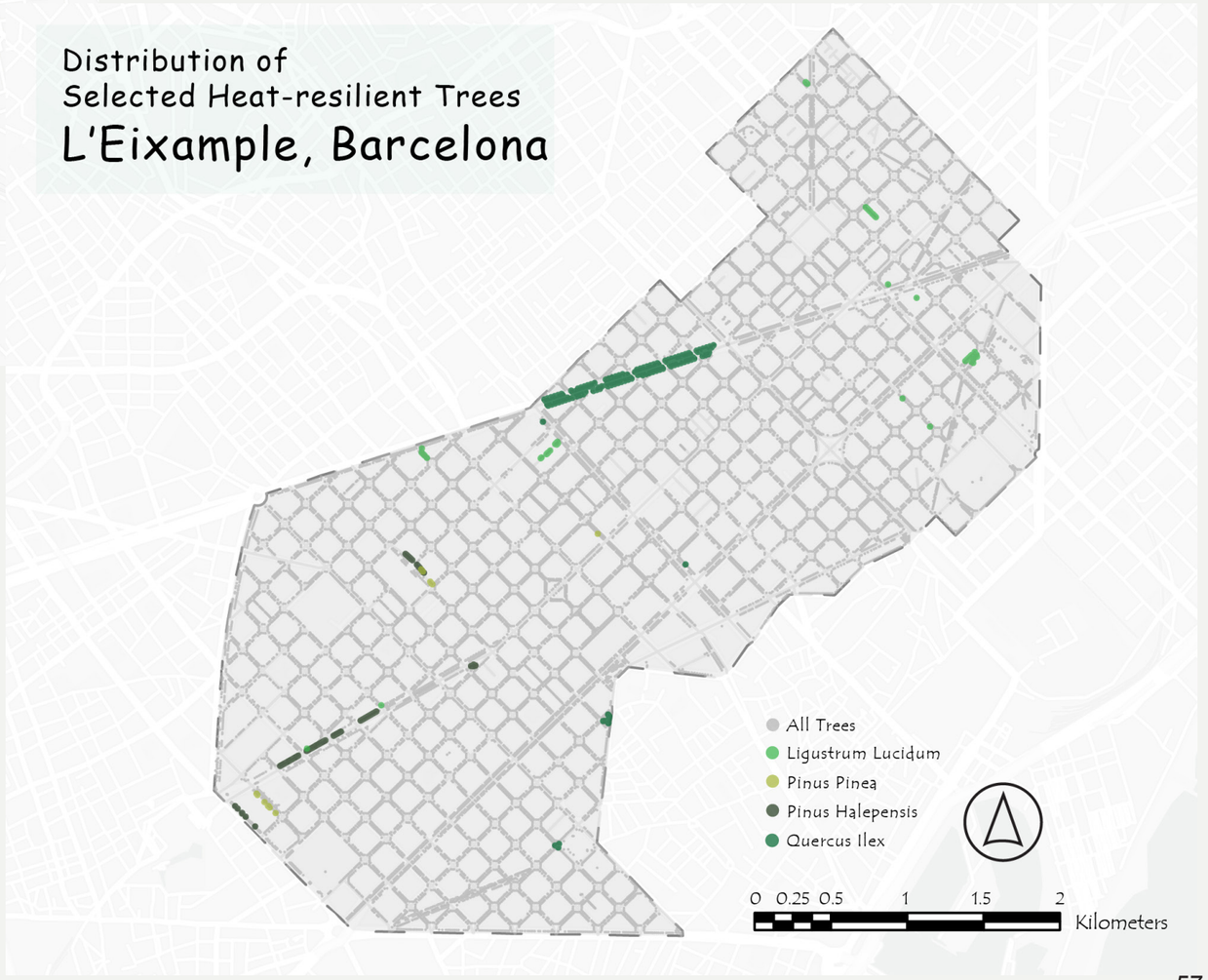
Map 8: Tree Density Map



Source: Studio Team (2023)

Map 9: Distribution of Heat-resilient Trees in Nou Barris

Source: Studio Team (2023)



Map 10: Distribution of Heat-resilient Trees in L'Eixample

Source: Studio Team (2023)

Proposal A

Transforming public engagement to ownership of resilience in Barcelona

THEORETICAL BACKGROUND

Upon identifying the challenges and opportunities, our studio developed three principal proposals to augment capacities and enhance resilience. During the exploratory phase, we conducted an initial investigation into the socioeconomic, institutional, and environmental contexts. This research enabled us to refine the issues identified through field research and stakeholder discussions in Barcelona. We started on a comprehensive examination of resilience within the city, employing a systems thinking approach to address the three client queries and develop our proposals. Consequently, our proposals are interrelated and capable of addressing multiple client questions.

The first proposal centers on the expansion of societal capacities to increase resilience, as delineated in the methodology section. Our studio's objective is to transform public engagement into local ownership through three primary initiatives: the community garden program, flood risk management co-design, and social housing networks. Our framework acknowledges the necessity for collaboration among city, district, and local neighborhood stakeholders for the success of these proposals. Our initiatives aim to decrease reliance on public funding by establishing sustainable or independent funding mechanisms, enhancing local economic activities, promoting green space equity, fostering public participation and trust in the government, and mitigating gentrification impacts. This framework is grounded in existing literature and theoretical perspectives, which we have thoroughly examined in this section.

Enhancing local economic progress is a pivotal factor in the successful implementation of Superblock planning that requires simultaneous efforts to mitigate gentrification. This segment of this report delves into urban planning ideologies that facilitate local economic advancement and foster community resilience. Within this framework, two theories emerge as potential options: placemaking and asset-based community development (ABCD) - both suggested by the studio for the ability to aid the local economic development of L'Eixample and Nou Barris' Superblock proposals. Each section will discuss the theory, review case studies, and discuss how the theory could be implemented.

Placemaking

Placemaking is a comprehensive approach to urban development that emphasizes community involvement and cooperation to develop public spaces that address the requirements and preferences of inhabitants within a specific area. As an economic development strategy, placemaking acknowledges the significance of public spaces as crucial components of a community's economic progress and dynamism. The objective of placemaking is to design spaces that are more appealing, practical, and accessible to users while also generating social, cultural, and economic opportunities.

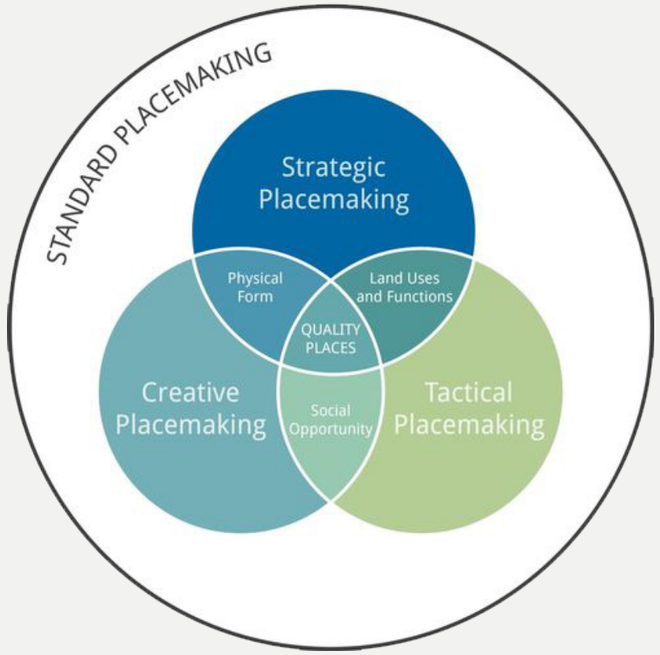
The concept of Superblocks in Barcelona is consistent with the objective of placemaking, which aims to create more attractive and eco-friendly spaces. Nevertheless, it should be emphasized that successful placemaking involves a collaborative approach that involves working closely with the community to identify strengths, sources of inspiration, and opportunities within a particular area. By utilizing these resources effectively, public areas can be improved significantly through diverse methods ranging from formal meetings and workshops to informal exchanges between individuals.

There are four distinct types of placemaking approaches (*See Figure 14*), each with its unique focus and methods. Conventional Placemaking is the most widely recognized form, aiming to create quality spaces where people desire to live, work, and play through initiatives such as street facade improvements, park enhancements, and events in town squares. Strategic Placemaking is a goal-oriented approach that requires cross-sector coalitions, often geared towards attracting high-talent workers who appreciate high-quality places. **Creative Placemaking** focuses on institutionalizing the art and culture of an area, fostering a lasting sense of place through projects like public art installations, chalk art initiatives, and outdoor concerts. Finally, Tactical Placemaking is characterized by low-risk, low-cost, and short-term projects, sometimes referred to as "guerrilla urbanism," "pop-up urbanism," "city repair," or "D.I.Y urbanism"(Wyckoff, 2014). In the context of the Superblock implementation area, emphasizing Creative Placemaking may be the most effective approach for promoting economic development strategies.

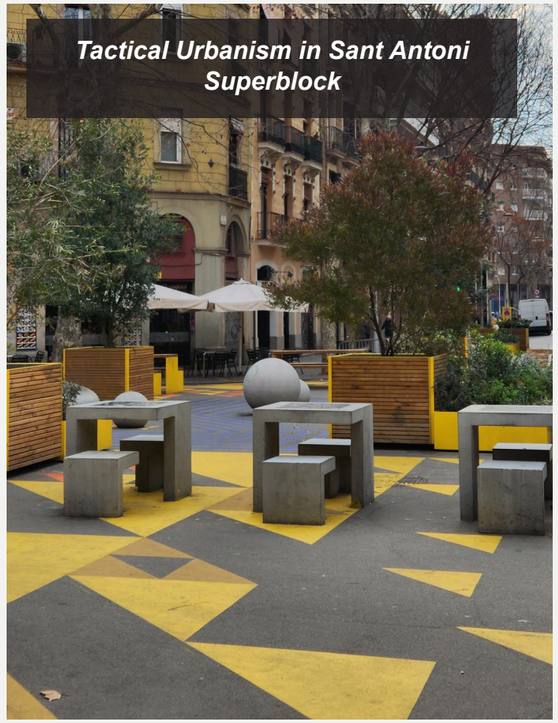
Creative Placemaking

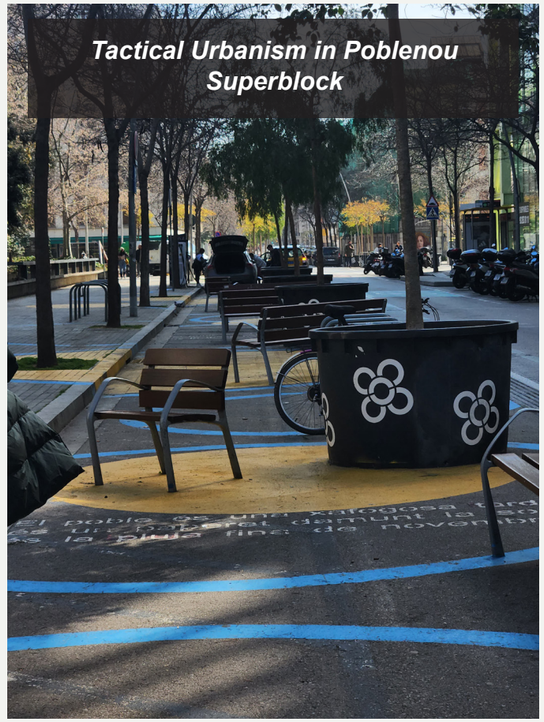
Creative placemaking is an approach that capitalizes on arts and culture, in collaboration with diverse partners, to shape the physical and social character of a location in order to foster economic development, facilitate lasting social change, and enhance the physical environment. This strategy encompasses a variety of artistic and cultural expressions, engages numerous stakeholders, and

Figure 14



Source: MSU Land Policy Institute





Source: Studio Team (2023)

seeks to transform underutilized spaces into dynamic, appealing, and functional destinations. Successful creative placemaking endeavors can act as catalysts for additional improvements in the surrounding area. (Markusen et al., 2010).

In the context of Barcelona's superblock sites, creative placemaking can be applied to transform these urban areas into more lively, people-centered spaces. As an integral component of the Superblock planning process, creative placemaking may entail cooperation between local artists and cultural institutions to create public art installations, murals, or performances that commemorate the unique history and identity of each superblock. Tactical urbanism as shown in *the images above*, a planning technique employed in the Superblocks, enables swift modifications in street utilization while providing the benefit of reversibility if necessary (Barcelona City Council, 2021). Local artists and cultural organizations can collaborate with planners in devising tactical urbanism strategies or other urban design elements.

This method also offers heightened visibility and effectively showcases potential alternative uses for public spaces. Such partnerships can contribute to a more robust sense of community interconnectedness.

Re-envisioning spaces within superblocks as community hubs that host cultural events, art exhibitions, or workshops can promote social connections and a sense of belonging among residents. Moreover, integrating arts and culture to enhance the physical environment, such as incorporating artistic elements into street furniture, landscaping, and architectural design, can create a visually appealing and inviting space. Given Barcelona's reputation for art and culture, leveraging local communities to support creative placemaking initiatives can attract people to superblocks, thereby stimulating economic activity, fostering social cohesion, and encouraging further investments in housing, schools, and other amenities.

By applying creative placemaking principles to Barcelona's superblock sites, the city can harness the potential of arts and culture to generate more vibrant, inclusive, and sustainable urban environments, benefiting both residents and visitors, ultimately inducing local economic development.

Gentrification

Gentrification involves the social, cultural, and economic "upgrading" of a neighborhood, often leading to the displacement of existing residents and businesses. This is a concern in the implementation of Barcelona's Superblock plan, which requires acknowledging potential gentrification in the area. Gentrification processes affect not only neighborhoods but also entire regions or cities. In such cases, the connection between public space improvements and the rising value of the surrounding environment becomes evident. This "value" draws capital investment and new residents, possibly resulting in gentrification regardless of the original intentions or the parties involved (Kahne, 2015).

Public space proponents need to balance the demand for improved and expanded public spaces while minimizing the risk of inadvertently contributing to gentrification. Although Placemaking can support economic development, it may also accelerate gentrification in previously underserved urban areas.

Blaming gentrification exclusively on public space investments or enhancements ignores the complex social and economic factors driving this phenomenon in urban neighborhoods (Kahne, 2015). Gentrification stems from a range of factors, including capital movement and the uneven production and consumption of urban space (Kahne, 2015).

Nonetheless, the ongoing debate about gentrification and public space frequently centers on displacement, which occurs when existing residents can no longer afford housing or neighborhood amenities due to increased prosperity. Various factors contribute to gentrification, such as housing stock, neighborhood amenities, transportation links, public schools, and proximity to other physical features and public spaces. Developing or investing in public space may increase an area's investment potential while concurrently creating more exclusive and segregated communities. This complexity often leads individuals to connect public space with gentrification, which must be considered when implementing Placemaking initiatives.

Implementation

Placemaking, when employed as a solution to gentrification, emphasizes the importance of community-driven public spaces that cultivate a sense of belonging and shared ownership. Successful public spaces cannot merely be constructed or imposed, as often occurs in privately-led gentrification efforts. Instead, they need to be inspired and nurtured by the communities that utilize them, including both long-term residents and newcomers.

Focusing on empowering communities to create public spaces that cater to their needs, interests, and values, placemaking connects community members to the physical transformations in their neighborhoods and to one another. This approach helps combat the divisive, top-down changes typically associated with gentrification (Kahne, 2015). The challenge is not whether public spaces should be created or improved, but rather how cities and neighborhoods can facilitate growth while preserving the community's culture and values. Planning policies should accommodate change while respecting and including local communities.

For the superblock project, placemaking can enable residents to take ownership

of their public spaces, celebrate their neighborhoods' unique strengths, and address specific challenges. By fostering inclusion and shared community ownership, Placemaking differs from gentrification, which often divides communities and promotes exclusivity (Kahne, 2015). Placemaking is about enhancing the quality of life without sacrificing public life, as it enables communities to define their priorities rather than having them dictated by external forces. By incorporating community focused placemaking into the Superblock project, cities can empower communities to take ownership of their public spaces, thereby mitigating the negative impacts of gentrification and promoting a more inclusive urban environment.

Case Study: Brookland-Edgewood Creative Placemaking

Brookland-Edgewood, Washington, D.C.

The Kresge Foundation, an organization funding community development projects, defines Creative Placemaking as a deliberate strategy to integrate arts and culture into comprehensive community development, acting as a catalyst for equitable living and working solutions for various social, economic, and racial groups within a neighborhood.

According to the creative placemaking case in Brookland-Edgewood, D.C. in the book Global Models of Citizen Participation by Daniel-Morales et al., The Brookland-Edgewood case in Washington, D.C. serves as an example of a successful Creative Placemaking project. Dance Place, a nonprofit organization established in 1980, has been a vital contributor to the neighborhood's cultural scene. After acquiring a grant from the Kresge Foundation for Arts Park development, Dance Place has offered performances, commissions, and inclusive training and educational programs to participants regardless of their financial means.

The Brookland-Edgewood neighborhood, characterized by low-income levels and high crime rates, experienced increasing real estate values during its economic development, raising concerns of potential displacement for community members. To address this, the District of Columbia Department of Housing and Community Development collaborated with Artspace Projects and Dance Place in 2005 to create the Artspace Lofts building and additional spaces for artists.

In 2016, Dance Place completed their Arts Campus, featuring various facilities and the 8th Street Arts Park. The Art on 8th free outdoor programming offers affordable and accessible performances, workshops, and recreational activities. The main stakeholders in the Brookland-Edgewood Creative Placemaking case include the District of Columbia Office of Planning (DCOP), Dance Place, Bozzuto Development, Inc., and the Brookland-Edgewood residents.

Dance Place is one of many stakeholders in the broader Creative Placemaking projects within the 8th St Arts Corridor, which intersects with Brookland, Edgewood, and the Catholic University of America (CUA) campus. Dance Place, Arts Walk, and Monroe Street Markets have revitalized the community and attracted visitors through creative initiatives.

In summary, the Brookland-Edgewood case demonstrates how Creative Placemaking can integrate arts and culture into community development, creating equitable living and working solutions for diverse populations. This project has revitalized the neighborhood and contributed to economic development without exacerbating gentrification, as it has provided affordable and accessible arts and cultural offerings to the community.

Dance Place, Brookland-Edgewood, Washington , D.C.

Source: Steinberg (2015)

Best Practices

1. Community Engagement
A crucial aspect of the Brookland-Edgewood Creative Placemaking case lies in the active participation of local inhabitants, artists, and cultural organizations during the planning and implementation phases. For Barcelona's Superblock initiative, cultivating community engagement is essential to ensure that the project addresses the needs and aspirations of residents. Organizing public meetings, workshops, and participatory design sessions can collect community input on the design, functionality, and programming of public spaces within the Superblocks. This collaborative methodology will facilitate a sense of ownership and belonging among residents, guaranteeing that the project serves the entire community.

2. Integration of Arts and Culture
As discussed before, incorporating arts, culture, and creative activities into the Superblock project can contribute to the development of lively and inclusive public spaces. Drawing inspiration from the Brookland-Edgewood case, Barcelona can promote the establishment of public art installations, murals, and sculptures within the Superblocks and collaborating with the artists within the local community. Moreover, support can be provided to local artists and cultural organizations for hosting cultural events, performances, and exhibitions that embody the city's diverse cultural heritage. To enable this integration, the city can foster partnerships with local art institutions, cultural associations, and creative industries. These collaborations will not only augment the aesthetic appeal of the Superblocks but also enhance the area's cultural vibrancy and social cohesion.

3. Affordable and Accessible Cultural Offerings
To promote inclusiveness and equity, it is vital to ensure that cultural and recreational offerings within the Superblocks remain accessible to all residents, irrespective of their income levels. Barcelona can learn from the Art on 8th outdoor programming in Brookland-Edgewood by organizing complimentary or low-cost performances, workshops, and other activities that cater to a diverse range of age groups and interests. These accessible cultural offerings can foster a sense of community and belonging among residents while mitigating the risks of gentrification and social exclusion. By prioritizing affordability and inclusiveness, Barcelona can guarantee that the Superblock initiative benefits all residents and cultivates a robust sense of local identity.

Asset-Based Community Development
Asset-Based Community Development (ABCD) is a sustainable, community-driven development approach that focuses on utilizing existing local assets to foster social improvement and economic growth (Stoltenberg Bruursema, 2015). Originating from the work of Professor John McKnight and Professor Jody Kretzmann in the late 1980s, the ABCD method emphasizes five key aspects:

1. Asset-Based Approach: ABCD encourages communities to identify and mobilize their often unacknowledged resources, allowing them to drive their own development process. This perspective stems from the belief that the most valuable resources exist within not outside of the community.

2. Deficit-Based vs Asset-Based Comparison: Unlike deficit-based approaches that focus on community problems, ABCD highlights the strengths, skills, and resources within the community to create solutions. The approach is grounded in the recognition of six key community assets: skills of local residents, power of local associations, resources of public, private and non-profit institutions, physical resources and ecology of local places, economic resources of local places, and stories and heritage of local places.

3. Power of Associations: ABCD recognizes the importance of local associations, informal groups, and networks in building social capital and enhancing community resilience. These associations play a crucial role in transformative efforts for local social and economic development.

4. Principles for Facilitating ABCD: Successful ABCD facilitation involves engaging and empowering local residents, fostering collaboration, and building upon existing assets to create sustainable change. Key principles include recognizing everyone's unique skills, building relationships, putting citizens at the center, involving others as active members, identifying motivations to act, fostering listening conversations, and encouraging institutions to serve as supportive partners in community-building efforts.

5. ABCD in Practice: Real-world examples demonstrate how communities can use the ABCD approach to address local challenges and create social and economic development by leveraging their unique assets. The practice involves collecting stories, bringing together a core group, mapping community assets, engaging connectors to build relationships, leading the creation of a community vision and plan, mobilizing the community's assets through action and association, and leveraging community knowledge to secure external investments and resources.

Implementation Strategy
To effectively implement the ABCD approach in Barcelona's Superblock project, it is important to first identify and engage individuals with unique skills and assets within the community. This can be achieved through surveys, interviews, and workshops that will help us pinpoint residents who can contribute to the Superblock initiatives. These individuals can be connected with others through mentorship programs and collaborative projects, ensuring that their talents are utilized for the improvement of the community.

Next, the government can work to involve local associations, such as neighborhood groups, clubs, and informal networks, in the development process. This can foster social capital and community resilience by encouraging these associations to collaborate on projects that address gentrification and support local businesses. This cooperation will not only empower community members but also create a sense of shared responsibility for the neighborhood's future.

Institutional engagement is also crucial for the success of the ABCD approach. The communities within the Superblock sites can partner with local government agencies, businesses, schools, and other organizations to leverage their resources and expertise in addressing the challenges posed by gentrification. These institutions can provide valuable support in areas such as urban planning, housing, and local economic development. Place-based assets are the unique characteristics that define each neighborhood within the Superblock plan. By recognizing and utilizing these features, such as cultural heritage, public spaces, and infrastructure, we can create an attractive and vibrant environment for residents and businesses. This involves preserving historical buildings, promoting local traditions and events, and enhancing the functionality and accessibility of public spaces within the implementation sites.

Lastly, fostering connections between individuals, associations, and institutions is

vital to the success of the ABCD approach. By identifying and supporting local connectors, we can facilitate the formation of a supportive community network that collaborates on solutions to gentrification and drives local economic development. This will ultimately lead to a more collaborative, resilient, and equitable community.

Another key aspect of ABCD, the power of associations, emphasizes the importance of leveraging the energy and resources found within existing community networks and groups. By intentionally stepping back and allowing local associations to take the lead, ABCD can foster community-driven development in the Superblock sites, rather than relying on external agencies. In Barcelona's Superblock plan, the power of association approach can be instrumental in building upon the shared history of strengths and successes in the site's communities. By placing special emphasis on the social relationships and connections within both formal and informal networks, this approach helps create a strong foundation for sustainable change.

To achieve this, it is essential to identify and engage various community associations, such as neighborhood groups, local clubs, and informal networks, in the Superblock development process. By involving these associations, we can ensure that the Superblock initiatives align with the community's needs and aspirations, fostering a sense of ownership and responsibility among residents. The ABCD's community-driven strategy in the Superblock implementation aligns with participatory approaches that prioritize active participation, empowerment, and the prevention of disempowerment for residents. This approach ensures that residents have a direct say in the decisions that impact their neighborhoods and lives.

In practice, this can involve organizing workshops, forums, and community meetings where residents can voice their concerns, ideas, and suggestions related to the Superblock initiatives. By actively engaging residents in the decision-making process, we can promote transparency, accountability, and community empowerment, ultimately leading to sustainable economic and social development within the Superblock area.

Patis escolars oberts: The city's schoolyards are open as a space for public use by families, children, and teenagers outside school hours, at weekends and during school holidays

Source: Studio Team (2023)

Case Study: Applying ABCD in Ethiopia

(Peters, Gonsamo, Molla, & Mathie, 2009)

The case of Ethiopia offers a unique perspective on development due to its reliance on food aid and high interest in driving its own growth. According to the final report Applying an asset-based community development (ABCD) approach in Ethiopia by Peters Brianne,, Oxfam and Coady International Institute conducted a study on Asset-Based Community Development (ABCD) in 21 Ethiopian communities between 2003-2006 to assess changes in organizational capacity, assets, and long-term livelihood outcomes. The study involved external organizations, local NGOs, and community groups from urban, peri-urban, and rural areas, with 35 to 2,000 members.

The project received support from organizations interested in innovative development strategies to address challenges faced by vulnerable and marginalized groups. A Program Monitoring & Evaluation (PM&E) process was implemented to allow for an exchange of learning among staff from Oxfam Canada, local NGOs, and Coady International Institute. Researchers used various tools, discussions, and sessions with different community members to gather information and build consensus.

In the Ethiopian case, ABCD helped communities recognize and strengthen their existing resources, leading to improved livelihoods, social capacity, and challenges to existing power structures. Though the impact varied across communities, ABCD addressed disempowerment and enhanced living conditions. Social capacity was crucial in this transformation, fostering social networks, inspiring livelihood improvements, and enabling communities to resist power structures through organized cooperation and resource leveraging.

ABCD led to increased ownership, strengthened leadership, participation, confidence, and relationship building within and outside communities. Despite historical stigma around group organizing, cooperative action and appreciation for community members' skills increased. The ABCD training motivated communities to create more effective links and access resources, fostering trust and rapport among individuals.

The study showed an increase in overall asset base, with outcomes varying depending on the initial resources and collective experience of individuals and community groups. Over three years, skills and knowledge acquired during group meetings enabled Ethiopian communities to increase their supplemental income at both individual and group levels. Additionally, the success of some ABCD groups attracted the interest of external actors, leading to opportunities to share their expertise.

The successful implementation of ABCD in Ethiopia can provide insights for adapting the Superblock concept in Barcelona to other regions while promoting local economic development. Some best practices that can be derived from the Ethiopian case:

- Community involvement and ownership: Engaging communities in the planning and implementation of the Superblock concept is essential. Local residents should play a central role in decision-making processes and be given the responsibility and ownership to design their project action plans.
- Strengthen leadership and participation: Encouraging local leadership and increasing participation from diverse segments of the population can ensure that the Superblock development is inclusive and representative of the community's needs and aspirations.
- Build relationships and networks: Fostering relationship building within and outside communities helps create effective links with local businesses, government institutions, and other stakeholders. This collaborative approach can maximize the positive impact of Superblocks on local economic development.
- Address gentrification concerns: Engaging in open dialogue with community members to identify priorities and potential gentrification issues is crucial. Strategies should be developed to ensure that existing residents are not displaced and can benefit from the improvements brought by the Superblock concept.
- Leverage local assets: Identifying and capitalizing on the unique assets of each community, such as human, physical, natural, social, and financial resources, can create sustainable, context-specific solutions that address local challenges and foster economic development.
- Monitor and evaluate progress: Establishing a monitoring and evaluation system to track the progress of Superblock implementation and its impact on local economic development and gentrification is vital. Lessons from successes and challenges should be used to adapt strategies as needed to ensure the initiative remains effective and relevant to the community's needs.

Mapping physical assets in Tebbo, Ethiopia

Conclusion

IIn summary, Asset-Based Community Development (ABCD) and creative placemaking both emphasize community-centered, asset-based development but differ in their focus on arts and culture, spatial aspects, methodologies, and funding sources. Both approaches prioritize community needs and desires, involving residents in decision-making and implementation processes, while also concentrating on identifying and leveraging local assets such as skills, knowledge, resources, and cultural heritage.

The key differences lie in the focus on arts and culture; creative placemaking specifically highlights the role of arts and culture in community development, integrating artistic and cultural expressions into public spaces and planning processes as catalysts for change. In contrast, ABCD is a more comprehensive approach, encompassing a broader range of assets and resources. Furthermore, the methods and tools employed in creative placemaking, such as public art installations, performances, and cultural programming, are often tailored to the arts and culture sector. ABCD, conversely, employs a more extensive array of strategies, including asset mapping, capacity inventories, and community engagement initiatives, applicable to various sectors and disciplines. Lastly, creative placemaking projects tend to rely on funding and support from arts and cultural organizations, foundations, and government agencies, whereas ABCD seeks funding and support from a more diverse range of public, private, and non-profit organizations.

Incorporating both community-led development approaches into Superblock implementation sites has the potential to create community-driven local economic development, positively impacting gentrification mitigation. Nevertheless, these concepts warrant further exploration and research within the potential implementation of Barcelona's Superblock.

PROPOSAL DEVELOPMENT PROCESS

Upon conducting theoretical investigation on resilience, research on the socio-economic, environmental and institutional systems and on-site visits in Barcelona, the team started developing our resilience planning proposals. As a next step, we elected to conduct several stakeholder mapping exercises, to help us streamline and synthesize information we held, as well as identify potential gaps.

Stakeholder mapping is a valuable tool in resilience planning interventions as it helps to identify and engage relevant stakeholders who play a critical role in building resilience within a community or organization. The steps in conducting stakeholder mapping involved:

Step 1: Identifying stakeholders directly or indirectly involved in or affected by the specific areas of enquiry - gentrification, green maintenance and quality of non-green streets. The list included various government institutions, civil society organizations, NGOs and support groups, think tanks and scholars, design studios and other stakeholders relevant to each area of enquiry. The identified groups were categorized based on their roles and degree of influence, and color coded based on their relevance to each are of enquiry. Stakeholders that were mentioned multiple times, within each area of enquiry, were also highlighted as most prominent for proposals responding to multiple client questions.

Step 2: Categorizing identified stakeholders based on the RACI

Figure 15: Step 1 - Identification of Stakeholders

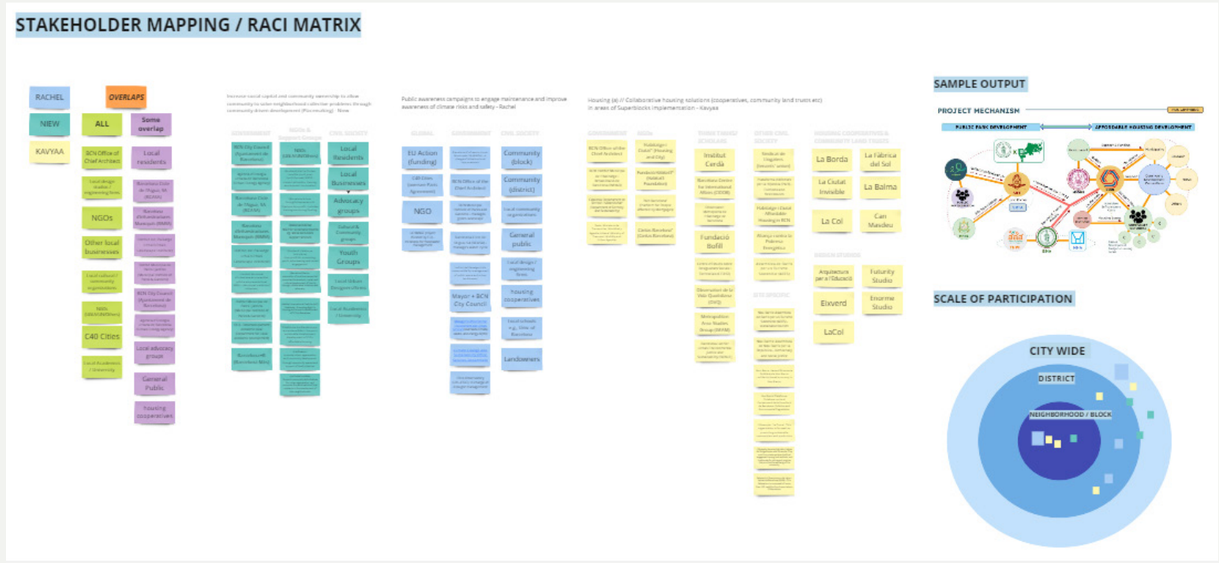


Figure 16: Step 2 - RACI Framework Stakeholder Mapping

Source: Studio Team (2023)

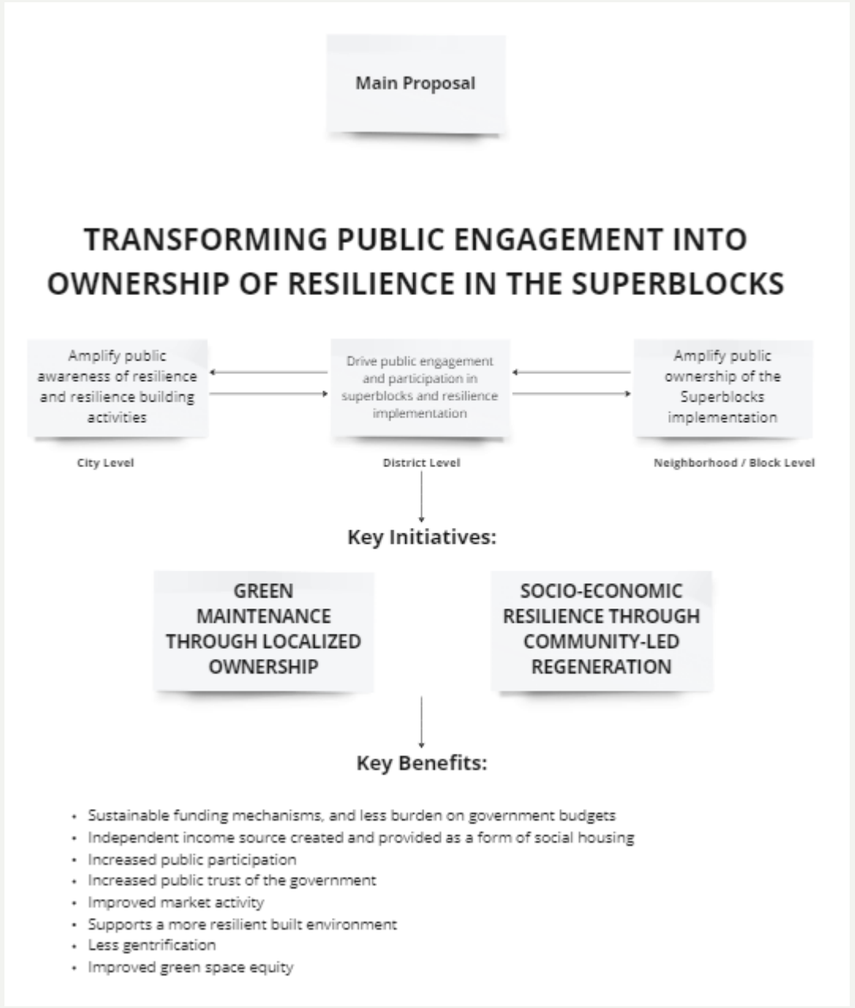
(Responsible, Accountable, Consulted, Informed) framework helped us to identify lines of responsibility and understand involvement required from each stakeholder for the success of the broader proposals, as well as each key initiatives. The categorization of stakeholders also helped us identify possible gaps in our understanding of stakeholders for each proposal, as well as their level of influence and potential level of involvement.

In this stage, key initiatives and associated stakeholders were also categorized based on their scale of participation: city-wide, district, or neighborhood level.

This was an important step in the proposal development process, as it helped us develop the foundations for the project mechanisms associated with each key initiative and the broader proposal.

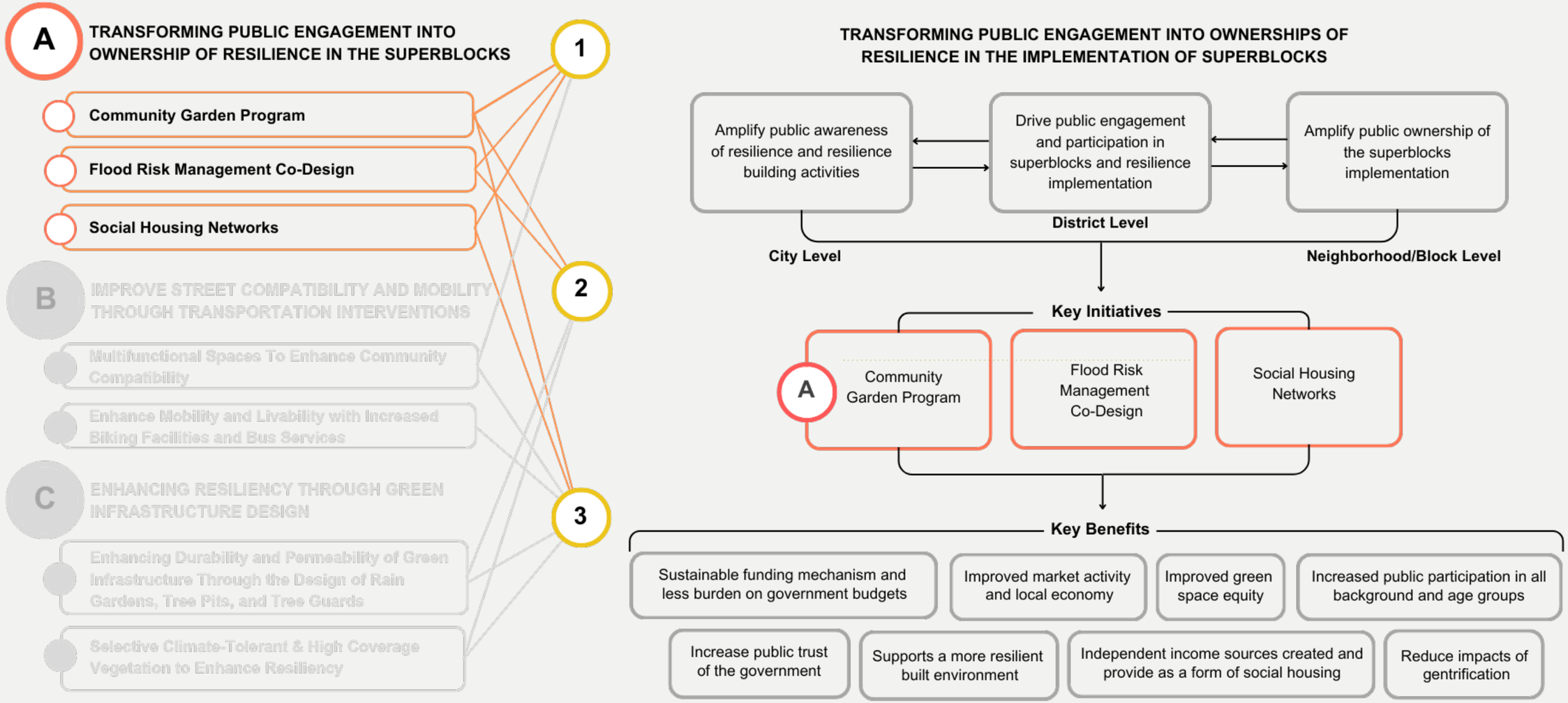
Step 3: The third step entailed **developing the full proposal framework**, which incorporates the three key initiatives, identified stakeholders, anticipated outcomes and key benefits. This process was iterative, as we explored the different ways through which each key initiative can create anticipated outcomes, and can be grouped together to form a comprehensive proposal focused on building socio-economic and environmental resilience for the residents in Barcelona.

Figure 17: Step 3 - Developing Proposal Framework



Source: Studio Team (2023)

Figure 18: Proposal A Framework



Source: Studio Team (2023)

01 COMMUNITY GARDEN PROGRAM

Our studio's first proposal is a community garden program which aims to engage with various stakeholders to create a sustainable public space maintenance and foster youth engagement. This will aim to utilize the spaces within the inner courtyard within the Cerda blocks. The Community Garden Program proposes a method to increase social capabilities through localized ownership. The initiative proposes action beyond public awareness and engagement by allocating ownership at the block level for each community garden. Moreover, the program leverages existing networks and infrastructure to help facilitate implementation of the program. The purpose of the program is to offer the tools and means to build local resilience. Therefore, as part of the Superilla program to collaborate to "green" public spaces (Barcelona City Council, 2023), the Community Garden Program provides an opportunity to green inner courtyards with low maintenance costs and high long-term benefits.

Business as usual
In the sites of study for proposed Superillas (Nou Barris and L'Eixample), community gardens are currently created through public-private partnerships (PPP) in the inner courtyards of blocks. The landowners receive variances in building design in exchange for land provided for a public purpose. These spaces are sometimes converted into community gardens, which are built through the Superillas Program and maintained by the city government. However, maintenance is constrained by public funding, which can sometimes be limited depending on the economic affluence of a district. Moreover, residents sometimes lack the knowledge to use or maintain the garden, which can result in disengagement (Ochoa, J. et. al., 2019).

What's different about this program?
The program extends traditional engagement both vertically and horizontally by casting a wide net of stakeholders. The program relies on the strengths and skills of a diverse list of stakeholders and allocates ownership accordingly in a collaborative effort to not only build, but maintain a sustainable community garden.

For empty public spaces in the inner courtyards, construction of community gardens can follow the traditional Public-Private Partnerships (PPP) model. However, the process involves engagement of local residents as well as subject matter experts (SMEs), such as Barcelona Cicle de L'Aigua, SA (BCASA) and Agencia d'Ecologia Urbana. These parties should be consulted to identify and fulfill residential needs (e.g., what kind of vegetation is desired, what amenities should be included, etc.) as well to ensure designs that are environmentally friendly and resilient (e.g., energy efficient, able to retain and recycle stormwater, etc.).

Upon construction, ownership shifts primarily to the community-level. Roles and responsibilities are established through a voluntary process that leverages the strengths of different stakeholders. For example, the gardens can be co-managed by educators, donors, and some volunteers to maintain the garden. Initially, there will be additional roles for training from SMEs e.g., Institut Municipal de Parcs i Jardins or other local stakeholders. However, as local residents develop the education, skillsets are passed on within the community.

Overall, the program allows residents to become owners of their own communities, invites collaboration across government entities, and invites participation of stakeholders that might have been isolated from the process e.g., landowners, nonprofits, housing cooperatives, global NGOs, etc.

Source: Studio Team (2023)

Key benefits
Community gardens are a fundamental form of urban agriculture that creates sustainable neighborhoods through increased social, physical, mental, and spiritual health. Findings show that community gardens not only lead to increased social capacities, but also that there is overwhelming support from the local community to build and maintain these gardens (Siewall, N. et. al, 2015). Several social benefits cited in literature include increased food security, self-efficacy of individuals, enhanced positive relationships, reduction of local crime, neighborhood revitalization, increase in community pride, neighborhood beautification, increased education, improved cross-cultural neighborhood exchange, and empowerment and building of individual and social resilience for individuals involved in garden projects (p.177, Siewall, N. et. al, 2015).

Community gardens are also an important tool in reducing social inequities as well as promoting green space in all neighborhoods (Siewall, N. et. al, 2015). A diverse partnership

between local, public, and civic organizations (e.g., nonprofits, local housing authorities, landowners, parks and recreation departments, schools, etc.) enables a high-performing community garden, in a way in which the community is engaged in the process of both development and maintenance (Robertson, L., 2017). Thus, the quality of community gardens can be more equitably distributed and improve socio-economic conditions of certain neighborhoods. Underserved communities tend to be skeptical of proposed community projects due to a history of being "over surveyed, overpromised, and under delivered" (NRPA, 2017). However, studies have also found that gardens help link communities to organizations and political and governmental authorities (Kaye & Hagen, 2019), which can improve perception of future community projects in those communities.

Moreover, civilian participation in maintenance can overcome budgetary constraints and relieve dependence on public funding. As mentioned, funding is currently restricted by budgets set for different departments. Given that funding is dependent on taxes, and differs across neighborhoods, maintenance of public green space can be unequal. Additionally, the government already currently spends millions of dollars a year on maintenance (Barcelona City Council, 2023). According to Robertson (2017), to reduce reliance on public budgets, citizen engagement can lead to participation in maintenance that the government can't necessarily afford (Robertson, L., 2017).

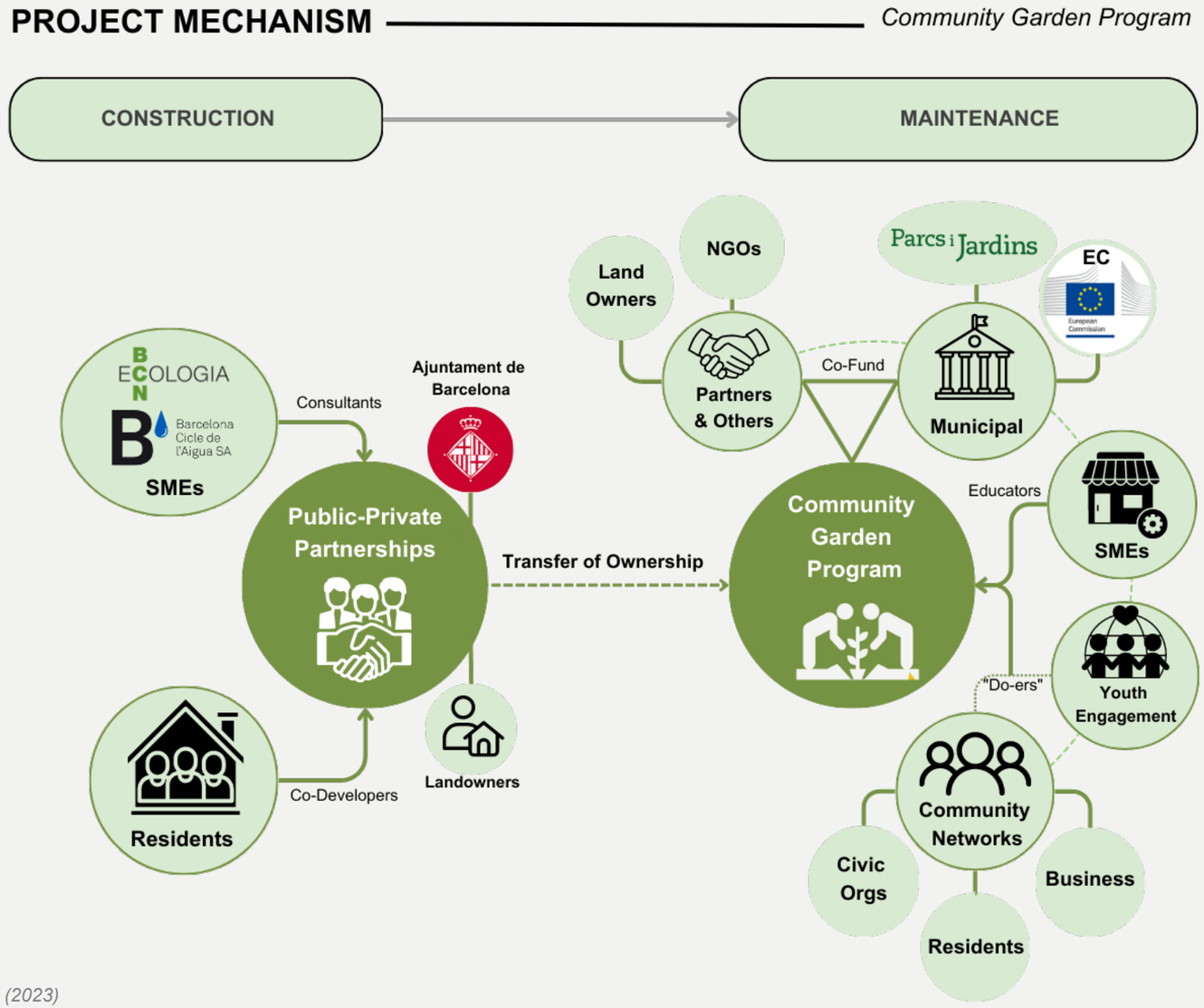
Mechanisms

Strategic implementation of the Community Garden Program involves first identifying and confirming who the key stakeholders are. Through public engagement, visioning exercises should be conducted for each neighborhood and roles and responsibilities can be allocated. The proposed plan is flexible and responsive to the needs of the communities such that each block can have variances. It is also critical to consider the environmental conditions associated with climate change in the space's design. Once the community garden is developed, ownership should be explicitly clarified (e.g., using the RACI matrix to identify different levels of involvement) through a volunteer process.

A RACI matrix is a project management tool used to clarify and define roles and responsibilities for each task or activity within a project or organization. The acronym RACI stands for Responsible, Accountable, Consulted, and Informed. A RACI matrix can help to ensure effective communication, reduce potential confusion, and increase accountability within a project or organization.

According to Ochoa et. al, (2019) required training on crop management and communication skills is critical in the beginning stages in order to further disseminate activities and limit a failure in maintenance. Lastly, a mechanism for continual engagement should be established for ongoing feedback and monitoring. This plan can be adopted in collaboration with the Green Infrastructure

Figure 19: Project Mechanism



Source: Studio Team (2023)

and Biodiversity Plan 2020 (Ajuntament de Barcelona, 2017) that aims to increase green space across Barcelona and the All Hands to Greenery Program under the Barcelona Nature Plan 2030 (Ajuntament de Barcelona, 2021), which engages residents in activities for climate adaptation.

Site Implementation in Nou Barris and L'Eixample

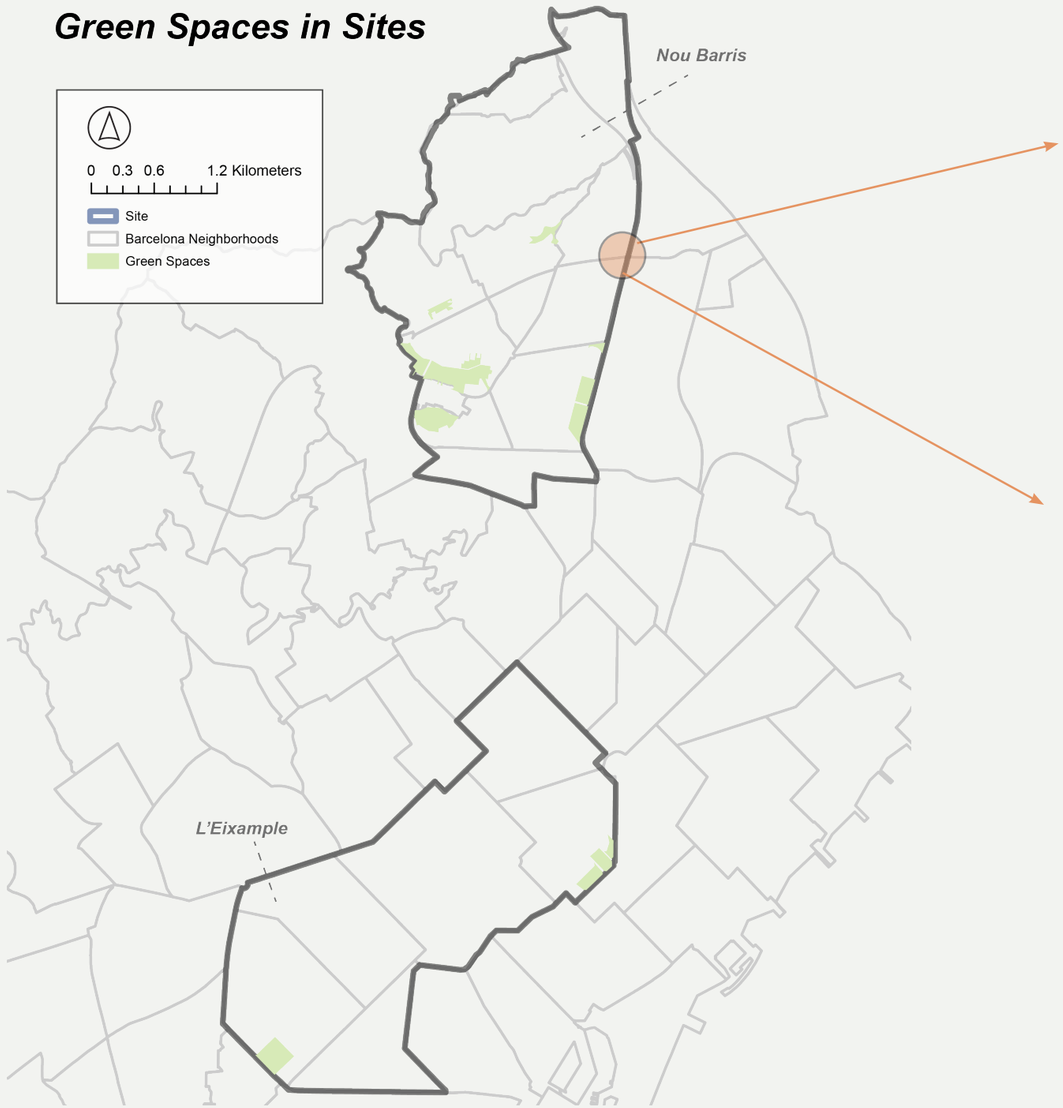
Implementation can look similar in both sites, such that both districts host inner courtyards where community gardens can be implemented. Nevertheless, there are some courtyards or public spaces in Nou Barris that are not enclosed. Because tourism is not prevalent in Nou Barris, there are no concerns of green gentrification in the case of public community gardens in that district. However, public gardens will require higher coordination as collaboration extends beyond one Superblock grid. Additionally, local and civic organizations can be specific to their locations. For example, the community in Nou Barris is primarily the elderly and young children. Therefore, incorporating youth engagement programs to sustain community gardens could be a reasonable approach. Furthermore, engagement or the means of communication will vary depending on the audience (Wood, 2017). For example, Social media may be an effective tool to reach students, while television and newspaper ads may be more effective in reaching the elderly. Furthermore, language is also a consideration. Residents in L'Eixample present a higher level of immigrants, which may require knowledge development and awareness raising in multiple languages.

The implementation of community gardens across neighborhoods can provide comprehensive benefits in both L'eixample and Nou barris. Howover, we have observed

Source: Studio Team (2023)

that there are unequal distribution of green spaces across the district, as shown in *Figure 20*, coupled with an uneven allocation of stormwater drains and permeable surfaces, which can be addressed through community gardens. This implementation can also improve climate and socio-economic resilience while protecting against gentrification. Furthermore, it can renew community engagement in isolated housing complexes such as the one located between Av. de Rio de Janeiro and Av. Meridiana. *See images to the right.*

Map 11: Green Spaces in Sites of Study (L'Eixample and Nou Barris)



Case Study: City Blossoms in Washington D.C.

Fostering Youth Engagement within Community Garden Projects

City Blossoms is a non-profit organization based in Washington, D.C. that utilizes gardening and environmental education to empower youth and build healthy, equitable communities (City Blossoms, 2021). City Blossoms works with schools, community organizations, and local residents to design and maintain gardens, provide youth-led programming, and promote sustainable and healthy living. One of the key programs offered by City Blossoms is the Youth Entrepreneurship Cooperative (YEC), which provides young people with the skills and resources to start their own gardening businesses. YEC participants learn about sustainable gardening practices, marketing and sales strategies, and business planning. They then use these skills to sell produce and garden products at farmers' markets and other local events. City Blossoms also offers a variety of other programs and resources for youth, including after-school garden clubs, summer camps, and workshops. The organization emphasizes hands-on learning and encourages youth to take an active role in planning and maintaining the gardens.

City Blossoms accomplishes its mission through five focus areas that incorporate free or affordable in-school and out-of-school programming, community engagement opportunities, resources and trainings:

Early Growers: Works with children ages 2 to 5 using its bilingual early childhood curriculum, First Harvest/Nuestra Primera Cosecha, to design age-appropriate gardens and programming to help participants make their first connections to nature and food

School Garden Partners: Collaborates with elementary and middle schools to incorporate gardens into their programming over multiple years.

Youth Entrepreneurship Cooperative: Enables high school students to develop job readiness skills while learning environmental and food justice concepts.

Community Green Spaces: Provides interactive gardens to create green spaces where youth and adults can interact with their environment and explore their creativity

Training & Resource Development: Offers trainings with a cultural connectivity lens and produces sharable resources, such as the bilingual cookbook, Garden Gastronomy/ Gastronomía del Jardín, for educators and community members

The organization employs a diversified funding strategy that includes donations, grants, earned revenue, and community partnerships. The organization engages in community partnerships and collaborations with other organizations to leverage resources and share expenses. For example, the organization partners with schools and community organizations to build and maintain gardens, and it collaborates with local businesses to host fundraising events and other activities. Overall, City Blossoms is an innovative organization that is helping to transform urban communities through gardening and environmental education. Its focus on youth engagement is a key aspect of its approach, as it seeks to empower young people to become leaders in their communities.

Figure 20: City Blossoms cultivates the well-being of communities through creative programming in youth-driven gardens.

Source: City Blossoms

Case Study: NYC Parks Stewardship Program & City Parks Foundation

A Case of Government & NGOs Working together. Government owns their own program + also provides funding & partnership with NGOs doing similar work.

NYC Parks Stewardship Program
The NYC Parks Stewardship Program is a volunteer program that engages New Yorkers in the maintenance and stewardship of the city's parks and green spaces. The program is run by the New York City Department of Parks and Recreation, and it aims to promote community involvement in park maintenance and enhance the health and well-being of the city's green spaces (NYC Parks, 2019). The NYC Parks Stewardship Program offers a wide range of volunteer opportunities, including tree planting and care, gardening, park cleanup, invasive species removal, and ecological restoration.

In addition to volunteer opportunities, the program offers training and educational opportunities to help volunteers build their skills and knowledge in park stewardship. This includes workshops on topics such as tree care, composting, and habitat restoration, as well as volunteer leadership training.The program also emphasizes youth engagement, and offers a variety of opportunities for young people to get involved in park stewardship. This includes youth conservation corps programs, after-school gardening clubs, and environmental education programs. Overall, the NYC Parks Stewardship Program aims to empowers communities and youths to take an active role in the maintenance and enhancement of their city's parks and green spaces. The program's focus on volunteerism, education, and youth engagement helps to build strong and resilient communities that value and protect their natural resources.

City Parks Foundation
The City Parks Foundation Program (CPF) is a non-profit organization that also works to improve and maintain parks in New York City. CPF was founded in 1989, and its mission is to empower communities to take an active role in improving their local parks (City Parks Foundation, 2022). The foundation operates a variety of programs and engages with youth in a variety of ways, providing programs and activities that are designed to promote learning, healthy living, and community engagement. Some of the ways that CPF engages with youth include:

Environmental Education: CPF offers a range of environmental education programs that teach young people about ecology, sustainability, and conservation. These programs are designed to help students connect with nature and develop an appreciation for the environment. In addition, the program also offers a science education and mentorship program for girls from underrepresented communities called the "Green Girls" program.

Sports and Fitness: CPF operates a number of sports and fitness programs in parks across New York City, including free tennis lessons and youth running programs. These programs are designed to promote physical activity, teamwork, and healthy habits.

Performing Arts: CPF's SummerStage program brings free music and performing arts events to parks across the city. These events provide young people with opportunities to experience live performances, develop their artistic skills, and connect with their communities.

Leadership Development: CPF offers a range of leadership development programs for young people, including mentorship programs and internships. These programs provide youth with opportunities to develop important skills and gain experience in areas like event planning, community engagement, and environmental advocacy.

Funding:
The NYC City Parks Foundation (CPF) is primarily funded through a combination of government grants, private donations, and corporate sponsorships. CPF receives funding from the New York City Department of Parks and Recreation, which provides grants for some of its programs. The organization also receives funding from various private foundations and corporations that support its mission of improving and maintaining parks in New York City. The organization also holds annual fundraising events, such as galas and benefit concerts, to raise funds for its programs. Corporate sponsorships are another important source of funding for CPF. The organization partners with a variety of companies that provide financial support for its programs and events in exchange for brand recognition and other benefits. This diverse range of funding sources allow the organization to continue its work of improving and maintaining parks in New York City and providing programs and activities that benefit the community.

Overall, CPF works to make New York City's parks more accessible, vibrant, and sustainable, while also providing opportunities for people to connect with nature and each other.

Case Study: Budapest

The ZUGkert community garden in Budapest is an example of public organization, for the purpose of creating more social cohesion and interaction. These community gardens take up “unused or under-utilized urban” (Ochoa, 2019), spaces. The community garden trend was started by the Center of Contemporary Architecture’s, in Hungarian, Kortárs Építészeti Közpon (KEK), lecture series, which then expanded to civil organizations implementing the strategy. Along with the help from other NGOs, community gardens grew in popularity all over Budapest. The first step was to educate the public on the benefits of community gardens and how to maintain them, then, the implementation. KEK takes pride in other communities that independently created their own gardens based on the previous work (Kortárs Építészeti Közpon, n.d.).The community benefited from the garden socially, culturally, and economically, as they were producing some of their own food.

Funding: While the government did not have any involvement at first, “the private sector showed considerable interest in the concept. Garden management deals with hotels and big companies like IBIS and Telekom, and more private landowners were responding positively to the idea” (Mseddi, 2022). Later, the government started to participate, once they saw the successes, by delegating their land to be maintained and used by the community.

How this mechanism can be elevated. Adoption of this mechanism can be implemented more broadly to support the maintenance of public spaces and other green infrastructure. The key idea of this initiative is to leverage existing capabilities, support existing infrastructure, plans, and policies, and transfer ownership to the local level through limited training e.g., picking up after themselves. The initiative highlights that collaborative ownership of social impact that begins at the individual level.

Stakeholders involve relevant municipal departments (Institut Municipal de Parcs i Jardins, Institut del Paisatge Urba, Barcelona City Council, Manager’s Office for the Environment and Urban Services, Barcelona d’ Infraestructures (BIMSA), etc.) and local administration to identify constraints within their budget and guide local communities on best practices in maintenance. Other stakeholders involve local communities (businesses, civic and professional associations, trade unions, foundations, universities, schools, etc.) to participate in community service activities and adopt skills and education to sustain maintenance. National or global networks (e.g., More Sustainable Barcelona (B+S) network) can also be utilized to source subject matter expertise or secure additional funding.

Source: The Urban Activist

02 FLOOD RISK MANAGEMENT CO-DESIGN

The initiative takes forward analysis conducted by researchers in collaboration with BCASA, in charge of pluvial rain management, and EBro Observatory (URL-CSIC), in charge of drought management (University of Barcelona, 2022). Following severe floods in 1996, the city had implemented rainwater retention basins and improved its flood management system to mitigate the impact of flash floods throughout the city (2022). However, in areas where storm water tanks are structurally difficult to implement, there is a lack of drainage due to impermeable surfaces, which creates socio-economic vulnerabilities by positioning communities in these areas vulnerable to property damage and safety concerns. Therefore, the initiative proposes community co-design of solutions in these areas, such as L'Eixample to improve awareness of flooding hazards and citizen participation in solutions such as the introduction of real-time flood reporting applications which can organize co-design workshops with the community members.

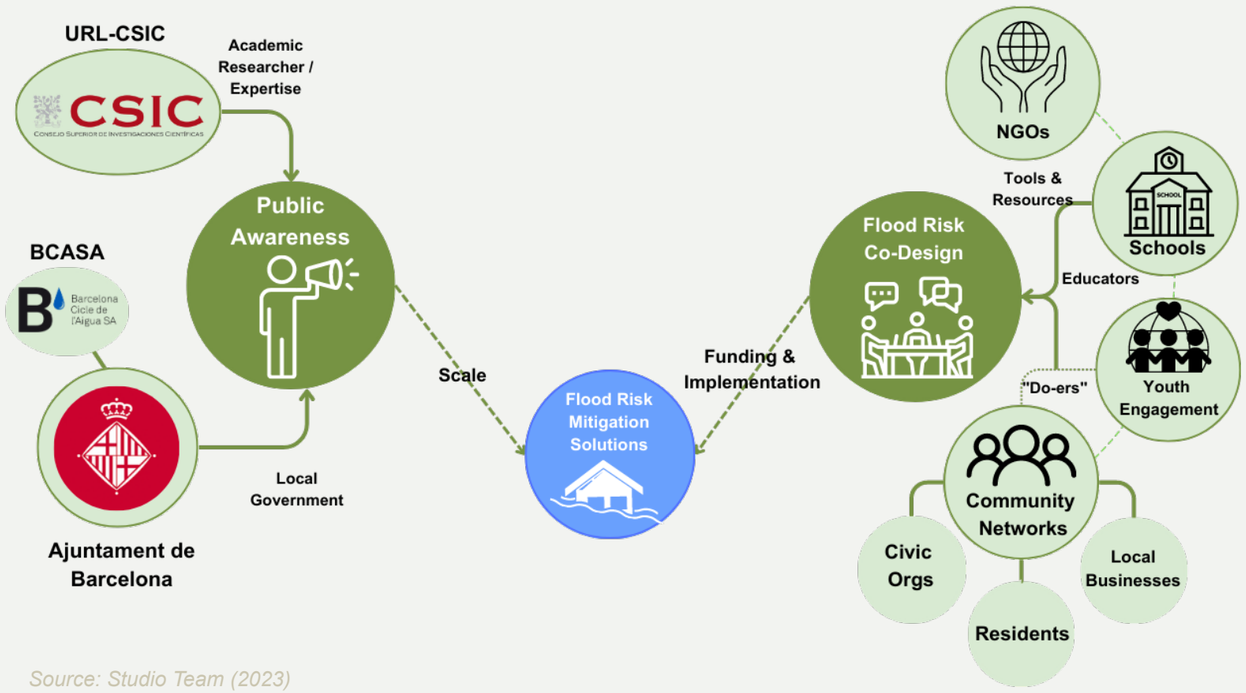
The initiative is critical because there is a lack of awareness of the risk of flooding among residents due to city-wide structural improvements that have reduced flooding as mentioned above (University of Barcelona, 2022). While the government has aimed to improve greening throughout the city to reduce impervious surfaces, studies have shown that hazards to pedestrians and socio-economic assets exist throughout the city, particularly in areas of high impervious surfaces (Russo, B. et. al, 2020). Moreover, greenery is not equally distributed such that certain communities are more vulnerable. Thus, improved public awareness and citizen participation will help reduce vulnerabilities incurred by social inequity as well as provide mitigation efforts throughout the city, regardless of district. Tailoring solutions to community specific-issues also addresses gaps within each community that will dictate the infrastructural design of adaptation measures.

There are two parts of stakeholder involvement: first, to improve public awareness of flood hazards and mitigation strategies; second, to co-design solutions for flood-prone areas. The first requires subject matter expertise (e.g., BCASA and URL-CSIC) to improve warnings and provide guidelines for the public to follow. The latter is driven at the community level in collaboration with schools and local businesses in order to co-design urban design solutions to mitigate flood risk. BCASA and URL-CSIC should then leverage existing platforms such as the Telecare Service, which sends mass messages for care services and Fonts BCN mobile app, which allows people to check their locations for drinking fountains (Ajuntament de Barcelona, 2022) to inform the public on flood hazards and mitigation strategies. At the community level, the Sustainability Participatory Council, which consists of elected representatives from the More Sustainable Barcelona (B+S) network of schools, businesses, NGOs, and universities (Barcelona City Council, 2022), can help connect local communities with local resources. The network, which was established in 2002, can ease the process of sourcing specific skill sets and funding to build design solutions. The key next step in implementation is then to identify high-risk flood prone areas and collaborate with key stakeholders to set up the necessary platforms for information sharing and engagement. Following the initial set up, the network is leveraged to create co-design programs for high-flood-risk areas. Programs require collaboration from NGOs (to fund), local community stakeholders (to design), and SMEs (to consult). For example, the I-CHANGE project focuses on this challenge through funding from Horizon 2020 funds (EU) and participation from the University of Barcelona (University of Barcelona, 2022).

For example, The Raval Theatre in Barcelona includes an "eco-innovative planting and watering system that is entirely self-sufficient" (European Green Capital, n.d.). The project aimed to improve water quality, reduce consumption, and limit water loss. This project was co-design and implemented by local architecture and engineering firms in 2013. Monitoring is then conducted through a citizen's information office. Thus, the initiative tailored solutions based on local initiative to improve its climate resilience capacity. Once created, the community continues to retain ownership to monitor the maintenance and impact of the project, such that communities become accountable for their own health and safety. As shown in this case study, the initiative leverages existing networks and programs to improve social capacities through citizen participation. It also improves public awareness in the process of creating local solutions that address specific community needs and vulnerabilities. This initiative ensures that citizen participation is constant, and not just part of the information gathering process. This is particularly important because most climate resilient measures have taken place at the municipal level, thereby isolating the public from key information relevant to their health and safety. Furthermore, by collaborating with schools, businesses, and NGOs, there is less reliance on government funding to implement solutions for climate adaptation.

Figure 21

PROJECT MECHANISM — *Flood Risk Management & Co-Design*



Source: Studio Team (2023)

Case Study: Transnational flood partnerships (FPs), Germany, France and Luxembourg

(Hirsch Hadorn et al., 2008; Clark et al., 2004; Elzinga, 2008)

Flood risk management requires the interaction of different stakeholders, and a platform for such interactions was created with the introduction of Flood Partnerships (FPs) in the Mosel and Saar watersheds. FPs are voluntary partnerships of communities, towns, and counties in a watershed or along a river reach aimed at reducing flood impacts through common activities and implementation of common flood risk reduction measures. FPs facilitate the transfer of information about new flood risk and hazard maps, coordination of local and regional emergency response services, adaptation of local and regional planning processes, discussion of conflicting demands regarding the use of flood-prone areas, and provision of information and advice for the population in the establishment of protective private measures and insurance policies.

In some FPs, single communities are beginning a participatory approach towards communal flood risk management plans (FRMPs). This approach involves workshop series with the population, where the steps of a goal-oriented, problem-solving, and participatory approach are performed. The workshops involve presenting potential flood problems, setting goals for flood risk management, discussing the potentials and limits of flood risk studies, and identifying other goals related to flood risk and protection that are financially viable. The process can be defined as transdisciplinary since the public combines their norms and values in the exchange with specialists of different involved disciplines. Preliminary results from pilot projects show that the methodology is successful, and it is perceived as a long-awaited step in the right direction, especially in communities where technical flood protection is not feasible due to economic or environmental issues. The level of rejection and negative comments is much lower when the population is involved in the identification of possible solutions. The exchange between partners has also led to the acceptance of measures that are generally possible and those that cannot be realized, and the respect of the public towards the involved experts and the administration has increased.

The use of such participatory and transdisciplinary approaches in flood risk management is a step towards a successful and sustainable approach. This approach considers the different viewpoints of the stakeholders involved and involves them in the decision-making process. It ensures the identification of measures that are not only technically feasible but also socially acceptable and financially viable.

Case Study: Davao City, Philippines

A recent project was conducted to develop a comprehensive methodology for enhancing flood resilience by improving society-wide disaster literacy under the governance formed through the active participation of all levels of stakeholders in Davao City, Philippines. Specifically, the development of the Online Synthesis System for Sustainability and Resilience, which integrates different disciplines, and the fostering of Facilitators, whose role is to interlink the science community and society, were implemented in a co-designing manner by the collective governance body. The development of basin- and barangay-scale hydrological models realized real-time flood forecasting and climate change impact assessment to identify intensified flood risk under the future climate. Co-designed e-learning workshops were held to foster about thirty Facilitators and help them produce twenty-one risk communication plans and workshop designs for fourteen barangays considering geographic, demographic, economic, and social features that they can utilize for public dissemination related to climate change adaptation to the target audiences in society.

Case Study: Managing Green Spaces in Kumasi, Ghana

In Africa, and particularly in Ghana, Republic of South Africa, Nigeria, Kenya, Nigeria and Uganda efforts have been made to strengthen community participation in planning systems as a means of giving local people a voice in local and national planning projects (Wilson et al., 2015; Okpala, 2009). Notwithstanding the various legislative arrangements put in place to promote participation of local people in the management of urban resources in Ghana, studies have shown that urban green spaces are rapidly disappearing from Ghanaian cities, especially Accra and Kumasi due to poor management practices (Fuwape & Onyekwelu, 2011; Langer & McNamara, 2011; Quagraine, 2011). The situation in Kumasi is worse since the city which was once given the accolade the garden city of West Africa has now lost much of its green spaces due to poor management practices (Adjei Mensah, 2014a, Asare, 2013).

Source: Studio Team (2023)

Case Study: East Side Coastal Resiliency Project

The East Side Coastal Resiliency Project (ESCR) is a large-scale infrastructure project aimed at reducing the risks posed by coastal storms and flooding in New York City (NYC.gov, 2023). The project was initiated in response to the significant damage and disruption caused by Hurricane Sandy in 2012 (NYC.gov, 2023). The ESCR is being developed through a participatory design process that involves a wide range of stakeholders, including local communities, government agencies, design professionals, and academic institutions (ESCR Project Proposal, 2022).

One of the primary elements of the participatory design process employed in the ESCR is the emphasis on community engagement and input. The project team has conducted numerous public workshops and meetings to gather feedback from local residents and business owners regarding their flood risk-related needs and concerns (NYC.gov, 2023). In addition, the team has utilized various outreach methods, such as social media and online surveys, to extend participation to a broader audience (NYC.gov, 2023).

Another crucial aspect of the participatory design process utilized in the ESCR is the integration of technical analysis and modeling with community input. The project team has leveraged various tools, including flood modeling software and geographic information systems (GIS), to analyze flood risk and identify potential solutions (NYC.gov, 2023). Nevertheless, these technical analyses have been augmented by community-based data, such as residents' knowledge of local flood patterns and historic flooding events (NYC.gov, 2023).

The participatory design process implemented in the ESCR also underscores the significance of collaboration and partnership among different stakeholders. The project team has closely collaborated with local and state government agencies, academic institutions, and design professionals to develop innovative solutions based on best practices and emerging research (ESCR Project Proposal, 2022). Furthermore, the project team has engaged in collaboration with local organizations and advocacy groups to ensure that the project is responsive to the needs of vulnerable communities and avoids exacerbating existing inequalities (ESCR Collaboration and Partnerships Report, 2023).

Source: NYC Parks

03 SOCIAL HOUSING NETWORK

Barcelona has been attracting international investment and tourism, which has contributed to the process of gentrification in certain neighborhoods. The increase in demand for housing, coupled with rising property prices, has resulted in displacement and changes in the socio-economic dynamics of some areas in the city. Gentrification has been most prominent in neighborhoods such as El Raval, Poble Sec, Sant Antoni, Gracia, and Poblenou, among others.

Factors driving gentrification in Barcelona include urban renewal projects, real estate speculation, tourism, and the growth of the creative economy. Gentrification can result in displacement of long-time residents, loss of affordable housing, changes in the cultural identity and character of neighborhoods, and increased inequality (Sanchez-Aguilera & Gonzalez, 2021). There have been various community responses to gentrification in Barcelona, including grassroots movements, social mobilization, and advocacy for affordable housing and tenants' rights.

This initiative seeks to amplify public engagement and ownership through participatory design competitions and workshops focused on shared housing in Barcelona. Participatory design is an approach to design that involves the active participation of stakeholders, including end-users, in the design process. The goal of participatory design is to ensure that the resulting product or service meets the needs and expectations of the people who will use it. Participatory design can increase a sense of ownership among stakeholders in several ways. By involving stakeholders, including end-users, in the design process, participatory design can help them to feel more invested in the final outcome. When stakeholders are involved in the design process, they are empowered to have a say in how the final product will look and function. By involving stakeholders in the design process, they gain a better understanding of the constraints and trade-offs involved in the design process. This understanding can lead to a greater appreciation of the final product or service and a greater sense of ownership over it. Finally, when stakeholders have a say in the design process, they can often personalize the final product or service to better meet their needs and preferences.

Ultimately, each neighborhood group would be co-designing the shared housing model that would be implemented in their neighborhoods, with residents also attaining equity over the housing organization.

Housing cooperatives are community-based organizations that provide affordable housing options to their members. As with any community-based organization, public awareness and education are critical components to ensure that the cooperative's mission, values, and objectives are understood and supported by the wider public. In this context, public awareness and education networks play an essential role in promoting and sustaining housing cooperatives. Additionally, housing cooperative networks are important because they bring together groups of housing cooperatives and their members to work collectively towards shared goals. For example, networks allow cooperatives to share resources such as tools, equipment, and expertise, which can help individual cooperatives save money and improve their operations.

Housing cooperatives play a significant role in Barcelona's housing landscape as a form of affordable, community-led housing. These cooperatives are driven by the principles of self-management, participatory decision-making, and social cohesion, and they provide an alternative model of housing provision that prioritizes the needs and interests of residents.

Examples of housing cooperatives in Barcelona include Sostre Civic, an umbrella organization with 900 members developing multiple projects, and La Borda, a smaller cooperative owning a single building. These cooperatives are directly managed by their members through regular assemblies and governing councils, with differences in governance and decision-making processes based on size. Larger cooperatives may have professionalized technical departments, while smaller ones often rely on voluntary organization and external interdisciplinary support. Housing cooperatives in Spain are classified as "protected housing", which imposes budget constraints, limits on dwelling floor areas, and eligibility criteria based on income and housing need. However, cooperative housing allows for a higher degree of experimentation in form and materialization compared to public or private sector housing, as it is self-managed. This gives dwellers direct control and decision-making powers throughout all project phases and creates a horizontal relationship with technical consultants.

Cooperative housing projects also prioritize social gathering and communal spaces, promoting shared activities and communal life as part of their ethos. While some of the projects analyzed in the article, including La Borda, are recognized as important prototypes, they often result from competitions and have varying levels of project resolution and engagement with future dwellers. Despite contravening existing regulations, these projects were still awarded housing development sites, indicating the willingness of the administration to review regulations and redefine housing through transformative design projects.

By working together, housing cooperatives can advocate for policies and regulations that benefit their communities. Housing cooperative networks can coordinate advocacy efforts across multiple cooperatives, amplifying their voices and increasing the chances of achieving policy change. Additionally, housing cooperative networks provide a platform for cooperatives to share their experiences, best practices, and challenges with one another. This can help to improve the effectiveness and efficiency of individual cooperatives, as well as foster innovation and creativity in the sector as a whole. Housing cooperative networks can also provide training, education, and other capacity-building resources to help individual cooperatives strengthen their operations and governance.

Existing housing cooperative networks, such as Sostre Civic can leverage their technical expertise, resources and contacts with local community groups to organize participatory design competitions and workshops, in partnership with design studios in Barcelona such as Arquitectura per a l'Educació, Futurity Studio and LaCol. Additionally, it would be imperative to engage city-level decision-making stakeholders including Institut Municipal de l'Habitatge i Rehabilitació de Barcelona (IMHAB), and specifically for sites of Superillas implementation, the BCN Office of the Chief Architect.

This is an opportunity for the Institut Municipal de l'Habitatge i Rehabilitació de Barcelona (IMHAB), the Barcelona public office on housing, to collaborate with private and non-governmental actors including local NGOs, design studios and existing housing cooperatives. The collaboration can issue a city-wide competition, calling for submissions from neighborhoods interested in building shared housing models (including housing cooperatives) in their areas to participate.

Scale of Participation:
City-wide participation on solution building for affordable housing/gentrification related challenges. Neighborhood groups have a say in defining solutions implemented in their blocks Opportunities to combine Superblocks implementation with addressing issues of socio-economic resilience as well, particularly focused on affordable and social housing solutions.

- Local neighborhood groups: local neighborhood groups can play a crucial role in building and supporting housing cooperatives. These groups can provide a platform for residents to come together, share information and ideas, and organize around issues related to housing and community development. Neighborhood groups imperative to involve in sites of Superillas implementation include Associació de Veïns i Veïnes del Fort Pienc (L'eixample) and Plataforma d'Afectats per la Hipoteca (Nou Barris).

- District scale: La Borda is a unique housing cooperative project located in the Sants neighborhood of Barcelona, Spain. It is a community-led initiative that was developed to provide affordable and sustainable housing options in the city. The project was initiated by a group of individuals who were interested in creating a cooperative living space that prioritized social and ecological values. After years of planning and fundraising, the La Borda project was finally completed in 2019, providing 28 units of affordable housing to its members.

- District scale: Sostre Civic is a housing cooperative located in Barcelona, Spain, that was created in 2015 in response to the growing housing crisis in the city. The cooperative aims to provide affordable and sustainable housing options for its members, while also promoting community engagement and social justice. The cooperative currently has two buildings, which provide a total of 48 units of affordable housing to its members. Sostre Civic works closely with local organizations and initiatives to promote social and environmental sustainability, and to support marginalized and vulnerable communities in the city. Members of the cooperative are also involved in organizing cultural and social activities, which help to foster a sense of community and belonging.

Benefits / Impact
1. Access to affordable housing: One of the primary benefits of housing cooperatives is that they provide an affordable housing option for members. By pooling resources and sharing expenses, members can enjoy lower housing costs than they would in the private rental or ownership market. This is especially important in Barcelona, where housing prices have been rising rapidly in recent years.

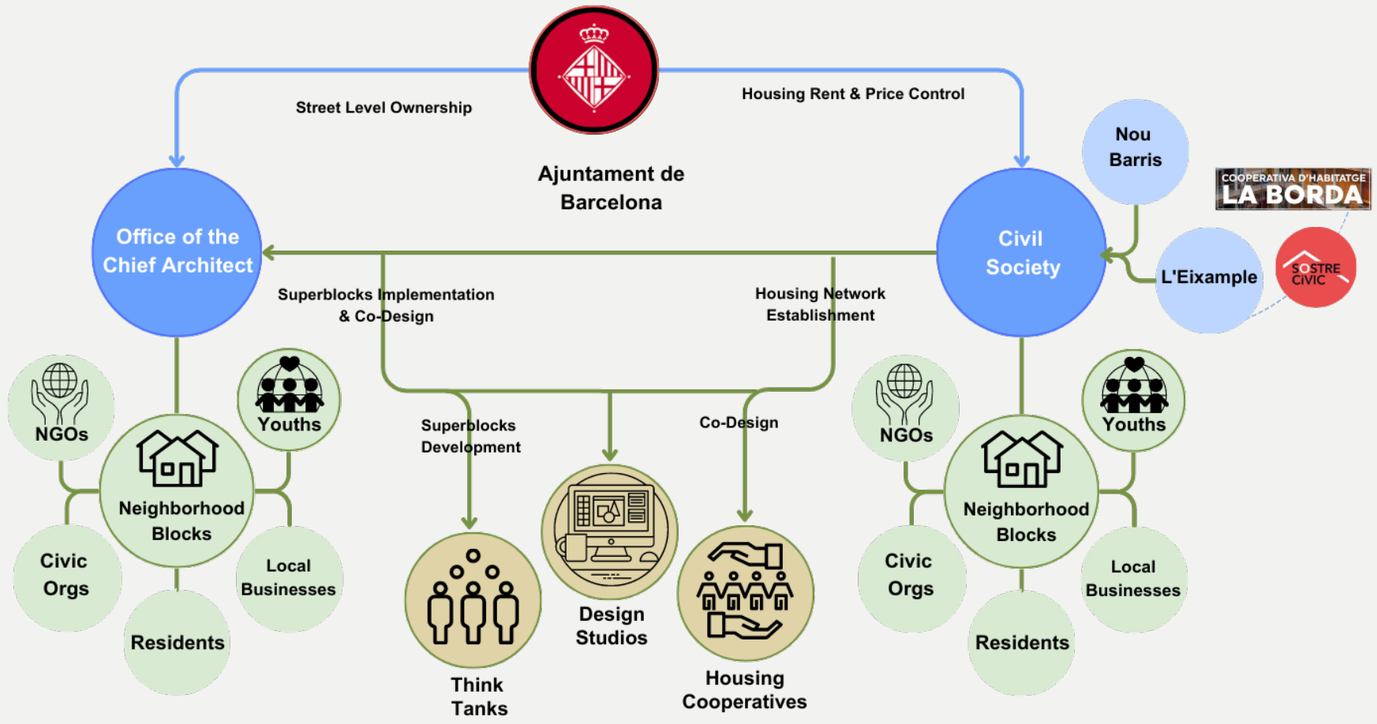
2. Democratic decision-making: Housing cooperatives are typically governed through a democratic process, with decisions made by members through a voting system. This can help ensure that all members have a say in important decisions related to their housing, and that decisions are made in the best interests of the community as a whole.

3. Empowerment and self-determination: By creating their own housing cooperatives, members can take control of their housing situation and become more empowered in their community. This can lead to greater self-determination and a sense of pride and ownership in their housing and neighborhood.

4. Advocacy and policy change: Housing cooperative networks can also work together to advocate for policies and initiatives that support cooperative development and affordable housing options more broadly. By building a collective voice, cooperative networks can help drive change and address the root causes of the housing crisis in Barcelona.

Figure 22

PROJECT MECHANISM — *Social Housing Network & Co-Design*



Source: Studio Team (2023)

Site of implementation:

L'Eixample

Based on the Barcelona Special Tourism Accommodation Plan (PEUAT), the Eixample district falls under Zone 1, a dedicated negative growth area, where no new tourist accommodations are permitted. Additionally, within our analysis of the gentrification index, L'eixample scored the highest in risk in terms of gentrification across Barcelona, considering socio-demographic, economic and housing-market based indicators. Therefore, L'eixample has the highest opportunity areas as well as highest level of urgency for the implementation of the social housing network program.

The social housing network program, therefore, can be implemented in tandem with the implementation of the Superblocks in L'eixample. Leveraging the newly established PEUTAT act, accommodations currently used for the purposes of tourism can be the first areas of implementation of neighborhood-based shared housing models. Existing housing cooperatives, such as La Borda, La Col, and La Fabrica del Sol for example, must first be consulted and involved in the co-design process, along with local neighborhood groups such as the Associacio de Veins.

Nou Barris

Civic participation in Nou Barris is characterized by active engagement and involvement of residents in local decision-making processes and community initiatives. The district has a strong tradition of grassroots activism and citizen participation, with various opportunities for residents to contribute to the development and improvement of their neighborhood. One prominent platform for civic participation in Nou Barris is the District Council (Consell de Districte). The District Council serves as a representative body that includes elected officials, neighborhood associations, and representatives from various sectors of the community. It provides a forum for dialogue, consultation, and collaboration between residents and local authorities.

Nou Barris also has a network of neighborhood associations (associacions de veïns) that play a crucial role in promoting civic participation. These associations bring together residents from different areas of the district, providing a platform for them to discuss common issues, organize community activities, and advocate for local needs. Furthermore, the district leads in Barcelona in innovative citizen participation methods, including participatory budgeting initiatives, allowing residents to directly participate in the decision-making process regarding the allocation of public funds for neighborhood improvements. The aim is to empower citizens and involve them in shaping their own communities by giving them a voice in determining local priorities (Ajuntament de Barcelona, 2020).

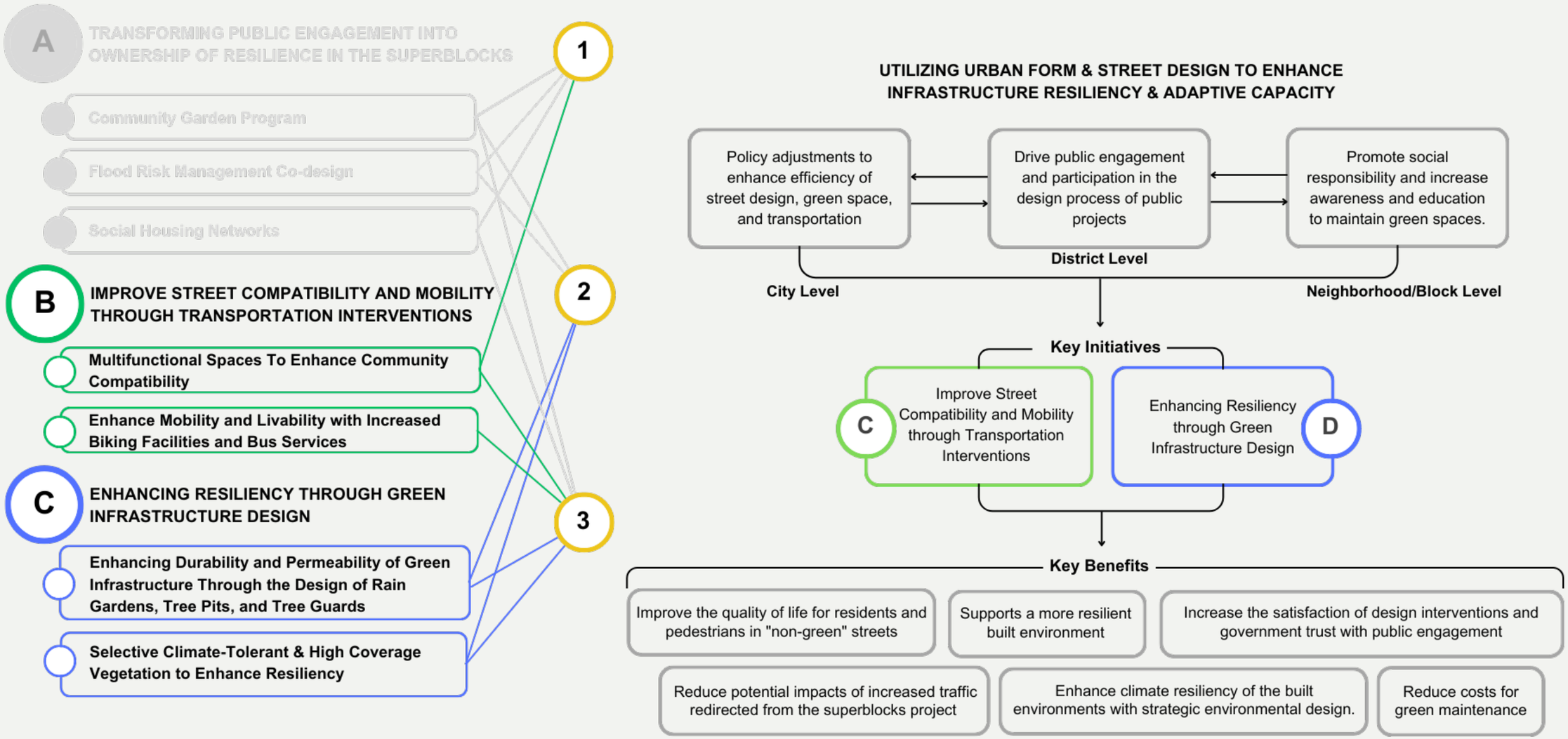
In 2022, the Cooperativa Sostre Cívic handed over the keys to 32 flats in Pla dels Cirerers, making it the fifth cooperative housing project in the city and the first to reach Nou Barris. The block, located on municipally owned land, consists of 32 homes and offers various shared spaces such as a library, communal kitchen, rooftop, and laundry spaces (Barcelona.cat, 2022).

Given the highly engaged civil society in Nou Barris, and that the district is comparatively at a lower risk in relation to gentrification, the housing cooperative network program can leverage the district's strength in co-developing effective housing network strategies throughout the city. Civil society organizations and citizen groups in Nou Barris, particularly for this program, can function as leaders in participatory systems and aid in the development and expansion of housing cooperative networks throughout the city, particularly in high-risk areas.

Source: Studio Team (2023)

Proposal B & C

Figure 23: Proposal B&C Framework



Source: Studio Team (2023)

QUALITY OF NON-GREEN STREETS

In order to better solve the problems on transportation and street designs, our team decided to learn from other countries' experience. Our team investigated actual practices from Denmark and the U.S, looking for solutions to better enhance compatibility among pedestrians, private cars, and bikers and increase the street life in communities.

1. MICRO SCALE GREEN MAINTENANCE & URBAN DESIGN INTERVENTION

A Dutch Business Applying Woonerf

Source: Sunday (2017)

Case Study: Urban Design

Woonerf is a Dutch word translated as "living street," and it employs strategies like traffic calming devices and low speed limits to compel drivers to slow down and safely share street spaces with walkers, cyclists, and other users. The woonerf was invented from the Netherlands in the 1960s, and motorized traffic is only permitted at walking speed here.

The absence of continuous curbs, low speed restrictions, and traffic calming techniques are defining characteristics of models, even though they vary depending on local conditions and demands. The idea is similar to that of Complete Streets, which emphasizes non-driving modes through the design of traffic calming measures, street furniture, bike infrastructure, and other features that make streets safer and more comfortable for all users. The strategy, according to proponents, fosters social interaction, activates public space, and frees up more space for parks and other green areas (Steinberg, 2015).

The city of Amsterdam is applying Woonerf in many of their living and business streets. It made the city life better using the simplest way: people can walk with cars, biking with cars, and drivers can park on streets… and everyone else can enjoy the community.

Figure 24: Four Principles of a Woonerf

Source: Steinberg (2015)

Case Study: Complete Streets in the United States

Complete Streets in the United States
Designed to best accommodate all forms of transportation and pedestrians on a single street, with an emphasis on safety and inclusion, Complete Streets is a planning technique that has been adopted all over the United States. This planning method aims to make transportation more accessible through “sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crosswalks, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more” (Smart Growth America, n.d.). Two of the main goals through this planning method are reducing pedestrian and vehicular collisions and reducing vehicular emissions. There is also an emphasis on accommodating vulnerable populations through this planning, whether it be children, the elderly, people with disabilities, or historically disenfranchised communities, while promoting a healthier and more active lifestyle.

Complete Streets are considered to be a form of green streets, which implements green infrastructure, as they often include stormwater catchments, public transportation, and vegetation (Catchments, 2017). The implementation of this plan has been mostly seen in suburban neighborhoods but has been adopted by 37 states. One example of how this planning method aims to address safety and efficiency for disenfranchised communities is in Pittsburgh. They realized that relying on 311 data to determine where street safety needed improvement caused black and brown neighborhoods to go underfunded and create a high rate of crashes,so instead, they worked with schools to create safer crosswalks.

Take inspiration from Woonerf Design in Amsterdam and the Complete Streets Design in the U.S. are effective to solve the transportation limitation in Barcelona. The enhancement from these two designs can help the city solve problems in promoting resilience, safety and sustainable transportation of the non-green streets. The practices of the Woonerf and the Complete Streets can enhance the livability on streets especially for “non-green” streets, which further elevates the interactions between pedestrians to traffic like automobiles and bikes (Woonerf Design, 2012).

Just like the Woonerf streets in Amsterdam, Barcelona’s superblocks can learn from this idea through the way they slow down cars’ speed and set signals in front of the vehicles’ entrances. Using the design ideas we captured from Woonerf, we can expand the walkable streets’ spaces, plant more trees, and increase the biking distance in Barcelona superblocks’ districts. These methods can save parking spaces and improve streets’ quality among superblocks.

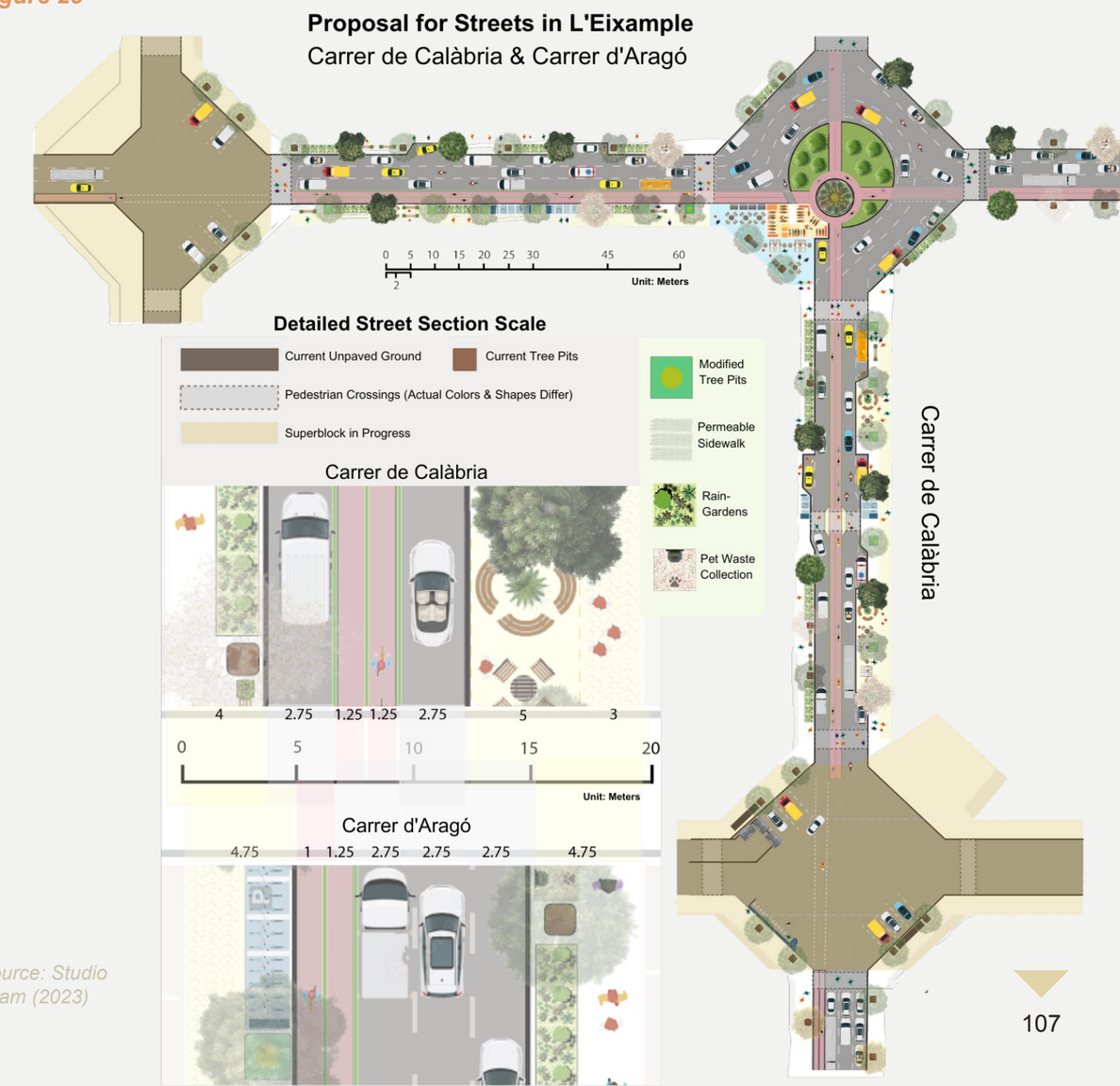
Urban Design/Green Maintenance Interventions
Nou Barris and L’Eixample have different spatial characteristics, including the transportation networks and streetscapes.

Nou Barris is a district located in the northeast part of the city lying on the mountain. The district of Non Barris relies more heavily on cars since there are a lot of uphills and downhills. T Streets are generally more narrow, and parking is a major problem here.

L’ Eixample, on the other hand, is a district that is located in the center of Barcelona. Superblocks have been implemented in parts of the L’Eixample, so people are more likely to walk and bike here instead of Nou-Barris as superblocks are pushing private cars out. Also, the more flatten geographic conditions may also encourage people to walk and bike. The streets are generally wider and more spacious than Nou Barris, and the streets design here should be more continuous and concise.

1. Urban Design - Street Intersection
Woonerf is an important intervention to the street intersections as we learned from case studies, and our team decide to apply it in both Nou Barris and L’Eixample The oasis in the middle of the Woonerf can serve as a part of a rain garden that increases the efficiency of green maintenance infrastructure. In meeting the requirements of enhancing walkability on streets, our team proposes to design a lot of multi-functional spaces in our interventions on the intersections between

Figure 25



Source: Studio Team (2023)

Carrer de Calabria and Carrer d' Arago. *See Figure 25*. In the proposed design, a quarter of the roundabout will be gated as a shared space, putting more benches and chairs for pedestrians to take a break. The shared space in the middle of street intersections can increase the continuity of street designs, which keeps up with resting areas in the streets of Calabria and Arago streets. In the multi-functional areas, residents can feel free to take a rest and enjoy a cup of coffee here in amplifying neighborhood relationships.

In response to the poor bike parking facilities on the streets of Calabria and Arago, the team sets more consolidated motorcycle parking spaces in the multi-functional used space on the street intersection [see figure xx, and it should be the pre-intervention bird's eye view picture]. The facility enhancement will bring safer and more fixed parking space for bikes, conducting a better biking environment for riders citywide. A system of digital management of motorcycle locks can be introduced to the mixed space of parking lots, ensuring the fees the government may add and the convenience of riders in storing their motorcycles.

The speed down street signs will be designed to be set in the street intersections as well. There will be more crossing lines added to street intersections, which also encourages people to walk through the narrowed streets rather than driving private cars. Slowing the speed of motor vehicles also improves the safety of both pedestrians and bike riders.

Figure 26: Multi-level Bike Racks
Source: Studio Team (2023)

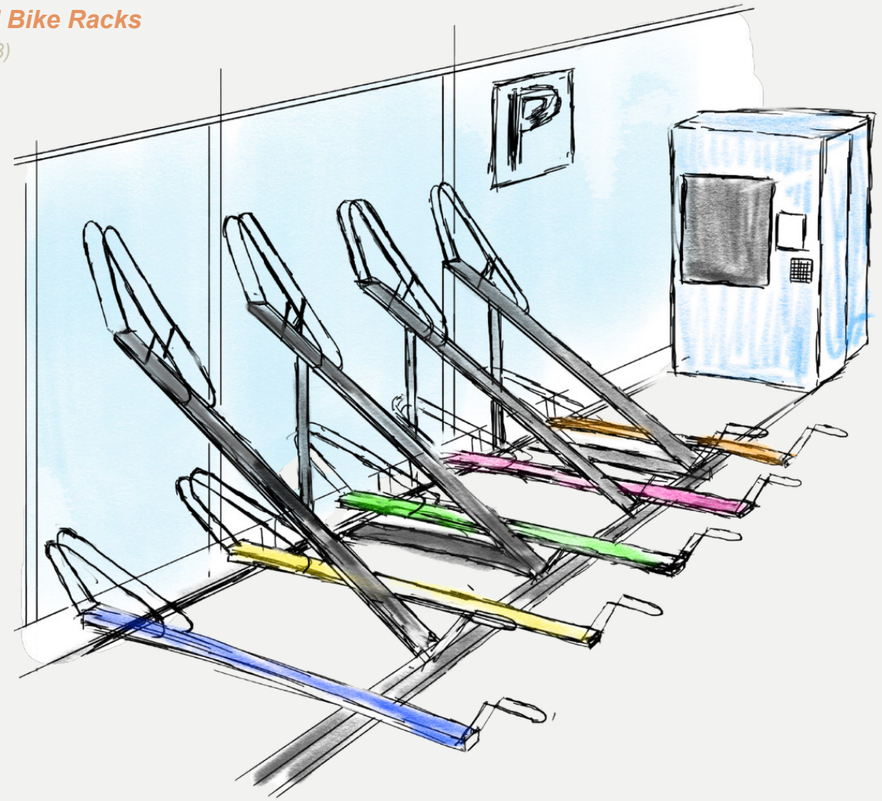


Figure 27: Streets in L'Eixample
Source: Studio Team (2023)

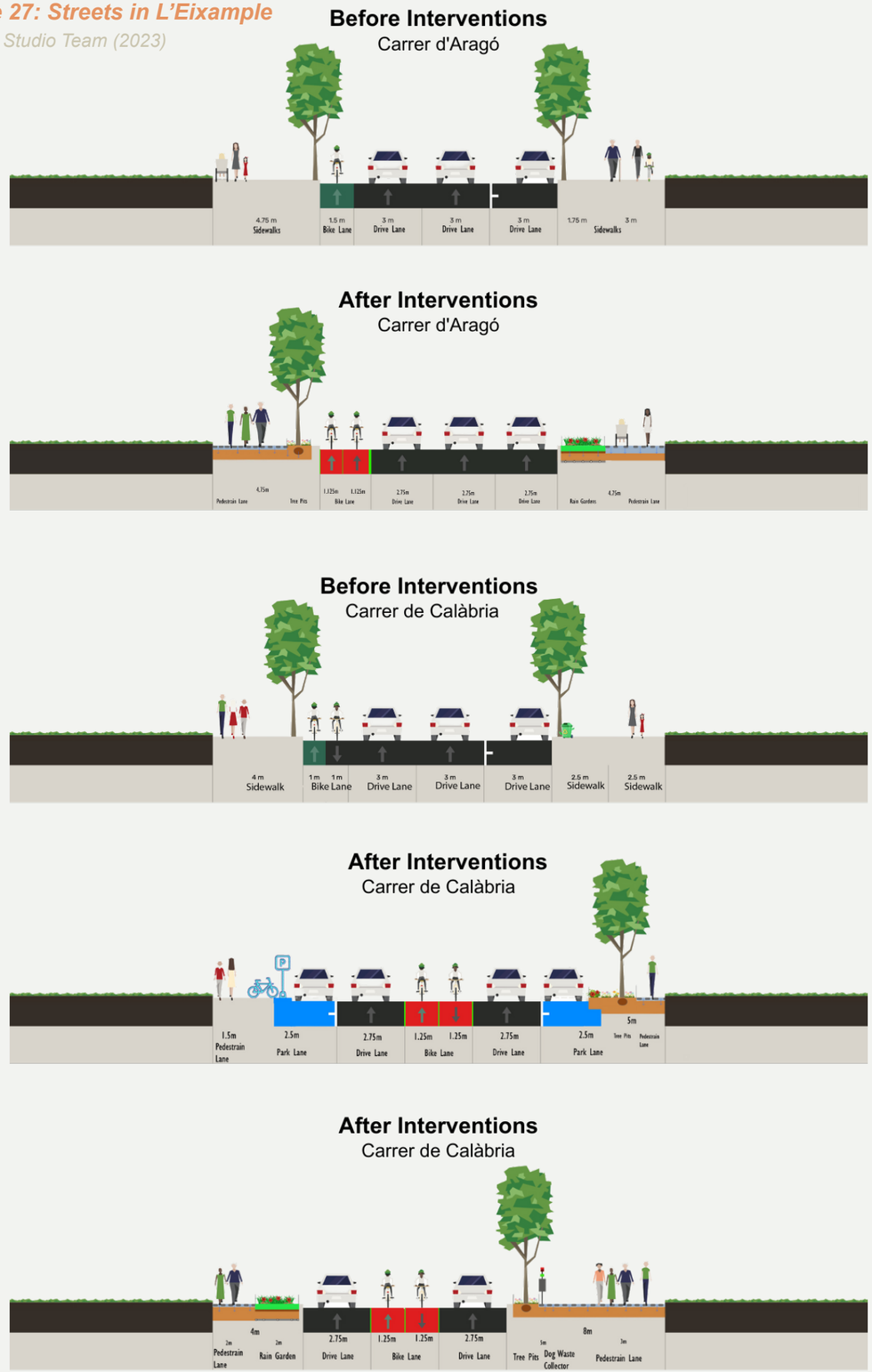
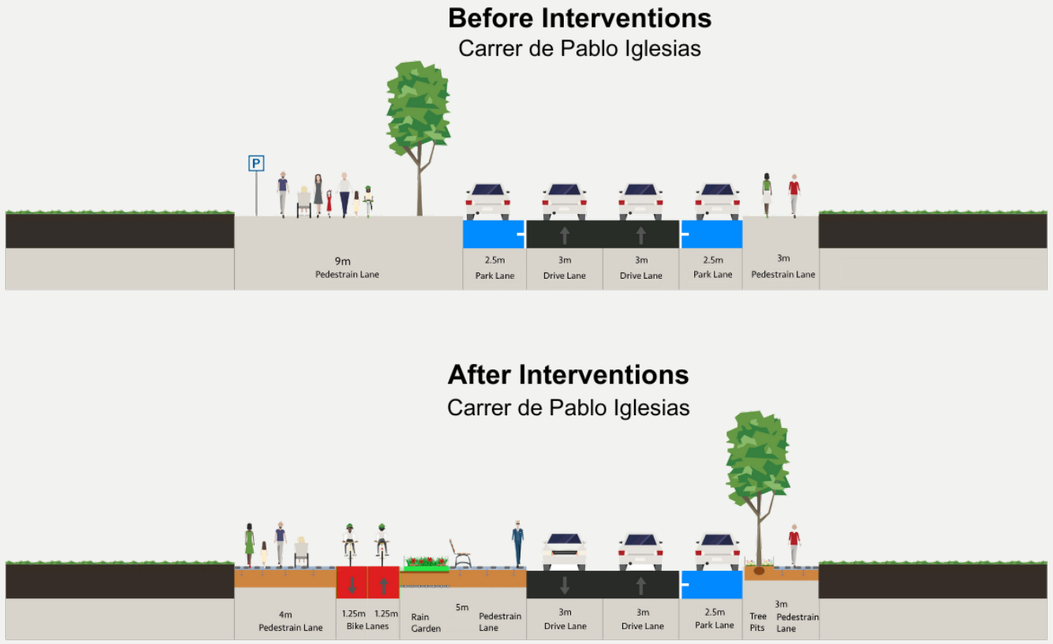


Figure 28

Source: Studio Team (2023)

When it comes to Nou Barris, the majority of the intersections will be used to expand the parking space. Our team proposed to design a shared space along the Carrer de Pablo Iglesias, and the multiple-used space will contain multiple amenities to provide space for relaxation and communications. Therefore, our team suggests to set some benches and rain gardens in this area to create a good sense of livability within the community.

Figure 29: Street in Nou Barris



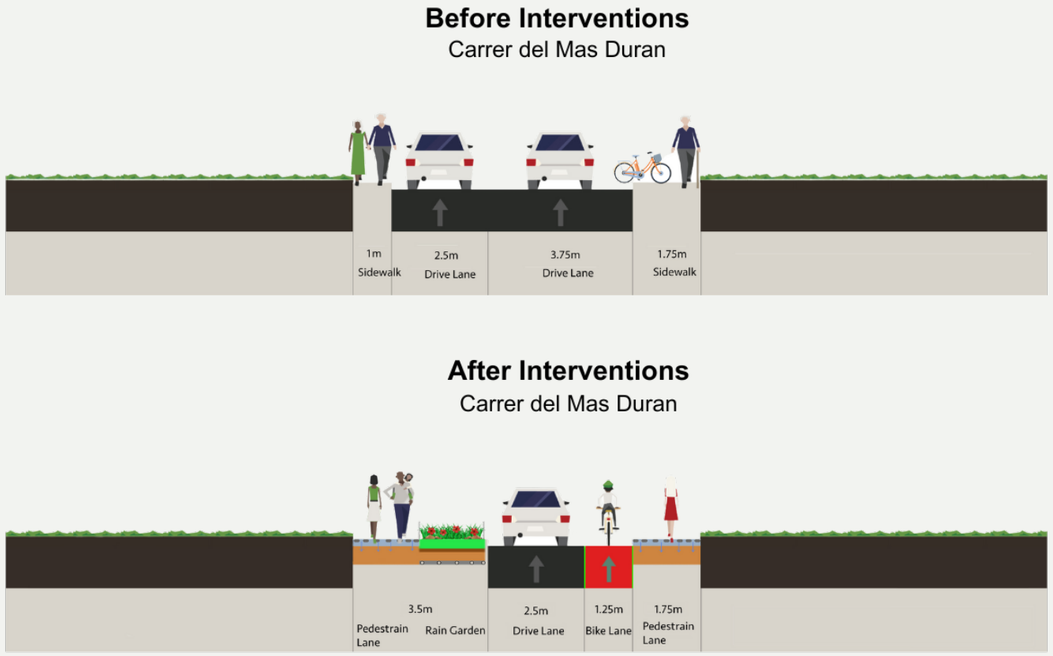
Source: Studio Team (2023)

Figure 30

Source: Studio Team (2023)

When it comes to the Carrer del Mas Duran, a very narrow street that only nine meters wide, several multi-level parking constructions were planned: secured bike parking and motorcycle parking smart station will be built, benches and relax areas will be set, and continuous tree pits and rain gardens will be designed in the delicate street intersections.

Figure 31: Street in Nou Barris



Source: Studio Team (2023)

2. Urban Design - Street Sections

For street sections, based on their different traffic volumes, we proposed to set two different intervention models on Calabria and Arago.

Our team suggests moving bike lanes to the middle of the street in Carrer de Calabria since it is not a major street, and the street signs can protect both bikers and pedestrians. Moving bike lanes to the middle can encourage people to choose to ride a bike instead of driving; riding bikes as a major method of transportation can not only reduce carbon usage but also aligns with design ideas of superblocks that push private cars out.

The removal of the whole-street bike lanes avoids the problem of illegal parking, which further reduces congestions brought by parking problems. Moreover, there will be some street parking spaces on both sides of the streets, but they will not take a full lane, but instead will be designed in segments. *See Figure 28 and Figure 30.* More bike stations will be built on the sides of pedestrian lanes beside the tree pits, and dog waste management facilities will be assigned on the side of pedestrian lanes.

Along with the streets, our team proposed to add more shared-spaces in pedestrian lanes, which is a continuity from street intersection parts. . In order to place the shared-spaces, our team expands the pedestrian lanes from five meters to eight meters in most of the places without parking lanes. The biggest changes of the pedestrian lane would happen underground, and we proposed to make the permeable pavements connected to the tree pits as the green maintenance intervention..

Our team did not propose as many changes to Carrer d'Arago as we proposed to Carrer de Calabria. Instead, we only proposed to extend the unidirectional bike lanes to cycling, making the whole street design more concise. Also, there will be more parking which will reduce illegal parking and its associated congestion.

When it comes to Nou Barris, even though the pedestrian lanes are very narrow, our team still proposed to plan dotted rain gardens along the Carrer del Mas Duran; additionally, instead of private cars and bikes sharing the same lane, for safety reasons, we propose a secure bike lane to separate bikes and cars.

Along with the Carrer de Pablo Iglesias, as the parking spaces are discontinuous and limited capacity, we proposed to establish secured parking spaces along the streets; in the middle of those parking curves, we propose some bike-sharing stations to introduce more electric bikes to attract more riders as the Non Barris a hilly district. A creation of space that accommodates flea markets and activities inside the community will be developed besides the parking space to increase the compatibility on street level. Based on the large pedestrian lane the street is currently having, we proposed to maximize the utility of sidewalks as we separated them into two sections and inserted two-way bike lanes in the middle. On the side where pedestrian lanes are wider than ten meters, the left part will be maintained as sidewalks, but the right part separated by bike lanes will be used as relaxation areas to contain a lot of benches and rain gardens. In the sectors of traffic lanes, some dotted inserted parking space will be proposed to add to maintain the street parking mode.

3. Green Maintenance Design

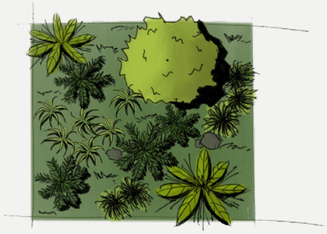
The green maintenance design will be based on rain gardens and tree pits on sidewalks. On the streets of Calabria, we proposed to add more facilities along the sidewalks such as dog waste management systems, tree pits, and rain gardens in fulfilling the requirements of the built environment inside the city. In addition, the pedestrian lanes of Carrer de Calabria are proposed to install permeable pavements to decrease the risk of flooding. The Carrer d' Arago will follow the interventions as Calabria but with wider pedestrian lanes.

Indeed, the original grass pits will be proposed to transform into a rain garden with more kinds of selected species of plants, improving the permeability and holding the water better than before. Furthermore, some unplanted grass pits are proposed to transform into tree-dominant tree pits for the same reason.

BARCELONA GREEN MAINTENANCE INTERVENTION

Figure 32: I. Rain Gardens

Source: Studio Team (2023)



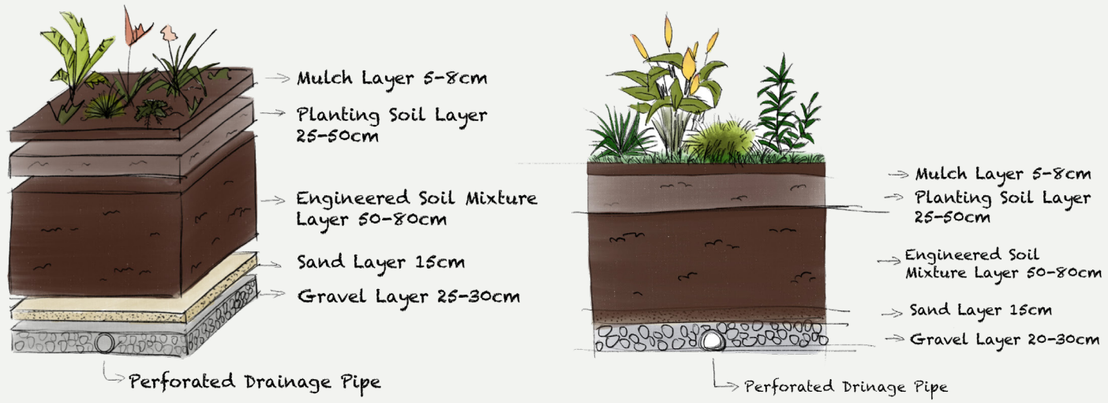
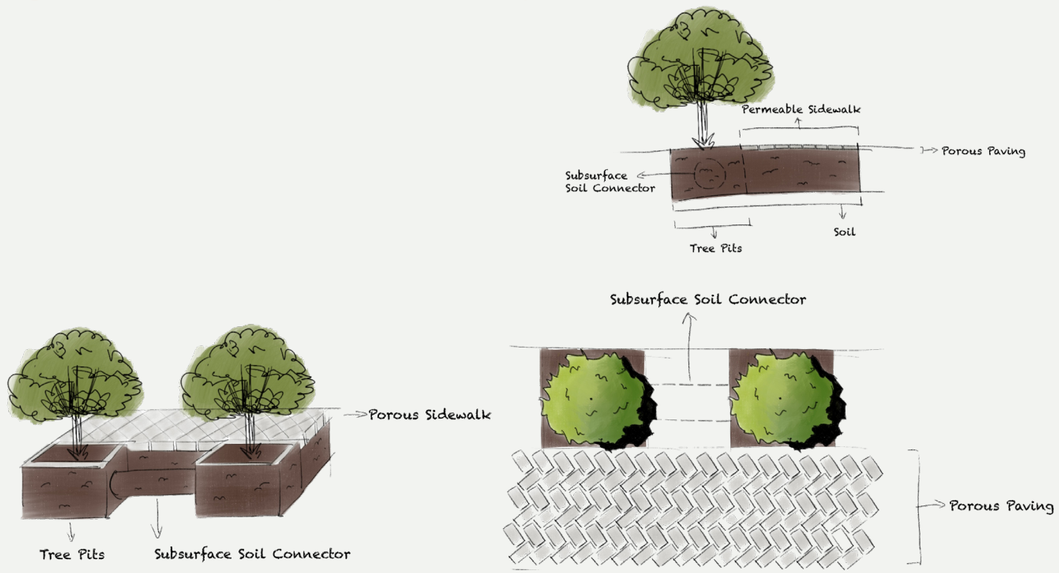
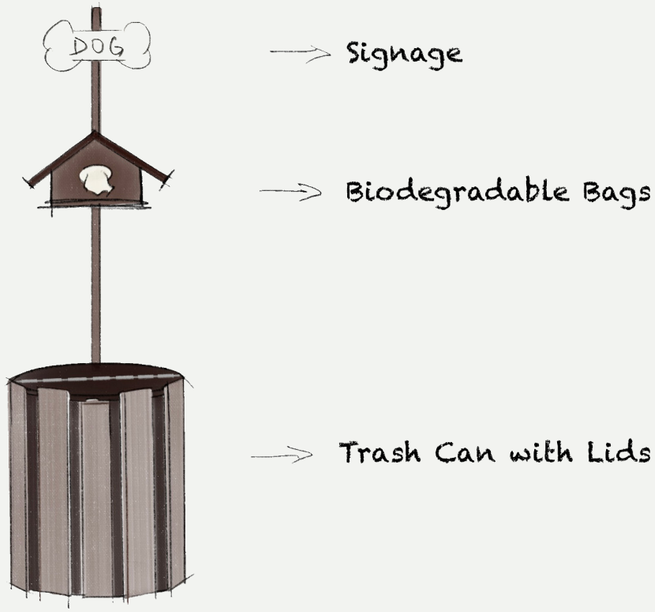


Figure 33: II. Tree Pits (Permeable Sidewalk)



Source: Studio Team (2023)

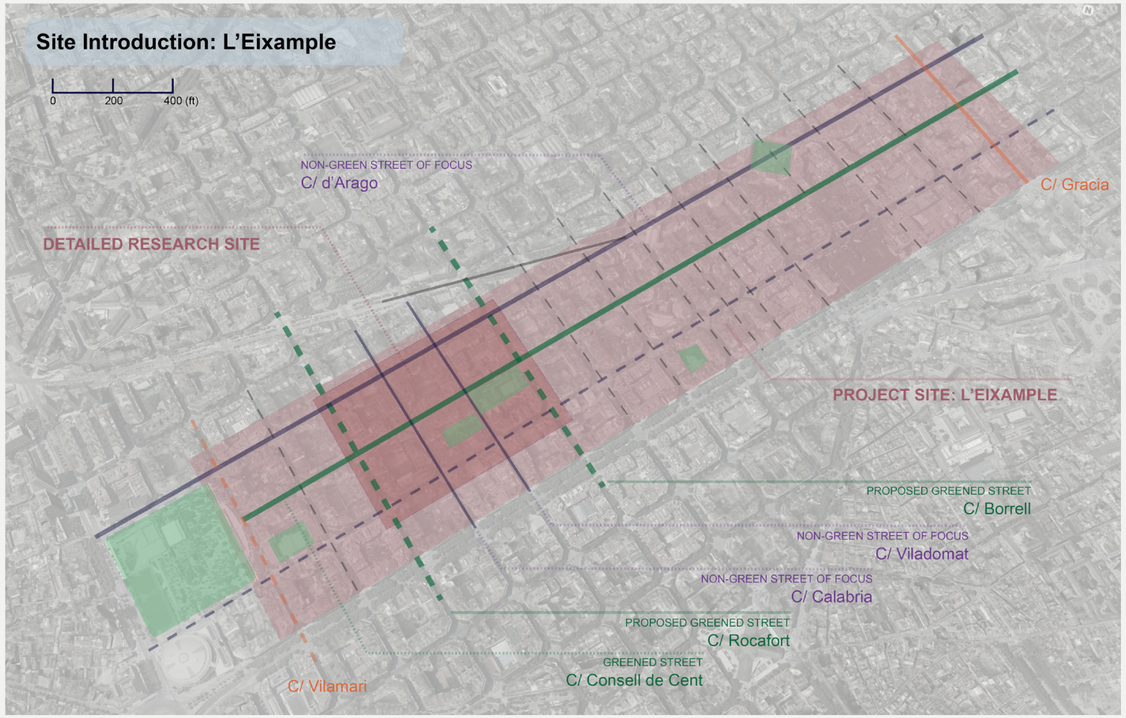
Figure 34: III. Pet Waste Management



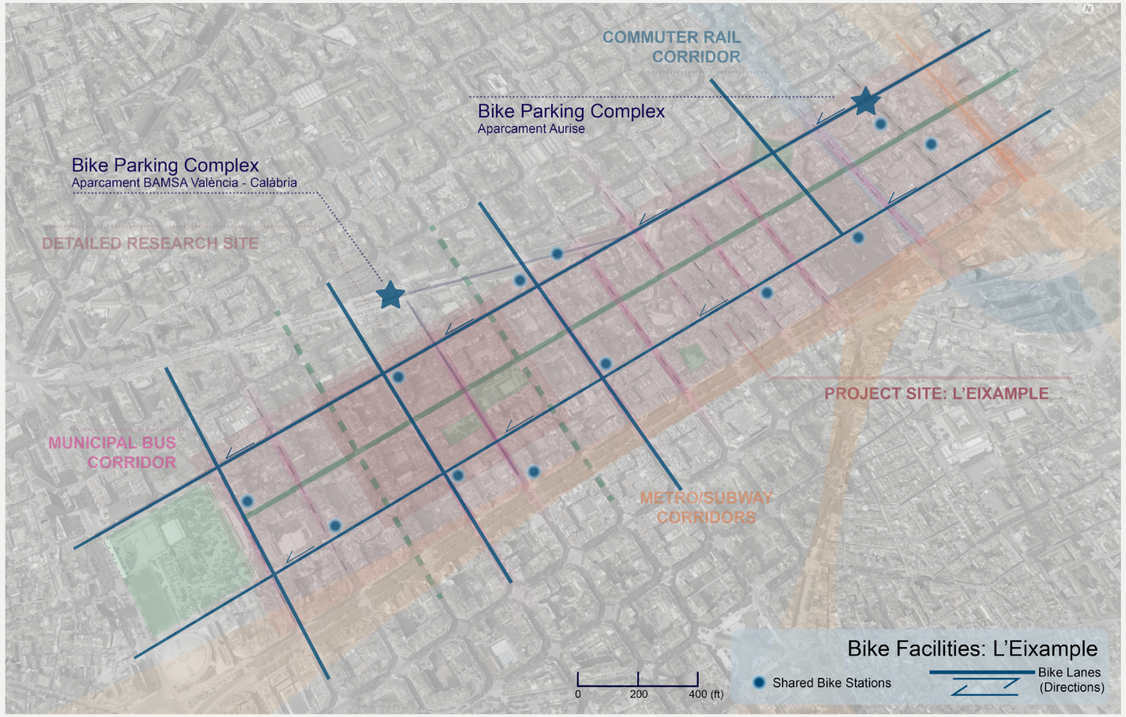
Macro-Scale Transportation Intervention

1. L'Eixample

Map 12: L'Eixample



Map 13: Bike Facility Locations

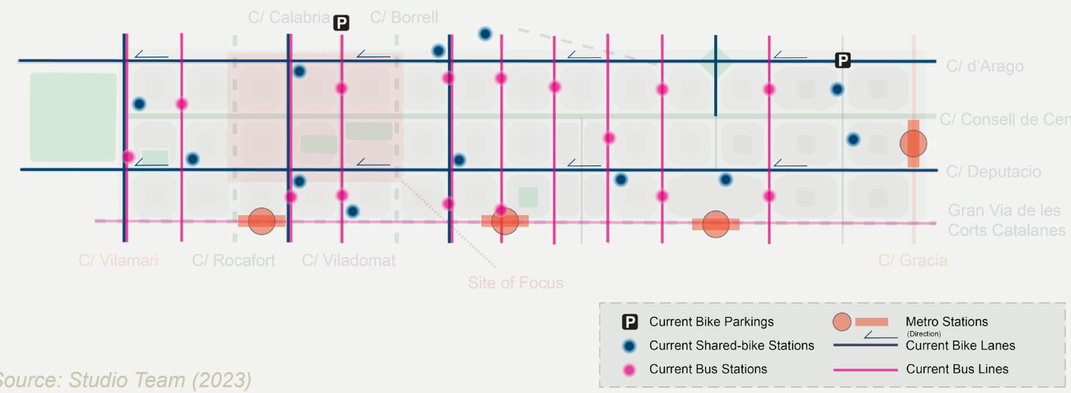


Source: Studio Team (2023)

Map 14: Transportation Situation in L'Eixample

Source: Studio Team (2023)

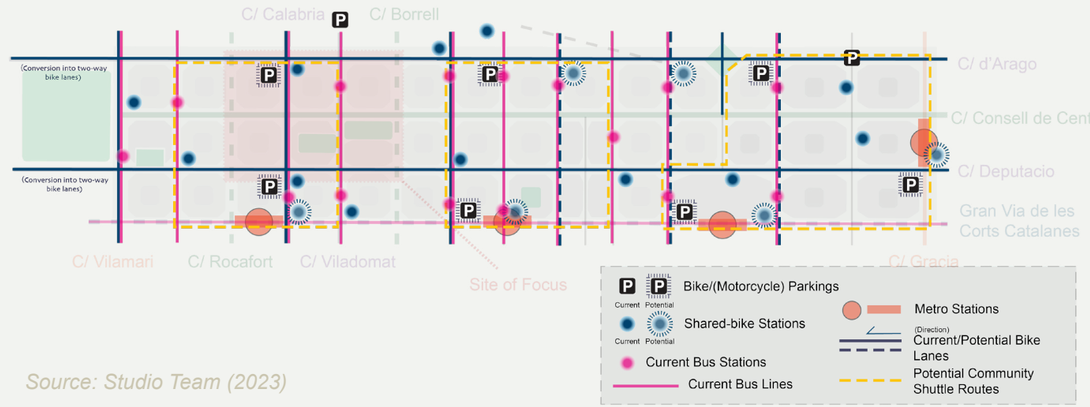
Figure 35: L'Eixample Transportation (pre-intervention)



Source: Studio Team (2023)

The Superblock planning model has already been implemented in parts of L'Eixample, so there is a need to enhance the bike facility transportation or bus services. During the field trip, our team observed that this site lacks a well-established public transportation that contains bike stations, entrenched bike lanes, enough permanent bus stations, and a steady Community Shuttle system.

Figure 36: L'Eixample Transportation Macro Level Intervention

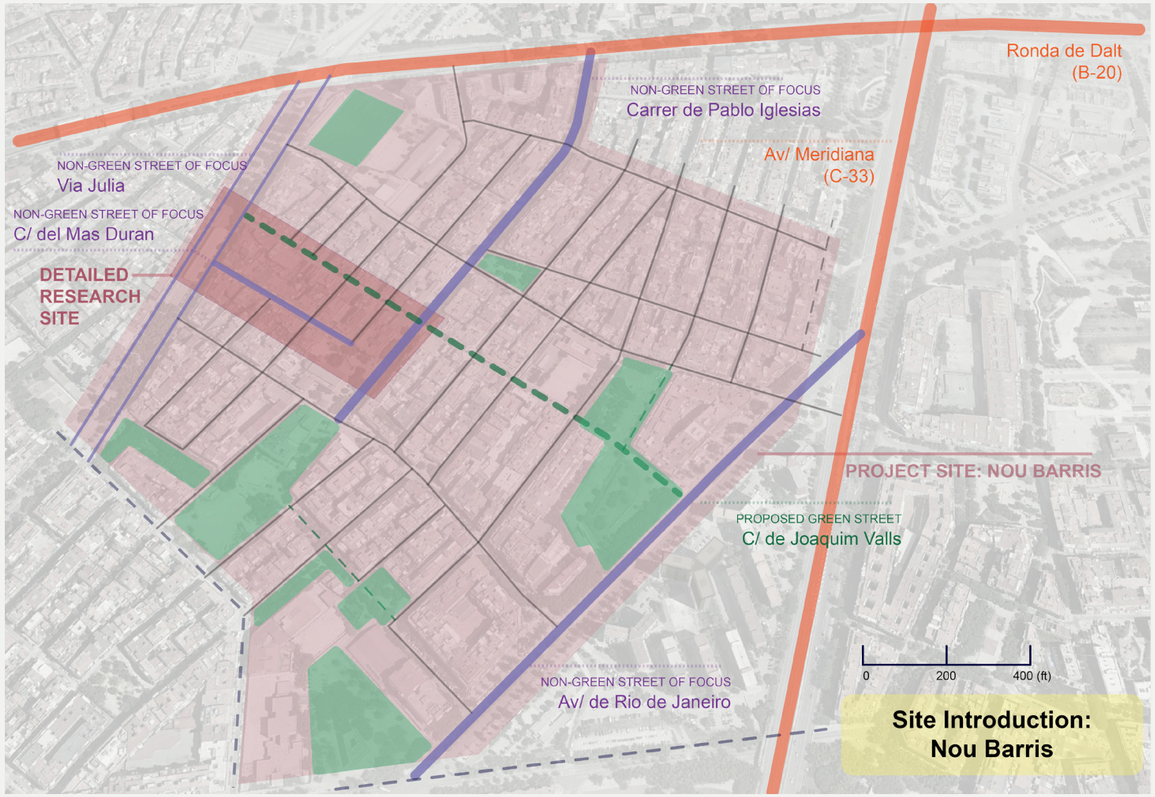


Source: Studio Team (2023)

For the macro level transportation challenges, we proposed to add a few bike stations and bus stations within the L'Eixample superblocks. In order to meet the desired goal of the City of Barcelona to reduce car dependency, our team proposes a strategy of reinforcing public transport. During our field trip, we observed that several bike stations are broken and insecure within L'Eixample; Therefore, our team proposed to add new stations to attract citizens to bike inside the superblocks inside of too much walking and driving. Furthermore, we propose to add new bus lines and stations in order to avoid long-distance walking and private car traffic. *See Figure 36.*

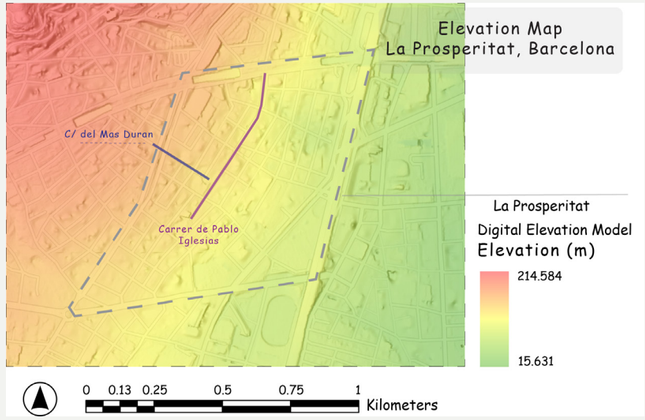
2. Nou Barris

Map 15: Nou Barris Site Introduction

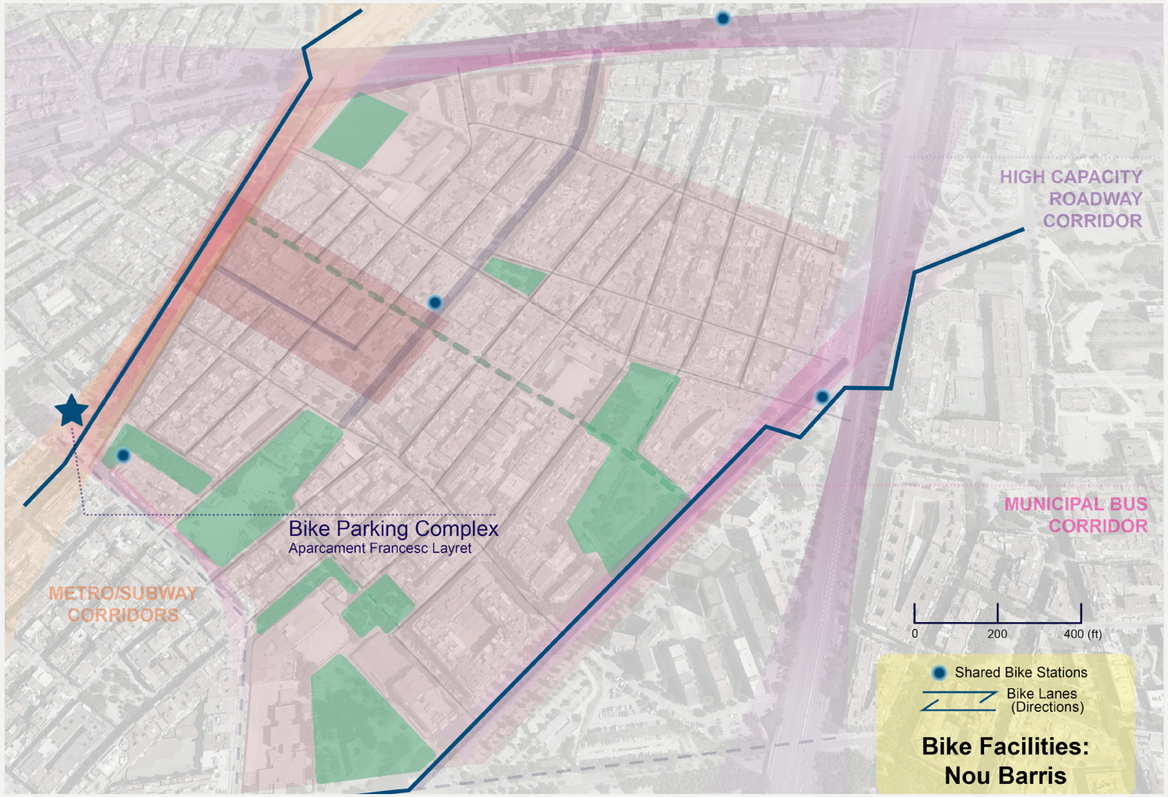


Source: Studio Team (2023)

Map 16: Nou Barris Elevation

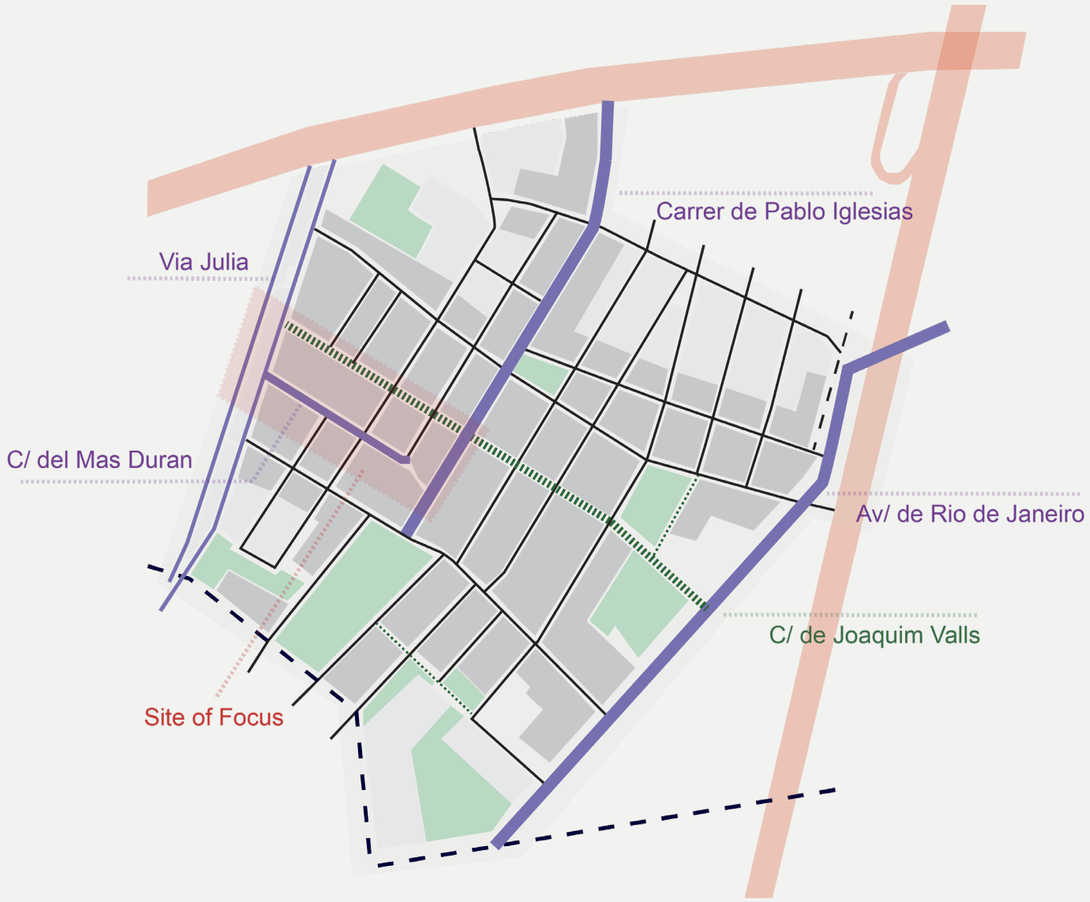


Map 17: Bike Facilities



Source: Studio Team (2023)

Map 18: Bird's Eye View of Nou Barris



Source: Studio Team (2023)

Map 19: Transportation in Nou Barris

Source: Studio Team (2023)

Map 20: Nou Barris Transportation (Original)

The site currently lacks valid bus lanes, bike facilities, and parking space; those limitations caused inconvenience, which means after arriving at Nou Barris via metro line, only transportation options within the district are driving or walking. The inconvenience of public transport is discouraging people to visit Nou Barris, which is negatively affecting its economic growth.

Map 21: Nou Barris Transportation Intervention

The proposed interventions take into account the fact that Nou Barris is a hilly district t. We also propose to add a lot of new bike lanes and separate them into two-ways or one-ways depending on the width of streets. We proposed to introduce more bike/motorcycle parkings in response to encourage more residents to bike instead of travel with private cars. More bus lanes and stations are also proposed to have more public transportation choices. The system of Community Shuttle is proposed to the community, providing more convenience and choices for residents who want to take public transport.

Promotion of Bicycle-Friendly Transportation Network

While the city of Barcelona considers the extension of bicycle facilities as one of the most important goals in the superblock plans, there is still a relatively limited bike-lane network, while non-core districts such as Nou Barris has a small portion of bicycle facilities as the strategy prioritizes increasing bike facilities first in core district and due to the terrains in the districts that discourages biking (Ajuntament de Barcelona, n.d.).The city has already started to implement an ambitious plan that will dramatically increase the number of bicycle-sharing stations and improve accessibility to biking with more bike lanes in the city (Superilla Barcelona, n.d.). However, the research team argues that aside from increasing the density of bike lanes, it is also crucial to promote user-friendly, efficient and aesthetic designs for bike lanes to achieve the transformation.

Comparing the case of Barcelona with multiple cities in Europe, the research team reviews in detail existing case studies of bike transportation network design in Amsterdam and Copenhagen. The city of Amsterdam in the Netherlands has constructed a comprehensive network that consists of individual two-way bike lanes with barriers from car lanes. The transformation of bike lanes from integrated one-way design into individual two-way sections can increase the efficiency of biking and protect cyclists from car flows. In addition, planners and designers in Amsterdam have attempted to install separated signals in bike lane crossings to further increase travel efficiency (Schwartz, 2011).To address the need to park bikes during working hours for commuting cyclists, the city has constructed numerous stacked mechanical bike parking facilities near subway stations and central business district (Mitra, 2023).

The city of Copenhagen has been widely regarded as one of the pioneers in promoting biking and walking instead of using private cars. While the city is famous for its redesigning of existing roads into bike lanes (and not as streets with partial bike lanes), the non-green street reconfiguration designs in Barcelona can borrow from the advanced design concepts of bike lanes in Copenhagen, where designers provide bike lanes with various and changing patterns that can artistically amuse cyclists and advertise images of the city (MT, 2021). Although the geography and terrain in Barcelona differ wildly from Copenhagen's, bike route designers can still learn from Copenhagen in providing bike-friendly infrastructures including cyclist bridges and cyclist coastline (Liverino, 2022). In addition to infrastructure construction, the city of Copenhagen also enacts several comprehensive regulations and design manuals for biking networks, and manages to create a biking culture in the city, which is a useful example for planners in Barcelona (Andersen, 2014).

Based on field trip observations, case studies in Amsterdam and Copenhagen, and quantitative data visualization, the team raises four proposals listed below:

1. Increasing the density and length of bicycle lanes.

Following the city's proposal in the Superblock plans that will add an extra 60 km to the existing bicycle lane network by 2024, the team proposes to construct and extend bicycle lanes on most roads that are considered appropriate for biking (excluding narrow neighborhood roads, hilly terrains, or freeways). In L'Eixample site, the unidirectional lanes will be converted into bike 'roads' with two directions, while in the Nou Barris site, more attention is given to incorporating existing terrains in designing a bike land network that best fits the narrower street pattern and the current road slopes.

2. Increasingly covered specific parking space for bicycles.

The team proposes to construct adjustable compact multi-level bike parking structures, which have been adopted by multiple Asian cities, along the intersection of modified non-green streets within the L'Eixample site, and along neighborhood-level corridors and public spaces within the Nou Barris site. Meanwhile, the team proposes that the city should enact related policies in transforming and adding specific spaces for bikes in municipal garages, and encouraging private garages to implement similar modifications.

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3. Enhancing capacities and completeness of bicycle lanes.

During the field observation, the team has found that existing bike lanes are often integrated with car lanes, while bike spaces are often occupied by cars in multiple scenarios when cars try to turn (left), make short stops, and during heavy congestions in peak hours. Along some of the two-directional lanes, only temporal barriers of very low height are placed in the middle. The lack of segregational barriers along bike

Figure 37: Smart multi-level underground bike parking in Tokyo, Japan

Source: Giken (n.d.)

lanes reduces biking efficiency and creates potential dangerous encounters between bikes and cars. As one of the urban design strategies, the team proposes to introduce permanent barriers that segregate bike lanes in both directions from car and pedestrian traffic, and potentially add greenery on the barriers to enliven the street environment.

4. Increasing the coverage and convenience of shared-bike stations.
As mentioned above, the city of Barcelona has a comprehensive transportation network which includes numerous modes in the metropolitan area. In its future transportation plans, the city has different targets to improve the existing network, such as adding new metro stations with line extensions, reconnecting tram lines, redesigning BRT network, and reconfiguring existing rail terminals into multi-modal transit centers (Superilla Barcelona, n.d.). Nevertheless, the research team has found that connectivity between different modes of transportation near and within the Superblock areas has been weak, especially for the connection among buses, bicycles and existing metro stations, which have been regarded as some of the most important transportation modes in the city's future. Through quantitative analysis, the team argues that bus stops are often far from bike parkings and shared bike facilities, while some of the major metro stations in the core downtown area still have non-(accessibility)-adapted exit(Transports Metropolitans de Barcelona, n.d.).

Comparing the case of Barcelona with multiple cities in Europe, the research team has reviewed in detail existing case studies of inter-modal connection plannings and designs in Munich and Vienna. The city of Munich has succeeded in integrating mid-distance commuter trains (S-Bahn), urban underground subway system (U-Bahn) and streetcars, which significantly increase the travel speed (with an extensive network of commuter rails across the city core) and system capacity in the core city area, in addition to the provision of accessible, seamless and informed connection experience between different modes of public transportation(Flint, 2013). The city also invests in an integrated location and monitoring system across different modes of transportation which can provide real-time information to customers, making the connection process even more efficient(IVU, n.d.). The city of Vienna, in addition to maintaining a comprehensive and classified public transportation network, proceeds even further in which 1) The city specifically designs all new bike routes and pedestrian walkways around public transportation node (Buehler & Pucher, 2016); 2) The city provides direct heavy-rail transit accesses to the reconfigured (and car-free) central old-town streets to enhance connectivity for public transit user (Buehler & Pucher, 2016); 3) The city emphasizes a coordinated development and operation between overground transportation (trams, buses) with underground transportations, mainly U-Bahn (Steinbauer, 2014).

While Barcelona is technically not a tram-dominated city like Vienna and Munich, transportation planners can utilize the planning ideas upon BRT system coordination in route planning and/or station siting, where the revised BRT system would allow better inter-modal connectivity. Meanwhile, planning institutions in Barcelona can consider the possibility of prioritizing bike route construction near transit nodes, placing bike-sharing facilities close to transit stops, and/or introducing a unified and comprehensive mobility information system across multiple transportation operators. Although buses generally carry bike racks in European cities due to density and time constraints, transportation planners can evaluate the possibilities of providing a bike-friendly bus/BRT network in the city of Barcelona, similar to numerous North American cities that maximize the connection smoothness between bikes and buses(US DOT, 2016).

Based on field trip observations, case studies of Munich and Vienna, and quantitative data visualization, the team suggests four proposals listed below:

1. Integrating shared-bike facilities, bicycle network, bus service provision and metro/commuter rail corridors.
The team proposes the placement of shared-bike lots and structured bike parkings approximate to existing metro/commuter rail stations, and relocates bus stops (if condition allows) near current biking facilities and/or metro/commuter rail stations in the city core to ease the transfer process among different modes of transportation. In L'Eixample site, the team is designing new shared-bike stations and bike parking facilities near the metro corridor on Gran Via de les Corts Catalanes (along metro line 1 and 2). In the Nou Barris site, the team is proposing a mini-terminal incorporating community shuttle buses, municipal buses, private bikes and shared-bikes near the metro stations of Via Julia (metro line 4). On the policy side, the team suggests more tolerant policies towards bicycles (in public transportation), and suggests potential modifications of local buses and BRTs with bike racks in the front which enables buses to carry full-size bicycles with ease (Trends in Japan, 2017).

2. Introducing community shuttle service with flexibility.
To further enhance the connectivity between the site area with rapid public transportation in L'Eixample, and to increase the public transportation coverage within the Nou Barris site, the team proposes the city of Barcelona to incorporate community shuttle service that links metro stations with local-and-neighborhood level streets within both sites. Similar to other European cities that have already initiated the service, community shuttles can enhance micro-scale mobility, encourage residents to choose transit during their travel, improve mobility equity, and partially reduce the operational pressure of mainline municipal buses (Fourtané, 2020). Introduction of a community shuttle network in Nou Barris will not only solve its current issue, lacking bus routes in its core, but also provide a more reliable and rapid form of transportation for the dominant elderly population in the area. The team proposes flexible modes within the concept, ranging from fixed-schedule mini buses to on-demand automobiles, from traditional vehicles with drivers to future mobility forms, while the operation of the shuttle can be directly managed by the municipal bus companies, by private firms, or by the community itself.

3. Creating better infrastructure and operational grounds for buses/BRTs.
[L'Eixample]. The team proposes the reorganization and re-arrangement of the current bus network in planned superblock areas, especially in the L'Eixample Site where few roads have been equipped with specific bus lanes and stops for buses will significantly impede the traffic flow. With a redesigned version of non-green streets on site, the team is reserving specific road space and parking quays along modified streets to ensure that buses can make effective and uninterrupted stops with enhanced moving efficiency. The team suggests the creation of exclusive bus lanes with two directions to accommodate more bus traffic and enhance connectivity between bus systems in the long term.

4. Re-accommodation of private vehicular traffic out of superblock areas
During previous research and site observations, the research group identifies that large flows of vehicular traffic are passing through the superblock areas as a

thruway option, to access basic amenities, or to reach specific destinations within the area. Besides the promotion of bike-friendly networks throughout the city and the facilitation of seamless multi-modal transportation connection, the research team also calls for other potential improvements that may contribute to a smoother travel experience and enhanced resilience within the superblock plan, especially for 'non-green' streets on site. The team suggests the city to re-accommodate private traffic out of superblock areas with city-wide policies, such as introducing Parking-and-ride (P+R) facilities near redesigned rail terminals, increasing parking creatively near the superblock areas with techniques such as underground parking and/or mechanical parking facilities, and more widely constructing new road network for thru-traffic that can be redirected to bypass the vulnerable hotspots. Following proposals that have been raised previously, the team argues that it is important to accommodate private vehicular traffic flows out of the superblock with policies and strategies that can fundamentally satisfy the travel demand of drivers.

Based on field trip observations, multiple comparative peer city studies, and quantitative data visualization, the team raises four proposals listed below:

1. Implement Park-and-ride (P+R) strategies along large capacity transit lines.
Park and ride is a transportation planning strategy that has been widely adopted across Europe where large scale parkings are placed near transit stations with seamless connections, reduced fare programs and redistribution of development. Park-and-ride interventions can help reducing congestion along roads leading into the city center, reducing congestion within the city center, reducing environmental externalities along roads, and raising revenues through parking fees and increased transit ridership(Institute for Transport Studies, 2023). In addition, the construction of park-and-ride facilities can become infrastructural foundations for paralleling congestion-reduction strategies and future urban development (Dijk & Montalvo, 2011). Park-and-ride facilities are anticipated to attract previous drivers who have specific destinations within superblock areas and who live within certain distances from transit stations. The team is suggesting park-and-ride complexes to be constructed or reconfigured along suburban commuter railroad stations in the Barcelona metropolitan area.

2. Promote transit oriented development (TOD) strategies along rail transit lines.
Transit oriented development, which refers to development near, and/or oriented to, mass transit facilities, has generated much interest in Europe over the last decade, and has come with significant positive improvements in cities such as Vienna, Stockholm and Amsterdam, contributing to larger transit ridership and less congestions on roads (Pojani & Stead, 2018). Transit-oriented developments will redirect previous drivers who pass through superblock regions heading to/from basic-level amenities such as ordinary dining and shopping needs by establishing attractive destinations farther from core downtown and near transit nodes. The team is suggesting TOD strategies to be implemented along suburban commuter railroad stations following scaled P+R proposals, as well as vacant sites along metro lines that have been deemed as having development potential.

3. Increase covered parking spaces with flexibility.
To accommodate private vehicular travels that are not redirected using the TOD and Park-and-ride strategies mentioned above, the team is proposing the extension and construction of covered parking spaces within and around superblock planning areas with flexibility in scales and forms. The team is proposing the encouragement of improving space utilization efficiency of existing indoor/underground parkings and the construction of smart stacked parking facilities around L'Eixample superblock implementation areas, and proposing enlarge the existing community parking garage under Nou Barris site with enhanced direct connection from/to ring roads and highways surrounding the region.

4. Increase routing options and expedite thruway traffic.
As mentioned in previous chapters, the city of Barcelona has constructed an expressway system that forms a ring in the metropolitan area, and is currently completing the left-over parts as well as new ring routes farther away from the city center. The team suggests the city to prioritize ring road constructions, potentially expand ring road functions and discuss future options in promoting more effective thruway travels.

Incorporation between Mobility and Tourism in the city
The team also recommends integrating between mobility and tourism in Barcelona, in which the modeling of transportation planning should incorporate tourism needs, the design of public transportation networks could be tourist-friendly, while the daily operations and regulations of transportation networks could anticipate the role of tourists.

Conclusion

Our proposals involves a comprehensive approach to address the specific and diverse local needs through Superillas implementation. The policy implications of these recommendations include greater accessibility, more sustainable city, and transforming public engagement into ownership of resilience in the Superblocks. Our proposals presents a holistic approach to urban design, transportation and green maintenance that can contribute to Barcelona's urban resilience. By adopting these strategies, the city can foster sustainable development, enhance public spaces, and improve overall quality of life for residents and visitors.

KEY TAKEAWAYS

By implementing our comprehensive proposals, we aim to achieve the following objectives in order to build a more resilient Barcelona:

- Enhance urban resilience through the creation of bike-friendly infrastructures and improved public transit options.
- Address climate issues by incorporating green infrastructure elements, such as rain gardens, into street designs.
- Empower local communities through the transfer of resource ownership and the implementation of Superillas (Superblocks).
- Improve accessibility and sustainability by adopting holistic urban design, transportation, and green maintenance strategies.

As a result of these integrated efforts, Barcelona can foster sustainable development, enhance public spaces, and improve the overall quality of life for both residents and visitors.

FINAL RECOMMENDATIONS

Our studio proposes to enhance Barcelona's urban resilience by:

1. Implementing various measures to create bike friendly infrastructures and enhance public transit option
2. Addressing climate issues by incorporating green infrastructure elements into our street designs; for example rain gardens
3. Transferring resources ownership to local level

Source: Ajuntament de Barcelona

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