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THEMATIC REVIEW

Resilience in Action
Barcelona's Superblock Programme

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Executive Summary

The Superblock programme (*programa Superilles* in Catalan) is an initiative implemented by the City of Barcelona to transform the city so it is ready to face 21st-century challenges.[1] It aims at making city neighbourhoods more resilient while "leaving no one behind".[2] This thematic review sheds light on the Superblock programme as an example of resilience in action, drawing on the experience of the Superblock project in Sant Antoni neighbourhood.[3][4] It describes the Superblock programme through the framework of the seven enabling city actions presented in the CEB technical brief "From Community Vulnerability to Resilience: The Experience of European Cities" (CEB 2022) to exemplify how the framework can be used by city practitioners to implement initiatives at the neighbourhood level.

The Superblock programme aims at fighting climate change by reducing greenhouse gas emissions, promoting adaptation to climate-related shocks and stresses,[5] and improving environmental conditions. It does so by reimagining urban streets and mobility patterns in city neighbourhoods, while reclaiming public space for people and ensuring that it is inclusive and economically vibrant. The following city actions have contributed to its successful implementation:

Aligning the Superblock programme with the goals of Barcelona's strategies. The Superblock programme is at the heart of the implementation of Barcelona's urban regeneration strategy (Ajuntament de Barcelona 2021a), and contributes to achieving the city's climate goals and sustainable mobility objectives (Ajuntament de Barcelona 2018b, 2021b and 2022b). The Superblock programme promotes a more equal and just society by supporting Barcelona's strategies such as the Gender Justice Plan and the Plan for Play in Public Spaces (Ajuntament de Barcelona 2021c and 2018a).

Assessing vulnerability factors. The City of Barcelona integrates a vulnerability lens in the planning of Superblock projects.[6] The Superblock programme primarily addresses vulnerability factors related to the living environment, with a focus on access to green space, air and noise pollution, and climate-related shocks and stresses (heatwaves, heavy rainfall and water scarcity). The Superblock programme adopts a gender-, age- and disability-sensitive approach to ensure that all community members benefit from the projects. Attention is paid to support local businesses that are driving economic development at the neighbourhood level and ensure that they do not face the risk of being displaced as a result of commercial gentrification following the implementation of the projects.[7]

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1 The Council of Europe Development Bank (CEB) co-financed the Superblock programme as part of a loan of €100 million to the Barcelona City Council.

2 "Leave no one behind" is the overarching vision driving the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 (United Nations 2017).

3 Resilience is the capacity of communities, institutions and systems within a city to cope, adapt and transform in order to thrive in the face of shocks and stresses (The Rockefeller Foundation and Arup 2014).

4 The thematic review defines a Superblock project as a neighbourhood initiative undertaken under the umbrella of the Superblock programme. A Superblock project comprises multiple interventions. The thematic review defines interventions as the components of a project.

5 Shocks are sudden, acute events; stresses are longer-term trends with a slow onset and a protracted duration.

6 Vulnerability factors can be broadly classified in three categories depending on the source of vulnerability: the living environment, individual characteristics and economic status.

7 Commercial (or retail) gentrification involves the "up-scaling of shops and related businesses, and the concomitant displacement of the local stores and services" (Hubbard 2018, p. 296).

Establishing an inclusive participatory planning process. Superblock projects rely on a highly inclusive participatory planning process to account for the diverse needs of communities. Attention is paid to "fill the empty seats at the table" by actively seeking participation of groups with vulnerabilities, such as people with visual impairments. The participatory planning is carried out in close collaboration with a local stakeholder group, the leading group, comprising community groups and local organisations. The leading group is actively involved in the development of the Neighbourhood Action Plan, which sets the basis for the implementation of the Superblock project.

Designing Superblock projects. Superblock projects integrate interventions across multiple dimensions: environment, society, economy and institutions (OECD 2014 and 2018). The Superblock programme promotes a novel model for green streets as single-platform, shared streets where pedestrians have priority. The Superblock area is transformed through structural and tactical interventions.[8] Interventions focus on significantly increasing green space, and include solutions to enhance climate adaptation. Superblock projects encourage diverse and inclusive uses of public spaces to ensure that green streets are truly shared by all. Usage plans are developed in Superblock areas to regulate local economic activities and ensure that the benefits are captured by local businesses, as part of the city's strategy to prevent gentrification. The Superblock programme strengthens community groups and local organisations by empowering them to actively participate in the development of Superblock projects.

Developing sustainable financing solutions. Diversifying sources of funding and financing is vital to scale up transformational initiatives. The Superblock programme is financed with municipal own-source revenues; transfers from the national government; European Union (EU) resources; and borrowing from international financial institutions (IFIs). Combining structural interventions with tactical interventions, which are about five times less expensive, enabled Barcelona to expand the project area in Sant Antoni. However, tactical interventions require more financial resources for maintenance given that deterioration occurs more quickly. Barcelona's experience also highlights the importance of allocating adequate financial resources to carry out the participatory planning process and to monitor results.

Co-ordinating initiatives within a multilevel governance system. Integrated urban and transport planning is vital to ensure that motorised mobility restrictions implemented as part of Superblock projects are part of a citywide policy to incentivise people to use public transport. Co-ordination between city planning and health departments is also essential to leverage the health benefits of projects. The City of Barcelona co-ordinates with the Barcelona Public Health Agency in carrying out a health benefit assessment of the Superblock programme. Co-ordination between city and national governments is equally important to facilitate sharing of experience to the benefit of other Spanish cities that are implementing similar initiatives.

Assessing impact. By transforming public space, the Superblock programme delivers significant environmental and climate-related benefits, as well as important health, social and economic benefits. In Sant Antoni neighbourhood, the Superblock project led to a decrease in vehicle traffic, a reduction in air and noise pollution, more diverse uses of public spaces and more visitors to the neighbourhood. Residents reported a perceived improvement in their well-being. Barcelona has developed a monitoring plan to

[8] Tactical urbanism is an approach to improve neighbourhoods using short-term, low-cost, scalable interventions that can be implemented quickly to test new ideas in support of long-term change (Lydon and Garcia 2015).

assess the benefits of scaling up the Superblock programme, comprising a set of 36 indicators across four areas: public spaces, mobility, environmental quality, and socio-economic dynamics.

The Superblock programme is inspiring action to strengthen city resilience in Spain and globally by demonstrating the multiple benefits of transitioning from a car-centred to a human-centred approach in planning urban streets. It has proven that it is possible to develop a new city model that is conducive to more liveable, green and economically vibrant public space. The following key lessons have emerged from the planning and implementation of Superblock projects:

- Climate action is an opportunity for inclusive urban transformation. Transforming public spaces and mobility modes provides an opportunity for addressing the climate crisis in a way that is equitable and inclusive.
- Participatory planning and tactical urbanism are central to promote behavioural change at the community level. Neighbourhood initiatives relying on inclusive participation and tactical urbanism to reimagine public space, such as Superblock projects, are an entry point for transforming the way people live and move in the city.
- Promoting behavioural change that is good for both people and the planet calls for transformational initiatives that integrate actions across multiple urban sectors to deliver environmental, health, social and economic benefits.
- Strong horizontal co-ordination across city departments is vital to leverage the benefits of transformational initiatives and "leave no one behind". In particular, sustainable and inclusive public transport and affordable housing solutions are essential to ensure that the new city model delivers benefits to all residents.
- Scaling up transformational initiatives citywide requires flexibility to adapt interventions to the local reality, given the diverse needs of city neighbourhoods, within the framework of coherent urban sectoral policies, and in alignment with a city's climate action and social justice goals.
- Empirical evidence provides the compass to ensure that behavioural change leads to the intended outcomes. Building empirical evidence that is robust and comparable across locations, and covers all project phases – from planning to monitoring – is a critical step to assess benefits before scaling up.

1. Introduction

The call for strengthening city resilience has never been more compelling. Cities are facing the impact of climate change, the war in Ukraine, the energy crisis and the consequences of the COVID-19 pandemic. Strengthening city resilience is not only about coping with and adapting to crises. It is about radically transforming the way we live and move around in order to thrive in an era of polycrisis.[9] The Superblock programme (*programa Superilles* in Catalan) implemented by the City of Barcelona (hereafter "Barcelona") shows that city resilience can be strengthened in a way that is inclusive and equitable. Barcelona's Superblock programme aims to transform the city so it is ready to face 21st-century challenges by making city neighbourhoods more resilient while "leaving no one behind".[10]

The Superblock programme is inspiring action to enhance city resilience in Spain and globally. The Superblock concept is being implemented in several Spanish cities.[11] Following in the footsteps of Barcelona, cities gathered in Barcelona on 22-25 March 2023 to pledge to develop a new model of public space[12] to meet humanity's unprecedented challenges, while improving the well-being of the most vulnerable populations (Ajuntament de Barcelona 2023a).[13] The Council of Europe Development Bank (CEB) has co-financed the Superblock programme as part of a loan of €100 million to the Barcelona City Council to strengthen city resilience. The CEB support to Barcelona is part of its broader engagement to help cities to become more resilient and inclusive in line with its mandate as the social development bank of Europe.

This thematic review sheds light on the Superblock programme as an example of resilience in action. It provides an overview of the programme and its main features, highlights the city actions that have been critical for its implementation, and draws lessons learned of relevance to other cities. The thematic review presents the experience of the Superblock project implemented in Sant Antoni neighbourhood to exemplify the key features of the programme.[14] The review is the outcome of a close collaboration with the Barcelona City Council and draws on the findings of on-site visits and interviews with community organisations carried out in April 2023 in Barcelona.

The thematic review aims at informing dialogue among city practitioners on how to implement successful initiatives to build resilience at the neighbourhood level. It is part of a broader CEB initiative to share the experience of European cities on strengthening resilience, as a companion publication of the CEB technical brief "From Community Vulnerability to Resilience: The Experience of European Cities". This publication reviews the Superblock programme through the framework presented in the technical brief, which identifies seven enabling city actions that are critical for enhancing resilience while "leaving no one behind", to exemplify how the framework can be applied by city practitioners to plan and implement initiatives at the neighbourhood level.

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9 Resilience is the capacity of communities, institutions and systems within a city to cope, adapt and transform in order to thrive in the face of shocks and stresses (The Rockefeller Foundation and Arup 2014).

10 "Leave no one behind" is the overarching vision driving the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 (United Nations 2017).

11 Spanish cities that are developing or planning to develop Superblock projects include Vitoria-Gasteiz, El Prat, Viladecans, A Coruña, Ferrol, Valencia and Logroño (Alsina-Pagès et al. 2021).

12 Public space comprises "all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive" based on the Charter of Public Space (Biennial of Public Space 2013). Public space in cities consists of three types of urban spaces: (i) street space (including streets, squares, pavement and bicycle lanes); (ii) public open space (including parks, playgrounds, gardens and waterfronts); and (iii) public facilities such as libraries and municipal markets (UN-Habitat 2015). In the thematic review, the term public space refers to street space and public open space.

13 The pledge for a new model of public space was signed by participating cities at the International Superblock Meeting hosted by Barcelona on 22-25 March 2023 (Ajuntament de Barcelona 2023g).

14 The thematic review defines a Superblock project as a neighbourhood initiative undertaken under the umbrella of the Superblock programme. A Superblock project comprises multiple interventions. The thematic review defines interventions as the components of a project.

The thematic review is structured as follows: Section 2 outlines the main features and the evolution of the Superblock programme; Section 3 illustrates the Superblock programme drawing on the framework of the seven enabling city actions; Section 4 discusses lessons learned. Annex 1 outlines the main climate-related and environmental challenges faced by Barcelona; and Annex 2 provides an overview of community groups and organisations in Sant Antoni neighbourhood.

2. Main features and evolution of the Superblock programme

Barcelona is a compact city with a population of more than 1.6 million over 100 km^2 (Ajuntament de Barcelona 2023i). It is a global, economically vibrant city and part of the Barcelona Metropolitan Area (*Àrea Metropolitana de Barcelona*), with a population of about 3.3 million (Àrea Metropolitana de Barcelona 2023). Yet it faces major 21st-century challenges. Barcelona's urban centre is the third most densely populated urban agglomeration with over 1 million inhabitants in Europe, after Athens and Bucharest.[15] It has one of the highest levels of air pollution in Spain, and it is exposed to heavy rainfall, droughts and heatwaves, which are increasing in frequency and intensity as a result of climate change (Ajuntament de Barcelona 2018b). On 15 January 2020, Barcelona declared a climate emergency and called all stakeholders to join forces in the fight against climate change. Barcelona also faces a shortage of public space, in particular green space, with an average green area per inhabitant significantly below the average of Spanish cities (see Annex 1). The Superblock programme was launched in 2015 by Barcelona as a transformational initiative to develop a new city model to strengthen resilience in a way that is equitable and "leaves no one behind". This section outlines the main features of the Superblock programme and its evolution since its launch.

2.1 From a city block to a street network approach

The Superblock programme builds on Barcelona's urban planning tradition, which is centred on a holistic and inclusive approach and prioritises access to basic services and amenities. Barcelona is characterised by mixed-use development and the predominance of a gridded street network, which covers the Eixample, Barcelona's central district (see Photo 1). Since the 19th century, Barcelona's blocks have been grouped into larger units for different purposes, from the provision of services at the neighbourhood level to the organisation of public transport (see Box 1).

The Superblock programme aims at fighting climate change by reducing greenhouse gas emissions, promoting adaptation to climate-related shocks and stresses,[16] and improving environmental conditions. It does so by reimagining urban streets and mobility patterns in city neighbourhoods, while reclaiming public space for people and ensuring that it is inclusive and economically vibrant. Through traffic is restricted within the Superblock area to prioritise active mobility and decrease air and noise pollution and congestion (Staricco and Brovarone 2022). The Superblock programme promotes a novel model for green, inclusive and environmentally sustainable streets (hereafter "green streets") developed to address 21st-century challenges. Green streets are shared, single-platform streets where pedestrians are given priority and a diversity of activities co-exist in a way that is balanced and respectful of the rights of all users. Particular attention is paid to include solutions for climate adaptation when designing public space to support

[15] The population density of Barcelona's urban centre is 6,573 inhabitants per km^2 based on 2015 data from the Global Human Settlement Layer (GHSL) produced by the Joint Research Centre and the European Commission, which analyse built-up areas based on a global, harmonised definition of urban centres (European Commission, Joint Research Centre 2023). The population density of the City of Barcelona is estimated to be significantly higher at 16,100 inhabitants per km^2 (Ajuntament de Barcelona 2023i).

[16] Shocks are typically characterised as sudden and acute events; stresses are longer-term trends with a slow onset and a protracted duration.

temperature regulation, water flow regulation and run-off mitigation. The reclaimed spaces previously destined for motorised traffic and the junctures of green streets are transformed into multifunctional public areas where community and cultural activities can take place and children can play safely.

Photo 1: The gridded street network in the Eixample district – Sant Antoni neighbourhood



Source: Òscar Giralt, licence CC BY-NC-ND 4.0. https://creativecommons.org/licenses/by-nc-nd/4.0/

The Superblock concept was originally applied to a grid of blocks and roads corresponding to approximately a 400 m by 400 m square.[17] Based on the initial concept, the roads at the edge of the Superblock area are for through traffic, while motorised mobility is restricted and priority is given to pedestrians within the Superblock area. The concept of the Superblock has evolved from a city block approach to a street network approach applied to an entire neighbourhood or district (Staricco and Brovarone 2022). Building upon lessons learned from the initial implementation of Superblock projects, restrictions on motorised mobility, which were originally implemented in a designated perimeter of city blocks, are applied to a wider perimeter.

Following the piloting of the street network approach in Sant Antoni neighbourhood, in 2020 the Barcelona City Council announced the development of four green streets in the Eixample district by 2023.[18] The plan is expected to be later expanded, arriving at a network of 21 green streets in the district by 2030. Shifting from a city block to a street network approach will facilitate the scaling-up of the Superblock programme citywide and will impact a larger area by creating an interconnected system of green and pedestrian spaces throughout the city (Ajuntament de Barcelona 2021d). The shift to a street network approach will also contribute to make green space more accessible and inclusive, therefore extending the benefits of the Superblock programme to all city dwellers.

[17] In the original concept, every Superblock area contains a total of nine blocks, with two horizontal and two vertical streets within. Every block is a 113 m square separated by 20-m-wide streets.
[18] Green streets in the Eixample district are also referred to as green axes.

Box 1

The historical and cultural roots of the Superblock programme in Barcelona

The Superblock programme is strongly rooted in Barcelona's urban development and planning tradition. In the mid-19th century, the Catalan engineer Ildefons Cerdà outlined a city expansion plan after the city's medieval walls were demolished. Cerdà planned a large regular grid made up of blocks of 113 m on each side and of streets 20 m wide. Accessibility was an important issue in the design of streets, so large avenues running diagonally across the grid were planned, and blocks were cut at a 45-degree angle in all corners for higher visibility at intersections. The original expansion plan also included green spaces in all blocks, as well as basic services and amenities such as markets, schools, hospitals and parks (Cerdà 1867). Real estate pressure led to building higher, while open space within the blocks was occupied by warehouses, shops or parking, resulting in a denser urban model, currently reaching up to 354 inhabitants per hectare in the Eixample district[a] (Ajuntament de Barcelona 2023i) and drastically decreasing the green area available to 2.1 m^2 per inhabitant in the same district (Ajuntament de Barcelona 2023e).

Several urban planners put forward proposals to group blocks to form a "superblock". Cerdà's plan envisaged the development of a tramway within the city, whose layout would occupy one of every two streets, thereby creating a superblock of 2-by-2 blocks following a transport criterion (Rueda Palenzuela 2017). In 1932, Le Corbusier and Josep Luis Sert developed the Macià plan, proposing a larger superblock (400 m by 400 m) to divert car mobility to the outer perimeter and limiting car circulation in the inner streets. This plan was never carried out. Later in 1959 the architects Antoni Bonet and Oriol Bohigas further developed the idea of using a large group of nine city blocks as a planning tool. The larger blocks were characterised by traffic organisation based on street hierarchy; human scale of urban planning; high density; and streets and squares as commercial and living areas.

The modern concept of *Superilles* was developed at the beginning of the 21st century by Salvador Rueda, at that time director of the Urban Ecology Agency of Barcelona. Rueda's vision, similar to Cerdà's, was to ensure that every urban dweller would benefit from the advantages of rural living – a sense of quiet, clean air and water, green spaces and tight-knit community – alongside the benefits of urban living such as connectivity, cultural vibrancy, efficient distribution of people and goods, mixing of diverse communities, and economic opportunities. Rueda's vision conceived each Superblock as the union of nine blocks whose interior streets were restricted to passing traffic, thus creating quieter and greener public spaces, suitable for social interaction (Rueda Palenzuela 2017).

a. Based on 2021 district-level population density data.

2.2 Selecting neighbourhoods

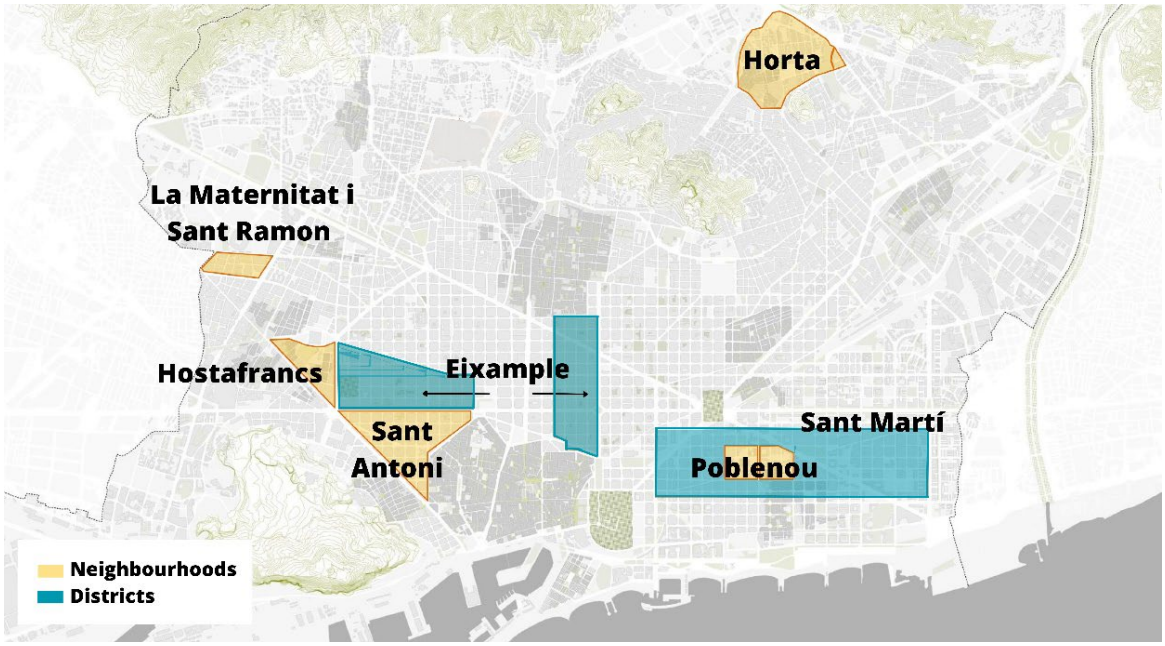
The selection of neighbourhoods to pilot a transformational initiative such as the Superblock programme is a key factor for its success and replicability. The neighbourhood selection criteria for the Superblock programme have evolved over time in a process of constant learning and adaptation to external events such as the COVID-19 pandemic, with the ultimate objective of scaling up implementation citywide. The Superblock programme was first implemented in five city neighbourhoods: Poblenou, Sant Antoni, La Maternitat i Sant Ramon, Horta and Hostafrancs. These neighbourhoods were selected because they provided the opportunity to leverage and exploit synergies with other catalytic investments in the areas, and to demonstrate success that would then support the scaling-up of the programme citywide. The implementation of the Superblock programme in these neighbourhoods built on lessons learned from

pilot initiatives carried out across city neighbourhoods in Barcelona since the 1990s, such as in El Born in 1993 and Vila de Grácia in 2006.

The Poblenou neighbourhood was selected as the first site to implement the Superblock programme because of the synergies with urban renewal initiatives being carried out in the area as part of the 22@ Innovation District, which aimed to transform the economic profile of the neighbourhood from an old industrial area to a research and innovation hub. The neighbourhood was chosen also because of its relatively low level of car traffic, which was expected to make motorised mobility restrictions more acceptable to residents, while providing the opportunity to test the Superblock concept on Barcelona's gridded street network (Staricco and Brovarone 2022). Building on the experience of implementing the first Superblock pilot project in Poblenou in 2016, Barcelona identified in February 2017 the opportunity to implement a new Superblock project in Sant Antoni neighbourhood, which is characterised by dynamic commercial and cultural activities centred on its historic market. The implementation of the Superblock project in Sant Antoni, a neighbourhood located in the Eixample district, was carried out in parallel with the redevelopment of the Sant Antoni Market to exploit synergies between the two projects. The Superblock project and the new market were inaugurated at the same time.

The onset of the COVID-19 pandemic provided the momentum for accelerating implementation and scaling up the Superblock programme citywide, starting with the Eixample district. The decision to start expanding the Superblock programme in the Eixample district responded to the need to address critical environmental challenges in the city's central district. While the Eixample district has the best public transport services of the entire Barcelona metropolitan area, the district is characterised by congestion, lack of public space, and high levels of air and noise pollution. In addition to the larger initiative in Eixample, a network of green streets has been developed in the Sant Martí district. In scaling up the Superblock programme citywide, Barcelona plans to take social factors into consideration for the selection of the areas of intervention, in line with the objectives set in the city's urban regeneration strategy *Superilla Barcelona*, which aims at promoting more balanced and equitable territorial development (Ajuntament de Barcelona 2021a, see also Subsection 3.1). Figure 1 below maps the Superblock projects implemented since 2015, including the scaling-up in the Eixample and Sant Martí districts.

Figure 1. Map of Superblock projects implemented since 2015



Source: Authors based on Ajuntament de Barcelona 2020d.

3. The Superblock programme – Seven enabling city actions

The CEB technical brief identifies seven enabling city actions that are critical to strengthen resilience in city neighbourhoods, while "leaving no one behind", building on the experience of European cities (CEB 2022). This section describes the Superblock programme drawing from the framework of the seven enabling city actions, to exemplify how the framework can be used as a tool to support city practitioners when designing and implementing resilience-strengthening initiatives at the neighbourhood level. It also shines a spotlight on the Superblock project implemented in the neighbourhood of Sant Antoni over the period 2017-2019. Figure 2 below depicts the seven city actions that have enabled the successful planning and implementation of Superblock projects, and that are described in this section. The city actions are inter-linked and part of an iterative process.

Figure 2. The Superblock Programme – Seven enabling city actions



Source: CEB.

3.1 Aligning the Superblock programme with the goals of Barcelona's strategies

The Superblock programme is at the heart of the implementation of the city's holistic and integrated approach to urban regeneration, set out in the *Superilla Barcelona* strategy, approved in October 2021 (Ajuntament de Barcelona 2021a). The regeneration strategy aims at promoting a balanced territorial development among the areas of the city, while valuing and enhancing the diversity and uniqueness of city neighbourhoods. The strategy includes four axes of interventions: (i) revitalising the local economic

fabric; (ii) promoting sustainable mobility; (iii) improving neighbourhoods, expanding and improving green infrastructure; and (iv) transforming public spaces. The Superblock programme is central for the implementation of the fourth axis of intervention aiming at transforming public spaces.

As a tool for urban transformation, the Superblock programme supports the implementation of multiple city strategies and plans. The Superblock programme contributes to achieving the overarching climate mitigation and adaptation goals set in Barcelona's Climate Plan 2018-2030 and Climate Emergency Action Plan for 2030 (Ajuntament de Barcelona 2018b and 2021b).[19] In line with its commitment to implement the Paris Climate Agreement,[20] Barcelona aims to reduce greenhouse gas emissions by 50% by 2030, compared with levels in 1992, and to become carbon-neutral by 2050 (Ajuntament de Barcelona 2021b). In parallel, Barcelona has set targets for climate adaptation for 2030 to address its climate change challenges, including rising temperatures, reduced availability of water and increased flooding (see Annex 1 for an overview of climate-related and environmental challenges faced by Barcelona). One of Barcelona's targets for climate adaptation is to increase green space per inhabitant by 1 m^2 from 2016 to 2030 (Ajuntament de Barcelona 2021b). To this end, Barcelona has developed the Nature Plan 2021-2030, a strategic participatory tool to address the challenge of increasing green space in a dense urban fabric (Ajuntament de Barcelona 2021e). In line with the city's climate goals, the Superblock programme contributes to reducing greenhouse gas emissions, and strengthening resilience to climate-related shocks and stresses while improving the quality of the environment. In particular, the Superblock programme plays a key role in achieving the goal of increasing green space per inhabitant.

The Superblock programme is instrumental to achieving Barcelona's sustainable mobility objectives, which are in turn critical for attaining the city's climate mitigation goals. Barcelona's Urban Mobility Plan for 2024 aims at increasing by 8% the percentage of journeys made on foot, by bicycle or on public transport in Barcelona over the period 2018-2024 (Ajuntament de Barcelona 2022b).[21] To achieve those goals, the plan sets out a series of measures to enhance sustainable mobility, such as improving accessibility and safety of pedestrian spaces and expanding public transport and bicycle networks.

The Superblock programme contributes to promoting a more equal and just society by supporting the implementation of Barcelona's Gender Justice Plan (Ajuntament de Barcelona 2021c). The Superblock programme is an example of gender-sensitive urban planning, since it aims to make public spaces safer for women, and to promote a diversity of uses in public spaces, including care-giving activities that are often not given sufficient consideration in traditional planning approaches (Ajuntament de Barcelona 2017a).

The Superblock programme also contributes to the successful implementation of the city's Plan for Play in Public Spaces (Ajuntament de Barcelona 2018a), which aims at enhancing opportunities for safe play and physical activity by creating playgrounds and areas for play using tactical urbanism.[22] In addition, the Superblock programme supports the Protect the Schools Programme (Ajuntament de Barcelona 2020a), which focuses on minimising motorised transport in the perimeters surrounding schools to ensure safety for children and increase accessibility to schools.

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19 The Climate Emergency Action Plan for 2030 complements the Climate Plan 2018-2030. It was approved after Barcelona declared a climate emergency in January 2020 and takes into account the impact of COVID-19 on achieving climate goals.

20 The Paris Climate Agreement under the United Nations Framework Convention on Climate Change was adopted in December 2015 at the 21st Conference of the Parties (COP 21) in Paris.

21 From 74% in 2018 and 82% in 2024.

22 Tactical urbanism is an approach to improve neighbourhoods using short-term, low-cost, scalable interventions that can be implemented quickly to test new ideas in support of long-term change (Lydon and Garcia 2015).

The Superblock programme is aligned with Barcelona's COVID-19 strategy, which aimed at accelerating the shift to more sustainable mobility patterns to contain the spread of the virus (Ajuntament de Barcelona 2020c). The COVID-19 pandemic prompted Barcelona to develop a strategy to promote the rapid and effective expansion of dedicated areas for walking and cycling across the city. Interventions were executed in a rapid manner in the weeks following the first COVID-19 lockdown, relying mostly on tactical urbanism (Barcelona Regional and Ajuntament de Barcelona 2023). In line with the COVID-19 response strategy, a number of tactical interventions were implemented to increase pedestrian spaces in Superblock areas, with the view of converting them into structural interventions at a later stage.

3.2 Assessing vulnerability factors

Integrating a vulnerability lens in the planning of Superblock projects is crucial to ensure that all community members benefit from the programme. This subsection discusses relevant vulnerabilities to consider when designing projects to transform public spaces, and how such vulnerabilities are assessed as an input to the participatory planning process of Superblock projects. This thematic review adopts an integrated approach to assessing vulnerability, in line with the approach laid out in the CEB Strategic Framework 2023-2027 (CEB 2023) and the CEB technical brief "From Community Vulnerability to Resilience: The Experience of European Cities" (CEB 2022). There are multiple factors affecting vulnerability. Vulnerability factors can be broadly classified in three categories depending on the source of vulnerability: the living environment,[23] individual characteristics[24] and economic status.[25]

The main objective of the Superblock programme is to address vulnerability factors related to the living environment, while integrating a gender-, age- and disability-sensitive approach to take into consideration sources of vulnerability associated with individual characteristics. Attention is also paid to ensure that the implementation of the Superblock programme supports the local economy, and does not displace residents and local commercial activities as a result of gentrification. The following vulnerability factors are addressed by Superblock projects:

- ***Vulnerability factors related to the living environment.*** The Superblock programme aims at addressing vulnerability factors related to the living environment, with a focus on inadequate access to green space, exposure to air and noise pollution, and climate-related shocks and stresses – heatwaves, heavy rainfalls and droughts (see Annex 1). Since the start of the COVID-19 pandemic, Superblock projects have also been instrumental in mitigating vulnerability factors associated with the health emergency. Superblock projects, in conjunction with emergency measures to restrict motorised mobility, provided communities with increased access to public space, when, at the early stages of the pandemic in 2020, the Spanish government introduced national regulations to restrict movements of people and to ensure social distancing to mitigate the transmission of the virus (Ajuntament de Barcelona 2020c).[26]

[23] These vulnerability factors are related to the built and natural environment in which an individual or a group lives, including (i) the availability and accessibility of high-quality, affordable infrastructure, services and amenities (e.g. public space, health facilities); (ii) the nature, health and resilience of environmental systems to which a group has access; (iii) access to land and affordable housing; and (iv) climate-related or other physical risks.

[24] Individual characteristics related for instance to gender, age, ethnicity and disability may also be a source of vulnerability in certain contexts.

[25] These vulnerability factors are related to level of income and employment status, among others. Economically vulnerable groups may include the income poor, un-/under-employed, workers dependent on sectors that are relatively more affected by changing circumstances, or those less able to switch to different jobs or economic activities.

[26] Royal Decree, of 14 March 2020, declaring the state of emergency for the management of the health crisis caused by COVID-19 (Real Decreto 463/2020).

- ***Vulnerability factors related to individual characteristics.*** The planning of Superblock projects takes into consideration individual vulnerability factors that may prevent some community members from accessing and enjoying public space, in particular factors related to gender, age and disability (Metropolis 2022a). The aim is to ensure that people of all genders, ages and abilities fully benefit from Superblock projects.[27] Communities can benefit to the fullest from Superblock projects only if a gender-sensitive approach is adopted to make public spaces safer for all and to enhance perceived safety in public spaces. Considering the needs of the elderly when planning public space is of paramount importance to ensure that Superblock projects contribute to reducing the isolation that older people are more likely to face and that increased during the COVID-19 pandemic. In addition, attention is paid to ensure that people with disabilities can move around with safety and autonomy in green streets, and that play areas are safe, accessible and inclusive for all children, including those with disabilities. Barcelona also monitors the share of foreign population in a neighbourhood, a potential vulnerability factor, when planning Superblock projects.

- ***Economic vulnerability factors.*** Increasing access to open space in city neighbourhoods has the potential of strengthening the local economic landscape by improving walkability and visibility of street-level commercial activities. At the same time, interventions that improve the quality of the living environment could worsen economic vulnerabilities if attention is not paid to potential trade-offs. In particular, Superblock projects may lead to gentrification if measures are not taken to prevent the displacement of local residents. Similarly, supporting local businesses that are driving economic development at the neighbourhood level is important to ensure that local commercial activities are not negatively affected and do not face the risk of being displaced by new businesses as a result of commercial gentrification.[28]

Barcelona's Superblock municipal team works very closely with district staff, in particular social workers, to identify and assess relevant vulnerability factors in project areas as part of the preparatory work to the participatory planning process. The assessment allows the municipal team to identify priority groups with vulnerabilities that would need to be considered in the participatory process. The assessment of vulnerability factors is embedded in the Superblock programme's monitoring plan, which collects a broad range of indicators to identify multiple dimensions of vulnerability in project areas (Ajuntament de Barcelona 2021f). The list of monitoring indicators is provided in Subsection 3.7 below. To exemplify how the Superblock programme integrates a vulnerability lens in the planning process, Box 2 below provides an overview of relevant vulnerability factors for the implementation of the Superblock project in Saint Antoni neighbourhood.

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[27] SDG 11, on Sustainable Cities and Communities, calls for "[Making] cities and human settlements inclusive, safe, resilient and sustainable". Target 11.7 of SDG 11 is "By 2030, provide universal access to safe, inclusive and accessible green and public spaces, in particular for women and children, older persons and persons with disabilities." See the UN SDG Knowledge Platform: https://sustainabledevelopment.un.org/sdg11.

[28] Commercial (or retail) gentrification involves the "up-scaling of shops and related businesses, and the concomitant displacement of the local stores and services" (Hubbard 2018, p. 296).

Box 2

Vulnerability factors in Sant Antoni neighbourhood

With about 38,000 inhabitants, Sant Antoni is a neighbourhood with a high population density of 473 inhabitants per hectare in comparison with Barcelona's average density of 161 inhabitants per hectare and Eixample's density of 354 inhabitants per hectare (Ajuntament de Barcelona 2023d, 2023j and 2023i). The neighbourhood is flanked by mobility axes such as the Gran Vía de les Corts Catalanes. In 2016, prior to the implementation of the Superblock project, motorised mobility accounted for 51.7% of the use of public space in the neighbourhood. About 45.5% of public space was destined for pedestrians and only 2.9% for green and recreational areas (BCN Ecologia 2016). The Sant Antoni neighbourhood borders Raval, which is one of Barcelona's most disadvantaged neighbourhoods with very limited access to green space. The vulnerability of adjacent areas is an important factor to consider in the implementation of a Superblock project with the objective of amplifying the benefits of the project for vulnerable communities.

The Superblock project in Saint Antoni primarily aimed at addressing vulnerability factors related to the living environment, in particular the lack of open and green space, congestion, and air and noise pollution. In 2017, green space in Sant Antoni was only about 0.87 m^2 per inhabitant, significantly below the average for the city and the Eixample district (Ajuntament de Barcelona 2017b). In 2016, 79% of the population in Sant Antoni suffered from a noise level higher than the maximum level recommended by the World Health Organization (WHO) (Ajuntament de Barcelona 2017c). Moreover, air quality was low, with the population suffering from concentration levels of nitrogen dioxide (NO_2) of more than 40 µg/m^3 (Ajuntament de Barcelona 2017c). In 2017, before the Superblock was implemented in the neighbourhood, average levels of Particulate Matter 10 (PM_{10}) in Sant Antoni were 25.6 µg/m^3, surpassing the WHO recommended mean values of 20 µg/m^3, with peak levels arriving at 36.8 µg/m^3 (Agència de Salut Pública de Barcelona 2021). The high population density coupled with the intense traffic flows on the streets that delimit the neighbourhood[a] are the main drivers of noise and air pollution.

A gender-, age- and disability-sensitive approach was integrated in the planning process. Particular attention has been paid to ensure that public spaces are adapted to the needs of the elderly. The Sant Antoni neighbourhood has a slightly higher share of elderly population compared with the city average: the percentage of the population older than 65 is 22.7% in Sant Antoni, compared with 21.3% for Barcelona (BCN Ecologia 2016).

The Sant Antoni neighbourhood is characterised by a strong commercial presence, with a varied array of shops that attract both neighbourhood residents and visitors from other areas of the city. In Sant Antoni, the density of commercial activities is high, at 22.2 activities per hectare (Ajuntament de Barcelona 2017c), compared with an average of about 10.8 activities per hectare in the Eixample district[b]. Prior to the implementation of the Superblock project, the main non-residential use of buildings in the neighbourhood was commerce (43.9%), followed by offices (19.5%), industry (14.4%) and tourism and hospitality (5.5%) (Ajuntament de Barcelona 2017c). The significant presence of local businesses, which drive local economic development, was identified as a strength of the area, and a potential economic vulnerability factor to be considered when planning the Superblock project. The aim was to ensure that the project did not lead to the displacement of local businesses as a result of gentrification, but that on the contrary it would strengthen the local economic landscape.

a. The Sant Antoni neighbourhood is delimited by the following high-traffic roads: Gran Via de les Corts Catalanes, Avinguda Parallel, Ronda Sant Pau, Ronda Sant Antoni and Carrer de Comte Urgell.
b. Based on information provided by Barcelona City Council.

3.3 Establishing an inclusive participatory planning process

Superblock projects are developed based on a highly inclusive participatory planning process to ensure that the transformed public spaces are adapted to the diverse needs of the community and the local context. An inclusive participatory process is also essential to build trust and secure support from community members when developing initiatives aiming to promote behavioural change. The Superblock programme's participatory approach has been gradually developed and enhanced based on the implementation of the first Superblock projects in Poblenou and Sant Antoni.

The implementation of the first Superblock project in Poblenou in 2016 provided lessons learned that led the city to strengthen the participatory planning process and place it at the centre of the planning of Superblock projects. The implementation of the Superblock project in Poblenou was met with some initial resistance from residents. The resistance was in part due to the fact that the Superblock represented a new concept and most residents were not familiar with it, and limited participation was sought from the community ahead of implementation. In order to respond to residents' concerns in Poblenou, the participatory process was intensified after implementation. Strengthening the participatory process was instrumental to clarifying questions and doubts related to the Superblock concept. The local participation process led to the community's decision to ease motorised transport restrictions in the neighbourhood. For instance, a decision was taken to allow buses to circulate within the Superblock area (Staricco and Brovarone 2022).

Building on the lessons learned from the Superblock project in Poblenou, in Sant Antoni the participatory process started in 2017, significantly ahead of implementation, and continued until after project completion. The participatory planning in Sant Antoni was developed as a community-driven process and it was formalised through the development of a Neighbourhood Action Plan. The changes to the participatory planning process that were tested in Sant Antoni have been applied to all subsequent Superblock projects (see Spotlight 1 below for a description of the participatory process carried out for the Superblock project in Sant Antoni).

Currently, the participatory planning is facilitated by the Superblock municipal team in close collaboration with a local stakeholder group, the leading group (*grup impulsor* in Catalan*)*, comprising members of community groups and local organisations. The leading group acts as a link between the municipal team and community members and is actively involved in the development of the Neighbourhood Action Plan, which sets the basis for the implementation of the Superblock project by defining the project area, modalities and typologies of interventions. The Neighbourhood Action Plan identifies priority interventions to reorganise the street network to promote sustainable mobility modes and diverse uses of public spaces in the neighbourhood. The Neighbourhood Action Plan is tailored to each community where the Superblock is implemented, ensuring that each intervention carried out under the Superblock project is customised to the needs of diverse communities (Ajuntament de Barcelona 2017b). The participatory process seeks to create a safe space where community groups with different priorities and needs can come together to discuss and negotiate the scale and typologies of interventions with the municipal team and among one another, with the aim of finding balanced solutions to conciliate different uses of public spaces.

As vulnerability is often accompanied by reduced representation and voice in local decision-making, particular attention is paid to "fill the empty seats at the table". Actively seeking participation of groups with potential vulnerability factors ensures that interventions take their needs into account and that they fully benefit from Superblock projects. As the participatory process continues to be enhanced and adapted, a stronger emphasis is being placed on involving groups with disabilities, with a focus on people with visual impairments, and women's groups. In particular, collaboration with ONCE (*Organización Nacional de Ciegos Españoles*), the Spanish organisation promoting the integration of people with visual

impairments in society, has been strengthened in the participatory planning process for the Superblock project in the Eixample district. For instance, exploratory walks with people with disabilities have been carried out to identify their specific needs (Ajuntament de Barcelona 2021g). In addition, walks with women's groups have been organised to gauge their sense of safety when using public spaces, in line with the guidelines of Barcelona's Gender Justice Plan (Ajuntament de Barcelona 2021c). Exploratory walks have also taken place in Sant Antoni, to learn from the implementation of the Superblock in the neighbourhood, identify what aspects of its implementation were working and what could be improved when designing interventions in the Eixample district (Ajuntament de Barcelona 2021h). In the participatory process, particular attention is also given to involve the AFAs (*Associacions de Famílies d'Alumnes*), community associations of families with children in local schools, to ensure that safety and services for children are prioritised, in line with the city's Plan for Play in Public Spaces and Protect the Schools Programme (Ajuntament de Barcelona 2018a and 2020a).



The inclusive participatory process for the Superblock project in Sant Antoni

The Superblock programme's inclusive participation process was tested and developed in Sant Antoni. The establishment of the leading group in 2017 with responsibility for developing and approving the Neighbourhood Action Plan along with municipal staff was key to mobilise the community and ensure local support for the Superblock project. The leading group comprises members of community-based organisations in the neighbourhood[a]. Among the most active members of the leading group in Sant Antoni are the Sant Antoni Neighbourhood Association (*Associació de Veïns i Veïnes del Barri de Sant Antoni*), the Sant Antoni Commerce Association (*Sant Antoni Comerç*), the Sant Antoni Market Association and the AFAs (Ajuntament de Barcelona 2019a).

The participatory process in Sant Antoni started in February 2017 and continued through the implementation of the project until after completion. Building on the diagnostic assessment of vulnerability factors in the area, the participatory process was structured in three phases: (i) the participatory planning process leading to the approval of the Neighbourhood Action Plan in December 2017; (ii) the participatory implementation of interventions carried out under the project; and (iii) participatory monitoring after works were implemented (Ajuntament de Barcelona 2017b).

Participatory planning. The Neighbourhood Action Plan was developed through a participatory process. Between February and October 2017, the municipal team met with the leading group five times and held a session open to all neighbourhood residents to gather inputs to inform the development of the Neighbourhood Action Plan. Beyond the regular meetings of the leading group and the open participatory workshop, participatory sessions were carried out with groups that were perceived as being particularly affected by the project. For instance, sessions were held with AFAs from schools located in the Superblock area, as well as with local shop owners, representatives of the Sant Antoni Market and ONCE (Ajuntament de Barcelona 2019a).

The Neighbourhood Action Plan, which was approved in December 2017, set the basis for how the Superblock was developed, particularly regarding the transformation of the neighbourhood's street network, including the identification of streets where mobility restrictions would be introduced and the degree to which car circulation would be regulated within the Superblock area (Ajuntament de Barcelona 2017b). One of the main outcomes of the participatory process was the decision on the area and the

typologies of interventions. The leading group opted for a relatively large implementation area and a combination of structural and tactical interventions.

Another key decision that emerged from the participatory planning process was the degree of restrictions to motorised traffic. The original proposal from the Superblock municipal team was to change the direction of traffic circulation to make through traffic restrictions even more effective. Residents decided instead not to change the direction of traffic, and only reorganise traffic circulation by restricting passing straight through at the crossroads between two green streets (Ajuntament de Barcelona 2017d, see also Subsection 3.4). Perception, however, changed over time. In a consultation with the leading group held four years after implementation, residents highlighted that they would now prefer to further restrict traffic.

Participatory implementation. The Neighbourhood Action Plan became the blueprint for the implementation of structural and tactical interventions in the neighbourhood. Building on the participatory process, the Superblock municipal team presented and discussed proposals for interventions with the leading group and key stakeholders, such as local commercial establishments. Sessions to assess implementation progress of works were also held regularly (Ajuntament de Barcelona 2017e).

Participatory monitoring. Beyond the participatory process itself and the information available on the city council website, a communication campaign was conducted in the neighbourhood once implementation was completed, with the objective of sharing information with residents and addressing their questions and concerns (Ajuntament de Barcelona 2019b). Moreover, information sessions were held in the streets after structural and tactical works were completed. Follow-up participatory sessions were carried out in 2022 to identify areas of improvement and to implement needed changes after the Superblock project had been in place for a couple of years (Ajuntament de Barcelona 2022c). Areas of discussion included the maintenance of public areas and the arrangements for delivery of goods (Ajuntament de Barcelona 2022d).

a. The leading group comprises members from the following community associations: Sant Antoni Neighbourhood Association; Sant Antoni Commerce Association; Sant Antoni Market Association; AFA Ferran Sunyer; AFA Tres Tombs; AFA Sagrat Cor; Xeix Project – Fostering intercultural relations around local businesses; Fem Sant Antoni (collective of Sant Antoni neighbours and local organisations); Community Centre Cotxeres Borrell; Antiques Market (*Encants Sant Antoni*); Shop Owners of the Urgell Street (*Botigues Carrer Urgell*); Community Centre for the Elderly in Sant Antoni (*Espai de Gent Gran Sant Antoni*); Barcelona's LGBTI Centre (*Centre LGTBI de Barcelona*).

3.4 Designing Superblock projects

The Superblock programme provides the overarching framework for transforming public space and mobility in neighbourhoods. Within this framework, specific interventions are identified in line with the priorities set in Neighbourhood Action Plans and adapted to the local context. Superblock projects integrate interventions across multiple dimensions driving resilience – environmental, social, economic and institutional resilience.[29] This subsection provides an overview of the core features of Superblock interventions across the four dimensions, drawing on the experiences from the Superblock projects implemented to date.

[29] The Organisation for Economic Co-operation and Development (OECD) Ministerial Council's statement of 2014 identifies the following four dimensions of resilience: environmental resilience, social resilience, economic resilience and institutional resilience (OECD 2014 and 2018).

Environment

Environmental resilience is critical in the face of increasing environmental degradation, the overuse of natural resources and climate change. Interventions to strengthen environmental resilience in city neighbourhoods are at the core of the Superblock programme. The street network is reorganised with the objective of transforming urban streets to address environmental and climate-related challenges. Streets are classified based on the following three categories:

- *Green (neighbourhood) streets* are single-platform, shared streets with speed limit of 10 kph. The curb-less design of green streets provides a visual signal to vehicles that pedestrians have the right-of-way. Distinction between spaces dedicated to pedestrians, cyclists and motorised vehicles are removed so that the street space can be shared in a way that is safe and respectful of all users. Through the reorganisation of the street network, streets are reclaimed as public space for people by transforming the intersection of green streets into public squares (Ajuntament de Barcelona 2021d). Interventions also focus on significantly increasing green space and biodiversity. Photo 2 below shows a green street in Sant Antoni neighbourhood.

- *Orange (local) streets* are local streets with a speed limit of 30 kph where private vehicles and bicycles co-exist. In these streets, Superblock interventions focus on significantly increasing pedestrian zones and vegetation.

- *Red (basic) streets* are primary roads with a speed limit of 50 kph[30] which are accessible to local public transport. These streets are designed to efficiently connect different areas of the city, also by bike and on foot, while efforts are made to increase pedestrian areas and vegetation.

Photo 2. A green street in Sant Antoni

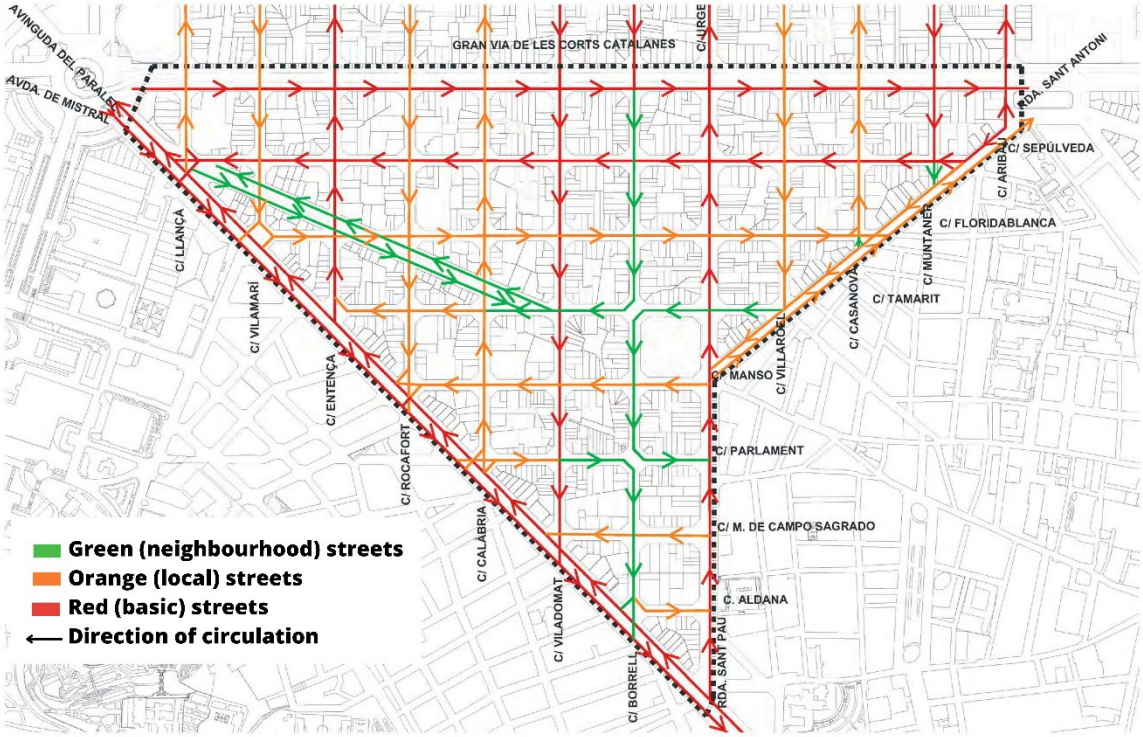


Source: Adrià Goula.

[30] Except in school surroundings, where the limit is 30 kph.

In Sant Antoni, the street network has been transformed in the Superblock area by introducing green, orange and red streets and reclaiming public space for people. In addition, traffic circulation has been reorganised by restricting passing straight through at the crossroads between two green streets to discourage through traffic inside the Superblock area (see Figure 3). When reorganising traffic circulation, the optimal location of urban bus stops and routes were considered with the view of not impairing the efficiency of the public transport network (Ajuntament de Barcelona 2017b).

Figure 3. Reorganisation of traffic circulation in Sant Antoni



Source: Based on Ajuntament de Barcelona 2017b.

The Superblock area is reimagined through a combination of structural and tactical interventions. Structural interventions are permanent, are more expensive and take more time to implement. Tactical urbanism involves short-term, low-cost, scalable interventions that can be implemented quickly to test new ideas, and are easily reversible. Tactical interventions can be made permanent after observing and evaluating the impact of the intervention on users and the environment. With their colourful design, tactical interventions have become the iconic brand image of the Superblock project in Sant Antoni, giving the Superblock programme more visibility nationally and internationally. On the other hand, permanent interventions have the advantage of significantly increasing the quality of public spaces, which can in turn lead to greater acceptance of Superblock projects.

In Sant Antoni, the Superblock project was implemented in two phases, with a combination of permanent and tactical interventions. In the first phase, structural, permanent interventions were carried out to transform public space. Overall, 5,000 m^2 for pedestrians were developed, including a market plaza of 1,800 m^2 near the Sant Antoni Market (see Photo 3). Moreover, measures were introduced to promote active mobility, such as the development of new cycling lanes, and to offset the impact of motorised mobility restrictions, including the creation of a plan for the delivery of goods, particularly to the market (Ajuntament de Barcelona 2017f). The first phase started in November 2017 and was completed in May 2018 (Ajuntament de Barcelona 2019c). The end of the first phase of implementation coincided with the completion of the redevelopment of the Sant Antoni Market, which had been in progress for almost a decade. The second phase of implementation included a combination of permanent and tactical

interventions in the areas surrounding the market, combining structural redesign of some streets with tactical interventions in other areas (see Photo 4). For instance, tactical interventions have been made around schools to improve walkability and safety for children (Ajuntament de Barcelona 2017g). The second phase began in the first trimester of 2018 and ended in 2019 (Ajuntament de Barcelona 2019c). In total, 23,709 m^2 for pedestrians have been secured in the neighbourhood.

Photo 3. The Sant Antoni Market Plaza



Source: Adrià Goula, Lourdes Jansana, Asier Rua.

Photo 4. Tactical interventions near Sant Antoni Market



Source: Òscar Giralt, licence CC BY-NC-ND 4.0. https://creativecommons.org/licenses/by-nc-nd/4.0/

A key difference between the Superblock projects in Poblenou and Sant Antoni is the area of intervention. The Superblock project in Poblenou was implemented in a 3-by-3 city block, while the Superblock in Sant Antoni was implemented at neighbourhood scale based on a street network approach. On one hand, the larger scale of intervention in Sant Antoni was associated with less strict restrictions to motorised traffic compared with the Superblock project in Poblenou. On the other hand, the extension of the area of intervention in Sant Antoni has allowed the expansion of benefits to a larger population without creating a sharp divide between winners, i.e. residents living within the city blocks, and losers, i.e. those living in the perimeter of the Superblock area. The Sant Antoni Superblock served as a blueprint for shifting the Superblock implementation strategy from a city block to a street network approach.

The Superblock concept is now being scaled up in the Eixample district, with the development of four green streets in 2023. The four green streets in the Eixample district are expected to become the model for 21st-century urban streets (see Photo 5). The design of the green streets in the Eixample district has integrated lessons learned from the implementation of the green streets in Sant Antoni. Attention is paid to including solutions to enhance climate adaptation in the design of green streets. In particular, the location and configuration of green spaces play an important role in promoting the growth of trees and vegetation, and are critical for urban temperature regulation, water flow regulation and run-off mitigation (Graça et al. 2022). For instance, native trees are planted at a distance from buildings to maximise space for roots to grow and enhance biodiversity, with 142 different species being planted in the four new green streets in the Eixample district (Ajuntament de Barcelona 2022e). In each green street, two green strips are developed with asymmetrical arrangements to ensure maximum sun exposure. In addition, a permeable and fertile subsoil is used to ensure that the roots of trees are better supplied with nutrients and to promote the effective management of the water cycle. The green strips will support rainwater management by collecting water, thereby contributing to its seepage and retention. Asphalt is replaced with cement tiles and natural stone pieces. Large open squares are developed at the intersection of green streets.

Photo 5. Rendition of a green street in the Eixample district



Source: Ajuntament de Barcelona 2020d.



Source: Ajuntament de Barcelona; Equip: UTE B67 Palomeras Arquitectes SLP and Cierto Estudio SCCLP.

On-street parking regulation for private vehicles is critical for transforming mobility patterns. At the time of implementation of the Superblock project in Sant Antoni, Barcelona had already begun the process of introducing regulations to restrict and discourage on-street parking for private vehicles citywide. Having on-street parking regulation in place significantly facilitated the implementation of the Superblock project in Sant Antoni. Within the Superblock area, private vehicles are not allowed to park in public areas. While a total of 252 on-street parking spaces were removed, underground parking for residents and visitors was built as part of the renovation of the Sant Antoni Market (Ajuntament de Barcelona 2017b).

Society

Social resilience depends on the capacity of cities to deliver inclusive services in a way that empowers individuals to participate fully in society. The Superblock programme builds on the strength of communities to enhance social resilience and "leave no one behind". By reimagining streets for people, Superblock projects encourage diverse and inclusive uses of public space that reinforce the uniqueness of city neighbourhoods, and ensures that green streets are truly shared by all. To this end, public space is designed with a gender-, age- and disability-sensitive approach.

Superblock projects aim to promote street life that reflects a diversity of uses of public spaces, by providing an environment that is conducive to active mobility (e.g. walking and cycling), social activities (e.g. playing, talking, eating and social gatherings) as well as care-giving activities (Ajuntament de Barcelona 2017a). The emphasis on care-giving activities reflects a gender-sensitive approach given that care-related tasks are currently largely carried out by women. The Superblock programme seeks to adapt public space to better support care-related tasks, in line with Barcelona's gender-sensitive guidelines to urban planning (Ajuntament de Barcelona 2020b). For instance, Barcelona has implemented the Vila Veïna pilot project in four neighbourhoods to support caregivers. Vila Veïna offices provide resources to facilitate access to care services and offer free community activities to strengthen community ties in neighbourhoods (Ajuntament de Barcelona 2022g). Barcelona's Vila Veïna project is part of a global city initiative to recognise and support caregivers, building on the experience of Bogotá's Care System, a city-led model of participatory governance in care-giving (Metropolis 2022b). The aim is to scale up the Vila Veïna project in parallel with the scaling-up of the Superblock programme. Ensuring safety and a dynamic street life is also critical to ensure that women can use and benefit from public spaces (see, for instance, Metropolis 2018). The design of the green streets in the Eixample district integrates Barcelona's gender-sensitive guidelines to urban planning as well as the findings of exploratory walks carried out with women's groups as an input to the participatory planning process (Ajuntament de Barcelona 2020b). One of the findings

of the exploratory walks is the importance of lighting the streets earlier during the summer. In the Eixample district, street lighting is designed to make green streets more attractive and safer spaces.

Diverse uses of public spaces promote opportunities for people of all ages to come together and carry out joint activities, and organise cultural events in line with the identity of the neighbourhoods. For instance, in Sant Antoni, shops and businesses organised workshops for young children and families on a variety of themes (e.g. sustainable gardening, air quality and mobility) as part of the inauguration event of the Superblock project. Diverse and inclusive uses of public spaces are encouraged by installing multi-functional street furniture (Ajuntament de Barcelona 2023f). The placement of elements of temporary street furniture without a clearly defined use promotes social activities that are carried out throughout the day by people of different ages (see Photo 6). Public spaces are child-friendly. Play areas are created in public squares in particular in proximity of schools. Ensuring safety and accessibility around schools is also a priority in all Superblock projects.

Particular attention is paid to ensure that the needs of people with visual impairments are considered when designing green streets. The removal of segregation between different uses and the curb-less design of single-platform streets could negatively impact the safety and autonomy of people with visual impairments. This is due to the fact that the gap between street and sidewalk is key to facilitate safe walking by people with visual impairments. In consultation with representatives of ONCE, Barcelona worked closely with people with visual impairments to meet their needs. In Sant Antoni, tactile pathways have been installed on the pavement along the walking itineraries that were carried out before the Superblock was implemented to facilitate the orientation of people with visual impairments, thus enhancing their security and autonomy. Tactile pathways have been incorporated in the design criteria of the green streets in the Eixample district. The Superblock municipal team is working closely with groups representing people with cognitive disabilities to identify their needs and take them into account in future Superblock projects. One of the findings that emerged from the consultations is the importance of considering how bright colours may affect the ability of people with cognitive disabilities to access and enjoy public spaces, in particular when planning tactical interventions.

Photo 6. Social Activities in Sant Antoni's Superblock area



Source: Òscar Giralt, licence CC BY-NC-ND 4.0. https://creativecommons.org/licenses/by-nc-nd/4.0/

Economy

Economic resilience encompasses the capacity of cities to promote inclusive growth and harness economic opportunities. More walkable public spaces and motorised mobility restrictions have the potential to generate significant economic benefits by promoting street-level economic activities. The Superblock programme aims to make the local economy more vibrant by supporting local businesses and ensuring that the reorganisation of the street network does not have negative economic impact on local commercial activities and the most vulnerable residents.

Local regulations are introduced to enable local businesses to capture the economic benefits of Superblock projects by ensuring that local commercial activities are not displaced as a result of gentrification following the implementation of the projects. In line with the city's long tradition of implementing planning regulations that promote mixed land use, usage plans are developed with inputs from the community to regulate commercial activities in each Superblock area. Usage plans aim at protecting existing street-level commercial activities from the risk of being displaced and preserving local economic diversity in neighbourhoods, while regulating commercial activities that produce excessive noise.

The usage plans are developed and implemented in line with Barcelona's urban planning regulations. In particular, the usage plan approved for Sant Antoni neighbourhood includes restrictions on issuing new licences for restaurants and bars, and businesses related to musical, sports, entertainment and tourism activities (such as bike rental shops), since the neighbourhood is close to some of the city's most touristic areas, and therefore at risk of gentrification (Ajuntament de Barcelona 2018c). In addition, regulations set limits on the floor space that can be occupied by a single street-level commercial activity to prevent displacement of small businesses by chain stores that would require large floor space. The usage plan also regulates the density of shops of a single type in an area, the distance between types of commerce, and the distance between specific types of commerce and public buildings such as schools (Ajuntament de Barcelona 2018c).

The regulations set in the usage plans are part of the city's broader strategy to prevent gentrification. Disparities in the access to and quality of public space, such as green space, among neighbourhoods can accelerate gentrification, by leading to an increase in housing prices in areas that are better provided with public spaces and amenities. To this end, the plan of the Barcelona City Council to scale up the Superblock programme citywide is key to address the risk of gentrification by aiming to provide equitable access to public space and amenities across neighbourhoods. In addition, Barcelona has a policy in place to ensure that urban regeneration projects are carried out with the same standards of quality citywide while ensuring that they are adapted to the specific needs of neighbourhoods. Carrying out interventions in a uniform and homogeneous way across all areas ensures that the quality of public space is the same throughout the city. For instance, the same building materials are used across all Superblock projects. This policy prevents creating or amplifying disparities between different areas of the city (Ajuntament de Barcelona 2021a).

The city's plan to address the risk of gentrification also includes scaling up investments in social and affordable housing. In Barcelona, the share of the housing stock for social and affordable housing is significantly lower than in other European cities.[31] A citywide social and affordable housing policy is key to ensure that transformational initiatives at the neighbourhood level, such as Superblock projects, do not lead to gentrification. In Barcelona, city regulations for market-based new housing construction and

[31] In Barcelona, only about 7.5% of the housing stock was for social and affordable housing, compared with 48% in Amsterdam, 30% in Berlin, 23% in London and 17% in Paris based on 2015 data (Ajuntament de Barcelona 2016).

large-scale housing renovation require developers to set aside 30% of apartments for affordable housing (Ajuntament de Barcelona 2018d).

In neighbourhoods characterised by a high density of commercial activities, such as Sant Antoni, the loading and unloading spaces that local businesses need for their suppliers are reorganised with the aim of balancing different uses of public spaces while ensuring that commercial activities are not disrupted. In Sant Antoni, the location of loading and unloading spaces has been partially moved to the basement of the market to free up space on the surface, and loading-unloading times have been restricted to designated hours (Ajuntament de Barcelona 2017b).

Co-ordinating interventions to discourage private motorised mobility with public transport policies is key to ensure that economically vulnerable groups can access basic services and employment opportunities by public transport. A restructuring of the public transport fare system was carried out in 2020 together with the implementation of a low-emission zone in Barcelona in order to ensure that lower-income population would not be disproportionally affected by the measure. Moreover, in 2022 and 2023 Barcelona introduced fare reductions at the metropolitan level, to promote the use of public transportation in the context of the current energy crisis. Discounted public transport fares are available for economically vulnerable groups and specific groups, such as the elderly and students (Transports Metropolitans de Barcelona 2023).

Institutions

Institutional resilience depends on a city's capacity to support open, transparent and inclusive processes to meet citizens' needs and build trust in the city government. The Superblock programme strengthens institutional resilience by empowering community organisations to actively participate in the planning, implementation and monitoring of Superblock projects.

Sant Antoni has a vibrant community life. Key community and local actors such as the Sant Antoni Neighbourhood Association, the Sant Antoni Commerce Association, ONCE, the Barcelona's LGBTI Centre and the AFAs play a central role in the community life of the neighbourhood. Community organisations and local institutions were instrumental to the successful implementation of the Superblock project in Sant Antoni, by helping orient and define interventions, and making sure that they reflected a diversity of needs and uses, and were specific to the neighbourhood. For instance, the Sant Antoni Neighbourhood Association has been a long-standing advocate for the creation of more public space in the neighbourhood and has been actively involved in the participatory process of the Superblock project.

At the same time, the participatory planning process further contributed to strengthen community groups and local organisations in the neighbourhood by providing them with a platform to convene and discuss their needs. The Superblock project has enabled community associations to strengthen their relationships and better co-ordinate inputs among one another. The community space Calàbria 66, which houses the federation of community associations of the neighbourhood, was key to ensure such co-ordination by giving support to newer organisations and by providing information and space for the groups to meet and organise activities. In addition, local organisations, such as the Barcelona's LGBTI Centre, highly benefit from increased access to public space where they can hold their activities. Carrying out their activities in an open space helps strengthen ties between community members and neighbourhood residents.

Annex 2 provides an overview of community groups and organisations that play a central role in the community life of Sant Antoni neighbourhood, and discusses how they contributed to ensuring the successful implementation of the Superblock project.

Table 1 below summarises the Superblock programme's core areas of interventions across the four dimensions.

Table 1. Typologies of Superblock interventions by dimension

Dimension		Core interventions
Environment	Strengthening environmental resilience by reclaiming public space for people, increasing access to green space and reducing motorised mobility	▪ Reconfiguring the street network based on three categories of streets (red, orange and green) ▪ Designing green streets as shared, single-platform streets to prioritise pedestrian use and cycling ▪ Reorganising traffic circulation ▪ Transforming the intersection of green streets into public squares ▪ Replacing on-street parking with underground parking ▪ Increasing green space and vegetation
Society	Strengthening social resilience by promoting multiple and inclusive uses of public space, through a gender-, age- and disability-sensitive approach	▪ Creating public spaces that promote social and cultural interaction ▪ Promoting diverse and inclusive uses of public space for people of all ages ▪ Adapting public space to the needs of caregivers and making them safer for women ▪ Making public areas safe and accessible for people with visual impairments ▪ Planning open spaces with a child-friendly approach ▪ Improving safety and accessibility around schools
Economy	Strengthening economic resilience by supporting local businesses and reducing the risk of gentrification	▪ Promoting street-level economic activities by making public space more walkable ▪ Preventing displacement of local businesses ▪ Preserving the diversity of local commercial activities ▪ Co-ordinating motorised mobility restrictions with public transport policies to ensure affordability ▪ Reorganising the loading and unloading spaces for local businesses in line with the new street network model
Institutions	Strengthening institutional resilience by empowering community groups and local organisations	▪ Empowering community organisations to actively participate in the planning, implementation and monitoring of Superblock projects ▪ Enabling community organisations to carry out activities in public spaces to strengthen ties between community members and neighbourhood residents

3.5 Developing sustainable financing solutions

Over the period 2016-2022, the Barcelona City Council allocated a municipal budget of about €30.7 million to the Superblock programme. Expenditures varied significantly from year to year, in line with the implementation schedule of Superblock projects. In 2022, a total of €18.8 million was spent on the programme, as part of the plan to scale up the programme in the Eixample district. A large expenditure (€5.9 million) was recorded in 2019, the year of completion of the Superblock project in Sant

Antoni.[32] The Superblock project in Sant Antoni cost a total investment budget of €7.5 million, equivalent to a cost of about €197 per resident over the period 2017-2019. The first phase, which involved structural interventions, required an investment of €3.6 million. The second phase, which comprised a combination of tactical and structural interventions, cost €3.9 million (Ajuntament de Barcelona 2019c).

Diversifying sources of funding and financing for public investments is vital to enable the scaling-up of transformational initiatives, such as the Superblock programme. The Superblock programme is financed with municipal own-source revenues; transfers from the national government; European Union (EU) resources, such as the National Recovery and Resilience Facility; and borrowing from international financial institutions (IFIs) such as the CEB and the European Investment Bank. The CEB has co-financed the Superblock programme as part of its first loan of €100 million to the Barcelona City Council to support the city in its efforts to strengthen resilience.[33] IFIs, such as the CEB, enable cities to access external sources of long-term financing at competitive terms to strengthen resilience.

Given the significant benefits for society and the environment of transformational programmes such as the Superblock, there is a strong rationale for leveraging resources from higher tiers of government, in conjunction with EU funds, to pilot local initiatives and support their scaling-up nationwide. For instance, the Spanish Ministry of Health, in collaboration with the Spanish Network of Healthy Cities, has created a national fund to support Spanish municipalities in promoting healthy lifestyles by reclaiming and transforming public spaces, with resources from the National Recovery and Resilience Facility (RECS 2022). Such funds are particularly important for small and medium-size cities, which may face stronger constraints in accessing external financial resources to pilot transformational initiatives. IFIs also support the scaling-up of such initiatives by providing intermediated financing to small and medium-size cities through Public Development Banks and/or commercial banks.

Tactical interventions are estimated to be on average five times less expensive than permanent interventions. Combining structural interventions with tactical interventions enabled Barcelona to expand the project area in Sant Antoni to include a larger area in the neighbourhood. However, implementing tactical interventions is not without challenges. Tactical interventions require more financial and human resources for maintenance than permanent interventions given that deterioration occurs more quickly in temporary interventions than in permanent ones. When assessing the costs of tactical urbanism vis-à-vis permanent interventions, it is therefore important to consider both capital costs and needed resources for optimal maintenance. Since tactical interventions are temporary, it is also vital to account for the cost of converting temporary interventions into permanent ones.

Barcelona's experience with the implementation of the Superblock programme highlights the importance of allocating adequate financial resources to carry out the participatory planning process before implementation starts. Community support is essential for the sustainability of Superblock projects, and it takes significant time and resources to mobilise community groups and reach out to the most vulnerable groups. Similarly, it is critical to set aside adequate financial resources to monitor the programme and assess its long-term benefits. The overall monitoring budget for the Superblock programme over a period of ten years is estimated at about €750,000, including the cost of the equipment (cameras and air quality and noise sensors) for monitoring mobility flows and air and noise contamination levels in project areas.

[32] Based on information provided by Barcelona City Council in April 2023.
[33] This first loan to the city was approved in 2018 and partially financed Barcelona's investment budget for 2018-2020. Following the successful co-operation, in 2022, the CEB approved a €70 million loan to continue supporting Barcelona in its strategy to become a more resilient city. This new loan will co-finance Barcelona's investment budget for 2022-2024.

3.6 Co-ordinating initiatives within a multilevel governance system

Integrated municipal planning is critical to implement transformational initiatives such as the Superblock programme. Leveraging the benefits of Superblock projects requires strong horizontal co-ordination among city departments – in particular in the areas of land use, transport, housing and the environment. In 2015, Barcelona took the decision to integrate its mobility and infrastructure unit, ecology and service delivery unit and urban planning unit into one department to enhance co-ordination. This led to the creation of the Ecology, Urban Planning and Mobility Department, which is currently responsible for the planning, implementation and monitoring of the Superblock programme, in co-ordination with other city departments. The implementation of the Superblock programme is also supported by an advisory board of 17 experts from different relevant areas (Ajuntament de Barcelona 2022e). The enhanced horizontal co-ordination facilitates continuous learning and ensures responsiveness to the evolving needs of the communities.

Within the Ecology, Urban Planning and Mobility Department, the implementation of the Superblock programme is co-ordinated by a multidisciplinary Superblock Technical Office (*Oficina Tècnica Superilla Barcelona*) under the Office of the Chief Architect (Ajuntament de Barcelona 2020d). The Office of the Chief Architect is responsible for developing the city's strategic directions on sustainable development, ecology, climate emergency and mobility. The Superblock Technical Office within the Office of the Chief Architect has overall responsibility for co-ordinating the design and implementation of the Superblock programme across city departments. The Superblock Technical Office co-ordinates a cross-departmental team responsible for Superblock development and implementation, comprising 15 officers from different city departments. The Superblock Technical Office works closely with municipal staff responsible for the Superblock participatory planning as well as municipal staff at the district level to identify vulnerability factors in project areas, design the participatory process, mobilise community groups in collaboration with local institutions and community organisations. It also co-ordinates closely with the Department for Gender Mainstreaming to integrate a gender-sensitive approach in the Superblock programme.[34] A major task of the Superblock Technical Office is seeking inputs from and co-ordinating with city departments to define the maintenance plan for Superblock projects, and allocate significant human and financial resources to ensure adequate maintenance of public squares and green spaces.

Integrated urban and transport planning is essential for planning transformational programmes such as the Superblock. It is critical to ensure that motorised mobility restrictions implemented as part of Superblock projects are part of a citywide policy to incentivise people to use public transport, by enhancing the quality, accessibility and affordability of public transport. In addition, scaling up the Superblock programme citywide is expected to lead to an increase in the use of public transport. The expected impact of Superblock projects on the use of private vehicles is therefore taken into account when planning Barcelona's public transport system.

Horizontal co-ordination between health and transport city departments is essential to leverage the health benefits of motorised mobility restrictions. A global study published by The Lancet Global Health reviews city governance and planning policies across 25 cities to assess whether they support health and sustainability outcomes. The study highlights Barcelona as one of the few cities that has integrated health-focused actions and health impact assessments into urban and transport policies (Lowe et al. 2022). The Superblock Technical Office co-ordinates closely with the Barcelona Public Health Agency, and other independent institutions such as the Barcelona Institute for Global Health (ISGlobal), in carrying out a health benefit assessment of the Superblock programme, to demonstrate that initiatives to transform public spaces are also public health interventions (Ramirez-Rubio et al. 2019).

[34] Based on information provided by Barcelona City Council in April 2023.

Vertical co-ordination across tiers of government is equally important to facilitate learning and sharing of experience from the Superblock programme to the benefit of other Spanish cities that are implementing similar initiatives, and ensure alignment with national policies. The central government plays a critical role in mobilising grant resources to support cities with the development and implementation of transformational initiatives (see Subsection 3.5 above). The national government also facilitates the dissemination of good practices and knowledge transfer among cities. For instance, in 2022 the Spanish Ministry of Health published a guide for planning healthy cities, featuring the Superblock programme (Ministerio de Sanidad 2022).

3.7 Assessing impact

By transforming public space, the Superblock programme aims at fighting climate change and delivering significant environmental benefits for people living in the Superblock and surrounding areas, while also providing important health, social and economic benefits. Superblock projects lead to a reduction in motorised mobility, a decrease in air and noise pollution, while increasing access to public space for pedestrians, in particular green space. Increased access to green space delivers multiple benefits. Simulations carried out by the Barcelona City Council show that Superblock projects can lead to a 1.2°C drop in ambient temperature, thus contributing to urban heat adaptation.[35] Increased access to walkable spaces is critical to achieve the WHO's target for decreasing physical inactivity by 15% by 2030 (WHO 2018). Access to walkable places is associated with improved mental health, and a reduction in obesity and chronic diseases (Arup 2016). Available empirical evidence shows that the walkability of an area is highly correlated with storefront business and that the proximity to pedestrian streets and public spaces also tends to improve the visibility of commercial activities, with significant benefits for the local economy (Arup 2016).

The COVID-19 pandemic has highlighted the role that the built environment plays in improving health outcomes. The health benefits of Superblock projects were particularly evident during the pandemic when regulations were put in place to ensure social distancing, which was problematic in dense neighbourhoods with limited pedestrian areas. By increasing public space and restricting private motorised mobility, Superblock projects helped increase the space available to pedestrians, making it easier to maintain distance between them.

Establishing a monitoring plan to assess the benefits of innovative initiatives such as the Superblock programme is essential to learn from implementation and take lessons learned into account. In 2021, Barcelona developed a monitoring plan for the Superblock programme, building on the lessons learned from the implementation of the Superblock project in Sant Antoni (Ajuntament de Barcelona 2021f). The monitoring plan aims at gathering empirical evidence on relevant vulnerability factors in project areas and assessing the benefits over time of Superblock projects. The monitoring plan for the Superblock programme comprises a set of 36 indicators that are collected regularly by the Barcelona City Council in the project areas. The monitoring plan assesses benefits across four areas: (i) public spaces; (ii) mobility; (iii) environmental quality; and (iv) socio-economic dynamics. Table 2 below lists the indicators monitored across the four areas. The indicators are then aggregated to develop six composite indexes that allow a comprehensive assessment of the project areas and the benefits of the Superblock programme, covering liveability, use of public space, sustainable mobility, the quality of the environment, local economic development and neighbourhood diversity.

The Superblock programme monitors indicators assessing vulnerability factors related to the living environment in project areas, such as green space per capita, CO_2 emissions, noise and air pollution.

[35] Based on information provided by Barcelona City Council.

Information is also collected on relevant individual vulnerability factors, such as the share of elderly population and the share of foreign population, to ensure that the needs of these groups are considered when planning Superblock projects. Economic indicators such as household disposable income, average housing prices and density of street-level shops are also monitored to assess potential economic vulnerability factors in project areas (see also Subsection 3.2 above).

Table 2. The Superblock programme's monitoring indicators

Public spaces	Mobility	Environmental quality	Socio-economic dynamics
▪ Superblock area (m^2) ▪ Pedestrian priority area (including shared streets[a]) (m^2) ▪ Outdoor restaurants and bar terraces (m^2) ▪ Children's play areas (m^2) ▪ Number of benches and chairs ▪ Number of tables ▪ Diversity of uses of public spaces (number of uses/hour/zone) ▪ Users' assessment of public spaces (qualitative indicator)	▪ Pedestrian-only area (m^2) ▪ Pedestrian-only area (m^2) per inhabitant ▪ Total shared street area[a] (m^2) ▪ Area for bicycles (m) ▪ Number of parking spots for bicycles ▪ Area reserved for delivery of goods (m) ▪ Pedestrian traffic (people/hour/zone) ▪ Motorised traffic (vehicles/hour/zone) ▪ Bicycle traffic (vehicles/hour/zone) ▪ Road accidents (number/100 m)	▪ Green space (m^2) ▪ Green space (m^2) per inhabitant ▪ Number of trees ▪ Permeable area (m^2) ▪ Sustainable urban drainage systems area (m^2) ▪ CO_2 emissions (kg CO_2/year) ▪ Percentage of total energy consumption from renewable sources ▪ Percentage of construction material with ecologic certification label ▪ Noise pollution levels (A-weighted decibels) ▪ Air pollution (NO_2 and PM_{10}) ($\mu g/m^3$)	▪ Number of people and organisations that participated in the project ▪ Ageing index (ratio of population older than 65 and younger than 14) ▪ Percentage of foreign population ▪ Family disposable income ▪ Density of street-level shops (number of shops/ 100 m) ▪ Average purchase housing prices (€/m^2) ▪ Average rental housing prices (€/m^2) ▪ Total cost of the project

a. Street space shared between pedestrians and motorised vehicles.
Source: Ajuntament de Barcelona 2021f.

Indicators will be collected regularly over a period of ten years to assess the benefits of scaling up the Superblock programme against baseline values for the year 2022. Monitoring reports covering quantitative data will be updated annually. Qualitative information will be collected every two years through fieldwork and interviews (Ajuntament de Barcelona 2021f). Monitoring quantitative data requires specialised equipment such as air quality and noise sensors to measure the decrease in air and noise pollution. Diversity of uses of public spaces is measured by observing activities in public spaces and documenting diverse uses with cameras.

Spotlight 2 below highlights available evidence on the significant environmental, health, social and economic benefits delivered by the Superblock project in Sant Antoni neighbourhood. Benefits include a decrease in vehicle traffic, a reduction in air and noise pollution, increased access to green space, more diverse uses of public spaces and more visitors to the neighbourhood. Such benefits have led to an increase in well-being for residents, with potential health benefits. Evidence also indicates that the Superblock project in Sant Antoni may have contributed to supporting a faster economic recovery after the COVID-19 pandemic.



The benefits of the Superblock project in Sant Antoni neighbourhood

Available evidence indicates that the Superblock project has delivered environmental, health, social and economic benefits for residents of Sant Antoni and surrounding areas. The empirical evidence is based on the monitoring indicators collected by the Barcelona City Council as well as the study carried out by the Barcelona Public Health Agency (*Agència de Salut Pública de Barcelona*) to assess the benefits of three Superblock projects – Poblenou, Sant Antoni and Horta – one year after implementation. The Barcelona Public Health Agency's assessment is based on a survey of beneficiaries and measurements of air and noise pollution (Agència de Salut Pública de Barcelona 2021).

Environmental benefits. Based on monitoring indicators collected by the Barcelona City Council, overall daily vehicle traffic decreased by 17% across Sant Antoni neighbourhood over 2017-2022 (Ajuntament de Barcelona 2023b). Vehicle transit per day was measured in nine different streets in the area, including red, orange and green streets. A decrease in daily vehicle transit was recorded in all streets, except in one red street (Villadomat Street), which saw a 5% increase in daily vehicle transit. Comte Borrell Street (a green street) registered an 83% decrease in daily traffic (Ajuntament de Barcelona 2023b).

As a result of the reorganisation of the street network, about 23,709 m^2 of walkable space has been added (Ajuntament de Barcelona 2019c). The neighbourhood also benefited from a significant decrease in NO_2 concentration levels of overall 40.3%, from 57 $\mu g/m^3$ in 2017 to 34 $\mu g/m^3$ in 2022 (Ajuntament de Barcelona 2023b). In addition, the study carried out by the Barcelona Public Health Agency recorded a decrease of 17% in PM_{10} concentration levels (a 4.1 $\mu g/m^3$ decrease) between 2017 and 2018, at the crossing of Borrell and Tamarit Streets (Agència de Salut Pública de Barcelona 2021). Noise pollution levels also decreased by 2.5 decibels (dB) during the morning, 3 dB in the afternoon and 4 dB in the evening in the period between 2017 and 2022 (Ajuntament de Barcelona 2023b).

Health benefits. The decline in air and noise pollution and the more active lifestyle associated with walkable places in Sant Antoni is expected to lead to significant health benefits for residents. Based on the study carried out by the Barcelona Public Health Agency, residents reported a perceived improvement in their well-being and sleep quality (Agència de Salut Pública de Barcelona 2021). By contributing to reducing the heat island effect, increased access to green space particularly benefits the elderly, who are the most affected by the health impact of heatwaves, as mortality rates increase with age during a heatwave (Ajuntament de Barcelona 2018b).

Social benefits. The Superblock programme promotes opportunities for social interaction, and by doing so it contributes to reducing social exclusion. According to the Barcelona Public Health Agency's study, multiple and diverse uses of public spaces (including resting, talking, shopping, walking, playing and exercising) were observed during the first year of implementation of the Superblock project in Sant Antoni. The reduction of vehicle traffic, as well as the presence of urban furniture, increased the number of people in public spaces. The surveys showed that the area was experienced as a more welcoming space by the residents. Residents reported that the area was more "full of life" and "more like a neighbourhood" (Agència de Salut Pública de Barcelona 2021).

Economic benefits. An annual survey carried out by the Sant Antoni Commerce Association found that the number of visitors to the neighbourhood increased following the inauguration of the market and the Superblock project (Ajuntament de Barcelona 2022a). Before the inauguration of the Superblock project

and of the new market, the neighbourhood received about 55 million visitors per year. After completion of the Superblock project, 64 million visitors were recorded in 2018 and 61 million in 2019. The increase is likely associated with the combined effect of the inauguration of the market and the Superblock project. About 47% of visitors are residents of the neighbourhood, and 53% come from outside the neighbourhood (Ajuntament de Barcelona 2021i). The increase in the number of visitors benefited local businesses. A survey of 48 commercial activities was carried out eight months after completion of the Sant Antoni Superblock project in the neighbourhood. The survey found that 83% of the merchants noted an improvement in comfort in walking in the neighbourhood, and 69% noted an increase in the passage of people (Ajuntament de Barcelona 2022f).

Moreover, the Sant Antoni neighbourhood saw a faster economic recovery from COVID-19 compared with other areas of the city. Data on private expenditure collected by Barcelona's Municipal Data Office (*Oficina Municipal de Dades*, OMD) based on the use of credit and debit cards in commercial establishments between March and June 2021 found a higher increase in the number of transactions and sales in Sant Antoni after the relaxation of COVID-19 restrictions compared with the city average (Ajuntament de Barcelona 2023c). The positive impact of the Superblock project on the local economy may have contributed to the economic recovery.

4. Resilience in action – Lessons learned from the Superblock programme

The Superblock programme demonstrates the multiple benefits of transitioning from a car-centred to a human-centred approach in planning urban streets. It has proven that it is possible to develop a new city model that is conducive to more liveable, green and economically vibrant public space. This section highlights six key lessons that have emerged from the planning and implementation of Superblock projects as a way to promote city-to-city learning and knowledge sharing.

Climate action is an opportunity for inclusive urban transformation.

The Superblock programme shows that transforming public space and mobility modes provides an opportunity for addressing the climate crisis in a way that is equitable and inclusive. Inclusive climate action starts by tailoring the participatory approach to adequately represent the diverse needs of community groups. Barcelona has made it a priority to proactively "fill the empty seats at the table" by reaching out from the outset to groups who may be impacted by the project and to create an environment where all community groups can have their voices heard and count. Gender, age and disability are among the vulnerability factors to consider when undertaking transformational initiatives at the neighbourhood level. In particular, the Superblock programme highlights the importance of adopting a gender-, age- and disability-sensitive approach when designing a participatory planning process to transform public space. In addition, it underscores the importance of combining any initiative to increase green space with measures to reduce the risk of gentrification.

Participatory planning and tactical urbanism are central to promote behavioural change at the community level.

Behavioural change starts at the community level. Initiatives at the neighbourhood level are therefore an effective entry point for transforming the way people live and move in the city. Barcelona's new city model centred on green streets shows that a shift towards active mobility can be achieved without banning motorised traffic in neighbourhoods, provided that the project has the support of the community. By involving communities from the outset in the planning process, an inclusive participatory

planning is vital to build local support for behavioural change. The Superblock programme goes beyond participatory planning by empowering communities to co-design solutions adapted to local conditions through their active role in the development of Neighbourhood Action Plans. In addition, the Superblock programme underscores the importance of tactical interventions to promote behavioural change at the community level. Reimaging urban streets through tactical urbanism can significantly contribute to promoting a shift towards active mobility and diverse uses of public space. It has also proven instrumental to build community support for investing in permanent interventions that reconfigure public space.

Promoting behavioural change that is good for both people and the planet calls for integrated interventions across multiple sectors.

Promoting behavioural change that delivers benefits to both communities and the environment requires transformational initiatives that integrate actions across urban sectors. The Superblock programme adopts a multipronged approach to strengthening resilience by combining interventions across four dimensions – environment, society, economy and institutions – to capture synergies. For instance, combining interventions to increase access to green space with measures to promote local commercial activities ensures that Superblock projects deliver both environmental and economic benefits. In addition, the Superblock programme's community-based approach provides the opportunity for strengthening institutional resilience, which is in turn critical for the effective implementation of transformational initiatives.

Strong horizontal co-ordination across city departments is vital to leverage the benefits of transformational initiatives and "leave no one behind".

Implementing a transformational programme such as the Superblock requires strong horizontal co-ordination across city departments to "leave no one behind". Neighbourhood-level initiatives to transform public space and mobility modes can deliver benefits to all residents only if sustainable and inclusive public transport and affordable housing solutions are available. An inclusive and affordable public transport system is essential to ensure that the new city model delivers the intended benefits without affecting the capacity of the most vulnerable groups to access basic services and employment. Ensuring a mix of housing solutions in neighbourhoods, including social and affordable housing, is vital to address the risk of gentrification. Horizontal co-ordination between planning and health departments is also needed to mainstream health considerations in the planning of public space and thus maximise the health benefits of initiatives.

Scaling up transformational initiatives citywide requires flexibility within the framework of coherent urban sectoral policies.

Adopting a flexible, community-based approach that is aligned with citywide urban policies is essential to effectively scale up neighbourhood initiatives. The Superblock programme enables communities to adapt interventions to their local reality. Such flexibility is essential to expand implementation citywide while valuing the diverse needs and unique identify of city neighbourhoods. Flexibility is also needed in the initial phase to identify neighbourhoods to pilot the programme. For instance, there may be benefits in piloting transformational programmes such as the Superblock in neighbourhoods with low levels of car traffic, where motorised mobility restrictions can be more acceptable, to showcase the benefits of a new city model. At the same time, the Superblock programme underscores the importance of scaling up neighbourhood initiatives within the context of citywide sectoral strategies and policies, in particular in the areas of public transport and affordable housing, and in alignment with a city's climate action and social justice goals.

Empirical evidence provides the compass to ensure that behavioural change leads to the intended outcomes.

Collecting empirical evidence when piloting innovative, multidisciplinary initiatives at the neighbourhood level is a critical step to assess benefits and learn lessons before scaling up. The Superblock programme highlights the importance of developing a methodological approach to building empirical evidence that is robust and comparable across locations, and covers all project phases – from planning to monitoring. At the planning stage, evidence is essential to calibrate the approach to the reality on the ground. In particular, a diagnostic assessment of vulnerability factors is necessary to develop an inclusive participatory planning process. At completion, robust empirical evidence provides the compass to assess whether the initiative has delivered the intended outcomes. Evidence from the implementation of the Superblock programme shows that interventions related to the built environment can contribute to achieving significant health, social and economic benefits, which need to be measured as part of the programme's monitoring plan. It is also important to ensure that empirical evidence is collected to assess the extent to which an initiative leads to behavioural change based on a combination of quantitative and qualitative data collection methods. When testing innovative approaches such as the Superblock programme, empirical evidence also helps demonstrate success and thus win support for change.

Annex 1 – Climate-related and environmental challenges faced by Barcelona

Barcelona faces a number of climate-related shocks and stresses and environmental challenges, including heavy rainfall, heatwaves, water scarcity, air pollution, noise pollution and limited access to green space.

Heavy rainfall – Although erratic rainfall patterns, including strong periods of heavy rainfall, are frequent in the Mediterranean region, this hazard is becoming more accentuated as a direct consequence of climate change. Recent evidence indicates that total rain levels are decreasing, while the intensity and concentration of rainfall is on the rise (Ajuntament de Barcelona 2021b). Between 1959 and 2018, one episode of torrential rain (with an hourly intensity superior to 60 mm/h) was registered each five years on average, while in 2020 two episodes were registered. Similarly, episodes of intense rains[36] have risen from three a year on average to four in 2020. The impact of this hazard is worsened by the fact that the city has considerably increased its urban pervious surface over time (from 45% to 72% between 1959 and 2009), resulting in a reduced ability to absorb water in the ground (Ajuntament de Barcelona 2021b).

Heatwaves – Barcelona is one of the Spanish cities most exposed to extreme temperatures. The hot summer climate is compounded by heat-producing cars and heat-absorbing concrete surfaces, resulting in the heat island effect. Barcelona is typically about 3°C warmer than the region around it (Ajuntament de Barcelona 2021b), while temperatures in the city centre can be up to 8°C higher than surrounding areas (Mueller et al. 2020). The city suffered from heatwaves 11 times between 1982 and 2019, and four times in 2020-2021 (Ajuntament de Barcelona 2021b). Heatwaves have a particularly hazardous impact on ecosystems and the population, with the elderly, children and the most fragile being especially affected. It is estimated that between 1992 and 2015, 980 male deaths and 2,729 female deaths in Barcelona are attributable to extreme heat (Ajuntament de Barcelona 2021b).

Water scarcity – Barcelona faces the hazard of increasing water scarcity, which is being exacerbated by climate change. Starting in the spring of 2021 and extending until the end of 2022, the region of Catalonia experienced the most severe drought since 2008, an emergency affecting over 5.5 million people in the region. In November 2022, Catalan dammed water reserves were below 30% of their capacity, prompting municipalities to implement regulations to limit water use (Generalitat de Catalunya 2022). Even though Barcelona was not among the most affected areas, ensuring efficient and reliable water supply is a top priority for the city, as outlined in the Climate Plan 2018-2030. The plan outlines the importance of expanding permeable surfaces, sustainable urban drainage systems and green roofs that trap water (Ajuntament de Barcelona 2021b).

Air pollution – Air pollution is one of the biggest public health issues in Barcelona. Nitrogen dioxide (NO_2) and suspended particles are the main pollutants caused by motorised traffic. Air pollution is associated with increased mortality. The Barcelona Public Health Agency estimates that if Barcelona managed to reduce air pollution to the limits recommended by the WHO, 1,900 natural deaths would be avoided every year, based on pre-pandemic pollution levels (Agència de Salut Pública de Barcelona 2022b). Barcelona recently ranked the sixth city with the higher mortality risk due to air pollution from a total of 858 European cities (Rodrigez-Rey et al. 2022).

[36] Rain of more than 20 minutes with an intensity superior to 60 mm/h.

Noise pollution – Noise pollution is a major environmental health issue (Bonet-Solà et al. 2021). Road traffic is the biggest source of noise pollution in Barcelona, with 57% of the population being exposed to noise levels equal or superior to the limits set by the WHO, during both day and night. Around 16% of the city's adult population suffers intense discomfort due to traffic-related noise, while around 4% suffers from severe sleep disorders connected to road traffic noise levels, particularly in the central neighbourhoods of the city. Chronic exposure to traffic-related noise is responsible for around 300 new cases of ischemic heart disease as well as 30 deaths related to such pathology each year in Barcelona (Agència de Salut Pública de Barcelona 2022a).

Limited access to green space – Climate-related shocks and stresses are compounded by the fact that Barcelona suffers from limited access to green space, with an average green area per inhabitant significantly below the average of Spanish cities. Among Spanish cities with more than 100,000 inhabitants, Barcelona ranks 60th out of 63 in terms of green space per person, with 7 m^2 of green area per inhabitant (MITMA 2023 and Ajuntament de Barcelona 2023h).[37] However, access to green areas varies drastically within the city, with the Eixample district, for example, having an average of only 2.1 m^2 of green space per inhabitant (Ajuntament de Barcelona 2023e). Barcelona's Climate Emergency Action Plan for 2030 set the goal to increase the average green space per inhabitant by 1 m^2 per inhabitant by 2030 (Ajuntament de Barcelona 2021b).

Climate-related and environmental challenges are having increasingly negative effects on health outcomes for the population. The cumulative impact of lack of opportunities to engage in physical activity, increased air and noise pollution, heatwaves, and poor access to green space is estimated to cause 3,000 cases of premature deaths per year in Barcelona (Mueller et al. 2017).

[37] Excluding the Collserola forest greenery.

Annex 2 – Community groups and organisations in Sant Antoni neighbourhood

Sant Antoni has a vibrant community life. The presence of dynamic local institutions and community organisations in the neighbourhood played a key role in ensuring that the Superblock project met the needs of all community groups. At the same time, the project has contributed to strengthening the roles of community groups and local organisations in Sant Antoni by providing them with a platform to convene and discuss their needs and priorities. This annex provides an overview of some of the most vibrant community groups and organisations in Sant Antoni based on information collected through on-site visits and interviews carried out in April 2023 in Barcelona.

The Sant Antoni Neighbourhood Association – *Associació de Veïns i Veïnes del Barri de Sant Antoni*

Neighbourhood associations are rooted in the Spanish tradition of community engagement at the neighbourhood level. They play a key role in mobilising community groups, in particular in advocating for the need of public infrastructure investment at the neighbourhood level. Created in 1967, the Sant Antoni Neighbourhood Association has been a long-standing advocate for the creation of more public space in the neighbourhood and has been actively involved in the participatory process of the Superblock project. The Sant Antoni Neighbourhood Association actively provides input to policies and projects that affect the neighbourhood; it also provides support to the community, acting as reference point for information on services available to groups in a situation of vulnerability (such as social housing and distribution of food and clothes). It also contributes to strengthening community ties by organising cultural events and inclusive initiatives; for instance, the Sant Antoni Neighbourhood Association is involved in a programme to promote safety in public spaces for women. As an active member of the Superblock leading group, the Sant Antoni Neighbourhood Association focused on ensuring that the Superblock project would not accelerate gentrification in the neighbourhood. To this end, the association advocated for the approval of the usage plan to amplify the benefits of the Superblock project for the Sant Antoni community.

The Sant Antoni Commerce Association – *Sant Antoni Comerç*

Founded in 1995, the Sant Antoni Commerce Association is the main neighbourhood association that advocates for the interest of local business owners. It represents about 260 businesses located in the area. The Sant Antoni Commerce Association was highly involved in the Superblock participatory process. The association was instrumental in building consensus for the Superblock project at the early stages of the planning process. Given the initial mixed reaction from the community in Poblenou from the implementation of the Superblock project, local businesses were initially concerned about the possible negative impact of the project for their business, in particular about the ability of customers to access shops. In support of the local business community, the Sant Antoni Commerce Association advocated strongly for applying motorised mobility restrictions in a manner that ensured that the neighbourhood would remain accessible by car while discouraging through traffic. The Sant Antoni Commerce Association also advocated for the development of the usage plan to limit the risk of displacement for local businesses due to gentrification, and for closely monitoring the impact of the Superblock project on local commercial activities. By actively participating in the Superblock planning process, the Sant Antoni Commerce Association was able to successfully advocate for the needs of local businesses and confirm its role as the reference organisation for businesses in the neighbourhood.

ONCE – *Organización Nacional de Ciegos Españoles*

ONCE is a national organisation established in 1938 with the mission of promoting social inclusion and improving the quality of life for people with visual impairments. It has since evolved and it currently offers support to people with any type of physical and mental disability. The organisation offers a range of social services aiming to improve the autonomy and quality of life of people with disabilities, such as direct assistance and educational and sporting activities. ONCE local representatives have been working actively with the Superblock municipal team to advocate for people with disabilities, and take measures to ensure that the green street model is adapted to meet their needs. Despite being a national organisation, with a presence across each Spanish region, ONCE has a historic attachment with the Sant Antoni neighbourhood, where its office for the region of Catalonia is currently located. Its previous offices were also located in the neighbourhood, with the building eventually being converted into the community space Calàbria 66.

Barcelona's LGBTI Centre – *Centre LGTBI de Barcelona*

At the beginning of 2019, the Barcelona City Council inaugurated in Sant Antoni the city's first centre dedicated to the LGBTI (Lesbian, Gay, Bisexual, Transgender and Intersex) population. The centre provides services and organises activities for the LGBTI community and affiliate organisations, and offers services and support to people from the LGBTI community who suffered discrimination or violence. The centre also provides cultural and educational activities to all city residents, with a focus on promoting inclusion of the LGBTI population in society. The centre has significantly benefited from the project. It is located at the heart of the Superblock project, where tactical interventions were carried out. The Superblock project enabled the Barcelona's LGBTI Centre to use the public space in front of the centre for its own activities several times during the year. The ability to hold its activities in a public space has reinforced its vocation of being a space open to all, and of fostering an atmosphere of openness and transparency that is key to promoting the social inclusion of the LGBTI community. Access to public space has also further facilitated the provision of information and services for people from the LGBTI community.

AFAs – *Associacions de Famílies d'Alumnes*

AFAs, community associations of families with students enrolled in local schools, are non-profit voluntary organisations that promote participation and collaboration of parents with local schools, acting as an interlocutor to deal with issues that affect the families of children enrolled in the schools. AFAs have been actively involved in the participatory process of the Superblock project in Sant Antoni. Representatives of three AFAs have been engaged in the participatory process, in close co-ordination with other AFAs in the city. AFAs closely co-ordinate their activities through a citywide network. AFAs are among the strongest advocates of Superblock projects and motorised mobility restrictions. Among the main concerns of AFAs are air quality, as well as safety of children in public space, particularly related to spaces for play. The Superblock project has contributed to further strengthening the capacity of AFAs to co-ordinate their activities and to advocate for the need to create safe and child-friendly neighbourhoods.

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