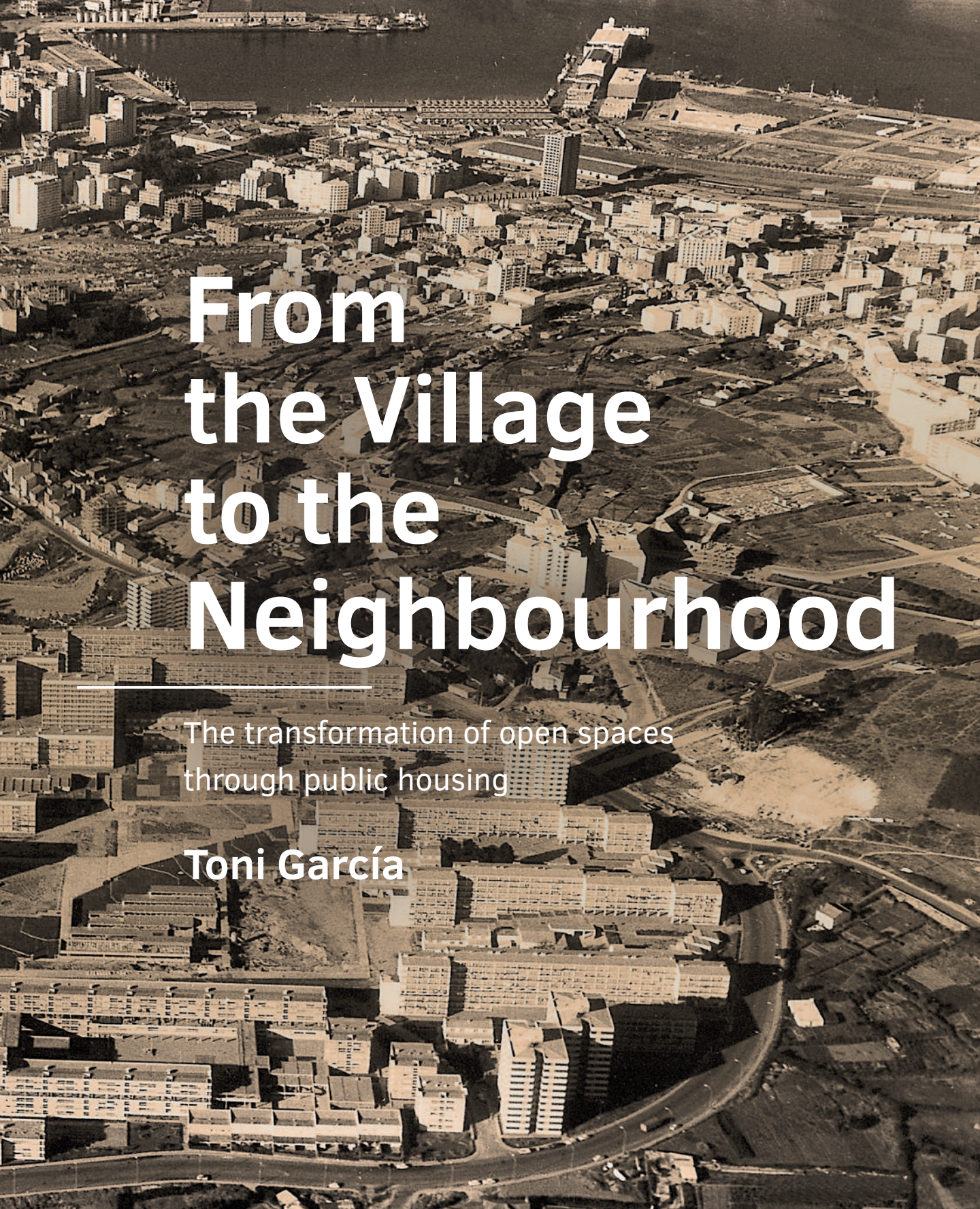

# From the Village to the Neighbourhood

The transformation of open spaces through public housing

**Toni García**

# From the Village to the Neighbourhood

## The transformation of open spaces through public housing

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# From the Village to the Neighbourhood

## The transformation of open spaces through public housing

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by

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**This dissertation has been approved by the promotors.**

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Aos meus pais, que me regalaron dous mundos:

a memoria da súa aldea e a vida en comunidade do barrio

# Contents

# Summary

This thesis examines urban transformation and opportunities for urban upgrading through the rehabilitation and recycling of public housing neighbourhoods built in intermediate cities with a rural base and slow growth.

The research explores the past and present of the residential estates of the main Galician industrial cities in order to discover, on different scales in four chapters, how the public housing projects built in the second half of the twentieth century were formed, how their urban integration process has taken shape, what the open spaces associated with public housing are like, and if they have served as a bridge between the public, the community and the private, to end with recommendations that can help in participative processes of integral urban regeneration for better articulation, integration and urban cohesion of the open spaces included in the public project.

After a first chapter introducing the problem, the main questions, the structure of the research, the methodology used, and the theoretical and analytical framework, the second chapter studies the context within which the public housing appeared, and how it was integrated into the consolidated city in Europe, Spain and Galicia, in order to explain the location where the public housing was developed, as a basis for analysing the study cases.

Chapter three evaluates the formative potential of the residential estates in the urban fabric at the scale of the neighbourhood, studying the initial formation of estates, considered as peripheral fragments, answering the question of how it affects the inherited territorial structure in the urban setting of the estate. It also shares with chapter four the study of the creation of relationship spaces from the construction of the estates, which allows us to observe their urban arrangement, responding to how it affects the distribution of the built elements and open spaces of the neighbourhood in the urban cohesion of the public housing project.

Chapter four studies current open spaces on two scales, within the estate and in its surroundings. On the first scale, we study the creation of spaces for social interaction in the housing estates, which allows us to observe their urban fit, responding to how the distribution of the built elements and open spaces of the neighbourhood affects the spatial cohesion of the estate. The second scale studies the current configuration of the open spaces inside the estate, responding to how the configuration of the space between buildings influences the quality of the spaces for social interaction.

Chapter five shares the parameters used in the analysis of the case studies, answering the question of what conclusions can be drawn from the comparison of the case studies, which spaces of opportunity are found in the case studies, and what is the framework for discussion from where to begin establishing intervention proposals for the physical regeneration of the estate based on the improving the spaces of opportunity.

# Samenvatting

Deze thesis onderzoekt de stedelijke transformatie en mogelijkheden tot stedelijke verbeteringen door de modernisering en renovatie van woonwijken in middelgrote stadjes met een ruraal karakter en gekenmerkt door langzame groei.

Dit onderzoek behandelt het heden en verleden van de woonwijken van de voornaamste industrie steden in Galicië. In vier hoofdstukken wordt onderzocht hoe de woonwijken zijn aangelegd in de tweede helft van de twintigste eeuw, hoe het integratie proces met de bestaande stad is verlopen, welke de open ruimtes zijn in en rond de woonwijken en of en in hoeverre zij een functie vervullen als brug tussen publiek, gemeenschappelijk en privaat gebruik. Het onderzoek wordt afgesloten met aanbevelingen die tot verbeteringen kunnen leiden in de participative processen bij integrale modernisering van steden en stadswijken waar het gaat om het beter onderbouwd opnemen en integreren van open ruimtes in de publieke ruimte, zodat een samenhangend stadsbeeld ontstaat.

In hoofdstuk één wordt het probleem geïntroduceerd en worden de onderzoeksvragen, de structuur en de opzet van het onderzoek en het theoretisch en analytisch kader behandeld. In hoofdstuk twee wordt ingegaan op de context waarin de woonwijk is ontstaan en hoe die zijn opgenomen in de stadsuitbreiding in Europa, Spanje en Galicië. Met deze duiding van de lokaties waar de wijken zijn ontstaan wordt een analyse kader verkregen voor de bestudeerde wijken.

In hoofdstuk drie wordt het formatieve karakter van residentiële estates voor de stad op wijkniveau bekeken, vanaf het ontwikkelen van de eerste estates, de perifere fragmenten, en hoe zij de oorspronkelijke territoriale structuur van de stad beïnvloeden. Evenals in hoofdstuk 4 wordt de verbindende functie van de ruimtes die ontstaan bij de ontwikkeling van de estates bestudeerd; wij zien hun ligging in de stedelijke omgeving en daarmee hoe de verdeling van bebouwing en open ruimtes van wijken in de stedelijke omgeving wordt gecreëerd.

In hoofdstuk vier wordt de open ruimte vanuit twee perspectieven onderzocht: vanuit het perspectief van binnen de estate en van het persepctief van de omgeving. Het eerste perspectief ziet op het creëeren van ruimtes voor de sociale interactie tussen de woonwijken; het stelt ons in staat te zien hoe de wijken passen in de stedelijke omgeving en hoe de verdeling van de bouwelementen en open ruimtes van invloed zijn op de ruimtelijke samenhang van de estates. Binnen het tweede perspectief wordt de

huidige configuratie van de open ruimtes binnen de wijk bestudeerd en wat de invloed is van die configuratie op de kwaliteit van de sociale interactie in de wijk.

In hoofdstuk vijf worden de parameters benoemd die gebruikt worden in de analyse van de case studies en worden conclusies getrokken uit de vergelijking van de verschillende case studies. De ruimtes die kansen op verbetering bieden worden geïdentificeerd evenals het kader voor het ontwikkelen van interventie voorstellen om door het verbeteren van die geselecteerde open ruimtes de wijk te moderniseren.

# Preface

*"The city of the future will mainly be made from existing materials, to which something will have been added that reinterprets them, which by acting in their interstices in some way reinvents them."* (Secchi 1983, p.12)

In the twenty-five years I have worked as an architect and urban planner, and seventeen as professor in A Coruña, and previously at the UNAM in Mexico and the PUUC in Brazil, I have dealt with the construction of the city and its spaces, observing the speed of urban development processes, the physical and social fragmentation associated with them, the difficulty of finding alternatives for territorial cohesion and social inclusion, and even for their spatial representation. My work over these years, participating in projects for the improvement of housing and rural settlements in Latin America through the Spanish Ministry of Foreign Affairs in cities such as Jacmel in Haiti or Puerto Plata in the Dominican Republic, and recently with my students in neighbourhoods and metropolitan areas such as A Coruña and Vigo, or on lesser scales from housing to external space, have led me to reflect on the need for a public project in the construction of urban spaces for social interaction.

At this moment of pandemic, which follows a period of economic crisis from which Spain has not recovered, caused by the real state bubble, which left a rocketing growth of the urban peripheries, a large number of empty homes and the increasingly severe need for housing for a population with less income, it is necessary to stop and consider, to see how that even in precarious times, such as the middle of the twentieth century, public projects led to the construction of housing, and how the democratization of the country has made it possible to humanise the space of these first peripheries, turning the collective into something public. We will see this as we embark on a journey back through the history of the buildings and cities we have inherited, although in this case those that were built as a result of a public responsibility towards a social majority, and which are now being re-evaluated and rehabilitated in a collective improvement project that involves all of society.

During this period I have been lucky enough to have worked, studied and lived in different European countries, to have been a resident or neighbour of areas with public housing, frequently surprised by the rotundity and unity of these parts of the

city, by their marginal condition and abandonment, but also by the potential of the large spaces they contain within their interior or on their outskirts, by the use of large scales based on isolated blocks and their combination with smaller spaces, which at times are extremely labyrinthine. I have had a multitude of experiences, ranging from those in peripheral neighbourhoods, dormitory districts frequently isolated from the city, such as Märkisches Viertel in Berlin, Bijlmermeer in Amsterdam, or Les Pyramides in Evry, to other such as Montbau in Barcelona, where I observed something that is denied to the majority of these types of areas: heterogeneity, a wide social spectrum and different activities that breathe life into its large open spaces, surprised by the variety of perspectives in relation to the housing, the richness and variety of alternatives between private, public and community spaces, and the presence of vegetation as an element that coalesces the unit.

Low social prestige is the norm when it comes to defining these residential spaces, which began to appear in the middle of the last century. Much has been written on their major flaws, problems in terms of habitability, and the low quality of their construction and layout from the moment they were built. But after visiting them or living in them, I have seen that they should not all be tarred with the same brush, and when I visit them with students or talk about them in lectures, I always focus on finding their weak points and their strong points, as with all of the other examples we study, based on the principle that every type of building or city has them. And I also ask them to consider their potential, because none of these spaces should be considered as a finished, futureless place: they all have qualities we can learn from and with which we can work with to improve the life of their inhabitants, and by extension the lives of all of the inhabitants of the cities in which they are found.

In the mid-1990s I was finishing my architecture studies in Lille, in my final academic year while I was dealing with the regeneration of an area on the outskirts next to a neighbourhood with public housing, I came across the demolition of a series of large rent-controlled housing blocks (HLM). In addition to my interest in how these public housing projects had come about, I became curious as to how they had been integrated into the city, and how their future and the future of their residents was being managed. At that particular moment in an industrial city like Lille, which had seen the closure of its steelworks and had a large number of unemployed, I was able to see for the first time the impact of a housing policy that focused on demolition and displacing its inhabitants, seeking to eradicated what was considered as a social problem, to end up transferring it to another location. While Lille's industry was relocating and the old working class districts were being demolished, Euralille was built, a new centre for a Lille considered as a services city, between Paris, London and Brussels. This summed up something that I later saw in many other European cities: their conversion to tertiary cities, a reflection of the imposition of neo-Liberal

policies with minimum state intervention and a change towards a model that affects urban spaces through the sale of public land or housing projects, and the increased privatisation of services.

From living in a city undergoing "reconversion," I now lived in a city undergoing "reconstruction." The Berlin of that time has little to do with the modern-day capital; the city in ruins I knew was still without any of the projects that have transformed it. I lived in the East, in the district of Prenzlauer Berg, in a building on an old block with an interior patio on Greifswalder Strasse, next to the endless blocks of prefabricated Soviet-style blocks on Michelangelo Strasse. It was there, without any improvements in the living conditions of the neighbourhoods, that renewal work timidly began after ownership of the residential blocks was transferred to communal real estate concerns, most of which have now been bought out by foreign investors. In Berlin I saw types of residential ownership that were alternatives to public intervention and the private market: collective rooms, self-construction, self-management and squatting, a result of the need for housing and also a result of the power vacuum that existed in the years after the fall of the Wall. The Siedlungen of the Weimar Republic were a happy "anecdote" in the fragmented fabric of a city in which the state properties from the East were privatised, and the social market economy of the Federal Republic was dismantled in the West. It was a time of changing trends following the consolidation of the Keynesian model of the welfare state, which since then has spread over the whole of Europe, breaking away from the presence of the state both in terms of the productive economy and in the provision of welfare.

If I still had any doubts, during this period I finally understood something that the majority of my neighbours in East Berlin failed to understand: that the basic right to housing is today a matter of the market economy. The paradigm changed, and basic needs such as housing instead became a commodity. And since then, I have observed with interest the public housing policies that seek to provide access to decent housing for the majority of society. This thesis partly came about as a result of my concerns regarding this unresolved need in my country, and encouraged me to look for explanations for the construction of public housing, its relationship with the "inherited city" and its maintenance (particularly its rehabilitation), as it is my intention to be actively engaged in this stage.

I spent the final years of the twentieth century between Rotterdam and Amsterdam. My first home in the Netherlands was in the district of Voorhof, to the south of Delft. It was a neighbourhood built at the end of the 1960s based on the criteria of "mixing use," bringing together a large number of immigrants such as myself, living in small, rented, high-rise apartments, facing the houses and low-rise buildings with gardens that were mainly occupied by elderly Dutch citizens. Despite the slightly neglected

appearance of the building and its surrounding area, life in this neighbourhood was pleasant, with people walking the streets, shops and businesses on the ground floors of the avenues, with schools, nurseries, gardens and large areas with trees inside their large blocks; it was close to the historic town centre, and its accessibility and continuity from the urban layout enriched its urban diversity. It had nothing to do with the squalor and violence I found in peripheral neighbourhoods like Bijlmermeer or Pendrecht, the result – amongst other factors – of their gradual abandonment, lack of maintenance and management with limited resources, in the hands of cooperatives consisting of the resident population who owned their homes.

At that time, large parts of the city were subject to a regeneration policy that was open to private developers. The most visible projects were in the obsolete areas of the ports of Amsterdam and Rotterdam, but these also included neighbourhoods with public housing. I was given a close insight into this process thanks to being able to work with Dick Van Gameren at De Architectengroep while he designed and built the houses of Funen Park and Borneo in the Eastern docklands of Amsterdam, or those built around the Sloterpark, in the western extension planned by Van Eesteren. As a result, I achieved a better understanding of the new housing policy, its history and the failure of transferring to the free market the majority of the properties intended for public housing. These were demolished, building new homes in their place, seeking to attract residents with higher incomes with the aim of achieving a greater social mix in these districts, something that was not achieved in this case.

Since then, I have closely followed the process of urban regeneration in the Netherlands, and the change that took place from 2006 onwards, focusing more on improving living conditions for the population living in decaying areas, based on improving their surroundings and homes through rehabilitation projects, increasing their density as a more uniform means of social renewal, which also included new housing. The economic crisis has led to changes in this policy, paralysing the planned demolitions and construction of new homes in favour of rehabilitation projects, complementing them with improved public services and commercial premises.

In the Netherlands, I was able to discover the difficulties involved and also the transcendental nature over time of a housing policy that benefited the majority of society, with a stock of real estate consisting of public housing that has been considered as such for all of its useful life, having been built and managed by the public authorities of other types of organisations as cooperatives. And I have lived through the change towards a greater liberalisation of the real estate market, at a time when the stock of state housing built after the Second World War needed to be renovated. This experience directly connected my interest in post-war public housing with current urban regeneration policies; in other words, with the interventions

that seek to improve living conditions in these parts of the city. As a result, when I decided to carry out a research project that explained the transformation of these parts of the city in Galicia, Spain, and their need for improvement, taking into account the potential contribution of my European experiences, I understood that the Netherlands was the best place to be able to discuss my research, not with the aim of comparing it, but instead with the aim of exchanging opinions based on its experience, observing from outside something that was not yet considered a necessity in Galicia.

On my return to Spain at the turn of the new century, the country was still experiencing a real estate boom, without any plans to rehabilitate the public housing built during the post-war period. The improvements in these parts of the city were still the responsible of the local authorities, generally the regional governments to whom housing policies had been transferred in the mid-1980s. Since then the projects have varied from one region to another, characterised by the rehabilitation of buildings by repairing common elements, together with specific interventions in the areas around the buildings and public spaces, and to a lesser extent more extensive projects involving the demolition and replacement of the building and the restructuring of entire urban areas. In the cases where these types of projects were carried out, they were generally planned without any previous analysis of the needs of the population, without questioning the future of these parts of the city, and purely focusing on the problems resulting from their poor construction.

In Galicia there have still not been any cases of integrated urban regeneration. Partial improvements have been made to neighbourhoods, in many cases adding the social services, healthcare facilities and educational centres they lacked, with funding for the construction and improvement of public spaces. I have witnessed this gradual change in the urban structure of the city, with the transformation of the places where I played as a child, from the Horta district in Barcelona where I was born, to the landscape of ash and iron in Meicende, on the industrial outskirts of the city of A Coruña, from where we moved after a short stay to the allotments, empty plots and dirt roads of A Cubela, a former village transformed into a neighbourhood of rural immigrants, where I grew up. In these spaces which I remember as being made up of fragments of different industrial and rural landscapes, there was the disorder of the incomplete, a gradual transformation made up of individual pieces, and the poverty of their shanties, compared to the order of the neighbouring public housing estate being constructed, where we would walk between empty plots and asphalted roads without cars or buildings, along pavements with newly planted trees, and with the street lighting that was yet to appear in my neighbourhood.

At that time I did not understand the processes behind the construction of the city, the need for public policies, which called for the existence of a democratic state with a welfare function dedicated to the majority of society, with the capacity to transform urban spaces and provide access to decent housing. Today my neighbourhood has services and public spaces where there were once allotments and hovels, but the same has not occurred in other districts, those that are even more peripheral or poorly connected to the rest of the urban fabric, and especially those with public housing built between 1940 and 1980.

I have witnessed a change that has improved our quality of life, with its most visible manifestation in the space in which its inhabitants relate to each other. This has encouraged me to try to understand how this transformation has taken place, and even to consider the needs that prompted the public housing proposals of the post-war period, their aims, their hits and their misses, their ability to create community life, and the mechanisms used in their design. My experiences here and in the rest of Europe, and the current need to improve the urban spaces associated with public housing, are the reasons for my interest in carrying out a study that explains how public housing projects have been conceived, how they are integrated into the consolidated city, the nature of the relational space associated with public housing, and if this has served as a connecting point between the public, the community and the private. I understand that all of this will allow me to propose a series of recommendations that may help towards an improved urban organisation, integration and cohesion of their relational spaces, the area that takes up the majority of investments in urban regeneration policies in Europe, and based on which life in society can begin. It is my aim to reflect all of this in my research, and I will be satisfied if this serves to shed light on these spaces, and leads to greater interest being shown in improving them and the quality of life of their inhabitants.

# 1 Introduction

# 1 Introduction

*"The public space of a city is not a space that is left over between streets and buildings. Neither is it an empty space that is considered to be public merely for legal reasons. Nor is it a "specialised" space that has to visited, in the same way as a museum or a show. Instead, these spaces are potential public spaces, but something more is necessary in order for them to be public spaces of a city."* (Borja & Muxí 2003, p.7)

Today, one of the major challenges facing Spanish cities is the rehabilitation of one of its most unique morphological elements: the areas of public housing and the open spaces associated with it, comprising a large number of neighbourhoods[1]. These are areas that attracted the immigrants who settled in our cities during the process of urban growth and industrialisation, mainly built using open block typologies, raised in very short periods of time due to the housing needs for a population that grew at a very fast rate. This resulted in construction on a large scale at low prices and with standards of comfort far removed from what we consider a minimum level today.

These urban areas were originally located in areas far away from the urban centres, with a lack of services and limited maintenance of their public spaces. However, the urban sprawl that has occurred over the last few decades has turned them into central locations that are highly attractive as housing.

1 According to modern urban planning theory, the neighbourhood is defined as a primary association consisting of a certain number of homes with their collective services (Benevolo 1982, p.169) But when we refer to public housing and neighbourhoods in Spain, it is important to remember that not all of the public housing projects built between 1939 and 1976 served to create neighbourhoods. In general, they form part of a neighbourhood, taking into account the fact that the term still refers to the inhabitants of a part of a city, normally without any connections with administrative frontiers, as well as a part of the territory of the city, with its own physiognomy and characterised by distinctive features that give it a certain sense of unity and individuality (Merlin and Choay 2015). In Spain, the neighbourhood or *barrio* is still the basic unit of social life, and where multiple functions are concentrated in terms of material, cultural and relational uses, as well as providing a sense of emotional security (Remy & Voyé [1992] 2006, p. 171). As we will see later on, I am interested in this feature in terms of studying how public housing is included in its immediate surroundings, using the boundaries of the neighbourhood as the framework from where to observe its spatial transformation.

The common denominator between their houses and public spaces[2] is visible physical, environmental and social degradation, and significant need for improvement. Although they are quite different in nature, they suffer from fairly common problems: the deterioration of the buildings, poor living conditions, a loss of functional vitality, a demographic vacuum, aging, few services and poor equipment, as well as problems associated with social exclusion and marginalisation. These are urban fragments, which when properly rehabilitated, can have a significant effect on urban sustainability.

Since the last quarter of the twentieth century, many European cities have changed as a result of revitalising, reconverting and rehabilitating their internal structures. A part of this transformation process focuses on improving spatial quality, concentrating on the fragment and using the urban project as the intervention tool. This is a sign that the urban organisation processes that have taken place during this period split away from the idea of the unity of modern urban planning, instead considering the urban structure as being comprised of a large number of fragments to work with. This new logic represents a break from the modern paradigms, concentrating instead on the existing city and dealing with its reformation by recognising a complex situation, piece by piece.

One of the areas that has received special attention as the object of urban transformation are the public housing estates[3] built after 1939 on the second

2 I define public space as a place for social interaction, a public domain, the place where an exchange between different social groups is possible (Hajer & Reijndorp 2001, p.11). Here I do not mean that all or part of the space associated with public housing at the time of its construction (or even now) has this characteristic; what I do consider to be desirable is that it achieves this condition of mediating in an improvement project. Public space has been the key to urban regeneration strategies throughout the entire world for the last few decades (Hajer & Reijndorp 2001, p.7), and conforms its theoretical framework within this thesis, as we will see later on. Public space is a space of representation and socialisation, the territorial and the physical, "In essence a space that is freely accessible for everyone: public is the opposite of private" (Hajer & Reijndorp 2001, p.11). Open Space is defined as the group of public, private and community spaces that make up the unconstructed part of the urban fabric. The part of the open space that is usually privately owned, publicly accessible, but for community use, is defined as community space for the local social and community functions of their surrounding neighbourhoods, coinciding with Carmona (2014). In the study cases of this thesis, the community space represents a small part of the open space, and is found mainly in the housing estates as a link between the private residential space and the public space formed by the streets, squares and parks.

3 This thesis studies the public housing projects built in the main cities of Galicia, north-west Spain, between 1939 and 1976, adopting the principles of modern urban planning associated with the idea of the city as an aggregation of urban units. The concept of the neighbourhood unit, groups of houses with collective service that became widespread throughout the peripheries of European cities, called the *polígono* (housing estate) in Spain, which according to Solà-Morales (1997, p.91) is characterised by its unitary nature, where parcelisation, urban development and construction took place simultaneously, resulting in urban growth with enclosed, segregated "packets" with intermittent borders, and a monotonous internal design. Their construction was promoted by the Instituto Nacional de la Vivienda (INV), the National Institute of Housing created by the Law of April 1939 following the Civil War that led to the dictatorship of Francisco Franco. Its mission was to encourage the construction of housing and ensure that full use was made of them. Their construction involved

periphery[4]. Therefore, in this thesis, in order to fully comprehend their urban transformation and need for rehabilitation through policies based on improving the space associated with public housing, it is necessary to study their past and their present, in order to discover how the public housing projects built between 1939 and 1976 were formed, how they were integrated in the consolidated city, what the space is like in relation to public housing, and if this has served as a nexus between the public, the collective and the private, in order to suggest recommendations that may help towards achieving an improved coordination, integration and urban cohesion of their spaces for social interaction.

The improvement projects currently underway in Europe are based on policies and interventions that focus on improving public space as a major step forward in the search for better urban living conditions. And so, the most common criteria applied in these processes in European cities are firstly to remedy the conditions resulting from incomplete construction; secondly, bringing a sense of quality to the urban space built there, and thirdly, overcoming the sense of isolation an integrating it within the urban structure.

Asking how the construction of these fragments affects urban cohesion and the improvement of the urban habitat, studying its transformation and reviewing the intervention parameters used up until now to improve it would allow us to account for

the Organización Sindical del Hogar (OSH), the Syndicated Home Organisation, and from 1957 onwards by the Ministry of Housing. The size and urban complexity of the public housing estates increased from the 1960s onwards in Spain, with projects that occupied a significant percentage of land dedicated for building purposes and a large number of houses. In medium-sized cities such as those in the region of Galicia, this meant it was necessary to modify their spatial organisation, in many cases duplicating their surface area.

4 The first urban peripheries came about as a result of the industrial growth at the end of the nineteenth century that led to mass migration from the countryside to the cities, in spaces located on the outskirts of the traditional compact city that depended on the urban centre, especially for tertiary activities and traditional meeting places. In a second stage, this semi-urbanised territory quickly coalesced, the result of a second process of industrialisation and new migrations from the countryside into the city, resulting in an extensive and accelerated urban growth. This second periphery was located on the perimeter of the urban sprawl that originated in the mid-20th century, further removed from the city centre both in terms of its distance and the continuity of its buildings. This was the location chosen to compensate for the serious lack of housing by creating public housing projects between 1939 and 1976, resulting in new residential models with their own logic that was disconnected from the existing urban layout. The haphazard way in which they were built is indicative of the absence of a unitary city model and a way of building in parts that redefined their morphological structure and transformed their spatial relationships.
Today, these districts are no longer on the outskirts in geographical terms. Very few of them still have the appearance of occupying a peripheral location due to an absence of structure and continuity, with a lack of uniformity and incomplete sections. In general, they now have a structure and urban continuity that was absent when they were first built, with a morphology based on a heterogeneous, fragmented structure as a result of their creation and consolidation, where urban obstacles still play an important role.

how significant a change in the urban reality can be based on different interventions in public spaces, first with public projects that focus on the construction of housing and spaces, and then their rehabilitation and improvement.

As this study examines public projects from the perspective of the unit formed by housing and its associated space, I have sought to include the scope between the private space of homes and external urban space, in order to be able to observe different degrees of relationships in it between the public and the private. Otherwise, this could be left to one side, usually seen as being in conflict or as a border, and not with the structuring quality that brings a sense of continuity to the space for urban interaction. This idea, which focuses on studying the interaction between residential spaces and external spaces, is based on the concept of the modern city project, to observe how it is included in a continuous layout. As a result, the modern idea of cities comprised of parts is connected with the idea of the continuity of the consolidated urban layout. However, in order to be able to observe this over time, from the construction of public housing to its situation in the current urban structure and its possibilities for improvement, I have had to associate this housing with its space for interaction on a larger scale, at the point where it is included, in the first peripheries and at the moment of its transformation.

Within this sequence of arguments, this study is comprised of three different areas:

1 The fragment from where it is studied (the combination of housing and spaces for interaction).
2 The place from where its transformation and inclusion in the inherited layout is observed (the first peripheries), analysed from the perspective of the neighbourhood.
3 The immediate surroundings in which this transformation occurs (public space – space for social interaction).

Each of these areas complements and makes it possible to explain those on a smaller scale, with the fragment (the combination of housing and spaces for interaction) being the focal point of this study, observed over time on an immediate scale and on an urban scale.

**So why is this thesis titled "From the Village to the Neighbourhood"?**

The reason is because I want to highlight two situations that bring together the creation and transformation of modern housing following the appearance of industrialisation and the extension of urbanisation: the change that affected their inhabitants and the space in which they lived, their emigration from the countryside to the city, and their arrival in homes built on the outskirts of the city. This led to a

change in habits, mainly seen in the new urban space in which they live as a group, representing an imperfect urbanity formalised over time, by being situated between the rural environment they left, and the outskirts of the city in which they work.

**For how long can this situation continue?**

How and at what stage are these urban fragments on the outskirts included in the existing layout of the city? The thesis does not only refer to the first episode, that of the creation of public housing, but instead aims to identify in it the urban values of its surroundings, asking how they were integrated in the consolidated city, what the spaces for personal interaction associated with the housing are like, and if this has served as a nexus between the public, the collective and the private, identifying the limits of the neighbourhood as the framework through which to observe its spatial transformation. As previously mentioned, I use the neighbourhood as the framework of the study, partly because it is the dimension in which modern urban planning brings together the residential fragments, and partly because it is the space in which its inhabitants interact with each other.

**What has happened since then?**
**How have these urban fabrics brought together in neighbourhoods been transformed?**
**What do they need in order to improve the lives of their inhabitants?**

The answer to these questions can be found by observing the current situation of the neighbourhoods that contain the residential fragments we are studying, and in the modern urban regeneration policies that have been applied in Europe over the last few decades, considering the morphological scenario in the operability of local regeneration policies. As we have seen, this presents us with one of the most important issues of debate in relation to the construction of the contemporary city, of rehabilitating and recycling its parts, in order to then propose recommendations that may help towards achieving a better structuring, integration and urban cohesion of the spaces for social interaction included in public projects.

**To whom could this research be of interest?**

This thesis should be of interest to the public authorities at regional and local level, landowners and those who are responsible for the upkeep of spaces associated with public housing and improving their facilities. In Galicia, the public authorities have apprehensively begun to carry out interventions in neighbourhoods with public housing, and as in the rest of Europe, they have taken very different approaches, either wholly or partially rehabilitating, reforming or replacing these urban structures,

mainly intervening on their external spaces, and dealing with their social aspects less successfully.

In all likelihood this study will be of interest to private developers, who can identify business opportunities on the land where this housing has been built, as the majority of the post-war housing projects have gone from being peripheral structures to being in central, highly valuable locations in comparison with other parts of the city. In Galicia, there have been suggestions that these buildings should be demolished, although fortunately this has not happened. However, there is talk of rehabilitation, which may also be considered as a business opportunity for private developers, and an opportunity for the public authorities to promote programmes that involve social, economic and urban planning improvements, giving equal consideration to the rehabilitation of buildings and the improvement of public space.

Up until this point there had not been a policy that allowed for the integrated urban regeneration of these residential fragments, and the policy that now allows it does not provide any criteria for the intervention carried out. Therefore, in order to evaluate their characteristics it is necessary to study the current situation of public housing, its origins and its evolution, and to ensure a correct intervention policy, it is necessary to propose recommendations that can help all of the different actors involved in its rehabilitation, and which can be included in future urban regeneration policies.

In terms of their number and the amount of built space, the public housing projects studied in this thesis were the largest of those carried out in Galicia during the twentieth century, changing the value and use of the territory. As in other parts of Europe, their planning mistakes, difficulties in terms of maintenance, and their relationship with the rest of the urban fabric contributed towards them becoming marginal areas. Although over the years and thanks to their gradual integration into the urban centre and a central position within the metropolitan growth, they now possess a strategic value in the urban rehabilitation process of our cities, proving to be areas with great potential for including new spaces for social interaction, attracting new residents, and improving the quality of life of their inhabitants.

The study I have undertaken in this thesis should also be of use to researchers interested in the urban regeneration of these parts of the city, and those who study their origins and evolution. It will help those who are interested in knowing another study case, but mainly for the purpose of improving the criteria that are currently applied and making new recommendations that help towards achieving a better coordination, integration and urban cohesion of the spaces for social interaction that form a part of public housing projects. I will define these criteria by comparing the intervention models used in different European countries, which have come about as a result of urban regeneration legislation.

In Spain, The majority of the literature on public housing has consisted of more general studies by geographers, architects and urban planners, mainly from the perspective of architecture, urban planning and modern history. These contributions are essential in order to understand the processes behind the creation of numerous neighbourhoods with public housing and how they fit within the urban layout, such as those by Fernando de Terán, Ramón López de Lucio or Carlos Sambricio. The most common aspects of studies on public housing from the post-war period in Spain are a description of their creation, a period, a typology, or an examination of a single city. The most frequent study cases are in Madrid and Barcelona, as these are the cities the largest number of public housing projects; the most important of these studies are those of Luís Moya on Madrid, and Amador Ferrer Aixalà on Barcelona.

Over the last decade, research groups have shown increased interest in the rehabilitation, regeneration and renovation of neighbourhoods with public housing built between 1939 and 1976, focusing in particular on its transformation, the assessment of its current status, and the measures to correct its obsolescence. These groups include the "RE-HAB" platform from the Polytechnic University of Madrid coordinated by Agustín Hernández Aja, and the "HABITAR" group at the Polytechnic University of Catalonia, lead by Xavier Monteys. At the University of Zaragoza there are different groups such as "Urban Landscapes and Contemporary Project" headed by Javier Monclús, the "Zaragoza Housing" chair lead by Belinda López Mesa and Julio Tejedor Bielsa, and "Ciudad 3R" (Rehabilitation, Regeneration, Renewal), a national collaborative project directed by Juan Rubio del Val. At the University of Seville there are different groups such as the "ADICI" Neighbourhood Transition Project coordinated by Esteban de Manuel Jerez, the "In-Gentes" group coordinated by Luz Fernández Valderrama, and the "City, Architecture and Contemporary Heritage" group of the IUACC, coordinated by María del Mar Loren Méndez, with a section for urban obsolescence whose head researcher is Carlos García Vázquez. The University of Granada has the "Efficient Housing and Urban Recycling" group, led by Elisa Valero, and the "CAVIAR" group at the University of the Basque Country, led by Javier Hernández Minguillón.

And finally, I believe that the people who should be most interested in this research will be the inhabitants of the neighbourhoods with public housing, as a result of shedding light on the current condition of the places where they live, and for publishing a proposal in favour of an integrated urban regeneration that improves their living conditions.

**So why have I carried out this research? How useful is it to me?**

Very few studies have been carried out in Galicia on the subject of public housing projects, and those that do exist have dealt with sociological aspects or questions of human geography, but not from the perspective of urban planning or architecture, with

the exception of the unpublished thesis of Martín Fernández (2010) titled "*Génesis y evolución de los polígonos del INV en Galicia*" (The origins and evolution of public housing estates in Galicia), which applies to the creation of the largest public housing estates built between 1960-70, and the book "*Vivenda colectiva, Vivenda protexida. Social housing in Galicia*", written by myself in collaboration with Yolanda Somoza (2008). This is the first synopsis of one hundred years of history of public housing built in Galicia, using a mainly graphic format based on 37 examples showing how it has evolved, using plan and section views of standard apartment layouts, showing the surfaces and percentages of use and occupation.

This publication and the subsequent exhibition summarise two years of work in which for the first time the five provincial archives of the Galician Institute of Housing and Land (IGUS) were opened for research purposes. These were transferred to the regional government in the 1980s, and allowed us to evaluate all of the projects, bring together documentation from highly dispersed locations, and visit the majority of the locations with public housing built between 1939 and 1976, identifying its state of deterioration and need for improvement.

What I have found on reflecting about the variety of interventions carried out and their current status has encouraged me to complete the initial work, and is one of the reasons why I am carrying out this research. My aim now is to go beyond describing the origins or current status of post-war public housing projects in Galicia, in order to help with their future rehabilitation. For this reason, a study of this kind is of interest for the situation in Galicia, studying post-war public housing in the region's main cities, observing the transformation of the urban layout, and proposing spatial and planning recommendations for its improvement. From the viewpoint of a new policy, it is necessary to evaluate these residential fragments, as any intervention in the building fabric affects the city as a whole.

As an architect, I consider architecture to be social in nature, although the reduced scale of an architectural project is not sufficient to improve the living conditions of wider sectors of society. For some considerable time architects have opted to focus on the issue of design, the interior of the space that surrounds our constructions, withdrawing from the debate which has deprived society of a more humanistic vision and solutions to improve the habitability of our settings, and the definition of the major concepts that give our profession meaning, such as that of constructing and inhabiting (García & Somoza 2008, p.114). It is necessary to intervene in the decision making process on a larger scale, and this research is useful for me because it makes me feel involved in improving the quality of urban life through the urban spaces associated with public housing, creating opinions about its need for improvement, in the hope of being able to take part in its rehabilitation.

As a professor, I feel the need to bring my students into contact with a landscape that is essential in the contemporary urban history of Galicia, but which does not form a part of their studies. By publishing this research it will be possible to include a methodology in lectures on urbanism and architectural planning for identifying, evaluating and intervening in these residential areas. In doing so I have included documentation that in many cases is unpublished, completed with analyses and representations of my own making.

This research should also serve as the starting point for an area of investigation that for some inexplicable reason is not studied in our universities. Despite the criticism received at the time of their construction, modern residential units are of undeniable interest as an example of projects.

In Galicia, despite the greater economic and technical limitations, projects were developed that represented a great step forward in the architectural panorama of the time. The forms of the Modern Movement were able to take shape through the construction of these residential units, designed by architects who were working in other Spanish cities, together with the arrival of urbanisation of the object in comparison to the fabric. They brought the image of the "modern" to what was still a rural area, in a dictatorship that censored any concept of social equality. This issue would give rise to another investigation, as contemporary as that of the rehabilitation of these structures or even more so, based on how the forms and images of the modern movement have penetrated dictatorial or authoritarian societies, leaving to one side the social attitudes that led to their creation.

As a citizen, I have carried out this research due to my concerns for the situation we are currently experiencing in Europe, as we witness a growth in neo-Liberal policies, increased privatisation in the public sphere, and a loss of decision-making power by the states. I believe it is necessary to vindicate the role of public projects in the construction of urban relational spaces, to remember what we have achieved and what we may lose, how western societies have been able to construct spaces for coexistence based on the common good, and how this is reflected in the quality of our cities.

**Which other study cases are related to this thesis?**

Intermediate cities, urban edge growths and urban shrinkage all offer cases that allow us to observe relationships of urban integration over time, examples that propose a morphological adaptation in order to achieve spatial cohesion. Given that this study of Galician cities aims to show how they were structured, and particularly how this happened on their periphery in order to establish parameters of spatial cohesion, the importance of socio-spatial integration from the point of view of urban conformation offers the possibility of understanding regeneration processes in situations of slow

growth, of transformation on the urban periphery, and on intermediate scales such as those of Galician cities.

Intermediate cities have been considered since the 1990s as urban spaces with a great potential for adaptation within the new process of globalisation, as they are a sustainable alternative to the problems posed by the excessive growth of large urban agglomerations (mega-cities, megalopolises), offering the opportunity for more balanced territorial development (Bellet & Llop 2000), in line with the sustainability objectives of the UN-Habitat 2030 urban agenda.

The network of medium and intermediate-sized cities stands out within the structure of the Spanish territory, encompassing both the urban space of the cities or towns and the rural or territorial areas that are linked to them. Given that these cities play a major role as nodes in urban and territorial networks, particularly in less industrialised regions such as Galicia, this thesis serves to assert the value of intermediate cities, considering that their urban planning can become more efficient than that of a large city, as they are more governable and easier to manage. They offer the possibility of achieving a better quality of life for their inhabitants, with plans that are much better adapted to the opportunities offered by the different spaces and locations within the cities, favouring the value of each particular region and of each particular city.

This thesis is also related to the cases of transformation of the urban border, both in processes of containment in slow-growing cities, as well as of expansion Urban edge growths. It also contributes particularly to the study of cases where the transformation of the urban edge is observed from a period of expansion through to one of containment, as is the case in Galician cities. The periphery that once comprised the residential areas is now part of the city, and with greater or lesser spatial cohesion offers more opportunities for integration and greater consolidation, while the processes of suburbanisation extending to the surrounding councils establish a new urban border that responds to a "functional network" operated by production, consumption, and personal relationships (Dupuy 2008, p.53).

The slow, stagnant or decreasing growth of Galician cities can be associated with "urban shrinkage." Although there is no consensus on the definition of the concept, according to Pallagst, Wiechmann and Martinez-Fernandez (2014) this multidimensional process takes place in cities, parts of cities, or entire metropolitan areas around the world that suffer a loss of population and experience a decline in their economic and social bases, to which other authors have added physical and environmental issues, all of which are more or less interrelated (Sousa et al. 2011). Some authors defend that this phenomenon should not be understood as something negative, but as an opportunity, observing that a "right sizing" can make it possible to adapt the city, making it sustainable and

aesthetically attractive on the basis of vacant and residual spaces (Hollander et al. 2009). This is considered as a process of city reconversion or complex transformations, in which it is essential to define the actions, such as the one used in the Toledo Declaration of 2010 on "Integrated Urban Regeneration".

Today in Europe, cases of shrinkage are mainly found in post-Socialist countries (especially Latvia, Bulgaria, Romania, Hungary, Slovakia and eastern Germany), northern countries (particularly Finland and Sweden) and Mediterranean countries (Italy and Spain) (Hollander et al. 2009, pp.6-7). The implementation of policies based on "urban shrinkage" has contributed towards reducing problems or improving their situation: the German success stories are well known, such as those of the 19 cities of the Saxony-Anhalt region compiled in the book "International Building Exhibition Urban Redevelopment Saxony-Anhalt 2010," and those of Halle, Leipzig or Dresden, the last of which was explained by Wiechmann (2007), where the administration was aware of the reality of urban decline, abandoning growth-based policies, implementing measures that restored the quality of life to citizens, and creating favourable conditions for new opportunities, in order to recover the attractiveness of the city and increase its population.

A significant number of activities and initiatives have been carried out by European scientists working in networks with the aim of promoting regeneration strategies for shrinking cities, such as the "CIRES" group ("cities regrowing smaller") led by Wiechmann between 2009 and 2013, the "Shrink Smart" ("The Governance of Shrinkage within a European Context") project, or the "SCiRN" (Shrinking Cities International Research Network) focused on the study of shrinking cities in a global context. It is therefore surprising that in the Spanish context, shrinking cities are still a relatively undervalued phenomenon. In Galicia, the process of shrinkage can be clearly seen in the city of Ferrol, which is in decline due to demographic, economic, social, housing, and environmental factors (López 2016, p.137). As a result, this thesis can help to reflect on the need to propose urban developments other than those based on continuous growth and extensive land occupation, which due to the housing crisis have clearly evidenced serious aspects such as social degradation, low standards of quality of life, significant imbalances in the municipal budgets, and economic decline.

**What do the spaces for opportunity represent in this thesis?**

This study defines the spaces of opportunity based on their accumulative historical transformation, in which their spatial-temporal adaptation to the environment, their genesis and morphological transformation must be considered as an essential element of their transformation, recognising outstanding structuring characteristics to be considered in any process of urban regeneration, considering the structure of historical

urban form and its morphological components to unlock their hidden regenerative potential (Feliciotti et al. 2017, p. 77). The spaces of opportunity suffer from a certain lack of definition, as vacant and residual spaces lacking spatial coherence, located within the housing estates (in the space between buildings), on its edge and in relation to the city (in its surroundings and other neighbourhoods). They are spaces that today are faced with a need for regeneration, where there is the opportunity of correcting the physical obsolescence of the estates to become spaces for social interaction (public spaces).

To identify them, we use the analysis at different scales of the case studies, from the city to housing, observing how and where spaces of opportunity have been created over time, from their construction to the current situation. In order to define the scalar content, the scales proposed by different authors are used, both to evaluate the current state of housing estates and to intervene in their integral urban regeneration.

These include the design and evaluation strategies of the "RE-HAB" group of Madrid Polytechnic (2016), which includes scales ranging from the urban area through to the open space of the neighbourhood where the action is to take place, up to the building and housing level. These strategies consider that the intervention in an area or neighbourhood must not be isolated from the socio-spatial structure within which it is inserted, and that it cannot be considered an independent area segregated from its surroundings (urban, social, economic, environmental, etc.); the interrelationship with its surroundings and the city as a whole must be considered, dealing with local and global aspects that include a multi-scale perspective (from the neighbourhood to the city and from the city to the neighbourhood). On an urban scale, there are spaces of opportunity that condition the rehabilitation in the city scale, including those that surpass the local scale of the neighbourhood. On the neighbourhood scale, the spaces of opportunity are located on the edge of the intervention, in its interior space and in its construction. The interior space of the neighbourhood refers to aspects such as sociability, urbanity, complexity, and diversity on the scale of proximity, expressed in a variety of spaces between the private and the public. The spaces of opportunity in the scale of construction are found in buildings and housing, in their recycling, and in the incorporation of changes in lifestyles and housing needs.

Identifying spaces of opportunity in the case studies, shows limitations and potential spaces within the estate, at its edge and in its surroundings, where action can be taken to improve its spatial cohesion. In response to how to intervene in the spaces of opportunity, guidelines are presented in this thesis for the regeneration of housing estates, as a framework for discussion from which to begin to establish proposals for intervention.

Taking into account that in urban design and in the value that designers bring to the intervention alternatives, it incorporates into the discussion their experience, the value

of the past and the present in their interpretation of the spatial-temporal analysis, the inheritance of the capacity for adaptation, the morphological values existing in time and the decision on the elements that must be taken into account to begin the project process. These intervention proposals are operationalised within the framework of public policy, recognising the spatial values that it must consider and the actors who must validate them (Albrechts 2006). Taking into account that space is defined with the people, the participation of local actors in the process of urban design and in the construction of public space is fundamental. Considering that the spaces of opportunity depend on the active participation of local actors to maintain the continuity of the urban regeneration project over time and at all scales, because this continuity over time validates the spaces of opportunity, it is necessary for the achievement of a multi-scale spatial configuration in permanent adaptation. The urban form is itself a complex system, characterised by nested spatial-temporal scales, each responding to change differently but, as a whole, contributing to the preservation of the system through constant adaptation (Feliciotti et al. 2017, p. 62).

**What is this thesis not about? (limits and constraints)**

This is not a sociological thesis: it does not contemplate the analysis of social life and human interactions, the use that people make of space, despite considering that their knowledge is essential for the design of urban plans and policies. Nor is it an anthropological thesis, although I personally feel attracted to understanding the responses of the inhabitants of the neighbourhoods to the changes in their environment, from rural to urban, and in the interpersonal relations they establish. This is not a thesis of urban geography, although the urban phenomenon of several cities is explained after analysing their urban system, both formally and functionally. As an architect and urban planner, my knowledge allows me to study cities from a holistic perspective, to propose ways of planning and ordering their physical space. The physical aspects dealt with in this thesis (urban, architectural and environmental) are a decisive complement to those social and economic aspects that, without being part of this study, are necessary in the decision-making process for the integrated urban regeneration of neighbourhoods.

This is not a thesis about the "Urban Project," which evaluates and considers it as the only tool for action in the design of the city on an intermediate scale, or as the main strategy for the regeneration and transformation of the urban fabric, despite the fact that Solà-Morales (1999) defines the urban project as an intervention on a territorial scale that produces effects beyond its scope of action, with special attention to the urban form, to give structure and form to the formal vagueness of partial plans. In particular, this thesis considers that the urban project in its application is exhausted in the intermediate scale, which Solà-Morales places between the plan and the architectural project, a project of the place based on the architectural object, which is fundamentally recognised in

itself, and not so much in its surroundings. In this study it is understood that today this formal approach towards creating architecture for the city must be more integrated on different scales, in particular in integrated urban regeneration projects, where as well as acting on the physical and socio-economic aspects on the intermediate scale of the neighbourhood, it is essential to include the projects in the policies that encompass the planning of the city as a whole, because of how they affect its needs, the general efficiency of the urban system, and social cohesion. This is what is proposed in the thesis, by including the neighbourhood and urban scale as an asset in the transformation of the urban project and in the generation of spaces of opportunity.

The complexity of today's urban processes calls for more flexible planning instruments that consider them in their totality. The processes of metropolitanisation expand the nucleus of the largest cities, but not so much that of smaller cities, which as a part of their dynamic of slower growth it is important that they maintain and improve their urban structure with a certain degree of compactness. Therefore, any transformation that takes place in neighbourhoods with public housing that need to be renewed should recognise this structuring value.

This thesis does not reject the value of the intermediate scale in the plans to improve the urban ensemble of Galician cities, where the fragmentation caused by the developmentalism of the period of the dictatorship can be repaired, on the one hand by taking into account the rehabilitation and renovation of neighbourhoods that update the original urban structure in order to integrate it into the metropolitan area, and on the other hand, with projects related to obsolete spaces between neighbourhoods, which would add new elements to the city and improve the functioning of the urban system.

In this way, several scales are interrelated in the thesis starting with the intermediate scale, considering the general phenomenon to which the intermediate slow-growth cities belong in a context of regionalisation and consolidation of the urban nucleus, and in itself. Given the particularities that intermediate cities have in the processes of shrinkage, this context is of greater value: as the speed of change is lower, it allows for an adaptation process that can be better, slower, with less pressure, and which offers more possibilities of orienting the transformation and correcting it. And in itself, because it is not only necessary to recognise the values that public housing neighbourhoods had in the construction of the city, in themselves and in their environment, but instead because today, integrated urban regeneration projects involve a greater number of stakeholders, as it is no longer only a question of affordable public housing. The position of these neighbourhoods makes it possible to introduce a more diverse mix of uses and inhabitants, and in order to face up to this new demand, it is necessary to reconsider the structuring value that they have had in order to recognise and reinforce it, not to deny it.

## § 1.1 Problem statement

### What is the problem?

The public housing estates built on the borders of Galician cities between 1939 and 1976 need to be improved at social, economic and environmental level. The lack of recognition of these conditions is manifested in the poor quality of their public space.

### How can it be solved?

An integrated urban rehabilitation of the public housing estates could be the solution, where public policies can help to promote it. In Spain, the first laws for the rehabilitation of neighbourhoods appeared with the last national housing plans from 2005-2008, which focused on providing the population with access to housing, and the plans from 2009-2012 focusing on housing and rehabilitation, which extended the scope of intervention of the Areas for Rehabilitation (ARI), previously applied to historic centres, but which were now applicable to neighbourhoods that were more than 15 years old. In 2013 the Law on Urban Rehabilitation, Regeneration and Renewal was published, with the aim of using public policies to create a more sustainable, efficient and competitive urban environment, which together with building renovation projects, also included projects for urban regeneration and renewal, affecting the urbanisation of public spaces.

Many of the requirements that refer to achieving a sustainable, competitive urban environment currently originate in the European Union or from international agreements to which Spain is a party. These include Directive 2002/91/EU, revised in Directive 2010/31/EU, on the energy performance of buildings and Directive 2012/27/EU on energy efficiency. In addition to these are the 2007 Leipzig Charter, which established a framework of reference for sustainable cities, the Thematic Strategy on the Urban Environment, the Reference Framework of the European Sustainable City Initiative, or the Toledo Declaration, signed by the Ministers in charge of urban development of the 27 Member States of the European Union on the 22nd of June 2010. According to this Declaration, "the main battle of urban sustainability has to precisely focus on achieving the highest possible level of eco-efficiency in the urban fabrics of consolidated cities," highlighting the importance of integrated urban regeneration and its strategic potential for a more intelligent, sustainable and socially inclusive urban development in Europe.

Urban rehabilitation and the improvement of living conditions in peripheral residential areas that affect the social balance in cities are a fundamental aspect within the

programmes of the European Union, providing funding for networked cooperation projects between different countries. In the last few decades this has resulted in policies on different scales, such as the URBAN programme financed by the European Regional Development Fund (ERDF) for the revitalisation of urban peripheries in crisis and sustainable urban development; the QUARTIERS EN CRISIS European network to promote the regeneration of neighbourhoods, and the SUITE network of the URBACT programme, dedicated to maximising in a sustainable and accessible manner the supply of housing to ensure social cohesion. Other projects have included "Neighbourhood Housing Models - NEHOM" (www.nhh.no/geo/NEHOM/), dedicated to evaluating the quality of life in degraded neighbourhoods; the "Sustainable Refurbishment Europe - SUREURO" project (www.sureuro.com), which supports bodies and companies that work with urban renovation/rehabilitation, essentially in degraded neighbourhoods; or the RESTATE project (www.restate.geog.uu.nl) which analysed 29 neighbourhoods, with the participation of ten countries, including Spain.

There are also opportunities to find solutions from international bodies, generally for cases outside of Europe, as may be seen in the publications of the OECD (Organisation for Economic Co-operation and Development) on improving social inclusion at local level, sustainable urban management, and Integrating distressed urban areas from 1998; and in the UN-Habitat programmes, such as the Global Housing Strategy, Sustainable Cities Programme or the Sustainable urban development network, and recently with the "International Guidelines on Urban and Territorial Planning," (2015), which establish the social and economic value of public space to achieve sustainable cities and communities, highlighting how urban regeneration can be useful to increase residential and economic density, to promote the greater social integration of communities, as well as to provide quality public spaces by improving and revitalising existing ones, making them more accessible and generating a more vibrant and inclusive urban life.

In addition to this is the New Urban Agenda or NAU resulting from the "Habitat III" meeting held in Quito, Ecuador, in 2016, which seeks to represent a common ideal for a better and more sustainable future, in which all people enjoy equal rights and access to the benefits and opportunities that cities can offer, and in which the international community reconsiders urban systems and the physical form of our urban spaces as a means of achieving this (United Nations, 2017, New Urban Agenda).

**What would happen if we were to solve the problem?**

At social level, the rehabilitation and recycling of these neighbourhoods would improve the quality of the urban surroundings, the consolidation of citizens' networks, and strengthened social cohesion. At environmental level, the rehabilitation and recycling would lead to a reduction in land use for property development, the construction

of infrastructures and mobility needs, as well the production of waste and energy consumption. These aspects, in combination with galvanising the construction sector, lead to improvements at economic level. In fact, there is general consensus in considering that the renovation of consolidated urban areas is a clear strategy for preventing the need for new growth, the demographic abandonment of existing neighbourhoods, and their social and physical degradation. This shows that the rehabilitation of numerous post-war housing projects and the urban revitalisation of the neighbourhoods in which they were built are relevant in achieving sustainable urban development in our cities.

The current economic crisis affecting us has once again meant that we have to concentrate on rehabilitating areas that are already built, and that it will be unavoidable to work on the rehabilitation of neighbourhoods with post-war public housing projects. Their importance at social and urban planning level is clear, as they belong to the continuity of the urban layout in terms of its formal and social diversity, as well as housing a large part of the urban population. The criteria that could be applied in these interventions will be essential in ensuring that they are more effectively integrated in the future, and in achieving a better quality of life in our cities, reinforcing the spatial continuum and recognising this diversity with its original activator (public space).

## § 1.2 Theoretical framework

*"What do we mean when we refer to public space? For town planners, architects and designers, public space means the gaps between buildings that must be filled in a way that coincides with the aims of developers and the authorities, which are usually the same In this case, it is a district on which intervention work is to be carried out, a setting to be organised in order to ensure fluid movement between different points, adequate uses, desirable meanings, an unsoiled space that will have to function so that the security and visibility of the businesses or official buildings that stand before them are guaranteed. It comes as no surprise that the notion of public space became especially fashionable amongst city planners from the moment of the large-scale urban reconversion projects, as a way of making them attractive to speculators, tourism and institutional demands in terms of legitimacy. In this case, referring to space in a context that is determined by the capitalist organisation of the territory and construction projects is always a euphemism: in reality, what they really mean is land.* (Delgado 2011, pp. 9-10)

Questioning the significance of public space, particularly in terms of its transformation and contemporary use as a result of the inclusion of modern housing developments, takes on a strategic dimension in this thesis. We will construct its theoretical framework based on its definition, as this calls for considering the urban places and forms for relation and social encounters, and which can significantly help towards defining the new approaches that characterise the modern-day scenario of our cities and their urban structures.

The city as a collective entity is basically expressed in the network of public spaces. As the main reference points of the collective memory, they represent the encounter with others and with the place itself, and are associated with the capacity of identification and appropriation of the population, making a decisive contribution towards the structuring and recognition of the city. This explains why public spaces traditionally occupy a preferential position in discourses on the city, because when we consider public space we do so in relation to the city, on the ways in which it is inhabited and the ways in which it is constructed, and in the words of Habermas, how it is represented.

In the words of Cerasi (1990, p.87), the collective space of a city can be defined as a unitary system of spaces and buildings contained within the urbanised territory, which have an effect on collective life, which define a common use for large sectors of the population, and which are the centre and places for their collective experience. It is in this universe of activities, places and times that the task of constructing public spaces takes place.

However, until now public spaces have never been the subject of so much attention and controversy, as a result of being emptied or reduced in size, being privatised or domesticated, in terms of their physical appearance and the appearance of the relationships they encourage, or which they make possible. They have also received this attention as a place where different abstract ideas take shape, such as democracy, citizenship, coexistence, civility, consensus, through which an orderly mass of free, equal beings should be able to move, using this space to travel to and from work or to consume, and where, in their free time, they should be able to walk without any concerns (Delgado 2011, p.10). However, as Manuel Delgado also states in analysing this dream of a public space that is a result of dialogue and agreement, this collapses as soon as the first external signs appear of an unequal society, which rejects or turns its back on those who behave in a different way.

I use the physical and territorial aspect of public space in this thesis to observe the creation and the dynamic transformation of urban space, by introducing a layout with a radically different form and dimension to those that currently exist, extending the amount of urban space and number of inhabitants, altering the known urban space and its frontiers, at both physical and social level. Seen from this perspective, public space

is a space of representation and socialisation, something territorial and physical; while interaction and communication take place in the public sphere, which Hannah Arendt defines as "a common world that brings us all together, but which nevertheless prevents from falling on top of each other" (Arendt [1958] 1998, pp. 26-35), and Habermas ([1962] 1982) analysed in depth, defining it as where public opinion is developed within the framework of modern democracies.

It is in this physical and public dimension, defined by Hanna Arendt as "the world that is shared by everyone and different to the space that each of us occupies in private; it connects and separates us at the same time," that connects and separates objects and individuals (Collin Rowe 1985, p. 26), altered according to some and extended according to others, the arrival of these new housing developments that stand on the outskirts of the city, for which the physical aspect of their inclusion, observing how they came about and the possibilities of including them to a greater or lesser degree in the current urban fabric are impossible to analyse, unless it is through a reflection on space into which they can be progressively integrated.

## § 1.2.1 Is public space the city? Or what is public space?

The absence of theories that contribute towards explaining public space means that a wide variety of notions are brought into play that prevent any clear understanding of the phenomena to which they refer. For example, in order to define public space, references are nearly always made to private space, remarking on their differences. This ambiguous situation has been worsened today as a result of the repercussion of global transformations at local scale, whose effects alter the characteristics of cities, modifying their structure and influencing their spaces through new dynamics that model the processes of urbanisation within a context of large-scale migratory movements, social exclusion, environmental pollution and different types of violence. This is revealed by the safe, exclusive atmosphere of private spaces, compared to the sociability of public spaces.

In contemporary urban studies, public space is considered as a fundamental part of the city and a factor that conditions the daily lives of its inhabitants. However, there is still a lack of knowledge about its characteristics, situation, functions and determining factors. Achieving an understanding of public space largely depends on the conception of the city, the processes that take place within it and which provide its spatiality, so that in general terms, knowledge of the city is determined by a knowledge of its public space, and vice versa.

Based on this idea of considering that above all the city is public space, Borja (1998, pp.61-62) states that:

*"We consider the city as the complex, physical, political and cultural product, European and Mediterranean, American and Asian, that we have characterised in our culture, in our imagination and in our values as a concentration of population and activities, a social and functional blend, a capacity of self-governance, and a space of symbolic identification and civic involvement. The city as a place of encounters and exchange, the city as culture and commerce. The city of places, and not only of spaces of movement."*

This statement by Jordi Borja can give rise to reflections on the relationships produced by public space and the conditions it requires, as the city depends on it. Here it is essential to refer to the quality of public space, considered as a place of encounter and interaction. By considering public space as a space for the population, on the contrary to private space, we assume that both exist in a coordinated manner, and that they are reorganised according to the transformations that occur in society. From this perspective, the statement by Jordi Borja that "the city is people in the street" (Borja & Muxi 2003, p.25) reinforces the role of this public space, defining the quality of the city based on the quality of life and citizenship of its inhabitants. This leads me to think about how the inclusion of a new urban fragment alters the quality of this space, or when an existing fragment is modified, how this especially occurs between consolidated structures or on the urban periphery, and how the dynamic of the city values this new fragment.

The condition of public space as belonging to citizens is something that has been achieved and altered throughout history. The inherited city has been characterised by the presence of public spaces capable of giving the urban structure a precise identity and recognisable shape, beyond their purely functional purpose of providing access to private spaces.

A large number of authors use Greek and Roman ideas not only to explain the conception and functions of public space in the history of the European city (López de Lucio 2013, pp.19-30), but also their current situation as part of a city-territory (Cacciari, 2010). Cacciari is one of these authors, who in considering the history of the city, compares the Greek model with the Roman model, the polis with the civitas, the agora with the forum. He defines the first as being ethnic, endogamous and impermeable, something that came about before the concept of the citizen, compared to the legalist model of the Roman civitas, a city he describes as open and experiencing continuous growth. This leads me to reflect on whether, as he says, these are conditions that are inherited by the modern city, together with the idea of citizenship, because we agree to abide by certain laws and obey a certain regime, regardless of our religion or ethnicity.

Cacciari considers the modern European city as a legacy of the Roman model, while still maintaining the nostalgia of the Greek polis; in other words, there is a debate between its condition as a living space, as a place of shelter and the meeting point of a community, in comparison to its condition as a machine, as a backdrop for business and exchange. He classifies these alternatives as opposing, and that they have alternated in the conception of public spaces from the 15th through to the 20th century, as when the city adopts the appearance of an agora, of a meeting point, then we rush to destroy it, as it contrasts with the functionality of the city as an environment, as a machine, as an extensive space in continuous growth.

In the process of constructing modern European cities, this extension is seen in its urbanisation beyond the known limits, articulated on the basis of the boundary between the private and the public. The need to improve and increase public areas, a scarce asset that is densely used in the inherited city and is a reflection of the predominance of private ownership, partly explains the relevance of the public realm, a guarantee for the public use of these spaces, increasingly considered as civil spaces in the new bourgeois city.

As a result, the construction of the city could be explained as a result of this difficult balance between private ownership and public use, spatial categories that are often considered as opposing and exclusive, but which in fact complement each other. In this duality, the public aspect of the city is frequently defined as a "liberated space", seized from private hands.

Public space is a part of the open spaces, defining open spaces as the group of public, private and community spaces that make up the unconstructed part of the urban fabric. The part of the open space that is usually privately owned, publicly accessible, but for community use, is defined as community space for the local social and community functions of their surrounding neighbourhoods, coinciding with Carmona (2014, p.8). In the study cases of this thesis, the community space represents a small part of the open space, and is found mainly in the estates as a link between the private residential space and the public space formed by the streets, squares and parks.

Public space is as a place for social interaction, a public domain, the place where an exchange between different social groups is possible (Hajer & Reijndorp, 2001, p.11). Public space is a space of representation and socialisation, the territorial and the physical, "In essence a space that is freely accessible for everyone: public is the opposite of private" (Hajer & Reijndorp, 2001, p.11).

The relationship between public space and private space is dynamic, and depends on the urban policies that place greater emphasis on one or the other. In the words

of Sorking, some policies have led to the announcement of the death of Public Space (Sorkin 1992). This idea is partly derived from the analyses of Los Angeles School of Geography led by Davis (1992, p.195), who in his description of this city, stated that:

*The universal consequence of the crusade to secure the city is the destruction of any truly democratic urban space. The American city is being systematically turned inward. The "public" spaces of the new megastructures and supermalls have supplanted traditional streets and disciplined their spontaneity. Inside malls, office centers, and cultural complexes, public activities are sorted into strictly functional compartments under the gaze of private police force. This architectural privatization of the physical public sphere, moreover is complemented by a parallel restructuring of electronic space, as heavily guarded, pay-access databases and subscription cable services expropriate the invisible agora. In Los Angeles, for example, the ghetto is defined not only by its paucity of parks and public amenities, but also by the fact that it is not wired into any of the key information circuits. In contrast, the affluent Westside is plugged -often at public expense- into dense networks of educational and cultural media."*

Even before Davis, Edward Soja (1989) pointed out that "truly public spaces were few and far between, as what the social theorists call "civil society" seemed to melt into the airwaves and free ways and other circuitries of the sprawling urban scene". According to Soja, Los Angeles is an "exo-polis", where public space consists of roads that connect different parts of a fragmented city, where the relationships between them are governed by the private sphere of the motor vehicle.

A public space that differs from the concept of the European compact city, but which is not too distant from what we can see on their metropolitan outskirts. The fracturing of the traditional compact city has now been further exacerbated by the rise of the motor vehicle and the increased use of motor vehicles by the population, resulting in the appearance of a generalised process of suburban development and the appearance of peripheral zones. This represents the consummation of the change towards a new urban model, from the orderly concept of the inherited city based on a network of places and sequences, to the planning of a fragmented system which since then has defined the city's growth.

The city we have inherited grew around public spaces: squares, streets and parks, as well as markets, cafés and theatres. The effect was simultaneous, with public space giving meaning to private space and vice versa, as buildings also define public space.

This public-private arrangement, which can help us to summarize the inherited city and its growth during the nineteenth century, over which was configured the characteristic structure that organised the urban layout, and over which new modern

fragments were incorporated, underwent numerous transformations during the 20th century. As we will see later on, starting in the period between the wars, the appearance of the open block and functional zoning, typical of the Modern Movement, disrupted this configuration. The open landscape, the predominance of architectural forms and the different allocation of uses jeopardised the configuration of the inherited city and its spaces for social interaction.

## § 1.2.2 Contemporary public space

As already mentioned, for the purpose of this thesis it is essential to observe both the transformation of the public space of the inherited city at the moment of including new fragments associated with the proposals of the Modern Movement, as well as the buildings associated with them, without overlooking the fact that observing them does not end in this thesis with their initial impact, but instead with solutions for the inclusion in the modern day of spaces resulting from this model and which today, as the cities continue to sprawl, are considered as a part of the inherited city.

These places, which belong to the construction of the modern city, form a part of contemporary public space, generally without any sense of integration, differentiated from the existing layout by being set apart and without any relationship with it, as well as with the new developments on the urban outskirts due to maintaining their relationship with the consolidated city. In any event, they form a part of this new city, together with new spaces and transformations that also modify their use, something that makes it necessary to understand what we consider today as public space if we want to work with it, its inherited elements, and those that will appear in the future.

The debate about public space that was started by Jacobs (1961), Lynch (1963), Hall (1966) or Goffman (1963) mainly refers to the search for balance in cases of the formalism of the architecture of the modern movement, and the assertion of a return to the "street" of some of the aspects defended from aesthetic perspectives. This debate is about what Lefebvre ([1970] 1971) classifies as the "urbanism of men of good will", an urbanism based on a humanist philosophy created at a human scale, tending towards formalism or aestheticism.

Twenty years later, and still today, the debate on public space and its death has changed the scenario, with the spread of neo-Liberalism, the progressive dismantling of the welfare state, and in urbanism and public space with the gradual transferral of the decision-making process from the state towards private developers. This was

announced some years later by Sennett (1972), who indicated that the public scenario has been usurped by a private scenario to the detriment of both individuals and society as a whole. For this reason, other authors have warned about the decline of the public sector, absorbed by unstoppable processes of privatisation, as indicated by Harvey (2013, p.15):

*"The results of this increasing polarization in the distribution of wealth and power are indelibly etched into the spatial forms of our cities, which increasingly become cities of fortified fragments, of gated communities and privatized public spaces kept under constant surveillance. The neoliberal protection of private property rights and their values becomes a hegemonic form of politics, even for the lower middle class, in the developing world in particular, the city."*

While the policy for public spaces was essential for social cohesion in the 20th century, as Harvey (1989, p.270) says:

*"It was only in such a context of rationalized and totally organized external and public space, that interior and very private senses of time and space could properly flourish. The space of the body, of consciousness, of the psyche spaces kept too long repressed, given the absolute suppositions of Enlightenment thought, but now opening up as a consequence of psychological and philosophical findings, could be liberated only through the rational organization of exterior space and time."*

In the last 30 years of the 20th century this idea began to change, at a time when with relation to public space and the city itself, the scenario was one of the urban planning of developers that Lefebvre described; an urban planning and urban design based on inequality, fragmentation, comfort and consumption of public space, through the processes of gentrification, heritagization and tourism.

Today, social, technological and cultural changes can be seen that are expressed in the configuration of the city and how it is understood as a whole, and in particular, in the formalisation of public spaces through formative networks. Studies on contemporary public space and the city also point towards the disappearance of the boundaries between the countryside and the city and changes in means of communication as the aspects that most influence the use and characteristics of contemporary public spaces.

The disappearance of the boundaries between the countryside and the city, between the rural space and urban space, guides the processes of suburbanisation towards models of dispersed growth, extended over large urban regions, where the rupture and fragmentation of structures leads to the disaggregation of the consolidated city.

This change in the traditional form of the city makes it difficult to understand, and offers hurdles to structuring new ways of understanding and formalising the spatial continuity of the urban layout, as demonstrated by the difficulties involved in representing it (Sennet 1991). Today, urban centres form a part of a polycentric territory, in which the weakening of a single centrality has given way to the perception of diverse centralities. The traditional topological order has been reversed, so that instead of the city as a built, defined and differentiated space, we have a process of constant, unmanageable and changing expansion, whose frontiers are blurred and indistinct (Martí 1999, pp. 52-57)

As a part of this process of transformation, innovations in communications networks and new information technologies acquire an especially prominent role, deeply altering spatial and temporal relationships and the effectiveness and meaning of public spaces as places for sociability, as a part of a process that some authors have warned for some time as marking the end of public space, considering that it is no longer built as a mutation of the places and forms passed down by the history of the city (Sorkin, 2004).

Our society is characterised by the role of mobility in the modern city and the increased use of motor transport. The importance of infrastructures associated with mobility now goes beyond their function of providing accessibility; they serve to construct the territory, divide space, model grid structures, and are distinguished as elements through which we perceive this reality being constructed.

In the contemporary metropolis, we can see the modification of the parameters that have traditionally characterised public space and its role in the formation of the spatial continuum of the city. This is a reflection of the space for social interaction in our society, which has taken shape in its specialisation, the imposition of restrictions of use and a progressive privatisation.

However, as indicated by Harvey (2013, p.72):

*"Public spaces and public goods in the city have always been a matter of state power and public administration, and such spaces and goods do not necessarily a commons make. Throughout the history of urbanization, the provision of public spaces and public goods (such as sanitation, public health, education, and the like) by either public or private means has been crucial for capitalist development."*

If this is the case, then what is the reason for the continuous privatisation of public space that would seem to point towards its eventual disappearance? According to Lefevbre ([1974] 2000) this is because space has an organisational model that focuses on the concepts of isotopia, heterotopia and utopia. In this case, "isotopia" is defined

as "a topos and everything that surrounds it (neighbourhoods, outskirts…); in other words, the things that constitute a place. But if somewhere else there is a homologous or analogous topos, this place belongs to the isotopia": Heterotopia would be the other place, the otherness, while the utopia would be "that which is outside (…), the non-place, which does not have a place, but which seeks its place. "Given that the urban, considered as a field, is not simply conceived as an empty space covered with objects (…) It is a highly complex field of tensions: it is a virtuality, an impossible possible that seeks what has been done, a presence-absence that is always renewed, always demanding", then we need a neutral element that makes it possible to structure these tensions.

This neutral element is public space, which operates either as a division or nexus between isotopic and heterotopic spaces. Public space would be the factor that would permit the city to be isotopic at most, or in urban planning terms, cohesive.

The periphery, which Thomas Sieverts ([1997] 2004) called the "space between cities," to identify it today more than ever as the place of the contemporary city, is where the changes referred to above are especially confirmed. The distance from the consolidated city, caused by erroneous land and housing policies, and the search for an unreal contact with nature, takes shape in autonomous locations far removed from the traditional urban centres, and in almost exclusively using single-family homes. Conceived as places of refuge, it is clearer to see the loss of identity and significance of public space, largely overtaken by private space, which forms a large part of it. The flaws at public level of these aggregated private residential spaces, created with the illusion of being able to construct the city as an ensemble of houses, represent the fissure between residential systems and collective functions, standing as the maximum expression of the banal uniformity extended to the territory as a whole, taking shape in the ways in which it is inhabited.

In this contemporary space on the periphery, the spatial centrality, public dimension, human density and spaces for social interaction – the majority of the elements that were missing in the expanding suburbs – are now found in shopping malls. Their basic aim is to create the effect of being a city, eliminating or neutralising the negative aspects of urban life. In them, image tends to replace space, and control over their access makes them apparently public places, while imposing a strict filter on users in order to create the sensation of having found safety, thereby denying one of the basic principles of public space in Western cities: its generalised accessibility.

Like the shopping malls, and also reliant on their position on high-capacity networks and private forms of mobility, we find new places that form a part of contemporary spaces which are associated with movement. Defined by Marc Augé as non-places ([1992] 2000), they reflect the change from identifying space to consuming it, the

ways in which the surface are appropriated, and where travel and movement constitute the basis of new meanings. These non-places exemplify the crisis affecting spaces for social interaction and what would seem to be a division between the local and the global and the individual and the collective, mediatised almost exclusively by information technologies and the media.

The danger of these specialised spaces is that they represent a denial of public space. Their uniformity and single purpose constitute an impoverishment of the city, or at least its profound transformation into something which, due to the absolute domination of the private, has little to do with the idea of urbanity.

In parallel to these processes supported by the extension of urban development, others appear that cause gaps and areas of opportunity to appear within the interior of the city. These include the dismantling and abandonment of industrial areas or spaces associated with transport infrastructures, and in the public housing estates built in the mid-20th century, which are subject to renewal or rehabilitation projects, where their position on the outskirts makes them strategic in future urban developments.

At the same time as these processes, the public space within the inherited city is emptied and deteriorates, due to the ageing of the resident population and the youngest and most dynamic residents moving to the outskirts. As a result of this, a large amount of the public space in the inherited city is finally considered as archaeological remains that should be protected because of their historic interest; a showcase for showing off museum projects, far removed from the idea of a living city.

Overcoming these problems has formed the basis of progressive urban policies implemented in numerous cities, according to Borja and Muxi (2003, pp.117-118):

*"The condition of being a citizen represents a three-pronged challenge to the city and the local government; there is a political challenge, of conquering the legal and operational capacity to contribute towards the universalization of the political and legal statute for all of the population, and also acquiring the skills and resources necessary for the development of public policies that make it possible to exercise and protect the rights and obligations of citizens. Then there is a social challenge: promoting urban social policies that attack the discrimination that impede or hinder the scope of the population: employment, situations of vulnerability, cultural marginalisation, etc. And there is a specifically urban challenge: of making the city, its central and monumental areas, its generalised mobility and accessibility, the quality and visibility of its neighbourhoods, the strength of integration of its public spaces and the self-esteem of its inhabitants into physical and symbolic surroundings that contribute towards giving meaning to the daily life of its citizens."*

According to this author, the definition of a city with an egalitarian (isotopic) vocation would be:

1. The city being understood as a public space.
2. The aesthetic value of its form must be derived from its function, and its quality must form part of the content.
3. The urban projects based on public space must contribute towards social redistribution.
4. The public space and urban projects must be based on principles of de-centralisation, participation and social dialogue.
5. The urban projects have different scales that configure policies in relation to the urban units: neighbourhoods, districts, the city, the metropolitan area.
6. Public pride based on a sense of belonging calls for communication systems, including marketing, that encourage the self-esteem of the citizens.

However, other authors as Delgado (2011, p.24) defend that the concept of public space:

*"...would operate as a mechanism through which the dominant class is capable of making the contradictions that support it not appear to be obvious, at the same time as also obtaining the approval of the dominant class by making use of an instrument – the political system – which is capable of convincing those who are dominated of their neutrality. It also consists of creating the illusion of having finally achieved the longed-for unity between society and the State, inasmuch as the supposed representatives of society have achieved a consensus that overcomes class differences."*

It should come as no surprise that faced with this transformation of the use of space, a great deal of recent literature on public space consists of reflections on the loss of the public dimension of urban life and the crisis of built forms. In addition to this is the rekindled interest in the question of public space from the public authorities, with projects that generally gloss over a social problem through urban design. However, while the municipal authorities continue to invest in public space for all, others, from a neo-Liberal perspective, call for the transfer of the responsibility and creation of projects for public spaces into private hands. The underlying idea is clear: to fragment and split up the urban territory as a reflection of social fragmentation and segregation, preventing the development of a more cohesive and diversified city, breaking away from the problem between the centre and the periphery.

At this point, I believe that having defined the features of contemporary public spaces, it is necessary to identify key aspects involved in their intervention, in order to achieve a better understanding of them and to lay the theoretical foundations for proposing how to improve them.

## § 1.2.3 Key factors for intervening in contemporary public spaces

In contrast to the dynamics that make the city spread outwards and empty the central city of content, or turn it into an urban backdrop, the solutions that have so far appeared for intervening in public space are fragmentary, like the landscape of the new urban development. This apparent duality of extension and implosion can be found today in the two main types of intervention: on the one hand, urban regeneration projects, which I prefer to call urban reciycling projects, or urban rehabilitation projects, in the same way as Oriol Nello (2012, pp.187-188), considering that the concept of regeneration has connotations of moral imposition; and on the other hand, the creation of new spaces that correspond to the previously described urban conditions.

Current proposals in favour of defending the city define public places as playing a key role, continuing as spaces for social relations: the city considered from a perspective of freedom, coexistence and with a diversity of activities and people, spaces and buildings; according to Schoonbrodt (1994, pp.389-395), the organisation of coexistence, the condition of the urban, and in the words of Jordi Borja, the antidote to globalisation and the progressive concentration of power. Furthermore, taking into account in its construction that intervention in defining the public spaces we are discussing is now fundamental, as a result of physically translating the collective dimension to the contemporary city.

As we previously mentioned, public space does not only concern the creation of a collective spatial dimension that is outside of the home and the creation of places to meet, but instead forms a part of the problem of transforming the public aspect of contemporary society. The modern city is a multicultural space, both in terms of the composition and origins of its inhabitants and the variety of people who visit and use it in very different ways. The aspect that is now in crisis in public space is the possibility of meeting others.

### Coexistence and diversity

In order to achieve the coexistence and diversity to which we referred, a combination of activities and individuals is necessary. There would seem to be general consent on the functional complexity to be included in the construction of a public space; in any event, this functionality should not be limited to the public sphere, but instead should be used as a basic concept in urban rehabilitation projects and plans for new parts of the city. Also, it must not be presented as a problem of exclusion, but instead of strategies of complementarity and diversity. Up to this point the matter is clear; the problem arises in making this principle a reality.

Bearing in mind that most of the activities that form a part of our social life, working life, free time and cultural activities are dominated by private initiative, the solution to achieving a better mixture of functions and activities requires greater public control, extending the concept of the provision of services, meaning greater control by the public in controlling and planning tertiary activities and their associated infrastructures. It also calls for supporting an alternative use of the city and a concept of providing services that is not limited to residence, but which instead should find its real meaning in the role they can play in redefining systems and parts of the city, in the combination of functions of collective urban space.

### Continuity and orientation

The need for a comprehensive, legible order must serve as a basic principle for defining public places and spaces. Orientation is an essential attribute of the urban, and the city is essentially contact and communication, providing us with accessibility and information (Rueda 1998). To do so, continuity is the basic argument that underlies the orientation of the urban form. However, achieving continuity today is a complex task, as the hurdle of the fragmentation of urban structures is further exacerbated by the simultaneous existence of different and simultaneous reading codes. For this reason, achieving continuity should not be translated into a simple linear geometric link, but instead into the conception of a multi-faceted, temporal and complex strategy in which the construction of new public places becomes essential in order to achieve the legibility of the whole.

This condition refers to the diversity of settings to be considered, reminding us that the definition of collective places must be based on and considered in terms of different scales and functions. It must also take into account a certain degree of hierarchy that makes it possible to recognise the different places that range from the territory through to domestic space that favour the construction of a continuity that makes it possible to identify and highlight the urban variety, and at the same time, contributes towards redefining a new structure that is capable of strengthening social interactions, and providing space for new ones.

### Legibility

We previously stated that the notion of order is inherent to the city and a basic principle of the configuration of collective spaces: the human attribute that ascribes space with the ability to orientate, and allows it to be read and understood. Spatial and architectural legibility are a result of the way in which collective space is created, as according to Cerasi (1990) it corresponds to the need to make the most representative places and value of the collective legible, even the balances of power.

Today, this legibility is especially important, as it is usually associated with the complex and the unintelligible. Complexity is inherent to the urban, and not an attribute of the contemporary city; nothing prevents the complex from being intelligible, even more so if the explicit demand of a public facet is common to the population, whereby the structural scarcity of public places today seems even greater than it really is real.

### Mobility

All of the different aspects that help to shape the territory seem to be subject to movement. Initially neutral, infrastructures have become aspects that conform the urban space. According to López de Lucio (2000, p.29), at the same time as the specialisation of road networks gradually eliminates the ability to serve as a support, their own existence is gradually delegitimised, opening the way for their privatisation.

The need is proposed to integrate different ways of moving from one place to another, not for going as fast as possible, or even achieving a uniform accessibility as the ideal way of organising mobility. It is important to recover its role in the construction of public space, and in comparison to the acceptance of "non-places," recognising that these are also places, being able to achieve a conscious ability to contribute a sense of identity, significance and pertinence. As Auge states, to recover the capacity to guide and welcome, the figurative and spatial dimension that helps to overcome the current sense of estrangement resulting from their experience as spaces of anonymity for an increasingly larger number of groups and individuals.

### Articulation, integration, cohesion

We have previously commented on the limitation that is implicit in the confrontation between the public and private domain. The difficulties involved in their new redefinition vary between the need for their delimitation, and the ambiguity of their limits. To do so, as indicated by Solà-Morales (2000, pp.20-26), it is necessary to recognise that the importance of public space does not lie in its quantitative dimension or its symbolic importance, but instead its condition of "referring private spaces with each other, also making them collective heritage. Giving an urban, public character to buildings and places that without it would only be private. Urbanising the private... absorbing it into the public sphere".

The concept and overcoming of the limits of the frontiers between the public and the private cannot be reduced to a legislative question or margins, or of a lack of use of the spaces and fragments contained in its interior. Due to the strategic aspect of constructing the new territorial scenario, we also have to pay attention to the transition spaces. Suture zones, empty spaces where movement occurs, places for

meeting where margins are superimposed, usually created as a result of unresolved tensions that have made it impossible for them to be occupied, or as a result of their former functions becoming obsolete. These tensions are overcome when two or more urban fragments are articulated, integrated, achieving urban cohesion. Articulation is understood as the property of linking two or more different fragments; integration is understood as the degree of connection that the urban fragment establishes with its surroundings, based on the correction of connectivity and permeability problems. And cohesion is understood as the fitting of a built fragment into its surroundings, ensuring that transitions occur with relative continuity.

## § 1.3 Research question

Three main themes are proposed in this research as the basis of the problem statement. The first seeks to understand how the public housing estates were formed, and how they were integrated in the consolidated city. The second explains the nature of the public space associated with public housing, and if it has served as a bridge between the public, the collective and the private. The third puts forwards a series of recommendations that contribute towards the improved urban structuring, integration and cohesion of the public spaces included in the public project. As a result, the main question posed by this research is:

**What does the public project, housing and open spaces associated with it, contribute towards the spatial cohesion and improvement of the urban structure over time?**

With the aim of answering the main question, it is necessary to explore three groups of complementary questions:

Group 1. Chapter 2. In the creation of the public housing and their process of urban integration, it is necessary y to explain the degree of transformation brought about by urban growth after the second half of the twentieth century, in which themes such as their degree of expansion, their structure, the position of public projects, and the space generated through their intervention should provide us with the theoretical framework prior to analysing the study cases. To do so, it is necessary to answer the following questions:

– How has the construction of the city been structured through housing projects?
– What urban structure did it produce?
– What was the location like where the public projects were carried out?

Group 2. Chapter 3-4. With respect to the interventions connected with the creation of spaces for social interaction associated with public housing projects, it is necessary to explain both their initial creation as a peripheral fragment, and the creation of spaces for social interaction as a result of these new city fabrics, their transformation and their current configuration, which will allow us to observe their urban layout, answering the following questions:

– How does it affect the inherited territorial structure in the urban setting of the housing estate?
– How does it affect the distribution of the built elements and open spaces of the neighbourhood in the urban spatial cohesion of the public housing project?
– How does the configuration of the space between buildings influence the quality of the spaces for relations?

Group 3. Chapter 5. With respect to the recommendations that help towards achieving greater spatial cohesion of the spaces for social interaction included in the public project, the following questions will be answered by bringing together the parameters used in analysing the study cases, both in terms of ordering the built elements and open spaces, as strategies for the formation of exterior space:

– What conclusions can be drawn from the comparison of the case studies?
– Which spaces of opportunity are found in the case studies?
– What is the framework for discussion from where to begin establishing intervention proposals for the physical regeneration of the estate based on the improvement of the spaces of opportunity?

## § 1.4 Research structure

The research is divided into three main sections:

### Part 1. Approach. Chapter 1-2

This part is divided into two chapters: the first introduces the problem, the main questions, the structure of the research, the methodology used, and the theoretical

and analytical framework within which the research is situated. This is developed in the second chapter, organising the context within which the public housing appeared, and how they were integrated in the compact city. This allows us to explain the growth of these first peripheries, their structure and the location where the public projects were developed, as a basis for analysing the subsequent study cases.

### Part 2. Empirical research / Analysis. Chapter 3-4

Through the study cases, we will see how different spatial configurations fit together in peripheral territories, what they are like, and how they are transformed over time, becoming integrated within the urban space. This part will have two complementary chapters: chapter 3 is dedicated to where the public project is carried out, and chapter 4 to the mechanisms and effects of the project.

Chapter 3 explores spatial transformation at neighbourhood scale, and the historical development of the location where the intervention takes place. In it we see how the creation of new fragments of the city affects the continuity of the urban project, from the moment when public housing projects are included in a peripheral setting, through to their current integration, forming neighbourhoods. The analysis documents the evolution of the intervention from the present to the past, and explains the context at the moment of the intervention, subject to the contamination of previous uses that still remain or influence the project and its subsequent relationship with the structure of the neighbourhood.

Chapter 4 deals with the current configuration of the space between buildings, helping us to understand their current organisation by analysing the strategies for the configuration of the structure, organisation and three-dimensional composition. The analysis of the organisation defines the current support of the project, and contemplates the rules for the distribution of built elements and open spaces in urban units, while the exploration of the three-dimensional mechanisms of composition queries the strategies that define the urban unity, and the systems and effects brought about as a result of creating a space for social interaction between buildings.

### Part 3. Comparison and discussion

This section deals with the possibility of transforming the neighbourhoods on the basis of the different scales analysed, presenting a series of recommendations and divided into two chapters. Chapter 5 deals with the spaces of opportunity, while the chapter 6 sets out the final conclusions of the research.

Chapter 5 of the thesis is organised into five sections. The first describes the types of spaces of opportunity, defining them as places in which to rehabilitate and recycle the contemporary city; these are interrelated on various scales, within the housing estate, on its periphery in relation to other neighbourhoods, and to the city. The second section establishes the criteria for intervention based on the institutional framework, the incentive policies and the experiments carried out in obsolete neighbourhoods. In the third section, a comparison is made between the case studies of the thesis based on a graph that summarises the parameters used in the analysis. In the fourth section, these parameters are reviewed (organised according to aspects that refer to the environment, formal aspects, accessibility, use, and construction factors); and in the fifth section, spatial guidelines are established that are applicable in the planning of the design of the spaces of relationship integrated into the public project on the scales in which the spaces of opportunity are recognised, with observations and recommendations for their application.

The final chapter, chapter 6, answers the main issue and the three groups of questions raised in the thesis (section 1.3). These are the final conclusions of the research that will explain the degree of transformation that the construction of public housing estates has entailed, how they have been modified over time, what the current configuration of their relationship spaces is like, and which are the recommendations for improving their urban cohesion.

## § 1.5 Research methodology

### Selection of study cases

The analysis focuses on the first urban peripheries, an ambit which today has the necessary features of urban continuity to understand how the public project fits in, something which is not so apparent in the new peripheries which have been created by applying a formula based on low densities and isolated urban enclaves.

The study cases are located in the three main cities of one of the most rural territories of Western Europe, with old cities and a process of urban development that is very new and extensive. The peripheral position of Galicia and the study cases built in the region make it possible to see that even in highly precarious situations, public projects have influenced in the creation of spaces for social interaction, and in the cohesion of incomplete and fragmented peripheral ambits.

The study cases are newly-built public housing projects from between 1950-1970, fragments of the city comprising housing estates and the exterior space associated with them, chosen due to the interest of the relationship between the housing and its external space at all scales, the level of organisation of the built elements and open spaces, the complexity of the strategies used for the creation of exterior space, and how they fit together at neighbourhood level.

In small cities or towns, these projects may involve the reorganisation of the urban relationships of their whole fabric, while in middle-sized cities the influence of these projects is restricted to the new opportunities that are produced for the affected neighbourhood. The research is confined to the transformations that occur in middle-sized cities, because in them the process is explained through the morphological relationships that occur in a more restricted territorial ambit: that of the intervention area with its immediate surroundings, and with the territory in which it is situated.

The question of the urban layout calls for focusing the study from the perspective of less exceptional spaces, those which are most similar to the logic behind the formation of the normal city. This is another reason why it was decided to apply the analysis on the project units with residential uses, and at neighbourhood level, considering this as an essential part of the configuration of the compact city.

## § 1.6 Analytical framework

In this thesis, the study of public housing projects is relevant due to their importance in the formation of the urban structure of the periphery, in the city, and over time. For this reason, their formative potential in the urban pattern is evaluated, taking into account the value of the relationship between private, community, and public open spaces, and seeking to evaluate this relationship based on its component parts.

An analysis of the study cases serves to explain how these public housing projects fit in with their place of construction, their transformation, and their current configuration, basing this analysis on an understanding of the urban form over time, viewed from the perspective of Urban Morphology.

According to Conzen, Urban Morphology is defined as the study of the built form of cities, whose analysis seeks to explain the layout and spatial composition of urban structures and open spaces, the physical product of social actions on the surroundings

over time (Conzen 2012). As a part of this idea of the city considered as a series of historical layers or as a palimpsest (Conzen 2004, p.51), the analysis makes it possible to differentiate the different layers of the urban form and the activities that have contributed towards the occupation of its land over time. Taking all of this into account, the analysis of the study cases included in the thesis consists of a formal and functional analysis over time, using two scales:

- On the first scale, at neighbourhood level as studied in Chapter 3, the thesis considers the spatial transformation of the location where the public housing projects have been located over time. This analysis of the location makes it possible to evaluate the integration and organisation of the new 'fragment' in its surroundings.
- On the second scale, the current configuration of the space between buildings, studied in Chapter 4, the thesis considers the current structure, organisation and strategies for the formation of exterior spaces (mechanisms for three-dimensional organisation, and spatial quality factors). These help to analyse the morphological coherence of this new urban space, in comparison to the existing space.

In the analyses carried out in this thesis, we have seen how a new urban form has fit into place by structuring the new fabric with the urban pattern of the surrounding areas, its integration into the territory by overcoming its unitary condition and new layout, and the coherence between the urban structure of the new urban fragment and the surrounding area. By studying this ability to become structured, we can see to what extent it overcomes the fragmented nature of the territory; by studying this integration, we can see to what extent it overcomes its segregation; and by studying this coherence, we can see how it overcomes the disconnected nature of the territory.

The cohesion of the territory will depend on how each neighbourhood unit and their open spaces are adapted, structured and integrated within the immediate surroundings, but also with the other public and community spaces. In order to describe, analyse and explain how the urban form has originated, the three components that Conzen interrelates on a functional level have been used (Conzen 1968, pp.113-16):

- The town plan, consisting of a 2-D representation of the town's physical layout, consisting of its streets, plots and buildings.
- The building fabric, consisting of the buildings and open spaces associated with them.
- The pattern of land, in order to observe the structures and land use in detail.

By using maps and aerial photographs of the same location from different periods, a morphological scenario is presented that shows the urban development that has

occurred at different stages of the period being studied, making it possible to see where the public housing was built, the borders of the intervention, and the current limits of the neighbourhood to which it belongs. This analysis allows us to define which morphological aspects are decisive in the urban form, and by including time, to define which of these morphological aspects is relevant in the urban form of the period being studied. These morphological scenarios, which are organised in each of the study cases, make it possible to compare the transformation of the location over time, and to compare certain study cases with others through their distinctive typological aspects. By doing so, we can identify which aspects as unique to a specific urban form, and which are common to other urban forms.

The public housing projects from the period studied in Galicia have influenced the surroundings in which they were built, configuring a spatial unit between the consolidated city and the projects themselves that poses difficulties in following the morphological reference of these border patterns. These spatial units make it possible to explain the causes of the lack of cohesion and continuity with the consolidated city, by being created as an element of fragmentation, segregation or disconnection from the fabrics that form them, and maintaining the morphological features of a border. At the same time, in these locations it is possible to study the degree of urban cohesion that has been achieved since the construction of these housing estates, and to consider what can be done to recover it if it has not already been achieved.

In order to define these spatial areas, we use the concept of the fringe belt identified by Herbert Louis (1936) and subsequently defined by Conzen (1960) and Whitehand (2006) as "*a zone of extensive urban land use formed at the edge of an urban area during a period when the built-up area is either not growing or growing only very slowly*", in observing that in the process of expansion of urban centres, there are uses that require a large amount of low-cost land for their implantation on the periphery, in an area on the urban border that *becomes embedded within the built-up area during a resurgence of urban growth* (Whitehand 2006, p.2048) (De Alvarenga 2015, p.121).

In the analysis at neighbourhood level, as well as representing the borders of the public housing project and the spatial area between it and the consolidated city, the combined urban plan is dissected, highlighting in different temporal layers the built surface and the road infrastructure. This makes it possible to evaluate the urban cohesion of the public housing project based on the conditioning factors that affect the transformation of the land in the area where it was built, its level of integration and structuring within the urban border, and the influence of how the land was obtained, continuity in this border or location, the transformation of the ground plan, and the way in which the space is organised, as discussed in Chapter 3.

The analysis of the current configuration of space between buildings contained in Chapter 4 is based on a representative fragment of these public housing projects, consisting of the buildings and the open spaces between them. This three-dimensional study of urban spaces explores the value of the relationship between private, community and public space according to its component parts, based on the ideas of the Italian architect Saverio Muratori, where the urban form and structure are defined as an aggregation of ideas, choices and actions, which can be seen in the buildings and the spaces around them, referring to these buildings and spaces as *edilizia*, or 'built landscape' (Moudon 2004, p.19).

This idea is extended in relation to the morphological scenario at neighbourhood scale, analysing the space between buildings on the basis of the ideas of Gianfranco Caniggia, a disciple of Muratori, for whom the urban form has to be analysed from the scale of the individual building through to the scale of the territory in which it is built, as he considers that the city is built from small elements, from the small to the large scale (Caniggia & Maffei 1979, pp.57-74, 122-65), explaining how human surroundings are made of built objects that are interrelated and identified on four scales: the building, the group of buildings as a *tessuto* (building fabric), the city, and the territory. Each of these built objects is described as a complex entity made of component elements, structures, systems and organisms, observing how the objects are dispersed within each other, and how objects on one scale fit within objects of other scales.

The analyses of Conzen, Muratori and Caniggia focus on the European historic city, and although the tools they develop make it possible to evaluate changes in the current built space in terms of time, form and scale, they do not apply them to the analysis of Modernist urban structures. In order to observe approaches to the study cases I propose, it is necessary to review subsequent contributions from the different schools of urban morphology, which are currently related to the International Seminar on Urban Form (ISUF). I also take into account that in the British school, the group of geographers who continued the teachings of Conzen at the University of Birmingham (The Urban Morphology Research Group) defined different lines of research, including those of Whitehand and Larkham on the contemporary city, studying the effects of industrialisation on the urban form and residence in the suburbs. Meanwhile, the group of Italian architects whose work is based on Muratori's critique of the Modernist city, which includes Rossi, Aymonino or Grassi, do not make a systematic analysis of the modern city, instead differentiating it from the historic city in the way in which the buildings are associated with the city, and how they have been designed (Aymonino [1976], 1981).

Muratori's influence can also be seen in the work of the members of the French school, although unlike Muratori, they consider that the Modernist movement did not

create an irreversible break with the past, and do not consider it only as an opposition to the traditional city, but instead as a series of new design principles that have gradually filtered into the process of constructing the city. The investigations carried out by the LADRHAUS in Versailles focus on Modernism, motivated by an interest in identifying architectural models and ingredients in order to create good urban design, considering that the present does not signify a break with the past, because the past contains models for the future, as a past and future which they do not associate with the continuity and discontinuity of the built space, because if they have existed in the past, they can exist in the future. In the same way as in this thesis, they consider that the process of questioning the city, the urban fabric and the plot division has consequences on the architectural project, influences the decision on where they will be located, and makes it obligatory to design the buildings while considering the territory and how it will be transformed, accepting the legacy of the Modernist movement, especially in projects that have been capable of contributing towards the construction of the city and which resolve an urban problem while still affirming their modernity (Panerai et al. [1977] 2009, p. 184-85).

In order to carry out the formal and functional analysis of the space between buildings, we observe their current structure and organisation. In order to go beyond a simple morphological discussion of the relationship between the solid and the void, the three-dimensionality of the urban form is considered as the spatial pattern formed by the objects of a city, with its buildings, open spaces, topography, and the way in which these elements are linked with and related to their environment, taking into account, as defined by Lynch (1981, p.47), that the objects that constitute an urban model are arranged in a way that is modified by their use, quality, or ownership. In this relationship between form and function, the thesis observes the strategies of formation of the exterior space, studying the mechanisms of three-dimensional organisation and the quality factors of the space. To determine these factors, the definitions established by different authors are reviewed: for example, Sola-Morales (1987, p.24-26) asks which elements are taken into account when they are designed (elements of the urban project); Carmona (2003) groups and defines them based on the key features of good urban design (morphological, perceptual, social, visual, functional and temporal aspects); López de Lucio (2000) defines them based on the conditions of viability of public space (functional complexity with a mixture of uses and activities, residential density, continuity and spatial contiguity, clarity in the delimitation and formation of public space, integration and social cohesion); for Lynch (1981) the good shape of a city provides five criteria: vitality, sense, fit, access and control; Rueda (2018) bases his ideas on an analysis of the problems presented by a multitude of urban systems and the analysis of those that have managed to minimise them in order to define the design parameters of new urban developments and the regeneration of existing ones, establishing an intentional urban model

that is compact in its morphology, complex (mixed in uses and biodiverse) in its organisation, metabolically efficient and socially cohesive.

Out of all these factors, the thesis takes into account those that can be recognised by means of the morphological, spatial and environmental analysis. In particular, chapter four of the thesis takes into account factors considered by López de Lucio (2000) and Carmona (2003) in order to analyse the configuration of space between buildings and on the edge of the project. In this way, the use of space defined in the supporting structure of the project and in the organisation of the constructed elements is related to Carmona's Functional principle and the Functional Complexity described by López de Lucio. Meanwhile, within the strategies for the formation of the external space, those connected with the formal configuration are related to Carmona's principle of Morphology (urban form, urban layout) and that of Spatial Continuity of López de Lucio. Those related to the spatial quality are connected with Carmona's principles of the construction of place (Perceptual), density and environmental design, as well as Carmona's Functional principle, and those of Clarity in the delimitation and formalisation of the space and residential Density of López de Lucio.

And in chapter five, by reviewing the parameters used to verify their utility in relation to the objectives of the analysis set out in the thesis (section 1.3), these are grouped together in a summary graph as environmental factors (factors of climatic comfort related to Carmona's environmental Functional principle), formal factors (of formal configuration) and accessibility factors (of spatial quality) (both related to Carmona's Morphological principle and the Spatial Continuity principle of López de Lucio), factors of use (types of spaces and uses related to the Functional use of public space of Carmona and the functional complexity principle of López de Lucio), and construction factors (related to the Functional and Perceptual principles of Carmona, and Clarity and Density principles of López de Lucio).

All of these factors have served as the basis for my reflections on how the residential fragments built in the second half of the 20th century have contributed towards the creation of the Galician city, observing the value of the formative potential of these public housing projects in creating an urban structure on the periphery and on the city; in the spatial relationship within the project, on its limits with the urban border and with the consolidated city. This is defined using the analytical parameters described below, and which serve to observe this urban transformation over time, from the territorial scale to the scale of the object, and from this to territorial scale, from the village to the neighbourhood over time, and from the neighbourhood to the space between buildings seen today.

## § 1.6.1 Spatial transformation at neighbourhood scale. Historical framework

**Morphological scenario – The location of the intervention**
In each of the study cases, a morphological scenario is established which documents the process of growth, urban transformation and its original context, subject to the contamination of previous uses that remain or influence the project and its subsequent relationship with the structure of the neighbourhood. In order to describe these scenarios, an evolutionary sequence of plans and images is used, based on the ground planimetry and comparing it with aerial photographs from different periods, using the following parameters:

**Urban grain:** streets, blocks and plots in relation to the topographic elements and the urban and rural road network, highlighting two levels:

- **Urban-rural:** highlighting the urban grain built on the topographic support, "eliminating" the rural presence to reveal the urban limits, its expansion, and to what extent it has penetrated in the rural environment.
- **Rural-urban:** Highlighting the space enclosing the urban grain, delimited by a network of rural roads, to reveal its continuation within the process of urban growth.

**Road network:** development of the road network.Highlighting the urban road network, over the network of rural roads and paths. This makes it possible to identify the degree of colonisation, proportion and heterogeneity of the space occupied over time as a result of urban development. This reveals to what extent the rural network has remained or been eliminated in the process of urban development.

**Borders of the intervention:** limits, contacts, obstacles and sections. Highlighting the point of contact between sections in expansion and embryonic fabrics, revealing the transformation of the space of the intervention and the sections in the surroundings.

## § 1.6.2 Current configuration of the space between buildings

This will analyse the supporting structure, organisation and formation strategies for exterior space, at the scale of the neighbourhood and the area used for the public housing project, using the following parameters:

**Supporting structure. Framework of the current intervention.**
Supporting structure for the built elements and spaces in the neighbourhood, in relation to the public housing project.

**Organisation. Built elements – Open spaces**
Rules of distribution for built elements and open spaces in the neighbourhood in relation to the public housing project:

- **Spaces** (private, collective, public). Surface area of spaces within the framework of the intervention at neighbourhood scale.
- **Land uses.** Percentage of use of the space measured by neighbourhood districts in relation to the area of the project analysed.
- **Open spaces per dwelling.** Percentage of open spaces in relation to the public space measured by neighbourhood districts.
- **Buildability.** Percentage of built surface in relation to the occupied space measured by neighbourhood districts.
- **Density – Open spaces.** Housing density in relation to occupied space, measured by neighbourhood districts.
- **Connectivity–Accessibility–Permeability.** Characteristics of the space for connection and movement.

**Formation strategies for exterior space**
Three-dimensional organisational mechanisms and quality factors for exterior space in public housing projects:

- **Layers of formal configuration.** Configuration of the form and organisation of the exterior space of the intervention, internal and external borders of the intervention. Composition of the space between blocks and spatial continuity in their immediate surroundings.
- **Functionality of the exterior space.** Spatial connections, relationships between housing and exterior space. Use of space around buildings, resulting in the urban development and creation of exterior-interior spatial relationships.
- **Spatial quality.** Accesibility, permeability, climatic comfort and spatial attraction. Variation of the spatial connections and movements through the exterior space.

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# 2 The creation of space in the first peripheries through public housing

# 2 The creation of space in the first peripheries through public housing

## Introduction

Urban growth associated with the need to house the population is a basic problem which has to be solved in each stage of constructing a city. As defined by Solá-Morales (1997, p.22), over time this process brings together processes of subdivision, urban development and construction, which in different spatial and temporal combinations give rise to the morphological abundance of the city.

In mid-20th century Europe, the growth of urban development processes was accompanied by the migration of population from the countryside into the cities. In response to the need for housing, public projects were built on the outskirts of the cities, where for the first time the process of urban development, sub-division and construction took place simultaneously. While cities had grown up until this point in a continuous process, in which they were designed in parts, the most novel aspect of this period was the uniform management of these residential structures in all of their stages of planning, development and construction, together with their location on the outskirts of the city, further underpinning their configuration as an isolated, peripheral fragment.

The construction of these fragments of the city summed up in their design and development the process of urban growth and development in the mid-20th century. This chapter examines the construction of the city through these unitary fragments, making it possible to understand the way they grew and their structure, as well as the locations in which public projects were developed, as the basis for an analysis of the study cases.

The relationship between the scale of the city and housing is one of the most important aspects relating to public housing built in the mid-20th century in Europe, and as we will see later on, depending on its size and position, it is the factor that allows these elements to define new urban relationships, both at the time of their construction and in any subsequent interventions.

The parts of the city studied were designed as complete urban planning units, considered as units that were differentiated from their surroundings, which included open spaces and complementary services together with housing, of a larger size and complexity than

that of the public housing from the 1960s and 1970s than in the first post-war projects, where open space began to be diversified from the streets to the spaces between buildings. These were also important areas for experimentation, leading to important theoretical contributions by including innovations in terms of their architecture and urban planning, and were used as models for subsequent developments, marking a turning point in the way of building cities (Busquets 2004).

Considering the city as a built form, according to Colin Rowe ([1973] 1981), can be done from two points of view: as a forum model, or as an acropolis model.

The forum model is what was considered until the start of the 20th century as the appropriate model for urban planning projects, based on creating public spaces, streets and squares, with buildings as a randomly divided "filler" depending on the limits of the property. This "filler" was initially subject to regulations in terms of its limits with public space through its façade, and then its interior through habitability regulations. The resulting urban development model was based on the layout as a way of defining public open spaces, with local ordinances as was of regulating and controlling the private space and buildings. Planning and local ordinances were the instruments used to build cities for centuries.

The forum model associated with the traditional city was forgotten after the Second World War, and then revived in the 1970s as a result of the critical revision of the modern movement, and since then has been at the centre of the urban planning debate.

The idea of buildings as fillers between public spaces defined as a compact solid is very flexible, allowing for it to be adapted to all types of property sub-divisions and all types of building projects, great or small, on regular or irregular plots, with high or low densities, or with wide or narrow patios.

The city model associated with the principles of modern architecture is based on planning its buildings, as in Colin Rowe's acropolis model. Functionalism breaks the city down into its component elements, defined in the four functions of the Athens Charter (dwelling, work, transportation and recreation), deconstructing the urban structure to then reassemble it in a different way. Since the first CIAM, the "living cell" has been studied to define types of buildings by aggregation, connecting together these buildings to create neighbourhoods, and finally connecting these together to once again construct the city.

Modern urban planning is based on designing objects, buildings, which do not fit in conventional plot layouts and which cannot form a part of a built "filler". The space between these objects is considered to be a "green space". These are buildings in parks, architecture which blends into nature, the surroundings of the building.

This proposal presupposes the need for public ownership of all of the land. It calls for unitary projects that are large enough to ignore the fragmentation of private ownership of the land, which needs to be done where land can be bought at a reasonable price, generally on the outskirts of the city.

While the peripheral location of these projects became a necessity, their fragmented perception limited their development as a model. As indicated by Colin Rowe, there is a limit to the agglomeration of different types of objects in a given space. When an urban project focuses on the objects, the space no longer acts as a structuring factor and becomes residual, as what is left between the blocks. The accumulation of isolated object in a continuous empty space is the reason for the fundamental problem that affects the urban peripheries built according to the principles of the modern movement. This problem is not a lack of open spaces, but on the contrary, an excess of open spaces without any urban quality.

The public housing we are examining was based on being peripheral and unitary in nature, but today, in many cases (at least in Spain) now occupies a central position in relation to the inherited compact city and its metropolitan development. The creation of its space as a unitary project, its modern-day transformation into property occupying a central position and its necessary rehabilitation based on the potential of its open space, until completing the potential of the housing, has once again brought it into the spotlight as a type of accommodation for the population living in the cities. For this reason, faced with the different ways of dealing with its renewal, rehabilitation and regeneration, and based on the analysis of the study cases, it is necessary to study the different stages involved in its creation, and the main factors that have served as a framework of reference, summing up a historical period and the way of conceiving external urban space. This, at least in the case of Galicia, resulted in the duplicity of its cities and the creation of larger number of potentially public spaces with a larger surface area to those that previously existed.

In studying the creation of public housing projects and their process of urban integration, it is necessary to explain the transformation brought about by their construction in the second half of the 20th century, in terms of aspects such as their structure, their location and the space created as a result of their construction, which will provide us with the theoretical framework required prior to analysing the study cases. For this reason, in this chapter the following questions will be answered:

- How has the construction of the city been structured through the housing projects?
- What urban structure did it produce?
- What was the location like where public projects were executed?

## § 2.1 The construction of the modern western city

Until the end of the 19th century, urban development plans generally considered the city as an indivisible whole. Planned urban growth occurred with the creation of new districts, as it was easier to build onto the city rather than to continue transforming and densifying the old city. At this time, the German doctrine of the regulatory plan described by Josef Stübben ([1907] 2009) was the framework used for urban extension projects, and when a sector of the city was dealt with, it was as a part of a whole and not as an independent unit.

From the start of the 20th century, the city began to be considered as something too complex to be organised as a whole. This led to a change in the way in which intervention projects were carried out, breaking the urban structure down into its component parts, studying them separately to then reconstruct the city using more appropriate components. This was the analytical model used as the basis for the construction of modern cities, based on the doctrine of the Athens Charter of 1945, the year when the first examples of residential units were built according to this thesis. These were new, adjacent segments built on peripheral land that was cheaper and more easily available, where it was possible to experiment with new models, especially with mixed typologies and more flexible, self-sufficient volumetric arrangements, due to their facilities and their relationship with the rest of the city.

Within this analytical approach, a particularly relevant idea is that of the city as an agglomeration of different parts. This idea implies that it is possible to break the city down into sectors or neighbourhoods, which can be organised separately, then recomposing the city as an agglomeration. According to Benevolo (1978), "The procedure that goes from the specific to the general forms a part of scientific tradition, and has been accepted since the start of architectural research, as a guarantee of the correctness and gradual control of the results. Each built object must be broken down into simple elements and then recomposed, associating these elements in a new, rationally motivated way".

The city is composed of residential urban units, neighbourhoods, with their facilities grouped together in a neighbourhood centre, and of non-residential urban units, large-scale, specialised complexes and others that reproduce the functions of an urban centre in the modern city: business, administration and leisure.

This idea of the city as a unit comprised of component parts appears in proposals for new cities as well as for existing cities. In the latter case, they are nearly always on the scale of peripheral neighbourhoods, in autonomous residential units with their own services, forming the main part of the aggregate as a whole.

This theory of the "equipped" neighbourhood, consisting of housing blocks, buildings for collective services and open spaces, inspired the majority of the projects and designs in the second half of the 20th century. The only alternative to the equipped neighbourhood in terms of contemporary urban planning is the theory of the complex building with collective services, mixed properties or equipped blocks, which include housing and facilities in units on a smaller scale than the neighbourhood.

Since the CIAM began at the start of the 20th century, contributions have been made based on these models, through which I will attempt to explain the development of modern thinking and urban planning theory with regard to the construction of the modern city.

## § 2.1.1 The origin of the integration of collective services and residential areas

In the 19th century, experiments began with new formulas for the growth of the cities, and the relationship between public space and built space. New formulas that led to different models of growth that were developed during the 20th century, with the common feature of growth by "packages" compared to pre-industrial building-by-building growth, further attempting to redress the balance between buildings and open spaces that had been lost in previous periods (Martí 2000, pp.13-20).

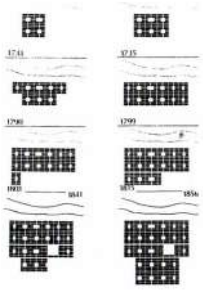


FIG. 2.1
*Savannah, 1733-1856*

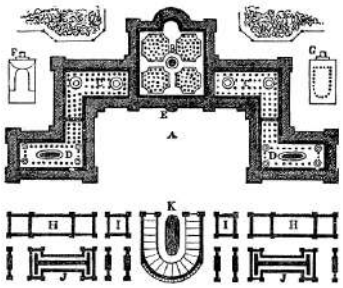


FIG. 2.2
*Phalanstère, Charles Fourier 1822*

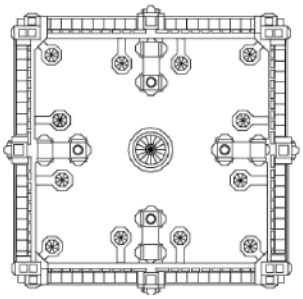


FIG. 2.3
*New Harmony, Robert Owen 1825*

The first proposals for these new models for integrating collective services into residential blocks were presented by utopic socialists such as Charles Fourier (FIG. 2.2) and Robert Owen (FIG. 2.3), which resulted in the model of the company town, although there were already precedents in the city planned and built by agglomerating equipped residential units: the US city of Savannah (FIG. 2.1). The basic unit in Savannah is the ward, a square

unit with interior streets and public spaces in the centre, integrating open spaces and plots for public or communal buildings. The agglomeration of four of these units resulted in the original city taking shape in 1733, which grew until 1856, at a total of 24 units.

Nevertheless, it would take until the 20th century for specific proposals to appear for the gradual integration of services to configure entire cities. In the 19th century the foundations of modern urban planning were laid, based on the criticisms levelled by the first social scientists at the European industrial cities, which then spread throughout the second half of the 19th century amongst humanists and "regenerationists", such as the Countess Von Dohna-Poninski. Under the pseudonym "Arminius", in 1847 she published the book "The Large Cities in their Housing Crisis and the Foundations of a Radical Remedy", which explores the concept of habitability, not limited to the home, but also to the surrounding green spaces and areas for leisure and relaxation. Only two years earlier, Engels had published the articles that comprised his essay The Housing Question, and many others sought to improve cities whose expansion had resulted in degraded peripheries, with poor quality housing without any collective services or green zones.

In the 20th century, the "garden city" theories of Ebenezer Howard and the industrial city of Tony Garnier were put into practice. Both represented alternatives to the existing cities, both in terms of their internal configuration and agglomeration of units with services, as well as their position in the territory, with trams and railways to grow on cheaper land, removed from the urban periphery.

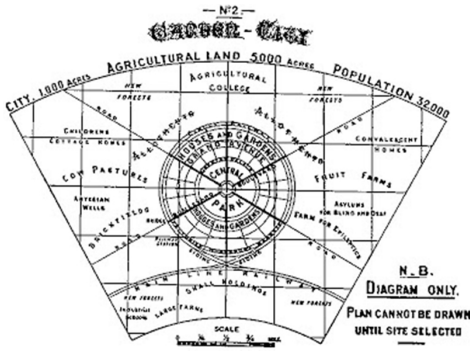



FIG. 2.4 *Garden City, Ebenezer Howard 1898*

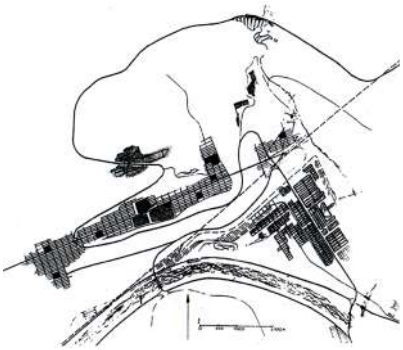


FIG. 2.5 *Cité Industrielle, Toni Garnier 1904*

Howard's garden city theory ([1898] 1965) proposes extending modern cities by creating a halo of low-density satellite cities, featuring an internal structure forming the city as a series of connected units with collective services (FIG. 2.4). Each of these units is called a ward, with a total of six in the city. Each ward is considered as an autonomous urban unit, with residential strips on both sides of a central green strip containing the church and school, which comprise the first level of services. The second level of services is for

the city as a whole, consisting of the most important public buildings, in the centre, surrounded by a large central park. This proposal allows for the gradual integration of the services, associated with the idea of building the city ward by ward, with residential units equipped with collective services, which when grouped together allow the city to be defined as a whole.

In contrast to the idea of the city as a whole, the idea began to appear of the city as the sum of its component parts. This concept can be seen in the construction of the first garden cities, designed by Unwin and Parker: Letchworth (1902), Hampstead (1909) and Welwyn (1919).

In 1907, Tony Garnier proposed a linear model for urban agglomeration, the "cité industrielle" (FIG. 2.5) , with residential neighbourhoods on both sides of the urban centre, subdivided into small units around a primary school, with two-storey houses surrounded by unfenced gardens. This layout was based on the idea of creating residential units with community services, agglomerated to form the city as a whole.

### Conclusions

In the nineteenth and early twentieth centuries, European cities continued to be built by expanding on the consolidated city, extending into degraded peripheries, and with an urban structure that was considered as an indivisible whole. However, a number of alternatives began to appear:

- A number of sporadic proposals appeared that would have an influence in subsequent decades on countering poor residential quality, and the lack of housing, public services, and open spaces
- An alternative based on the idea of the city as a sum of different parts, as an aggregation of units with collective services.

## § 2.1.2 The idea of the city of a group of urban units. The concept of the neighbourhood unit. Groups of houses with collective services.

In 1929, Clarence Perry (Perry 1929; Brody 2009) drew up a design corresponding to his concept of the neighbourhood unit. The way in which motor vehicles affect urban organisation resulted in the idea that influences contemporary urban planning of separating the circulation of pedestrians and vehicles, and with it the idea of organising autonomous urban units with collective services, which form a city when they are brought together.

In his plan (FIG. 2.6), Perry proposed a different road layout, with high capacity roads marking the perimeter of a neighbourhood unit to connect it with the rest of the city, and an internal road system exclusively for traffic within the neighbourhood unit. In this system separated by the road network, the concept of the neighbourhood unit was aimed at responding to the social problems associated with the construction of residential complexes, proposing the integration of collective equipment and services close to the homes. These services were the basic facilities for establishing an operational model of a local community, seen as an autonomous urban unit, with a sufficiently large population to justify the presence of an elementary school in the centre of the neighbourhood unit together with other services, setting aside 10% for recreational areas and parks throughout the whole of the unit. This community centre was situated less than 400 metres from the farthest house and businesses, on the main road which connected the unit to other agglomerated units.

Perry's proposal was not an isolated event. Similar principles were applied by Henry Wright and Clarence S. Stein, firstly in Sunnyside Gardens in 1924, and later in the new city of Radburn in 1928 (US Department of the Interior 1974).

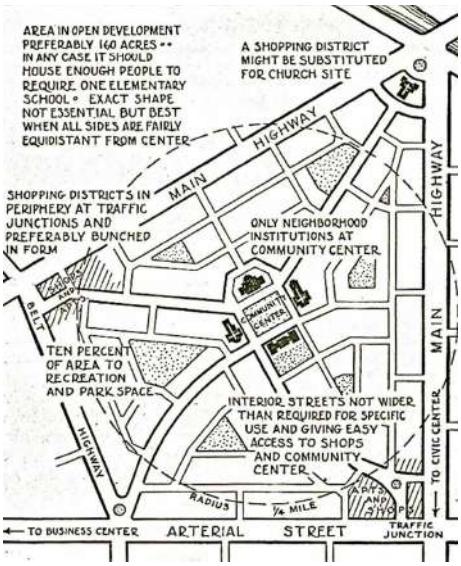



FIG. 2.6 *Neighbourhood unit, Clarence Perry 1929*

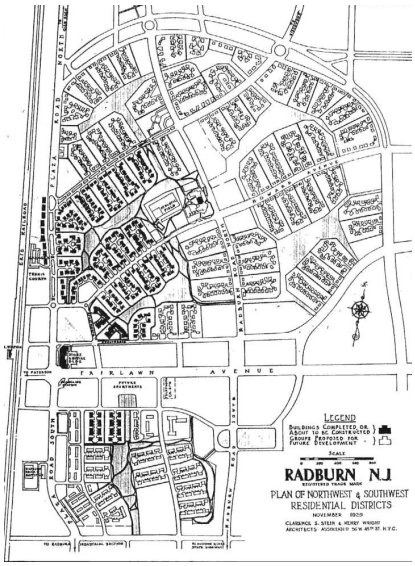



FIG. 2.7 *Radburn unit, Wright & Stein 1928*

With the same size as Howard's garden city, Radburn is 16 miles from New York, but was not designed as an autonomous city, but instead as a dormitory town connected to the main city by train and road, for workers commuting to New York. Stein defined his main structure in five points, highlighting the innovation of separating pedestrian and vehicle

traffic with crossroads on two levels, with the rooms of the houses facing onto pedestrian streets and communal gardens. Traditional blocks were replaced by "superblocks", with streets being classified into four categories, with large green zones inside the superblocks. These collective gardens formed linear parks that branched out throughout the whole city, limiting the surface area given over to individual gardens, a concept based on the proposals of Unwin in his essay "Nothing Gained by Overcrowding" ([1912] 2012).

Radburn was divided into three sectors or neighbourhood units with collective services, and in the same way as Perry's scheme, the schools were located in the centre, although at twice the distance (800 metres). His organisational model systematises the urban units, establishing agglomerations of increasing size, with the minimum unit defined by the agglomeration of residential properties. Grouped around a community central space, these formed superblocks, which when grouped in turn around a school formed the neighbourhood unit (FIG. 2.7), which when grouped around a community centre formed the city as a whole (Buder 1990, pp.168-172).

Although the construction of Radburn was halted by the Great Depression, its model has influenced modern urban planning. Its urban structure, with other typologies, forms the basis of the residential units built during the 20th century, determining the concept of residential surroundings equipped with collective services and without traffic, while still maintaining the car as the main form of transportation.

### § 2.1.2.1 The breaking down of the city into its component elements

In the period between the two World Wars, especially from the first CIAM held in La Sarraz in 1928 to the fourth CIAM in Athens in 1933, functionalist urban planning incorporated this idea of the modern city as an agglomeration of different parts into the urban planning proposals of the modern movement, as an alternative to the industrial city. Urban planning was seen as the culmination of a process that broke down the city into its component parts, starting with the home as the smallest unit, and studying the best way of organising these components in order to assemble them in a new way.

At the second CIAM held in Frankfurt in 1929, the topics of debate were the minimum dwelling and residential typologies, considering the residential unit as the most basic element of modern urban structures. Having studied housing, the third CIAM in 1930 moved on to their agglomeration: the way of grouping buildings together to form the neighbourhood and housing as an element of public interest. This edition included the presentation by Gropius titled "Low Buildings, Medium-High or High Buildings?" and the joint presentation by Herbert Boehm and Eugen Kaufmann. The first studied

different ways of grouping together homes and buildings, specified in the theory of zeilenbau or linear construction, proposals for linear, parallel blocks in a north-south direction, varying in terms of their density, height and distance necessary for suitable exposure to sunlight (FIG. 2.8-3). Boehm and Kaufmann presented different alternatives to the way of organising single-family terraced homes, arranged in single or double rows (FIG. 2.8-2).

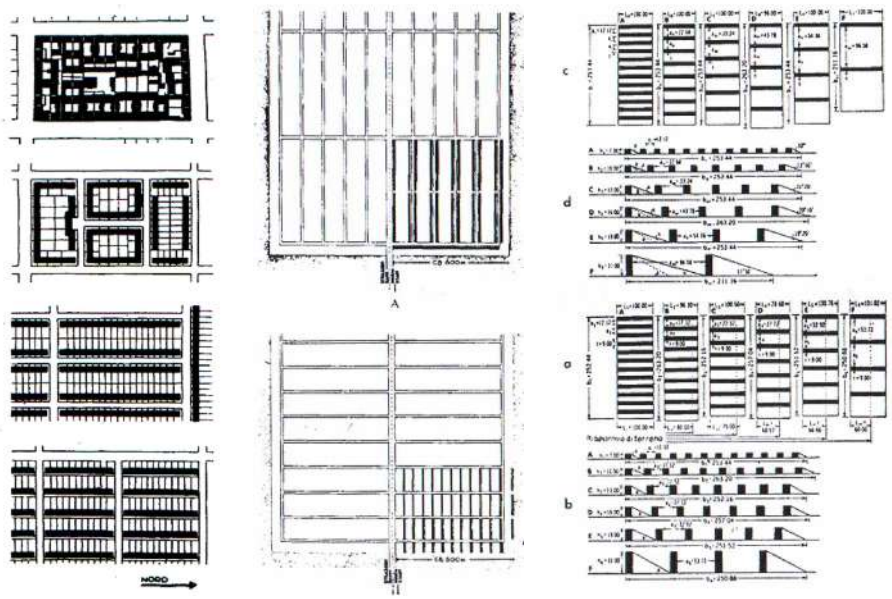


FIG. 2.8 *The urban block evolution, 1930. 1-Ernst May, 2-Herbert Boehm & Eugen Kaufmann, 3-Walter Gropius*

These first three CIAM witnessed the evolution from the compact block of the 19th century, in which there was a clear link between the street and the building, to blocks with a separation between the street and the buildings, proposing developments in single rows running diagonally to the street.

These theories were tested in the construction of workers' homes in the Weimar Republic. Between 1924 and 1929, the siedlungen were designed as model neighbourhoods in which new construction technologies could be applied, with new patterns of distribution based on the existenzenminimum, the minimum living space. From an urban perspective, they were conceived as part of a city incorporated into the previously existing urban structure, in an attempt to both complement and diversify it (Martí 2000, p.23), not as self-sufficient urban units, but instead as districts of a large industrial city, organised in a new, discontinuous way, intersected by green spaces that made it possible to structure an agglomeration so that it could grow continuously.

The article "The Hard Line"(Martí & Monteys 1985) discusses the linear implantation concept of the radical rationalists that was applied in the siedlungen, as well as the concept of discontinuous urban development or Trabaten-Prinzip, used by Ernst May for the Frankfurt Plan in 1930.

The siedlungen are not considered as self-sufficient urban units, and are generally located on the urban periphery. Their size and location determine their dependency on the city to which they belong, which according to Aymonino defines them as "subordinate cities" (Aymonino 1981), or peripheral residential neighbourhoods.

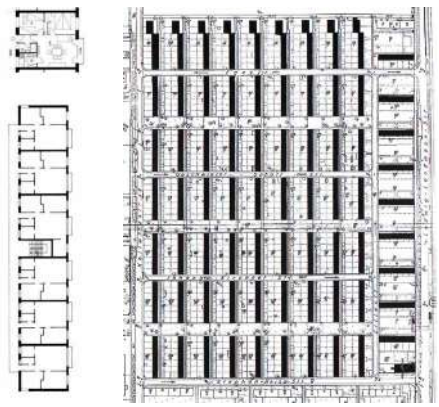


FIG. 2.9 *Siedlung Westhausen. Ernst May, 1929*

FIG. 2.10 *Frankfurt, 1930 (Siedlungen in a red circle)*

The siedlungen may seem to be a step backwards in the modern evolution of the city considered as an agglomeration of urban units, if we compare them with the autonomy of the proposals of Perry, Wright and Stein, and especially with the Italian satellite cities, much closer to the idea of the neighbourhood unit or integrated urban unit in which the services play a structuring role, as can be seen in the projects designed during the Fascist era in Agro Pontino, from 1932 to 1937. It is true that the siedlungen give priority to the mass production of housing in comparison to the integration of collective services, although these are not so scarce as to not consider the importance of the collective situation in relation to the residential situation. When Ernst May examined the units built in Frankfurt between 1925 and 1930, he admitted that two of the most necessary services were not built due to a lack of funds – the social centre and old people's home – although land had been set aside for them. However, there were already schools, laundries, central heating installations and basic stores grouped together in the areas with most traffic, as well as a large green zone, which as Gropius' theory of zeilenbau was gradually incorporated for the use of the residential blocks, came to be conceived as a collective garden, leisure area and sports zone, an indication of is unitary conception as a neighbourhood and unit with its own character.

## § 2.1.2.2 The urban assembly. The combination of the component elements

The breaking down of the city into its component elements delayed studying the composition of the unit, considered as a deductive assembly process from home-building-neighbourhood-city, leaving until after the Second World War the large-scale experimentation of residential units that completed and added complexity to the modern concept of the city, considered as a series of agglomerated parts. But before this there was still time to define criteria that would subsequently be applied, and to try to rationalise the process of planning the city by separating its different functions. With zoning as the basic concept of the Athens Charter, which came about as a result of the fourth CIAM in 1933, the modern urban structure was broken down into unit, neighbourhood and city scales, with their corresponding services. Housing was treated as a hygienic living machine, circulation as just another function, with green spaces as the backdrop for different types of uses.

The aim was to bring back the sense of balance between open spaces and built spaces that had been lost in the industrial city. The city was considered as a park, prepared for the different functions of urban life. Circulation was separated with different routes for pedestrians, slow and fast vehicles, freely laid out over the continuous space of the city-park. A space in which homes and different kinds of amenities, schools, hospitals, stores, sports facilities, streets for pedestrians and vehicles all came together to form the neighbourhood, the main structure of the modern city.

The modern city proposed in the Athens Charter, compared to the randomness and/or repetition of the traditional city, could be formed with larger elements, each designed with a unitary architectural structure and combinations of elements, allowing for a varied, orderly final composition.

The first example of its application can be seen in the "Amsterdam General Extension Plan" designed by Cornelius van Eesteren in 1934 (FIG. 2.11). This is a zoning document, not an alignment document, which defines a clear general structure, subsequently defining the urban layout in partial plans. Growth is focused in three districts, each structured by adding neighbourhoods or neighbourhood units, configured around a primary school, and separated by green zones. Each of these neighbourhoods is planned according to a Partial Plan, imposed on the execution of the architectural projects in order to maintain the unitary nature of the plan.

The expansion of Amsterdam was not proposed as a process of simply adding parts with districts consisting of neighbourhood units, but instead as a composition, as a series of relationships and identities based around the central element of Lake Sloterplas, achieving a sense of continuity between different neighbourhoods,

FIG. 2.11 *Amsterdam Plan, 1930*

FIG. 2.12 *Amsterdam Plan, 1963*

using systems of visual axes, wooded areas, canals and road networks. Apart from growth to the west of the city, the 1934 plan included future expansion towards the south in the district of Buitenveldert. It is interesting to note that when the plan for this district was drawn up in 1957, a new multi-functional urban unit was introduced with all of the elements required to construct a fragment of the city with a certain degree of autonomy. This unit, which consists of different types of residential buildings with associated open spaces and services, is grouped together with others using a serial technique of variations on the same theme (Galindo 2003).

## Conclusions

In the first half of the twentieth century, the growth of transportation methods and especially the automobile influenced urban planning and the process of expansion beyond the urban border; problems with accommodation and insalubrious conditions increased, and the city was perceived as something excessively complex to plan as a whole, seeking the following solutions:

- Changing the way of working with the city, breaking down its structure into its component parts,
- Studying the urban components separately, and then assembling them as a whole: house-building-neighbourhood-city.
- Considering housing as a basic unit, from which urban units are organised with collective services, which form a city when combined together.

The public housing projects that were built at this time, influenced by the idea of the city as an aggregate of component parts, mainly consisted of new neighbourhoods in which built space was given priority, without detracting any importance from the facilities and spaces for social interaction

- These were designed as new urban extensions, without becoming self-sufficient, with amenities and green zones that allowed them to complement and connect with the rest of the city.
- They were identified as a new urban fabric that was structured to the surrounding areas, without any fragmentation; that were integrated by overcoming their new, fragmentary nature using spaces for social interaction; which were highly coherent, as they were linked with the surrounding areas, and highly cohesive, as they were adapted, structured and integrated with the surrounding territory, but also with the public and community spaces.

### § 2.1.3 The construction of new cities based on the idea of the neighbourhood unit.

The construction of neighbourhoods after the Second World War adopted the principles of the neighbourhood unit. The size and types of buildings they included varied, but the unit was always considered as an urban composition unit, a minimum unit or minimum plannable unit in the city, characterised by the presence of primary services (Benevolo et al. [1977] 2000). All of them configure a residential unit of sufficient size to warrant the presence of a school. The school and complementary community services are grouped together in the centre of the neighbourhood so that they can be reached on foot from any of the houses. The open spaces, generally parks, are the main leisure areas, generally no smaller than 10% of the total surface area. The shops and businesses are generally located on the outskirts of the neighbourhood unit, next to important crossroads leading to other cities. These roads are laid out according to the particular needs of each street, avoiding a combination of vehicular and pedestrian traffic. These principles, reminiscent of Perry's neighbourhood unit, are applied to many low-density residential units. Their application in medium or high density units, together with a wide variety of residential units and spatial relationships reveal the different alternatives and complexity of their design as we move from the 1950s to the 1960s, and with them a new way of perceiving the city, the modern alternative to the traditional city.

## § 2.1.3.1 Self-sufficient cities. New Towns and satellite cities

At the end of the Second World War, the ideas contained in the Athens Charter began to spread throughout the whole of Europe: living, working, recreation and circulation, principles that influenced the reconstruction of the cities damaged in the war as well as the efforts to find solutions to the growth of Europe's largest cities.

This period was marked by the reformulation of the models of the modern movement applied to the construction of the new towns initially proposed in Patrick Abercrombie's Greater London Plan of 1944 (FIG. 2.13), of how satellite cities could decongest London. Subsequently, based on the suggestions of the Reith Committee in 1945, these were considered as new, self-sufficient cities created to solve the problem of urban growth all over the United Kingdom (Alexander 2009, pp.68-72).

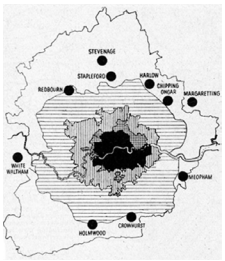



FIG. 2.13 *Greater London Plan*

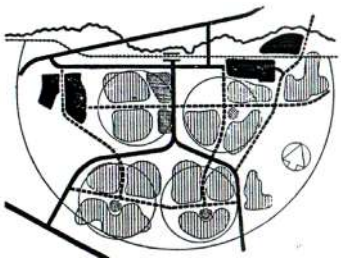


FIG. 2.14 *Harlow* new town scheme

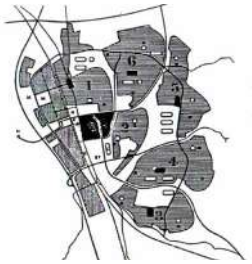


FIG. 2.15 *Stevenage* new town

In the first generation of New Towns, fourteen of which were designed before 1950, new neighbourhood units were proposed of between four and six thousand people, mainly based on the idea of the "garden city", containing single-family homes with gardens, a low density and self-sufficient neighbourhood units. These first New Towns were conceived as an agglomeration of residential units or neighbourhoods, each of which had a neighbourhood centre. In turn, the neighbourhoods were grouped together in districts or sectors that included several residential units, which in turn had a fully equipped district centre. The districts were generally separated by wide green zones, with an urban centre containing services and, in some cases, a peripheral industrial zone. This type of planning can be seen in the towns of Stevenage (1946-52) (FIG. 2.14) and Harlow (1947-49) (FIG. 2.15), which correspond to a model based on sequenced integration, strict zoning and a configuration based on an agglomeration of different parts with separate specialised units, in which the neighbourhoods with their neighbourhood centre are the residential units, and the urban centre and industrial zone comprise the non-residential units.

At the same time as the first New Towns were built as low-density satellite cities depending on London, evolving towards the self-sufficiency included in their position on the outskirts of the central city, we see the construction of new Scandinavian satellite cities. These marked the starting point of the application of the ideas of self-sufficiency in the concept of the neighbourhood or city district, an alternative to the defects identified in the first English New Towns (Hall 1991), particular in terms of the size, degree of isolation and "anti-urbanity" of the neighbourhood units. Their design was clearly marked by the neo-empiricist ideas of the 1940s, which sought inspiration from the specific features of the location, the climate, local materials and the lifestyle of its inhabitants, as a reaction against the rationalist ideas from before the Second World War (Ordeig Corsini 2004, p.96). They were a way of decongesting the urban centres of their capitals and organising the growth of their region; the majority of the inhabitants of these new cities commuted to the capital to work, as they did not contain any industrial zones. Each neighbourhood has a sub-centre and a main urban centre with basic business, recreational and sports facilities. Their planning is based on public transport and grouped buildings, as opposed to the British model, based on private vehicles and single-family homes with gardens.

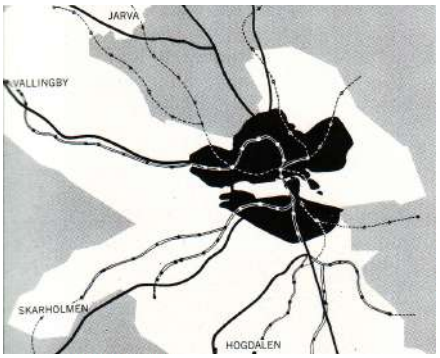



FIG. 2.16 *Stockholm satelite cities*

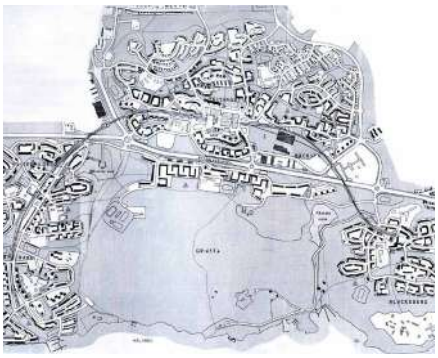


FIG. 2.17 *Vällingby satellite city plan*

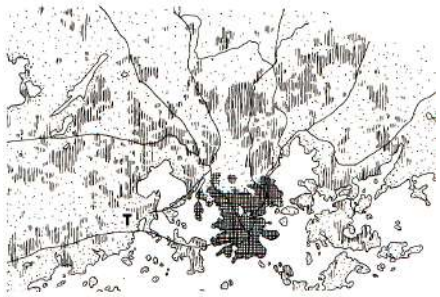


FIG. 2.18 *Helsinki satellite cities*

FIG. 2.19 *Tapiola satellite citiy plan*

In Stockholm, the satellite cities were proposed as operations associated with the public metro system. The new neighbourhood units were designed as part of the Greater Stockholm Plan of 1952 (Fig. 2.16), grouped along these metro lines, with the transport network forming the backbone of the urban planning project (Cervero 1998, pp.109-155). They are no further than 30 minutes from the centre of Stockholm, and the density of their neighbourhoods was designed according to the distance from the homes to the metro stops, whereby no home was any further than 500 metres away. The planning process used residential units that decreased in size depending on their distance from the stations: tower blocks with more than ten floors surrounding the stations, collective buildings 50 metres away from them, with single family homes at the greatest distance from them. The first generation of satellite cities included Vällingby (1953-57) (Fig. 2.17), with a similar structure to Harlow, with five large residential districts, together with the cities of Farsta and Skärholmen, characterised by having buildings adapted to the landscape. The second generation consisted of Täby, Testa-Rinkeby and Norra Järvafelt, with denser, more geometric layouts.

All of these urban projects were publicly funded, with the exception of Tapiola (1952-70), Helsinki's first satellite city (Fig. 2.18), financed by a private not-for-profit organisation, involving trade unions and charities. This city, which forms the nucleus of a larger conurbation, consists of three residential neighbourhoods and an urban centre set amongst woodland (Fig. 2.19). It represents an alternative to the official development plan for the region of Helsinki proposed by Heiki von Hertzen, based on limiting the population in the city centre and dispersing its population throughout a halo of seven satellite cities, of which two more were built, Espoo Bay and Porkkala.

### § 2.1.3.2 The complex building with collective services

Although the early years of European reconstruction were influenced by the planning projects in the United Kingdom and Scandinavian neo-empiricism as an alternative to proposals for neighbourhoods equipped with open spaces, organised at different relational levels, complex buildings appeared with collective services including homes and services on a smaller scale than the neighbourhood. These influenced urban developments characterised by the zoning of the city and the appearance of housing estates with blocks or towers in the middle of green zones, with segregated pedestrian and vehicle traffic. This was a paradigm of the organisation of the Ville Radieuse, the vertical city announced by Le Corbusier, expressed in the first Unité d´Habitation built in Marseilles (1946-1952), as a commission from the French Ministry of Reconstruction in the summer of 1945. Its designs includes the concepts of the composition of the city in parts, although viewed from the perspective of an

architectural element, as the minimum autonomous element of the city, which by being combined constitutes a larger unit with common services for all of the Unités (Fig.2.20), until arriving at the city as a whole (Ordeig Corsini 2004, p.58).

FIG. 2.20 *Unites de Marseille plan, Le Corbusier 1945*

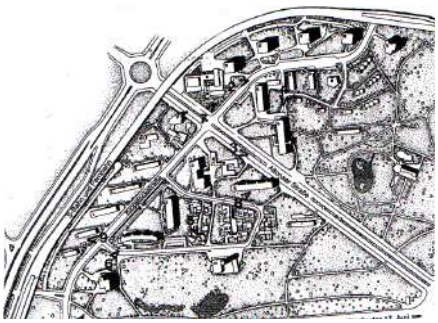


FIG. 2.21 *Hansaviertel plan, Berlin 1957*

FIG. 2.22 *Roehampton plan, London 1952*

This experiment, which was never completed, offers a subordinate interpretation of the residential areas, abstracted from the location, calling for unitary projects that are large enough to ignore the fragmentation of the privately owned land, obliging them to be built on the outskirts or designed with the singularity of an urban park, as can be seen in the residential unit of Hansaviertel, built for the Interbau exhibition in Berlin in 1957 (FIG. 2.21), or the suburban district of Roehampton in London (1952-55) (FIG. 2.22), planned by the architects Hubert Bennet, Leslie Martin and Robert Matthew. It is divided into two urban planning units, Alton East and Alton West, containing the residential areas, while the main collective services and businesses are mainly located in the previously existing centre of Roehampton. It is considered as the last attempt to adapt a peripheral neighbourhood to the principles of Le Corbusier's Ville Radiuese: its carefully studied fusion of landscape and buildings includes the existing vegetation between the buildings, laid out as a series of squares, streets and

public gardens that depend on the conditions of the terrain and visual conditions within the landscape, influenced by contemporary Scandinavian experiments, in the same way as the different types of housing units (Benevolo et al. [1977] 2000, p.108).

This consideration of residential architecture as the main protagonist in the structuring of the city is influenced by the large housing blocks built in France after 1945. The first projects were mainly post-war reconstructions, and the new neighbourhoods were located in what would become the common denominator in the 1950s, in empty, poorly communicated peripheral zones, selected urgently in response to an immediate need for housing. With a lack of services, tall, open blocks were built in rows, around open spaces. Modern-day analysis of the open spaces of French residential projects, including the ZUP built after 1958 and the subsequent *Villes Nouvelles*, show how a wide variety of strategies were used in their design and construction to make the open space a structuring element, and not an empty space as previously thought. The planners of these residential units applied the theories they had learned in the School of Fine Arts, which associated architecture and the landscape, highlighting the association of green zones, the relationship between built and open spaces, and variations in level (Klein et al. 2011, pp. 213-221).

## Conclusions

After the Second World War, new cities were planned in Europe, and many others were rebuilt or reorganised in order to absorb the urban growth and expansion of a new industrial phase, applying the following solutions:

- A scaled model of integration, zoning and structuring was adopted, based on a group of specialised neighbourhood units, aggregated to form districts and cities.
- A model was implemented based on complex buildings with collective facilities, integrated into groups on a smaller scale than that of the neighbourhood, and which influenced in the appearance of housing estates with blocks or towers in the middle of green zones, separating road and pedestrian traffic.
- Housing was grouped around basic equipment in order to form a neighbourhood unit or neighbourhood, as a unitary residential fragment, structured by a specialised road network which could be combined in different ways.

The public housing projects built at this time based on the idea of the neighbourhood unit formed new cities or neighbourhoods, with different types of low, medium and high-density types of accommodation, with spatial alternatives that became more complex from the 1950s onwards

– These were conceived as new cities or neighbourhoods, with facilities, green zones and industries that formed self-sufficient units on the urban periphery, without any continuity with their surrounding area, and only connected to the central city by public transport.
– They were distinguished as a new urban fabric, an isolated fragment that was not structured with the surrounding areas, with a lack of integration and coherence. Their cohesion was only internal, depending on how well they were structured and integrated with public and community spaces.

## § 2.1.4 The search for alternatives to the idea of the neighbourhood unit.

During the 1950s and 1960s, the characteristic structuring of the previous decades evolved towards more complex types of organisation, mainly characterised by combining different types of housing and focusing more closely on the relationship between buildings and the surrounding space. This transformation can be seen in the post-war CIAM until 1951, when the projects underway to construct modern cities throughout the whole world were compared and examined (Munford 2002).

The eighth CIAM in 1951 explored the question of urban planning in greater depth, especially the question of relational space in the heart of the city, introducing it into functionalist urban planning as a new element to complete the model of the modern city from a humanist perspective, superimposing a centre dedicated to public matters in order to correct the mechanistic, schematic vision of the Athens Charter. In his conference "Centres for Community Life," José Luís Sert stated that the essential concept behind the idea of a city is not its residential aspect but its public aspect: the presence of public space makes a city more than a group of houses. The idea of the heart of the city is considered as opposed to the idea of decentralisation, representing an attempt to rediscover urban values lost as a result of urban expansion towards the outskirts, and also of facing up to the reconstruction of city centres destroyed during the Second World War (Sert et al. 1955).

At the ninth CIAM held in Aix-en-Provence in 1953, Van der Broek and Bakema considered a mixed unit model, which they referred to as mixed development (Benevolo et al. [1977] 2000, p.105). This consists of a combination of high and low buildings, combined in different ways, with rows of terraced houses, houses built around patios, medium sized apartment blocks, high blocks and tower blocks, allowing for a wide variety of residential buildings. In terms of the availability of services and their relationship with the residential areas and open spaces, the proposals of van der Broek and Bakema evolve from the modular open block compositions to which services

are added, organised into neighbourhoods separated from their surroundings by extensive green areas (such as the project for Pendrech in 1949-51 (FIG. 2.23) with the OPBOUW group, or in the Klein Driene neighbourhood in Hengelo (FIG. 2.24) between 1956-58), towards more complex neighbourhood units in which the residential areas are not a product of repeating a module, but instead form a continuous element that cannot be subdivided, almost resulting in a megastructure such as the Pampus Plan for the extension of Amsterdam in 1965 (FIG. 2.25), where the services, instead of being structuring, central or linear elements, are elements located in the interstices, in the large open spaces.

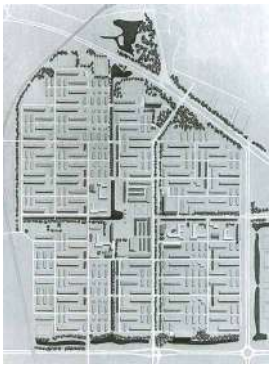


FIG. 2.23 *Pendrech plan, 1949*

FIG. 2.24 *Klein Driene, 1956*

FIG. 2.25 *Pampus Plan, 1965*

These proposals are especially important in the British attempts to find a solution to the problems detected in the first generation of New Towns. Their low densities, combined with extensive green zones, resulted in high infrastructure costs, producing a lack of visual variety and animation. Their population was not sufficient to maintain the services located in a structure of centres and sub-centres at different levels (urban, district and neighbourhood), where the rise in private transport by car modified the city concept, detracting from the importance of pedestrians when faced with the need for parking space and garages. Based on these defects, greater interest was focused on studying the visual finish of the built landscape, through the concept of the townscape.

In the second generation of New Towns, built between 1951 and 1961, the aim was to achieve a more urban quality, using higher densities and more compact fabrics, capable of strengthening the urban centre. Larger cities were built, criticising the use of single-family homes for their high costs in terms of transportation and services, focusing on the separation of pedestrian and vehicle traffic, incorporating streets inside buildings and landscaping the spaces between blocks. The urban structure was modified, placing greater emphasis on the location of schools and shopping centres, which became the backbone of the urban fabric.

FIG. 2.26 *Hook, 1961-62*

FIG. 2.27 *Cumbernauld, 1958*

FIG. 2.28 *Thamesmead, 1967*

These proposals can be seen in the plans for the new cities of Hook, Cumbernauld, Rucorn, Irvine and Thamesmead, called New Town in Town as they are located around London. Their basic planning ideas were based on those from the report on Hook, The Planning of a new town from 1962, and are also influenced by the Buchanan report, "Traffic in Towns" from 1963, which contains a series of recommendations for reducing the impact of cars on the environment, reducing it and segregating it, seeking to conserve and improve quality of life in different parts of the city. As described by Barry Cullingworth and Vincent Nadin, "There must be areas of good environment -urban rooms- where people can live, work, shop, look about and move around on foot in reasonable freedom from the hazards of motor traffic, and there must be a complementary network of roads -urban corridors- for effecting the primary distribution of traffic to the environmental areas" (Cullingworth & Nadin 2002, p.329).

Unlike the first new towns, in the unconstructed project for Hook from London County Council in 1961-62 (FIG. 2.26), the idea of a city comprised of a group of self-sufficient neighbourhoods was abandoned. The neighbourhood units which in the first new towns had been laid out radially around the centre of the city and the main industrial zone, were now organised around a linear structure with residential areas next to a centre and three peripheral industrial areas surrounding an exterior ring road, setting aside large areas as parkland. The densities decreased from 250 inhabitants per hectare in the central zone to 175 inhabitants per hectare in the peripheral zone. The pedestrian road network is separate and raised on walkways over the vehicle traffic, connecting the centre with the social services and businesses with the nearby residential areas, and with the remaining areas within ten minutes on foot. This centre is accessible to vehicle traffic, but is not surrounded by car parks, as was the case with the first new towns (Alonso et al. 2007, pp.107-114).

The size of the residential units increased after the first and second new towns. Although, in general, the response to their organisation was to divide the intervention area into separate projects, there are examples of the construction of a complete urban sector through a common project, which tends to convert the project for a neighbourhood into the project for large, complex building, abandoning the idea of an urban project in favour of a large-scale, fully equipped architecture project. According to Benevolo ([1977] 2000, p.226), the only example of this kind is the Le Mirail ZUP in Toulouse (FIG. 2.29), designed by Candilis, Josic and Woods in 1960, which formed a part of a programme of residential complexes built in well communicated spaces, with infrastructures and services, seeking to correct the problems of the grands ensembles prior to 1958. Le Mirail is laid out around a permanent urban infrastructure, which could be adapted to construction in stages. This infrastructure consists of a central boulevard, a backbone that separates pedestrians and vehicle traffic into two levels, over which is a high density of housing and services. In the design stage, Le Mirail was a continuous urban unit, although in the construction stage it was divided into five neighbourhoods. Only the first three follow the original design, maintaining their continuity with the central boulevard and linear green zone, consisting of parks and gardens belonging to homes that previously stood on the site.

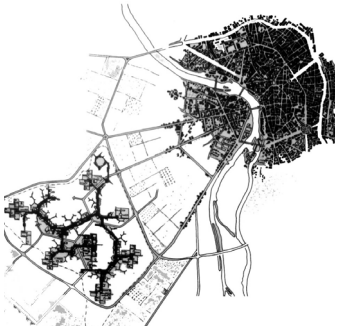


FIG. 2.29 *Toulouse Le Mirail, 1960*

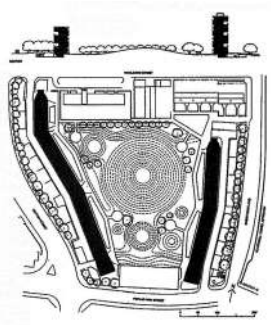


FIG. 2.30 *Robin Hood Gardens, 1969*

FIG. 2.31 *Park Hill/Hyde Park*

Unlike the situation with residential units planned by grouping together neighbourhoods, based on the principles of the neighbourhood unit, Le Mirail is organised continuously, based on belonging to a common structure to the whole city, and not on the self-sufficiency of its neighbourhoods. Le Mirail proposes a linear concentration of its urban activities, similar to those seen in the new town of Hook, at the same time as being presented as a project that is open to modification and change, in order to adapt to the needs of its inhabitants, influencing the design of the villes nouvelles built after 1965. These neighbourhood unit ideas were put forward by the members of Team X following on from the Smithsons' design for Golden Lane in 1954, proposing large residential units, some of which were built as isolated blocks,

with the aim of converting a building equipped as an urban unit. These included Park Hill/Hyde Park by Jack Lynn and Ivor Smith in 1959-61 (FIG. 2.31), and later on Robin Hood Gardens by the Smithsons in 1969-75 (FIG. 2.30), where the open space between the blocks of apartments is the central organising structure, artificially changing its topography to create an interior landscape.

The large-scale interventions based on agglomerated parts include the third generation of New Towns. From the second half of the 1960s onwards, their development was considered as a process; their form was not presupposed by instead was built over time. The urban plans for the third generation of New Towns represented a return to the idea of the neighbourhood unit, with single-family homes now reached by private vehicles. The most significant of these was Milton Keynes (1970), with an urban structure providing equal access to all of its different parts and equal options for all of its residents, flexible and uniform, without any kind of hierarchy (FIG. 2.32). The strategic plan of Llewellyn-Davies & Partners proposed an irregular grid of roads 1 kilometre long, superimposed over the existing agricultural landscape. Each square is a neighbourhood unit, separated from the surrounding roads by green spaces. Combined with the low building density, the services are dispersed, with some in the geometric centre and others in the outer green zone, without being configured as neighbourhood centres.


FIG. 2.32 *Milton Keynes plan, 1970* *Urban structure* *Netherfield neighbourhood* unit

Milton Keynes is a specific example of modern planning, as its residential areas and business areas are better connected. Unlike the new towns that came before it, it does not contain any specific sectors for working areas. Instead, these are scattered over different areas, meaning they are better integrated with the residential areas (Benevolo et al. [1977] 2000, pp.227-229).

## Conclusions

During the 1950s and 60s, the process of urban expansion continued, with the construction of new cities in response to the intention to decongest the large cities, with increased mobility and a demand for housing due to an increase in population. The solutions were:

- The organisation of the new cities and neighbourhoods was diversified, with structures that developed from different aggregation methods, with the repetition of residential modules, to continuous linear structures, in which the structuring elements formed the urban equipment.
- Now the idea of the city was not based on the residential, but instead on the public, giving priority to the inclusion of spaces for social interaction, so that the city and the neighbourhood were more than just a group of houses.
- Housing formed a part of specialised aggregation systems, with a wide variety of residential structures and spaces for social interaction, which continued to be unitary in nature, as their development, plot division and construction was carried out simultaneously.

The public housing projects built at this time constituted new cities or neighbourhoods that were characterised by containing different types of residential solutions with high densities and compact fabrics, seeking to enrich the relationship between the built space and external space.

- They were conceived as new cities or neighbourhoods with facilities and a wide variety of spaces for social interaction between the private space and external space. The first designs from the 1950s were located on peripheries far from the central core, while those from the 1960s tended to be organised in continuation with the urban structure, overcoming their situation as self-sufficient units.
- They were distinguished as a new urban fabric with difficulties to connect with the urban pattern of their surroundings, with a lack of integration resulting from their inability to overcome their situation as newly built fragments, and with a lack of coherence as they were not properly connected with their surrounding area. Their cohesion depended on how well they were structured and integrated with public and community spaces.

## § 2.1.5 A return to the inherited city?

The sociological and urban planning studies carried out during the 1960s[1] on the new types of residential units helped to improve previous interventions, and at the same time provided empirical evidence that opened the way for critiques from within the discipline on modern urban planning theory, including López de Lucio (2013, pp.146-148) who highlighted the following aspects:

- The new neighbourhoods built during the 1950s and 1960s are peripheral, frequently on the outskirts of the consolidated city, strictly mono-functional (as satellite cities), poorly communicated, social ghettoes in which the uniform presence of low income levels, poor professional qualification and minimal social prestige are the norm.
- The construction quality and layout is mediocre, and the homes are tiny.
- The repetition of parallel blocks positioned transversally to the perimeter roads result in a banal appearance.
- The problem of giving a sense of meaning to the spaces between the blocks and hierarchizing them, together with the problems involved in maintaining the open spaces, is further exacerbated by poor definition of the plots, resulting in a confusion between the private, the public and the community.
- The labyrinthine nature of many of the residential units makes it difficult for outsiders to find their way around and leads to problems with vandalism, especially as a result of the loss of any sense of enclosed, delimited and defined public space that provides greater security.

As we have seen, modern urban planning theory proposed the organisation of the city in parts, consisting of neighbourhoods conceived as enclosed, inward-looking units, equipped with all of the necessary services. The American authoress Jane Jacobs, in her book "*The Death and Life of Great American Cities*", published in 1961, favours an openly urban lifestyle opposed to suburban areas, defending a road layout that clearly distinguishes between the public and the private. She also criticises the consequences of zoning and the segregation of traffic, especially in terms of safety in residential units, stating that cities require a wide variety of interrelated uses for this purpose that urban planning should catalyse and encourage, on the contrary to what happens in the modern city.

1 Duquesne, Jean, "*Vivre a Sarcelles*" Ed. Civilisation, 1966 / Clerc, Paul, "*Grands Ensembles, Banlieus Nouvelles: Enquête démographique et psycho-sociologique*". Ed. Presses universitaires de France, 1967 / Gaviría, Mario and de Terán, Fernando "*El Gran San Blás. Análisis socio-urbanístico de un barrio nuevo español*", Revista Arquitectura COAM, Nº113-114, Madrid 1968.

The ideal modernist neighbourhood consisted of 7,000 people, the basic unit for having a primary school, maintaining local businesses and having a community centre. For Jacobs, the concept of the neighbourhood does not make any sense in large cities if it is understood as an enclosed, self-sufficient unit, as if it were a small city or large town. She considers their size as being unsuitable for any decision-making processes to be made in the city, considering the city as a higher level of self-governance, streets as the place where the idea of neighbourliness has real meaning, and a district of 100,000 inhabitants as being the only suitable intermediate stage of self-governance. "The ideal neighbourhood, based on current urban planning and zoning theories, too large to have effective capacities or real significance in terms of being a neighbourhood, is at the same time too small to function as a district. In reality, it is not equipped to provide any type of service" (Jacobs [1961] 2011). For Jacobs, the neighbourhood should not be the unit used for urban composition, but instead should be designed considering its integration in its district. From this perspective, the design of the neighbourhood has to be based on a series of internal objectives, so that the neighbourhood is an "urban territory"; and not a small, subordinate city. It should also be based on objectives related to the rest of the city, with a road layout that connects to and continues with the network surrounding the district, without any frontiers in the form of empty spaces (parks) or single-purpose public buildings.

Far from presenting a new urban planning theory, Jacobs' book reconsiders the relationship between public spaces and compact cities. Seen from Europe, her descriptions of the relationships of proximity in the city of New York coincide with the problems identified by sociologists and urban planners in analysing the urban proposals based on the open order, particularly the proposals of the Modern Movement aimed at housing the poorest sectors of society, with a lack of services and activity in their external spaces. The life that Jacobs portrays in streets and parks supports the proposals that appeared from the 1970s onwards, emphasising the need for urban planning to turn its attention back onto the design of public space, by returning to the traditional urban models based on the layout of streets and squares, and buildings facing onto them forming enclosed blocks. All of this occurred against the backdrop of renewed interest in historic centres and their reconstruction, more than their extension, representing a backwards glance to the past in search of old ideas that could replace the ideas of the Modern Movement.

Before this became a reality and the discourse was reduced to the architectural element and its immediately surrounding space from the perspective of postmodernism, with the questioning and abandonment of the urban principles of the Modern Movement and the corrected version of Team X, Henri Lefebvre ([1968] 1978, pp.138-159) published Le Droit à la ville, which explores the general trend towards the extension of urban planning, and considers its repercussions for humanity and its future. Its

consequences include the gradual destruction of the traditional city model, which is not considered as a vindication of its traditional forms, which as we will see was supported by many other critics. For Lefebvre, "the right to the city cannot be conceived as a simple right to visit or return to the traditional cities. It can only be formulated as the right to urban life, transformed and renewed." Lefebvre refers to the right to the city as one of the fundamental rights of humanity and citizens, a right that involves motivating civil society to recreate the city as part of a common, collective mission: "the right to the city takes shape as a higher form of rights: the right to liberty, to individualisation in socialisation, to the habitat and to inhabit."

Lefebvre's ideas go beyond criticising the design of cities in parts, the independent parts with which they are constructed and their lack of integration or connection with the inherited city. In fact, over and above the problem of the result is the problem of the excessive number of buildings that are constructed. His concerns refer to the global nature of a process in which we are currently immersed, and while the criticism of his time focused on the intermediate scales, the objects and spaces for social interaction, the city would continue to expand.

If the proposals from this period looked back towards the inherited arrangements and compact cities, proposing to halt growth which continuing to extend throughout the territory, this occurred at the same time as the last stage of the "New Towns in Town". This was a decision to recover the neighbourhoods that were becoming empty in London before continuing to develop outside of the city, proposing new, more flexible and specific growth models organised by regions, as opposed to those that proposed a more radical split with modern ideas, vindicating the historic city and defending the idea of the exempt monument as a unique urban feature. This was the case of Aldo Rossi or Leon Krier, who in 1978 presented the Palermo Declaration, which proposed a return to traditional, controlled public space, stating that "public space can only be constructed with streets and squares."

Books such as "The Architecture of the City" published by Aldo Rossi in 1966, and "Urban Space" by Rob Krier from 1975, represent this change of direction in urban planning. But it was Colin Rowe's book "Collage City", published in 1978, which criticised the urban model associated with modern architecture, based on its consideration of the architectural object as an element which defines the city in a composition by agglomeration. Rowe states that the limits of this way of conceiving urban planning are those of human perception itself: what the eye and the brain are capable of capturing or understanding, identifying spatial fragmentation as the fundamental reason behind the problems of external space in new residential units.

In conclusion, for Rowe, one result of modern urban planning is an accumulation of isolated objects in a continuous, un-manipulated vacuum, an accumulation he considers as being responsible for an excessive number of open spaces without any urban quality on the outskirts of our cities. Because when an urban project focuses on objects, space ceases to be a structuring element, and simply becomes what is left between the blocks. A residual space without any regime of its own, considered as a green zone that should provide a sense of cohesion to the unit. In order to provide a solution, as we have seen, traditional urban models are used, associated with the idea of the compact city, to which blocks are later connected as an alternative to the open block, used as a modular element in order to design urban layouts in a regular grid, similar to the expansion projects of the 19th century.

Modern urban planning and zoning projects are pushed to one side in favour of projects on an intermediate scale, supported by the layouts and ordinances previously used in the inherited city, built as a continuation and with a combination of uses in the residential areas. However, as stated by Benévolo ([1960] 1987, p.1043):

*"The reduction and detention of urban growth in the old industrialised countries have led to a curious situation: they have made it necessary to consider the city built in the past (whether traditional or modern, good or bad) as a definitive object, which will necessarily be a living environment in the near future. Its parts can be preserved, transformed, or otherwise demolished and rebuilt... this change gradually takes shape, with a certain delay in relation to demographic development. Even when the population no longer grows, internal mobility, changes in lifestyle and economic development call for an increased number of buildings. The large-scale urban development programmes that have begun in the 1950s and 1960s will be carried out in the following decades, even though the requirements may change over the years."*

In fact, urban sprawl has not been halted and the postmodern veil is not a real alternative, but does introduce the question of the convenience of rehabilitating, renovating or improving existing elements before demolishing and rebuilding. First this will be with the conservation of historic city centres, then in the buildings and urban remnants from the 19th and 20th centuries. And with them comes the turn of the neighbourhoods containing public housing estates that sprang up in the last few decades of the 20th century in Europe.

### Conclusions

From the 1970s onwards, while the process of urban expansion continued, criticism levelled against the urban development plan, the structuring of the city by parts and modern zoning regulations all served to reduce the proposals aimed at organising the city to projects that operated on an immediate scale, supported by layouts that had been used previously in the inherited city, in an attempt to return to building continuously, with a combination of uses and greater functional complexity.

- The proposals for breaking with modern urban planning methods focused more closely on renovating the historic city and consolidated fabrics, instead of expanding.
- The alternative proposed a return to traditional urban planning models, based on the layout of streets and squares, with buildings aligned to them forming closed blocks, in comparison to the modern alternative of new, more flexible models of growth, related to the consolidated city.

## § 2.2 The urban structure of the first Spanish peripheries

While the previous section explained how cities had been built in Europe from the second half of the 20th century onwards through public housing projects, in this section I will examine the urban structure in Spain during the same period, and how the urban transformation took place of the peripheral space where public housing was built, within the regulatory frameworks of the periods, and in their application through urban planning projects.

During much of the last century, the urban structure of the periphery in Spain was classified as a space that was undefined, incomplete and without any identity, without any of the features of the inherited city or of the surrounding rural space: an area characterised by a predominance of productive and residential activities, with little diversity, and as a result, dependent on the existence of other areas of centrality.

The first Spanish periphery consists of the first ring of urban expansion, which originated in the second half of the nineteenth century, but which developed and became consolidated in the first third of the twentieth century. A key element in its formation was the country's initial industrialisation and emigration from the countryside to the city, reflected in urban growth based on the relationship between communication infrastructures and industrial areas, where residential areas were

built. Once this first stage of growth had become established, by the middle of the 20th century there was a second wave of industrialisation and an increase in migration, which amongst other aspects led to a major deficit in housing, as a result of which the first periphery became the area in which the problem of economic housing was solved, but in which urban living conditions were below the level of the inherited city.

The first Spanish periphery was built as a result of the effects brought about by the urban growth of the inherited city, and its extension towards the surrounding perimeter. As we have already seen, in the initial stage of colonisation of the territory, a result of early industrialisation and migrations, urban growth exceeded the limits that defined the inherited city in continuity with the road network in some points, through which growth developed in a partial or fragmentary way. The result was the configuration of a semi-urbanised area amongst agricultural areas or previously existing centres of populations, whose main characteristic was the creation of dispersed residential locations, which became organised around the existing industries and communications infrastructures.

The second phase of colonisation of this territory is what interests us in this study. From the middle of the 20th century, this semi-urbanised territory began to grow at an increasingly rapid rate, a result of this second stage of industrialisation and new migratory movements that led to accelerated, extensive urban growth. This process took shape in new residential models, characterised by having their own logic that was not in line with the existing urban pattern. These new residential units were built in territory defined by the structure of the residential areas of the first periphery, which were executed in a deficient, incomplete way in comparison with the standards applied to the inherited city (functional complexity, mix of uses and activities, high residential density, spatial continuity, integration, cohesion and structuring of the urban fabric), which together with these periods of major immigration and a lack of housing, meant that the construction of new homes became a matter of urgency. The need for housing was the first problem that was solved, leaving to one side the improvement of the surrounding areas and the construction of basic social infrastructures. As a result, these new peripheral fragments in the second half of the 20th century in Spain were characterised by a poor level of urban and residential quality, due to the absence of suitable resources for the development of urban life, such as collective amenities, services and public spaces.

This incomplete territorial situation was further exacerbated by a poor level of accessibility from and to the centre, as well as to the residential and territorial fragment that surrounded it. Widespread problems arose in terms of isolation or deficient connections between different parts of the periphery, and between these

and the inherited city, due to the absence of suitable infrastructures, the presence of physical barriers that were not resolved or integrated, and the juxtaposition and conflict between the consolidated parts of the city.

This peripheral area from the second half of the 20th century in Spain was predominated by housing in comparison to other urban activities, characterised by a lack or total absence of tertiary activities, and as a result an absence of any functions of centrality, the presence of activities that were rejected by the centre or which it could not assimilate, and suffering from a high degree of monofunctionality, which as we will see, is not an exclusive feature of these residential units, but also of the territorial framework in which they are located.

The process of constructing this peripheral space in Spain took shape in what seems to have been a random overlapping of different fragments to form a heterogeneous whole, in opposition to the city planning model based on the idea of a whole, and the construction of its component parts. In turn, the urban fragments juxtaposed in this way are a result of different development projects, with different origins and layouts, without any kind of connections between them. Any sense of continuity is lacking between the component parts and the whole, from the inexistence of a previous model through to an overall notion as a forming a part of the urban system, controlling their own growth as well as their existence as part of the urban ensemble.

I will now explain the influence in Spain of the different political decisions and plans that made possible the construction of this periphery, marred by its marginal position and inaccessibility from the rest of the urban system, as well as the important role of public housing within its process of formation. We will see how the different public housing policies and decisions that focused on it instead of urban planning played a unique, essential role in defining the urban structure of this period.

### § 2.2.1 Urban development during the post-war period from 1939-45. Marginal urban development, replacements, and re-alignments

The years following the Spanish Civil War (1936-39) were conditioned at urban level by a deteriorated housing stock, combined with the need to rebuild a large number of towns and cities: a total of 183 were devastated, with approximately 250,000 homes that were unfit for inhabitation, and a similar number that were damaged (Fernández 2003, p.640), representing between them more than 16% of the total of 6,370,280 family homes accounted for in the first census carried out by the National

Institute of Statistics (INE) in 1950. Reconstruction was mainly hindered by a lack of construction materials and investment by private capital. The first construction companies did not appear until the 1950s, meaning that during the 1940s few new homes were built and the cities were not transformed; this occurred in tandem with the construction of public housing, mainly consisting of buildings or shanties erected illegally in peripheral areas, or in empty urban spaces (FIG. 2.34). The importance of this marginal urban development as a means of producing urban space helped to configure much of the landscape of these peripheries and urban transformation in the early post-war years. A certain degree of rationality can be seen in the process, which in many cases developed on the basis of geometric plot pattern that reserved space for streets, and which was based on the peripheral sectors created in many Spanish cities from the end of the 19th century, and which were reproduced after the war as a result of the need for housing for poor immigrants who arrived in ever greater numbers as the cities became industrialised.

FIG. 2.33 *Madrid, 1931*

FIG. 2.34 *Legazpi, Madrid 1940*

FIG. 2.35 *Castilla Sq, Madrid 1940*

However, this was not the only type of urban development that took place in the post-war period. Within the inherited urban fabric, a number of sporadic replacements of existing buildings and filling in of empty spaces took place, the result of which was an increase in their height, shape and volume, contributing to an increase in the population density and the over-use of existing infrastructures. On some occasions, this process was complemented with the modification of the layout of certain streets, or the opening of new roads, dividing up large city blocks and providing access to their interiors, offering new possibilities for construction and meaning that the local councils had to modify or circumvent the existing municipal ordinances or alignments. Apart from this growth caused by the sedimentation of the existing urban fabric, which partly explains the need to expand towards peripheral areas, overflows occurred on the perimeter of the urban centre, prolonging streets through urban development projects (FIG. 2.35) or according to the expansion plans included in the Municipal Statute of 1924, and also through new plans or reformed configurations that changed the use of land that was generally for agricultural purposes.

Any of these different means paved the way for urban expansion, and in the construction process, peripheral land was occupied by small fragments, building by building. Sometimes this process was controlled by local councils, or otherwise it was carried out illegally, making it necessary to approve other projects for modifying alignments in order to legalise them and provide them with roads and infrastructures. This growth was joined shortly afterwards by the construction of public housing[2] , which from the outset was a type of unitary intervention comprised of similar housing blocks, erected hastily with a joint project on land that was singly owned and managed. These residential 'fragments', known in Spain as *polígonos*[3], brought about a significant change in the urban form, and especially to the peripheral land where they were built. In quantitative terms, the first housing estates from the 1940s and 50s did not have the same dimension as those built from the 1960s onwards, but even so they comprised unitary fragments that increased the amount of built and residential land, incorporating a new urban space with homogeneous morphological features. This was not only new space as a result of being created with its construction, but also because it corresponded to a new way of constructing urban space, representing a change from the inherited city of closed blocks and continuous perimeters, to the city of open and discontinuous constructions (Terán 1999, p. 228).

### § 2.2.1.1 The influence of the sectorial division of State interventions

The policies adopted by the government that appeared after the civil war played an important role in appearance of this type of urban growth. The dictatorship of General Franco between 1939-1975 started out with the idea of the totalitarian state based on

2 This type of housing was referred to in the Spanish housing policy from 1939 as 'protected', considering that it was low-cost and built according to projects that had been drafted or officially approved by the State, meeting the necessary hygienic, technical and economic conditions defined by the law, and which were built exclusively in the post-war years by official or sponsored entities, until the appearance of private initiatives that would be mainly responsible for their development from the 1960s onwards.

3 Spain's polígonos, like the other large-scale housing estates built throughout Europe in the mid-20th century, are a common prototype of modern urban development applied to the construction of large-scale public housing projects on the urban periphery, in which urban development, subdivisions and buildings are all executed simultaneously and as a whole. The consequences of this process are urban growth that results in enclosed compartments with discontinuous borders, segregation, and internal monotony (Solá-Morales, 1997, p.91). In Spain, they were the most accessible economic response to the need for housing, as residential fragments alongside the city, built on the cheapest available land, which was previously set aside for this purpose, together with the building of roads that helped to organise them. This model made it possible for them to gradually increase in size, from the small housing estates of the 1940s and 50s that were built in all of the country's towns and cities with barely any facilities, to the large independent estates built in the 1960s and 70s, which doubled the existing urban space of medium-sized cities, and which included space for facilities and green zones.

a unified organisation, which it aimed to develop through a National Organisation and Reconstruction Plan that never actually came to fruition. Instead, all of the regime's policies were dealt with by independent bodies whose interventions were anything but a unitary policy. As we will see later on, this dysfunction between the centralising idea of the State and the sectorial division of its interventions led to the overlapping of functions between the municipal and national authorities in the planning and control of urban growth. This is one of the aspects that helps to explain the result of land management policies, and the situation of the new constructions on the urban peripheries.

Amongst the different sectorial organisations that were created, the National Institute of Housing (INV) was the one that had the greatest influence on urban development. It was created in 1939 with the aim of promoting the construction of public housing, and ensuring that they were properly used, organising housing policy by passing laws and approving the Housing Plans. It was the main (and virtually the only) body responsible for the housing policy implemented in Spain from 1939 until the return of democracy in 1975. In exceptional circumstances, the INV participated in the construction and funding of housing that was basically reserved for the Labour Organisation for Housing (OSH), which was created as the "construction company" of the INV. A General Directorate for Architecture (DGA) was also created, with the aim of controlling and managing urban development activities in general, and in particular those associated with local corporations, verifying plans and urban projects presented for approval to the Central Committee for Local Sanitation, which was responsible for giving planning permission at that time. During the period between 1939-1945, the DGA was directed by Pedro Muguruza, with Pedro Bidagor as Head of the Urban Development Department, at a time when the planning of Spanish cities was carried out according to the criteria of the "Madrid Plan", the first major project of the DGA, which focused on "the planning of enclosed urban units, surrounded by open spaces, as opposed to spreading out like an oil stain" (Bidagor 1967, pp. 6-7).

The same law that created the INV in 1939 also created the system of "protected housing", which remained in force until the law for "limited income housing" was passed in 1954. Here it is important to consider that the population grew between 1940-1950 by 2,161,141 inhabitants, from a population of 25,877,971 in 1940 to 28,039,112 in 1950 according to data from the National Institute of Statistics (INE), 39% of whom lived in centres of population with more than 10,000 inhabitants in 1940, and 45% in 1950, and that physical and financial difficulties, as well as part of the investment being re-directed to "reimbursable housing" for the middle classes (Cotorruelo 1960, p.58), which resulted in the limited construction of protected (social) housing, with an average of 16,000 homes built per year. This further exacerbated the deficit in housing for the poorest sectors of society, who were forced to

live in illegal settlements that were typical of the peripheral landscape at this time, and which were still a feature of Spanish urban development until the late 1980s.

This dysfunction between sectorial municipal planning, the execution of projects through uncoordinated state bodies, and the processes that exceeded all estimates for urban growth, further contributed to the disorganisation of a periphery that was already being constantly transformed. This can be seen more clearly in the fact that until the appearance of the Law on the Regulation of Local Ordinances (LBRL) in 1945, local councils were not obliged to publish their General Plan, and that the urban planning legislation was the same that had been in place since before the civil war, which mainly focused on legislation regarding urban expansion and interior reforms. Even the LBRL only proposed the need for a "general urban development plan," considered as a plan for alignments with ordinances and services.

## Conclusions

During the 1940s, the urban growth of Spanish cities only took place on a small scale, mainly involving reconstruction work following the Civil War, and the development of illegal, substandard housing on the urban periphery, as a result of the need for housing and an increasingly destitute population.

- Unlike the majority of European countries, Spain was both politically and economically isolated. Its cities were only rebuilt slowly, and despite the expansion of its cities and the difficulties involved in organising them as a whole, this construction process took place in continuity with the consolidated cities.
- In the municipal plans or reformed alignments from the post-war period, the land on the urban border was arranged as a prolongation of the urban pattern, influencing the change of rural land to urban land by connecting together small fragments, building by building.
- The planning and control of urban growth, and the management of land all became further complicated due to an overlapping of state and municipal functions, leading to even greater disorganisation on the urban periphery.
- The urban periphery in which public housing projects were built at this time did not lack structure or continuity, and had a morphology based on heterogeneity, in the fragmentation of its fabric as a result of its formation process.

The few public housing projects that were built at this time focused on housing considered as a basic unit, from which urban units with few collective services were organised.

– In Spain, these represented another way of building urban space that was different from planning, changing the urban structure of the inherited city with closed blocks and continuous border, to the city of open, discontinuous buildings, with a joint project for publicly managed and owned land.

## § 2.2.2 A periphery with small, isolated neighbourhood units: 1945-1956

The 1940s were characterised by urban sprawl, with a periphery that went beyond all planning estimates, consisting of illegally occupied urban land covered with substandard housing and shanty towns, especially in cities such as Madrid and Barcelona (FIG. 2.36-2.37), which received the largest number of immigrants, with the same process occurring on a smaller scale in the rest of the Spanish cities. The situation in Madrid was critical: in 1948, it was estimated that a total of 300,000 people lived in the suburbs, with an average occupation of nine people per dwelling (Brandis 1983, p. 216), representing 25.7% of the 1,167,000 inhabitants of Madrid, according to the Municipal Statistics Bulletin of 1948. The same situation occurred in Barcelona, where immigration was the main cause of an increased presence of substandard housing, with larger numbers of sublet properties, the growth of existing shanty towns, and the appearance of other new shanty towns on its periphery (Busquets [1999] 2005).

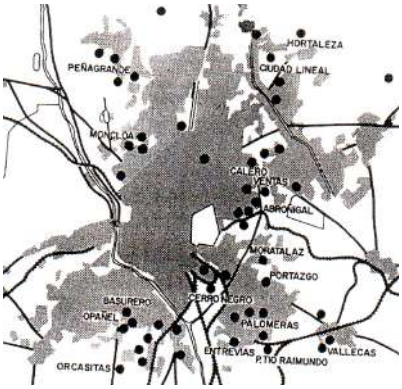



FIG. 2.36 *Madrid shanty towns, 1956*

FIG. 2.37 *Barcelona shanty towns, 1945*

The Madrid Plan of 1941 (passed in 1946) (FIG. 2.39), was the first of the large-scale plans from this period, aimed at solving the problems of urban growth, and a reference point for the plans of other Spanish cities. It helps us to understand the theoretical model the government intended to implant in response to urban expansion and peripheral growth, by proposing future growth based on a limited central core, enclosed

by a peripheral ring of independent, self-sufficient units, separate from each other and from the central core by green rings and spaces, basing these satellite towns on existing centres of population (Terán [1978] 1982, p.173) (FIG. 2.40-2.41). The outcome was not as expected, with pressure for real estate leading to all of the planned green spaces being filled, and the problems of living in Madrid becoming further exacerbated.

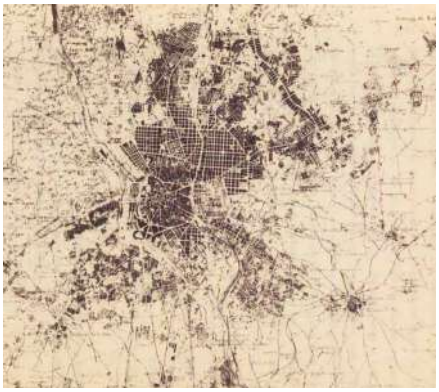


FIG. 2.38 *Madrid, 1948*

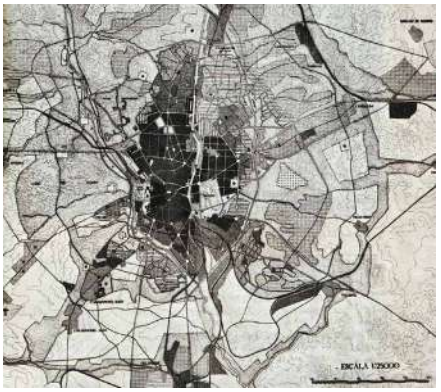


FIG. 2.39 *Bidagor Plan, Madrid 1941*

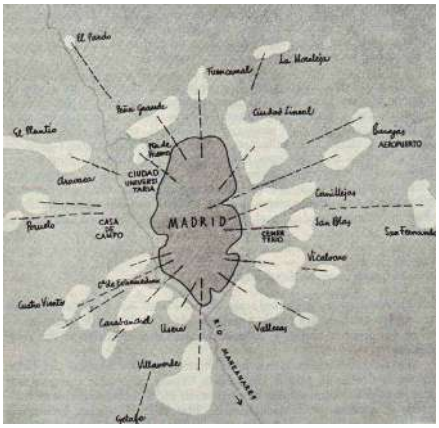



FIG. 2.40 *Satellite towns, Bidagor Plan 1941*

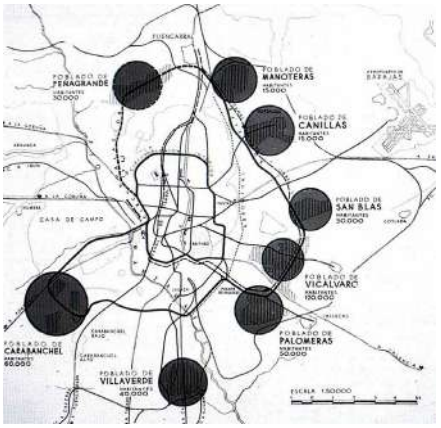



FIG. 2.41 *Satellite towns, Bidagor proposal 1948*

At the same time as these attempts to bring about municipal organisation, the National Institute of Housing presented the "First Housing Plan" (1944-1954) and at the same time, defined another system of official protection for housing, the "reimbursable housing" which could receive funding in the form of subsidies and loans, or tax reductions. The Housing Plan proposed the construction of 1,400,000 homes in ten years, although no more than 310,000 were actually completed (Vaz 2009, p.146). The main reasons for this poor outcome were a lack of private initiative,

difficulties in obtaining financing, and the poor technical and constructive capacity of Spain at that time.

During the period from 1945 to 1956, which ended with the drafting of the first land law that we will examine later on, a new planning element appeared, the "alignment plan," which differed from the previous interior expansion and reformation plans by including all of the urban area, and defining alignments (Larrodera 1972, p. 8), aimed at physical and spatial aspects predominated by the road layout, the separation of residential and industrial areas, and the scarcity of land reserved for other public and collective uses, the need for which was still not apparent, as the cities continued to use existing spaces and lacked funding for other new spaces. During this period, the cities concentrated their efforts on reconstruction, but neither the plans nor the authorities foresaw the need to reserve new open spaces or facilities.

These alignment plans had the foresight to take into account the body of the city (Solà-Morales 1981, p.202), based on understanding the built city by considering its topography, location, orientation, and the existing urban layout, in an attempt to define its shape by continuing with the existing layout, with the municipal ordinances defining a precise limit for the future built urban space. Even if the plans were incapable of defining these limits, they would influence subsequent planning that would include the limits, developments and layouts they proposed, leaving a legacy of a periphery with a layout associated with the existing city, adding blocks of buildings with inner patios characterising their residential design, located on the edge of the city as individual fragments, whose shape and height were changed by different ordinances over time.

The lack of foresight in terms of the land included in the alignment plans means that they were overwhelmed in dealing with many of the problems associated with future urban expansion, a result of industrialisation, large-scale movements, the rise of shanty towns and substandard housing resulting from emigration from the countryside to the city, and the need for land on which housing could be built. The population in Spain living in municipal districts with more than 10,000 inhabitants rose from 42.87% in 1930 to 48.81% in 1940, and to 52.08% in 1950, from a total of 23,667,095 inhabitants in 1930 to 28,117,873 in 1950, an increase of 4,479,705 inhabitants (Rojo de Castro 2003, p.226) despite the loss of population during the Civil War (1936-39), and essentially as a result of a major population movement towards the largest cities, especially in the most industrialised regions of Madrid, Barcelona and the Basque Country.

The early 1950s were marked by the urban disorganisation caused by the need for housing. This need led to the involvement of private initiatives, who built properties

along the roads leading into towns and cities, or on plots of rustic land, in comparison to public initiatives, which built small neighbourhood units or 'colonies' of publicly developed housing, especially from 1954 onwards.

Throughout the 1950s a change of direction in urban design spread throughout Spain, with the introduction of Rationalist models with criteria originating in the social hygiene movement. At the start of the decade, and until the passing of the Emergency Plans of 1957 and 1958-59, which we will examine in the following section, the public housing that was built was grouped into medium-sized housing estates with a high density, which without forming independent units, defined the streets simply as supports for rows of low blocks, with few amenities and poorly developed public spaces. The characteristic uniformity of these small housing estates was the result of their having been developed by the same body, the OSH, which operated with criteria that could be generalised to any territorial location and position of public housing in the city. However, there are small nuances that differentiate the housing stock built in each of Spain's cities, due to differences in their land market, the type of territorial development achieved, and the period when the construction of public housing intensified in each of these cities.

All of the process of building public housing, from the 1950s to the 1970s, was accompanied by a process of peripheralisation, once again with differences between cities. In cities such as Madrid, housing development began in the 1950s in the suburbs that had been created at the start of the century, occupying empty spaces that remained on the roads leading out of the city, on land classified as green spaces or rustic land that was not developed by private initiative (Moya 1983, p.80), unlike other cities whose housing stock grew in the 1960s, such as Barcelona, A Coruña or Vigo. Here the housing estates from the early 1950s were within the municipal boundaries, built on rustic land or residual farmland that was detached from the urban centre, with poor access due to a lack of public transport, and no urban roads that reached them.

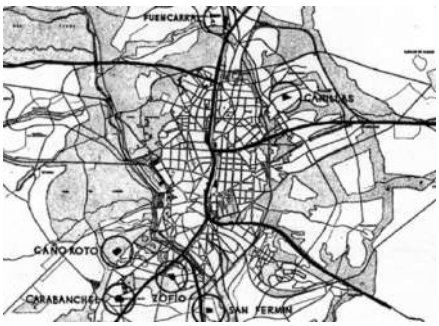



FIG. 2.42 *Absorption Settlements, Madrid 1955*

FIG. 2.43 *Residential estates, Barcelona 1945-54*

Up until this point, the public housing policy was structured as a populist political argument to be offered to the members of the regime and as a type of propaganda, with the aim of generating a certain degree of optimism at a time of serious poverty, and with a government that was isolated at both political and economic level. Housing was used in order to physically and socially organise the urban fabric according to its different types: building working-class neighbourhoods characterised by being on the periphery, neighbourhoods for the middle class, housing for members of the armed forces, housing for civil servants, and housing for employees of specific companies, socially segregated in order to establish the social order the dictatorial regime sought.

In 1954, a change in the management of the Committee for the Urban Organisation of Madrid allowed projects to be carried out by architects such as Sota, Fisac, Oiza, Corrales, and Molezún, who incorporated the Rationalist trends of the Modern Movement, based on the construction of *"Absorption, Minimal and Agricultural Settlements."*[4] According to Luís Moya, apart from rationalising housing and making it possible to create minimum inhabitable surfaces, the appearance of Rationalist housing estates in the mid-1950s was mainly a result of economising in the development of open spaces in these neighbourhoods (FIG. 2.44), based on the flawed theoretical principle that all land unoccupied by buildings and roads is a green zone (Moya 1983, p.106).

FIG. 2.44 *Vallecas Minimal Settlement, Luis Cubillo Madrid 1958*

4 The "Absorption Settlements" formed a part of a programme aimed at relocating the residents of shanty towns that had been destroyed by public works, which were intended to be a temporary solution until their users had the resources to move to better quality housing. The "Minimal Settlements" were very similar in terms of their objectives, but emphasising their temporary nature thanks to the minimum living spaces they offered. The "Agricultural Settlements" were intended to help rural immigrants adapt to the urban setting, by installing a stable in each home. All of them maintained the previously mentioned general features for housing estates from the 1950s, including a road system characterised by perimeter roads and others that intersected the estate or cul-de-sacs, with individual parallel blocks running from north to south along their respective roads, and paying little attention to the outdoor spaces.

From the second half of the 1950s, the main obsessions of territorial and development policy would be industrialisation and the control of migratory flows into the cities (López Groh 2009, p.29). From 1954, the state once again tired to react to the major need for housing, by promoting new public housing legislation, the "Law for Limited Income Housing" from 1954, the "Second Housing Plan" from 1956-60, and the "Land Law" in 1956, which defined a new direction towards the start of reduced state control, inviting private initiative to build housing, with changes in the ministerial organisation aimed at achieving greater coordination between urban development and housing planning, with the INV remaining in control of the process. At this time, Spain signed an agreement with the USA in 1953 that led to the end of its political and economic isolation, and which affected the major industrial growth of the 1960s. This led to increased growth of the urban peripheries where industries were located together with the new immigrant population, leading to the development of large housing estates under the auspices of a national land reservation policy that was an important element in the housing plans, based on a change in the degree of intervention in public housing, in order to achieve the construction of complete neighbourhoods.

## Conclusions

In Spanish cities, the 1950s were characterised by urban disorganisation caused by a lack of housing, predominated by construction work along the main roads leading into towns and cities resulting from the division of rural land, resulting in an urban structure marked by a loss of functional complexity, with poor continuity and connections with the layout of the consolidated city.

- State regulations used public housing as a way of attempting to physically and socially structure the urban fabric while ignoring municipal planning directives. Working class neighbourhoods were built on the periphery, neighbourhoods for the middle classes, housing for military personnel, for civil servants, and for the employees of state-run companies, which were segregated by social class with the aim of establishing the social order intended by the dictatorial regime.
- Municipal plans at this time consisted of alignments, and handed down the legacy of a periphery with layouts associated with the consolidated city, as a result of having taken into account the characteristics of the different locations, defining their shape by continuity with the existing layout, and defining a boundary for the future built space, which was overcome by future urban expansion due to a failure to set aside a suitable amount of land.

The public housing projects built at this time were based on simplifying the idea of the city as a series of aggregated parts, based on the Rationalist models with Hygienist criteria from the first half of the twentieth century in Europe. They were generally built on the urban border, on rural land with poor accessibility, without creating independent units,

- They were organised into medium-sized, high-density housing estates, as a unitary fragment with uniform morphological features, with few facilities and the street as the sole source of social interaction, simply based on low, linear blocks with little attention to urban development.
- Their situation as new, unitary fragments hindered their integration, reducing their coherence and structuring together with the surrounding areas, despite being on the urban border, or close to it. Their cohesion was also limited as they were not adapted to the immediate surroundings, or structured or integrated with them, or with the public and community spaces.

## § 2.2.3 Peripheral neighbourhoods with new residential fragments of unitary management and construction: 1956-69

### § 2.2.3.1 An attempt at future growth by coordinating urban policies

Until the 1950s, Spanish urban development was controlled by a series of partial laws and regulations, passed at different moments without forming a coherent whole, which proved to be "insufficient for the purpose of dealing with and resolving urban organisation to the real extent required by the demographic growth and future of Spain, and as recommended by modern techniques" (Land Law of 1956, paragraph I). The passing of the Land Law in 1956 led to the unification of the previous urban development legislation, creating an organisation that represented a significant conceptual change in the urban development criteria that had been applied in Spain up until that date, setting land aside in anticipation of future urban growth, which would be developed through partial development plans.

Amongst the urban development problems that had been inherited, and which the new planning process envisaged by the Land Law had to deal with, was the short amount of time available to deal with urban planning and organisation, the lack of foresight and programming in the growth of the urban centres, the excessive sprawl around the perimeters of cities due to poorly located housing estates which were disproportionate to the limited resources available at that time, as well as fighting against speculation,

uncontrolled migratory flows, or the strictly local focus of urban planning, without any consideration of the processes of urban sprawl towards metropolitan areas.

Amongst the solutions included in the Law were the need to channel these migratory flows, ensuring that urban planning stayed one step ahead of this demographic situation so that it was no longer a consequence of it, abandoning the local approach towards urban organisation, creating a culture of complying with the obligations resulting from the land regime, providing reserves of land for open spaces and facilities, and limiting the indiscriminate growth of centres of population with housing estates without the illegal transfer of land or subdivisions.

At this point, urban development became an integral responsibility of the public authorities, with the aim of controlling the construction of cities, and without whose planning and authorisation it was now impossible to develop or build. For this purpose, the law indicated that planning was the essential, fundamental basis for all urban planning, with partial planning responsible for developing the general plans for land reserves, while stipulating that their approval was the responsibility of the Central Urban Development Committee in the provincial capitals or in cities with more than 50,000 inhabitants, thereby maintaining state control over municipal planning. This would entail dysfunctions between the development of municipal planning projects, and the execution of the new residential fragments.

The practical application of this new law coincided with the design and construction of the large housing estates, the most important public housing projects carried out in the 20th century in Spain, and those which have had the greatest impact on the urban layout and the transformation of their spaces for social interaction. Their construction placed the emphasis on rationalising the problems for the urgent mass production of housing, with the application of new technologies, generalising this planning into the creation of housing blocks surrounded by parks.

The law introduced the idea of "Estates of Urban Interest", laid out according to "partial development plans" aimed at organising a municipal area for execution through an urban development project and subsequent building plan, allowing for the compulsory purchasing of the land required for their construction both by the State and local councils, whether or not this was defined by municipal planning. This led to greater difficulties in managing the land, and in the development of municipal planning regulations.

Article 12 of the Law refers to the conditions of partial development plans, which much define the perimeters of the different types of uses; the indication of alignments, elevations and characteristics of the streets and squares to be preserved,

modified or created; the surfaces set aside as open spaces; the locations reserved in each area for public buildings and services; and regulations regarding the use of terrain in terms of the volume, use, and sanitary and aesthetic conditions of the buildings and natural elements in each zone. However, one of its main problems was that it did not require the partial development plans to define the subdivision or organisation, indicating that the subdivision or re-division project should be presented as a separate document (Terán 1969, p.14).

### § 2.2.3.2 Public Works and Housing policies subordinate to urban development policy

Faced with the expected need for land on which to execute the second housing plan, in 1956 a decree was passed that attempted to systematise the management and production of developed land, offering suitable land to private initiative on which to build housing, having paid the compulsory purchase costs, development and management costs which would be advanced by the INV. This decree still maintained the requirement for planning of the land prior to commencing building work, an aspect which, as we will see, disappeared over time, as the urgent need for housing nearly always took priority over planning.

In 1957, the Ministry of Housing was created, whose main purpose was to unify the fragmented legislation which existed at that time. It was responsible for building the majority of the public housing estates in Spain, and moving from a policy of rented property towards one of ownership, organised through the creation of "subsidised homes." The Ministry of Housing directed and controlled urban development policies, while local councils were responsible for their direct management, with all other aspects under the auspices of the Ministry of Governance. The fact that municipal matters were shared between two ministries would further hinder aspects connected with urban development, channelling the urban organisation policy through this planning, especially the relationship between municipal decisions and interests, and the directives and laws passed by the supra-municipal authorities. This meant that municipal planning was generally carried out through direct action by the State, independently from the local councils, proposing partial development plans for housing without the previous general plan, or even skipping the decisions of the local councils completely in order to streamline the management and transformation of land.

The first objective of the Ministry focused on the hugely pressing need for housing in Madrid, passing the "Social Emergency Plan for Madrid" on the 13th of November 1957, which was subsequently applied to other cities such as Barcelona in 1958 and Bilbao in 1959. In Madrid alone, the plan envisaged the construction of 60,000 homes

in two years, with the aim of limiting and decentralising Madrid in order to deter immigration and the abnormal development of its suburbs, creating a protective green belt as a perimeter, and redirecting new industries by dispersing them in satellite cities (Moya 1983, p.38).

The measures detailed in the Plan included the creation of the "Managed Settlements" which marked a new stage in the conception of housing estates, whose purpose was to settle the immigrant population and prevent the uncontrolled occupation of land, resulting in larger residential units which had a rational design (FIG. 2.45-2.46), but which, due to the need to reduce material costs to a minimum, had deficient living conditions (Brandis 1983, p.220).

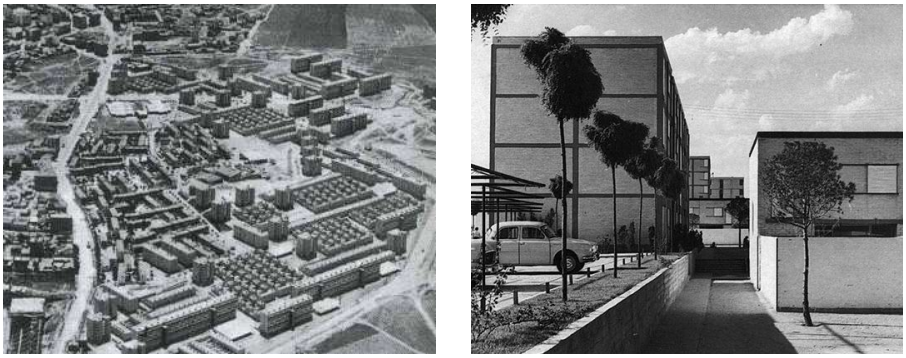


FIG. 2.45 *Caño Roto managed settlement, Madrid 1963*

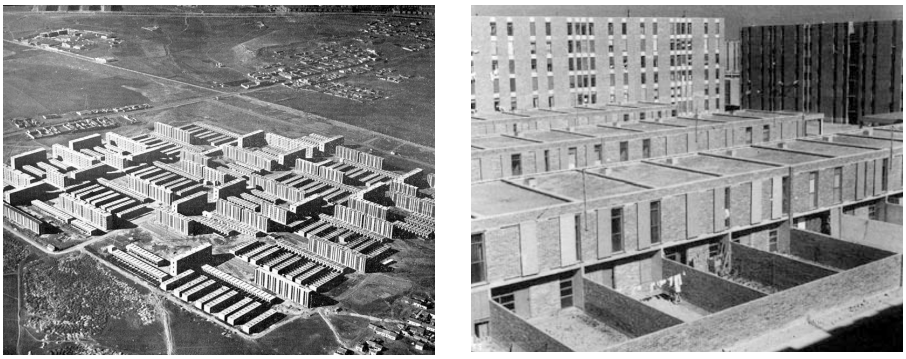


FIG. 2.46 *Orcasitas managed settlement, Madrid 1959*

In 1959, the "Urban Development Board" was created, a new political instrument aimed at giving priority to the transformation of land through an independent body responsible for executing the technical and economic procedures that were necessary for implementing the urban management process carried out by the General Directorate of Urban Development. It was responsible for acquiring land, generally by compulsory purchasing, developing it according to a partial development plan, and transferring it to the INV for the construction of public housing, or to be sold to private initiatives.

In 1959, the "National Economic Stabilisation Plan" was introduced, with the aim of solving the complicated economic situation affecting the country in the late 1950s, and which helped to encourage Spain's economic boom in the 1960s. In the financial year of 1960, the budget and objectives of the Urban Development Board rose from 400 million pesetas to nearly 1,500 million pesetas, which were used to create a second programme to prepare up to 4000 hectares of land, of which 2,175 hectares were allocated to the Board itself. Later on, this second programme was extended to 8,169 hectares, and between the year of its creation in 1959 and 1964, it built a total of 205 housing estates with 9,591 hectares of residential, commercial and industrial space, of which 5,300 hectares corresponded to 169 residential and commercial estates (Bidagor 1967, p.19). This programme covered practically all of the country's provincial capitals and cities of a reasonable size, all of which required new housing.

The Third National Housing Plan for 1961-1976, approved in 1961, set out the policies for planning the housing sector, taking into account the existing deficit and future estimates based on the development of the country. This was the legal framework that served as the basis for the last examples of public housing studied in this thesis, which were built on land set aside by the Urban Development Board in the "Second Land Preparation Plan" in 1960. The plan recognised the importance of having enough developed land for the construction of housing and services for the new housing estates, calculating the number of homes necessary based on possible migratory movements between cities, internal renting, demographic growth, and the need to replace housing from before 1936, or those which had been built subsequently but which did not reach the necessary quality standards. Based on this data, and with an average density of 500 inhabitants/hectare, it was calculated that a total of 3,713,900 homes were required, and 33,000 hectares of developed land, to be built over a 16-year period, far removed from the 4,000 hectares which were currently being transformed by the INV and Urban Development Board at that time, and which required a fresh impetus to prepare land and build homes.

In order to calculate the necessary facilities, known as "complementary buildings," three types of urban units were defined, with different types of facilities depending on their population and surface area. The smallest of these was known as the "residential nucleus" with 5,000 inhabitants in less than 10 hectares; the second was the "neighbourhood unit" with 20,000 inhabitants in four nuclei, covering a total of 40 hectares, and the largest was the "district unit", with 100,000 inhabitants organised into five neighbourhoods, covering a total of 250 hectares.

As had been envisaged by the housing plan, the land policy was a major obstacle in its development. For this reason, and to avoid problems with land prices, and especially the capital gains obtained from compulsory purchasing processes, in July 1962 a law was passed on the "Valuation of land subject to compulsory purchasing in the execution of housing and urban development plans." Its aim was to prevent private individuals profiting from work and services executed by the public authorities, at the same time as making it legal for housing estates to be laid out on land affected by the housing plan, without any general or development planning, or the modification of planning decisions for estates that had already been planned. As a result, the Board had greater freedom and flexibility, and the value of compulsory purchases did not increase, as it was still rural land due to not being classified in a municipal plan.

Once again, the urgent need for housing overtook orderly urban development planning coordinated through municipal and territorial plans, which meant that for many years urban development policy lost ground in favour of the housing policies of the Ministry itself, and the infrastructure policies of the Ministry of Public Works, whose projects made it the leading player in Spanish urban development policy during this period. The "National Urban Development Plan" which should have accompanied the housing plan was never drafted, and the "Development Plans" (the first of which was approved in 1964) were eminently economic in nature, with barely any coordination with the housing plans.

However, this subordination to sectorial policies did not only occur in the case of housing: it was even greater in the areas of public works, tourism and industry, which together with the development plans, demonstrated a clear will to promote "developmentalism" rather than organisation and planning. With the passing of the industrial liberalisation decree in 1963, it was possible for all types of industries to freely set up, extend and move their businesses within the country; the same occurred with urban road policies, which were defined in the "Arterial Road Network Plan", which had major repercussions on our cities (FIG. 2.47-2.48), as it did not propose any type of urban development planning other than that associated with the road and traffic networks, which finally resulted in an extensive model of growth.

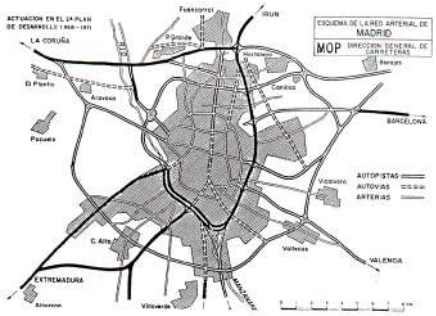



FIG. 2.47 *Madrid road network plan 1968*

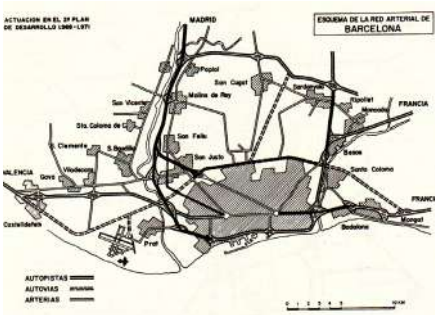



FIG. 2.48 *Barcelona road network plan 1968*

## § 2.2.3.3 Public Works and Housing policies condition municipal planning

The municipal plans passed as a result of the Land Law of 1956 came in response to the growth of Spain's cities, anticipating what was going to happen rather than organising the existing city (Solà-Morales 1981). Despite the fact that the housing, industry or tourism policies made decisions without paying any heed to these municipal plans, the basic problem they suffered was their vision of the future, quantifying excessive growth that encouraged an urban development based on the idea of reserves, rather than expectations due to necessity. Although after the passing of the Land Law there were still some municipal plans that maintained the layout of alignments, the remainder were organised according to three basic concepts:

- Extending the land reserves, which would be developed by partial development plans;
- A road system to support these plans, which would help to shape the growth and scale of the city;
- Open areas, which included spaces outside of residential properties, and green zones.
- These three basic concepts summarise municipal planning during the period from 1956-1975, which marked the urban development of Spanish cities for many years, coinciding with periods of massive growth, and in which five trends can be identified (Terán, 1970, p.16):
- The first corresponds to a small group of plans, which were direct conversions of previously existing alignment plans.
- The second belongs to a group that abandoned these alignments, and which was incorporated into what was known as "organic planning", using the housing

estates that were extensions on the periphery of the existing town centre, formally defined through their construction details.

- The third trend involved the maturing of these criteria, although with more systematised zoning procedures, leaving all volumetric organisation to the partial development plan.
- The fourth trend shared the previous ideas, while placing special emphasis on leaving a large urban reservation area, based on the criteria of the "concentric city".
- The fifth trend relates to the "directional growth plans", as proposed by the General Directorate for Urban Development.

The Housing Plan did not take into account the economic changes that would occur in Spain, and there was no coordination between the housing and development plans[5], which meant that the land problem was not solved, but instead became worse. The need for buildable land was not covered, nor was the plan capable of making the cost of the land exceeds the established percentage.

During the 1960s, the urban development policy was overridden by uncontrolled developmentalism. Its absence was so disastrous, that the application of the Land Law was avoided both by private individuals and by the local and state authorities, and even by the General Directorate of Urban Development itself. As a result of uncontrolled property development and lax regulations, the modification of local ordinances and the authorisation of licences was allowed in "reserved land" without any partial development plan and alongside urban land, with buildings with more floors or covering more surface area than permitted by law, activities that would destroy or jeopardise the coherent growth of the country's cities, leaving behind an extensive, incomplete peripheral landscape in which only the large-scale public housing projects and infrastructures offered a properly defined, completed appearance (FIG. 2.49-2.50). The result was that the space they contained uniquely defined the space available for immediate contact between their inhabitants, and determined the overall spaces for social interaction in cities that were now growing, with a different function to the space of the inherited city, which until now had been the main space for urban interaction at functional, representative, and symbolic level.

5 The "*Second Development Plan (1968-71)*" and the "*Third Development Plan (1972-75)*" promoted the construction of housing through cooperatives, the construction of housing for rent, and the collaboration of non-profit organisations. The planned investment for the housing sector was divided into seven sub-sectors. 12,000 direct construction homes were built, 150,000 limited income homes, 150,000 subsidised homes, and 200,000 "*Group 1*" limited income homes.

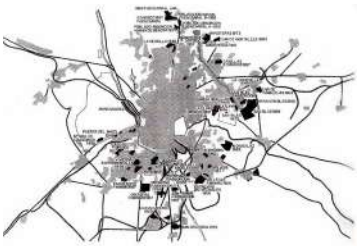


FIG. 2.49 *Madrid estates 1950-70*

FIG. 2.50 *Barcelona estates 1950-70*

The public housing built from 1965 onwards complemented the process of occupying the empty spaces on the immediate periphery, and occupied spaces that were farther away. In cities such as Barcelona, these were built in adjacent municipal districts, due to the improvement of infrastructures and the need for more extensive areas to build increasingly larger housing estates. The result was that as a part of this extensive process, in which new urban spaces began to appear, the residential fragment with its immediate space constituted the main space for social interaction for the new neighbourhood communities, which were increasingly isolated and at a greater distance from the public spaces of the consolidated city.

## Conclusions

In Spain, the 1960s marked the period of greatest urban expansion in the twentieth century, with new neighbourhoods being built as a matter of urgency, in order to absorb growth and the lack of housing caused by the country's rapid industrialisation.

- The state housing and infrastructure policy monopolised the construction of Spain's cities, overlooking general municipal and territorial plans in order to direct urban planning by partial development plans, which defined the criteria for urban development by law:
- Their aim was to speed up the construction of housing and infrastructures, and the management and transformation of land.
- This made compulsory purchasing possible, determining the location where public housing projects would be built, usually on low-cost rural land on the periphery.
- The result was the creation of a model of extensive growth that was subordinated to public works
- Rather than organising the consolidated city, the municipal plans from this period attempted to respond to the process of urban expansion, supported by a road system used to dimension this growth, the scale of the city, and the location of housing.

– The lack of control over urban development led to an extensive peripheral landscape in the process of being transformed, with a large amount of undeveloped reserve land in anticipation of future growth, where only large-scale public housing projects and infrastructures provided a defined layout, without actually structuring urban growth.

The large public housing estates built at this time were based on the idea of 'neighbourhood units' and their aggregation, in order to build new neighbourhood or residential 'fragments', where blocks or towers were the main elements of the built space, rather than collective facilities and spaces for social interaction.

– They were conceived as unitary, high-density groups of structures with spaces for social interaction and limited facilities. Their unitary nature was reinforced by the simultaneous undertaking of the process of urban development, plot division and construction, as well as the definition of the limits of the project, their uses and their characteristics.
– At the time of their construction, little consideration was given to integrating the housing estates with their surroundings. Their distance from the urban border meant they could not link up with the divided sections in the vicinity, making them more of an obstacle than an element of transition. This reduced their morphological coherence and intensified their condition as a unitary fragment, both externally and on their border by differentiating their limits from the rest of the peripheral space and the consolidated city, and internally, due to the fact that the space they contained constituted the main space for social interaction in these new neighbourhood communities.

### § 2.2.4 From a degraded periphery to demands for its improvement: 1969-1979

As we have seen, public housing policy in Spain has played a pivotal role in the construction of its cities, mainly between 1950 and 1970, prevailing over what should have been an orderly urban planning process, coordinated by municipal and territorial plans. This made the public housing built at this time all the more unique, as these residential fragments were practically the only elements, together with the large infrastructures, which while being located on the periphery and without actually structuring urban growth, were capable of imposing a sense of order, and defining a space.

The public housing built in Spain after the war is diverse, both in terms of its urban proposal and its architectural quality, which grew in size during this 25-year period in density and volume. It was characterised by being poorly inserted in the urban layout, poorly connected with the rest of the urban area, preferably located on the periphery of cities, with deficient infrastructures and a virtual absence of facilities and public services. This, together with its limited maintenance and poor construction quality, especially in the large housing estates with more than 500 homes, led to an accelerated deterioration of the materials used, and the rapid degradation of living conditions.

At the end of the 1960s, questions began to be raised about the excessive amount of construction and its impact on Spanish urban development, as it was often illegal and characterised by the absence of any professional standards. The uncontrolled urban development and construction activities in this decade raised doubts about the benefits of growing and building without controls, with little attention being paid to the obligations set out in the Land Law, and in particular the irrelevant role of urban development and territorial organisation.

The public housing that had been built up until this date caused dissatisfaction, and led to its users mobilising in order to demand improvements, especially in the case of the conflicts with the Labour Organisation for Housing (OSH) that began in Barcelona in 1969. This was a consequence of a housing policy which, in the public sector, had been based for many years on building poor-quality, poorly equipped, peripheral estates at the lowest possible cost, further exacerbated by the attempt by the OSH to rid itself of its obligations to repair and maintain these buildings, due to the fact that, "the appalling physical quality of the housing has led to such a serious deterioration, that the cost of repairs will far exceed the quotas set aside for conservation and maintenance work" (Dols 1974, pp.75-77). At first, the OSH tried to increase the price of its quotas, and later on to transfer ownership of the housing to its owners, with the need to repair them. The result was that the owners organised themselves and stopped paying the monthly quotas until repairs were carried out to their homes, blocks and infrastructures, the neighbourhoods were provided with the necessary services and amenities, and the residents were provided with their leasehold contracts.

This collective movement, in a closely controlled society, in which public meetings and demonstrations were prohibited, represented a turning point in which citizens' movements began to support the need for participation in decision-making processes and the improvement of the quality of life in the cities, mainly in the peripheries and newly-constructed neighbourhoods. The result of this movement was visible following the return of democracy to Spain, while the state once again attempted to incorporate urban development into the urban and territorial construction process, maintaining the need to bring down land prices and put an end to profiteering as one of its main

goals. The aim was now to achieve this objective thanks to the increased participation of private initiative, which was offered a large amount of land and estates which had already been expropriated by the Board, at the same time as setting underway a major programme of large-scale urban development projects in the major cities, in which the public authorities were responsible for building the large infrastructures, leaving private initiatives in charge of executing the buildings and their surrounding areas.

### § 2.2.4.1 The failure of extensive urban growth as a model of development

The appearance of large private developers in the construction of large-scale housing projects began with the free market policies of the 1960s[6], and continued with the passing in 1970 of the Decree-Law on Urgent Urban Development Actions (ACTUR). The idea was for the ACTUR to be based on the experience of British 'new towns', and as such the projects were conceived as small, independent cities, although without their industrial content (López de Lucio 2013, p.149). The ACTUR made it possible to manage the development of larger plots of land more quickly (FIG. 2.51), reducing the cost of compulsory purchases of peripheral land, in combination with publicly managed urban planning and development, all with the aim of meeting the demand for public housing in large urban areas, especially Madrid and Barcelona, as well as to create an orderly supply of land as a way of combating speculation (Capel 1975, pp. 62-65). The ACTUR envisaged making more than 11,000 hectares of land available for nearly one million inhabitants, a figure that represented a 25% increase in the population from the 1970s, according to the National Institute of Statistics.

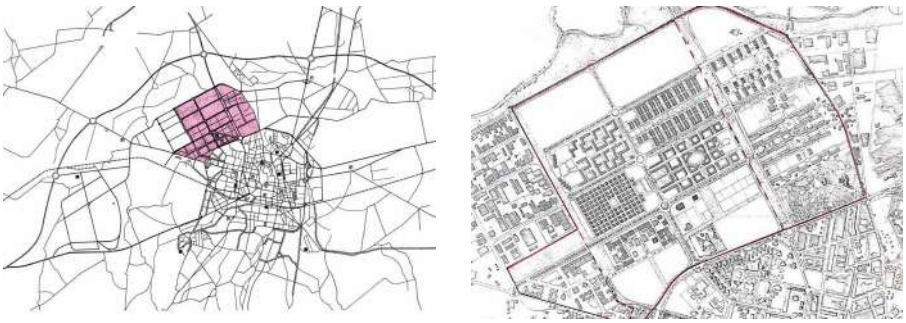


FIG. 2.51 *Actur Lakua, Vitoria 1970-76*

6 The large construction companies associated with industrial groups or banks who originated at this time still play an important role in the development of public housing projects, and in the mechanisms that were created to transfer their profits towards private investment. Their influence on Spanish urban development contrasts with their limited contribution in terms of using more rational production methods, improving the organisation of the surrounding areas, and the construction quality of the large projects carried out at that time.

Despite the criticism raised against the results obtained, the government continued to insist on extensive urban growth as a model of development. This trend can be seen in the first draft modifying the Land Law in 1971, which included proposals to make the planning process more flexible, and to allow for a greater offer of land, which proposed changing the existing type of plan, whose aim was to show a final image of the territory, for another model in which the planning process was considered as cyclic and continuous. This renewed effort attempted to resolve the need for urban planning that was not achieved, blocked by the state's own planning structures, where rather than failures in the plans themselves, it was the failures of the urban planning policies that had the greatest negative effect, and where, with a few exceptions, territorial planning has always failed: in the policies used to organise cities, the intervention methods applied, the different problems affecting the balance between conservation and growth, landscape issues, and issues on a regional scale, all of which were presented in the laws, and solidly based on studies and research, but which nevertheless were never properly implemented (Dalda 2009, p.111).

This continuity of the extensive development model was cut short in 1973 by the first oil crisis, which led to a global recession and accelerated the appearance of an economic downturn in western nations, which had started several years earlier with the breakdown of the US production model. In Spain, this crisis revealed the limitations of its development model, with industrial growth based on major energy demands and foreign technology, further hindered by inequalities in terms of the distribution of personal income and regional income, which despite average economic growth of more than 7.5% in the 1960s, failed to provide employment to nearly one million of the workers from rural areas, who mainly emigrated to other European countries (López Groh 2009, p. 64). Increased oil prices meant that the rest of Europe implemented economic reforms which had an immediate knock on effect on Spain, interrupting the demand for labour, with a major downturn in construction, a 30% decrease in revenue from tourism, and an 8% decrease in exports (Sudriá 2012).

Together with the economic and social instability that affected all of Europe, in Spain there was major political instability due to opposition against the dictatorship and constant changes in the government, during the last of which in 1973, the Ministry of Development Planning and the General Directorate for Territorial Planning were created, which further complicated the decision-making process with regard to urban and territorial planning, by sharing responsibilities with the General Directorate for Urban Development. This situation once again revealed the absolute independence of the political and administrative bodies in relation to the plans that had required the functioning of the Land Law (Terán 1982, p.490), and shows the difficulty and apathy that affected the regime in coordinating an urban development process whose scale

it was incapable of measuring, and whose extensive, destructive repercussions on the country are still pending a solution.

The widespread extent of urban development during this period was not foreseen by the Land Law of 1956, despite contemplating mechanisms that made it possible to channel it, and which were not applied mainly due to the inactivity of the dictatorial regime, in a society without democracy, with weak urban development structures, and only a limited tradition of urban planning and management. Until this time, land legislation and its application through planning projects was oriented in different directions depending on the type of city:

- In the smaller cities, their growth generally occurred as a result of extensions that continued with the inherited urban layout.
- In medium-sized cities, with industry or tourism, this growth occurred thanks to extensions created by building neighbourhoods on the urban border, the reformation of central sections using alignment plans, and discontinuous growth that took place thanks to partial development plans that were initially developed by the authorities, and then by private initiative.

Many of these interventions, which did not form a part of an overall planning project, finally overloaded the existing road network, serving as an excuse for the creation of new road sections, which increased the presence of public works in the urban planning process, resulting in a dependence on private vehicles which, in turn, allowed for the creation of peripheries that were increasingly distant from the consolidated city. This trend was affirmed in 1974 with the passing of the Roads Law, which stipulated that general planning regulations should be subservient to the sectorial road policy.

### § 2.2.4.2 The end of developmentalism and the return to democracy

In 1975, the new Land Law was passed, which introduced changes that influenced urban development from 1978 onwards, coinciding with the start of democracy and the end of the dictatorship. The description of reasons to justify the new law took into account what had happened in terms of urban development since the approval of the Land Law of 1956, characterised by the disorder of the urban peripheries and congestion of the city centres, attributed to causes such as a lack of disciplined urban planning; a lack of developed land; a lack of road infrastructure; the unjustified rise in land prices; the absence of economic planning in physical planning; the existence of inadequate administrative structures and coordination mechanisms;

excessive regulations affecting the development of housing, without any margin for public facilities; a lack of coordination between public and private investment in the execution of development plans; and even a lack of flexibility in the design of urban development plans, which were considered as a completed document.

From the perspective of the production of space, these years marked the end of developmentalism and an authoritarian model for the creation of cities, lacking any sense of equity, which implemented functionalist criteria for the simplification and rationalisation of urban life, with the decentralised concentration of activities and housing, on an increasingly larger scale, and located in peripheral areas. In the same way as Ford's industrial production model, the strategy of accumulation and decentralisation entered into crisis, with the idea of absorbing all of this growth with "production units" of urban space (López Groh 2009, p. 65), which took shape in Spain with the housing estates, ACTUR or PAU, conditioning large peripheral areas that were further affected by the fragmentation of much of the industrial activity, their dispersal throughout the territory, and the former industrial sites that were subject to urban regeneration projects in subsequent decades.

However, while the consequences of this tumultuous political, social and economic period had a negative effect on the urban structure, and were decisive in its modern-day configuration, the opposition to this development model had its most constructive and inspirational response in the Programme for Neighbourhoods Under Redevelopment in Madrid (FIG. 2.52). A result of a strong neighbourhood movement that had begun in the late 1960s, and after more than a dozen protests and marches demanding the right to decent housing, in 1979 it achieved its goal, with the Ministry of Housing ordering improvement work on the peripheral spaces where they lived, occupied by shanty towns and public housing estates built in the 1950s, keeping its population in place, which took part in the decision-making process together with technicians and politicians, affecting more than 300,000 people living in an area of nearly 8 square kilometres, and 38,000 new homes (López de Lucio 2013, p.174).

FIG. 2.52 *Urban renewal neighbourhoods, Madrid 1976-88 (Pozo del tio Raimundo, Madrid 1975-1981)*

This was an operation that was restricted to a city at a specific historical moment, which despite being unparalleled in other parts of Spain, was an accurate reflection of the enthusiasm created by the new democratic period, and the possibilities that were unfolding in order to achieve an improved quality of life for all of the country's citizens.

## Conclusions

In the 1970s, with the end of the dictatorship and until the start of democracy, despite criticism of the excessive amount of construction carried out and its impact on the territory, the government insisted on extensive growth as the model for urban development.

- Proposals were defined to make the planning process more flexible and to allow for a larger offer of land, which overloaded the existing road network and was used as an excuse to build new sections.
  - The result was a major increase in the presence of public works in urban planning projects, resulting in an urban development that depended on private cars, and the growth of peripheries that were increasingly distant from the consolidated city.
- During this period, the peripheries of Spanish cities continued to grow and extend their limits with a model of autonomous urban "packages" which included public industrial and housing estates, which were nearly always located on undeveloped land, without any continuity with the consolidated urban layout.

The public housing built in Spain at this time was diverse in terms of its urban development planning and its architectural quality, increasing their size, density and volume.

- The period was characterised by the construction of low-quality, poorly equipped peripheral estates, with limited maintenance, poorly planned and with limited connections to the rest of the urban layout.
  - The result was an accelerated physical deterioration and rapid breakdown of living conditions, leading to dissatisfaction and protests by residents for improvements to be carried out.
- Its fragmented condition, and the size and diversity of the space between the estates and the consolidated city led to them being segregated and disjoined, without the possibility of becoming connected, as the transformed area was a fractured territory with sections that were difficult to link together, and without any sense of coherence, due to the difficulty of fitting in with their surroundings.

## § 2.3 The creation of space on the urban border of Galician cities

In the previous section, I explained the situation of the urban structure of Spain from the second half of the 20th century onwards, and how a transformation occurred in the urban development of peripheral space, in which public housing was built within the regulatory framework of the time, and in the way it was applied through planning. In this section I will discuss how this transformation took shape in Galicia during the same period, describing the morphological features of its most important cities, and the spaces in which the study cases were built.

In general, urban development processes can be explained as a cause of industrialisation and migration (Solá Morales 1997, p.42). However, in Galicia this has not been the case; in general, what has happened instead is a process of fragmented rural urban development (González Franco 2011, pp.571-72), which can be seen in spatial terms through the formation of rural centres with an urban morphology, in which this urban appearance is a result of the colonisation of extensive areas of rural land. The origin of these processes lies in the simultaneous failure of the region's urban industrialisation and the collapse of the traditional agricultural model, which resulted in a large number of unemployed labourers in rural areas who could not be absorbed by industries in the cities, being obliged to choose between emigrating to other regions or seek employment in the construction sector, in the weak expansion of tertiary industry in rural areas, or through combinations of urban employment or subemployment in areas around the cities, complementing their income with their own agricultural products.

During the 20th century, Galician demographics were characterised by a loss of rural population, which generally moved to the large industrial cities in Spain and abroad and to a lesser extent to the cities in the region itself. Nevertheless, Galicia's cities grew, although to a lesser extent than the large industrial cities of Spain, to the extent that this population change was accompanied by an economic change, as a result of population moving from the primary sector to the tertiary sector, and to a lesser extent to the industrial sector. The lower rate of urban development and economic activity in the Galician cities in comparison to the more industrialised cities caused a delay in urban development processes, and although the demand for housing was not as severe as in other Spanish cities, we will see that it was sufficient to cause tension in terms of their urban development that had a definitive influence on their transformation, and the way in which their space was used.

The period studied in this section coincides with the dictatorship and its different economic stages, which varied from the autarchy of the post-war period, followed by uncontrolled developmentalism, and then ending with an economic and institutional

crisis. They were forty years in which Galicia and its cities were rapidly transformed in terms of their uses and form, at the mercy of private influences and interests that focused on limitless growth, sacrificing whatever was considered necessary, without any type of responsibility.

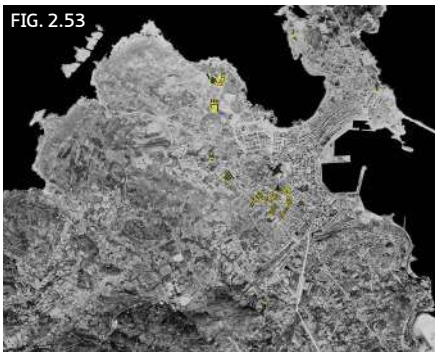
The oversizing of the amount of planned land, management difficulties due to highly fragmented private properties, smallholdings, and the small and medium size of our cities are all features that differentiate Galician urban development from the rest of the country, with a special emphasis on the planning and development of public housing, due to being some of the few examples of urban development management and transformation that were executed.

During this period, we can see how, from the first public housing projects built at the start of the dictatorship through to those on a larger scale that were built at a later stage than those in the rest of the country, there was an attempt at planning that was overwhelmed by disproportionate growth, individual interests, and a lack of coordination between different authorities. The result was that there were normally two opposing voices in all urban development processes, one from the local authorities and the other from the national government, which always led to complications, changes, and the overlapping of plans and projects which affected territorial disorganisation and its development, especially on the urban peripheries.

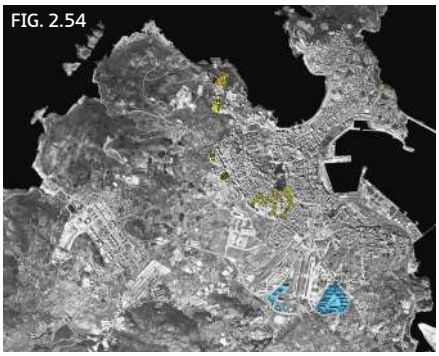
In the same way as the rest of Spain, in the Galician cities the General Directorate of Urban Development, through its planning procedures, the Urban Development Board, through public policies and investments, the Ministry of Public Works, responsible for building infrastructures, or the Ministry of Housing, which built the cities with the housing estates, all contributed towards forcing municipal planning to accept faits accomplis or external decisions, altering their urban development plans or directly drafting them so that they complied with the decisions imposed on them. As a result, the planning of residential land together with the planning of industrial land, the construction of large infrastructures, sectorial decisions such as those affecting tourism or economic planning, all conditioned the urban development of the region's cities, defining the urban form with greater strength and more presence than in the actual urban development plans.As a basic part of this planned land, the public housing estates, together with road infrastructures, uniquely identified the formation of space on the urban border of Galicia's cities, which from this moment on were characterised by road systems that connected different fragments of the city and agricultural areas, limiting the urban sprawl that had been exaggerated for the real needs of the time. In these new spaces, planned for growth that was not completed until several decades later, the large general systems of infrastructures, green zones and amenities began to be defined that would condition the future urban space.

## § 2.3 The creation of space on the urban border of Galician cities

A Coruña

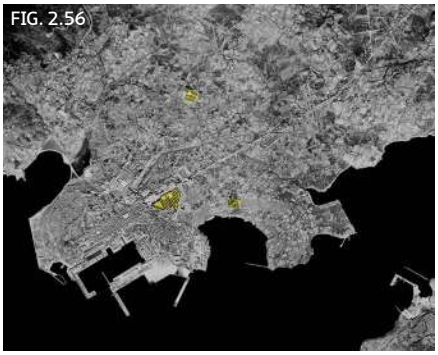



1957

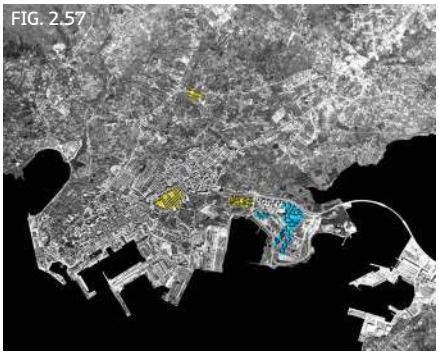



1972

Ferrol

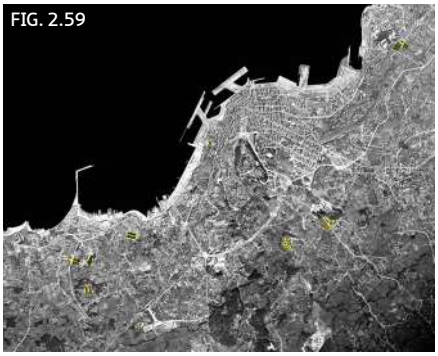



1957

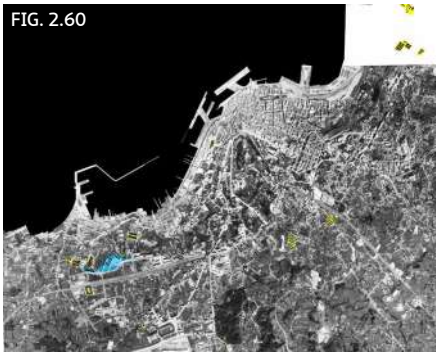



1978

Vigo

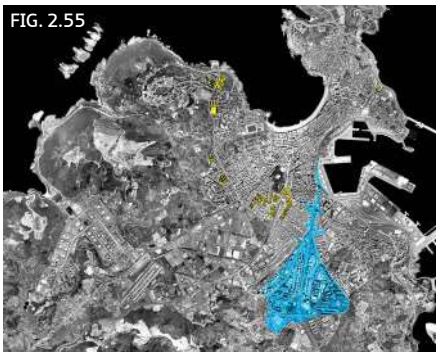



1957




1972

Residential estates 1939-59 Residential estates 1960-76

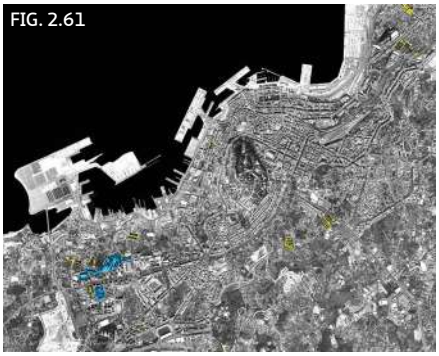



2000

The urban border of A Coruña in the 1940s and 50s was dedicated to agricultural smallholdings that were used as the basis for the plots in which future neighbourhoods were built. These small housing estates built close to the urban border have not been an obstacle to future growth, and in general have eventually come to form a part of new neighbourhoods created by continuity with the existing layout. During the 1960s and 70s the installation of industrial and residential estates on peripheral land, with the colonisation of rural land in the main area of urban development, resulted in the large Elviña estate and the neighbourhood of "Las Flores" became the image of the city.


2000

The public housing estates built in Ferrol between the 1940s and 50s were generally located close to the urban border. They were all small and with limited facilities, surrounded by a rural network of paths converted into a basic road network. The exception was the Recimil estate which represents a large unitary fragment surrounded by heterogeneous constructions that date from the first expansion period of the 1950s. In the 1960s, the suburbanisation process increased in the second stage of expansion, as well as the large housing estate of Caranza planned and built between the 1970s and 80s, with a structure surrounded by a road network that hindered its integration with the surrounding areas.



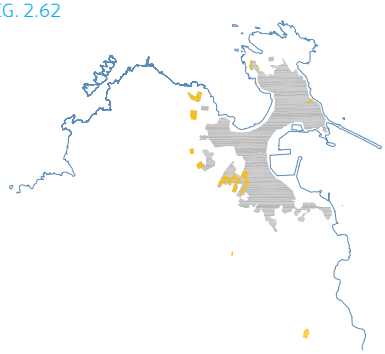

2000

The processes of occupation and construction of the urban border in Vigo have been the result of a combination of built elements, in particular the housing estates and industrial estates built from the 1950s onwards, and did not form new, independent neighbourhoods, but instead isolated residential fragments in the middle of plots of agricultural land, superimposed over the existing rural road network. This is the case of the "Cristo de la Victoria" development, which in the 1960s became part of the large housing estate of Coia that were planned during the 60s and built in the following decades conceived as an autonomous, self-sufficient urban element, outside of the consolidated city but still close to it.

## § 2.3 The creation of space on the urban border of Galician cities

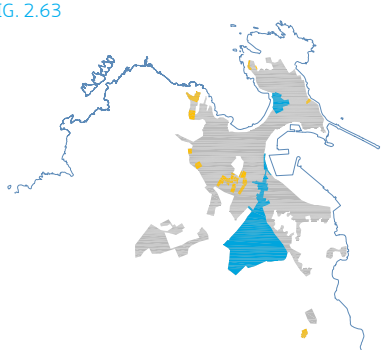
A Coruña

FIG. 2.62



3,567,378 m² 333,627 m² (9.4%) **1957**

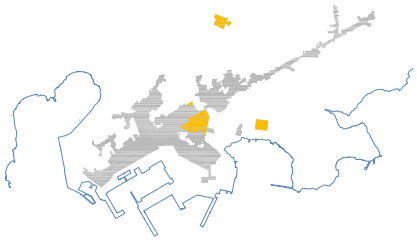
FIG. 2.63



6,855,031 m² 1,583,084 m² (23.1%) **1972**

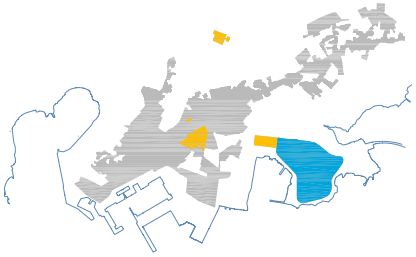
Ferrol

FIG. 2.65



1,581,618 m² 145,265 m² (9.2%) **1957**

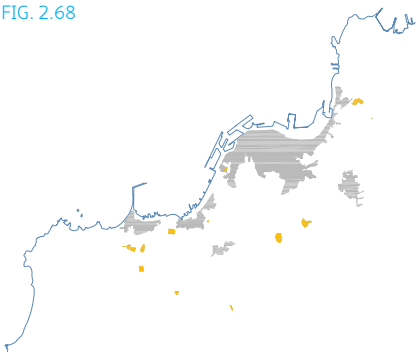
FIG. 2.66



3,609,600 m² 747,041 m² (20.7%) **1978**

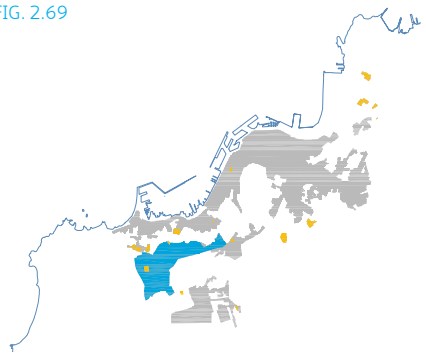
Vigo

FIG. 2.68



1,924,553 m² 102,769 m² (5.3%) **1957**

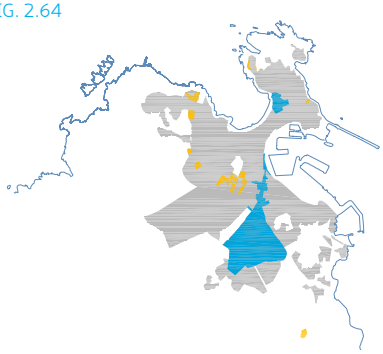
FIG. 2.69



4,583,359 m² 864,855 m² (18.9%) **1972**

Consolidated city  Residential estates 1939-59  Residential estates 1960-76

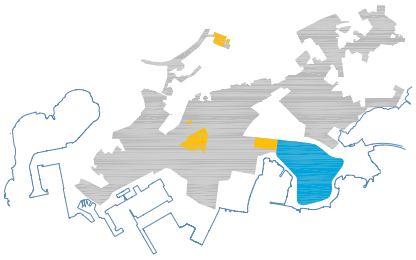
FIG. 2.64



9,571,435 m²  1,583,084 m² (16.5%)  **2000**

In the late 1950s, the small residential estates built on the urban border of A Coruña represented 9.4% of the consolidated city. This was a small percentage in relation to the transformation made to the urban structure, and the limits of the planned area were increased and more agricultural land was transformed into urban land. In the 1970s, the residential estates represented 23.1% and the greatest effect of transformation they brought about to the periphery was modifying the form of the city until today, introducing fragments that were separate from its growth by gradual expansion.

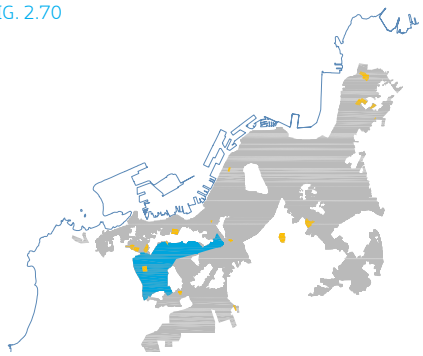
FIG. 2.67



5,190,787 m²  747,041 m² (14.4%)  **2000**

The residential estates built in Ferrol before the 1960s represented a percentage of 9.2% of the consolidated city, divided between the urban expansion of the Recimil estate and the housing estates built close to villages and parishes that were close to the urban border. In the 1970s, the residential estates represented 20.7% and the Caranza estate changed the scale and directionality of urban growth, expanding the surface area and built volume of the city. In combination with the process of suburban expansion, this led to a major change in the way in which space was used, increasing the distances and sense of discontinuity between the consolidated city and an increasingly extensive periphery.

FIG. 2.70



9,354,748 m²  864,855 m² (9.2%)  **2000**

The small residential estates built in Vigo before the 1960s represented a percentage of 5.3% of the consolidated city. They were located outside of the unregulated area without any facilities, some in neighbourhoods alongside the port and mostly in rural parishes, as part of the origin of the mass colonisation of the rural periphery. In the 1970s, the residential estates represented 18.9% and the housing estate of Coia was one of the few elements that were planned at a time of extensive growth, which in just a short space of time would alter the urban dimension, its structure and the spatial interactions of its inhabitants.

## § 2.3.1 Rural development and the subdivision of rural land: 1939-1959

In Galicia, the 1940s marked the start of a new model of spatial organisation that was promoted by the victors of the Civil War, influenced by the country's international isolation and its economic problems, with an anti-urban ideology, the protection of agricultural zones, a strongly centralised government, and the loss of municipal power. This was partly a result of the support received during the war by the most rural regions full of smallholdings, such as Galicia, compared to the large cities, industrialised zones and areas under the control of powerful landowners, which had received more benefits from the Republic reforms prior to the coup in 1936 (Pereiro 1981, pp.111-12). However, emigration from the countryside to the city resulted in a continued process of urban concentration, and so instead of a minimum physical transformation of the cities, this decade saw the laying of the foundations for their future expansion, and the large-scale development of housing by the state.

Galician cities received emigrants from rural areas, but not to the same degree as other Spanish cities, especially Madrid and Barcelona. Between 1940 and 1960, Galicia's main cities grew by around 70%, according to data from the National Institute of Statistics. A Coruña's population grew from 104,220 to 177,502 and Vigo from 85,272 to 144,914, while the rest of the cities grew to a lesser extent, and did not exceed 60,000 inhabitants, with the exception of Ferrol, which had a population of 59,829 in 1940, and 74,799 in 1960. Until the 1950s, positive net population growth covered losses due to emigration, but after this date emigration rose, coinciding with a period of economic growth in Latin America and Western Europe. As a result, Galicia's percentage in terms of the total population of Spain fell from 11.5% at the start of the century, to 7.6% in 1970 (Dalda et al. 2006, pp.15-18).

In Galicia, despite the fact that none of its towns or cities were destroyed during the Civil War, the situation of its main cities was also characterised by urban disorder, mainly due to the need for housing. Without any planning, limited private initiatives built houses by subdividing rural land on the edge of the cities and along the roads leading into towns and cities, making use of existing services and roads.

### § 2.3.1.1 The transformation of the urban border

At this time, the urban border of Galicia's main cities consisted of a periphery full of smallholdings that would later serve as the basis for future neighbourhoods. This was where the processes of occupation and construction began to be defined that would

eventually transform the space of the region's cities. The majority of these processes were a result of an accumulation of built spaces, such as industrial estates and public housing estates on the border of the city, many of which were isolated and scattered in the middle of plots of farmland, superimposed on the existing road network, and disconnected from the territory in which they were built. Their small size and limited facilities means that they were not configured as new neighbourhoods, but instead as isolated residential fragments that still depended on the main city, waiting to be included in the closest urban pattern, or, as we will see later on, into a new, larger neighbourhood or estate as a result of having extended the amount of land available for building projects, helping their initially small size to be the seed for a larger scale colonisation, and the compulsory purchasing of agricultural land for public use.

These features were common in what were the three main Galician cities at that time (Vigo, Coruña and Ferrol) the only cities that had been industrialised, although at a later stage than other Spanish cities. However, the majority of the public housing built in Coruña and Ferrol was close to the border of the existing urban area, or even within it, unlike Vigo, where these housing estates were built farther away from the urban border, as can be seen in aerial photos from the period (FIG. 2.53-2.56-2.59), in locations which have still not been incorporated into the urban pattern today.

Until the end of the 1940s, Vigo continued to grow in a linear and peripheral direction that had begun in the 1920s, building roads to create plots of land and building without any sense of the whole, which were mainly located on the prolongation of streets and neighbours connected to the city centre by tram, a result of the limited attraction the city had on its hinterland, of the structure of smallholdings that affected land ownership, and the lack of housing and employment (Souto, 1990, p.177). The dimension and objectives of this area of intervention changed following the appearance of the Decree of 20th June 1947, which granted Vigo the third customs-free zone in Spain, developing an enormous reserve of land next to the port. By considering the industrialisation of Vigo as a priority objective, despite failing to execute the large-scale infrastructures that were announced and with a reserve of land that was much smaller than the initially planned two million square metres, the idea of a city was defined that has conditioned its development up until the present day.

Until the entry into force of the Alignments Plan of 1948, A Coruña continued with the orderly growth of its urban centre, defined by the layout of the second expansion plan of 1910, which proved to be incapable of controlling the urban development of a periphery that was disconnected from the city centre, allowing for growth in parishes and villages near the border of the city. This was a result of the small amount of land planned for this expansion, the absence of municipal ordinances aimed at defining this peripheral growth, and the inability to respond to new local and national

projects, such as the implantation of public housing estates outside of the urban border, the construction of the train station, the refurbishment of the city's port, or the construction of an industrial estate in the estuary of O Burgo. The result was the subdivision of part of the agricultural land on property that was not included in the Municipal Plan, and the creation of new centres of population at the northern and southern tip of the urban border (Gallego & González-Cebrián 1975, pp. 77-80).

In Ferrol, growth within the city's walls that had modified the height of the eighteenth century city was no longer sufficient to absorb the growing population and shipbuilding industry. The expansion project planned in 1930 was never executed, and in the years after the Civil War, a linear expansion project was hurriedly completed outside of the city walls, based on the main access road to the city, known as the 'First Expansion', although due to its shape, size, and type of inhabitants, this objective never really came to fruition. In the early 1940s, the first housing built outside of the city walls consisted of the public housing of Recimil (FIG. 2.79-2.82), which on the contrary to the majority of Spanish cities, was not the result of a private company owned by the local middle class starting to develop a planned expansion area within the city, but instead a public initiative, making use of limited resources in an effort to deal with the lack of housing (Clemente 1984, pp.82-83). This was not actually achieved, further aggravating the urban development of rural space within the dense, discontinuous and scattered network of hamlets and villages, supported by the main road network and the large number of rural tracks, leaving large gaps between the built fragments and the areas used for agriculture. These same plots of agricultural land gradually ceased to be of interest as such, in favour of their transformation as urban land as they were gradually connected to urban infrastructures. This was a common feature of the periphery of the three main Galician cities in the mid-20th century, in which urban development projects were carried out in a rural space predominated by meadows and farmland with an agricultural production base, which was then modified by the emigration of its population towards these cities, or to other large cities in Spain and Europe.

### § 2.3.1.2 The influence of municipal planning on peripheral transformation

As we saw in the previous chapter, the urban structure of the Spanish peripheries after the Civil War was highly conditioned by the confrontation between national and local policies, where housing was often an element imposed on the local planning, built and defined by a state housing policy that was also used as an economic policy to solve other problems, rather than the actual need for housing (Pereiro 1981, p.112). This frequently self-serving lack of coordination between state and local planning, due to the difference

between local ambitions and the centralist stance of the state, was highly present in the development of Galicia's cities, and significantly conditioned their growth at this time.

In these years prior to the passing of the Land Law of 1956, a number of plans were approved for the Galician cities, all referred to as 'alignments', such as the plans for Vigo (1943), Santiago de Compostela (1947), A Coruña (1948), Pontevedra (1953) and Ourense (1955). Apart from taking into account limited land reserves, the design of the road network took priority over other physical and spatial aspects. This lack of foresight with regard to future urban growth coincided with the period of greatest expansion of Galicia's cities, and the increased use of private vehicles, which would further hinder the organisation of urban growth, increasing the built space and extending the limits of the urban border.

The General Alignments Plan for Vigo, drafted in 1943 by Manuel Cominges, was considered as an internal refurbishment and expansion plan for the urban centre, without any definition of urban extension, focused on designing partial urban developments through the creation of roads, and delimiting alignments and blocks of buildings. The result was the design of an urban growth that came in response to the interests of powerful local figures, based on land values, creating a socially differentiated space with neighbourhoods for middle class families and luxury homes, excluding any organisation of working class neighbourhoods. It located them outside of the unregulated area, highlighting the need to locate them in rural parishes on the outskirts, close to the industrial areas, and the need to build cheap, accessible housing for the working class. As we will see, the lack of definition that affected this plan, which remained in force until the 1970s, caused serious problems of overcrowding and environmental degradation in peripheral districts without infrastructures or urban facilities (Pereiro 1981, p.124-128), which was the origin of the mass colonisation of the rural periphery with single-family homes in response to the lack of housing.

The General Alignments Plan for A Coruña, from 1948, influenced by the Cort Plan from 1945, proposed an extension to the city based on adapting the existing buildings, overlooking any interior reforms and the orthogonal layout of the expansion plans. This was the first plan to define the urban development of the city, with an expansion project divided into 12 neighbourhoods with different types of buildings, connected by a road system with different capacities, and an external area containing agricultural land, industrial areas, and future satellite populations that would absorb the housing estates on the periphery (González-Cebrián 1984, pp. 200-203). As we will see later on, ineffective municipal management and state interventions that were executed in parallel to the plan, developing access roads together with industrial and residential public land, demonstrated how ineffective the plan was in dealing with the requirements and excesses of the future development. The result was that the limits of

the planned area were increased, more agricultural land was transformed into urban land, and the size and position of the green zones were altered.

### § 2.3.1.3 The Housing policy and the influence of state regulations. Study Cases

While the municipal plans from this time suffered from inadequate resources and management, the successive state regulations and plans caused even more imbalance in the development of the Galician cities, especially in their peripheries. The result was that they always interrupted the necessary pause to develop the plan, exceeding their expectations, extending their limits and the intervention areas they contained. We will now examine the influence of these state regulations, especially those that modified the use of the land and the construction of housing, because by using them as an instrument for planning and execution, infrastructures were superimposed on a highly fragmented agricultural landscape that were completely opposite in terms of their form of implantation, use and surface area to those proposed in the municipal alignment plan, based on creating new roads and building house by house on the "plot" as a unit.

The idea of planning in state housing policy was introduced after the first housing plan of 1944-45, which also financed the construction of small, low density neighbourhood units in the majority of Galicia's towns and cities. These used repetitive designs of linear blocks, or terraced single-family homes, defined by the models indicated in the national plans, which conditioned their shape by regulating their surface area and floor layout (García & Somoza 2008, p.29). This embodied the dominant ideology regarding public housing from the first years after the war, an expression of the falsely utopic and ruralist authoritarian concept of a dictatorship that attempted to conceal the insufficiency of its results and the support provided to land speculators (Clemente 1984, p.84).

The public housing built during this period was close to the consolidated city and in rural areas of the municipal periphery, in parallel to the expansion processes of urban development, taking advantage of their lower land values. These neighbourhood units did not serve to organise the process of urban sprawl into the rural surroundings, but instead were only isolated residential fragments grouped together in a space with problems of accessibility. As we will see later on, they have not posed any type of obstacle to subsequent development, and in general came to form a part of new neighbourhoods created as a result of the expansion of the existing urban layout, and of planned neighbourhoods containing public housing, as the land on which they were built was the seed for the future expansion of public land. Despite the fact that many of them were small in size, their unitary construction, planning and management offered

a perspective of a whole that did not exist in the uniformity of growth by alignment plans and municipal ordinances. This unitary nature and the fact that they were the only urban elements within a peripheral space that generally lacked roads or streets, meant that their imperfect urbanity suggested the first spaces for urban interaction outside of the central city, in confrontation with the rural spaces they colonised.

This was the period when the three oldest study cases in this thesis were built: the "Recimil" estate, in Ferrol (1939-49), the "Cristo de la victoria" estate in Vigo (1949) and the "María Pita" estate in A Coruña (1955). All three bring together the different alternatives that were possible for the implantation of public housing at this time. Recimil forms a part of the expansion area of Ferrol, in continuation with the urban pattern. The María Pita estate was built on top of a former village on the border of the city of A Coruña, while the Cristo de la Victoria estate was built outside of the city limits of Vigo in the middle of farmland, whose only road connections consisted of the existing rural paths.

The Recimil estate (FIG. 2.79-2.82), under municipal control and rented to naval workers, has a layout based on a fragment of the urban development and expansion project for Ferrol designed by the architect Rey Pedreira in 1930. It is the largest estate of those built during this period by the National Institute of Housing in Galicia. Its structure is configured as a neighbourhood consisting of four large open blocks with 1,033 homes, open spaces, a school, shops, a market and a church. Its position, in front of the avenue formerly known as the "Avenida del Generalísimo" and the Plaza de España square, means its façade forms a part of the main entrance road into the city, although this privileged position could not overcome its enclosed nature, as an urban fragment that is socially and functionally isolated, and which is influenced as much by its poor construction quality and state of abandonment as the fact that it is a unitary fragment surrounded by heterogeneous constructions that date from the first expansion period of the 1950s to the north, by a rural network of paths that was converted into a basic road network in the second stage of expansion, and finally by the buildings around the Plaza de España square, firstly those occupied by army officers and shipyard executives, and later on by its own façade facing towards the Avenue, as a part of reform work carried out in the 1960s intended to improve its outer appearance and its covering structure (López & Ucha, 1962).

The "Cristo de la Victoria" housing block in Vigo (FIG. 2.87-2.90) dates from the moment of greatest activity in the construction of public housing in the city, in an attempt to respond to the need for housing that augmented during the 1950s, due to an increased urban population resulting from an incipient industrialisation and migration from the countryside to the city. They were located on municipal land without any facilities, some in neighbourhoods alongside the port and most in rural

parishes, as is the case of the "Cristo de la Victoria". It is a singular block enclosing a community open space with a "social" building known as the "Home of the Producer".

The María Pita estate (FIG. 2.71-2.73-2.91) was built according to the guidelines of the second programme of the Labour Plan from 1954-1960, in which new types of apartments were presented based on economic criteria, converting the type of classification into a form of social control and segregation, by awarding houses with a quality and surface area that varied according to the occupants' social class. A three-bedroomed home for the same type of family could measure 82, 56, or 42 square metres, depending on the social class of the family in questions. The Maria Pita estate in A Coruña exemplifies this variation of programmes and surfaces in blocks that were adapted to different elevations, with U-shaped buildings designed to overcome the monotony of linear blocks, creating open squares and courtyards that form a part of the urban development project, containing trees and green zones. This idiosyncrasy in the definition at project level of the urban design elements did not continue in its management process: the spaces for social interaction were never completed, nor were they maintained (García & Somoza 2008, p.29). This was a result of its functional isolation, and the lack of any interrelationship between the urban fabric and the majority of the housing built during this period; however, it was also a result of limited municipal management at the service of the local authorities, ignored by state planning projects.

At the same time as the first types of public housing were built after the war, a new type of urban planning was defined with the passing of the Land Law in 1956, in which urban scenarios were characterised by the development of land reserves through partial development plans. However, this had very little immediate effect in Galicia at local level, especially with regard to the formation of the general development plans, which continued to maintain the same elements of the alignment and expansion plans (Pereiro 1981, p. 138), as they continued to apply the concept of alignments instead of the organisation of land uses (Souto 1990, p.182), and, as we will see, they required management processes which were lacking in the municipal authorities, with difficulties to control the expansion, the future plans for growth, and the planning of land reserves for buildings and green zones.

As previously mentioned, the decisions made by the officials in charge of housing and public works were always imposed on urban planning projects, in the same way as in the rest of Spain, although at a later stage and over a longer period of time. As a result, the main development (and virtually the only development) that came about from the growth model introduced by the Land Law of 1956 was the public housing built by the National Institute of Housing.

At the end of the 1950s, when low-quality public housing was being built in the expansion areas of nearly all of Galicia's cities, with few open spaces, in areas outside of municipal planning regulations, the "Second Land Preparation Programme" was approved, which generalised the land reserve to be developed over the following decades, and which would serve as the basis for planning future access infrastructures into the cities and the large housing estates that would be built in the coming years. This decision, which implied a major increase in the urban development process, coincided with the approval of the National Economic Stabilisation Plan, and the creation of the Urban Development Board, which attempted to organise the transformation of this urban development, influencing the planning of the growth of Spanish cities.

## Conclusions

The urban structure of the Galician cities in the 1940s and 50s, unlike many Spanish cities, was not affected by the Civil War. There was no reconstruction work, the region's low level of industrialisation meant that it did not attract so many emigrants, and substandard housing was not a feature of peripheral growth

- The confrontation between national and municipal policies, between centralised power and local ambitions, conditioned the urban growth of Galicia's cities
  - Land use was modified, imposing the location for the construction of public projects contained in municipal planning regulations.
  - This form of urban transformation and land production, which was common in Spain during the dictatorship, hindered the land management process in Galicia, due to its highly humanised nature, and the fact that it was divided amongst a large number of landowners.
- Municipal planning in the Galician cities organised growth on the basis of alignments and expansion plans, prolonging streets and neighbourhoods house by house, and proved to be incapable of controlling peripheral urban growth.
  - The urban border of the main Galician cities was dedicated to agricultural smallholdings that were used as the basis for the plots in which future neighbourhoods were built.
  - The need for housing was absorbed by villages and parishes close to the urban border, beyond the reach of planning regulations.
  - The buildings that followed the directives of the plan continued with the consolidated urban layout; they were superimposed over the existing smallholdings, supported by an extensive network of rural paths that connected the villages with the farmland, and which eventually became streets.
- The processes of occupation and construction of the urban border in the main Galician cities have been the result of a combination of built elements, in particular the housing estates and industrial estates built from the 1950s onwards. Many of these were isolated in the middle of plots of agricultural land, superimposed over the existing road network, and disconnected from the territory in which they were built.

The public housing estates built in Galicia between the 1940s and 50s (FIG. 2.62-2.65-2.68) are small and with limited facilities. They are generally located close to the urban border due to lower land prices, and did not form new, independent neighbourhoods, but instead isolated residential fragments that depend on the central city

- The Galician housing estates are smaller than those that were built in the main Spanish cities, and are closer to the urban border. This means that they have not been an obstacle to future growth, and in general have eventually come to form a part of new neighbourhoods created by continuity with the existing layout, and in some cases of neighbourhoods planned with public housing.
- Their unitary condition as a newly built fragment limits their integration, reducing their coherence and structuring with the surrounding areas, despite being on the urban border. Their cohesion is also reduced, as they are not integrated into or connected with their immediate surroundings, or with public and community spaces.

## § 2.3.1 Rural development and the subdivision of rural land 1939-59

A Coruña
Labañou
María Pita

FIG. 2.71
1945

FIG. 2.72
1948

A Coruña
Elviña
Barrio Flores

FIG. 2.75
1945

FIG. 2.76
1948

Ferrol
Recimil

FIG. 2.79
1930

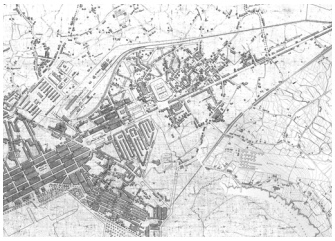


FIG. 2.80
1953

Ferrol
Caranza

FIG. 2.83
1953

FIG. 2.84
1954

Vigo
Coia
Cristo Victoria

FIG. 2.87
1949

FIG. 2.88
1957

FIG. 2.73
**1954**

FIG. 2.74
**1954**

FIG. 2.77
**1957**

FIG. 2.78
**1962**

FIG. 2.81
**1957**

FIG. 2.82
**1944**

FIG. 2.85
**1957**

FIG. 2.86
**1949**

FIG. 2.89
**1957**

FIG. 2.90
**1959**

## § 2.3.2 Planning in oversized land reserves: 1960-1967

During this short period of time, which ended with the First Economic and Social Development Plan (1964-1967), land was prepared and partial development plans were drafted that defined the large housing estates that were mainly completed in the 1970s. Because of their size and location, they were fundamental elements in the transformation of the urban form and space of Galicia's cities, as part of an extensive colonisation process of large areas of the periphery, delimited by a general alignment plan at state level produced by the National Institute of Housing, which began with the approval in 1961 of the Third National Housing Plan (1961-1976) and spread to all of Galicia's cities.

In addition to the planning, execution and unitary management of these housing estates, whose construction took a great deal of time, two other basic elements in the process of urban transformation at this time were built: the industrial estates of "A Grela" in Coruña, "As Gándaras" in Ferrol, and those in Arteixo and Porriño, on the municipalities bordering the cities of Coruña and Vigo; and the road system, which apart from conditioning the municipal planning and providing support for urban growth, would determine the form and development of Galician cities for many years.

Having already seen the effects of a lack of comprehension and coordination between municipal planning and state development plans, we will now see how at this moment in time the confrontation between them and the consequences were even greater. The planning of the public housing estates, industrial estates or road infrastructure at state level was carried out prior to drafting the general municipal plans in the majority of Galicia's cities, which meant that these interventions which had still not been developed had to be incorporated at a later stage into the new general municipal plans, adding a further sense of imprecision to the process of urban growth.

When the new general municipal plans were drafted on the basis of the Land Law of 1956, they did so by developing their land reserves or land set aside for development that had been prepared by partial development plans. The majority of these plans were executed with modifications and major delays in comparison to other Spanish regions, and despite this delay, it involved the urban development of several times the amount of existing urban land using an urban model of extensive growth, which were defined more in terms of expectations rather than actual needs. The excessive size of this land for development and the difficulty in its management were decisive in ensuring that only a small part of them were actually executed. Meanwhile, the municipal planning was modified without being able to materialise its urban vision, which contributed towards generating a fragmented image of the city (Fernández Prado 2010, p.445).

## § 2.3.2.1 Land planning and colonisation

The first stage of this extensive development in the early 1960s was influenced by the Third National Housing Plan, which helped to streamline the procedures for obtaining and developing land, defining the location of the majority of the housing estates built in Galicia's cities, at the same time as the first proposals were drafted for the future partial development plans, and the subdivision of plots of land was permitted for the construction of public housing by the Labour Organisation for Housing (OSH).

Generally, these initial partial development plans shared a series of common features for all of the country's cities. They no longer used the system of alignments in their design, and instead were based on expansion and growth estimates based on a model supported by a system of ring roads with reserve spaces, either for green zones or for building blocks or groups of houses, with densities of more than 100 homes per hectare, and a development potential of $3 m^3/m^2$. They were planned to be built on rural land, giving priority to their development over local regulations, which altered the limits and directives for municipal planning that were in force at that time by applying the provisions of Decree Law 52/1962 "on the valuation of land subject to compulsory purchasing in executing housing and urban development plans," which made it possible to agree on the delimitation of intervention areas, whether or not any general or partial urban development plans were in existence (Terán [1978]1982, p.445) (Pereiro 1981, p.151).

In the following section we will consider the structure that resulted from the design of the partial development plans in the study cases, and the transformation they brought about to the peripheral space in which they were built. Taking into account the fact that this process took much longer in Galicia than in other parts of Spain, and that depending on the particular case, a large number of modifications were made to the original partial development plan, I believe it is more logical for this study to explain the result of their implantation once the urban development process was complete, and once the majority of the homes had already been built, and not to explain the process of drafting and modifying the plan. Even so, it is interesting to note the common aspects that were maintained in the final design, as the different architects who drafted these plans paid more attention to the location and modification of the territory than to considering the design of the external space. The different sections of the projects indicate the relationship between the housing estates in its context, but there is less definition of the space between buildings, their details, and their organisation. In terms of volume, more attention was paid to them as a group rather than as an urban structure, focusing on the idea of an architectural "object" as an element used to provide a solution to the urban proposal (Fernández Prado 2010, p.446).

We will now go on to see the type of municipal plan that was being drafted at the time when the partial development plans were approved in the three study cases, and how this influenced the planning and transformation of the territory on the urban periphery they colonised, as part of a long phase of housing construction during the 1970s and 80s, in parallel with or following the approval of the municipal plans, and generally ten years after the organisation promoted by the first partial development plans and their subsequent urban development on land classified as urban reserves.

The housing estates built in A Coruña were planned before 1967, the year when the municipal plan of 1948 was revised. The first phase of organisation in Elviña dated from 1961; the second and third phases from 1964, at the same time as the first phase of the industrial estate of Bens; the connecting roads and Zalaeta estate date from 1963; the second phase of the industrial estate of Bens was from 1965; the neighbourhood of "Las Flores" was inaugurated in 1967 (FIG. 2.95-2.98), including the expansion of the city's port, and the creation of the refinery that had been designed in 1961 and which was opened in 1964, an indication of the extend of the actions that were carried out beyond the scope of the municipal planning in force at that time, and which were only subsequently included in the new Plan from 1967. This was a plan without any kind of economic directives, which was reduced to a schematic proposal, based on zoning, which used the concept of the partial development plan in a flexible way, with large areas pending planning. Over the years, these areas would be converted into a directionless urban sprawl that surrounded the city, occupying land that lacked any kind of facilities or public spaces, and which limited the planned growth. In 1969, the city council drafted the majority of the partial development plans, although their limits no longer coincided with those of the municipal plan, meaning they had to be sporadically changed in order to be able to approve the partial plans, and incorporate zones that had been planned as rural areas, but which industries and buildings had transformed into a disorderly, rundown area, absorbed by the city. While the plan from 1967 had temporarily left large parts of the urban periphery without any type of control, the consequences of applying a general ordinance to the rest of the consolidated city, joining together urban patterns with different structures and allowing more housing development, started a speculative process that helped to destroy an abundance of inherited structures built over centuries, with the subsequent loss of urban quality (Gallego & González-Cebrián 1975, p. 84-93).

In Vigo, the delimitation of the Coia estate was completed in 1961, and its partial development plan in 1963 (FIG. 2.107-2.110), while the execution of the municipal plan that had been established in 1960 on the orders of the central authorities was not approved until 1970. The processing of the development plan for Vigo exemplifies the lack of interest at local level in having a regulation that forced the city to regulate

its growth, in comparison to an attempt by the central authorities to classify the planning process as a way of controlling development, and the urgency on the part of the remaining authorities to see their projects brought to light. Up until the early 1960s, a series of alignment and partial development plans had been drafted in Vigo without any comprehensive vision, allowing for uncontrolled speculation that was tolerated by the municipal authorities, through subdivisions of land and housing located around the urban centre, causing a major problem in terms of infrastructures and services. In 1966, the draft version of the Municipal Plan was presented, which defined the general layout of the access roads and communications as the structuring element for the city, with land divided up using a system of zoning according to different uses, and with directives for urban organisation that divided the urban and reserve land into five districts, each of which contained five neighbourhoods. It is interesting to note the ideological content of the plan in terms of locating the different social classes and the types of housing; in the case of the "middle classes, upper middle classes and upper class," the best zones on the outskirts of the city were reserved, displacing the existing rural population. Over the following five years, the municipal corporation modified the plan with the intention of benefiting local interests, while the process of urban development continued to progress regardless of the plan. This was finally approved in 1970, exceeding the pre-drafted conditions, due to the unique system of smallholdings in the periphery, which had a decisive influence on Vigo's model of spatial growth (Pereiro 1981, pp.162-173) (Souto 1990, pp.401-433).

In the case of Caranza, Ferrol (FIG. 2.103-2.106), although previous studies had been carried out to define the limits of the housing estate, the approval of the Municipal Plan from 1961 came one year before the partial development plan of 1962. For the first time, the new Plan organised everything within the municipal limits, and was drafted at a moment of economic growth supported by a booming shipbuilding industry. However, its expectations far exceeded reality, and like the other plans from this period, its basic goal was development, with the resulting excessive estimates for urban land and land suitable for development. The Plan applied zoning through 17 large areas without taking their morphological diversity, with the road network as the only structural element. This type of planning meant it was obligatory to develop on the basis of the partial development plans and internal reformation plans, which were complicated to process and manage, and so it was only ever applied in the case of state-promoted projects that were beyond the scope of municipal management, using compulsory purchasing as the implementation process (in the case of the housing estates of Caranza, Esteiro and La Gandará), creating urban fragments that were internally coherent, but which, from an overall perspective, served to reinforce the image of a city made up of different parts, which characterises Ferrol (Precedo 1995, p. 110) and the rest of the Galician cities.

## § 2.3.2.2 Development of large areas of peripheral land

A second phase of development began in 1964, coinciding with the designation of A Coruña and Vigo as development hubs for the First Economic and Social Development Plan (1964-1967), and with the second phase of development of state housing projects. During this time, and until the end of the decade, compulsory purchasing and urban development projects were carried out, and the first housing projects were designed and built, in peripheral areas generally associated with access infrastructures leading into the city.

The industrial development hubs were located in industrial cities in regions with a low income, high levels of emigration, and an excessive dependency on agriculture, such as Galicia (Porto 1975, p.125). At a time when the existing urban development plans still applied the idea of continuity to the city, the regulations applied to these development hubs had a major effect on determining the expansion of the urban extension processes, in an attempt to make land more readily available for the implantation of new industries, and to avoid the dispersal of industry due to a lack of developed land, as was the case in Coruña and Vigo.

The urgency and lack of definition that affected these regulations allowed for a grey area in detailed planning processes, giving rise to disorganisation in the type of construction used for the industrial facilities, as well as their location within the industrial estate. The regulations that affected the hubs specified that in wholly industrial areas, any type of industry could be included, provided they respected the directives for their future road connections, water supplies, waste disposal and electricity supplies, as a preview of the planning process that would be applied. Authorisation for the installation of new industries could be obtained without the partial development plan for the estate, and without the development plan, with the sole condition that the industries who had set up in the estate before it was properly developed would pay for their facilities and access roads. The result of this unregulated approach was that for years the estate had the appearance of a temporary structure, with isolated industrial warehouses with temporary roads built on undeveloped land, within the setting of a future industrial estate whose physical boundary could not even be guessed, as they only existed on the plan, once again demonstrating the priority of any type of development, in this case industrial development, in comparison to urban planning.

The development hub of A Coruña identified areas for urban and industrial development. The first can only be identified by examining the urban development that took place through satellite zones, while the wholly industrial areas were located in zones that already contained industries, extending the proposals of the municipal plan that was in force in 1948. The intention to promote the implantation of industries

in such extensive areas without any overall planning, together with the structure of the human settlements, land ownership, road network, topography and other conditioning factors in this environment, led to a fragmented, disconnected development, that only served to worsen the existing chaos (Gallego & González-Cebrián 1975, p. 85).

In the development area of Vigo-Porriño, unlike other cities, its planning regulations were based on the municipal plan that was drafted to help locate areas that were completely industrial, without the rest of the regulations taking into account any other factors apart from zoning. The land was classified into areas subject to the planning regulations in force and the expansion of the city, which included all of the urban area defined in the municipal plan that was in force, areas protected for tourism use on the coast, wholly industrial areas, and 'tolerance areas' on rural land for locating specific industries in the rest of the municipal district, until connecting with the municipal district of Porriño (Pereiro 1981, p.150).

This stage, which was characterised by the planning and development of large areas of peripheral land for the implantation of housing and industry, led to the expansion of the urban boundaries beyond the edge of a city that had grown continuously until the start of the 1960s. The processes of estimating and developing public land on a large scale were accompanied by the replacement and appearance of new actors in the production of land and construction, leading to new architectural solutions and different ways of incorporating them into the urban periphery.

On the one hand, there are the peripheral areas that were developed using partial development plans, due to urban development work carried out beforehand by the state authorities, which led to a change in the land use, generally through compulsory purchasing, giving rise to large plots of publicly owned land that allowed for new ways of building that were disconnected from the construction process and the peripheral urban layout. This sphere also included projects by private developers, built plot by plot on the basis of alignments from the municipal planning project, with hybrid designs somewhere between enclosed blocks and isolated blocks. There were few of these in Galicia, due to the absence of large financial groups, the presence of small, family-run real estate companies, and the difficulties involved in operating on a highly fragmented land structure, consisting of large numbers of smallholdings. Very few private buildings were built on the plots that resulted from the previous subdivision process, and housing projects began to appear that were developed by financial groups, business owners and cooperatives, similar to those built by the state authorities, generally on land that had already been developed, and in public estates.

All of them resulted in different urban forms, together with the developments that had taken place from the outset of urban development on the rural space on the

urban periphery. In this case, growth had occurred on the basis of existing villages and the paths and roads that connected them, with the simultaneous presence of rural houses, new, larger buildings built along the streets that had been built over the former rural paths, and blocks built on plots that were a result of land speculation, without taking any municipal regulations into account, changing the use of the land and fragmenting its structure.

The end of this phase left behind an image of a territory that was being completely transformed, with large areas that had been planned, infrastructures and housing in the process of being built, and an extensive urban development process underway, affected by a lack of technical and economic resources at municipal level to control it, with state interventions being carried out regardless of the municipal planning, and private interests influencing the constant modification of regulations to benefit a vast minority, causing a loss of urban quality that would affect the vast majority.

## Conclusions

In the 1960s, while the large residential and industrial estates were being built in Spanish cities that were crucial to the growth of their peripheries, in Galicia the urban population grew, and its main cities became industrialised. At the same time, a large amount of peripheral land was prepared, and plans were drawn up for their construction over the next two decades.

- State planning defined the form and development of the main Galician cities.
  - The excessive amount of reserve land and the difficulties involved in its management meant that only a small part of these estates were executed, leaving behind a fragmented image of the cities, with large areas that were left undeveloped for several decades.
- The municipal planning of Galician cities was incapable of organising growth and controlling an urban development that covered twice the amount of land in the consolidated city.
  - Its influence was limited to having to adapt to national housing and public works policies that defined the locations for projects, without their directives.
  - Despite being designed according to a model of extensive growth and having land reserves, large areas on the urban border were left pending planning controls, without any facilities or public spaces.

    - The result was the urban development of a rural space on the immediate periphery, changing the value and use of the territory, and fragmenting its structure through extensive, low-density growth, which would hinder future plans.
- In areas on the periphery of Galician cities that had been developed by public projects, there was a change in land use, generally as a result of compulsory purchasing, leading to large, publicly-owned plots of land that make new ways of building possible, without any connection to the peripheral buildings and urban layout.
    - The difficulty of managing the land, with a large number of owners and smallholdings, resulted in the Galician estates having irregular boundaries, defined by the rural road network and/or large-scale public works, with discontinuous borders and poor connections with the urban pattern of the surrounding area.
    - Unlike the public housing estates built in many other Spanish cities, the Galician estates were located in the main areas of urban development, and in many cases became both the image of the city, and its new entrance points.
    - The installation of industries on peripheral land without the need for planning or urban development projects resulted in the colonisation of rural land, and the expansion of peripheral land with a poorly defined, temporary appearance.

The large housing estates that were planned during this decade and built in the following decades were conceived as autonomous, self-sufficient urban elements, outside of the consolidated city but still close to it. As they were built over a long period of time, they were not subject to the unitary planning, execution and management that characterised the estates built in the rest of Spain, and although they still maintained their unitary nature, the modifications that were made until their completion gave them a greater formal and social diversity.

- In the design of Galicia's housing estates, more attention was paid to the environmental characteristics of their location and their adaptation to the local topography, than to the design of their external space.
- They were considered more as a volumetric whole than as an urban structure, attempting to solve the urban question based on an architectural "object".
- The inclusion of the estate in the rural area that comprised the periphery left gaps between the built fragment and the consolidated city. At the time of their construction, this reduced the degree of territorial cohesion, and their level of adaptation, structuring and integration.

## § 2.3.2 Planning in oversized land reserves: 1960-1967

A Coruña
Labañou
María Pita

FIG. 2.91
1957

FIG. 2.92
1965

A Coruña
Elviña
Barrio Flores

FIG. 2.95
1965

FIG. 2.96
1965

Ferrol
Recimil

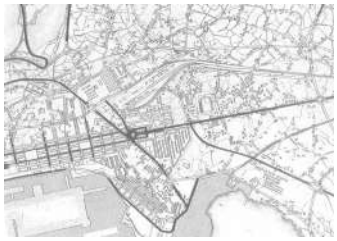


FIG. 2.99
1960

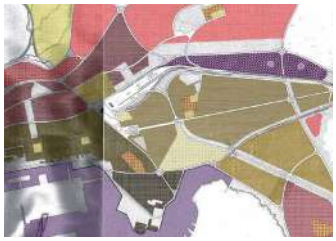


FIG. 2.100
1960

Ferrol
Caranza

FIG. 2.103
1960

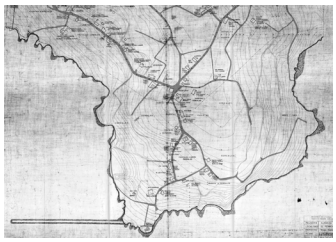


FIG. 2.104
1962

Vigo
Coia
Cristo Victoria

FIG. 2.107
1961

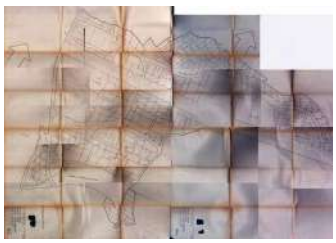


FIG. 2.108
1961

FIG. 2.93
**1967**

FIG. 2.94
**1960**

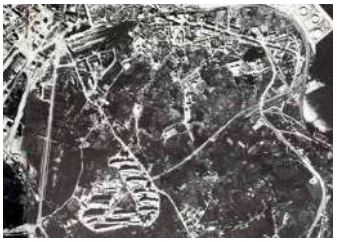


FIG. 2.97
**1967**

FIG. 2.98
**1967**

FIG. 2.101
**1965**

FIG. 2.102
**1965**

FIG. 2.105
**1967**

FIG. 2.106
**1970**

FIG. 2.109
**1966**

FIG. 2.110
**1966**

## § 2.3.3 Urban expansion based on housing estates: 1967-1976

During the 1960s and 1970s, the expansion areas that had been planned in the post-war years were completed, at the same time as the Galician cities were extended in accordance with the plans that had been approved in the 1960s in areas planned by the Urban Development Board on the basis of the Second Land Preparation Plan. This served to consolidate a fragmented periphery marked by the large public housing estates built under the auspices of the Third National Housing Plan (1961-1976), urban elements outside of the city itself, conceived as independent, self sufficient units, which despite their large size soon proved to be insufficient to absorb the increasing numbers of new residents. This was part of a process of urban concentration, in which 50% of the largest municipal districts accumulated approximately 78% of the population in 1960, and 80% by 1970, a clear indication of the general movement of the population towards the most industrialised port cities on the Atlantic coast, especially in the estuary of Vigo (Sarandeses & Gómez 1975, p. 16).

Factors such as the high percentage of population working in the primary sector (57% in comparison to the national average of 32.3%), the highly dispersed nature of its building developments, the fragmented nature of rural properties, the small size of the region's farms and smallholdings and the high level of human presence in the territory, despite an average demographic density of 88.9 inhabitants per square kilometre in 1970, with 127.5 inhabitants per square kilometre in the province of A Coruña and 173.4 inhabitants per square kilometre in Pontevedra (Nieto, 1975, p.56), all help to identify the unique nature of Galicia's territorial structure, and the particular role it played in the urban expansion processes of its cities. These were cities located on estuaries, with surroundings conditioned by their geography and a dense substrate of villages, with peripheral areas characterised by the tension caused by the continuous, linear forms resulting from urban growth and colonisation, and the historic territorial forms (Dalda 1991, p.230).

Between 1960 and 1980, the main Galician cities continued to receive population, while their area of influence grew together with the population of their neighbouring local councils. According to data from the National Institute of Statistics, A Coruña grew from a population of 177,502 to 232,356, Vigo from 144,914 to 258,724, and the rest of the cities had a lower population in 1980: Ferrol 91,764, Ourense 96,085, Santiago 96,695, Lugo 73.986 and Pontevedra 65,137. Urban areas continued to grow in comparison to the rural areas, which in combination with foreign emigration left Galicia with 2,753,836 inhabitants in 1980, compared to the 2,495,866 inhabitants it had in 1940, a growth rate of just 10% in comparison to the rate of 45% for the nation as a whole, which had a population of 26,014,278 in 1940, and 37,746,260 in 1980.

As we have seen, all of these circumstances led to a process of urban expansion for which land was prepared using partial development plans, which began to be prepared during the 1960s and built in the 1970s, with the majority being completed in the 1980s. The excessive amount of land set aside, management difficulties, the slowness that affected the execution of these plans, the arrival of the oil crisis in 1973 which caused financial problems with the government and local councils, together with the urban development changes that came about with the revision of the Land law in 1975, as well as the political changes caused by the end of the dictatorship in 1975 and the arrival of democracy in 1978, all contributed towards the uncertainty that led to many plans not being approved, or otherwise with buildings that were not started or only partially completed (Fernández Prado 2010, p.82).

Even so, the land that was developed and built in the Galician cities was so extensive that in many cases it duplicated the urban land that existed at the moment when it was planned, and even though this planning did not solve all of the demand for housing, the land that was transformed, and the housing estates and the infrastructures that were built, all modified the urban dimension, altering the form and space of the urban border on which they were built, as well as the city itself. This was partly because they were independent urban elements that offered a fragmented image of the city, in comparison to the continuous growth of the urban expansion areas, and in part due to the peripheral urban expansion with an excessive amount of land reserved before to their construction, and the housing problems for which a solution was obtained in unplanned areas beyond the scope of municipal management, or in neighbouring local councils.

## § 2.3.3.1 Elviña housing estate (A Coruña). Study Case

From amongst Galicia's cities, A Coruña has the largest amount of affected land, where the transformation caused by the housing estates built on the periphery had the greatest effect on modifying the structure and image of the city (FIG. 2.54-2.63). In the same way as other Spanish cities, the growth estimates were overly excessive, which led to excessive amounts of land being reserved and prepared to deal with the expected growth which, as we will see, was accompanied by difficulties to develop the planned projects in a short space of time, with the result that the urban perimeter had an incomplete, disorganised appearance for more than two decades.

The Urban Development Board and the National Institute of Housing jointly planned residential and industrial estates in A Coruña that were supported by large-scale road infrastructures, as the only significant elements to absorb the urban expansion of the city over a total surface area of 534.88 hectares. Between 1961 and 1965, a total of 298.88

hectares began to be developed, a surface area that was almost equal to the existing urban land, and the largest area developed in all of the Spanish cities. The housing estates were mainly located on the border of the city, in the valley of the Monelos River, with plans to develop 362.78 hectares in four phases, and 8 hectares inside the urban centre in Zalaeta; the industrial estates were located on the urban periphery, the first in A Grela-Bens, which covered 143.5 hectares, all on land that was considered to be free and with a low level of occupation, despite the fact nearly two thousand families were expropiated, a total of 5,000 people who had to be given new housing (Precedo, 1990, p.297-99).

In the same way as in A Coruña, the majority of the residential areas planned by the National Institute of Housing in Galicia in the 1960s had an urban model of enclosed groups of buildings surrounded by perimeter roads, with access to the housing blocks through cul-de-sacs, with the blocks built around a central space that is free for traffic (García & Somoza 2008, p.47).

This design can be found in the Barrio das Flores estate (FIG. 2.115-2.116), covering a total of 17 hectares, which began to be developed in 1961 and was finally completed in 1965, as a separate part of the first phase of the Elviña estate, covering 115.1 hectares, where the main road network consists of a ring road with entrances leading towards the buildings, with car parks in a cul-de-sac, with their interior arranged around a large central public space. This space is marked by the underground system of the city's oil pipeline, and is exclusively pedestrian, with green zones, and contains the majority of the neighbourhood's facilities, connecting with pedestrian walkways to other smaller community areas in the interior, between the housing blocks and their perimeter, arranged as squares containing collective services, with access to 2,000 homes of different densities (a total of 12,000 homes were initially planned for the Elviña estate). The Barrio das Flores estate is divided into five residential units, each containing an average of 400 homes, 713 of which were destined for use by the families that had been expropiated due to the different interventions carried out by the Ministry in the city.

This was the first intervention carried out by the National Institute of Housing within the Elviña estate designed as a self-sufficient element with facilities and open spaces, in which its planning, development and construction was carried out in a unitary manner in a short space of time, conditioning the more complete and uniform appearance of this estate in comparison to the others built in the city. In addition to this were the alternatives proposed in its urban design, breaking away from the linear design of the blocks, creating openings in the side walls and structural connections between the buildings, with different types of spaces for social interaction. These interventions were improved in the case of neighbourhood unit 3, designed by José Antonio Corrales, thanks to the use of variable sections in the blocks that affected the movement of pedestrians

on different levels, creating a megastructure containing public space, the building, and the road infrastructure.

The Elviña estate (FIG. 2.95-2.96), planned in 1961, and reformed and extended in 1967, 1969 and 1976, was built in the valley of the Monelos River on mainly rural land, forming part of a large publicly-owned piece of land used for agricultural research. To the south, its perimeter is in contact with the second expansion sector of the city, with extensions of former villages alongside paths and roads leading towards the city. It was decided that the first stage of the development project would be to build in the areas farthest from the urban border, like the Barrio das Flores, which would increase the value of the land in the rest of the estate, and which was subsequently sold to cooperatives and small-scale developers, thereby lowering the price paid for compulsory purchases, thereby having a less marked effect on the final price of the public housing (Fernández Prado 2010, p.169). However, this decision resulted in increasing the distance between the first residential units and the urban perimeter, contributing towards their physical isolation for years, as work was delayed on building the residential units in the rest of the estate for years.

The construction of Elviña modified the form of the city, introducing fragments that were separate from its growth by gradual expansion, at the same time as the urban planning was re-thought, changing this radial outward spread for a unidirectional movement, connected with the road infrastructure leading into the city that was inaugurated in 1955, first known as the Avenida de Lavedra, and then as the Avenida de Alfonso Molina. Its design was adapted to the original topography of the city, giving it a unique form and integration within the landscape, reinforced by its privileged location as the entrance façade into the city, and by the size and scale of the intervention, marked by road infrastructures that created a new urban mobility and connections between different neighbourhoods in the city, altering the previous hierarchy of the centre and its expansion area by making the periphery more accessible.

Following the planning and construction of the Elviña estate, a large number of other infrastructure and planning issues were proposed and resolved, which affected the city as a whole and defined the way it would grow over the second half of the 20th century, such as the extension of its access road network, the transformation of its sanitation network, the location of future industrial estates, and its communications with the port (Toba 2009, pp.56-61).

Positioned as a centre of urban transformation at this moment in time, the Elviña estate was not completed in time to provide a solution to the housing problem. While the compulsory purchasing of land was organised for its development, and before the approval of the new General Plan in 1967, an intensive construction process took place

in other areas of rural land on the urban perimeter, especially in the area known as Agra del Orzán, which altered the planning for the intervention with regard to the city's infrastructures.

The position of the Elviña estate, next to the main urban access infrastructures (FIG. 2.117), gave it an important presence as the façade to the entrance into the city, although at the same time it meant that its construction was associated with the completion of the road infrastructures, junctions, roundabouts and viaducts that became increasingly visible and occupied the space around the housing estate, increasing the complexity of the design and its development in the subsequent phases of construction. The Avenida de Alfonso Molina leading into the city divided the estate into two neighbourhoods, each with a population of approximately 20,000, defining its structure by means of a façade facing out onto the avenue, consisting of blocks and towers running alongside it that marked the limits of the estate, with an open central space in both parts used to organise the internal road network, green zones, facilities and car parks.

Only the first phase of construction of the Elviña housing estate involved the unitary planning, development and construction process that characterised the housing estates of the period, due to the fact that as with the rest of the Galician projects, the majority of the construction process was carried out years later, generally by private developers, in different stages and in different style. This gave the estate a diverse appearance with a wide variety of forms, without ever becoming a closed fragment, as was the case of the Barrio das Flores, although it still maintained the sense of forming a whole, which characterised the estate as a result of being enclosed by a network of roads that separated it from the rest of the urban fabric.

The second phase, which was planned in 1966 and extended in 1968, also known as the Plaza del Espino (Espino Square), covered 3 hectares and was intended for the construction of a services hub connected by train, bus and private car. Finally, priority was given to the construction of infrastructures, only adapting the road network at different levels with a tunnel that connected the industrial estate of A Grela with the port, and the viaduct that carries the Ronda de Outeiro, which transversely communicates the city from east to west, connecting the bus and train stations with the Avenida de Alfonso Molino that provides access to the city from north to south.

The third phase, planned in 1967, was redefined in 1975 and named the San Pedro de Mezonzo Estate. Covering 8.68 hectares, it was an internal reform project to resolve the link between the Avenida de Alfonso Molina with the city centre, crossing a series of built spaces using solutions at different heights, by building a viaduct that was opened in

1971, with a public park beneath it, and demolishing the neighbourhood of Castiñeiras and part of the neighbourhoods of Falperra and Santa Lucía.

The fourth phase, covering 236 hectares, was planned but never built, and it was not until the mid-1980s that the housing in the second and third phase was completed, located between the new road infrastructures and the land that had been left vacant after the demolition work. If we consider that by then, work had not been completed on the rest of the homes in phase one, this gives us an idea of how long it took for the housing estates to become consolidated, and the unfinished appearance that affected the city as a whole.

However, this was not the only problem that affected the city in the late 1970s, which came at the same time as the destruction of the historic centre, a lack of urban land, the absorption of rural centres of population into the urban fabric, and the lack of road structures that affected expansion, meaning that a large amount of available land could not be developed (González-Cebrián 1980, pp. 56-58). This chaos, which affected the whole city, from its perimeter right through to the centre, mainly caused by a failure to execute the public projects that began in the 1960s, and the excessive internal density permitted by the general plan of 1967, prevented any type of orderly growth with decent urban spaces, altering parts of the city with buildings that were completely out of scale. Meanwhile, the destruction of the historic centre as a result of regulations that allowed buildings to be demolished, replaced with other larger buildings that were changed from residential to tertiary use, and a lack of new urban land, a result of the stopping of the partial development plans approved in the early 1970s, led to a deficit of land for facilities and open spaces in the neighbourhoods, as well as for new housing, which would increase the demand to the neighbouring municipal districts.

What came after the arrival of democracy to Spain in 1978 was an attempt to complete these unfinished or undeveloped projects, such as the central hub of the Elviña housing estate, the elements limiting the growth of the city, and to make the necessary urban reforms to correct the excesses and destruction of the years of developmentalism, which were included amongst the objectives of the new general plan from 1985, which consolidated and legalised the interventions underway at that time (Precedo 1990, p.320). Without solving all of these problems, these urban improvements were most visible in an increased number of facilities and the recovery of open spaces for green zones. This also affected the housing estates, with the percentage of green zones increasing after the revisions made in the mid-1970s, in which the development potential of the whole was reduced, and plots containing land for development were transferred and prepared for public use. The unused spaces in the estates were gradually transformed into parks and squares with public social centres for the neighbourhood, although a great deal of space is now given over to car parks, and there is a certain

degree of confusion between the variety of public, private and collective land that is still awaiting definition, something that also gives an idea of the potential these spaces have for containing new activities and amenities.

### § 2.3.3.2 Coia housing estate (Vigo). Study Case

While in the case of Elviña we have seen how the estate has played a fundamental role in the city's urban transformation, to which a series of new infrastructures and services have been connected that transform the urban space, in the case of the city of Vigo, the Coia estate is still today one of the few planned elements of what has been the largest unplanned development on rural land in all of Galicia's cities (FIG. 2.60-2.69).

In the design for the Coia housing estate (FIG. 2.207-2.209), whose partial development plan was approved in 1963, we can still see a model based on the zoning system that separated residential, industrial and tertiary uses, segregating the types of mobility by differentiating roads for vehicle traffic from the spaces providing access to the buildings. Its design represented a step backwards in comparison to the housing estates planned for other Spanish cities in the 1960s, which attempted to overcome the Rationalist system, abandoning the parallel arrangements between blocks in order to configure enclosed spaces (Pereiro 1981, p.152). In Coia, the avenue known as Av. de Castelao divides a structure in two that serves as a façade for the first line of buildings that was erected, mainly with individual towers, then running along both sides of this façade, dividing the space into sectors containing rows of open blocks and towers connected together with streets and pedestrian areas, forming a continuous section without a centre, resulting in fragmented open spaces that combine green zones with the collective services of the neighbourhood (García & Somoza 2008, p.48).

The initial design of Coia was modified, increasing its density and the number of homes. Work began on its construction in the 1970s, and it was not completed until the 1980s, incorporating changes in its design and construction, as a result of which it lost part of its unitary nature, meaning the resulting urban structure was not so clear, but neither as monotonous as initially planned. This was a common feature in Galicia, differentiating them from those built in the rest of the country, whose design, planning and execution was carried out jointly in a single phase that was completed in the 1960s.

As with the other housing estates built in Galicia, the road network characterises the urban structure of Coia. The Avenida de Castelao became the main link between the urban centres to the east, the areas containing second homes to the west, and the new estates that were planned around it following the approval of the General Plan of 1970.

At the same time as this main avenue played the role of a supra-municipal structure, the internal road network that was connected to it consisted of a ring road around the perimeter with parking in cul-de-sacs, from where there are entrances towards the buildings via pedestrian walkways and open spaces. The terrain was uneven and an attempt was made to adapt the design of the estate by using stepped terraces, making it possible for the majority of its perimeter to coincide with the existing paths.

In the urban development of Coia (FIG. 2.107-2.110), the rustic land was transformed into construction land by compulsory purchasing. Apart from plundering the land in this way, it also meant displacing part of the population, and destroying the social and territorial structure of the parish of Coia, by demolishing its buildings and colonising its agricultural land. Its location was a result of the interest in locating workers to the west of the urban centre, between the industrial land of the customs-free zone, with the port to the north and the Citroën car factory to the south.

It is interesting to note how the location chosen for the Coia housing estate, in its construction process and in the transformation its implantation caused, serves as an extreme example of the territorial disorganisation caused by individual interests and the imposition of state planning regulations on its immediate surroundings. By observing what happened with Coia, we are provided with a clear image of the extent of the territorial transformation of the urban periphery of Vigo. No other Galician housing estate had such extensive surroundings that were colonised without any planning, or with such clear discrepancies between the different political and economic powers, whose results took shape in the delay that affected the approval of the General Plan and the development of Coia. The state powers were seeking to apply a uniform framework against defending the interests of individual ownership represented by the owners and the local powers, conditions which were also a result of the extremely subdivided nature of the land around the periphery, and the symbiotic concept of the family as a production unit (Souto 1990, p.411).

From the 1970s onwards, while Coia was being built, the deterioration of the city and its surrounding area worsened. The need for housing and a lack of foresight in the municipal planning that left the agricultural land unregulated meant that this was occupied by new residents: industrial workers who emigrated from rural areas, who attempted to reproduce their old way of life, now in a single family home with a garden, for whom agriculture served as an additional source of income, and a safety net in times of crisis (Leboreiro 2000, p.119).

The Local Regime Law of 1953 and the Land Law of 1956 gave the local council the power to manage and programme land, something that proved to be virtually impossible in practice. The arrival of the economic crisis of 1973, the financial failure

of the state, the political transition towards democracy, and the difficulties in dealing with small, fragmented rural properties complicated the development of an excessive land reserve, quantified at 2,750 hectares for the partial development plans promoted by the city council of Vigo between 1971-2, for 55,663 homes, of which only 2,230 were actually built (Souto 1990, p.416). These difficulties worsened following the modification of the land law of 1975, in the revised text from 1976, which intensify the conflicts with owners due to the obligation to increase the number of transfers of public land in the development of the new housing estates, and the problems of municipal management and financing. This led to the failure of the public management policy, giving rise to initiatives by owners and developers for partial development projects involving smaller streets and estates, or building on empty plots in urban streets with greater socio-economic value. The result was an increase in the densification of the urban residential space, an increase in urban planning violations, especially on the coast, and overcrowding in rural land and on the urban periphery, with increasingly dispersed buildings and the search for new ways of colonising the land on the periphery based on buildable plots.

As in the rest of the Galician cities, the occupation of land on the periphery was carried out in two ways that were equally disrespectful towards the environment, and which had the same transforming effect. They produced different results, but had the same objective: to extend the urban perimeter, and to change the rural surroundings from agricultural to residential use, to the point where they were converted into a neighbourhood on the urban perimeter with few facilities. As we have seen, the first of these types of occupation was unplanned, occupying rural land without any sense of order that replaced the existing system, worsening its deficits. The second method was planned, and at that time mainly corresponded to public works, including the housing estates like Coia, which introduced a new order that differed from the inherited urban structure, both in terms of its condition as a unitary fragment, and the unplanned nature of its surroundings (FIG. 2.210).

The construction of Coia exemplifies the attempt by the central authorities to solve the housing problem in Vigo, at the same time as revealing the lack of coordination with the local authorities, without any relationship between the planning produced in Madrid and the General Plan. Like the rest of the housing estates, it was created as a result of the urgent need for housing, focusing on the rapid development of an extensive area on cheaper, previously developed land, which would supposedly shorten the construction period by having more land available for services and facilities. However, the problems involved in public management and financing, and the search for private involvement in urban development at this time allowed for companies and banks to build housing cooperatives on publicly developed land. In 1961, the National Institute of Housing set aside 761,085 square metres of land for the estate; in 1965, the first 1250 homes

began to be built, developed by the Municipal Savings Bank of Vigo. These were an exception, as the majority were built once development work on the estate had been completed in 1971 (with an urban development project from 1970), planning a total of 8,496 homes, which were subsequently reduced to 5,020 in the joint modification of the General Plan and the partial development plan for Coia in 1975 (Souto 1990, p.427). The urban development project drafted in Madrid suffered from numerous defects, both in terms of the delimitation of green zones and in the creation of infrastructures. It did not take into account the progress of colonisation of rural land since the plan had been approved in 1963, including green zones in areas where buildings had already been erected, in breach of the standards defined by the Land Law for public green zones; without building the planned public facilities, the plots for which were sold off for building purposes; legalising buildings that had been erected without municipal licences; building facilities and housing in protection areas around roads; and with proposals for locations, volumes and built surface areas that exceeded those permitted in the General Plan. All of these factors contributed towards an increase in density of up to 85 homes per hectare, with the construction of 796 homes in addition to those that had been planned.

The actions of the central authorities were very different in terms of control and management. While it supervised compliance with the Land Law in the production of the General Plan, it allowed for irregularities in the management of the space that had been developed by the National Institute of Housing (Souto 1990, p.431). The final result was that Coia became a residential 'fragment' located on an extensive urban periphery, colonised by single-family housing built over previously existing agricultural structures.

### § 2.3.3.3 Caranza housing estate (Ferrol). Study Case

In the case of Vigo, we have seen how the housing estate of Coia was one of the few elements that were planned at a time of extensive growth, which in just a short space of time would alter the urban dimension, its structure and the spatial interactions of its inhabitants. In the case of Ferrol (FIG. 2.57-2.66), the Caranza estate changed the scale and directionality of urban growth, at the same time as the failed expansion project from the 1950s was still under development. This had focused urban expansion in the direction of the Av. de Castilla, expanding the surface area and built volume of the city.

Like the rest of the Galician cities, Ferrol maintained a rural structure as the support for its spatial growth, characterised by the colonisation of old agricultural structures and the redefinition of their use. According to data from the National Institute of Statistics, in 1970 a total of 17.72% of the constructions in the municipal district contained less

than two homes, of which 32.03% combined residential use with other agricultural uses. In addition to these were second family homes built on rural land near the coast, and although the spatial concentration around the urban centre increased, this occurred in tandem with the suburban dispersion of buildings (Clemente 1984, pp.81-82). The lack of housing, new urban uses, and a combination between industrial and tertiary urban employment with subsistence agriculture constituted a decisive factor in the extended occupation and changing use of peripheral land.

In addition to the expansion of construction in this peripheral territory, rural land outside of the city planned in the eighteenth century began to be colonised. This had remained compact and organised until the absence of planning measures and chaotic growth of the city's expansion areas covered it with buildings of different heights, combined with low-rise homes and farmland awaiting development. This profiteering process, which as we have seen characterised the expansion processes in the rest of the Galician cities, was accompanied in Ferrol by a major urban replacement programme that resulted in the demolition of the old neighbourhood of Esteiro (FIG. 2.119-2.202).

Esteiro had been built in the middle of the eighteenth century to provide housing for workers who were constructing the city and working in its shipyards, which gradually degraded to the point of acquiring a new centrality thanks to its physical connection with the areas of greater social interaction in the historic centre, the growth of the city's expansion area, and the planning of Caranza. Its demolition added a new conditioning factor to the transformation of the urban border, the creation of land suitable for development following the demolition process, and the displacement of the entire population of the neighbourhood to another that was still under construction (Caranza). These aspects were different to those found in the other Galician cities, where compulsory purchasing affected rural land and fewer people had to be rehoused. Even so, the significance of the disappearance of their surroundings was equally traumatic, as was also the case in Caranza.
The Caranza housing estate served to colonise an area of farmland connected with the coastline, modifying the structure and scale of the city. Its location was chosen on the basis of finding the cheapest available land, although this decision was conditioned by the land being relatively flat to avoid excess development costs, being properly oriented, and being relatively close to the urban centre, in order to ensure its connection with the expansion of the city and its planned and existing road infrastructures. These would facilitate the construction process, and also change the main access road into Ferrol, making Caranza the entrance façade to the city.

The General Plan of 1961 defined the first criteria for the development of Caranza, which would include zoning as open constructions with 4,000 homes for 17,000 inhabitants, distributed inside a surrounding ring road, with social facilities and

businesses in the centre. In 1962 the partial development plan for Caranza was drafted, defining a larger intervention area with 11,732 homes for 53,000 inhabitants, maintaining the presence of social facilities in the centre, a ring road, and connections with the main access road, revealing the negligible influence of municipal planning on the developments carried out by the Ministry of Housing. In the same year, the public authorities began work of the development of Caranza, subdividing and marking plots, installing lighting, sewers, and the interior road network, consisting of a ring road around the estate, running parallel to the new access road into the city, which connected Ferrol with the town of Fene over a new bridge that was opened in 1968, and an inner avenue that divided the central space. Secondary roads split off from these main roads, leading to residential areas designed as independent units, with car parks in cul-de-sacs, large green zones, open spaces and areas for facilities, which remained empty for many years.

Several modifications were made to the General Plan and the Partial Development Plan after the development of Caranza between 1962 and 1975 (FIG. 2.203-2.205), increasing the number of transfers, contemplating improvements to the number of facilities per home by taking into account the new construction regulations, altering some of the road layouts and car parks in order to adapt them to increased car use, and building new connections with the city centre. Also, as occurred with other plans from this period, certain planning conditions were improved, increasing the number of facilities and reducing the number of homes, until reaching a total of 4,795 (Fernández Prado 2010, pp.285-87).

In the same way as the other Galician cities, the buildings detailed in the partial development plans from the 1960s began to be constructed in the early 1970s. The availability of land and a reduction in the final number of homes to be built made it possible to vary the types of housing, allowing for more space for facilities and green zones, creating high-density, independent groups of buildings that were capable of encouraging community life, or at least not hindering it (Vallejo, 1971, p.2), with blocks of different sizes and mixed groups of blocks and towers, with paths, squares and gardens inside them as spaces for interaction, connected with each other and with the buildings, making it possible to separate them from road traffic by creating pedestrian areas such as walkways, colonnades and galleries, which included premises for businesses and services, focusing on enriching the space for interaction between the blocks and the use of their open spaces.

The slowness of the bureaucracy led to a ten-year gap between actually allocating the plots for construction and the development of Caranza, which covered the same surface area as the existing urban land in the city. In 1972, the last compulsory purchases were paid in Esteiro and work began on its demolition, at the same time as the first blocks

were completed in Caranza, and as land was obtained in A Gandara for industrial use, in defiance of the municipal plan which had marked it for residential use. The presence of such a large affected area for such a long period of time resulted in the large-scale transformation and disorganisation of the urban perimeter, which had extended due to the delays in constructing the buildings. The housing for cooperatives was built first, and then followed at a later stage by the publicly developed housing, which were the majority but were not delivered on completion, due to legal action between the Ministry and the building company because of irregularities in their construction. This was followed by squatters moving into the vacant properties in 1977 and a dispute between the awardees and the occupants, who finally formed an association to lobby the authorities until they approved new public housing projects (Clemente 1984, pp.92-93). The public housing in Caranza was mainly destined for workers from the city's shipyards, for the illegal occupants, for the families whose homes had been compulsorily purchased in Esteiro, A Gandara and Caranza, and to a lesser extent for the professionals and military personnel from the cooperatives, clearly demonstrating the need for housing, lack of resources, and administrative chaos that existed between the central authorities and the municipal government.

In 1983, now in the democratic era, the new general plan for Ferrol was passed, the first homes in the new housing estate under construction in Esteiro were delivered, and Caranza was completed, including regional and municipal sanitary services, hospitals and schools (FIG. 2.206). Like the rest of the large-scale projects carried out in Galicia, the delay in building the homes and facilities limited their functional autonomy, meaning they had to depend on the urban centre for goods and services. This limited activity, segregation of mobility and lack of maintenance for the open spaces led to their degradation, which in combination with the poor connections with the rest of the city and deficient public transportation, meant that for years these areas were marginal, isolated at social and functional level from the rest of the city.

## Conclusions

The industrialisation and urban expansion of Galician cities between the 1960s and 70s led to a major change in the way in which space was used, in just a short space of time, increasing the distances and sense of discontinuity between the consolidated city and an increasingly extensive periphery.

- The distance between people's place of work and their place of residence increased, modifying the pedestrian scale of the consolidated city, and transforming it into a city adapted to the use of motor vehicles.
- State planning discontinuously extended the limits and space occupied by urban growth, conditioning future stages of development, and obliging

municipal planners to adapt to the layout defined by the construction of new infrastructures and housing estates.

- The public projects for estates and infrastructures became the main instrument used to occupy and transform the periphery of the Galician cities.
- The public housing estates modified the dynamics of growth and spatial relationships of the Galician cities, supported by the construction of new road networks, which led to directional growth, making them the most important elements in their expansion and the image of the urban border.

The public housing estates planned in the 1960s and built between the 1970s and 80s in Galicia have a structure surrounded by a road network that hinders their integration with the surrounding areas, which are predominated by linear blocks or towers, with few facilities and a large amount of free space.

- They were conceived as self-sufficient, high-density unitary fragments, with different types of housing, as a result of having been built over a long period of time.
- At the time of their construction, the housing estates were barely integrated with their surroundings, although their location close to the urban border meant they were still able to connect to surrounding areas. Over time this meant that they were able to overcome the idea of these areas as an obstacle, in some cases becoming an element of transition.
- The difficulty in overcoming the lack of connections between the estate and its surrounding area, despite being less problematic than in many of the estates built in the rest of Spain, and without becoming a closed fragment, reduced their morphological coherence, meaning that today they are still unitary, externally and on their border, by differentiating their limits from those of the rest of the urban layout.
- Inside the housing estate, the presence and variety of open areas and spaces for social interaction between buildings were the only closely available alternatives that served as a meeting point for its residents
  - Their size and type varies from large parks to small private spaces associated with the homes, in public, private or collective land, and associated with amenities.
  - Their lack of functional complexity and structuring, the confusion that exists between private and public spaces, difficulties in orientation and a minimal amount of maintenance led to a sensation of confusion and insecurity, which increased over time.
  - Despite being incomplete, the adaptation, structuring and integration that these spaces have provided since they were improved and since the introduction of community amenities has shown their ability to provide a sense of cohesion, and their potential to be used for new activities and as spaces for social interaction.

## § 2.3.3 Urban expansion based on residential estates: 1967-1976

A Coruña
Labañou
María Pita

FIG. 2.111
1967

FIG. 2.112
1972

A Coruña
Elviña
Barrio Flores

FIG. 2.115
1972

FIG. 2.116
1972

Ferrol
Recimil

FIG. 2.119
1974

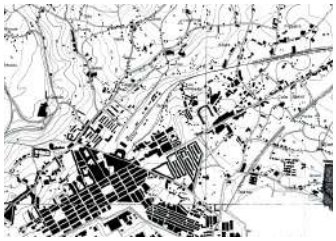


FIG. 2.200
1976

Ferrol
Caranza

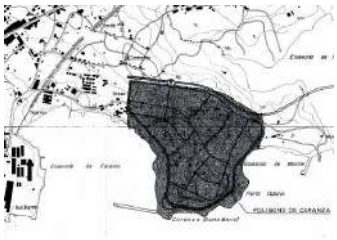


FIG. 2.203
1976

FIG. 2.204
1976

Vigo
Coia
Cristo Victoria

FIG. 2.207
1971

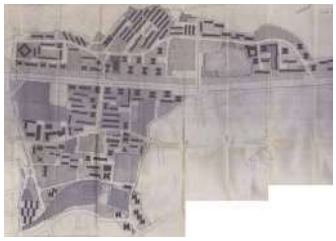


FIG. 2.208
1975

FIG. 2.113
**1972**

FIG. 2.114
**1980**

FIG. 2.117
**1973**

FIG. 2.118
**1980**

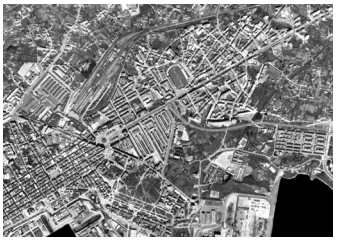


FIG. 2.201
**1978**

FIG. 2.202
**1980**

FIG. 2.205
**1978**

FIG. 2.206
**1987**

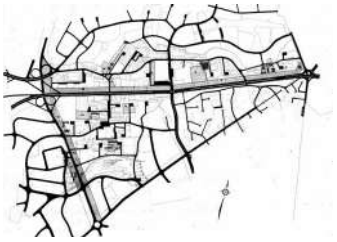


FIG. 2.209
**1975**

FIG. 2.210
**1982**

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**FIGURE 2.3** *New Harmony, Robert Owen 1825*. Source: http://edu.saline.free.fr/01-cites/1-thema/01-newharm.html
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**FIGURE 2.7** *Radburn unit, Wright & Stein 1928*. Source: T. Bendixson, "Milton Keynes: Image and Reality", p.94.
**FIGURE 2.8** *The urban block evolution, 1930*. Source: C.Martí, "las formas de la residencia en la ciudad moderna" p.35-36.
**FIGURE 2.9** *Siedlung Westhausen, Ernst May 1929*. Source: E. May Society, Frakfurt/ J. Perez , "Manzanas, bloques y casas", p.51
**FIGURE 2.10** *Frankfurt 1930*. Source: JL Sáinz Guerra, "Las Siedlungen alemanas de los años 20", p.34.
**FIGURE 2.11** *Plan Amsterdam 1934*. Source: J. Galindo, "Cornelis van Eesteren: la experiencia de Amsterdam, 1929-1958", p.55, p.153.
**FIGURE 2.12** *Plan Amsterdam 1963*. Source: J. Galindo, "Cornelis van Eesteren: la experiencia de Amsterdam, 1929-1958", p149
**FIGURE 2.13** *Greater London Plan*. Source: "Architects' Journal", vol. 101, 1945 March, p. 205.
**FIGURE 2.14** *Harlow new town scheme*. Source: M. Alonso, "experiencias urb del proyecto moderno" 2007,p.41
**FIGURE 2.15** *Stevenge new town*. Source: M. Alonso, "experiencias urb del proyecto moderno", 2007, p.35.
**FIGURE 2.16** *Stockholm satellite cities*. Source: H. Von Hertzen "Building a new town", 1973, p.20.
**FIGURE 2.17** *Vällingby satellite city plan*. Source: L.Benevolo "La proyectacion de la ciudad moderna", p.256.
**FIGURE 2.18** *Helsinki satellite cities*. Source: H. Von Hertzen "Building a new town", 1973, p.2
**FIGURE 2.19** *Tapiola satellite city plan*. Source: H. Von Hertzen "Building a new town", 1973, p.6
**FIGURE 2.20** *Unites de Marseille plan*. Source: W.Boesinger, "Le Corbusier 1887-1965" 1972, vol. V, p193
**FIGURE 2.21** *Hansaviertel plan, Berlin 1957*. Source: Revista AV nº1-2 Berlin IBA, p.69
**FIGURE 2.22** *Roehampthon plan*. Source: L.Benevolo, "El Diseño de la ciudad-V",1982, p.208
**FIGURE 2.23** *Pendrech plan, 1949*. Source: "Van Pendrecht tot Ommoord", 2005, p.154.
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**FIGURE 2.28** *Thamesmead, 1967*. Source: A. Kraaij "Thamesmead", Dash 12-13, p.211.
**FIGURE 2.29** *Toulouse le mirail, 1960*. Source: L.Benevolo "La proyectacion de la ciudad moderna", p. 265.
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**FIGURE 2.34** *Legazpi, Madrid 1940*. Source: https://urbancidades.wordpress.com

**FIGURE 2.35** *Castilla square, Madrid, 1940*. Source: http://revistaplacet.es/

**FIGURE 2.36** *Madrid shanty towns, 1956*. Source: de Teran, F. "Historia del Urbanismo en España III", 1999, p.268.

**FIGURE 2.37** *Barcelona shanty towns, 1945*. Source: Arxiu Municipal Administratiu de Barcelona.

**FIGURE 2.38** *Madrid 1948*. Source: www.ign.es/web/catalogo-cartoteca/resources/html/001668.html

**FIGURE 2.39** *Bidagor Plan, Madrid 1941*. Source: de Teran, F. "Planeamiento urb en la España contemporánea", 1982, p. 169.

**FIGURE 2.40** *Satellite towns, Bidagor Plan 1941*. Source: de Teran, F. "Planeamiento urbano en la España contemporánea", 1982, p. 264.

**FIGURE 2.41** *Satellite towns, Bidagor proposal 1948*. Source: F. Roch "Un siglo de vivienda social", 2003, vol.1, p259.

**FIGURE 2.42** *Absorption Settlements, Madrid 1955*. Source: "De la ciudad satélite a los poblados de absorción", Revista Nacional de Arquitectura, aug-sep 1956.

**FIGURE 2.43** *Residential estates, Barcelona 1945-54*. Source: Ferrer Aixala, A. "Els poligons de Barcelona", ed. UPC, 1996.

**FIGURE 2.44** *Vallecas Minimal Settlement, Madrid 1958*. Source: aerial view 1961-64 https://idem.madrid.org/visor, and Cortes, ].A "Un siglo de vivienda social", 2003, vol.2, p.107.

**FIGURE 2.45** *Caño Roto managed settlement, Madrid 1963*. Source: F. Galiano, L. et al. "La quimera moderna, los poblados dirigidos de madrid en la arquitectura de los 50", 1989, p. 65-67.

**FIGURE 2.46** *Orcasitas managed settlement, Madrid 1959*. Source: "Poblado dirigido de Orcasitas, en Madrid", Hogar y Arquitectura 62, 1964, and "El poblado de Orcasitas", Temas de Arquitectura, 1961.

**FIGURE 2.47** *Madrid road network plan 1968*. Source: de Teran, F. "Historia del urbanismo en España III", 1999, p.316.

**FIGURE 2.48** *Barcelona road network plan 1968*. Source: de Teran, F. "Planeamiento urb en la España contemporánea", 1982, p.454.

**FIGURE 2.49** *Madrid estates 1950-70*. Source: de Teran, F. "Historia del urbanismo en España III", 1999, p.270

**FIGURE 2.50** *Barcelona estates 1950-70*. Ferrer Aixala, A. "Poligonos de vivienda en la comarca de Barcelona (II)", 1974, p.33.

**FIGURE 2.51** *Actur Lakua, Vitoria 1970-76*. Sources: López de Lucio, R. "Origenes y reordenación del Actur Lakua en Vitoria-Gasteiz, urbanismo nº16, p.4-6.

**FIGURE 2.52** *Urban renewal neighbourhoods, Madrid 1976-88 (*Pozo del Tio Raimundo 1975-87). López de Lucio, R. "Vivienda colectiva, espacio público y ciudad" 2013, p.175-179.

## Chapter 2.3


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**FIGURE 2.53** *A Coruña aerial view 1957 with estates.* Source: Spanish Ministry of Defence, Madrid.
**FIGURE 2.54** *A Coruña aerial view 1972 with estates.* Source: Spain National Geographic Institute, Madrid.
**FIGURE 2.55** *A Coruña aerial view 2000 with estates.* Source: Xunta de Galicia (SITGA), Santiago de Compostela.
**FIGURE 2.56** *Ferrol aerial view 1957 with estates.* Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.57** *Ferrol aerial view 1978 with estates.* Source: Spain National Geographic Institute (IGN), Madrid.
**FIGURE 2.58** *Ferrol aerial view 2000 with estates.* Source: Xunta de Galicia (SITGA), Santiago de Compostela.
**FIGURE 2.59** *Vigo aerial view 1957 with estates.* Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.60** *Vigo aerial view 1972 with estates.* Source: Spain National Geographic Institute (IGN), Madrid.
**FIGURE 2.61** *Vigo aerial view 2000 with estates.* Source: Xunta de Galicia (SITGA), Santiago de Compostela
**FIGURE 2.62** *A Coruña 1957 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view1957.
**FIGURE 2.63** *A Coruña 1972 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view1972.
**FIGURE 2.64** *A Coruña 2000 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view2000.
**FIGURE 2.65** *Ferrol 1957 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 1957.
**FIGURE 2.66** *Ferrol 1978 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 1978.
**FIGURE 2.67** *Ferrol 2000 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 2000.
**FIGURE 2.68** *Vigo 1957 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 1957.
**FIGURE 2.69** *Vigo 1972 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 1972.
**FIGURE 2.70** *Vigo 2000 urban scheme.* Source: Prepared by the author, AutoCAD map and aerial view of 2000.
**FIGURE 2.71** *Labañou (A Coruña) map of 1945*. Source: A Coruña City Council's infraestructures Office.
**FIGURE 2.72** *Labañou (A Coruña) aerial view of 1948*. Source: A Coruña City Council´s infraestructures Office.
**FIGURE 2.73** *Labañou (A Coruña) 1954 cadastre*. Source: Historical Archive of the Kingdom of Galicia.
**FIGURE 2.74** *Labañou (A Coruña) 1954*. Source: A Coruña City Council's Historical Archive.
**FIGURE 2.75** *Elviña (A Coruña) map of 1945*. Source: A Coruña City Council's infraestructures Office.
**FIGURE 2.76** *Elviña (A Coruña) aerial view of 1948*. Source: A Coruña City Council's infraestructures Office.
**FIGURE 2.77** *Elviña (A Coruña) aerial view 1957*. Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.78** *Elviña (A Coruña) 1962*. Source: A Coruña City Council's Historical Archive.
**FIGURE 2.79** *Recimil (Ferrol) map of 1930*. Source: Ferrol City Council's Historical Archive.
**FIGURE 2.80** *Recimil (Ferrol) map of 1953*. Source: Ferrol City Council's mapping Office.
**FIGURE 2.81** *Recimil (Ferrol) aerial view 1957*. Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.82** *Recimil (Ferrol) 1944*. Source: Recimil Neighborhood Association.
**FIGURE 2.83** *Caranza (Ferrol) map of 1953*. Source: Ferrol City Council's mapping Office.
**FIGURE 2.84** *Caranza (Ferrol) 1954 cadastre*. Source: Historical Archive of the Kingdom of Galicia.
**FIGURE 2.85** *Caranza (Ferrol) aerial view 1957*. Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.86** *Caranza (Ferrol) 1949*. Source: Archive E. N. Bazan, Ferrol.
**FIGURE 2.87** *Coia (Vigo) map of 1949 (Antonio Cominges architect)*. Source: Vigo City Council's mapping Office.
**FIGURE 2.88** *Coia (Vigo) map of 1954*. Source: Vigo City Council's mapping Office.
**FIGURE 2.89** *Coia (Vigo) aerial view 1957*. Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.90** *Coia (Vigo)1959*. Source: Pereiro, J.L., "Desarrollo y deterioro urbano de la ciudad de Vigo", Ed. COAG, 1981, p.142.
**FIGURE 2.91** *Labañou aerial view 1957*. Source: Spanish Ministry of Defence. Cuatro Vientos, Madrid.
**FIGURE 2.92** *Labañou (A Coruña) urban plan of 1965*. Source: A Coruña Town Council's Historical Archive.
**FIGURE 2.93** *Labañou aerial view 1967*. Source: Historical Archive of the Kingdom of Galicia (CEFTA).
**FIGURE 2.94** *Labañou (A Coruña) 1970*. Source: A Coruña Town Council's Historical Archive.
**FIGURE 2.95** *Elviña urban plan of 1965 (current situation)*. Source: A Coruña Town Council's Historical Archive.
**FIGURE 2.96** *Elviña urban plan of 1965 (zoning)*. Source: A Coruña Town Council's Historical Archive.
**FIGURE 2.97** *Elviña (A Coruña) aerial view 1967*. Source: Historical Archive of the Kingdom of Galicia (CEFTA).
**FIGURE 2.98** *Elviña (A Coruña) 1967*. Source: Alberto Martí, in Toba, M. "José Antonio Corrales Unidad Vecinal nº3", Ed. COAG 2009, p.55
**FIGURE 2.99** *Recimil (Ferrol) urban plan of 1960 (road network)*. Source: Ferrol Town Council's mapping Office.
**FIGURE 2.100** *Recimil (Ferrol) urban plan of 1960 (zoning)*. Source: Ferrol Town Council's mapping Office.
**FIGURE 2.101** *Recimil and Spain Square (Ferrol) 1965*. Source: https://sites.google.com/site/ferrolantiguo2/plzespaa24.jpg
**FIGURE 2.102** *Recimil and Spain Square (Ferrol) 1965*. Source: https://sites.google.com/site/ferrolantiguo2/plzespaa22.jpg
**FIGURE 2.103** *Caranza urban plan of 1960 (road network)*. Source: Ferrol Town Council's mapping Office.

**FIGURE 2.104** *Caranza map of 1962 (topography of the current situation)*. Source: Archive of Galician Institute of Housing and Land (IGUS).
**FIGURE 2.105** *Caranza (Ferrol) aerial view 1967*. Source: Historical Archive of the Kingdom of Galicia (CEFTA).
**FIGURE 2.106** *Caranza (Ferrol) 1970*. Source: Sociedad Galicia de Caranza (Foto 1972 "Hogar y Arquitectura", nº101, 1972, p.6)
**FIGURE 2.107** *Coia (Vigo) 1961 (demolitions of the development project)*. Source: M.Fernández, "Génesis y evolución de los polígonos del INV en Galicia", 2010, p.216.
**FIGURE 2.108** *Coia (Vigo) map of 1961 (parcelation)*. Source: Archive of Galician Institute of Housing and Land
**FIGURE 2.109** *Coia (Vigo) aerial view 1966*. Source: Treasury Department, Cadastral Agency of Vigo.
**FIGURE 2.110** *Coia (Vigo)1966*. Source: http://aulagalicia.blogspot.com/2015/05/blog-post.html
**FIGURE 2.111** *Labañou (A Coruña) urban plan of 1967*. Source: A Coruña Town Council's Historical Archive.
**FIGURE 2.112** *Labañou (A Coruña) aerial view 1972*. Source: National Cartographic Centre, Madrid.
**FIGURE 2.113** *Labañou (A Coruña) 1971*. Source: Alberto Martí (La Voz de Galicia) https://vellaenobrebrigantium.blogspot.com/2016/11/vista-aerea-desde-labanou.html?spref=pi
**FIGURE 2.114** *Labañou (A Coruña) aerial view 1980*. Source: A Coruña Town Council´s infraestructures Office.
**FIGURE 2.115** *Elviña (A Coruña) aerial view 1972*. Source: Source: National Cartographic Centre, Madrid.
**FIGURE 2.116** *Elviña (A Coruña) 1972*. Source:Alberto Martí in Toba, M. "José Antonio Corrales Unidad Vecinal nº3", Ed. COAG 2009, p.53
**FIGURE 2.117** *Elviña (A Coruña) 1973*. Source: Paisajes Españoles SA, A Coruña City Council's Historical Archive
**FIGURE 2.118** *Elviña (A Coruña) aerial view 1980*. Source: A Coruña City Council's infraestructures Office .
**FIGURE 2.119** *Recimil (Ferrol) 1974 (demolition of Esteiro)*. Source: https://www.skyscrapercity.com/showthread.php?p=127946033#post127946033
**FIGURE 2.200** *Recimil (Ferrol) redevelopment plan of Caranza 1976*. Source: Archive of Galician Institute of Housing and Land (IGUS).
**FIGURE 2.201** *Recimil (Ferrol) aerial view 1978*. Source: Historical Archive of the Kingdom of Galicia (CEFTA).
**FIGURE 2.202** *Recimil (Ferrol) 1980*. Source: Mundobasket España 1986.
**FIGURE 2.203** *Caranza (Ferrol) redevelopment plan of Caranza 1976*. Source: Archive of Galician Institute of Housing and Land (IGUS).
**FIGURE 2.204** *Caranza (Ferrol) redevelopment plan of Caranza 1976*. Source: Archive of Galician Institute of Housing and Land (IGUS).
**FIGURE 2.205** *Caranza (Ferrol) aerial view 1978*. Source: Historical Archive of the Kingdom of Galicia (CEFTA).
**FIGURE 2.206** *Caranza (Ferrol) 1987*. Source: Paisajes Españoles SA
**FIGURE 2.207** *Coia (Vigo) aerial view 1971*. Source: National Cartographic Centre, Madrid.
**FIGURE 2.208** *Coia (Vigo) Plan of Coia 1975 (zoning)*. Source: Archive of Galician Land and Housing Agency.
**FIGURE 2.209** *Coia (Vigo) Plan of Coia 1975 (green areas)*. Source: Archive of Galician Land and Housing Agency.
**FIGURE 2.210** *Coia (Vigo) 1982*. Source: Paisajes Españoles SA.

# 3 Spatial transformation at neighbourhood scale

# 3 Spatial transformation at neighbourhood scale

## Introduction

This chapter explores the question of spatial transformation at the neighbourhood scale, which allows us to observe the development of the intervention area of residential spaces and their surroundings over time, and how this affects the continuity of the urban structure, from the moment of the construction of the housing estates in a peripheral environment defined by a rural fabric, through to their integration by forming a neighbourhood or becoming part of it.

The chapter is divided into five sections based on the analysis of the case studies presented in the previous chapter. In the first section, the intervention site is studied through the transformation of the rural and urban fabric at the edge of the housing estates. The second studies the generation of the land in the place where the housing estates are built from the transformation of the rural fabric and the creation of the layout of the elements of the urban fabric. The third studies the influence of the elements that have remained in place since the construction of the housing estates in the development of the urban fabric. The fourth studies the elements that make up the ground plan and their influence on the transformation of the rural fabric and the current urban fabric. Finally, the fifth studies the spatial organisation of the intervention site through the elements that comprise the ground plan (types of public-community-private land and types of road) and its volume (rural grain, urban grain and uses).

As part of the main research question related to the contribution of public housing to spatial cohesion and to the improvement of urban structure (p.58), this chapter studies the initial formation of housing estates, considered as peripheral fragments, answering the question of how it affects the inherited territorial structure in the urban setting of the estate. It also shares with chapter four the study of the creation of relationship spaces from the construction of the estates, which allows us to observe their urban arrangement, responding to how it affects the distribution of the built elements and free spaces of the neighbourhood in the urban cohesion of the public housing project.

### Why this study is necessary as a part of the thesis

In this thesis, the study of the housing estates is relevant due to their importance in the formation of the urban structure in the periphery, in the city, and over time. For this reason, it is essential to evaluate their formative potential in the urban fabric at the scale of the neighbourhood, because it allows us to observe the value of the relationship between private, community, and public open spaces through its components.

Studying urban transformation on a neighbourhood scale is essential to assess the need for the rehabilitation of areas with public housing, how they have been formed, how they have been integrated into the urban fabric, how the rural and urban fabric has influenced the configuration of the edge of the housing estate and the development of the surrounding neighbourhoods, and whether they have been an obstacle to their integration. By observing whether there are any discontinuities around the estate, we can explain the causes of the lack of cohesion and continuity with the urban fabric, and at the same time, it is at this scale that we can begin to identify the spaces of opportunity and their need for regeneration, inside (in the voids between buildings), outside (in relation to the city and other neighbourhoods), and on the edge of the spaces created in the construction and transformation of the estates.

### What I am going to be able to see at neighbourhood scale

In the introduction to the first chapter, the meaning of neighbourhood has been defined (p.27), which in Spain represents the basic unit of collective life in its cities. The neighbourhood is the space of which the residential areas form a part: in this thesis, in order to study its spatial transformation, the neighbourhood is established as an area that contains the limits of the area and its surroundings, with a large enough scope to include the large housing estates that comprise a neighbourhood in themselves, and the smaller estates that are part of a neighbourhood, as well as to observe how the estate fits within in the urban fabric, on its edge and in relation to its surroundings.

The neighbourhood scale in the analyses carried out in this chapter contains the elements of the rural and urban fabric between the housing estate and the city, which allows us to distinguish between the intervention area of the estate with its geometry, size and shape, and the type of rural and urban grain that explains the shape and size of the built elements; its relationship with the different types of rural and urban road network made up of paths, tracks and streets; the rural and urban fabric with its different uses, dimensions, shape, and type of aggregation. This is done in order to observe how and where new elements are incorporated, their permanence in the different stages of urban development within the estate, on its edge and in the surrounding neighbourhoods, how their position and size affect the rural and urban fabric, and how they fit within the overall urban development.

### What I am going to be able to see over time

Observing what happens over time in the area where the housing estates are built allows us to understand how the creation of new city fragments affects urban continuity, from the moment of their construction in a peripheral environment to their integration by forming a neighbourhood or becoming part of it, showing which elements remain, which elements influence the project, and its relationship with the structure of the neighbourhood.

In all the case studies, the analysis begins to be documented in the middle of the 20th century, with the exception of Recimil in 1930, as no other documentation was found before the construction of the housing estate. In this first stage, the characteristics of the rural fabric prior to the construction of the estates are observed. The second stage documents what happened after the construction of the small housing estates in the late 1950s, and at the time of the construction of the large housing estates in the late 1960s and early 1970s. This makes it possible to observe what the space where the city is being transformed is like, how the rural fabric in which this transformation takes place has been modified, and how the urban edge has changed. The third stage covers what happened between the end of the 1970s and the early 1980s, after the construction of large estates and in the area where the first estates were built. Finally, the fourth stage shows what their situation was like in the first decade of this century. In both cases, this makes it possible to observe how the construction of the estate has influenced the rural fabric and the development of the urban fabric.

### What is being sought in the analysis (methodology)

In the analyses of the case studies in this chapter, the same fragment of city is represented in different periods of time, before and after the construction of the different types of housing estates, in a rectangular frame of equal scale and dimension (2.5x1.5 km), placing the estate in its centre in order to be able to observe its transformation in relation to that of its edge (immediate limit) in the neighbourhood that it forms or of which it forms a part, and the relationship with the neighbourhoods that develop in its vicinity. This framework is elaborated based on the digital plans in AutoCAD of the cities from the year 2006, to which digitally scanned historical plans and aerial photographs have been superimposed, in order to redraw the content of each period.

This historical review process has made it possible to work in layers, differentiating each element that constitutes the place of intervention of the estate over time within the rural and urban fabric, making it possible to combine, measure and compare them. The aim is to intentionally represent the urban transformation as seen from the rural space, in order to demonstrate the value of the rural fabric: what is colonised, what remains, and what may condition future interventions in the development of the urban fabric.

## § 3.1 An intervention area of edges and sutures

This section examines: 1) where the public housing intervention area originates, 2) the outcome and characteristics of the construction process in the intervention area, and 3) the influence of the rural fabric on the transformation of the urban edge, in order to explain the changes produced in the intervention site after the construction of the housing estates.

### 3.1.1 What is this section about?

By analysing the intervention area, we can observe the transformation over time of the rural and urban fabric that forms the edge of the housing estate, the urban edge and the space between both, which helps us to explain the conditions that have occurred before, during and after the construction of the estate. In order to do so, we observe how the rural and urban grain varies, how it relates to the road network, how and where new elements are incorporated, and how their position and size affect the rural and urban fabric. In other words, which elements of the rural and urban fabric have conditioned the 'suture' on the edge of the estate.

By studying the **transformation** of the place where public housing is built, it is possible to observe how and where the original rural fabric has persisted over time, and which of its elements are modified or disappear at each stage of urban development. In all the case studies, this allows us to observe how the rural fabric has been transformed after the construction of the estates, what the space occupied by the estates and the rest of the urban elements in the rural fabric is like, and if this process has made it difficult to 'suture' the estate on its edge.

By studying the **result and characteristics** of the construction process in the intervention area of the estate, we can see how and where new elements are incorporated into the urban fabric, what they are like, and how they are transformed over time. In all the case studies, this allows us to observe which elements have conditioned the integration of the estates within the urban fabric, how and in what way they are located at the edge of the estate, how the urban fabric has developed up to the edge of the estate, and in its relationship with the surrounding neighbourhoods.

By studying the **influence** of the rural fabric on the transformation of the urban edge, we can see how and where the original rural fabric remains, and which of its elements are transformed or disappear over time. In all the case studies, this allows us to observe how the originally rural fabric has influenced the configuration of the edge of the estate and the integration of the estate into the urban fabric, whether it has been an obstacle

to the development of the urban fabric, and whether it has influenced the image and shape of the urban edge.

### 3.1.2 How is the analysis carried out?

The analysis uses three comparisons, the first representing the rural fabric that is maintained over time, the second representing the urban fabric that is created at each stage of urban development, and the third showing how much of the rural fabric is maintained at the edge of the housing estates and in the surrounding neighbourhoods.

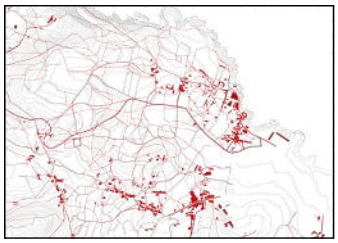
In order to represent the rural fabric over time, we highlight on the topography the group of buildings and rural roads formed by paths and roads, differentiated according to their width. All of them are represented with the same colour, in order to express them as the elements that make up the rural fabric, both in origin and over time, including non-urban buildings. With the intention of highlighting the role of the rural fabric in urban development, no element of the urban fabric is represented, displaying the place it occupies as an empty space. This comparison reveals how much of the rural fabric is eliminated and maintained around the estate in four different periods, prior to the construction of the estates, after their construction, and in the first decade of this century.

In order to represent the urban fabric that is created in each stage of urban development, the set of buildings and urban roads are identified on the topography, represented with the same colour to express them as the elements that make up the urban fabric as it expands. With the aim of indicating the form of urban growth, the rural fabric is not represented, instead representing the place it occupies as an empty space. With this comparison, we can observe the type of urban elements that predominate on the edge of the estate and in the surrounding neighbourhoods in four different periods, prior to the construction of the estates, after their construction, and in the first decade of this century.

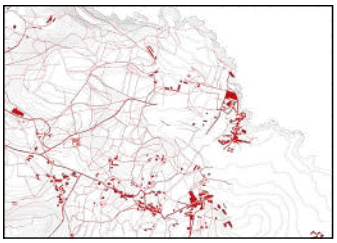
To represent how much of the rural fabric is maintained on the edge of the estates and in the surrounding neighbourhoods, the rural fabric of two different correlative periods is superimposed in the same analytical framework, differentiating by colour the rural fabric of the current period and the elements of the previous period that no longer form part of that fabric. This comparison reveals how much of the rural fabric is eliminated and maintained in three different periods, prior to and after the construction of the estates in the 1940s-50s and 1960s-70s, and from the 1980s to the first decade of this century.

## An intervention area of edges and sutures

A Coruña
Labañou
María Pita

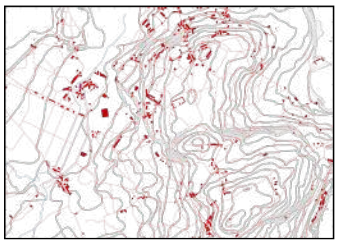


1948

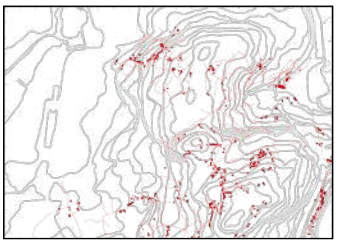


1957

A Coruña
Elviña
Barrio Flores

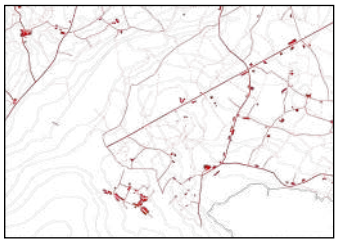


1945



1972

Ferrol
Recimil



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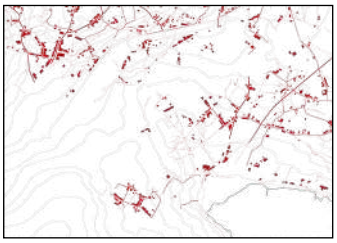
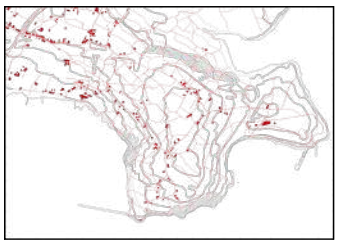
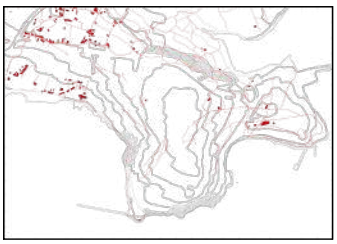


1957

Ferrol
Caranza



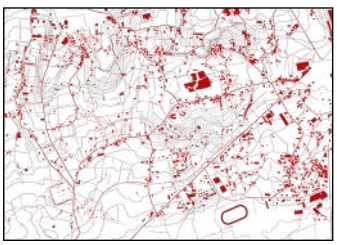
1957



1967

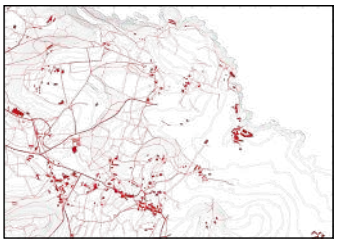
Vigo
Coia
Cristo Victoria

1949



1969

Path Track Building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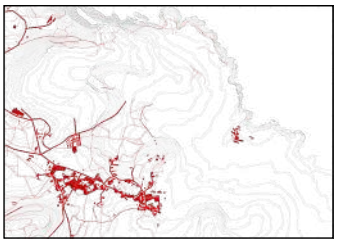
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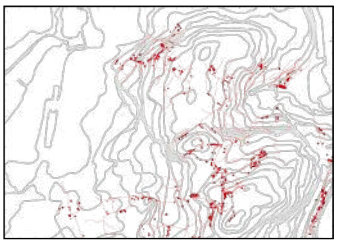
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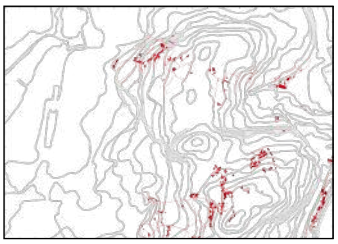
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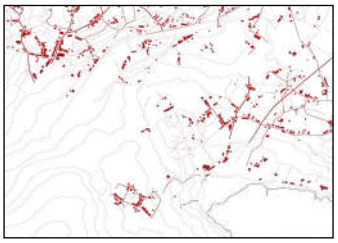
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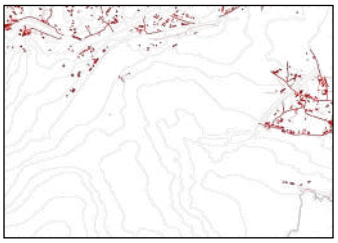
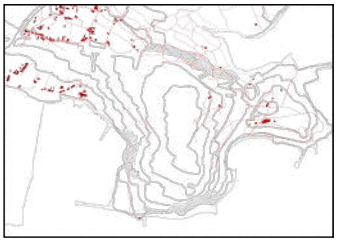

2006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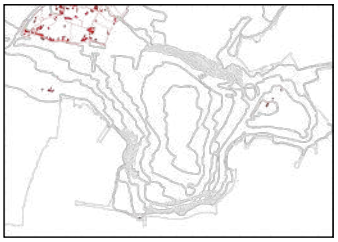
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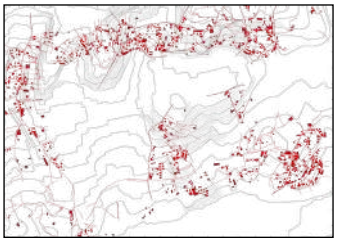
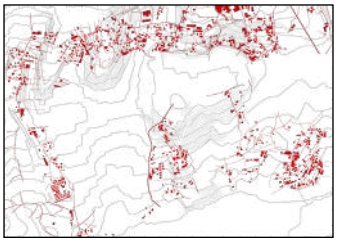
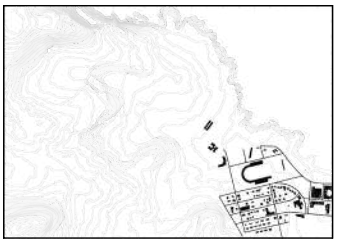
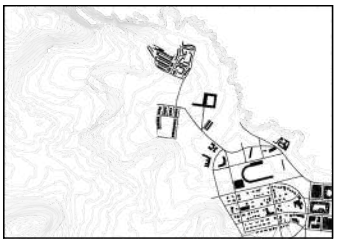

1985


2006

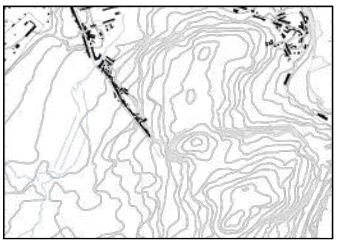
## An intervention area of edges and sutures

A Coruña
Labañou
María Pita


1948


1957

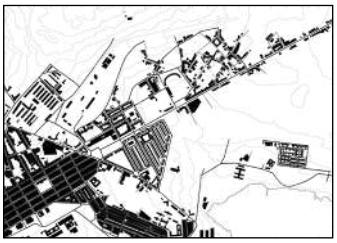
A Coruña
Elviña
Barrio Flores


1945

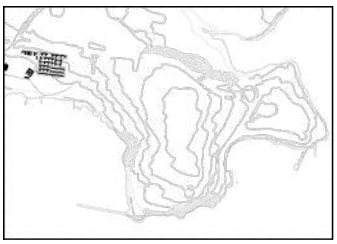

1972

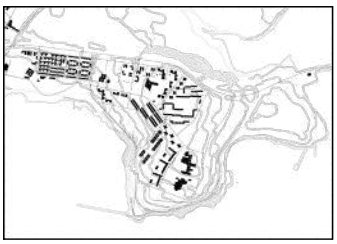
Ferrol
Recimil


1930

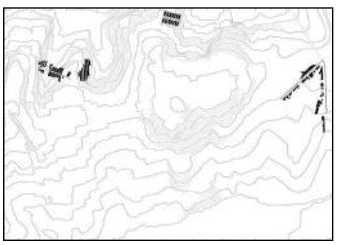

1957

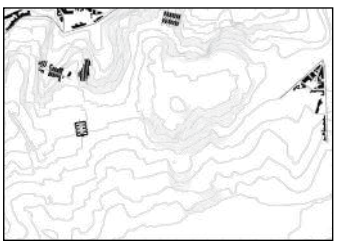
Ferrol
Caranza


1957


1967

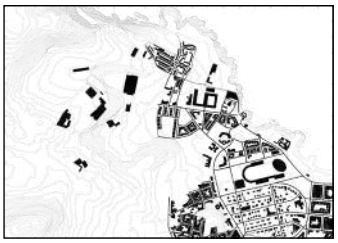
Vigo
Coia
Cristo Victoria


1949

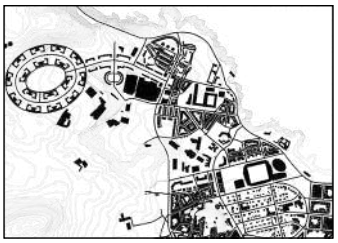

1969

Road Building

1980



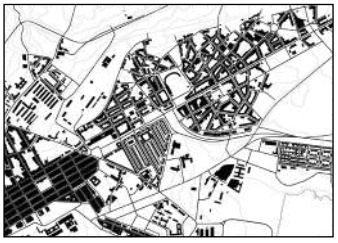
2006



1980

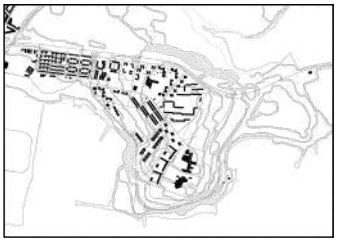
2006

1978



2006

1978



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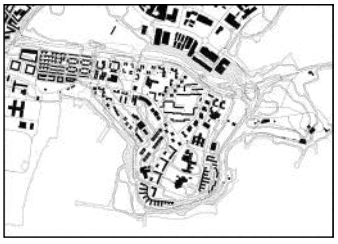
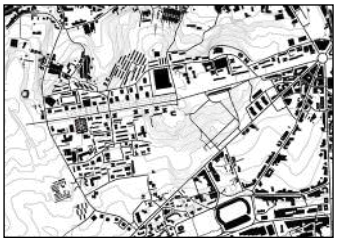


1985



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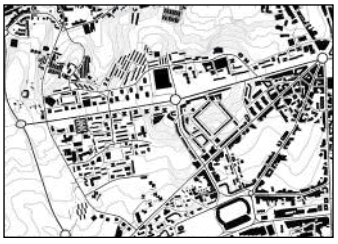


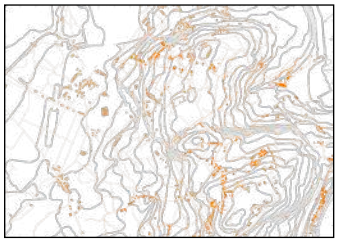
## An intervention area of edges and sutures

A Coruña
Labañou
María Pita

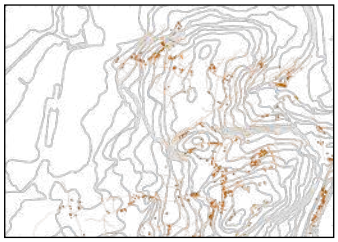
1948
1957

1957
1980

A Coruña
Elviña
Barrio Flores

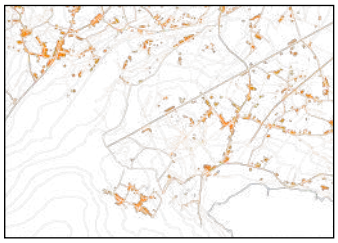


1945
1972

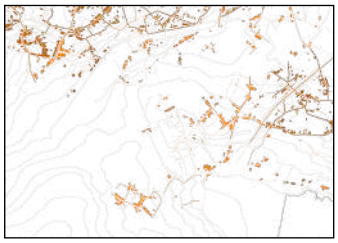


1972
1980

Ferrol
Recimil

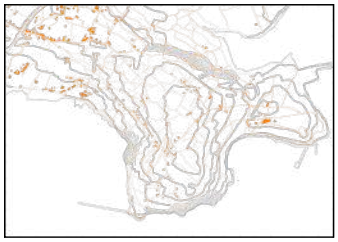


1930
1957

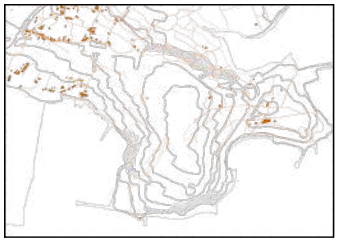


1957
1978

Ferrol
Caranza

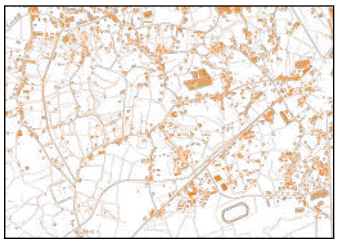


1957
1967



1967
1978

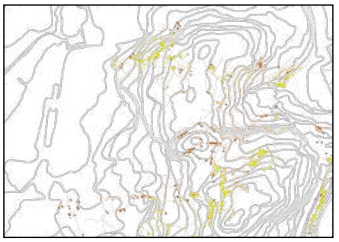
Vigo
Coia
Cristo Victoria

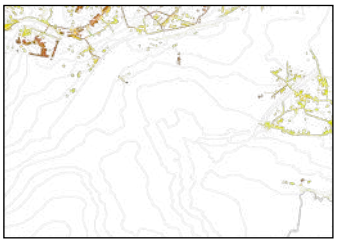


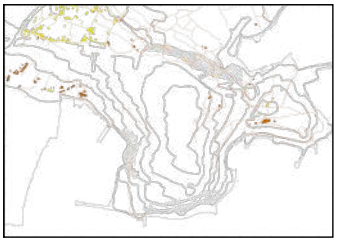
1949
1969

1969
1985


1980
2006


1980
2006


1978
2006


1978
2006


1985
2006

### 3.1.3 An intervention area of edges and sutures. Particular Conclusions

**1. The place where the public housing is constructed has its origin in the colonization of the rural space located on the urban edge, in a process that begins with the alteration of the elements present in the intervention site and continues with the fragmentation of the rural fabric, which makes it difficult to 'suture' the housing estate on its edge.**

Originally, the space where the public housing was built was a rural area, consisting of a dense network of villages with their own farmland and the roads connecting them. The construction of small housing estates in the 1940s and 50s was carried out by superimposing them on the rural fabric, which disappeared inside the estate and was altered on its immediate edge when the agricultural land was broken up, without losing part of the connection with the rural road network that served the estate as the only link with the urban fabric. With the exception of Recimil, which is connected to the urban expansion area, in the rest of the cases the estate is part of the rural fabric, which at this time formed a border between it and the urban fabric. This was very large in the case of the Cristo de la Victoria estate, and smaller in the case of Maria Pita.

As a result of the construction of the large housing estates in the 1960s and 1970s, a larger fragment of rural space was colonised, consisting of several villages and their farmland, which led to an increase in the size of the edge area around the estate, characterised by a greater variety of elements, buildings, and rural and urban roads, which, together with the topography, made it more difficult to suture them to the urban fabric. This fracture in the rural fabric led to the breakdown of the balance between the villages and the exploitation of their farmland. However, this did not happen in the intervention areas of the small estates that were distanced from the urban fabric, such as María Pita, which maintained its edge characterised by the rural fabric, which was a little more fragmented due to the increase in new urban elements, such as facilities, industrial warehouses, new estates and blocks of flats, which did not help to improve the isolated nature the estate and the difficulty of suturing it to the urban fabric.

In the 1980s, in all the estates, regardless of their size, fragments of the rural fabric remained on their edges: buildings, paths, and plots of land, which limited their suture with the urban fabric, in combination with the slowness in reducing their distance from it.

In the first decade of the twenty-first century, with the exception of Coia, the distance between the housing estates and the urban fabric of the neighbourhood that grew up around them was reduced, without achieving full suture despite the reduction or elimination of rural fragments on the edge of the estate, which were replaced by new estates and facilities, isolated buildings and unbuilt plots that represented a new obstacle to achieving full integration into the urban fabric. In cases such as Caranza or

the Barrio das Flores, the fragment of rural fabric was marginal, forming a small part of the edge between the estate and the surrounding neighbourhoods. In the case of Recimil or María Pita it disappeared from their edge, instead being situated between the urban fabric of the surrounding neighbourhoods. This was not the case in Coia, where the rural fabric is the basis upon which the density of the edge was increased with new single-family housing.

**2. The intervention area of the housing estate is an artificially constructed site, delimited by the geometry of the project, conditioned by topographical elements and poorly related to the urban structure, originally consisting of a weak road network and isolated buildings. This circumstance makes it difficult to develop the urban fabric up to the edge of the estate and in relation to the surrounding neighbourhoods.**

The first housing estates built in the 1940s and 50s comprise a small artificial fragment limited by the geometry of the project, surrounded by the rural fabric, and located at a distance from the urban fabric. Among all the cases studied in this period, the Cristo de la Victoria estate has a more marginal position in relation to the urban fabric, located in the middle of the rural fabric, and the only urban elements at a certain distance are other estates and growth areas due to the extension of streets. Maria Pita has a weak connection with an urban fabric composed of isolated buildings and empty lots close to growth areas and 'garden city'. This differ from Recimil, which is part of the urban expansion area with one of its façades facing the square and the main avenue leading to the city.

In the 1960s and 70s, the distance between the urban edge and the large housing estates, together with a greater extension of the edge of the estate, conditioned by topographical elements and rural plots, increased the complexity of the space between the estate and the urban fabric, making it difficult to suture them together. The Barrio das Flores has a weak connection defined by the growth based on the hamlet of villages and the new phases under construction of the Elviña housing estate. In Caranza, the connection with the urban fabric is even weaker, defined by the new entrance road to the city, the rural fabric on the edge, and a small estate which marks the boundary with the rural fabric.

In the 1980s, the urban edge in relation to the estates offered an image that was still highly fragmented, the result of the increase in isolated constructions and medium and low density fabrics of a heterogeneous nature that lacked cohesion. This can be clearly seen in María Pita, where the edge of the estate is formed by an urban fabric of blocks,

isolated buildings and empty lots that are part of the alignments of future blocks, and isolated schools and industries, superimposed on the rural fabric. It can also be seen in the Barrio das Flores, where the road infrastructure and the constructions of the first, second and third phase of the Elviña estate have been completed, which creates a clear but complex boundary with the Barrio das Flores, conditioned by the isolated buildings and roads of the estate on its west side, the growth areas based on the groups of rural houses on its west side, and the open space of the rural fabric to the south. In the rest of the estates, the distance to the urban edge is conditioned by the rural fabric, at a greater distance in Caranza than in Coia, which has an urban edge defined by constructions along the roads and isolated buildings in the rural fabric. The exception is Recimil, which, despite being part of a dense urban expansion area, has large areas that are difficult to suture together, conditioned by new roads and isolated buildings on the eastern edge of the estate.

In the first decade of the twenty-first century, the edge of the estates was comprised of a wide variety of constructions and fabrics of different grains and densities, which made it difficult for them to be totally integrated into the urban fabric, maintaining an image of an isolated fragment of the estate. This can be seen in Recimil or María Pita, where the edge of the estate is part of an urban fabric formed by estates, blocks, isolated buildings and plots; in the Barrio das Flores, part of a urban fabric with an edge conditioned by different types of roads, avenues on its north side and the city's ring road to the south; in Caranza, part of an urban fabric but visually limited by its peninsular position on the edge of the estuary and the ring road that separates it from the new industrial estate; and in Coia, where the urban fabric is characterized on the edge of the estate by low-density growth on the rural fabric, and the new neighbourhoods in their environment formed by blocks and isolated buildings supported by the road network.

**3. The colonizing nature of the housing estates dictates that the fragment of rural fabric on which they are built is an obstacle, less significant at first than when it is consolidated on the edge of the estate. This makes it a conditioning factor in the integration of the estate into the urban fabric, and a characteristic that influences the fragmented and heterogeneous image of the urban edge.**

Between the previous state and that of the construction of the housing estates of the 1940-50s, a small number of buildings, fragments of paths and tracks were removed from the rural fabric, located on the site of the project or in the space occupied by new, isolated constructions around the edge of the estate. This initial colonization of the rural fabric barely modified its structure, which continued to be a space on the edge

between the estate and the urban fabric, posing a small obstacle, more because of the distance created to the urban edge than because of the difficulties of transforming the rural fabric. This can be seen in the Cristo de la Victoria and Maria Pita estates, which form a part of the rural fabric, unlike Recimil, located on the urban edge.

The consequences of this process of colonization were multiplied in the areas where the large estates were built. Between the 1960s and the early 1970s, the almost complete disappearance of the rural fabric within the estates led to a significant degree of fragmentation on their edges, with the breakdown of the continuity of roads and tracks in the rural fabric, the loss of use of agricultural plots, and the increase in new construction.

Between the 1970s and 1980s, the edge of small estates was characterized by a greater fragmentation of the rural fabric and an increase in urban elements of different types and sizes. In María Pita, in the middle of the rural fabric, groups of plots of land were occupied, where facilities and industrial buildings were built, as opposed to the space where the new urban fabric was formed with blocks, isolated buildings and empty lots, where the rural fabric disappeared, in same way as in Recimil. In the larger estates, until the 1980s, fragments of the rural fabric were kept on the edges, which, added to the new urban elements built around them, offered a heterogeneous image of the urban edge.

From the 1980s to the first decade of the 2000s, with the exception of Coia, most of the estates did not have the rural fabric on their edges, but their plots of land and the road network served in many of them as a framework that conditioned the shape of the blocks, buildings or layout of the new streets, providing the urban fabric with part of the base to shape its heterogeneity. In cases such as Caranza or the Barrio das Flores, fragments of rural fabric still remain on its edge. In the case of Recimil or María Pita they have disappeared from the edge of the estate, and now form a part of the urban fabric of the surrounding neighbourhoods, unlike Coia, where they have served as a base for low-density growth on the edge of the estate.

## § 3.2 The creation of urban land

This section studies 1) how land is generated in the public housing intervention area, and 2) how land ownership conditions the delimitation of the intervention land, in order to explain how the site of the housing estate adapted to the rural and urban fabric.

### 3.2.1 What is this section about?

By analysing the creation of the urban land in the place where the housing estates were built, we can see the transformation over time of the rural areas that initially comprised the layout of the housing estate and its edge. This helps to explain how the plot for the estate was created and the rest of the urban elements that were built around it. To do so, we will see how the rural and urban plots vary, how and where new elements were incorporated, and how their position and size affected the transformation of the rural fabric: in other words, how the layout of elements that form a part of the urban fabric were generated from the rural fabric.

By studying how the plots were **generated** on which the different types of housing estates were built, we can see how and where the layout of plots of rural origin was transformed over time, what the result of shaping a new urban plot on the rural plot was, and how this process of subdivision influenced the edge of the estate. In all the case studies, this allows us to see how the rural plot layout was transformed as a result of the construction of the estates, what type of plot delimits the estates and the rest of the urban elements, and what the process was like of creating an urban plot layout based on the rural plot layout.

By studying how land ownership **conditions** the delimitation of the land where the interventions were carried out, we can observe the different types of ownership, how the shape of the land used for the intervention was generated, how the aggregation of plots occurred, and what type of perimeter the new urban plot layout created over the rural plot layout. In all the case studies, this allows us to observe the perimeter of the estates and the influence of existing elements on the fragmentation and continuity of the plots where the interventions were carried out.

### 3.2.2 How is the analysis carried out?

The analysis uses two complementary comparisons, which must be interpreted simultaneously. In the first, the rural plot layout and the urban fabric are represented over time; in the second, the urban fabric created at each stage of urban development is represented on the original rural plot layout.

To represent the rural and urban plot layout over time, in the absence of land registry plans, aerial photography of the intervention area is used from the previous state to the current one. This is limited by the impossibility of measuring the number of plots existing in each period, but it allows us to observe in the same representation the form and division of the land related to its use, in the different stages chosen for the analysis, before and after the construction of the different types of housing estates.

Using the collage technique, the perimeter of the urban elements that have been built in the intervention area in the last period analysed are superimposed over the aerial photography of each period, highlighting the housing estate in yellow and tracing the perimeter of the blocks, isolated buildings and open spaces. All of them are represented with the same colour to explain them as elements of the urban fabric. This comparison reveals how the use of the rural plot layout is modified, and how it is transformed by grouping them into plots for urban use.

To represent the urban fabric that is created at each stage of urban development over the original rural plot layout, aerial photography of the intervention area in the stage prior to the construction of the housing estates is also used. This has as a limitation the impossibility of identifying the ownership of the plots, although it does make it possible to observe in the same representation the shape and the division of the land related to its use, and the different types of urban elements that overlap in the original plot.

Using the collage technique, the buildings constructed in the intervention area are superimposed on the aerial photography, using different colours to differentiate those constructed in each period. By means of this comparison, we can observe the perimeter that delimits the housing estates and the rest of the urban elements built over the original rural fabric.

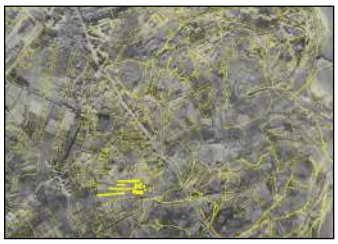
## The creation of urban land

A Coruña
Labañou
María Pita


1948

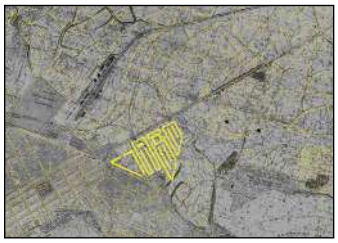

1957

A Coruña
Elviña
Barrio Flores


1945

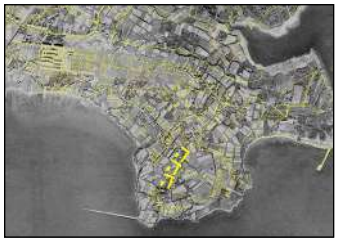

1972

Ferrol
Recimil


1930

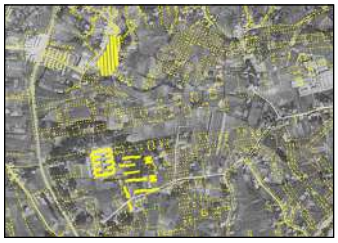

1957

Ferrol
Caranza


1957


1967

Vigo
Coia
Cristo Victoria


1957


1966

Building 2006

1980

2006

1980

2006

1978

2006

1978

2006

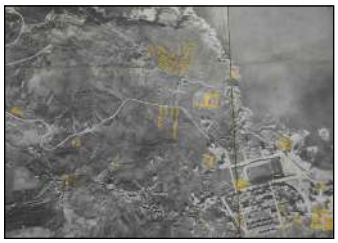
1971

2006

## The creation of urban land

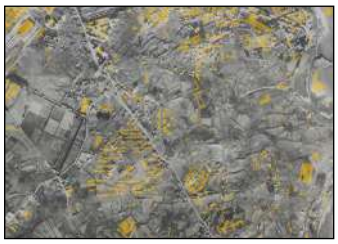
A Coruña
Labañou
María Pita


1948


1957

A Coruña
Elviña
Barrio Flores


1945


1972

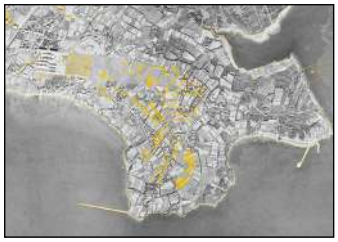
Ferrol
Recimil


1930


1957

Ferrol
Caranza


1957


1967

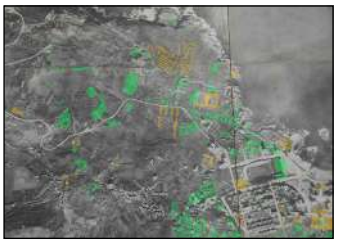
Vigo
Coia
Cristo Victoria


1948

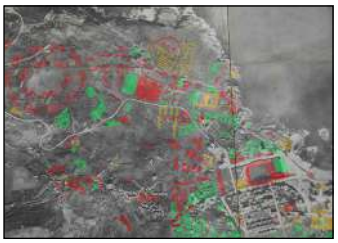

1966

Building 1954 Building 1980 Building 2006

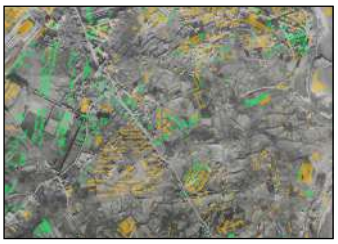
1980



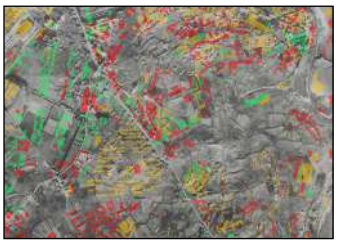
2006



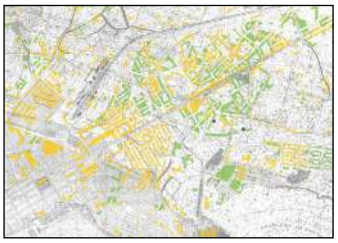
1980



2006

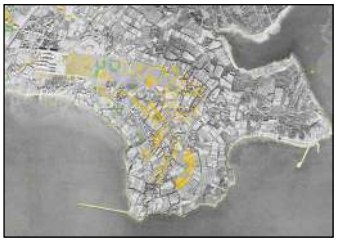


1978



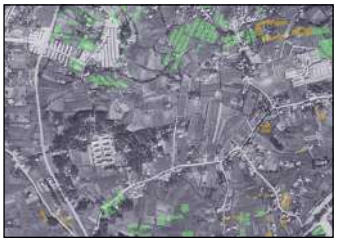
2006

1978



2006

1971



2006

### 3.2.3 The creation of urban land. Particular Conclusions

The result of the evaluation of land generation at neighbourhood level provides two conclusions related to the delimitation of the intervention land and to land ownership.

**1. The creation of urban land in the case studies is achieved by making an intervention area continuous by combining several plots, and to a lesser extent, as a result of developing a plot that is cohesive due to its large size, or having only been used for a single purpose.**

In general, the plot layout of the original rural fabric in the case studies is made up of a large number of small plots belonging to different owners, as a result of the smallholder character of the farming system. The construction of small housing estates in the 1940s and 50s was achieved by superimposing them over this plot layout of the rural fabric, which disappeared inside the estate and was altered at its immediate edge, as the shape of the estate did not coincide with the shape of the plots it occupied. This can be clearly seen in Recimil and in a subtler way in the case of María Pita and the Cristo de la Victoria estate, where the regular shape of the estate is better adapted to the rural plot layout, producing small fractures in its limits, increased by the difference of height in those façades where there is no relationship with other buildings and access roads.

In the 1960s and 70s, with the construction of the large housing estates and the increase in their size, a larger fragment of rural space was colonised, consisting of the plot layout of several villages that defined a broad and generally very irregular edge, characterised by buildings, roads and topography to which the project had to be adapted. Although inside the estates the rural plot layout was replaced by a new, more geometrical pattern, on its edge, between the buildings and the edge of the estate, large areas were created that were unused and disconnected from the rural fabric, making it difficult to integrate it with future growth. This can be seen in Coia, with the project plot conditioned by buildings and topography that delimit an extensive and irregular edge. It can also be seen in Caranza, although here the limits of the plot are conditioned by its geographical location and the road; or in the Barrio das Flores, part of the Elviña housing estate, with a project plot that is more regular, but equally adapted to the existing elements built on its edge.

In the 1980s, fragments of the rural fabric were maintained on the edges of all the housing estates and in the surrounding neighbourhoods. Their plot layout served as a basis for growth that was achieved through continuity, and generally without planning. The here, land was generated by using a plot or adding plots of rural origin to construct buildings that would eventually become a block, when they were not isolated buildings or facilities that consisted of several plots, while still maintaining the irregular shape of

the original plot layout. This can be seen in the area around María Pita housing estate, which constitutes an urban fabric of different plot shapes with the new buildings. These plot shapes remained until the blocks delimited by the original rural plot layout were completed, as a part of buildings with plots or unbuilt plots, and in the first decade of the twenty-first century they could still be clearly seen as part of the urban fabric in the neighbourhoods around the estates.

**2. Ownership of the land conditions the delimitation of the land used for the intervention. In general, in the case studies, as the land is in the hands of multiple owners and the plots are small, the land on which the housing estates are built tends to have irregular perimeters the larger they are, and more regular and continuous perimeters the smaller they are.**

On the land where the housing estates are built, there have been two main forms of land ownership, generally small, multiple-ownership plots, and to a lesser extent, large, single-ownership plots. In both situations, land ownership has passed into public hands, generally through compulsory purchasing. Where the State owned a large portion of the land, the consolidation of the plots was facilitated, resulting in a continuous intervention area, unlike most of the case studies, which consist of small, multiple-ownership plots, where difficulties in their management led to the delimitation of smaller intervention perimeters or to projects that were carried out in stages, leaving a large amount of compulsory purchased land unused for years.

The construction of the small housing estates of the 1940s and 50s was generally achieved by combining together a small number of multiply-owned plots, which, together with the regular shape of most of these estates, made it possible to create a continuous intervention area with regular perimeters. This is the case of María Pita and the Cristo de la Victoria estates, where the regular shape of the estate is better adapted to the rural plot layout. These differ from the large estates of the 1960s and 70s, which occupied a large area of small plots with multiple land ownership, generating a wide and usually very irregular perimeter, conditioned by the existing elements on their edge. The larger number and type of the existing elements explains the fragmentation and lack of continuity of the intervention areas, something that is more evident in Coia than in Elviña and Caranza.

## § 3.3 Existing elements of the edge or location

This section explores 1) the variation between the existing rural-urban grain and the expansion grain, and 2) the transformation of the new and existing road network, in order to evaluate at neighbourhood level 3) the situation of the existing elements resulting from the transformation of the intervention area over time.

### 3.3.1 What is this section about?

With the analysis of the existing elements maintained since the construction of the housing estates, their influence on the development of the urban fabric is studied, taking into account that they can act as a conditioning factor in the intervention area by influencing the development of the urban fabric. For this purpose, we examine the size, quantity, location and characteristics of the roads and buildings, both rural and urban, that remain in the different stages of urban development inside the estate, on its edge, and in the surrounding neighbourhoods. In other words, what percentage of the original urban-rural grain is maintained in the expansion grain, and how much of the original road network forms a part of the expansion network.

The study of the **variation** of the existing and expanding built grain over time reveals how and where the proportion of rural and urban grain varies in the different stages of expansion, what the existing built elements look like, and how they are transformed over time. In all the case studies, this makes it possible to observe how the construction of the estates varies the type and quantity of grain in the urban expansion, how the existing rural and urban elements influenced their configuration and that of the rest of the residential fabric, in their interior, on their edges, and in the surrounding neighbourhoods, and whether they have managed to become integrated within the urban fabric.

By studying the **transformation** of the existing and expanding road network over time, it is possible to see how and where the rural road network remains, where new expansion roads are developed and what type of road network remains, is transformed, or disappears at each stage of expansion. In all the case studies, this makes it possible to observe how the existing elements of the rural road network have influenced the configuration of the residential fabric and the undeveloped spaces of the urban edge, how new expansion roads are generated, and in which cases they are integrated within the urban fabric.

By representing the current **arrangement** of the existing elements inherited from the rural and urban fabric, prior to the construction of the estates, it is possible to see which

elements comprise them, how they are formed, where they are located, and their layout, size and quantity. In all the case studies, this makes it possible to see how the existing elements have influenced the transformation of the estate's intervention area, on its edge and in the surrounding neighbourhoods, whether the existing elements are rural or urban, which are more numerous, and whether they have been integrated into the urban fabric.

### 3.3.2 How is the analysis carried out?

Three comparisons are used in the analysis: the first corresponds to the proportion of rural and urban grain that remains over time, the second represents the existing elements of the rural and urban road network that are maintained in each stage of urban development, and the third shows how much grain and how much of the rural and urban road network is currently maintained from the network prior to the construction of the housing estates.

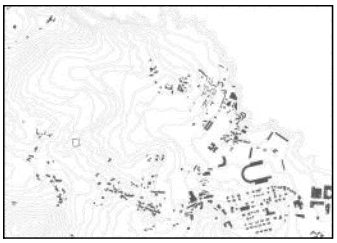
To measure the proportion of rural and urban grain that remains in different stages over time, it is taken into account that the grain represented includes rural and urban buildings, highlighting in black the amount of grain that remains from the previous stage, and in red the amount of expansion grain that is created in that stage. Using this comparison, it is possible to observe in four different periods, prior to the construction of the estates, after their construction, and at present, the type of built grain that predominates around the estate, on its edge and in the surrounding neighbourhoods, differentiating the influence of the existing rural and urban built elements in the urban configuration.

When representing the existing elements of the rural and urban road network that are maintained in each stage of urban development, it is taken into account that the types of road represented, roads, paths and streets, are differentiated by their thickness, distinguishing in black the road network that remains from the previous stage and in red the expansion road network that was created at that stage. Using this comparison, it is possible to observe in four different periods, prior to the construction of the estates, after their construction and at present, the type of road that predominates around the estate, on its edge and in the surrounding neighbourhoods, and the influence of the existing elements of the road network on the urban configuration.

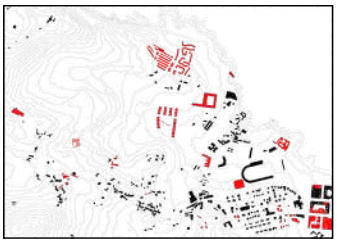
In order to represent how much grain and how much of the rural and urban road network currently remains from the period prior to the construction of the estates, the grain and road network remaining from the previous stage are highlighted in black, and the grain and road network created during that stage in red, first differentiating each one separately and finally integrating both within the same frame. Using this comparison, it is possible to see the value of the existing rural elements in the urban configuration and their relationship with the existing urban elements.

## Existing elements of the edge or location

A Coruña
Labañou
María Pita



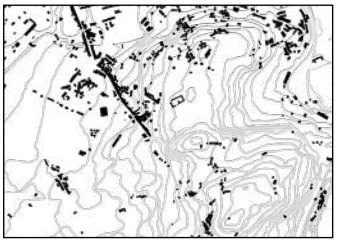
1948



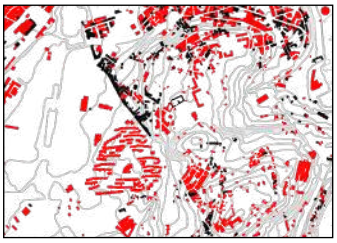
61.8%
*compared to 1948*

1957

A Coruña
Elviña
Barrio Flores



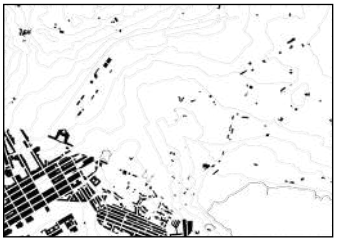
1945



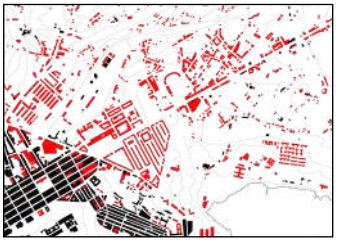
177.9%
*compared to 1945*

1972

Ferrol
Recimil



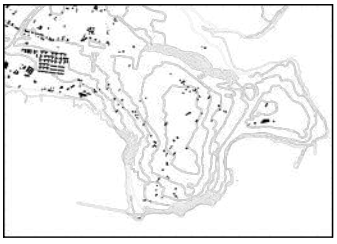
1930



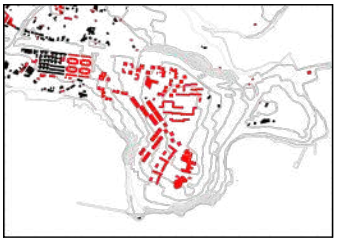
120.6%
*compared to 1930*

1957

Ferrol
Caranza



1957

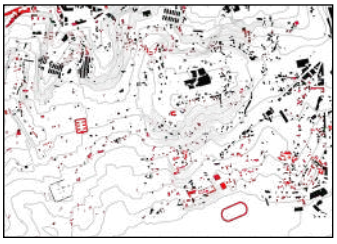


161.2%
*compared to 1957*

1967

Vigo
Coia
Cristo Victoria

1949



44.5%
*compared to 1949*

1969

Existing grain Expansion grain

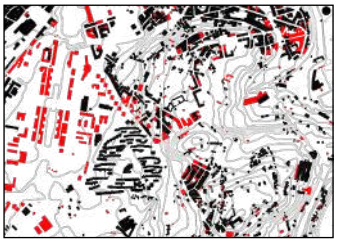
90.8% *compared to 1957*

1980

49.3% *compared to 1980*

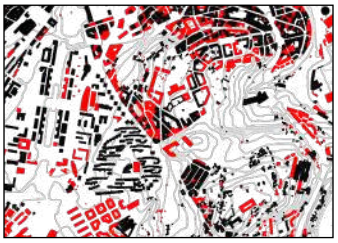
2006

35.6% *compared to 1972*



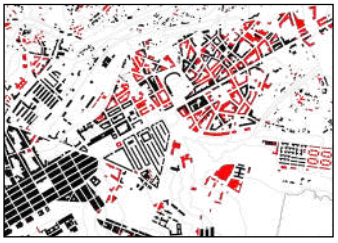
1980

45.2% *compared to 1980*



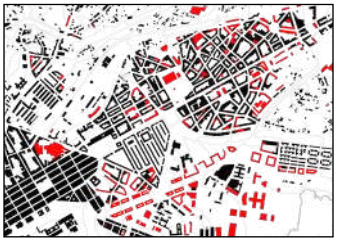
2006

23.5% *compared to 1957*



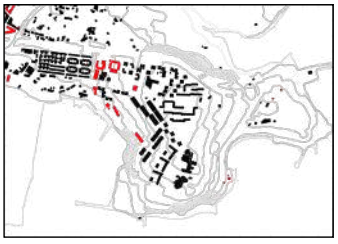
1984

25.6% *compared to 1984*



2006

12.5% *compared to 1967*

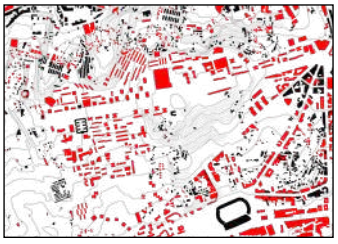


1978

120.9% *compared to 1978*

2006

166.9% *compared to 1969*



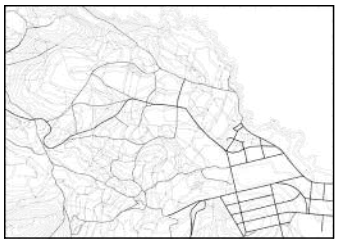
1985

15.6% *compared to 1985*

2006

## Existing elements of the edge or location

A Coruña
Labañou
María Pita


1948

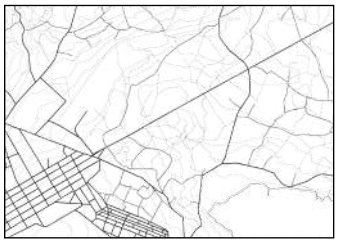

1957

A Coruña
Elviña
Barrio Flores


1945

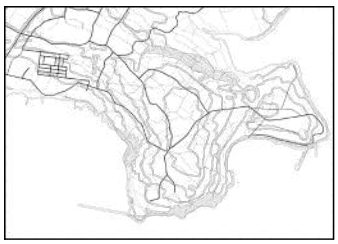

1972

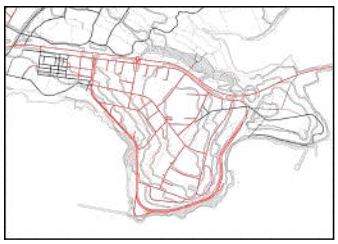
Ferrol
Recimil


1930


1957

Ferrol
Caranza


1957


1967

Vigo
Coia
Cristo Victoria

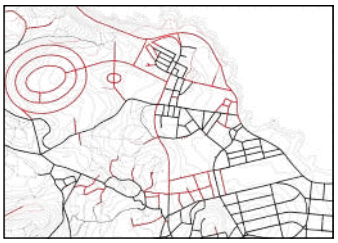

1949


1969

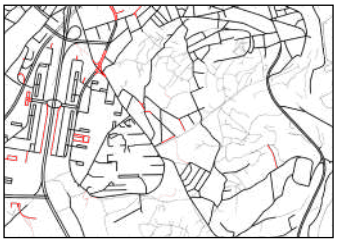
■ Existing network ■ Expansion network

1980

2006



1980

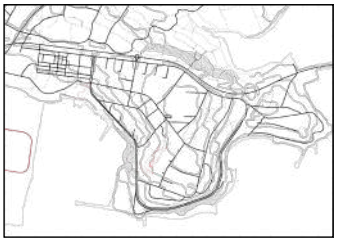


2006

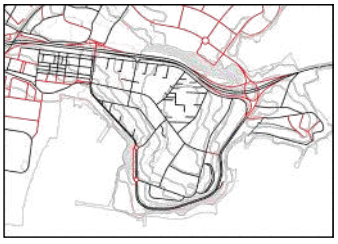
1984

2006

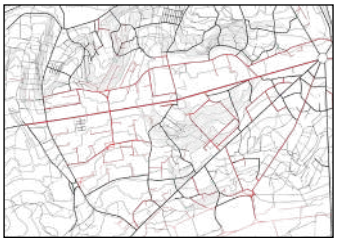
1978



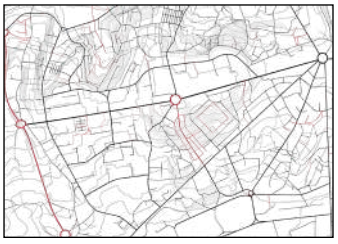
2006



1985



2006

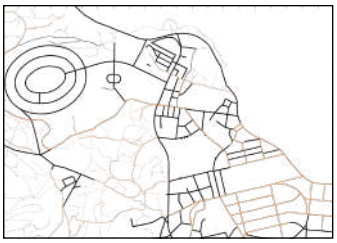


## Existing elements of the edge or location

A Coruña
**Labañou**
**María Pita**

*Existing areas from 1949*

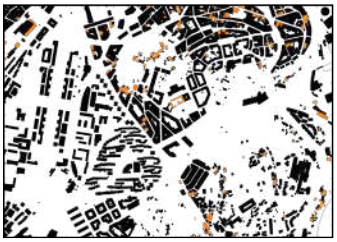
**2006**



*Existing network from 1949*

**2006**

A Coruña
**Elviña**
**Barrio Flores**



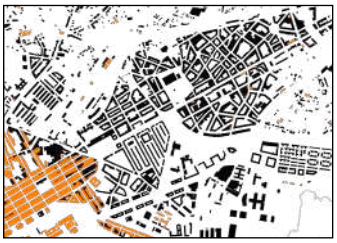
*Existing areas from 1945*

**2006**

*Existing network from 1945*

**2006**

Ferrol
**Recimil**



*Existing areas from 1930*

**2006**

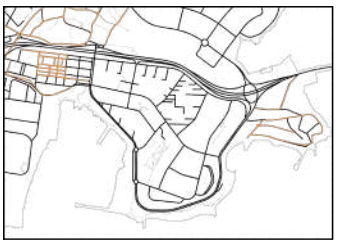
*Existing network from 1930*

**2006**

Ferrol
**Caranza**

*Existing areas from 1957*

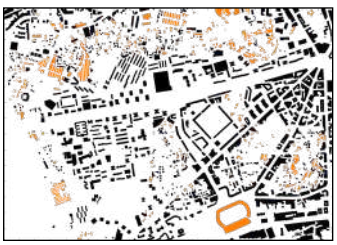
**2006**



*Existing network from 1957*

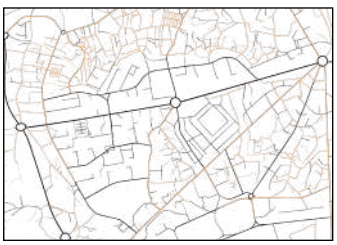
**2006**

Vigo
**Coia**
**Cristo Victoria**



*Existing areas from 1949*

**2006**



*Existing network from 1949*

**2006**

Pre-existing elements

*Existing areas +network from 1949*

**2006**

*Existing areas + network from 1945*

**2006**

*Existing areas +network from 1930*

**2006**

*Existing areas +network from 1957*

**2006**

*Existing areas +network from 1949*

**2006**

### 3.3.3 Existing elements of the edge or location. Particular Conclusions

**1. In the variation of the rural-urban grain over time, the proportion of urban grain in the different stages of expansion grows slowly in the neighbourhoods, without filling in the inherited fabric or on the edge of the housing estate. Meanwhile, the rural grain is maintained and even increased in the rural areas, becoming integrated into the urban fabric in the neighbourhoods where the urban grain grows by continuity.**

Between the previous stage and that of the construction of the housing estates, the increase in the percentage of rural-urban grain is not totally related to the construction of the small estates, and in the case of the large estates it is shared with other growths. In the first stage, between the end of the 1950s and the 1960s, when the smaller estates were built, the increase was between 44.5% in Coia and 61.8% in Labañou. In these peripheral situations of urban edge, the expansion grain mainly consists of isolated buildings, growth over the rural fabric, and constructions resulting from growth by continuity. A particular case in this same period is represented by Recimil, with an increase of 120.6% in the rural-urban grain, which coincides with a period of major expansion where the process of expanding the urban fabric is combined with the process of suburbanisation along the main road and its surroundings. Between the end of the 1960s and the first 70s, the construction of the large estates represented an increase in the expansion grain of 161.2% in Caranza and 177.9% in Elviña; in Caranza it was due to the estate, while in Elviña it was shared between the construction of the neighbourhood of Las Flores and the growth in the surrounding neighbourhoods. In the same way as in Coia, where the estate was completed at the beginning of the 1980s, the percentage increases to 166.9%, with the estate adding to the growth on its edge.

Throughout the entire process, the existing built elements do not represent a major conditioning factor in the project of the estate, and usually disappear from the intervention area when the estates are built. However, they do condition the suture of the peripheral edge depending on their size, quantity, location and architectural characteristics. This can be seen in the neighbourhoods around the estates, such as in Recimil and the Barrio das Flores, where the existing elements are mostly formed by residential constructions that were ultimately integrated into blocks, although there are also isolated residential buildings and those for other uses that condition the urban continuity to a greater degree, either because of their size or because of the distance at which they are located from the urban fabric.

To a lesser extent, this also occurs on the edge of the estates, conditioned by the existing elements of the old villages, small estates and isolated structures, as in Coia and Maria Pita. In the rest of the estates, the existing elements are specific conditioning factors, such as in the Barrio das Flores and on the southern edge of Recimil. Generally,

these existing elements are not considered as an asset of the past, but instead as a vestige or a previous activity. They altered the development of the blocks and the urban fabrics, their location is apparently circumstantial, and they eventually functioned as a further element of the urban fabric, maintaining their shape or that of their plot in the development of the neighbourhood. This situation has been maintained until the present day in the neighbourhoods around the estates, where in the final stage of expansion the grain increased from between 25.6% in Recimil to 45.2% around the Barrio das Flores and 49.3% around María Pita, with the exception in the 1980s of the growth due to the consolidation of the estates of Elviña, Coia and Caranza.

A different situation can be seen with the existing built elements in the villages that form a part of the peripheral edge around the estate: they were transformed due to the limits of their plot size to grow in height, as in Recimil, or in density by adding new blocks, as in Coia or María Pita. When they were not destroyed, their remains still stand in the area of urban continuity, as in the neighbourhoods around the Barrio das Flores.

In both cases, the number of buildings conserved determines the continuity or fragmentation of the intervention areas. Edges with numerous existing elements delimit discontinuous areas, while those with few existing elements define areas that can achieve a greater sense of continuity. The magnitude of the existing elements also influences the urban continuity: in the cases studied this is usually small, but when large elements are conserved, such as the railway in Recimil, the oil pipeline in the Barrio das Flores, or even large buildings around María Pita, these usually have a major potential for urban disintegration, maintaining a fracture in the urban space.

**2. In the case studies, it can be seen how as a part of the transformation of the road network over time, the rural roads on the edge and in the neighbourhoods around the housing estate have remained in place, serving as a support for the continuity of the expanded road network, continuing as a fragment in the road network brought about as a result of continuity, and as a road network in the undeveloped spaces of the urban edge.**

Most of the existing road elements that can be seen after the construction of the first housing estates in the 1950s are located in their surrounding areas, and not inside them. They are comprised of the dense network of tracks and roads of rural origin that define the plot layout, and provide access to the project site and the buildings on its edge, functioning as a link from which the periphery grows. With the exception of Recimil, which is connected to the urban fabric and the expansion road network of the urban expansion area, the rest of the cases are connected to the expansion road network by means of the existing road network.

Following the construction of the large housing estates in the 1960s and 1970s, the network of rural roads and tracks still remained on their edges and in the surrounding neighbourhoods. In the northern area of Coia it served as a link between the low-density fabric and the new estate, consolidating a type of suburban growth that made it difficult to continue with the urban fabric, in contrast to its south-eastern part, where it remained as a fragment within large blocks delimited by the expansion road network. In the Barrio das Flores the existing road elements served as a support for the continuity of the expansion network in the surrounding districts. Meanwhile, in Caranza, where the largest number of fragments of roads and tracks of rural origin remained inside the estate, these were barely linked to the existing rural fabric to the north, which was separated from the estate by the new expansion road network.

The layout of the existing road elements does not configure the structure of the estate in the intervention area, nor generally on its edge, where the existing elements that are preserved generally correspond to road fragments, or in exceptional cases give support to a low-density development, as in Coia. But if they contribute to the growth by continuity of the unplanned neighbourhoods in the surroundings of the estates, the slower their growth, the greater the adoption of the existing road as their support, transformed into a street by extension or without changing its alignment, remaining as a fragment within the new residential plots and also delimiting agricultural plots on the edge and within the urban fabric.

From the time when the estates were built up to the present day, the network of roads and tracks of rural origin has remained as a support for the expansion network in the neighbourhoods around estates such as the Barrio das Flores or Recimil, where growth by continuity has not required overcoming major fractures, and it has been possible to develop building by building, in sections with small voids, where the existing road network has made it possible to delimit plots with similar sizes to the adjacent ones, and where the section of street to be built from the existing road network allows the network to be continued over a small distance.

**3. There are existing elements inherited from the rural and urban fabric prior to the construction of the housing estates. The existing elements of rural origin are more numerous and are formed by buildings and roads that are maintained in spaces of rural origin, inside the incomplete blocks of growth by continuity in the neighbourhoods, and to a lesser extent on the edge of some housing estates. The existing elements of urban origin are comprised of buildings and roads of new growth and facilities on the urban edge.**

The existing built elements of rural origin that are currently found in the case studies are made up of isolated buildings, with or without a plot, growth over the rural fabric, and buildings integrated into the blocks of the neighbourhoods surrounding the housing estate. The existing buildings of urban origin include the inherited fabric in the cases near the urban edge, blocks resulting from growth by continuity, and isolated buildings of different sizes and uses other than residential purposes. Both have differences in terms of their size, quantity, location and architectural characteristics: while the existing elements of rural origin have a fine grain, are grouped and distributed in the territory in a dispersed manner, those of urban origin that are residential buildings form dense blocks or planned growth in continuity with the existing layout.

Around Recimil there are still single-family houses with separate or attached plots of land, belonging to former villages, and houses that are a part of blocks resulting from the process of suburbanisation. In the neighbourhoods around Barrio das Flores, the majority of residential buildings are integrated into blocks, although there are also single-family houses from old villages, generally with a plot of land. Around Coia there are still single-family houses with a plot of land that belonged to a village, small estates, and isolated constructions for non-residential use, something that can be seen to a lesser extent and in a more specific way in Caranza. On the other hand, in María Pita, there is a clear distance and position between the fine grain of the rural constructions and the urban growth with blocks, garden city, and isolated buildings.

The existing road elements of rural origin are comprised of fragments of the old network of tracks and paths converted into streets, but they also remain in the structure of the old rural plot layout, with agricultural uses, abandoned or integrated into a suburban network of low-density single-family housing. The existing road elements of urban origin include the inherited layout and a number of streets resulting from growth by continuity. In both cases, and with the exception of rural areas and spaces without any rural legacy, the road network appears to be integrated into the urban fabric with a short, organic and obstructed layout, in contrast to the network resulting from planned growth.

Around Recimil it is possible to see the grid-like mesh of the planned growth of the expansion area and the estate, and the originally rural network resulting from continuous growth, which can also be seen around the Barrio das Flores. In Coia, the network of roads and tracks of rural origin surrounds the estate, forming a low-density fabric. In Caranza a fragment of the rural fabric is still maintained on the edge of the estate, while in María Pita the rural fabric is very different from the urban fabric in its immediate surroundings.

## § 3.4 The transformation of the ground plan

This section studies 1) the influence of the original plot on the shape of the ground plan, 2) the influence of the geometry of the intervention area, and 3) the influence of the size and shape of the intervention area on the spatial configuration and the type of transformation of the ground plan, in order to evaluate them at neighbourhood scale before and after the housing estates were built.

### 3.4.1 What is this section about?

Through a formal analysis of the elements that make up the ground plan, we can see their influence on the transformation of the original and present-day layout, taking into account that the transformation of the ground plan acts as a conditioning factor for the intervention area and its spatial organisation, as it affects the way in which the urban fabric is configured. To do this we observe the geometry, size, and shape of the estates and the rest of the built elements, the space they occupied before they were built, what this area, its edge, and its immediate surroundings look like today, and how the construction of the estates has conditioned urban development. In other words, What the supporting structure of the intervention is like, what the current urban structure is like, and how the urban fabric has been developed.

By studying the **influence** of the elements that comprise the shape of the ground plan in the original fabric to compare it with the current urban fabric, we will evaluate which of these elements and to what degree they conditioned the design of the estate and its surroundings. The original fabric represents the situation prior to the construction of the estate, a peripheral fragment largely composed of a rural structure for agricultural use characterized by the presence of country homes and their adjacent farmland. Here we can see how it adapts to the topography, how its road network is structured, and where the elements built in relation to these two supports are located in the future intervention area.

By studying the **influence** of the geometry of the estate on the current urban structure, we will observe its alignment in the urban fabric in order to compare it with the original fabric. The current urban fabric contains the inherited built elements and those that have taken shape over time since the construction of the estate, representing a fragment predominated by the different building typologies and open spaces. Here, it will be possible to observe how the construction of the whole ensemble has been related to the geometry of the estate, on its edge and in the surrounding neighbourhoods, how it has been adapted to the topography and the road network,

how the rest of the residential fabrics have been formed, and whether there is suture and continuity in the urban fabric and surroundings of the estate.

By studying the **influence** of the size and shape of the estates on the development of the urban fabric, we will observe their conformation in relation to the main elements that accompany urban expansion, the road networks and buildings. The present-day urban fabric contains the new road network extension, the fragments of the inherited road network are related to it, the built area delimited by the main urban road network, and the open spaces that remains of the old rural fabric, in particular the spaces occupied by the villages. Here it will be possible to see how the configuration of the estate has been related to the construction of the whole, on its edge and in the surrounding neighbourhoods, and whether it affects the continuity of the urban fabric.

### 3.4.2 How is the analysis carried out?

The analysis compares the transformation of the original plot and the current plot, illustrating the direction in which the urban fabric was developed.

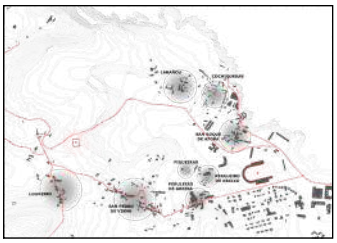
In the study of the original plot, it is interesting to observe the configuration of the villages, the space that delimits their farmland and the elements built outside their area in relation to the topography, in order to compare with the framework of the current plot the space that was occupied by the intervention area of the estate and the elements that are part of it. To achieve this, the main expansion road network of the urban fabric is represented within the same framework, indicating on the topography the homes of each village with its toponymy and the built elements, and highlighting those that represent a centre of community attraction, which in this period usually coincide with stadiums, cemeteries or train stations.

The current urban fabric is used to assess how much the different types of geometries of the estates conditioned their development. To achieve this, the main expansion road network of the urban fabric is represented in the same framework, highlighting all the built elements on the topography, in particular the linear blocks of the estates, which allows us to explain how they are configured internally and on their edge. In addition, the houses of the villages or fragments of them are shown, together with the blocks of the development by continuity of the neighbourhoods and the centres of community activity, which today are schools, sports, cultural and health centres.

The current urban fabric is used to assess how the size and shape of the estates influences the spatial configuration. To achieve this, the current and inherited principal expansion road network is represented in the same framework, indicating the direction in which it developed and the position of the estates.

## The transformation of the ground plan

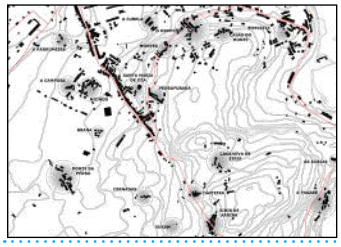
A Coruña
**Labañou**
**María Pita**



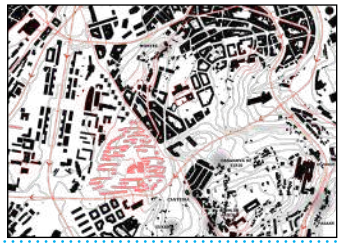
*Supporting structure*
**1948**

*Current structure*
**2006**

A Coruña
**Elviña**
**Barrio Flores**

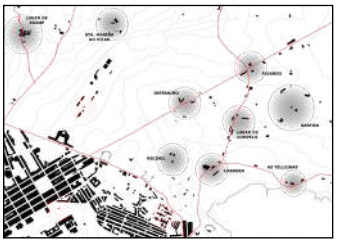


*Supporting structure*
**1945**

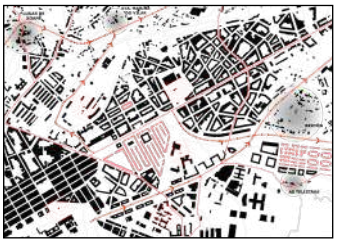


*Current structure*
**2006**

Ferrol
**Recimil**

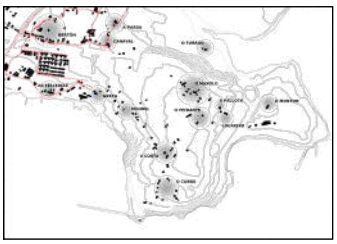


*Supporting structure*
**1930**



*Current structure*
**2006**

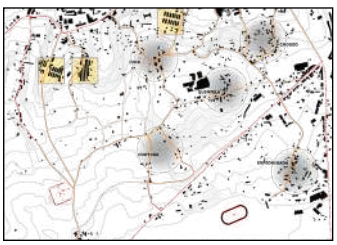
Ferrol
**Caranza**



*Supporting structure*
**1957**

*Current structure*
**2006**

Vigo
**Coia**
**Cristo Victoria**



*Supporting structure*
**1949**

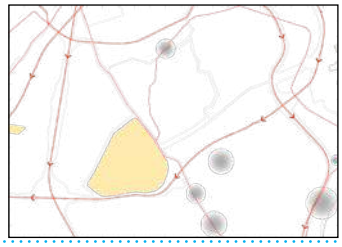
*Current structure*
**2006**

Village Centre of attraction New direction of expansion Inherited expansion path Public Housing

*Urban layout development*

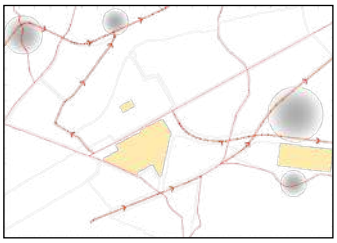
2006

*Urban layout development*



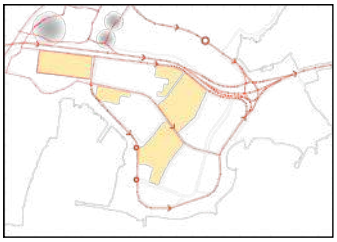
2006

*Urban layout development*



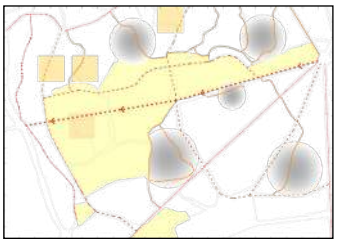
2006

*Urban layout development*



2006

*Urban layout development*



2006

### 3.4.3 The transformation of the ground plan. Particular Conclusions

The result of evaluating the transformation of the ground plan at neighbourhood scale offers three conclusions related to the elements of the original fabric, the geometry, and the size and shape of the intervention area.

**1. The elements that make up the shape of the ground plan in the original fabric are a conditioning factor in the project, especially on the edge of the intervention, where a significant role is played by the topography, the road network that delimits the intervention area, and the arrangement of villages in relation to the open spaces of the farmland.**

The area that the housing estates occupied originally consisted of the elements of a rural structure. Many of its elements would be substituted by the new layout of the estate, and in particular, the buildings inside the intervention area disappeared, with the exception of the amenity buildings in Elviña, or the Cristo de la Victoria estate in Caranza. However, in all the study cases it is has been proved that the topography conditioned the design of the interior of the future estate. In all of them, this adaptation to the topography led the use of techniques to correct the slope without excessive clearing and filling, by means of terraces or steps, regardless of their shape and size, as in María Pita, Barrio das Flores, Caranza and Coia. Recimil, on the other hand, was adapted to the original slope without the need for steps, situating the buildings parallel to the slope in order to compensate for the difference in level by creating a basement.

The edge of the future developments contained the largest number of elements that would continue to condition the design of the estate. The most striking case is that of Coia, where the villages and small apartment blocks would remain in place, conditioning the boundary of the project, which would be adapted to their perimeter. In the rest of the cases, the villages are not so close to what would be the future edge of the estate, or if there are any, as in the case of Elviña, it would not influence the design of the whole. Cases of existing elements of villages or fragments of them are more common in the neighbourhoods around the estate: in Elviña they would influence the shape of the urban fabric of the neighbourhoods; in Caranza and Labañou, the villages would continue to increase in density; and in Coia they would remain as low-density fragments in the middle of the urban fabric.

The same situation occurred with the original road network. In Coia, it not only remained on its edge, but also in its interior, maintaining the connection with the old villages and conditioning the design of the estate. In Recimil, the road network on its edge would be a decisive conditioning factor in the project, consisting of the main road

out of the city and the road bordering the old wall of the historical centre. In María Pita, Caranza and Barrio das Flores, the road network did not condition the design of the interior of the estate, but instead conditioned its subsequent development, with a poor connection as it is located at one end of the road network.

**2. The intervention areas in the case studies have different types of geometries, which have been a conditioning factor in their development. They represent a limitation, which is more significant in the transformation of the edge than in the project area itself, which has the freedom to colonise a ground plan comprised of several plots.**

The geometry of the terrain in the larger study cases tends to be elongated, linked to the road network of the project, and adapted on its edges to the original topography or plot layout, which gives it a sinuous, organic shape at its edge. In Coia, its northern boundary consists of the village houses and ravines that make it difficult to suture it to the existing fabric, on the contrary to its southern boundary, which extends unhindered on the slope towards the valley of the River Lagares. In Caranza, the shape of the peninsula delimited by the sea influences the variable geometry of the project, which is delimited to the north by the new access road into the city. The Barrio das Flores tends towards a concentric geometry, forming an independent residential unit within the housing estate of Elviña. The geometry of Elviña is characterised by the limits defined by the road network, fragments of villages and housing blocks in the surrounding districts, particularly on its eastern edge.

In the smaller estates, their geometry is more regular, tending towards a rectangular shape, as in the case of the Cristo de la Victoria estate, which is designed as one building; in the case of Maria Pita, the estate consists of a series of blocks built on stepped platforms, while Recimil is close to a triangular shape.

Unlike the housing estates and large facilities, the majority of urban fabrics are formed by continuity, based on the repetition of minimum units generally for residential use according to a clear order and rhythm, which is what guides the composition of their form of growth. The smaller size of the residential typology and its repetition within an urban fabric allows for greater flexibility in adapting to the urban form. For this reason, the geometry of the estates constitutes a conditioning factor for the project, limiting the possibility of repetition of the elements that compose the urban fabric with growth by continuity, which can be seen more clearly in the border spaces of the large estates, such as in the Barrio das Flores and in Coia. In addition to this is the distance between the residential fabric and the estate due to the topography or the existence of empty plots, unlike Caranza, which is isolated from any growth by continuity.

In the small estates, their groupings into blocks or smaller linear groups of buildings connected to the street pose less of a problem for the suture on its edge, with the topography, links to the road networks, or connections with larger structures being a more important conditioning factor. In María Pita, the difficulty of establishing a suture is due to its marginal position, with a boundary defined to the west by a new residential estate and on the east by an empty lot. In the case of the Cristo de la Victoria estate, it is enclosed as a block in the middle of a group of linear buildings, while in Recimil, as it is delimited by the road network to the north and east, this prevents any continuity with the surrounding areas, and to the southeast by facilities that do not form a continuous fabric.

With the estates, the linear single bay block was introduced as a basic element of the urban fabric, while the border spaces were grouped by means of urban continuity based on blocks built along the axes that form the streets and voids that would eventually become spaces for social interaction. This would occur in rural spaces such as in Coia, Recimil and María Pita, or by rearranging previously existing buildings scattered throughout the rural fabric, as in Elviña. In both cases, it is the building in the middle that defines the most elemental piece of the fabric, which generally ended up being joined into blocks with an interior patio of different dimensions, depending on how full or empty the space had previously been.

**3. The size and shape of the intervention area limits the possibilities of spatial configuration and determines the type of transformation of the ground plan, from the layout of the expansion road network through to the mechanisms of repetition in the processes of continuity with which the surrounding neighbourhoods are built, by means of isolated buildings or irregular blocks.**

The shape and size of the intervention area guides the type of compositional strategy used in the transformation of the ground plan, from the position of the most self-contained mechanisms, such as the isolated building, through to those that form a part of a larger structure, generally coinciding with an irregular block adapted to the previous transformation of the ground plan.

The construction of the largest estates was associated with the presence of a new road network that was integrated into the design of the estate. The shape and size of the estate conditioned the development or suture of the existing road network with the new estate road network. In most cases, specific junctions were made between the two, so that the larger the size and the longer its shape, the greater the distance to the link between the different parts of the estate, as is the case in Caranza. In some cases,

these junctions were increased by retaining fragments of the original road network, as in Coia, where rural plots on the edge of the estate allowed for a certain degree of continuity, albeit weakly, between these areas and the new structure of the estate. However, in the Barrio das Flores, its size and enclosed shape prevented any connection with the adjacent neighbourhoods, particularly on its southern edge, which is now exacerbated by a ring road oriented by the shape of the estate.

In the smaller estates, the new road network is built by continuing the road network inside the estate, as in the case of Maria Pita, or its layout is designed to give access to an existing estate, as in the case of the Cristo de la Victoria estate. Recimil, on the other hand, stands on the main access road to the city, and the new junction built in its southern part is not influenced by its shape or size, which is quite small at this point, and is linked to the facilities in the surrounding area, maintaining links with sections of the rural road network.

The estates are associated with the repetition of similar elements, as opposed to the underlying repetition that exists over time in the suture of the edge spaces, based on the identification of parallels and similarities between built elements and spaces that are unbuilt, or pending construction. The shape and size of the estates also limit the possibility of repeating the elements of an urban fabric, especially when the edge of the intervention has a larger number of voids, as seen in Coia or Maria Pita.

## § 3.5 Spatial organisation

This section examines 1) the variation in the proportion of public-community and private land, 2) the evolution of the types of road in the rural and urban network, 3) the transformation in terms of height of the urban and rural grain, and 4) the influence of the type, situation, and number of amenities in the spatial organisation, in order to evaluate it on a neighbourhood scale.

### 3.5.1 What is this section about?

With the spatial analysis of the intervention area, we are able to observe how the use of the land and its structures has changed over time. We measure the degree of alteration of the elements that make up the floor plan (types of public-community-private land and road network) and its volume (rural-urban grain and uses), in other words, the degree of transformation of the support for the intervention, and the elements that are built on it, its geometric modification, the quality of use, and its variation.

By studying the **proportion** of public-community and private land over time, we can observe the construction process that follows the urban form on the rural space with the increase of the spaces for social interaction and the road network, the presence of rural land with or without agricultural use in the urban space, and the position and proportion of the structure of the estate within its surroundings, in relation to private land that was initially for agricultural use and was gradually transformed into urban land as a combination of structures in the form of city blocks and residential buildings.

In the **evolution** of the types of road network in the rural and urban grid over time, we can see how much of the rural road network remains, how its cross-section has been transformed (from path to track and from track to street), whether its current presence is reduced to discontinuous fragments, or whether it has also been part of the layout of the new streets and voids. This will attempt to explain the influence of the road in the construction of the urban space, how much it has influenced the conformation of the space of the neighbourhoods around the housing estates, and if it still remains inside the estates in contrast with its grid-like structure.

By studying the **transformation** in height of the urban and rural grain over time, we can observe how and to what extent the type of grain varies with the construction of the estates, where it remains, what type of space is created by the fine grain of the original rural constructions, and what type of grain shapes the space of the neighbourhoods around the estates. In all cases, this allows us to represent the diversity of fabrics in relation to their volumetry and density, with the representation of the variation in height of the grain and the proportion of the built surface.

Representing the **influence** of the type, situation and quantity of amenities of public character in the spatial organization, we can see how and where amenities are introduced, leading to their presence in the estates, as well as on the urban edge and in the surrounding neighbourhoods, and if in some way they alter the urban space by helping to build spaces for social interaction for their inhabitants.

### 3.5.2 How is the analysis carried out?

Four comparisons are used in the analysis: two correspond to the transformation of the land and the other two to the size of their buildings.

In order to measure the types of land, public and community land is grouped together, differentiating it from private land, in the knowledge that in the transformation over time, community land basically contains the space between buildings on housing estates, which in many cases, together with the street, is the only open space inside the estate and in its surroundings. The aim of this comparison is to clearly observe the position and proportion of the structure of the estate within its environment, in relation to the private land that was initially agricultural and later urban land and the total number of structures in the form of blocks and residential buildings.

In studying the road network, it is interesting to observe to what extent the rural network has persisted within the urban network, in order to verify the change in spatiality and the value of rural elements in urban development. To achieve this, the roads, rural tracks and urban streets are represented in the same framework, differentiating their classification by their outline and thickness, highlighting the coexistence and conflict between the rural and urban space, in order to show the space that comprises the organic rural grid, the urban grid and the grouping of both.

In order to measure the volumetric variation of the urban and rural grain, two colour ranges of plus and minus three heights are established, which determine in all the case studies the difference between the rural buildings, the block, and the urban block. By being able to compare the framework over time with the diagram of built-up areas and percentages, this reveals the shape, type, and position of the built grain.

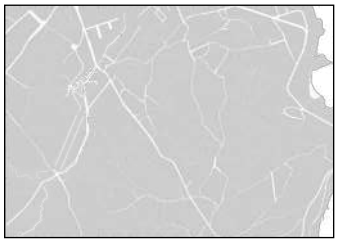
In addition to the volumetric variation, it is of interest to observe the use of the grain, its shape and position, in order to understand the value of collective activities within the space. To this end, public amenities for collective use are differentiated from industrial activities and others such as transport and health facilities. This is done by differentiating both uses by colours to highlight them from the rest of the urban and rural grain that is shown in grey. This makes it possible to observe the size of the amenities and their position within the estate and on its edge, a condition which, as we shall see in the following chapter, helps us to assess their degree of connectivity.

A Coruña
Labañou
María Pita


1948


1957

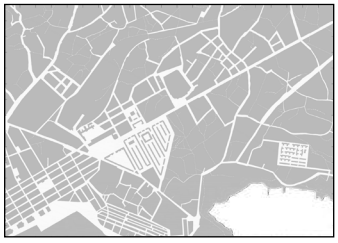
A Coruña
Elviña
Barrio Flores


1945

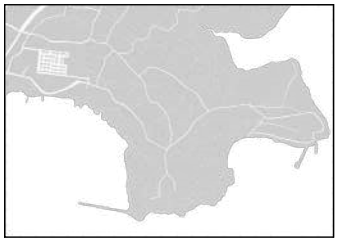

1972

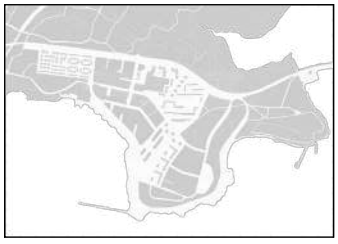
Ferrol
Recimil


1930


1957

Ferrol
Caranza

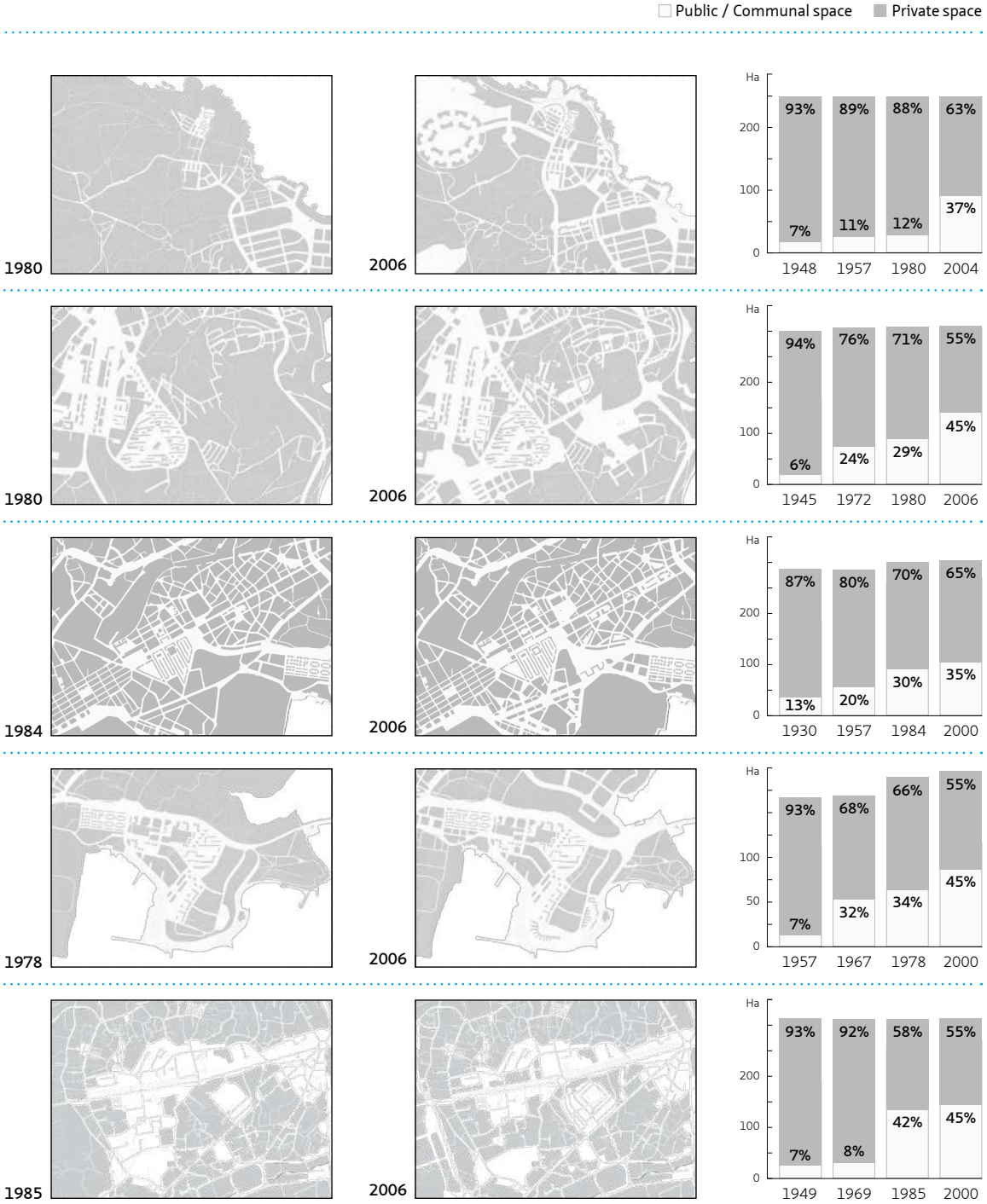

1957


1967

Vigo
Coia
Cristo Victoria


1949


1969


Public / Communal space
Private space
1980
2006
Ha
200
100
0
93%
7%
89%
11%
88%
12%
63%
37%
1948
1957
1980
2004
1980
2006
94%
6%
76%
24%
71%
29%
55%
45%
1945
1972
1980
2006
1984
2006
87%
13%
80%
20%
70%
30%
65%
35%
1930
1957
1984
2000
1978
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50
93%
7%
68%
32%
66%
34%
55%
45%
1957
1967
1978
2000
1985
2006
93%
7%
92%
8%
58%
42%
55%
45%
1949
1969
1985
2000

## Spatial organisation

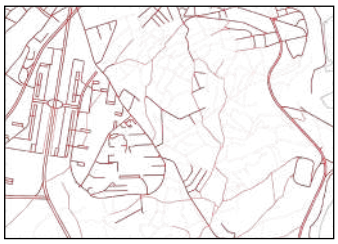
A Coruña
Labañou
María Pita


1948


1957

A Coruña
Elviña
Barrio Flores


1945

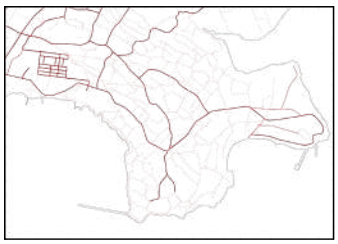

1972

Ferrol
Recimil


1930


1957

Ferrol
Caranza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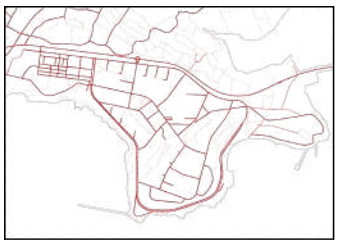
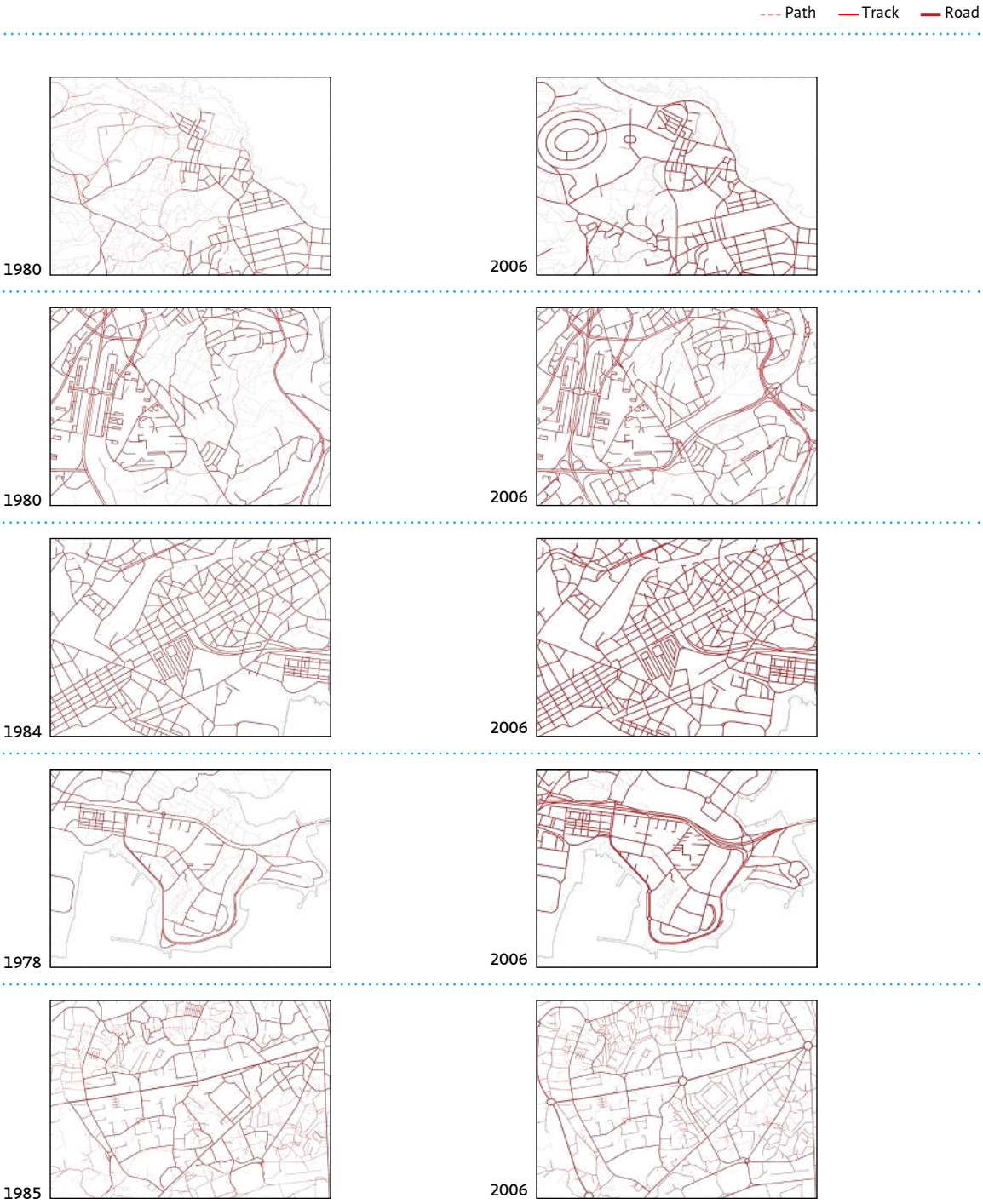

1967

Vigo
Coia
Cristo Victoria


1949


1969

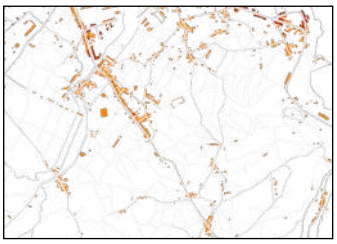

Path
Track
Road
1980
2006
1980
2006
1984
2006
1978
2006
1985
2006

A Coruña
Labañou
María Pita

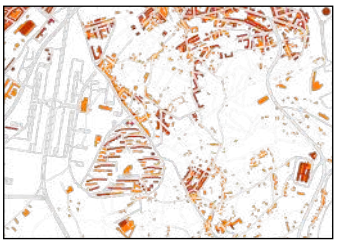
1948

1957

A Coruña
Elviña
Barrio Flores



1945



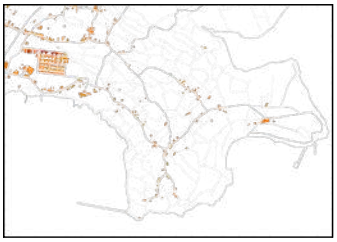
1972

Ferrol
Recimil

1930

1957

Ferrol
Caranza



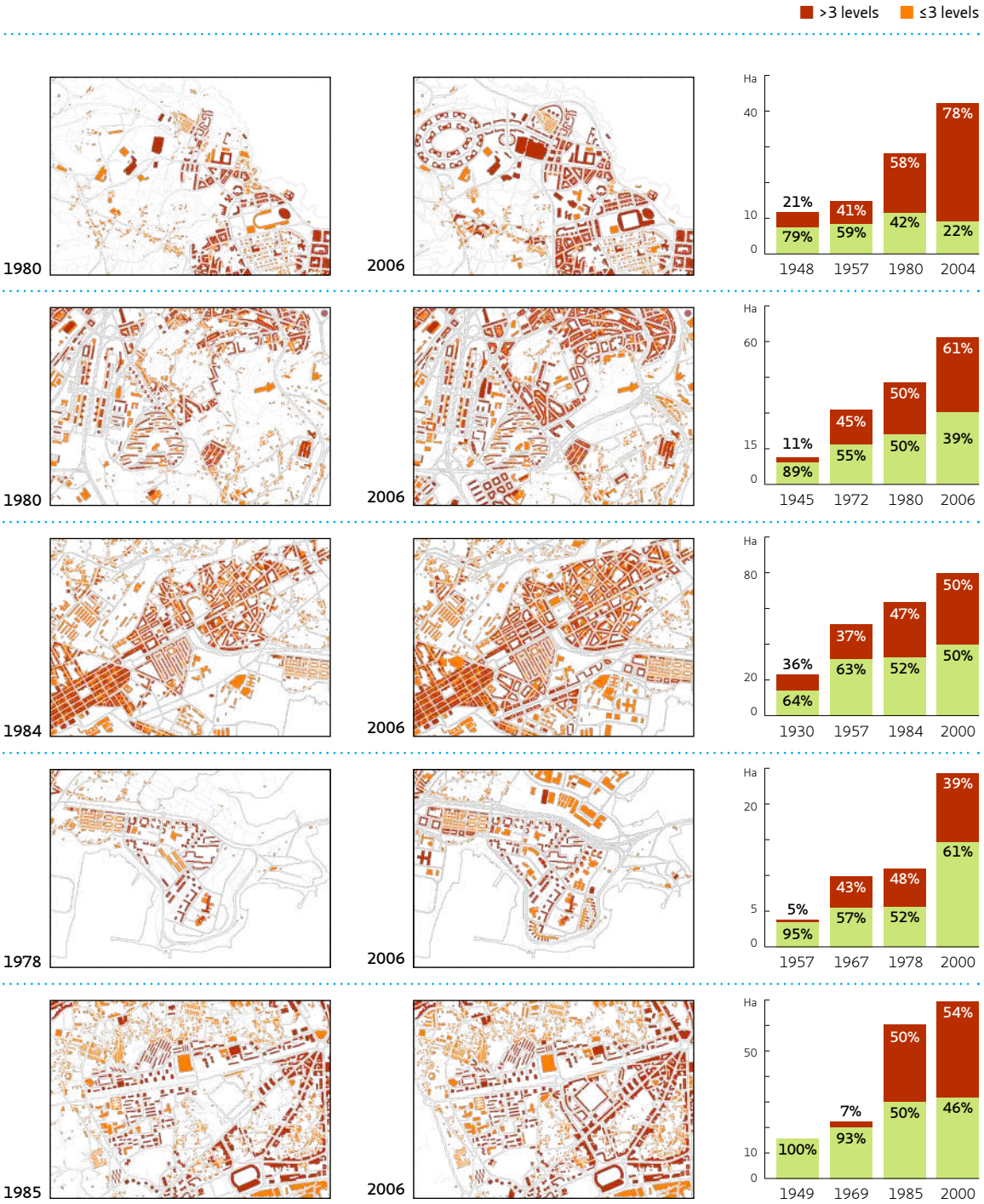
1957

1967

Vigo
Coia
Cristo Victoria

1949

1969


>3 levels
≤3 levels
1980
2006
Ha
40
10
0
21%
79%
41%
59%
58%
42%
78%
22%
1948
1957
1980
2004
1980
2006
Ha
60
15
0
11%
89%
45%
55%
50%
50%
61%
39%
1945
1972
1980
2006
1984
2006
Ha
80
20
0
36%
64%
37%
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47%
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1930
1957
1984
2000
1978
2006
Ha
20
5
0
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95%
43%
57%
48%
52%
39%
61%
1957
1967
1978
2000
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2006
Ha
50
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0
100%
7%
93%
50%
50%
54%
46%
1949
1969
1985
2000

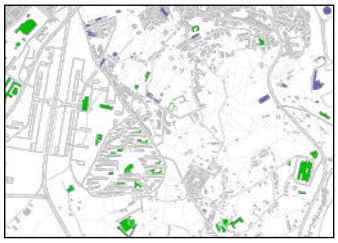
A Coruña
Labañou
María Pita


1948

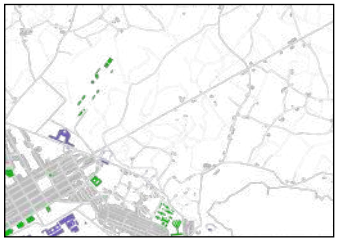

1957

A Coruña
Elviña
Barrio Flores


1945


1972

Ferrol
Recimil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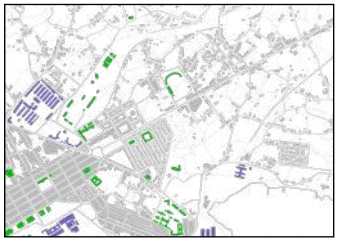
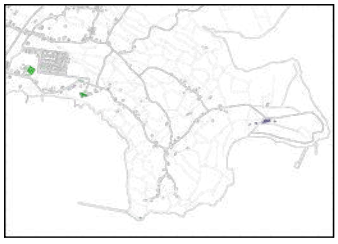
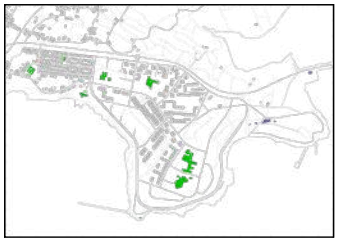
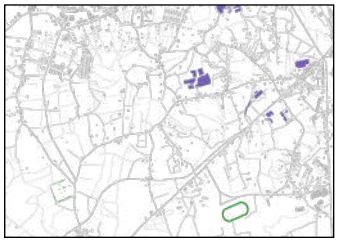

1957

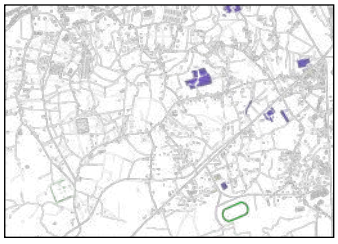
Ferrol
Caranza


1957


1967

Vigo
Coia
Cristo Victoria


1949

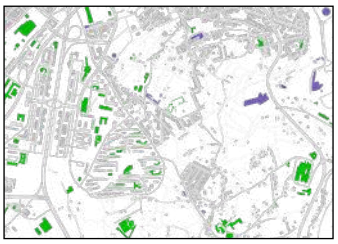

1969

Amenities Industry / Others

1980

2006

1980



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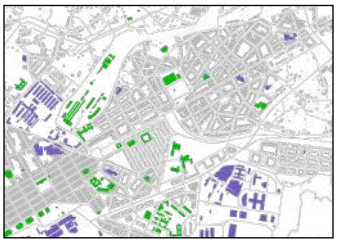

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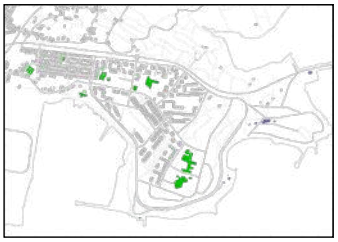

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### 3.5.3 Spatial Organisation. Particular Conclusions

The result of the evaluation of the spatial organization on a neighbourhood scale offers four conclusions in relation to the proportion of public-community and private land, the permanence of the rural road network, the increase in the type and height of the urban grain, and the introduction of the first public facilities.

**1. The proportion of public-community land was residual in the stage prior to the construction of the housing estates, increasing as their construction became consolidated, and today matches the amount of private land, assisted by the increase in the number of spaces for social interaction and the road network in the surrounding neighbourhoods.**

Prior to the construction of the residential estates, the proportion of private land made up of farmland exceeded 90%, compared to 6-7% for public land, which was mainly comprised of an extensive network of rural roads and a small number of streets. This proportion only varies in Recimil, where, as it is located in continuity with the urban centre, the amount of public-community land rises to 13%, adding the road network and the areas for social interaction in the urban centre.

When the first public housing estates were built in the 1950s, the proportion of public-community space only accounted for 8-11% of the land in projects such as Coia or María Pita and 20% in Recimil, due to the medium scale of the estate and the fact that they were surrounded by services, facilities and spaces for social interaction within their perimeter. In the rest of the cases, the increase in public-community space took shape inside the small estates, adding community spaces with no defined use to their road network.

With the construction of the large housing estates, the public-community land represents 24% in Elviña and 32% in Caranza, comprising a large number of community and empty spaces within the estate, maintaining a high level of private land for agricultural use in the surrounding area. The peripheral position of these large estates is accompanied by a limited development of the growth areas composed of old villages and new residential fragments superimposed on the farmland, which from the 1980s onwards became increasingly developed and dense, while inside the estates the building work was completed, delimiting the public-community space. Although this change was important in spatial terms, it was not so important proportionally: the public-community land represents 29% in Elviña, 34% in Caranza and 30% in Recimil, which at that time became an area of urban expansion, associated with the road to Castile. María Pita, with 12% of public land, and Coia, with 42%, represents the two extremes. The slowness of development on the urban edge of María Pita was

not stimulated by the smaller size of the estate, unlike in Coia, where the large size of the estate is accompanied by low-density growth in its surroundings and residential fragments in continuity with the urban fabric.

Today, private land still represents the majority in all the case studies, representing 55% in Elviña, Caranza and Coia, 63% in María Pita and 65% in Recimil, although its main use is no longer agricultural, instead consisting of buildings and empty plots on the edge of the estates or inside the surrounding neighbourhoods.

**2. In the case studies, we can see the persistence over time of a road network of rural origin in the layout of the new streets and empty spaces that comprise the neighbourhoods around the housing estates, in contrast to the grid-like network inside the estates.**

At the time when the housing estates were built, the road structure in their surroundings was defined by a dense network of rural roads and tracks, with few urban streets. With the incorporation of the small housing estates in the 1950s, this structure was barely altered in the cases of Coia and María Pita, where the small residential fragment incorporated streets into its internal structure with a regular geometry that differs from to the organic structure of the rural fabric. The union between these two road networks is very weak, connecting to an existing track that communicates villages and serves as a link to the streets of the urban edge, which began to be developed as an extension and new urban fabric. Recimil, on the other hand, is part of a process of urban expansion, combining in its layout the geometry of a larger number of new streets, and transforming rural tracks into roads without altering their alignment. In any case, the network of rural roads and tracks played a key role in the spatial organisation of this peripheral environment at this time.

The construction of the large housing estates led to the incorporation of a new, grid-type road structure that delimits large plots of land, where fragments of originally rural paths and tracks still remain, forming part of the unbuilt plots and open spaces that have not been developed around the residential blocks. These existing elements are more significant in Caranza than in Coia and Elviña due to the size and lack of development of the new plots. Around the estates, the network of paths and rural tracks is maintained, partly transformed into streets without changing their alignment, and partly as a fragment that still delimits agricultural plots of land, which have been progressively converted into plots for residential use.

Today, the network of roads and tracks of rural origin have been consolidated as streets forming the space of the neighbourhoods around the housing estates, and are still visible in large fragments of land of rural origin that have given way to a low-density housing development (Coia), or to vacant lots partly used as agricultural land (San Pedro de Visma or Castrillón in Coruña). In contrast, in Caranza there are still traces of paths inside the open spaces, but they have disappeared in their surroundings, as it is encircled by an industrial estate.

**3. The construction of the small housing estates introduces the medium grain as opposed to the fine grain of the original rural constructions, while the construction and consolidation of the large housing estates entails the increase in height of the urban grain. Both cases do not entail a significant increase in the built surface area, which occurs in the neighbourhoods around the estates, in a still unfinished process of increasing density and height.**

The peripheral space in which the housing estates were constructed has a small built up area, mostly with uniform fine grain constructions and a height of less than 3 storeys. The inclusion of the small housing estates in the 1950s, combined with a slow process of suburbanisation with the construction of isolated block or single-family houses on agricultural land, introduced a combination of fine- and medium-grain residential volumes. Although the increase in built surface area is small, the average number of buildings over 3 storeys increases to 40% on average. The exceptions are Recimil and Coia, in the first case because the built area is doubled from 22Ha to 50Ha, with an accumulation of medium grain along the Castile road. In the case of Coia, the increase ranges from 15Ha to 25Ha, with the proportion of buildings under 3 storeys remaining at 93%, due to a process of suburbanisation that occupies large areas with low densities, including the small housing estates.

The construction and subsequent consolidation of the large housing estates between the 1970s and 80s represented more of a volumetric alteration than an increase in the built area. The spatial configuration was modified by introducing verticality with the isolated block, while the percentage of constructions with more than three storeys was equal to those with less than three storeys. However, the increase in construction occurs in the neighbourhoods around the estates, in the form of an expansion with coarse-grained blocks and heights of over three metres. This densification process has still not been completed, and today the surface area and the size of the medium and large grains continue to increase, with the exception of Caranza, which is hemmed in by an industrial estate.

**4. The construction of the housing estates led to the introduction of the first public amenities of the urban edge: despite their initially humble nature, their progressive expansion makes them a reference for collective use by their inhabitants and in the surrounding neighbourhoods.**

When the small housing estates were constructed, some of them included a small building for use as a church, market or school. Despite their small size and the lack of resources for their maintenance, they were the only communal buildings inside the estates, without it being the solution to their dependence on the already meagre facilities of the urban nucleus. Recimil has a market and a school; Maria Pita does not have these facilities, but there is a church and an educational classroom in the annexed estate (Pardo de Santayana Group, known as "Korea"); the Cristo de la Victoria estate is organized around the "producer's home", a kind of social centre, but none of the other estates of Coia have facilities. With the exception of Recimil, next to the urban centre, and Maria Pita next to the school district, for the rest of the estates there are no major spaces with a public collective function in their surroundings, only factories or shops.

The construction of the large housing estates led to an increase in the number of churches, markets, and schools that allowed for the organization of community spaces inside them, while in their vicinity they were still scarce or non-existent, which meant that the estates were also used by the surrounding population.

The arrival of the democratic period at the end of the 1970s coincided with the end of the construction of the estates. Since then, educational, sporting and cultural facilities have been incorporated, mostly in open spaces inside the estates, civic centres, libraries or sports halls that have enriched community life and allow for greater diversity in the use of the spaces both inside the estates and in the surrounding neighbourhoods, helping their social cohesion. This is the case in Elviña, but not in the Barrio das Flores, in the small estates of the three cities which have a significant lack of amenities in their interior, or in the case of Coia and Caranza, where these structures were built, but which suffer from maintenance problems.

## § 3.6 Chapter Conclusions

This chapter shows that the construction of the housing estates alters the rural fabric and conditions the urban fabric, its transformation and current configuration. Therefore, the final conclusion corresponding to what has been observed in the chapter can be grouped into these two arguments based on the particular conclusions, as follows:

1. **The inherited territorial structure affects how the estate fits within the urban fabric.**

- The place where the housing estates are built has its origin in the colonization of the rural space located in the urban edge. The alteration of the elements present in the intervention area and the subsequent fragmentation of the rural fabric make it difficult to suture the estate on its edge.
- The fragment of rural fabric on which the housing estates are built is an obstacle, to a lesser extent at first than as it consolidates on the edge of the estate. This makes it a condition for the integration of the estate into the urban fabric, and a characteristic that influences the fragmented and heterogeneous image of the urban edge.
- The ownership of the land conditions the delimitation of the land where the intervention is carried out. In general, the plot where the housing estates are built is created by combining several small, multi-property plots, with irregular perimeters the larger they are, and which are more regular and continuous in the case of small plots.
- The rural grain is maintained and even increased in the existing plots of rural origin, and is integrated into the urban fabric in the neighbourhoods where the urban grain grows by continuity.
- In the transformation of the road network over time, the rural roads remain on the edge and in the group of neighbourhoods around the housing estate, serving as a support for the continuity of the expansion road network, remaining as a fragment in the road network developed by continuity, and as a road network in the non-urbanised spaces of the urban edge.
- There are remains inherited from the network of rural origin, formed by buildings and roads that are maintained in spaces of rural origin, within the incomplete blocks resulting from the continuity of growth in the neighbourhoods and, to a lesser extent, on the edge of some housing estates.
- The elements that configure the shape of the ground plan in the original fabric constitute a conditioning factor in the project, especially on the edge of the intervention, in which a significant role is played by the topography, the road

network that delimits the intervention area, and the layout of the villages in relation to the open spaces of the farmland.

**2. The distribution of the built elements and open spaces in the neighbourhood affects the spatial cohesion.**

- The place where the housing estates are built is an artificially constructed place, delimited by its geometry, conditioned by topographical elements and poorly related to the original urban structure formed by a weak road network and isolated buildings. This makes it difficult to develop the urban fabric to the edge of the estate, and in relation to the surrounding neighbourhoods.
- The size and shape of the intervention territory limits the possibilities of spatial configuration and influences the type of transformation of the ground plan, from the layout of the expansion road network through to the mechanisms of repetition in the processes of continuity with which the surrounding neighbourhoods are built, by means of isolated blocks or irregular blocks.
- The plot where the housing estates are built has different types of geometries that condition their development and represent a limitation, more significant in the transformation of the edge than in the project area itself.
- There are existing elements inherited from the urban fabric prior to the construction of the polygons that influence their development, comprised of buildings and roads belonging to new developments and facilities on the urban edge.
- The proportion of public-community land is residual in the stage prior to the construction of the housing estates, increasing as their construction is consolidated, now equalling the amount of private land, aided by the increase in spaces for relationship and road networks in the surrounding neighbourhoods.
- The construction of the small housing estates introduces the medium grain as opposed to the fine grain of the original rural constructions, while the construction and consolidation of the large housing estates entails an increase in height of the urban grain. Both cases involve an alteration of a density and height that is different to the buildings and neighbourhoods in their vicinity.
- The proportion of urban grain in the different stages of expansion grows slowly in the neighbourhoods, without completing the inherited grid or the edge of the housing estate, which makes integration difficult.
- The construction of the housing estates entailed the introduction of the first public amenities on the urban edge; despite their initially modest nature, their progressive increase has made them a reference point for collective use by their inhabitants and in the surrounding neighbourhoods.

# 4 Current configuration of the space between buildings

# 4 Current configuration of the space between buildings

## Introduction

This chapter studies the current configuration of the space between buildings in the housing estates and in their surroundings, which allows us to observe their arrangement, their form, structure and three-dimensional composition, how this defines the support of the open space inside the estates, what the rules of distribution of the built elements and open spaces are, and the strategies that define the formation of the space inside the estate.

The chapter is divided into three sections based on the analysis of the case studies presented in the previous chapters. The first section studies the type of support structure of the case studies at present, based on the types of layouts, buildings and degrees of privacy in the open space, in the estate, on its edge, and on the growths that have taken place in its surroundings. The second section studies the arrangement of the built elements and open spaces based on the different types of spaces, their use, distribution, connectivity, accessibility, permeability and degree of relationship between them, in the estate and its surroundings. The third section studies the organisation of the open spaces based on the elements that configure the form, organisation, functionality and quality of the spaces inside the estates.

As part of the main research question related to the contribution of public housing to spatial cohesion and the improvement of urban structure (p.58), this chapter studies open spaces on two scales, within the estate and in its surroundings. On the first scale, we study the creation of spaces for social interaction in the estates, which allows us to observe their urban fit, responding to how the distribution of the built elements and open spaces of the neighbourhood affects the spatial cohesion of the estate. The second scale studies the current configuration of the open spaces inside the estate, responding to how the configuration of the space between buildings influences the quality of the spaces for social interaction.

### Why this study is necessary as a part of the thesis

In this thesis, the study of open spaces is relevant, due to its importance in the formation of the urban structure. For this reason it is fundamental to evaluate their formative potential within the urban fabric on the scale of the housing estate and its surroundings, as it allows us to observe the value of the relationship between private, community and public space based on their components.

Studying the urban configuration at the scale of the open spaces of the estate and its surroundings is fundamental for evaluating the need for rehabilitation of neighbourhoods with public housing, understanding their form, how they are integrated into the estate, how they influence the configuration of its edge and the development of the neighbourhoods around it, what the space associated with the housing is like, and whether it has served as a link between private, community and public space. By observing whether there are discontinuities between the different parts of the estate, we can explain the causes of the lack of spatial cohesion and continuity within it and with the urban fabric, and at the same time, it is at this scale that we can finally identify the spaces of opportunity and make recommendations that will help to improve their articulation, integration and urban cohesion.

### What I am going to be able to see at the scale of the space between buildings

In the introduction to the first chapter, open space is defined as the group of public, private and community spaces that make up the unconstructed part of the urban fabric (p.28). In this thesis, the space between buildings is considered open space in order to highlight the role of buildings in the spatial configuration of the housing estate, which results in the existence of a large area of semi-public space for community use around the buildings, and the diversity of types of open spaces that make up their edge and their surroundings. To this end, the different types of open spaces will be observed at different scales, starting from a dimension that includes the fit of the estate in the urban fabric, on its edge and in relation to its surroundings, until detailing its configuration within the estate and in its component parts.

The scale of the space between buildings in this chapter contains the open spaces and constructions of the urban fabric in the housing estate and its surroundings, which allows us to appreciate the types of layouts of the current structure; where, how, and in what proportion the surface of private, community and public space varies; which elements encourage the use of space and movement, which limit it and which prevent it. The aim is to observe what type of open space predominates and the degree of integration of the different parts of the estate, between them, on its edge and in the growth of its surroundings, how the building is distributed, how the open spaces are organized around the building, and how these characteristics have influenced the structuring and integration of the different parts and the spatial cohesion of the estate.

### What I am going to be able to see in the community space inside the housing estate

In the introduction to the first chapter, the part of the open space that is usually privately owned, publicly accessible, but for community use, is defined as community space for the local social and community functions of their surrounding neighbourhoods, coinciding with Carmona (2014) (p.28). In the case studies of this thesis, the community space represents a small part of the open space, but its definition is of interest in this study since it is mainly in the housing estates, configuring most of its interior space, as a nexus between the residential private space and the public space formed by the streets, squares and parks on its edge. To explain this characteristic, the community spaces will be observed in relation to the rest of the open spaces on different scales, starting from a dimension that includes the fit of the estate within the urban fabric, on its edge and in relation to its surroundings, until detailing its configuration inside the estate and in its parts.

The scale of the community space in this chapter contains the open space and built inside the estate and in its environment, which allows us to appreciate the elements that comprise the open spaces, their organization and the limits that are produced between them; the type of spatial connections and relations that are established between the building and the open space; the factors that improve the spatial connections of the open space and which provide spatial attraction. Here the aim is to observe how the space around the buildings is used, the relationship between their typology and the types of open spaces, the elements that influence the form and configuration of the space and in which cases the spatial cohesion of the spaces within the estate is hindered.

### What is being sought in the analysis (methodology)

The case study analyses in this chapter depict the housing estate and its component parts today and at three different scales. The first scale is based on the same analytical framework used in the previous chapters, with the estate at its centre in order to observe how its structure is configured in relation to its edge and to its environment. In the second scale, the analytical framework is divided into districts, fragments of the estate or of the neighbourhood that form a unit with its own character, in order to observe how they relate to each other in the whole of the estate and in its environment. In the third scale, the small estates and neighbourhood units of the large estates studied are used, chosen for their formal and spatial qualities, in order to be able to observe the elements that configure the form, organisation, functionality and quality of the open space inside the estate.

In order to carry out the analysis, digital plans in AutoCAD from 2006 have been used, which have served as a basis for previous chapters, and each of their parts has been reviewed up to the present time by making visits to the site and using Google Maps, in two and three dimensions, to finally obtain a three-dimensional representation of each case.

## § 4.1 Supporting Structure. Current framework of spatial interrelations

This section considers the study of the current type of support structure of the built elements and spaces in the housing estate and its surroundings, in order to identify its components, how they are organised, and how they are related.

### 4.1.1 What is this section about?

By analysing the type of supporting structure in the case studies, we can observe different types of layouts, buildings and degrees of privacy in the open space, which helps us to explain the place occupied by the estate, its interior layout, the relationship with its edge and the growth that has taken place in its surroundings. To do this, the collection of layouts created by continuity and open building layouts are represented on the same map and in detail. These are combined to support the urban layout on which are highlighted the position and relationships between the types of buildings and their uses, linked to public and private open space; in other words, the types of layouts that support different degrees of privacy in open space that free up building typologies.

By studying the different types of layouts, buildings and open spaces from their joint representation, we can observe the supporting structure of the estate, its surroundings, and on its edges. In all the case studies, this makes it possible to observe the different forms that the layouts have taken, what is the degree of integration of the different parts of the estate, between them, on its edge and in the growth of its surroundings, how the buildings are distributed, how the open spaces are organized around the buildings, and how these characteristics have influenced the structuring of the different component parts.

### 4.1.2 How is the analysis carried out?

The analysis uses two complementary comparisons, which must be interpreted simultaneously. In the first, the urban structure of each case study is represented, and in the second, the level of integration of its road network.

In order to represent the urban structure, the city fragment used as a basis for the analyses of the case studies in chapter 3 is used, in a rectangular frame of equal scale and dimension (2.5x1.5 km), placing the housing estate in its centre in order to observe how its structure is currently configured in relation to that of its edge in the neighbourhood it forms or is part of, and in relation to its surroundings. This framework has been produced on the basis of the digital plans in AutoCAD of the cities from 2006, which have been compared and updated using Google Maps in two and three

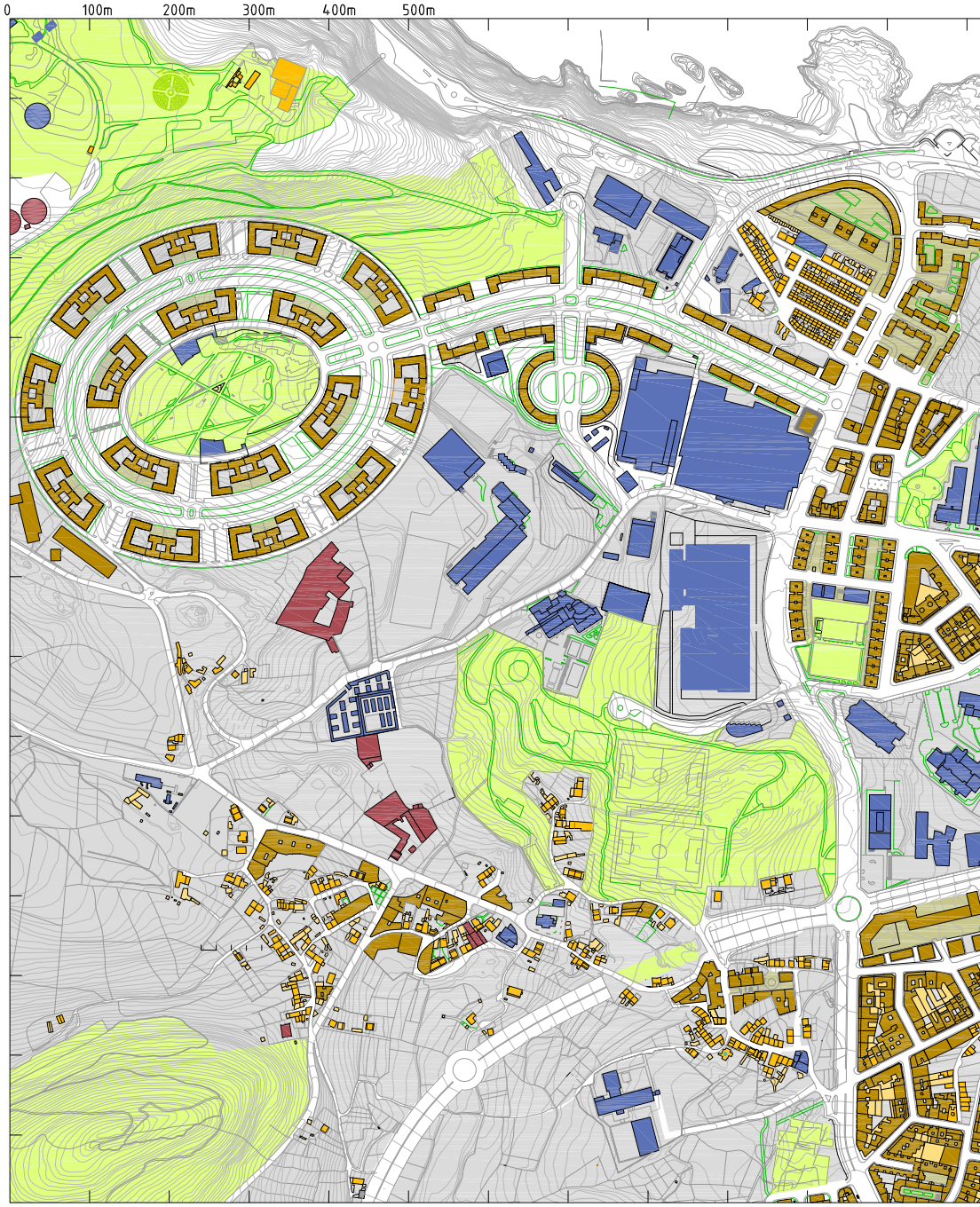
dimensions, examining each of the elements that comprise the urban structure and its volumetry, in order to redraw its content, differentiated by colour.

As a result, buildings more than three storeys high are shown in brown and the smaller ones in orange, making it possible to identify formerly rural areas, small estates and low-density growth areas, even inside the estates. Amenities are also represented in medium grey and industries in red, which allows us to observe the position of the amenities in the estates and the growth that has occurred since their construction, considering social amenities such as schools, markets and health centres, located in central positions where open space predominates over built space. Finally, the parks and squares are represented in light green, private open spaces in light grey and public open spaces in white, which makes it possible to differentiate the space of the street and car parking spaces from the areas that are clearly delimited as spaces for social interaction (parks and squares), and these from the rest of the open space, formed by rural plots, vacant plots, open space associated with amenities and industry, private gardens and spaces inside the blocks.

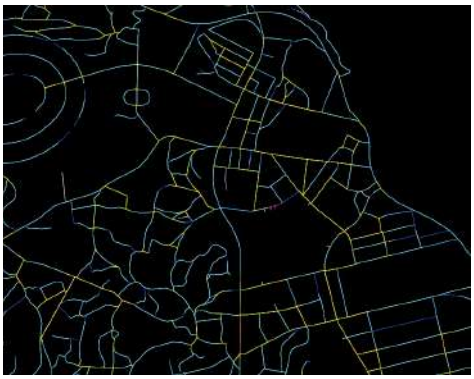
To represent the level of integration of each street in the case studies, the Space Syntax method has been adopted using the Depthmap computer application, which I have been able to access at TUDelft through Professor Akkelies van Nes. To carry out the analysis according to this theory, an axial plane is used which has been prepared from the AutoCAD map of each case study, formed by the smallest set of straight axes that cross each space, which makes it possible to observe how the connections between axes are produced and to quantify the degree of accessibility of the grid. This process is based on the axial depth or distance, which is defined as the minimum number of direction changes to reach one element of a spatial network from another. The analysis uses a local integration coefficient (HH) R3, which shows the integration of each street in relation to its immediate surroundings, up to three times the change of direction of each street. The result is a map in which the intensity of the integration is differentiated with a colour gradient that ranges from red to blue, where the red lines show the streets with the highest integration values, while the blue lines show the most segregated ones. The integration calculates how close each element is to the rest of the system components, measures how accessible each segment is to the rest and how much potential it has as a movement destination. This makes it possible to observe what the accessibility system looks like within the estate and in its environment, and what the integration levels of its elements are like.

A CORUÑA
María Pita

## Current Framework of spatial interrelations



Industry Amenities Buildings<3floors Building>3floors Private Open Spaces Community Open Spaces Parks & Squares Road Network



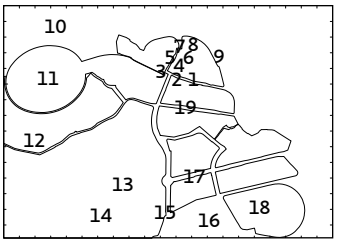
Space Syntax analysis of the street network configuration
Local integration (HH) R3

In the Maria Pita estate, the grid structure prevails, forming streets with a closed or partially open block, permitting allows contact between the internal layouts of the neighbourhood and those on its perimeter. The red lines show as higher integration values all the best-connected streets, while the blue lines show that the internal streets of the estate have low integration.

## A CORUÑA
## María Pita

## Current Framework of spatial interrelations

Image positions





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A CORUÑA

Barrio das Flores

## Current Framework of spatial interrelations

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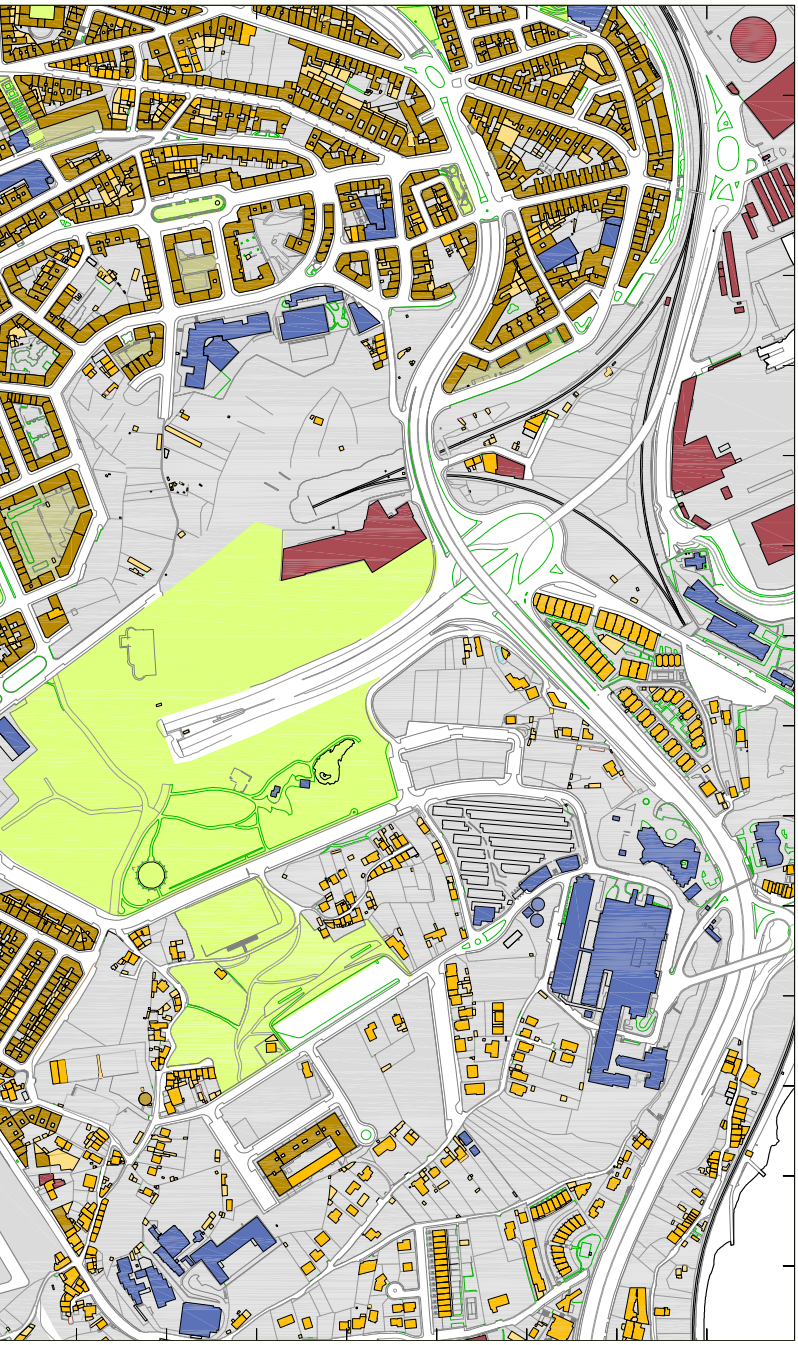


Space Syntax analysis of the street network configuration
Local integration (HH) R3

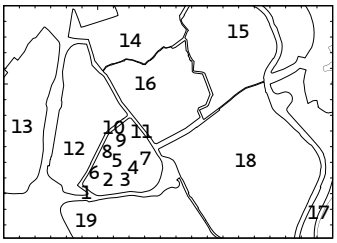
In the Barrio de las Flores a type of central structure is maintained around a space for community use, with green areas and amenities, with a weak connection to the linear connection of the Elviña estate of which it forms a part. The red lines show the highest integration values on the streets with the most services, while the blue lines show the low integration of the road network inside the estate.

A CORUÑA

## Barrio das Flores

## Current Framework of spatial interrelations

Image positions

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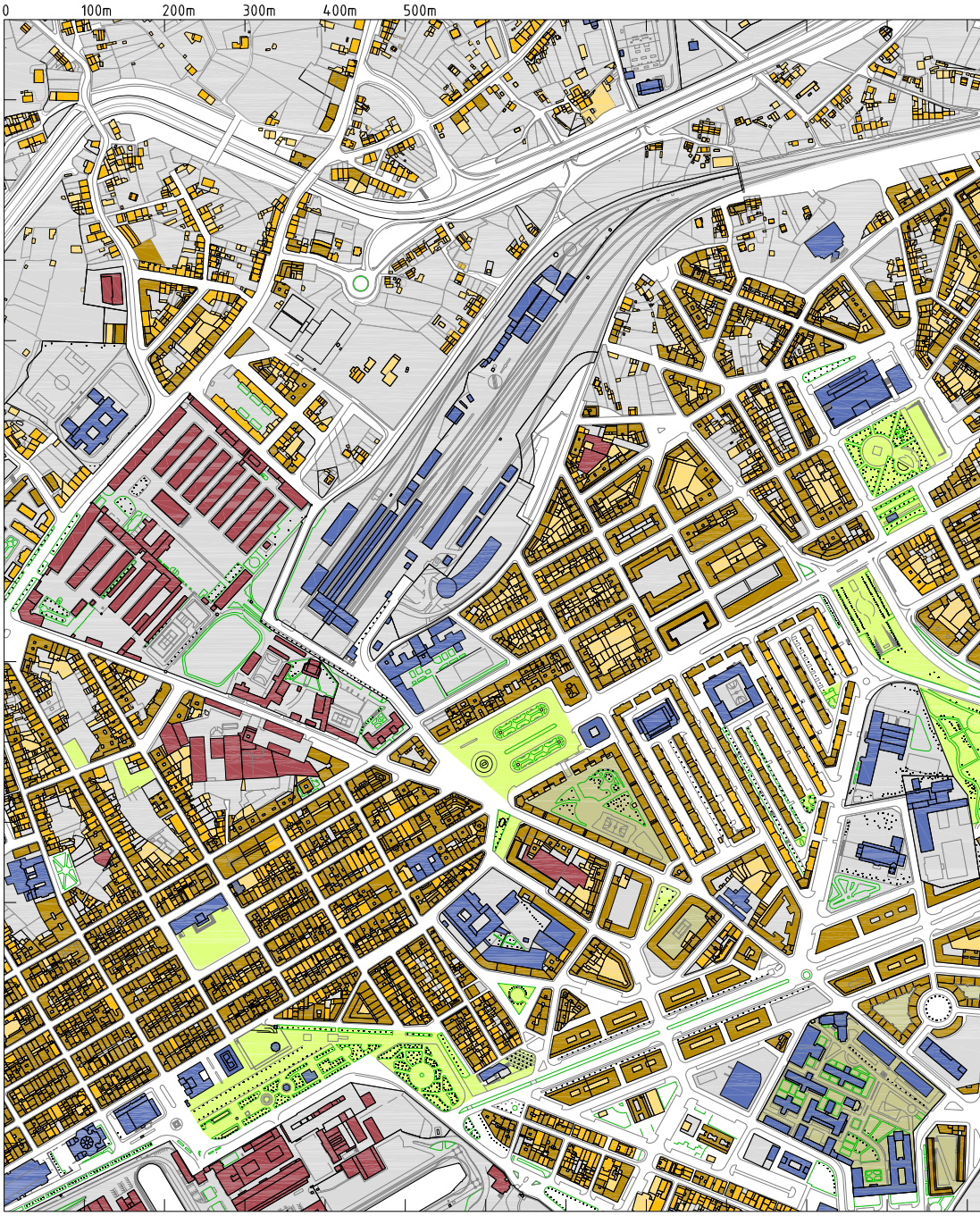
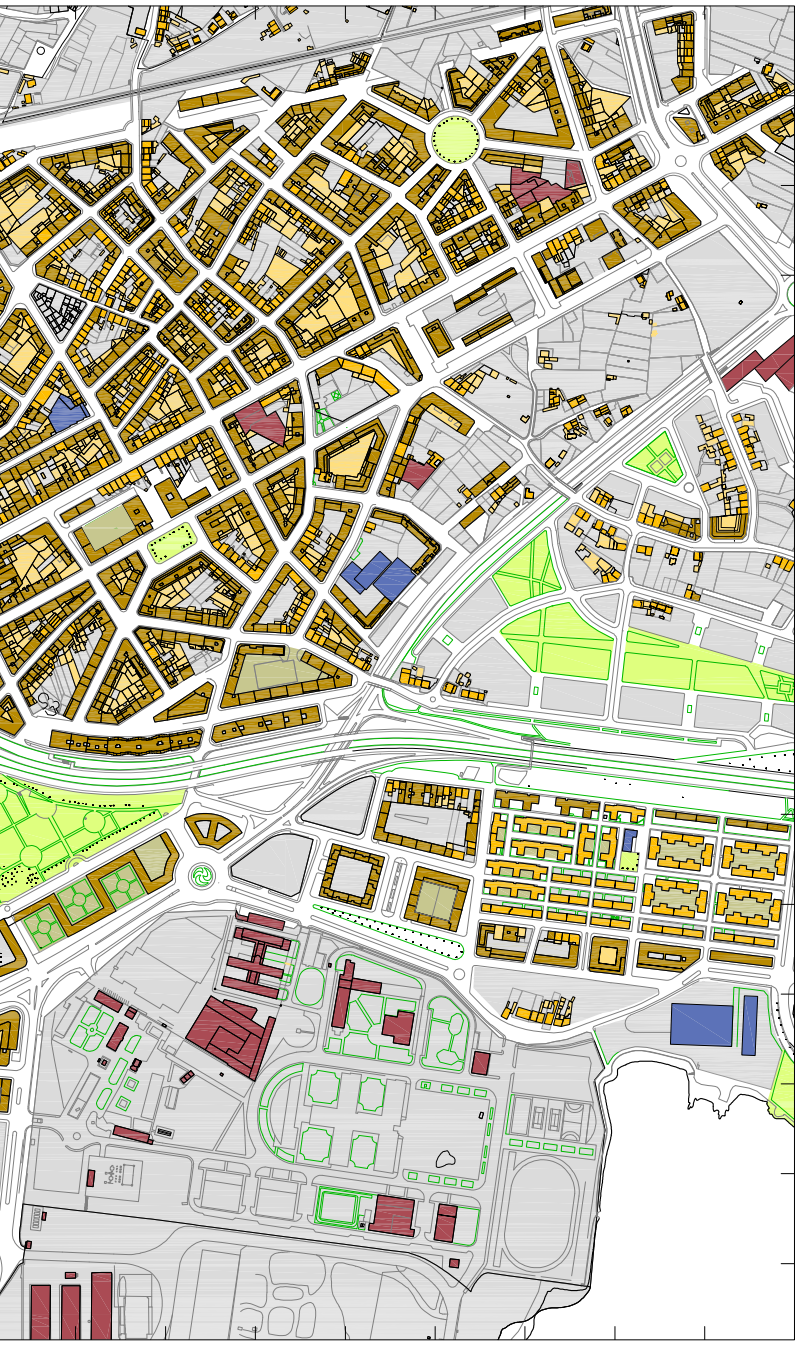
FERROL

Recimil

## Current Framework of spatial interrelations



Industry Amenities Buildings<3floors Building>3floors Private Open Spaces Community Open Spaces Parks & Squares Road Network



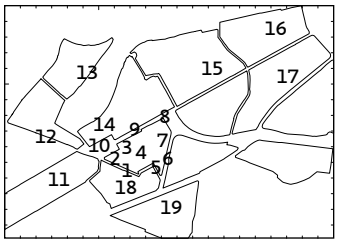
Space Syntax analysis of the street network configuration
Local integration (HH) R3

The area around the Recimil estate is dominated by the grid as a support structure for growth by continuity, and its component parts are correctly interconnected. The red lines show as higher integration values all the streets around the estate, while the blue lines show that the inner streets of the estate have low integration.

FERROL
Recimil

## Current Framework of spatial interrelations

Image positions





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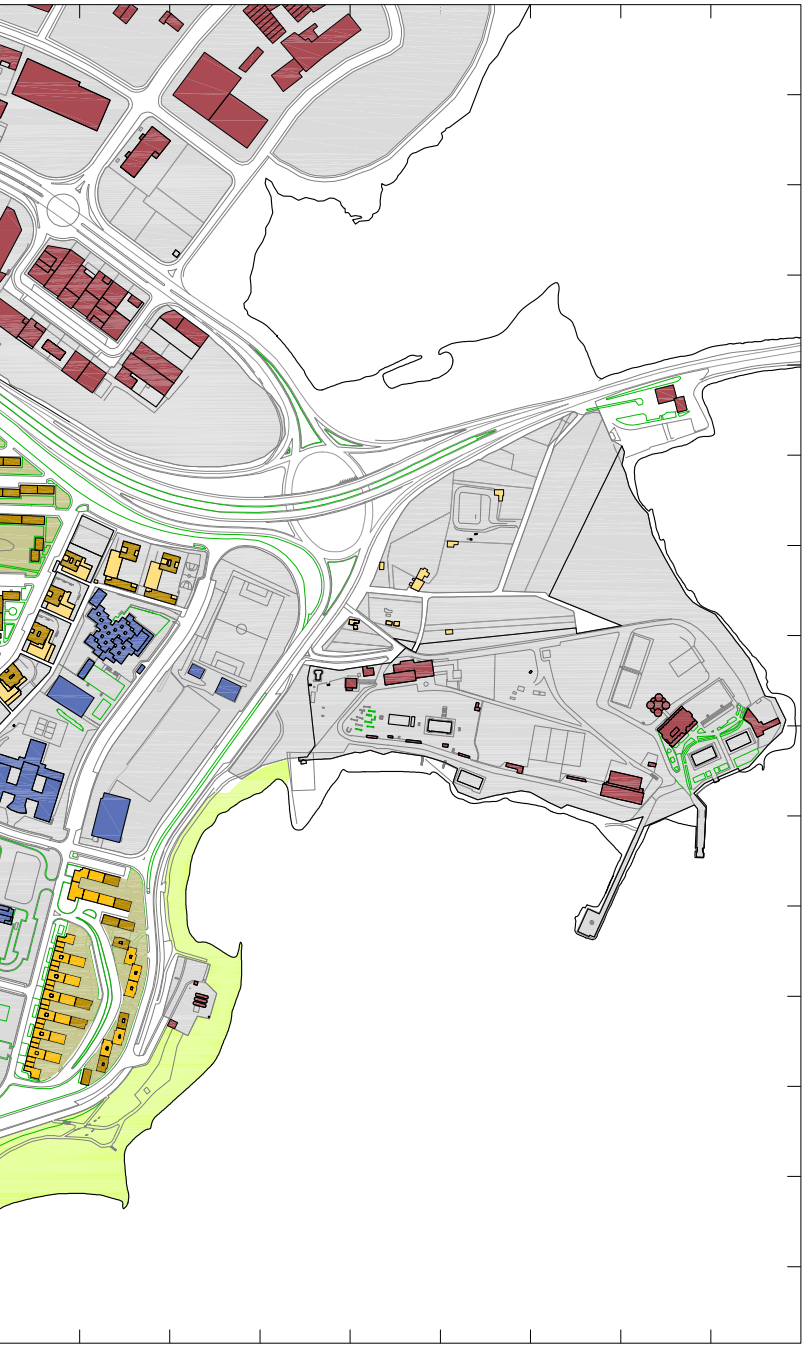
FERROL
Caranza

## Current Framework of spatial interrelations

Industry Amenities Buildings<3floors Building>3floors Private Open Spaces Community Open Spaces Parks & Squares Road Network



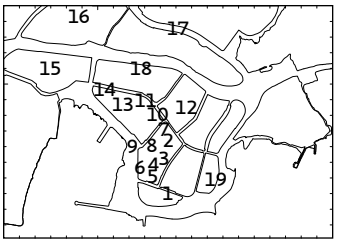
Space Syntax analysis of the street network configuration
Local integration (HH) R3

Caranza is predominated by residential units surrounded by roads combined with large amenities. The red lines show the highest integration values, with the fabric formed by streets and blocks as the best connected, while the blue lines show that the streets between isolated residential units have low integration.

FERROL
Caranza

## Current Framework of spatial interrelations

Image positions





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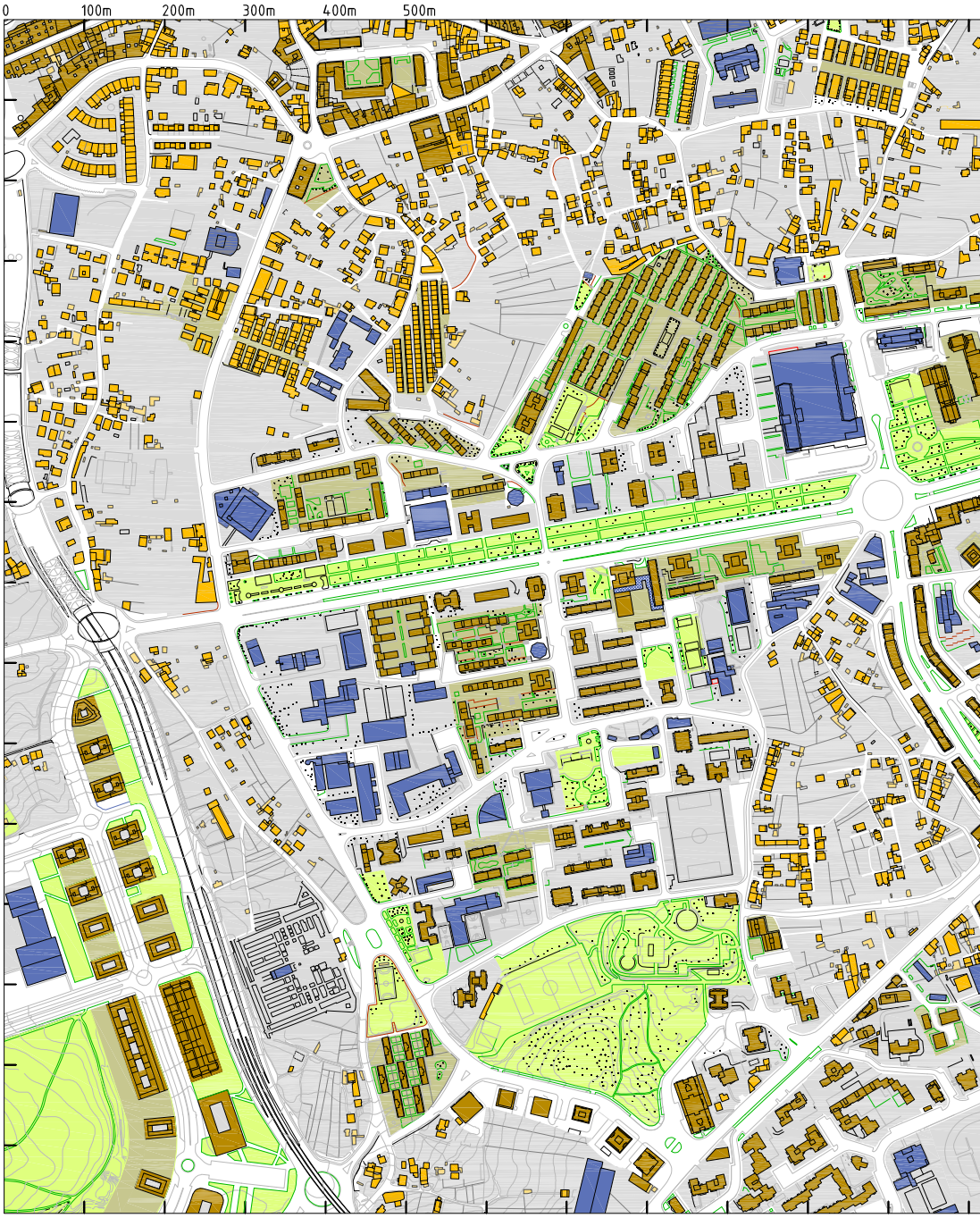
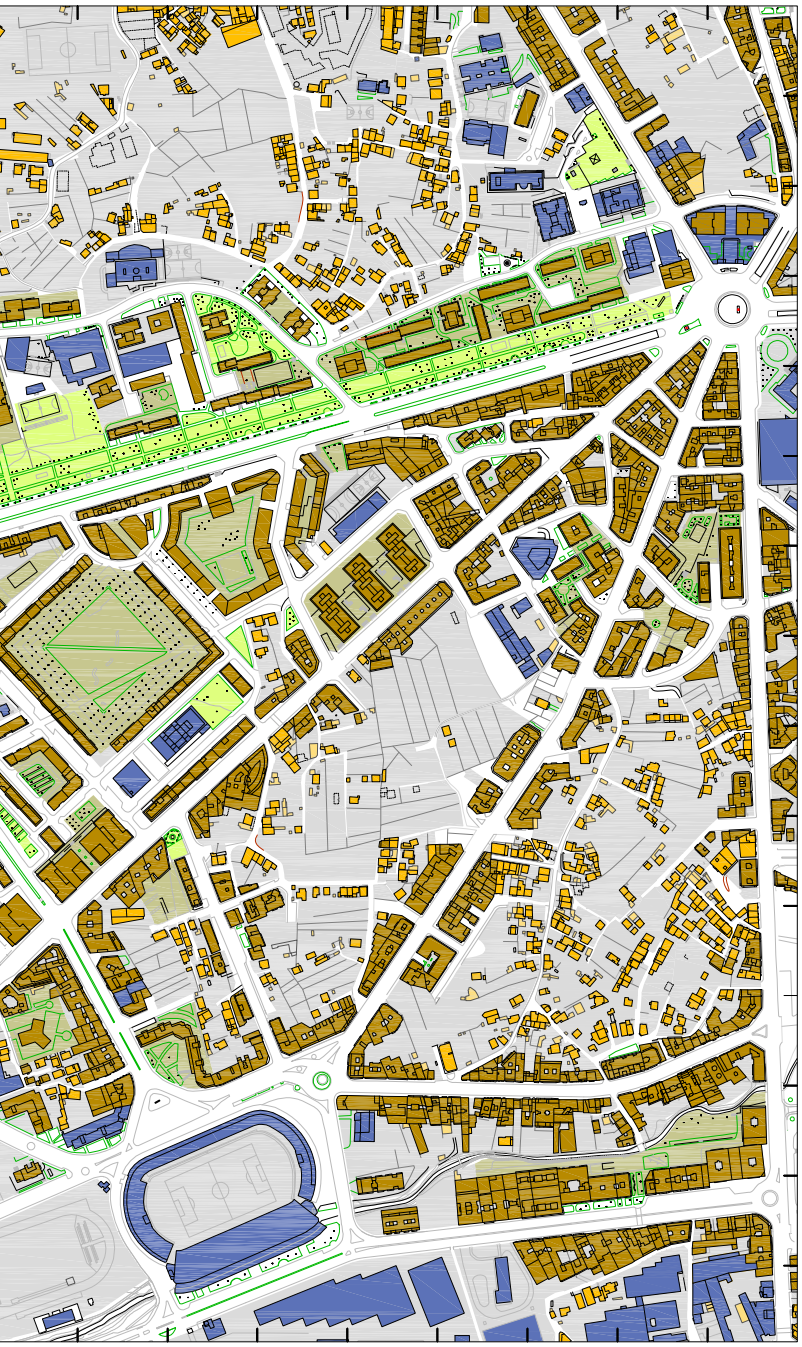
VIGO

Coia

## Current Framework of spatial interrelations



Industry Amenities Buildings<3floors Building>3floors Private Open Spaces Community Open Spaces Parks & Squares Road Network



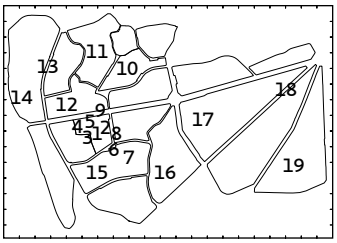
Space Syntax analysis of the street network configuration
Local integration (HH) R3

In Coia, the estate is organized around the main avenue, to which isolated buildings and residential units organized around central spaces are connected. The red lines show the highest integration values, with the Avenues as the best connected roads across the residential estate and its surroundings, while the blue lines show that most of the streets have low integration.

VIGO
Coia

## Current Framework of spatial interrelations

Image positions





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### 4.1.3 Supporting Structure. Particular Conclusions

**1. The supporting structure of the current urban form of the housing estates and their surroundings is formed by different types of layouts, buildings and degrees of privacy in the open space. In the large estates, the supporting structure is diverse, which provides a greater capacity for adaptation in its interior without improving integration with its surroundings, while the urban fabric of its surroundings allows for greater interconnection between them, but displays discontinuities on the edge of the estate.**

In the case studies, an urban structure can be seen which combines areas predominated by the grid, with areas predominated by open buildings, as in the case of the housing estates. If the layouts are the main element of the urban structure, the grid is configured as a support, as it is the case around the estates, where the space between roads determines the plot and its dimension, delimiting the street (public) and the buildings (private) which define different degrees of privacy in the open space. If the main element of the urban structure is the buildings, as in the case of the estates, a single urban unit is formed upon which the buildings are based. Generally in this case, their layouts are only intended to give access to the buildings. Both the grid and the estate offer different possibilities of fitting in with their surroundings. The grid allows contact between the internal layouts of the neighbourhood and those on its perimeter. Its flexibility lies in its capacity to structure fabrics based on elementary resources, such as the street, through more complex forms of growth such as the urban expansion areas. In the estate, the intervention area constitutes a single urban unit that achieves flexibility through independence between road and building.

Geometric designs predominate in the structure of the estates studied. In the small estates, the grid structure prevails, forming streets with a closed or partially open block, unlike the large estates, whose design no longer has the clarity it originally had, as it includes mixed systems which, on the other contrary, provide a greater capacity for adaptation and variety to the whole. These are generally formed by a combination of linear, central and large residential units, the result of modifications made as the estate was completed from the time of its construction.

In the large housing estates studied, the most commonly used basic layout is linear, influenced by the road network, with a dominant direction that organises a main axis of activities that is a reference both for the volumetric organisation of its surroundings and as a link to other types of layouts. This can be seen in Coia, where the estate is organized around the main avenue, to which isolated buildings and residential units organized around central spaces are connected. Caranza is predominated by residential units surrounded by roads combined with large amenities. In the Barrio das Flores a type of central structure is maintained around a space for public use, with green areas

and amenities, with a weak connection to the linear connection of the Elviña estate of which it forms a part.

This heterogeneous nature of the structure of the large estates is not sufficient to allow for sufficient organisation between the different parts within them, as it is influenced by the differentiation of uses by zones, a road system predominated by access roads leading to the buildings, with generally branched and hierarchical layouts that only connect the chosen point of destination, and a predominance of isolated, high-rise buildings, which highlight the autonomy of the estate and the difficulty of continuity and connection with the surroundings. The buildings in the estates are distributed in a scattered manner or are grouped in repeatable modules. When the buildings are grouped together, a hierarchy of spaces with different degrees of privacy can be established. If this grouping does not exist, the open space predominates over the built space, without clear limits between both, with the road network disconnected from the urban unit, and the building prevailing as an isolated object.

The area around the housing estate is dominated by the grid as a support structure for growth by continuity, and its component parts are correctly interconnected. The case studies that have used the grid as a supporting structure mechanism have different types of configuration that generally configure blocks in the space between the road network, in more regular forms in areas of planned growth, and more organic forms in areas defined by the rural plot layout. When the plots are narrow and elongated, they have given rise to streets that connect the opposite ends, and where the buildings follow their linear course. When the plot is small, the grid works as a street of reduced length. When the plot is larger, the grid adapts to and connects with the surrounding layout, generally as a result of the overlapping of existing layouts. When the plot is on the edge, the grid differs from the previous ones in that it does not establish a connection, but rather gives continuity to the road in the consolidated environment. These edges are found in vacant plots or fragments of the rural fabric, as well at the point where they coincide with large infrastructures or amenities. In the same way as on the edge of the estate, this is where discontinuities are generated with the fabric that supports growth by continuity.

In the estates, the discontinuity on their edges may also be due to variations in the topography, or to the presence of isolated buildings, but generally it is a result of the lack of continuity of the road network of the grid with that of the estate. This occurs in a space composed of diverse fragments, consisting of buildings and open spaces, which are more numerous the larger the edge of the estate and which lack a common grid and suitable coordination between their component parts.

## § 4.2 Organisation of built elements and open spaces

This section studies 1) the distribution of open spaces, 2) the variation between the use of open space and the built elements, and 3) the relationships between the use of space, connection and movement, in order to understand how they affect the spatial cohesion of the housing estate itself and its surroundings.

### 4.2.1 What is this section about?

By analysing the arrangement of the built elements and open spaces in the case studies, it is possible to observe the different types of spaces, their use, and the extent of the relationship between them in the estate and its surroundings. To do this, we observe the amount and location of the surface occupied by the open spaces, the use and type of open space and the relationship between the different parts of the estate and its surroundings, the open spaces per dwelling, the space occupied per district in relation to its floor space index, the density in relation to the types of open space, the connectivity in relation to the travel time between the different uses existing on the estate and its surroundings, the levels of accessibility and the degree of permeability of the whole.

By studying the **distribution** of open spaces in the estate and its surroundings, we can see where and in what proportion the surface area of private, community and public space varies. In all the case studies, this allows us to observe which type of open space predominates inside the estates, on their edges and in their surroundings, in which cases it hinders the spatial cohesion of the estate, which of them limits spatial integration, and which helps to improve its integration with its surroundings.

By studying the **variation** between the use of open space and the built elements in relation to the estate and its surroundings, we can see what the surface occupied by the open spaces looks like. In all the case studies, this allows us to observe what the different arrangements of the built elements and the private, community and public open space look like, how they influence the continuity and connection between the different parts of the estate and its surroundings, and which ones improve their integration and spatial cohesion.

By studying the **relationships** between the use of space, the connections and the movement between the estate and its surroundings, we can observe the elements that encourage the use of space and movement, those which limit it, and those which prevent it. In all the study cases, this allows us to observe the place where the different types of amenities and uses are located inside the estate and in its surroundings, how they influence the improvement of connectivity, which elements prevent or limit the permeability between the different parts, and how they influence the degree of accessibility and spatial cohesion.

### 4.2.2 How is the analysis carried out?

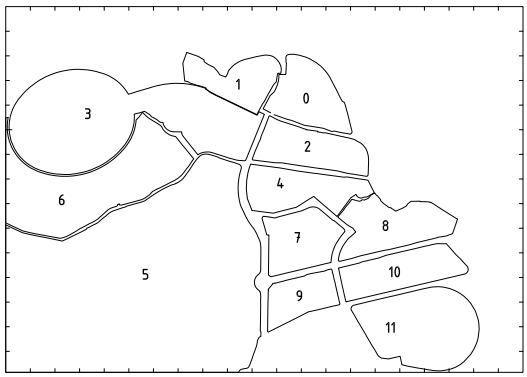
Three comparisons are used in the analysis, the first representing the surface occupied by the open spaces, the second the use of the land, and the third the degree of connection and movement between the estate and its surroundings.

To represent the area occupied by open spaces on the estate and its surroundings, the analytical framework of the case studies is divided into districts and the area of private, community and public space is represented separately. Roads and parking spaces are differentiated from parks and squares, in order to highlight the location of the parks and squares, which are few and far-between in the estate, from the road network that covers large areas of the estate and its surroundings. The division into districts makes it possible to recognise fragments which, when integrated into the estate or the neighbourhood, form a unit with its own character, in order to observe its internal spatial organisation and understand it as a whole. A distinction is made as 'district 0' between the small estate or the part of the large estate, chosen for its formal and spatial qualities, in order to study the strategies for organising the exterior space in the final section of the chapter, which allows it to be observed in relation to the rest of the estate and its surroundings.

To represent the variation between the use of open space and the built elements in relation to the estate and its environment, four complementary graphs are used, which can be interpreted individually or together. In the first graph, the percentage of the surface of the type of open space in each district and its degree of relationship with the district-0 are shown, using different colours to differentiate the values of the built, private, and community space, parks/ squares and the road network. The second graph represents the open spaces per dwelling in each district, differentiating the surface of private space per dwelling from the rest of the open community and public space. The third graph combines the representation in axonometry of the floor space index, and the graph of the percentage of built space per district in relation to its floor space index. The fourth graph shows the density in relation to the percentage of open space per district, differentiating between occupied, public, private, and community space.

To represent the degree of connection and movement between the estate and its surroundings, three complementary sets of graphics are used, which can be consulted individually or together. The first set of graphs represents the connectivity, combining a graph of the travel time in minutes from the district-0 and the surface area occupied by each facility, the location of the amenities on the ground plan, highlighting the shops, parks and squares from the rest, and a graph showing the use of the ground floors of the complex. A second set of three graphs shows the levels of accessibility in relation to travel time. The third graph represents the degree of permeability of the complex, differentiating the height of the barriers and the existing gradients.

## Urban parameters measurement A CORUÑA MARÍA PITA

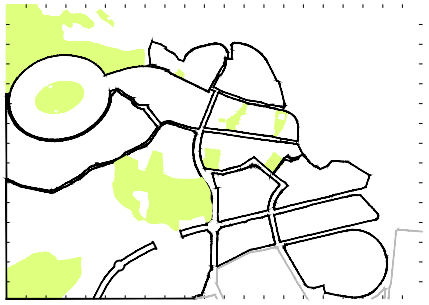



FRAMEWORK

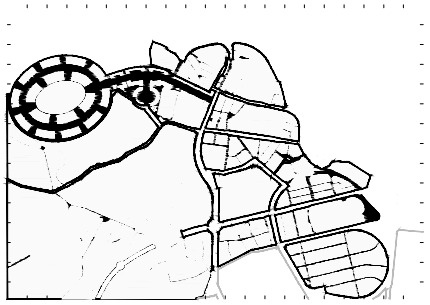
| | URBAN PARAMETERS / DISTRICT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA TOTAL AREA m² | O Built area m² | D Dwelling area m² | F Amenities area m² | TF TOTAL OPEN SPACES m² | C Community space district m² | P Private space district m² | PS Parks & Squares district m² | R Road networks district m² | FLOOR SPACE INDEX m²/m² | Density dwelling /ha | Open Spaces per dwelling m²/ dwelling | Public space per dwelling m²/ dwelling |
| FRAMEWORK | 1,790,785 | 369,372 | 213,528 | 153,890 | 1,461,433 | 44,653 | 884,476 | 227,798 | 304,506 | 1.28 | 88 | 242 | 70.25 |
| | O+TF | D+F | | | C+P+PS+R | 3.06% | 60.52% | 15.59% | 21.83% | | | | |
| DISTRICT 0 | 68,801 | 11,370 | 8,435 | 2,935 | 57,431 | 8,932 | 48,219 | 0 | 280 | 0.68 | 43 | 195 | 29 |
| DISTRICT 1 | 55,342 | 11,498 | 7,963 | 3,535 | 43,834 | 8,662 | 33,728 | 1,093 | 351 | 0.64 | 62 | 128 | 30 |
| DISTRICT 2 | 67,228 | 28,807 | 14,642 | 14,165 | 38,421 | 1,568 | 16,465 | 9,261 | 11,127 | 1.80 | 113 | 51 | 29 |
| DISTRICT 3 | 267,573 | 81,408 | 48,834 | 32,574 | 186,165 | 7,700 | 20,239 | 27,824 | 130,402 | 2.20 | 170 | 41 | 37 |
| DISTRICT 4 | 68,435 | 29,955 | 28,818 | 1,137 | 38,480 | 4,799 | 2,680 | 12,686 | 18,315 | 2.60 | 207 | 27 | 25 |
| DISTRICT 5 | 694,767 | 55,230 | 37,533 | 17,697 | 639,537 | 997 | 418,947 | 176,934 | 42,659 | 0.16 | 7 | 1,387 | 246 |
| DISTRICT 6 | 179,552 | 19,005 | 0 | 17,051 | 160,547 | 0 | 153,204 | 0 | 7,343 | 0.14 | 0 | 0 | 0 |
| DISTRICT 7 | 64,056 | 18,546 | 0 | 18,546 | 45,510 | 0 | 45,510 | 0 | 0 | 0.87 | 0 | 0 | 0 |
| DISTRICT 8 | 77,653 | 27,367 | 18,614 | 8,753 | 50,286 | 5,436 | 19,450 | 0 | 25,400 | 1.66 | 119 | 54 | 33 |
| DISTRICT 9 | 44,995 | 24,441 | 24,441 | 0 | 20,554 | 6,559 | 1,117 | 0 | 12,878 | 3.50 | 300 | 15 | 14 |
| DISTRICT 10 | 69,919 | 27,039 | 2,721 | 24,318 | 42,880 | 0 | 26,475 | 0 | 16,405 | 0.64 | 25 | 242 | 93 |
| DISTRICT 11 | 132,474 | 34,706 | 21,527 | 13,179 | 97,788 | 0 | 58,442 | 0 | 39,346 | 0.50 | 10 | 764 | 307 |

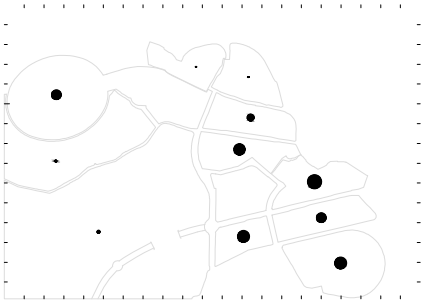
Private space districts 60.52%

Community space districts 3.06%



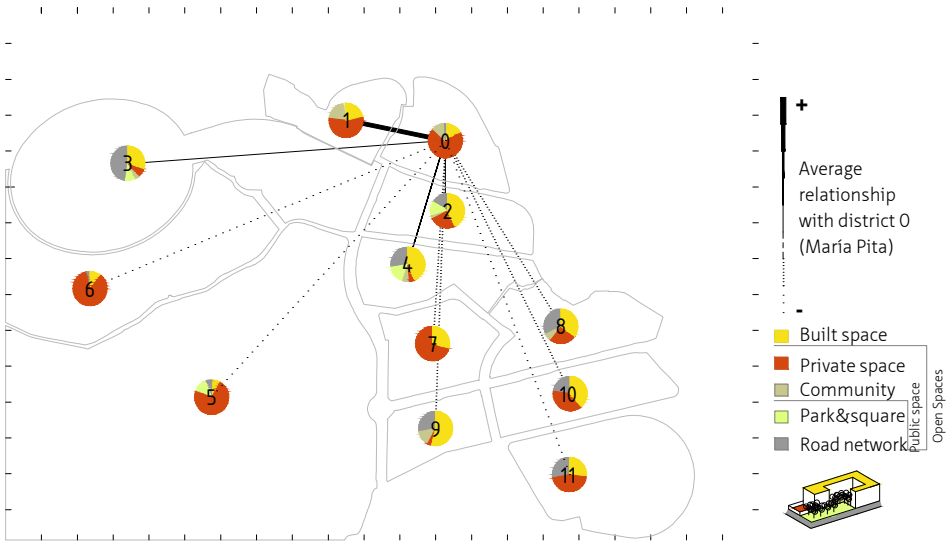
Parks & Squares districts 15.59%



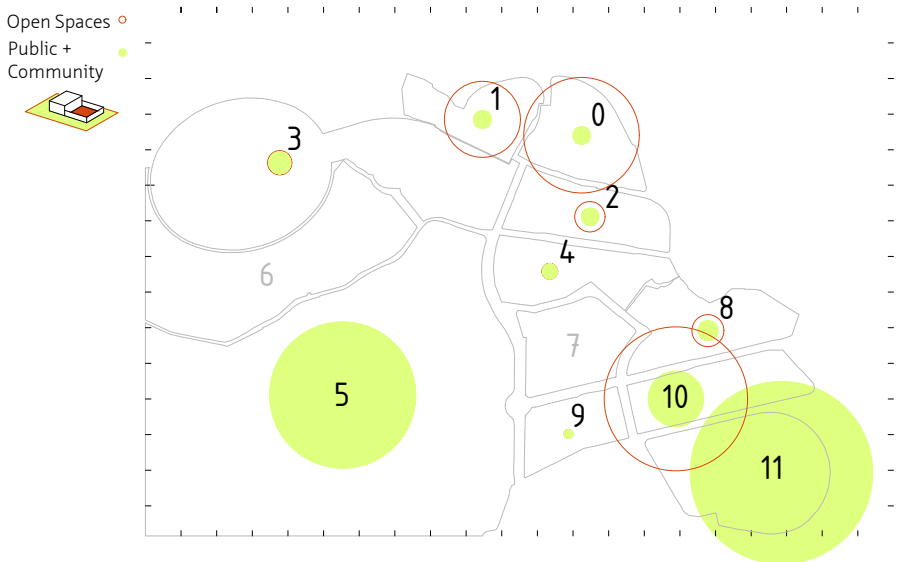


Road network districts 21.83%

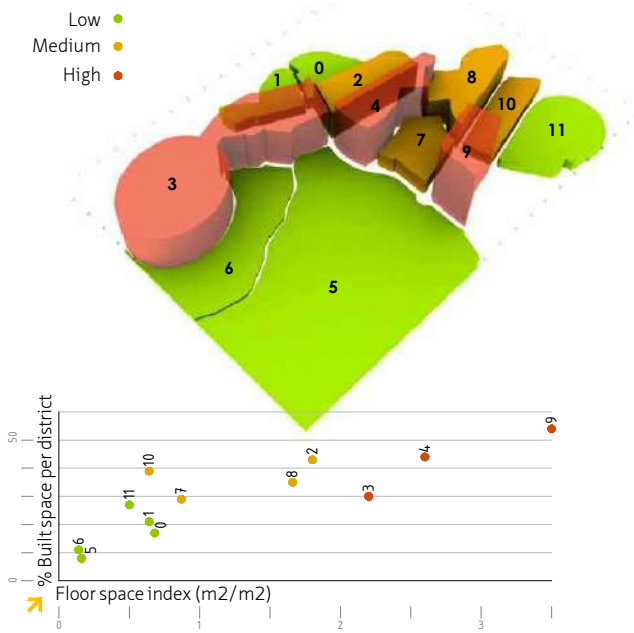
## 4.2.2 TYPES OF OPEN SPACES



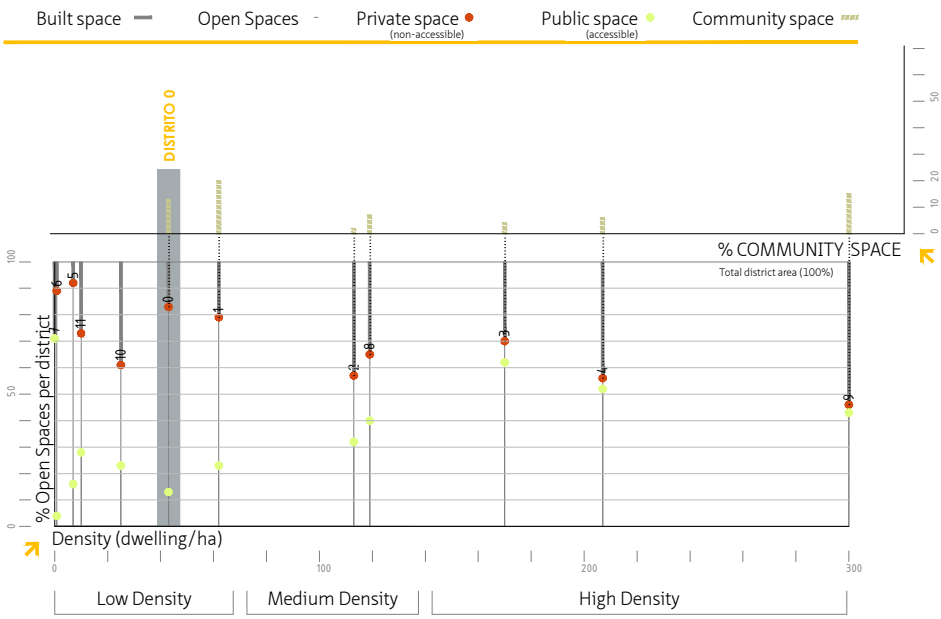

## 4.2.3 OPEN SPACES PER DWELLING



## 4.2.4 FLOOR SPACE INDEX

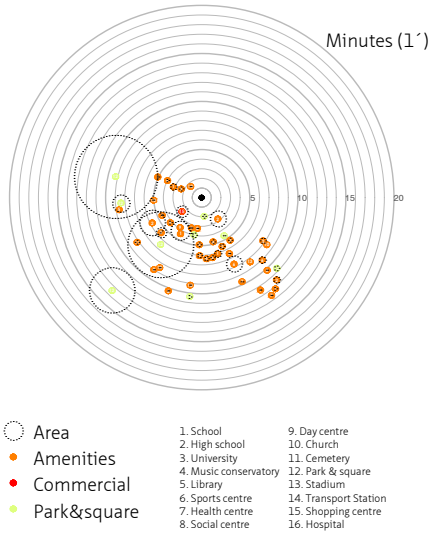


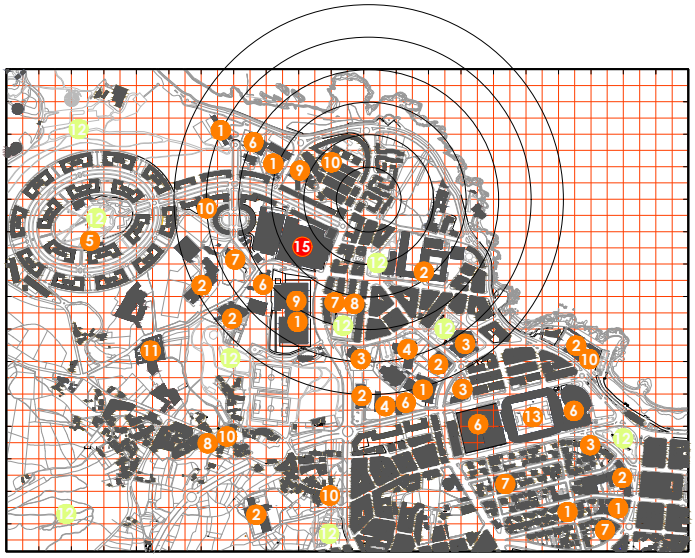

## 4.2.5 DENSITY - OPEN SPACES



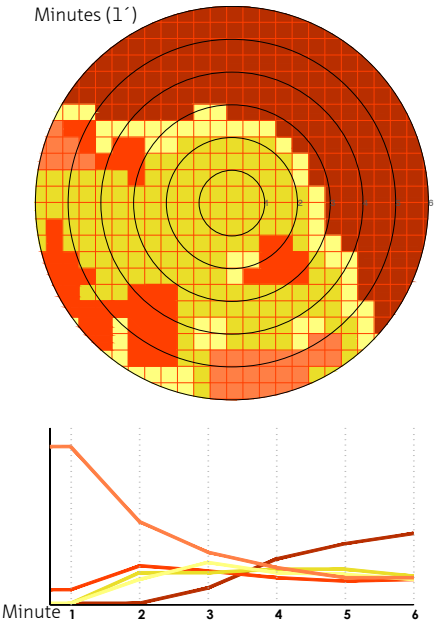
## A CORUÑA 4.2.6 CONNECTIVITY

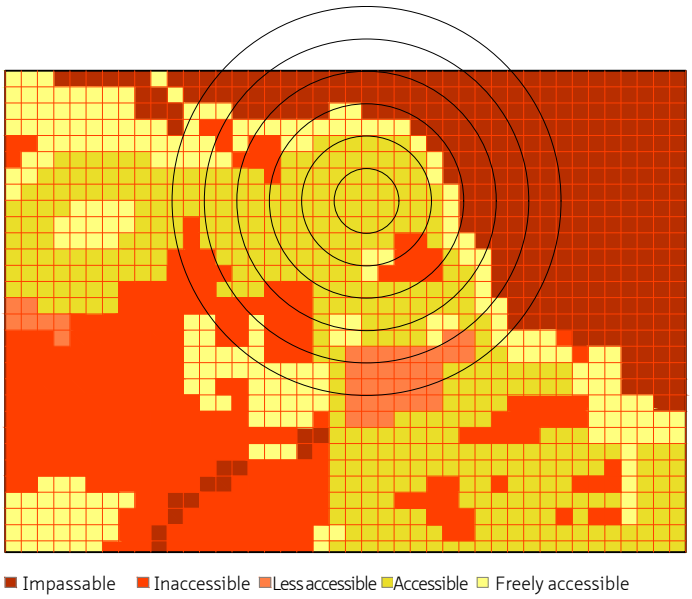
**María Pita**

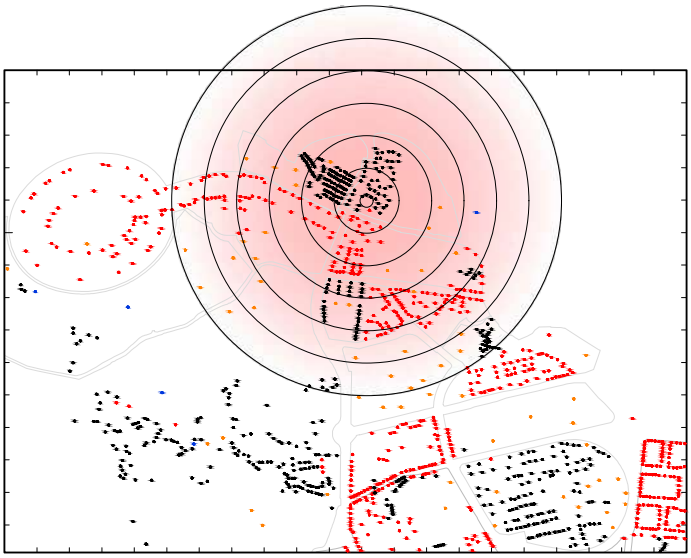


## 4.2.7 ACCESSIBILITY

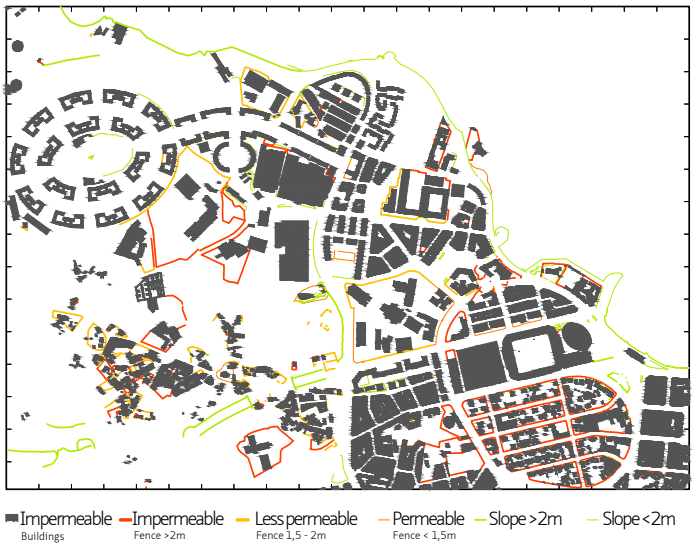


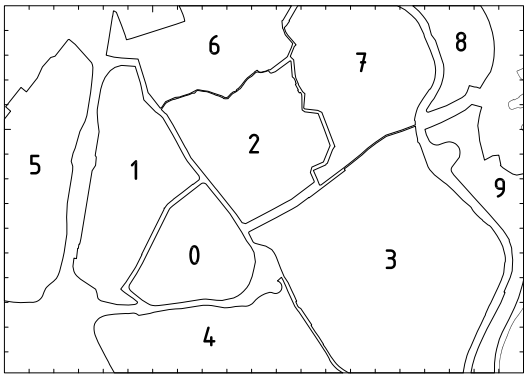


Ground floor use ● Housing ● Industry ● Commercial ● Amenities

## 4.2.8 PERMEABILITY



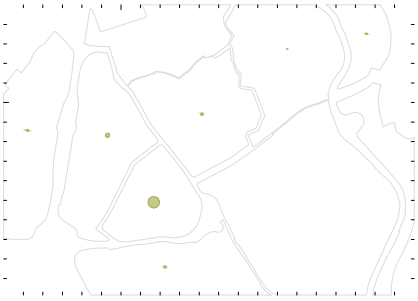
## Urban parameters measurement A CORUÑA BARRIO DAS FLORES



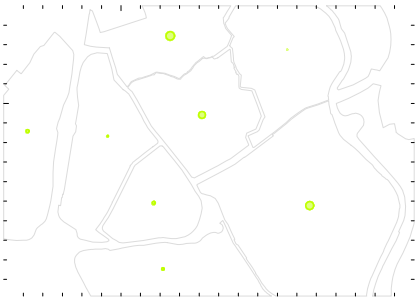

FRAMEWORK

| | URBAN PARAMETERS / DISTRICT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA TOTAL AREA m² | O Built area m² | D Dwelling area m² | F Amenities area m² | TF TOTAL OPEN SPACES m² | C Community space district m² | P Private space district m² | PS Parks & Squares district m² | R Road networks district m² | FLOOR SPACE INDEX m²/m² | Density dwelling /ha | Open Spaces per dwelling m²/ dwelling | Public space per dwelling m²/ dwelling |
| FRAMEWORK | 2,472,869 | 558,689 | 432,932 | 125,764 | 2,052,823 | 106,206 | 946,739 | 306,754 | 693,124 | 1.42 | 99.4 | 161.2 | 58.8 |
| | O+TF | D+F | | | C+P+PS+R | 5.17% | 46.12% | 14.95% | 33.76% | | | | |
| DISTRICT 0 | 161,062 | 41,325 | 31,695 | 9,630 | 119,737 | 45,666 | 4,873 | 13,374 | 55,824 | 1.36 | 124 | 60 | 57 |
| DISTRICT 1 | 257,012 | 54,969 | 31,176 | 23,793 | 202,043 | 25,215 | 46,780 | 10,367 | 119,681 | 1.19 | 75 | 105 | 81 |
| DISTRICT 2 | 251,672 | 73,826 | 64,845 | 8,981 | 216,535 | 11,593 | 104,016 | 49,553 | 51,373 | 1.90 | 155 | 45 | 19 |
| DISTRICT 3 | 635,468 | 89,778 | 57,073 | 32,705 | 589,031 | 0 | 337,816 | 143,825 | 107,390 | 0.63 | 33 | 258 | 98 |
| DISTRICT 4 | 235,111 | 39,848 | 27,192 | 12,656 | 212,258 | 8,427 | 132,319 | 16,995 | 54,517 | 1.01 | 65 | 127 | 41 |
| DISTRICT 5 | 256,513 | 52,416 | 33,973 | 18,443 | 204,097 | 8,713 | 56,492 | 20,397 | 118,495 | 1.20 | 87 | 91 | 66 |
| DISTRICT 6 | 193,628 | 53,108 | 50,235 | 2,873 | 180,138 | 0 | 60,764 | 49,643 | 69,731 | 1.67 | 111 | 65 | 37 |
| DISTRICT 7 | 279,016 | 95,232 | 85,490 | 9,742 | 183,784 | 4,145 | 111,336 | 2,398 | 65,905 | 1.96 | 130 | 51 | 20 |
| DISTRICT 8 | 82,419 | 38,985 | 36,669 | 2,316 | 43,434 | 2,447 | 11,037 | 202 | 29,748 | 2.94 | 203 | 26 | 19 |
| DISTRICT 9 | 120,968 | 19,202 | 14,584 | 4,625 | 101,766 | 0 | 81,306 | 0 | 20,460 | 0.39 | 11 | 784 | 150 |

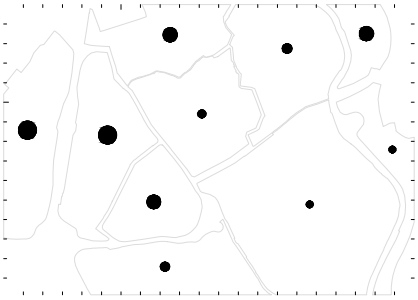
Private space districts 46.12%



Community space districts 5.17%



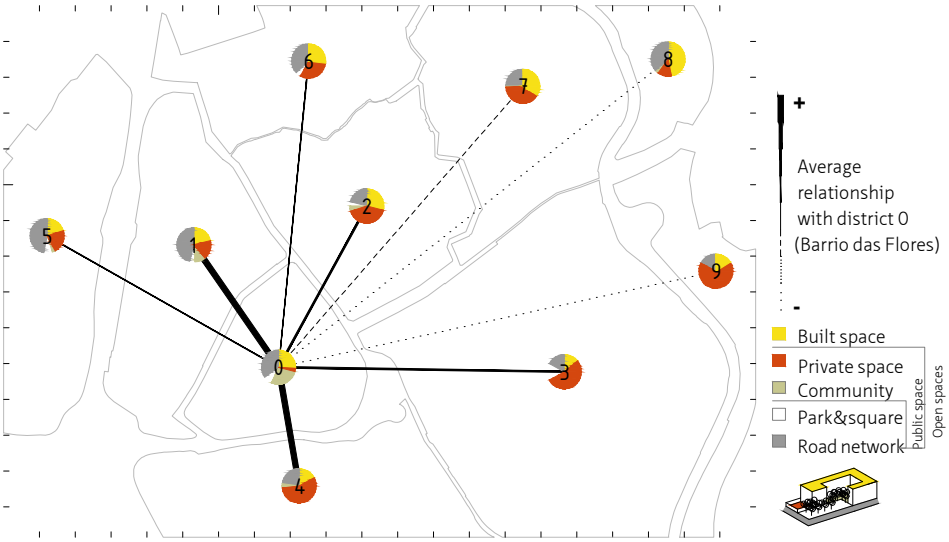
Parks & Squares districts 14.95%



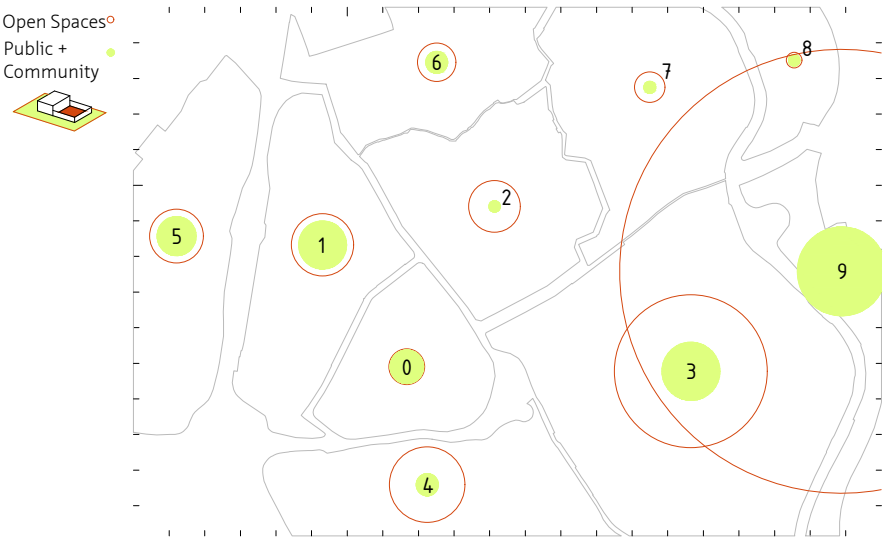
Road network districts 33.76%

A CORUÑA
Barrio das Flores

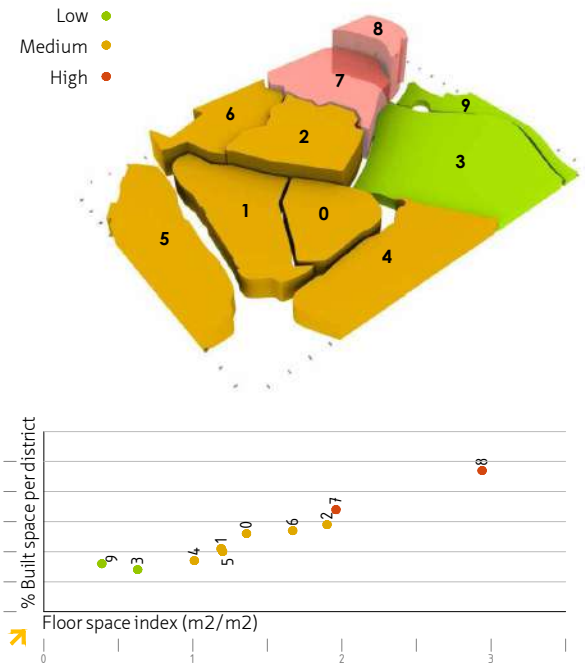
## 4.2.2 TYPES OPEN SPACES



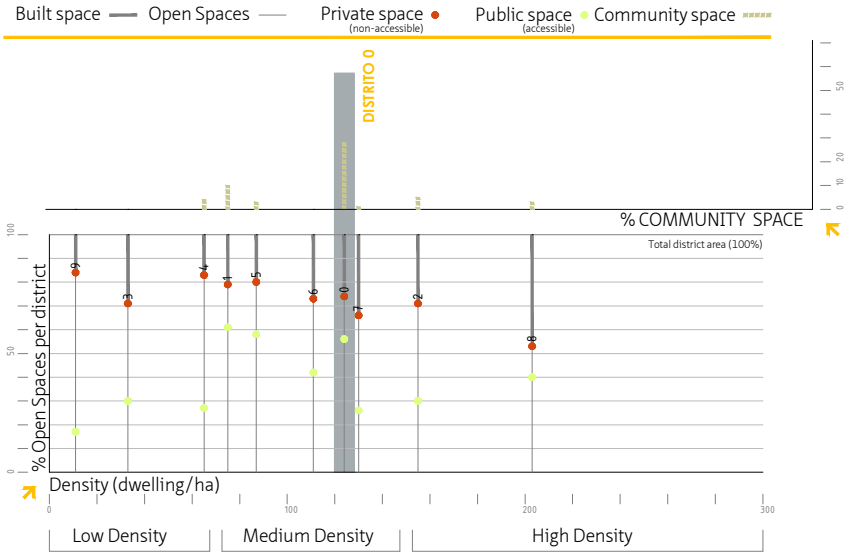

## 4.2.3 OPEN SPACES PER DWELLING



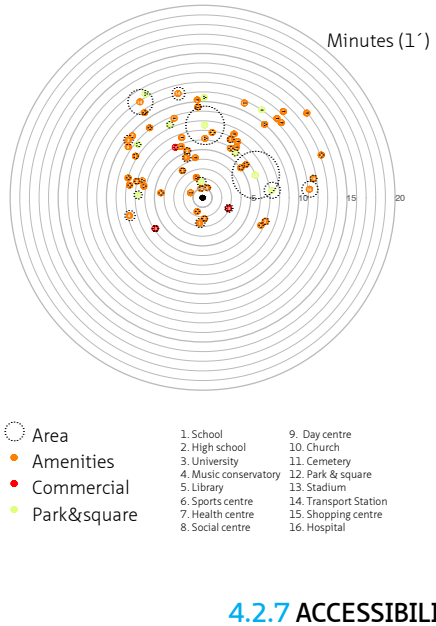
## 4.2.4 FLOOR SPACE INDEX

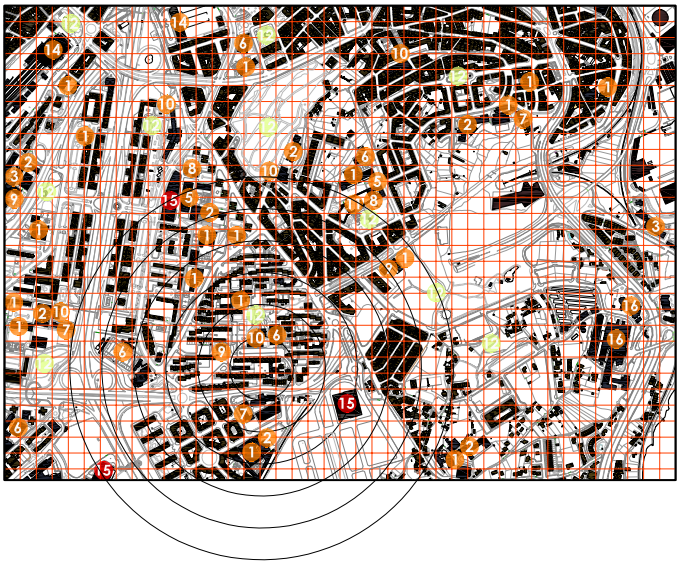



## 4.2.5 DENSITY - OPEN SPACES

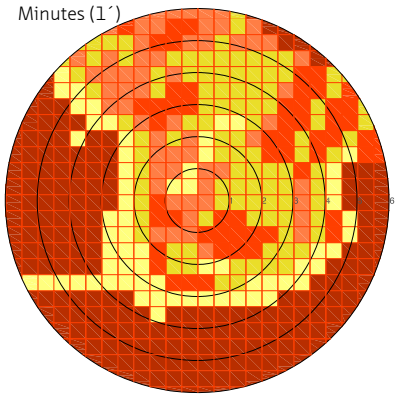


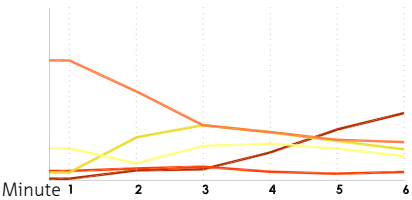
## 4.2.6 CONNECTIVITY

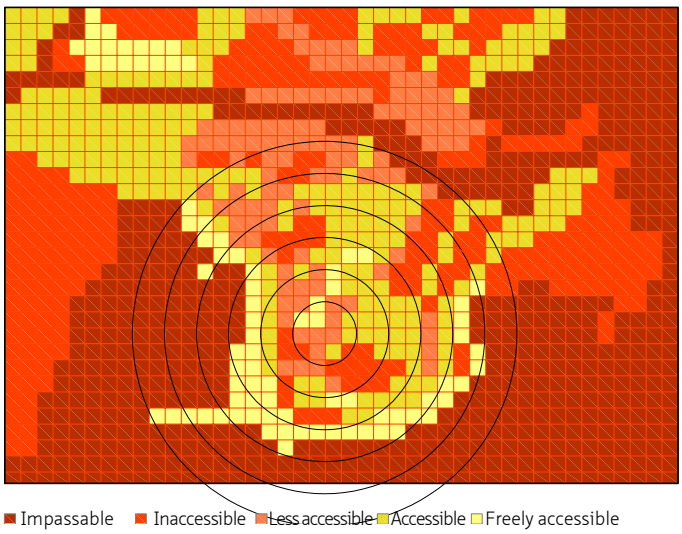


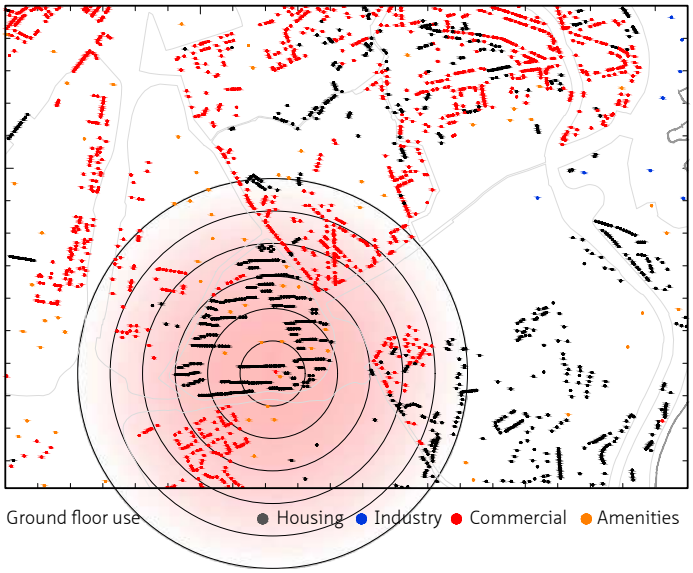



## 4.2.7 ACCESSIBILITY



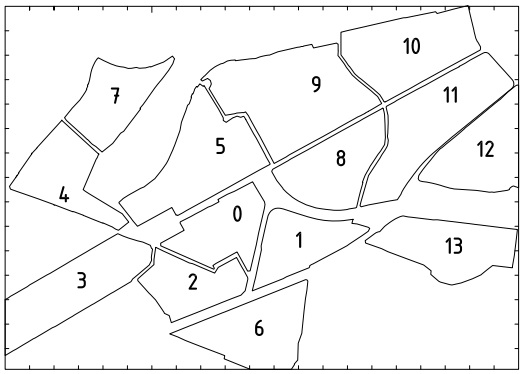





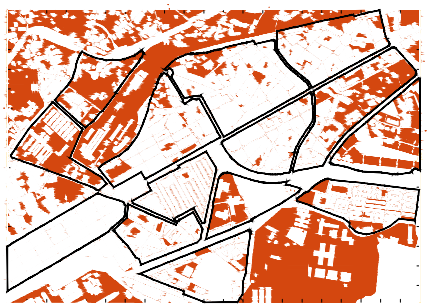

## 4.2.8 PERMEABILITY

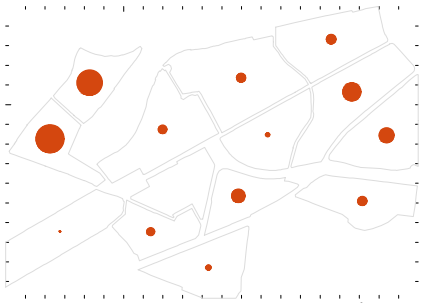
## Urban parameters measurement FERROL RECIMIL



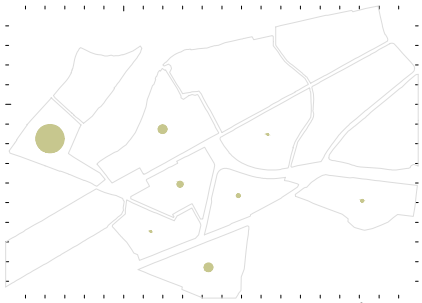

FRAMEWORK

| | URBAN PARAMETERS / DISTRICT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA TOTAL AREA m² | O Built area m² | D Dwelling area m² | F Amenities area m² | TF TOTAL OPEN SPACES m² | C Community space district m² | P Private space district m² | PS Parks & Squares district m² | R Road networks district m² | FLOOR SPACE INDEX m²/m² | Density dwelling /ha | Open Spaces per dwelling m²/ dwelling | Public space per dwelling m²/ dwelling |
| FRAMEWORK | 1,624,166 | 622,194 | 558,905 | 63,289 | 1,001,972 | 47,536 | 459,517 | 65,654 | 429,265 | 1.5 | 113.21 | 257.28 | 44.70 |
| | O+TF | D+F | | | C+P+PS+R | 4.74% | 45.86% | 6.55% | 42.85% | | | | |
| DISTRICT 0 | 83,873 | 28,665 | 24,280 | 4,385 | 55,208 | 10,285 | 0 | 968 | 43,955 | 1.28 | 110 | 60 | 60 |
| DISTRICT 1 | 81,291 | 15,986 | 8,991 | 6,995 | 65,305 | 6,077 | 27,605 | 21,481 | 10,142 | 1.04 | 77 | 104 | 60 |
| DISTRICT 2 | 76,372 | 38,802 | 30,184 | 8,618 | 37,570 | 1,803 | 13,734 | 3,313 | 18,720 | 2.81 | 210 | 23 | 15 |
| DISTRICT 3 | 126,686 | 90,257 | 87,854 | 2,403 | 36,429 | 0 | 1,320 | 3,864 | 31,245 | 2.87 | 213 | 13 | 12.8 |
| DISTRICT 4 | 91,134 | 27,052 | 18,511 | 8,541 | 64,082 | 0 | 64,082 | 0 | 0 | 0.39 | 30 | 237 | 0 |
| DISTRICT 5 | 149,671 | 80,557 | 76,137 | 4,420 | 69,114 | 0 | 29,513 | 0 | 39,601 | 2.27 | 168 | 27 | 16 |
| DISTRICT 6 | 112,030 | 33,719 | 20,044 | 13,675 | 78,311 | 22,348 | 13,364 | 0 | 42,599 | 1.50 | 108 | 65 | 54 |
| DISTRICT 7 | 84,039 | 13,100 | 13,100 | 0 | 70,939 | 0 | 53,185 | 0 | 17,754 | 0.34 | 26 | 329 | 83 |
| DISTRICT 8 | 104,799 | 59,717 | 58,183 | 1,534 | 45,082 | 1,564 | 9,898 | 1,415 | 32,205 | 2.53 | 196 | 22 | 17 |
| DISTRICT 9 | 197,663 | 86,442 | 79,019 | 7,423 | 111,221 | 0 | 45,036 | 10,974 | 55,211 | 1.55 | 109 | 52 | 31 |
| DISTRICT 10 | 134,455 | 66,356 | 64,431 | 1,925 | 68,099 | 0 | 31,040 | 2,189 | 34,870 | 2.05 | 160 | 32 | 17 |
| DISTRICT 11 | 153,686 | 39,812 | 36,705 | 3,107 | 113,874 | 0 | 69,402 | 0 | 44,472 | 1.18 | 92 | 80 | 31 |
| DISTRICT 12 | 128,114 | 10,895 | 10,895 | 0 | 109,589 | 0 | 49,624 | 21,018 | 38,947 | 0.13 | 4 | 2,471 | 200 |
| DISTRICT 13 | 107,984 | 30,834 | 30,571 | 263 | 77,150 | 5,460 | 51,714 | 432 | 19,544 | 1.09 | 82 | 87 | 29 |

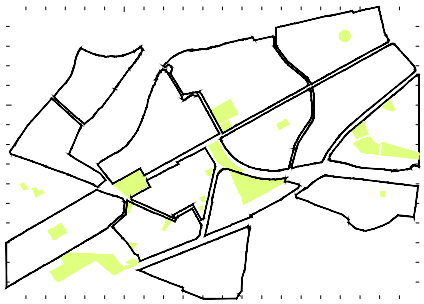


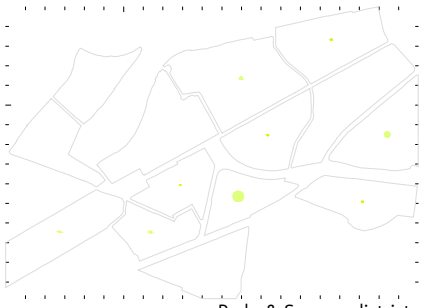


Private space districts 45.86%

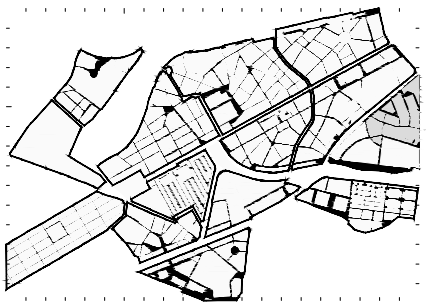


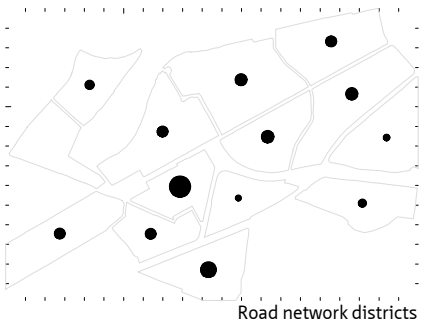
Community space districts 4.74%





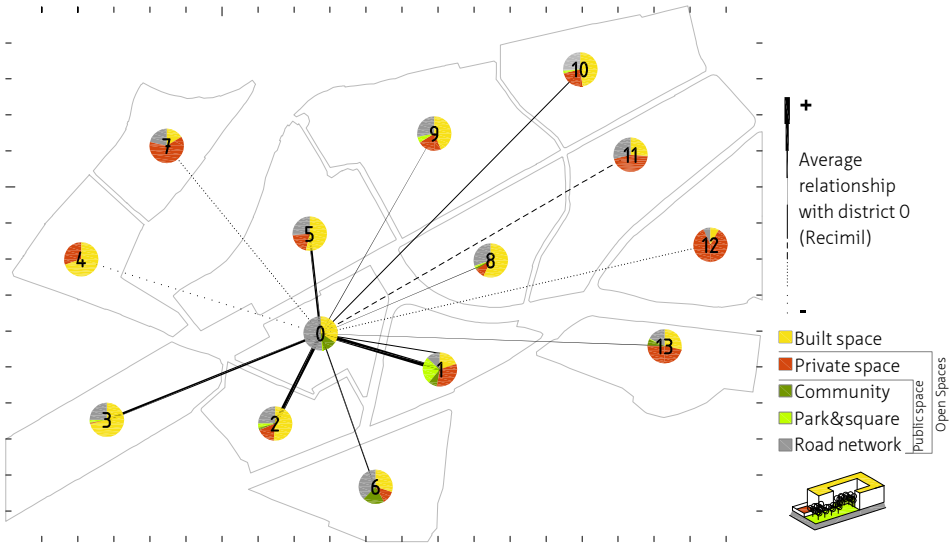
Parks & Squares districts 6.55%



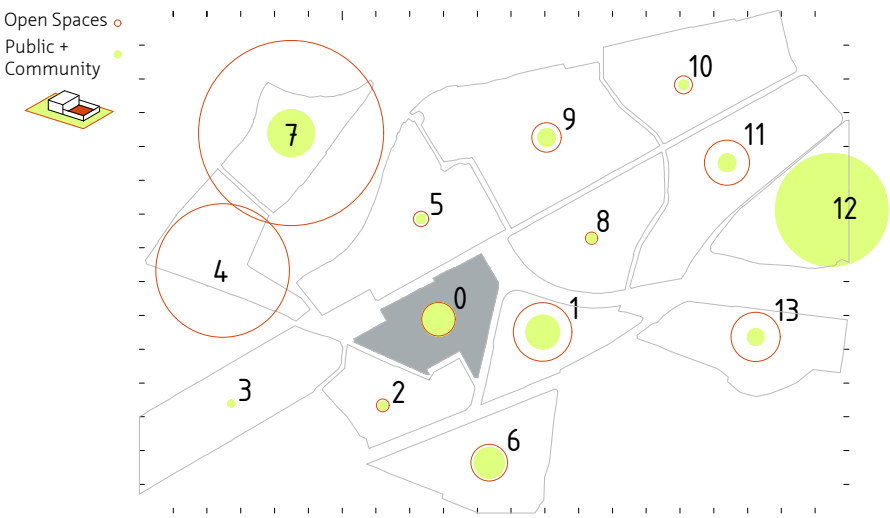


Road network districts 42.85%

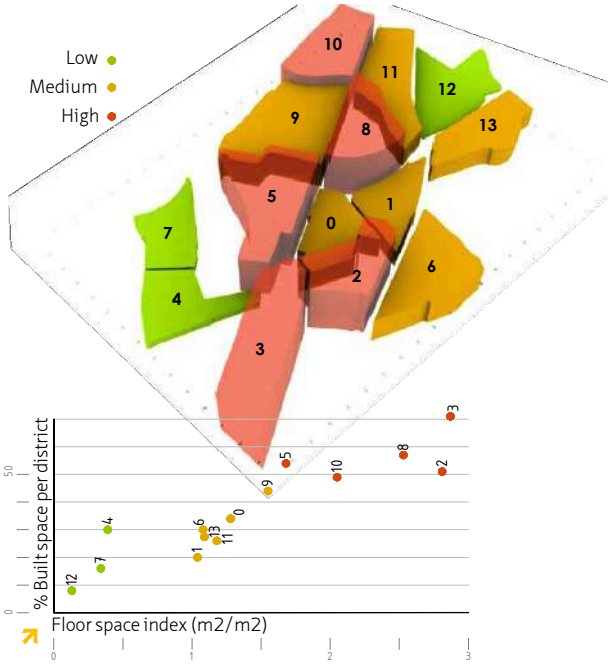
## 4.2.2 TYPES OPEN SPACES



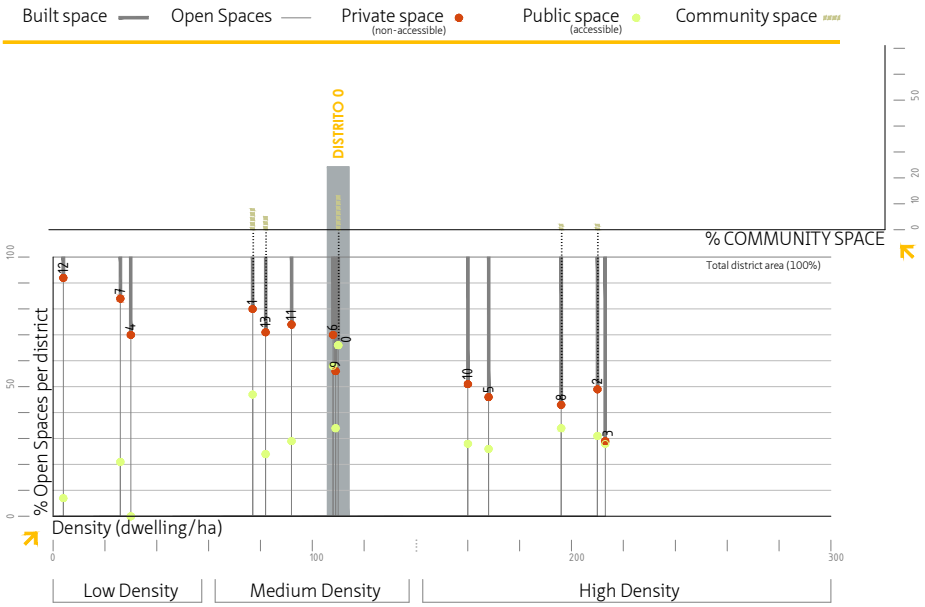

## 4.2.3 OPEN SPACES PER DWELLING



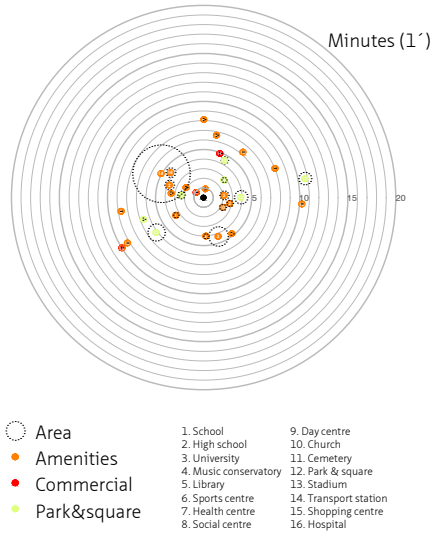
## 4.2.4 FLOOR SPACE INDEX

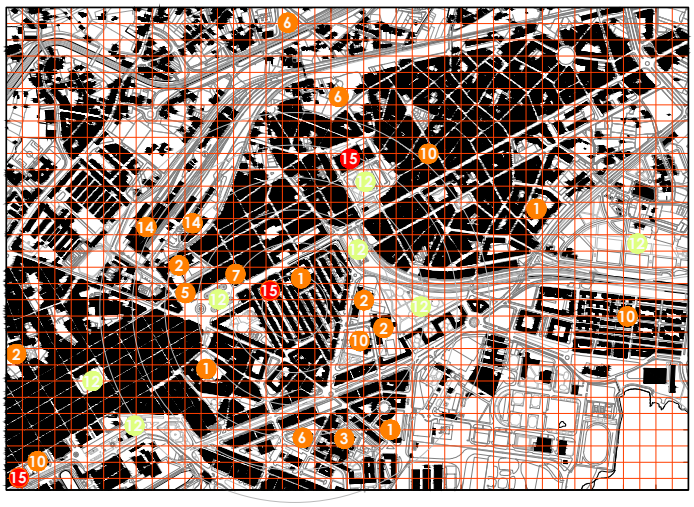



## 4.2.5 DENSITY - OPEN SPACES

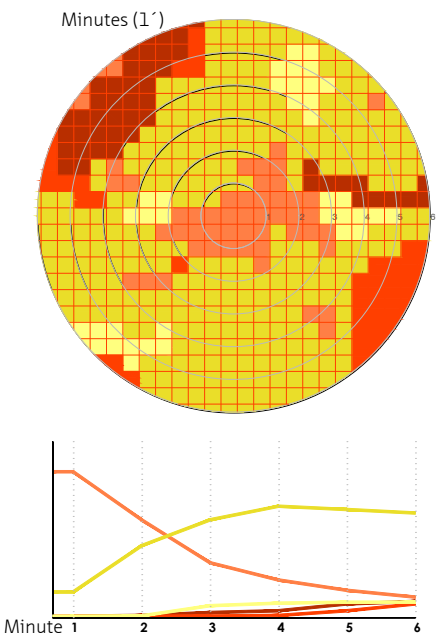


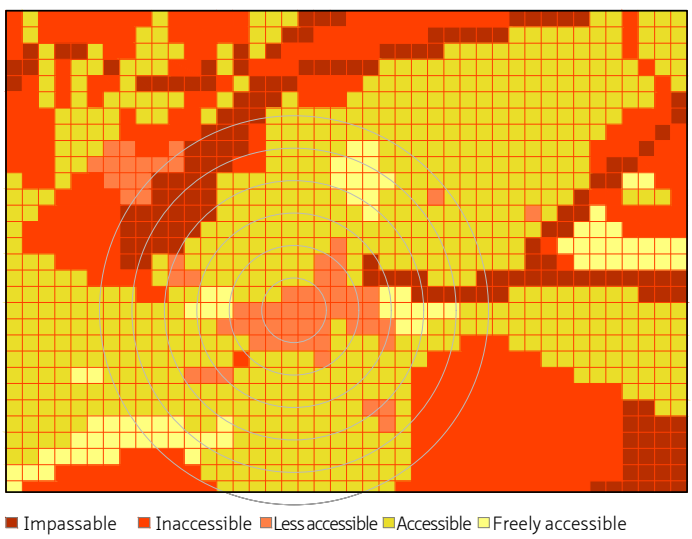
## 4.2.6 CONNECTIVITY

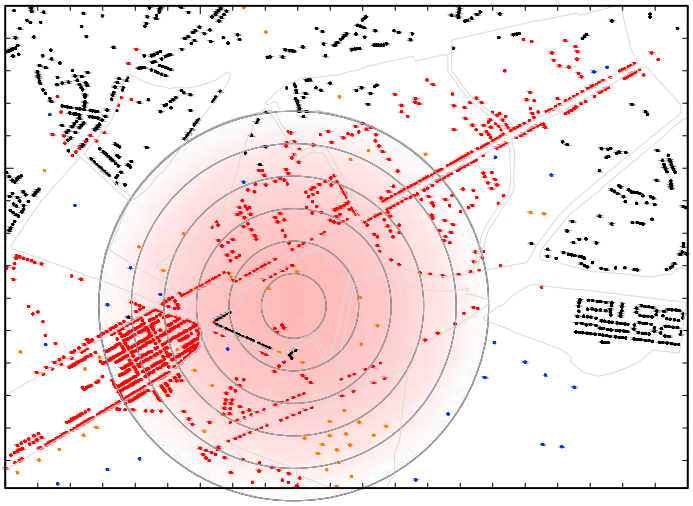


## 4.2.7 ACCESSIBILITY

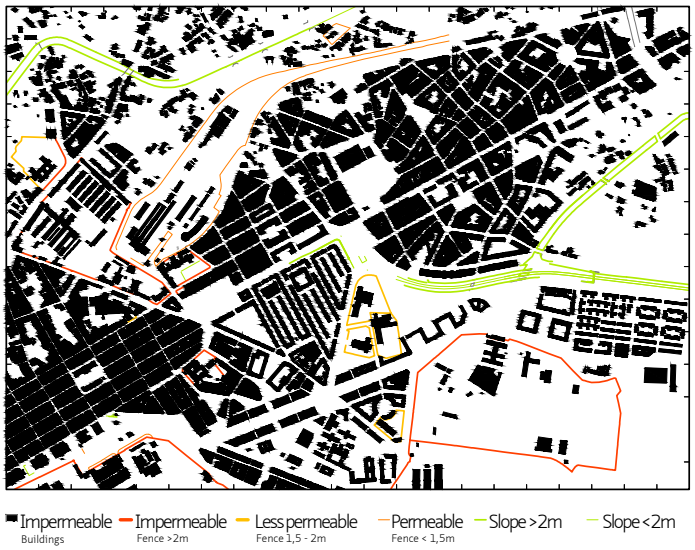


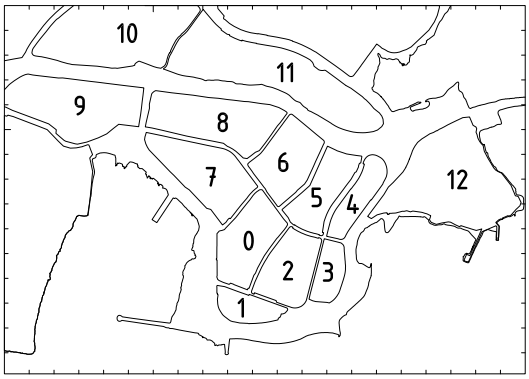


Ground floor use ● Housing ● Industry ● Commercial ● Amenities

## 4.2.8 PERMEABILITY

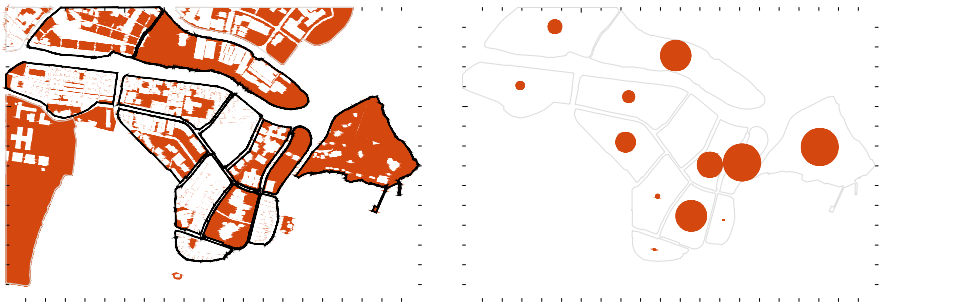


## Urban parameters measurement FERROL CARANZA




FRAMEWORK

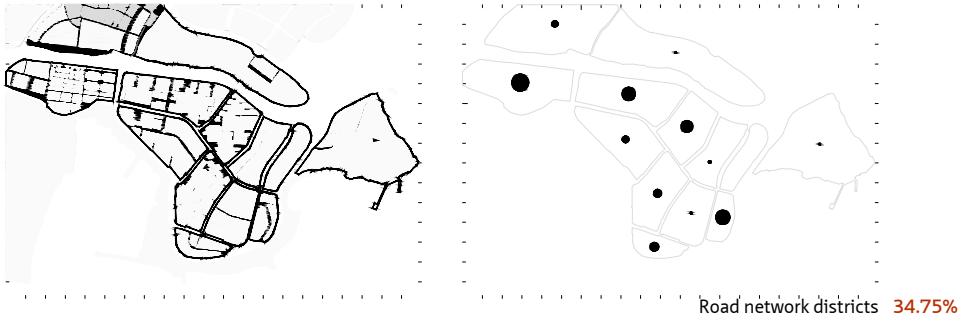
| | URBAN PARAMETERS / DISTRICT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA TOTAL AREA m² | O Built area m² | D Dwelling area m² | F Amenities area m² | TF TOTAL OPEN SPACES m² | C Community space district m² | P Private space district m² | PS Parks & Squares district m² | R Road networks district m² | FLOOR SPACE INDEX m²/m² | Density dwelling /ha | Open Spaces per dwelling m²/ dwelling | Public space per dwelling m²/ dwelling |
| FRAMEWORK | 1,033,769 | 184,008 | 105,853 | 77,536 | 849,761 | 96,296 | 519,354 | 35,126 | 198,985 | 0.91 | 72.92 | 171.08 | 42.33 |
| | O+TF | D+F | | | C+P+PS+R | 11.33% | 61.12% | 4.13% | 34.75% | | | | |
| DISTRICT 0 | 65,362 | 17,291 | 14,262 | 3,028 | 48,072 | 28,870 | 6,121 | 0 | 13,081 | 1.81 | 171 | 43 | 38 |
| DISTRICT 1 | 27,140 | 6,825 | 6,825 | 0 | 20,315 | 5,955 | 814 | 7,609 | 5,937 | 0.97 | 84 | 89 | 86 |
| DISTRICT 2 | 56,476 | 9,979 | 0 | 9,979 | 46,497 | 0 | 43,628 | 0 | 2,869 | 0.60 | 0 | 0 | 0 |
| DISTRICT 3 | 26,106 | 7,502 | 7,502 | 0 | 18,604 | 9,204 | 111 | 0 | 9,289 | 0.92 | 90 | 80 | 79 |
| DISTRICT 4 | 33,323 | 2,179 | 0 | 2,179 | 31,144 | 0 | 31,144 | 0 | 0 | 0.11 | 0 | 0 | 0 |
| DISTRICT 5 | 49,770 | 15,202 | 6,960 | 8,243 | 34,567 | 0 | 31,144 | 0 | 3,423 | 0.93 | 65 | 107 | 11 |
| DISTRICT 6 | 60,912 | 11,170 | 11,170 | 0 | 49,742 | 27,549 | 0 | 3,693 | 18,500 | 1.30 | 129 | 63 | 63 |
| DISTRICT 7 | 80,027 | 17,224 | 7,625 | 9,599 | 62,803 | 6,044 | 39,302 | 3,693 | 13,764 | 1.15 | 83 | 95 | 36 |
| DISTRICT 8 | 91,257 | 23,175 | 14,645 | 8,530 | 68,082 | 10,610 | 26,555 | 0 | 30,917 | 1.53 | 134 | 56 | 34 |
| DISTRICT 9 | 105,496 | 30,216 | 29,952 | 264 | 75,280 | 8,064 | 20,996 | 432 | 45,788 | 1.13 | 113 | 63 | 46 |
| DISTRICT 10 | 129,458 | 6,912 | 6,912 | 0 | 122,546 | 0 | 59,153 | 19,699 | 43,694 | 0.12 | 6 | 1,457 | 0 |
| DISTRICT 11 | 153,834 | 31,099 | 0 | 31,099 | 122,736 | 0 | 117,076 | 0 | 5,659 | 0.26 | 0 | 0 | 0 |
| DISTRICT 12 | 154,608 | 5,234 | 619 | 4,615 | 149,374 | 0 | 143,310 | 0 | 6,064 | 0.07 | 0 | 0 | 0 |



Private space districts 61.12%

Community space districts 11.33%

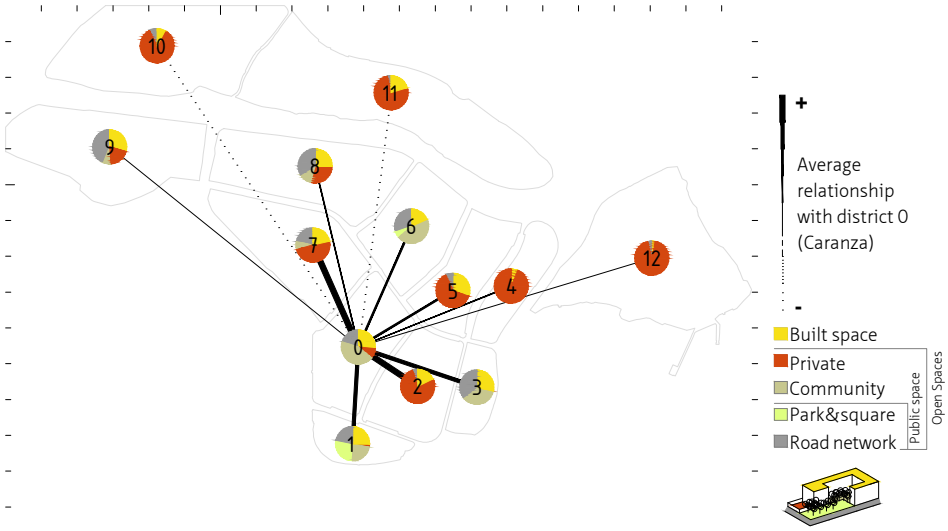
Parks & Squares districts 4.13%



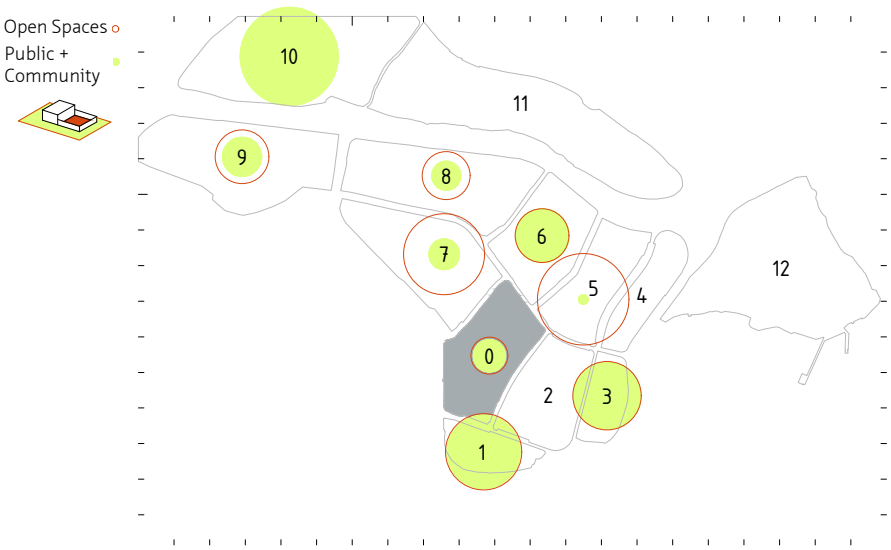
Road network districts 34.75%

FERROL
Caranza

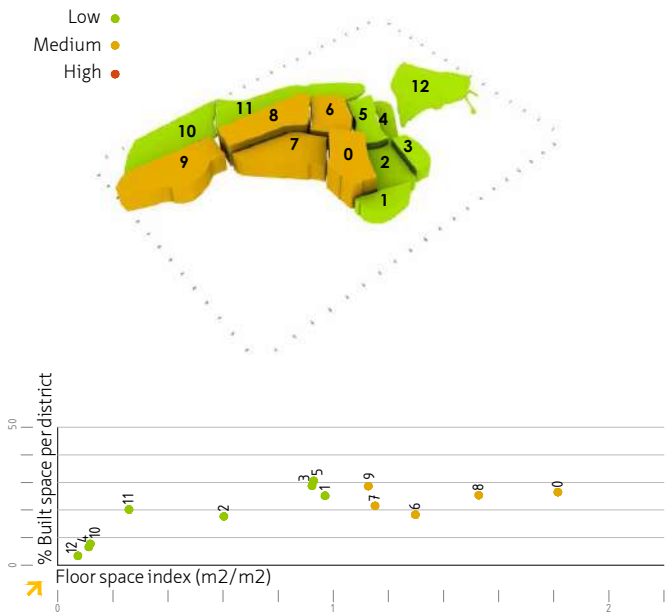
## 4.2.2 TYPES OPEN SPACES



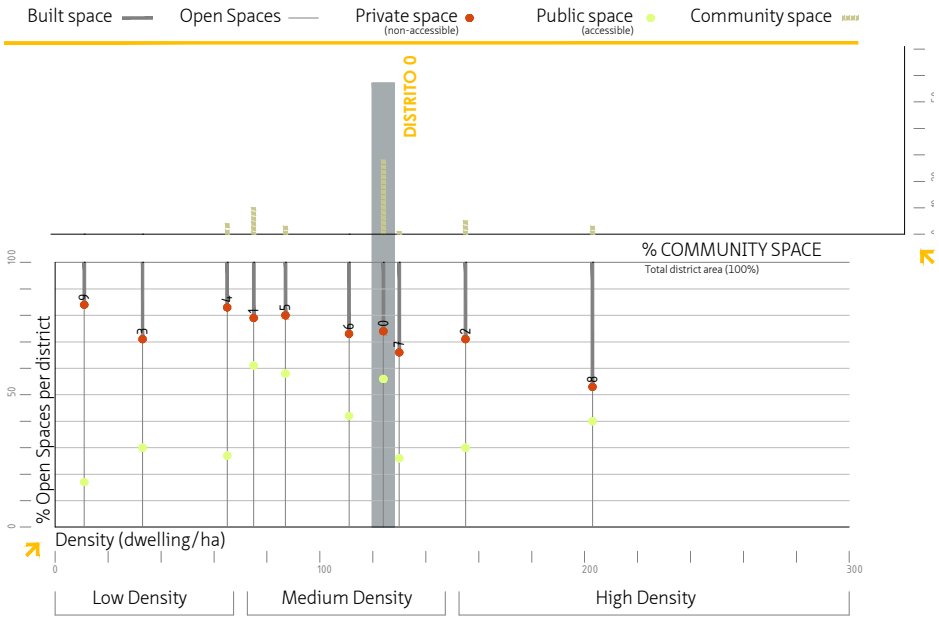

## 4.2.3 OPEN SPACES PER DWELLING



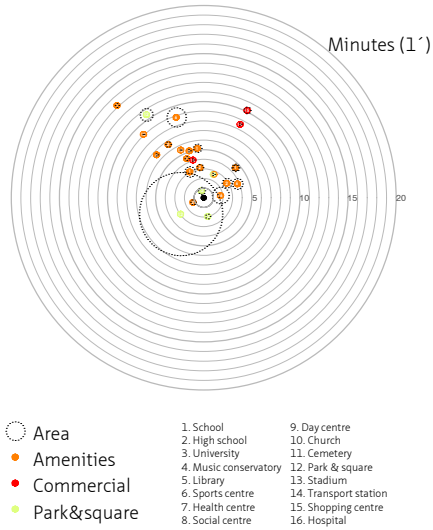
## 4.2.4 FLOOR SPACE INDEX

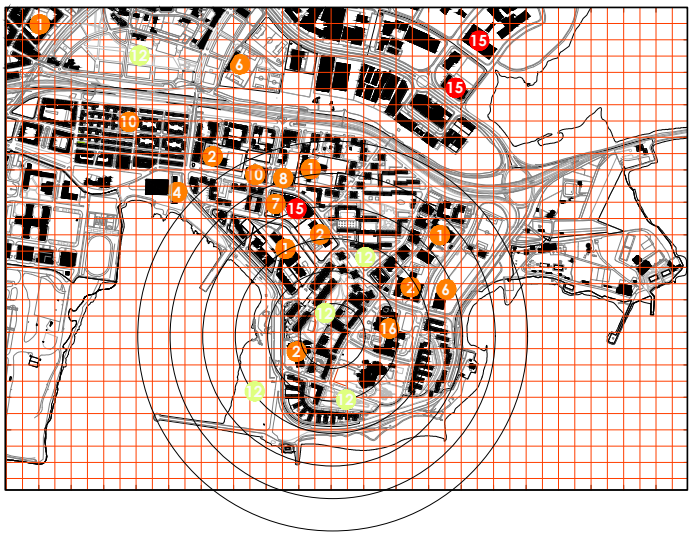



## 4.2.5 DENSITY - OPEN SPACES

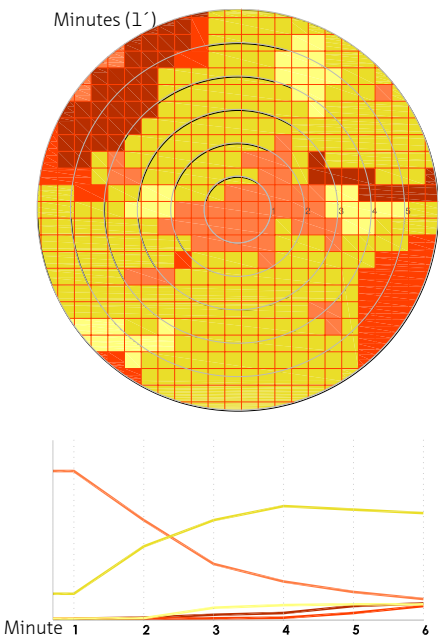


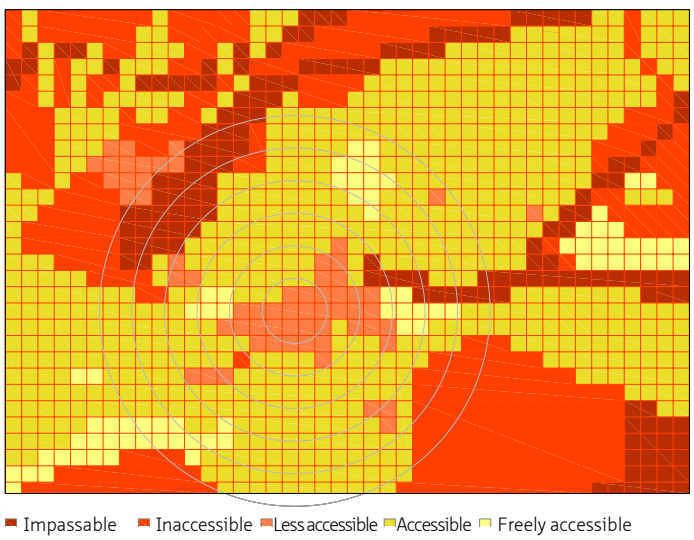
## 4.2.6 CONNECTIVITY

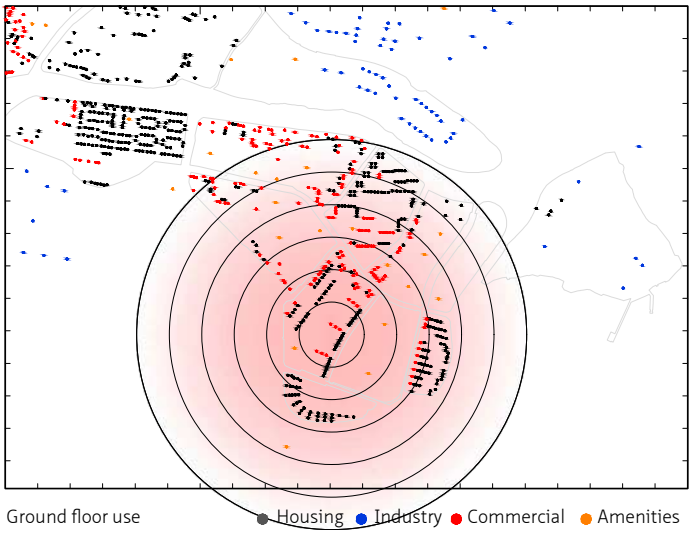


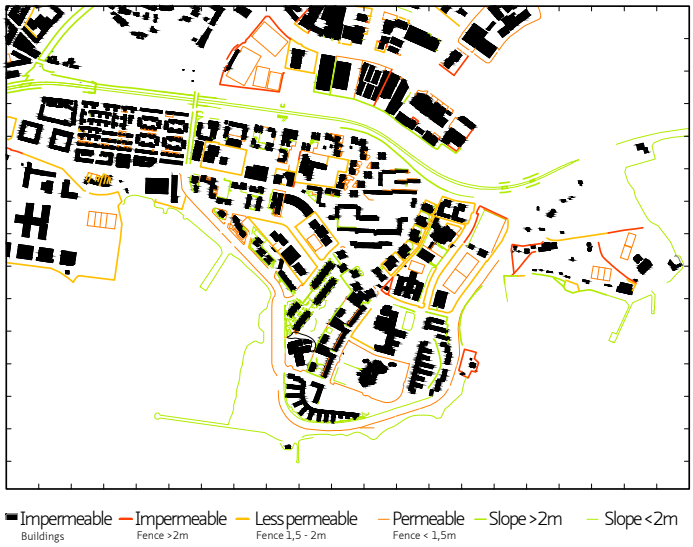
## 4.2.7 ACCESSIBILITY



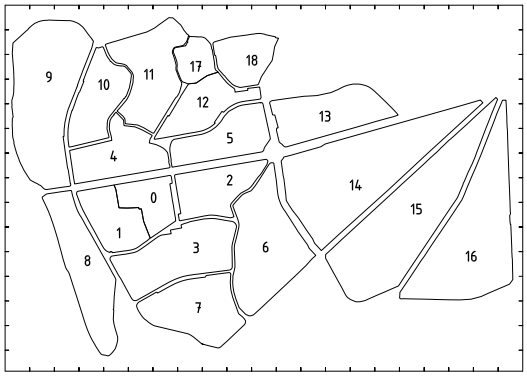






## 4.2.8 PERMEABILITY

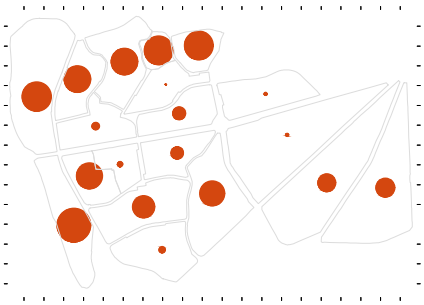


## Urban parameters measurement VIGO COIA

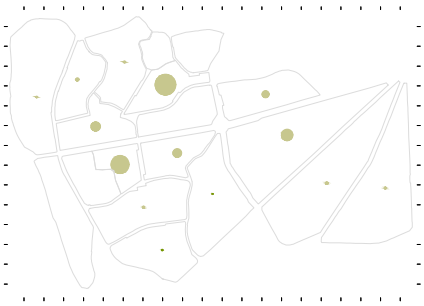



FRAMEWORK

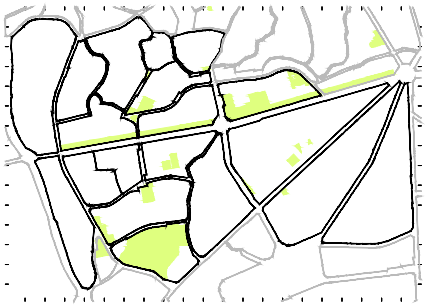
| | URBAN PARAMETERS / DISTRICT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA TOTAL AREA m² | O Built area m² | D Dwelling area m² | F Amenities area m² | TF TOTAL OPEN SPACES m² | C Community space district m² | P Private space district m² | PS Parks & Squares district m² | R Road networks district m² | FLOOR SPACE INDEX m²/m² | Density dwelling /ha | Open Spaces per dwelling m²/ dwelling | Public space per dwelling m²/ dwelling |
| FRAMEWORK | 1,689,943 | 396,002 | 341,856 | 54,146 | 1,293,941 | 161,141 | 724,095 | 150,703 | 258,002 | 1.14 | 92.26 | 198.20 | 50.82 |
| | O+TF | D+F | | | C+P+PS+R | 12.45% | 55.96% | 11.65% | 19.94% | | | | |
| DISTRICT 0 | 36,873 | 9,925 | 9,322 | 603 | 26,948 | 16,215 | 4,587 | 3,146 | 3,000 | 2.14 | 195 | 37,5 | 31 |
| DISTRICT 1 | 48,548 | 13,783 | 0 | 13,783 | 34,765 | 0 | 30,871 | 734 | 3,160 | 0.47 | 0 | 0 | 0 |
| DISTRICT 2 | 56,154 | 15,085 | 10,217 | 4,868 | 41,069 | 10,930 | 17,303 | 5,404 | 7,432 | 1.64 | 129 | 56.8 | 33 |
| DISTRICT 3 | 94,311 | 16,905 | 12,325 | 4,580 | 77,406 | 3,708 | 51,071 | 11,516 | 11,111 | 1.23 | 101 | 81.5 | 27.7 |
| DISTRICT 4 | 62,448 | 16,169 | 10,310 | 5,859 | 46,279 | 13,855 | 10,656 | 10,539 | 11,229 | 1.92 | 124 | 56 | 42 |
| DISTRICT 5 | 59,986 | 17,052 | 12,375 | 4,677 | 42,934 | 0 | 18,433 | 13,963 | 10,538 | 1.60 | 81 | 88.7 | 50.6 |
| DISTRICT 6 | 115,494 | 21,727 | 19,720 | 2,007 | 93,767 | 994 | 70,416 | 0 | 22,357 | 0.70 | 57 | 143.4 | 35.7 |
| DISTRICT 7 | 82,464 | 5,605 | 5,347 | 258 | 76,859 | 1,146 | 11,454 | 58,790 | 5,469 | 0.58 | 52 | 178 | 151.4 |
| DISTRICT 8 | 89,598 | 3,400 | 3,119 | 281 | 86,198 | 0 | 75,033 | 579 | 10,586 | 0.06 | 6 | 1,834 | 238 |
| DISTRICT 9 | 157,829 | 28,992 | 26,013 | 2,979 | 128,837 | 4,131 | 112,903 | 663 | 11,140 | 0.32 | 36 | 279.4 | 34.6 |
| DISTRICT 10 | 59,167 | 14,063 | 12,104 | 1,959 | 45,104 | 3,560 | 38,770 | 0 | 2,774 | 0,66 | 58 | 131 | 18.4 |
| DISTRICT 11 | 86,167 | 9,612 | 9,612 | 0 | 76,555 | 2,407 | 57,111 | 0 | 17,037 | 0.53 | 53 | 168.3 | 42.7 |
| DISTRICT 12 | 51,461 | 13,652 | 13,652 | 0 | 37,809 | 26,132 | 406 | 5,408 | 5,863 | 1.56 | 138 | 53.30 | 52.7 |
| DISTRICT 13 | 76,907 | 14,732 | 9,074 | 5,658 | 62,175 | 11,990 | 4,506 | 31,248 | 14,431 | 0.91 | 62 | 130.6 | 121.2 |
| DISTRICT 14 | 189,584 | 62,759 | 58,754 | 4,005 | 126,825 | 51,459 | 11,912 | 7,369 | 56,085 | 2.40 | 208 | 32.2 | 29 |
| DISTRICT 15 | 185,716 | 57,231 | 55,668 | 1,563 | 128,485 | 8,422 | 83,147 | 574 | 36,342 | 2.25 | 198 | 34.9 | 12.3 |
| DISTRICT 16 | 172,015 | 60,470 | 60,470 | 0 | 111,545 | 6,192 | 79,363 | 200 | 25,790 | 1.96 | 171 | 37.9 | 11 |
| DISTRICT 17 | 23,857 | 5,720 | 5,720 | 0 | 18,137 | 0 | 16,970 | 0 | 1,167 | 0.40 | 41 | 186.9 | 12 |
| DISTRICT 18 | 41,364 | 9,120 | 8,054 | 1,066 | 32,244 | 0 | 29,183 | 570 | 2,491 | 0.33 | 43 | 235.4 | 22.3 |

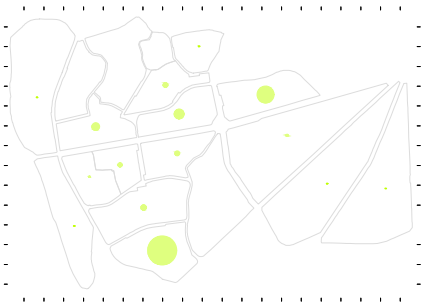


Private space districts 55.96%

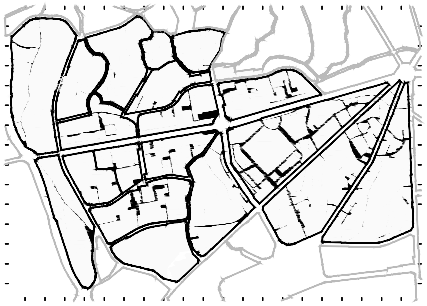


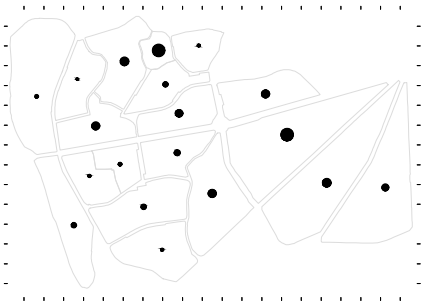
Community space districts 12.45%





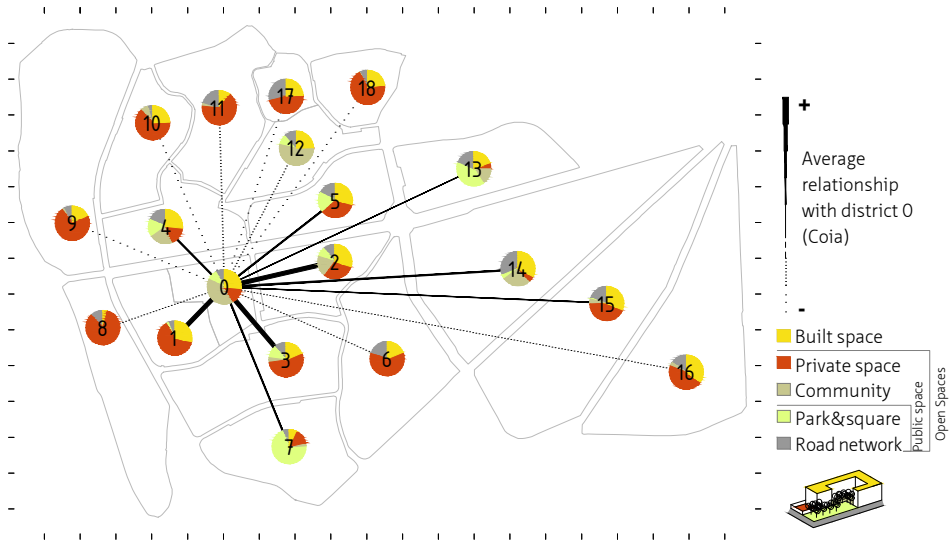
Parks & Squares districts 11.65%



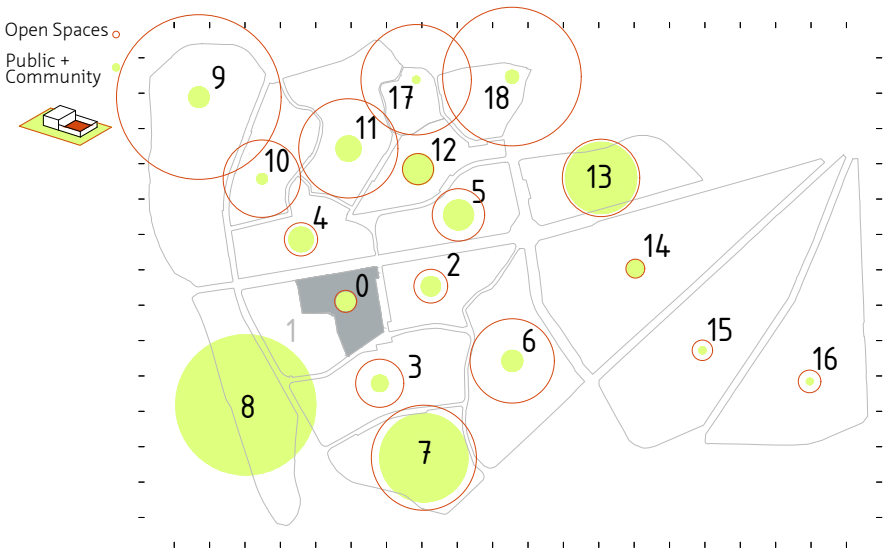


Road network districts 19.94%

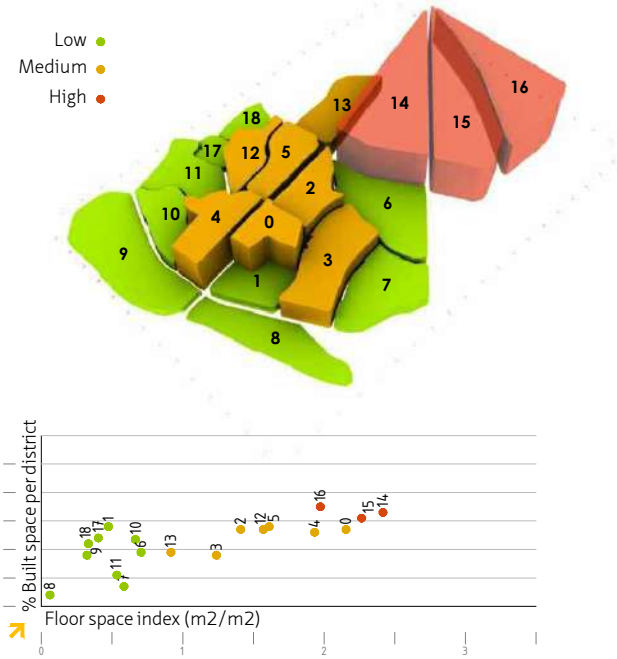
## 4.2.2 TYPES OPEN SPACES



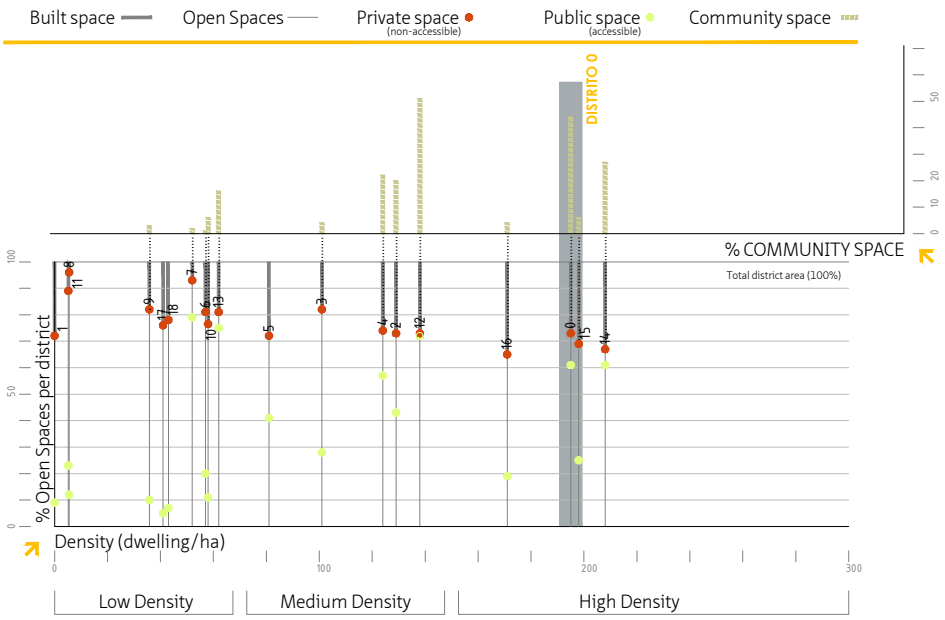

## 4.2.3 OPEN SPACES PER DWELLING



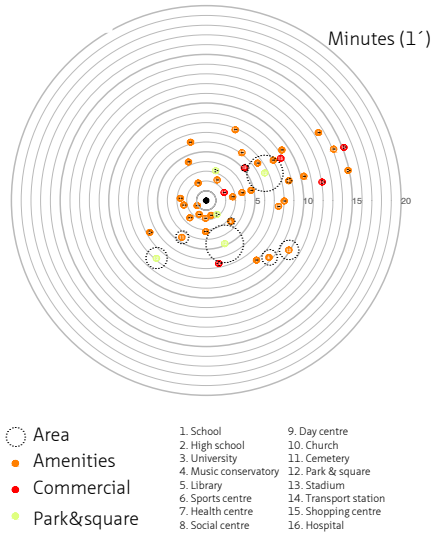
## 4.2.4 FLOOR SPACE INDEX

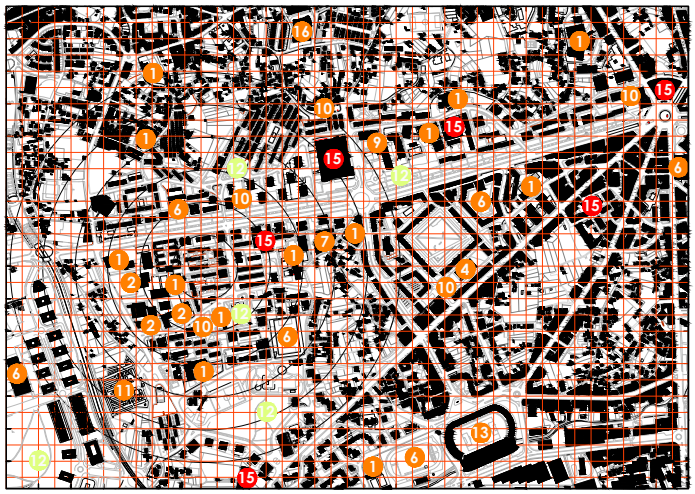



## 4.2.5 DENSITY - OPEN SPACES

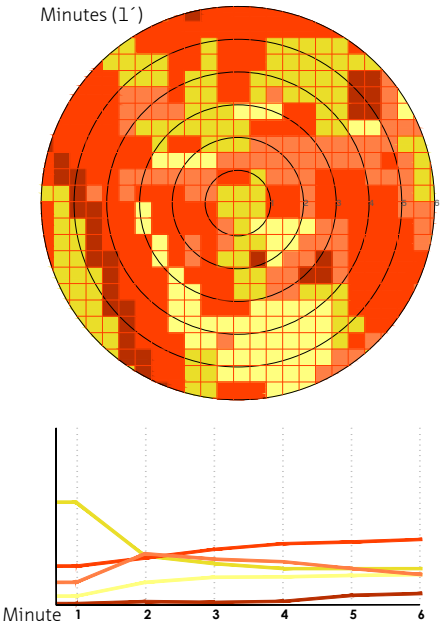


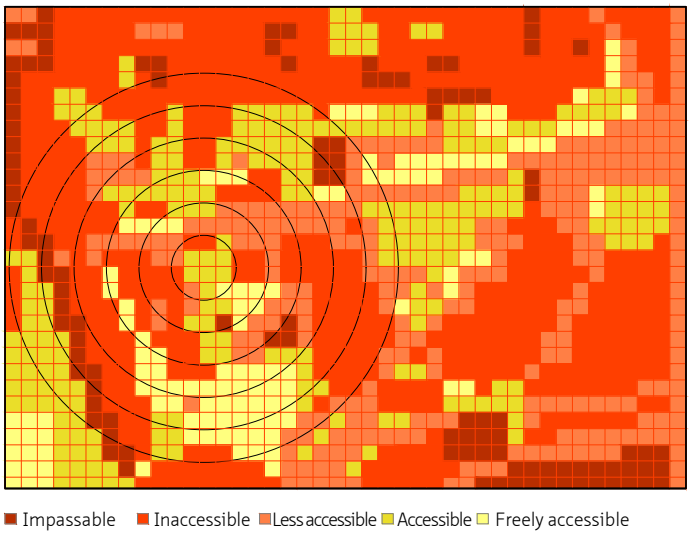
## 4.2.6 CONNECTIVITY

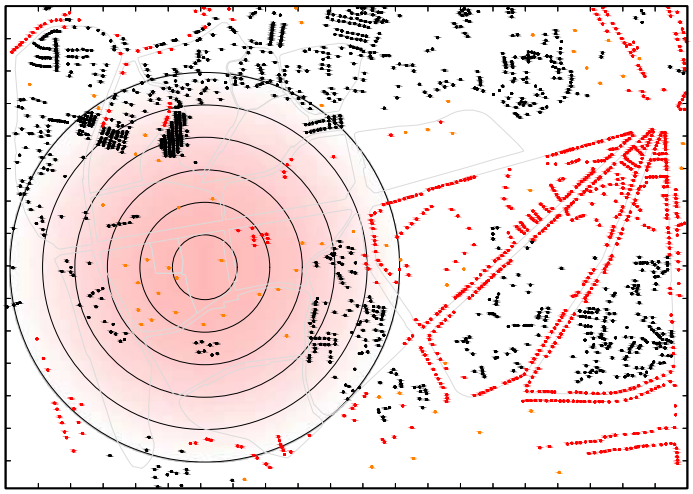


## 4.2.7 ACCESSIBILITY





Ground floor use ● Housing ● Industry ● Commercial ● Amenities

## 4.2.8 PERMEABILITY

■ Impermeable Buildings — Impermeable Fence >2m — Less permeable Fence 1,5 - 2m — Permeable Fence < 1,5m — Slope >2m — Slope <2m

### 4.2.3 Organisation of built elements and Open Spaces. Particular Conclusions

The result of the evaluation of the organization of the built elements and open spaces in the housing estate and its surroundings offers three conclusions related to the distribution, the surface area occupied by the open spaces and the use of the space, and the connections and the movement between the estate and its surroundings.

**1. In the case studies, half of the open space is private and is located in the surroundings of the housing estate and on its edge, making its spatial cohesion difficult. Most of the community space is located inside the estates, and its undefined character limits the integration of space between buildings, while the scant public space, generally located on the edges of the estate, has helped to improve the connections with its surroundings.**

In the case studies, we can differentiate between the open space that originates from a previous arrangement and planning, which is usually found in the housing estates and planned developments in its surroundings, and the open space resulting from a temporary process of accumulation and modification without any precise previous configuration, which is usually found on the edge of the estate or in its surroundings. The latter is generally private open space, consisting of plots without buildings, such as vacant lots and fragments of the rural fabric, or plots with isolated or low-density buildings, where open space predominates over the built environment. Its fragmentary character, with extensive and irregular limits, with dispersed construction, comprises a barrier preventing the continuity of the road network in the confluence with the estate and the coordination with its construction, making its spatial cohesion difficult. This can be seen in Coia, where the edge of the estate borders a large area of low-density private open space, and also in Maria Pita, whose surroundings are conditioned by the private open space of vacant lots and amenities. In the Barrio das Flores, and to a lesser extent in Recimil, part of its edge is characterised by a private open space of vacant plots of land and amenities. In Caranza, the edge of the estate is conditioned by the road network and its geographical location, surrounded by industries, amenities and new residential developments with a large area of private open space that makes integration difficult and reinforces its image as an isolated entity.

Inside the housing estates there are open spaces that were scheduled in the Partial Plan, which are complete or incomplete. The latter are usually poorly defined, fragmented, and maintain their originally residual characteristics, which generates ambiguity due to a lack of definition or clarity of uses, diffuse boundaries, and confusion with regard to their ownership. In addition, there is a sense of insecurity due to the fragmentation, irregularity, problems of accessibility and connection with the buildings and road traffic, which limits the integration of the space between buildings

and its integration with the estate as a whole. Most of this undeveloped open space is community, consisting of open spaces that are not occupied by the buildings within each plot, combining open spaces for pedestrians, green areas and car parks, generally associated with the tower typology, but which also exists in plots of linear blocks or between blocks. The largest proportion of this open community space is found in Caranza and Coia, accounting for 11.33 and 12.45% of the total open space in the analytical framework, while in the rest of the estates it varies from 5.17% in the Barrio das Flores to 3.06% in María Pita.

The public open spaces, parks and squares, are planned spaces that are generally located on the edges of the estate, making it possible to coordinate some of their parts in order to integrate them with the building. Inside the estate this public open space is scarce and varies between a linear and central form. In the linear type, the building follows an axis, and can be of two types: as a connection of the interior of the estate with different urban networks, as in Avenida de Castelao in Coia, or between parallel blocks, with gardens, pedestrian spaces and car parks with a sense of continuity and coherence, giving priority to movement over stillness, as in the Barrio das Flores. The central ones are also of two types: one that configures a large space on the neighbourhood scale where, if open space predominates over built space, this can be perceived as residual, as in the central space of the Barrio das Flores; or the space associated with a neighbouring unit with green zones and paved areas that form a whole within the unit.

**2. The surface occupied by the open spaces in the housing estates is not uniform: the different arrangement of the built elements and of the public and private space modifies the continuity and articulation between its parts, achieving a better integration in spaces with a typological mix, high density and defined community open space. In the areas surrounding the estates, spatial cohesion improves when the density, spatial continuity and compactness are increased, provided that they are accompanied by a configuration of the urban form that allows for integration between their parts.**

The surface area occupied by the buildings on the housing estates is low, and is comprised of different types of high-rise buildings that are arranged to leave a large amount of open space, predominated by the road network together with private and community educational, sports and health facilities, which reinforces the open nature of the complex and makes it difficult to interconnect its parts. Even so, the degree of land occupation inside the large estates is not uniform, and there are parts where the elements are more integrated, which has been helped by the reduction in the floor space index and the density of dwellings introduced during the lengthy process of

building the estates. In Coia, the open spaces per dwelling vary from 37.5 $m^2$/dwelling in district-0 to 56 $m^2$/dwelling in district-4, with a high density of 195 dwellings/ha in district-0 to 124 dwellings/ha in district-4, and a floor space index of 2.14 $m^2/m^2$ in district-0 to 1.92 $m^2/m^2$ in district-4. These values represent the average of the estate in Coia, where the different arrangement of the public and private space modifies its continuity and articulation, obtaining a better integration in spaces with a typological mixture, with some tower and medium height blocks with open community space in their interior that is delimited and not excessively fragmented, as in district 0 of Coia. This differs from spaces with high towers surrounded by a large amount of private open space, as in districts 5 and 13 in Coia, where the lack of continuity and integration limits the relationship with the surrounding buildings. In Caranza, the large amount of private and community open space around the residential units hinders the spatial cohesion of the whole, as can be seen in district-0, with a density 171 dwellings/ha and 43 $m^2$/dwelling open space, with approximate values to those of the small estate in Santa Mariña (district-9) or the average in Coia, but with a lower level of integration as it is the sum of two neighbourhood units with a large community space between them that limits the continuity between both. The district of Las Flores, with a density of 124 dwellings/ha, a floor space index of 1.36 $m^2/m^2$ and a moderate amount of open spaces per dwelling of 60 $m^2$/dwelling, is close to the average of the large estates, and also presents variations between the different residential units that comprise the whole. In Recimil, the estate occupies district-0 with a density of 110 dwellings/ha, a floor space index of 1.28 $m^2/m^2$ and a moderate amount of open spaces per dwelling of 60 $m^2$/dwelling, which, when unevenly distributed and concentrated on a margin, limits the interconnection between the different parts.

In the area around the housing estates, spatial cohesion improves when the density, spatial continuity and compactness within the urban fabric are increased, provided that they are accompanied by a configuration of the urban form that allows for integration and interconnection between its parts. This improvement can be seen relatively in district 14 of Coia (208 dwellings/ha, 32.2 $m^2$/dwelling open space), in district 8 of Recimil (196 dwellings/ha, 22 $m^2$/dwelling open space), in district 2 around the Barrio das Flores (155 dwellings/ha, 45 $m^2$/dwelling open space), where high densities are accompanied by a moderate but not sufficiently well-interconnected amount of open space between its parts. In contrast, there is no spatial cohesion in the districts with a low density, low floor space index and a large amount of private open space, as in district 9 of Coia (36 dwellings/ha, 279.4 $m^2$/dwelling open space) or in district-3 around the Barrio das Flores (33 dwellings/ha, 258 $m^2$/dwelling open space). However, the high densities alone can also offer a low-quality environment if they do not have public open space or if it is very reduced, as in district-8 that is at a distance from the Barrio das Flores (203 dwellings/ha, 26 $m^2$/dwelling open space) or in district-9 that is at a distance from María Pita (300 dwellings/ha, 15 $m^2$/dwelling open space).

**3. Inside the large housing estates where there is a variety of amenities, these encourage the use of space and movement from different parts of the estate to that area and improve connectivity, but not enough to overcome the lack of integration between parts of the estate, on its edge and with its surroundings, with reduced accessibility and permeability that prevents spatial cohesion.**

Inside the housing estates there are very few uses on the ground floors of the buildings. The amenities do not usually form part of the residential fabric; they are located in isolated buildings with independent plots that limit their integration, even though they are accessible and their use encourages movement from different parts of the estate. When there are amenities inside the estate or on its edge, they improve connectivity, while when they are outside the estate, the interior connectivity decreases. The amenities encourage the use of space and movement but are not sufficient to overcome the lack of integration between parts of the estate, on its edge and with its surroundings. In these places, there is a lack of articulation with the surrounding networks, due to the existence of discontinuous sections, spatial fractures that produce fragmentation, reduce accessibility and prevent continuity and spatial cohesion.

This can be seen in the Coia housing estate: on the edge of the estate there are educational, health and social facilities, the park and the shopping centre, which encourage movement from different parts of the estate and its surroundings to this area, as there are no other amenities. These amenities improve connectivity in the area, despite the limitation posed by the lack of use on the ground floor and the presence of slopes, barriers formed by the closure of amenities and housing, parking areas and roads that reduce pedestrian accessibility and permeability of the whole. In Caranza, residential use predominates on the ground floor and commercial use around the main road. The presence of educational, health, social and commercial facilities in various areas within the estate, combined with the absence of these facilities on its edge, encourages movement, although connectivity is limited in the neighbouring units due to the lack of use on the ground floor and their low accessibility, as they are located on terraces that make access and permeability difficult on most of their perimeter. This lack of permeability between parts of the estate increases on its edge due to the closure of amenities and factories, together with geographical and road limitations, which further reinforce the autonomous nature of the estate. In the Barrio das Flores, more than in any other estate, none of its scarce amenities encourage movement from the adjacent districts. On the contrary, the amenities located on its edge lead residents to move outside it, reducing the connectivity between its parts, which is reinforced by the lack of interior accessibility. A similar situation occurs in small estates such as Recimil and María Pita, where the surroundings are more accessible than the interior, and they depend on the amenities located on their edge.

## § 4.3 Strategies for the formation of community space

This section studies 1) the configuration of the form and arrangement of the open space inside the housing estate, 2) the functionality of the exterior space, spatial connections and the relationship between the housing and exterior space, and 3) the quality of the spaces inside the estate, in order to understand how they affect the arrangement of the estate.

### 4.3.1 What is this section about?

By analysing the composition of the exterior space in the case studies, we can observe the form, organisation, functionality and quality of the spaces inside the housing estates. To do this, we observe the elements that make up the open spaces, their volumetry, gradients, the borders that are created between them and with their perimeter, the horizontal platforms that result from adapting the buildings and their immediate surroundings to the topography, the visual control, the use and connection between the different parts of the open space and the dwelling, the climatic comfort, the accessibility and permeability between the private space and the community space, the movement between spaces, and the degree of openness of the open spaces.

By studying the **configuration** of the form and arrangement of the open space inside the housing estate, we can see what elements make up the spaces between buildings, how they are organised and what the boundaries between them are like. In all the case studies this allows us to observe the relationship between the typology of the buildings and the types of open spaces in their immediate surroundings, how topographic variation has influenced the form and configuration of the space, and in which cases the spatial cohesion of the spaces inside the estate is impeded.

By studying the **functionality** of the space outside the estate, we can observe the type of spatial connections and relationships that are established between the building and the open space. In all the case studies this allows us to observe the use of space around the buildings, distinguishing between living and transit areas, the relationships with the equipment and the dwellings, and the degree of visual control that exists between the common spaces inside the dwelling and the open space between buildings.

By studying the **quality** of the spaces inside the estate, we can see which factors improve the spatial connections of the open space and which ones provide spatial appeal. In all the case studies, this allows us to observe how climatic conditions influence the comfort of the open space between buildings, what degree of accessibility it has, what facilitates movement between different parts and connectivity with its surroundings, and when favourable conditions exist to perceive the space under visual control.

### 4.3.2 How is the analysis carried out?

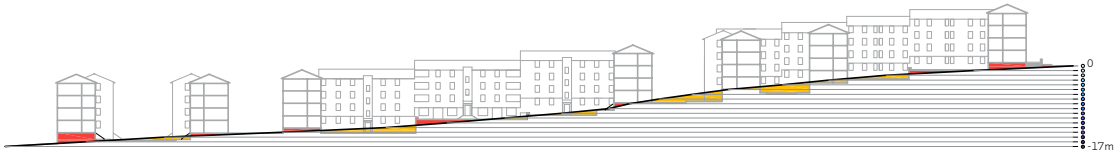
The analysis uses three comparisons: the first represents the elements that configure the form and arrangement of the open space, the second its functionality, and the third the quality of the spaces within the housing estate.

In order to represent the elements that configure the form and arrangement of the open space, a small estate or a neighbourhood unit is used from those that make up the large estates studied, chosen for their formal and spatial qualities. Four axonometries are presented that complement each other. In the first axonometry, the form is represented by making the volume of the buildings transparent, in order to highlight their occupation on the ground floor in black and the open spaces in grey, including in green gardens and green areas. A cross-section shows the relationship between the building and the open space, indicating the levelled area and embankment on the original terrain. In the second axonometry, the elements that configure the open spaces are represented in order to observe the edges of the neighbourhood unit, in its interior and with its perimeter, highlighting in grey the footprint of the building. In the third axonometry, the different elevations are represented, distinguishing the vertical sections, slopes and walls. Finally, the fourth axonometry represents the horizontal platforms resulting from adapting the buildings and their immediate space to the topography, distinguishing by colour the height per metre, in the same way as in the cross-section.

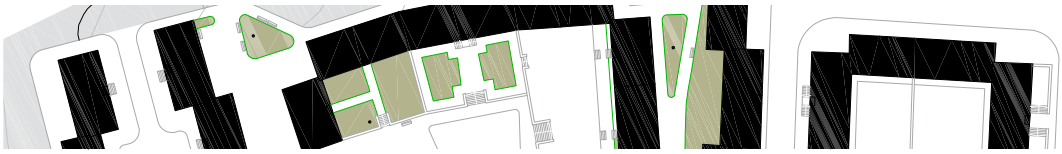
In order to represent the functionality of the open space, ground plans, axonometries, and cross-sections of the small estate or chosen neighbourhood unit are used, which can be interpreted together in two blocks. In the first one, the ground plan of the current situation is represented together with a diagram of uses (amenities, green areas and businesses) and spatial connections, differentiating the spaces and transit areas; there is also an axonometry, in which the accessibility of green areas, transit areas and access roads are highlighted. The second block represents the relationship between the housing and the exterior space by means of a cross-section and an axonometry in which the position of the kitchens and living rooms of the dwellings is highlighted, accompanied by a graph of the visual control and the accessibility.

In order to represent the quality of the spaces inside the estate, ground plans and axonometries are used, which can be interpreted together in three blocks. In the first one, the climatic comfort is represented by means of climatological data, ground plans and graphs, showing the proportion of the dominant wind, sunshine and the proportion of sun and shade at the summer solstice and winter equinox. In the second one, accessibility and permeability are represented, highlighting the entrances to the space and to the buildings, differentiating the private space from the community space. In the third one, the spatial attraction is represented, highlighting the movement, the degree of openness of the open spaces, and the area of visual control of a representative space.

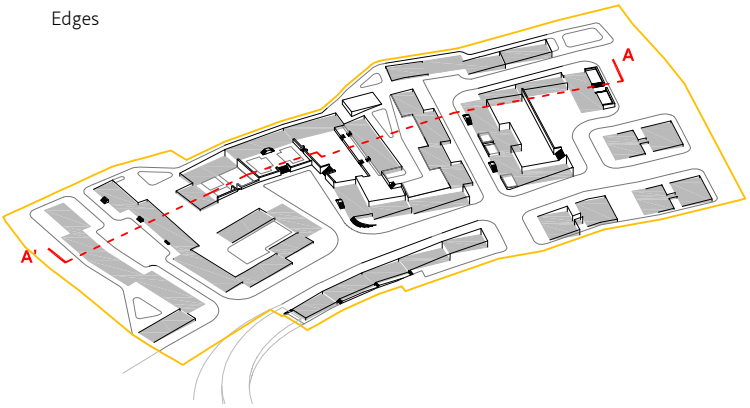
## 4.3.1 Layers of formal structure




Levelled area Embankment

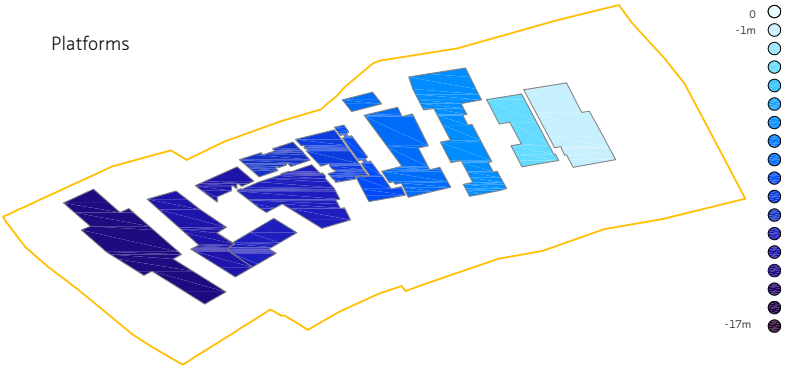


Edges



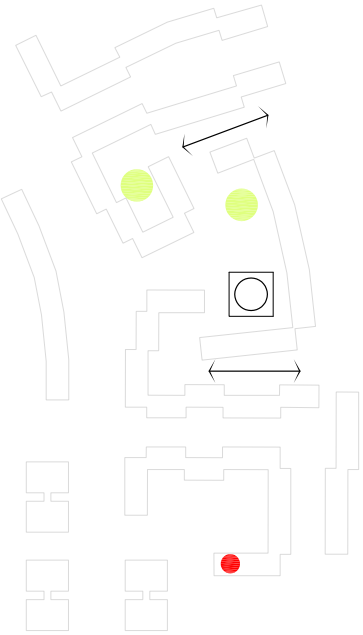

Topographical variations

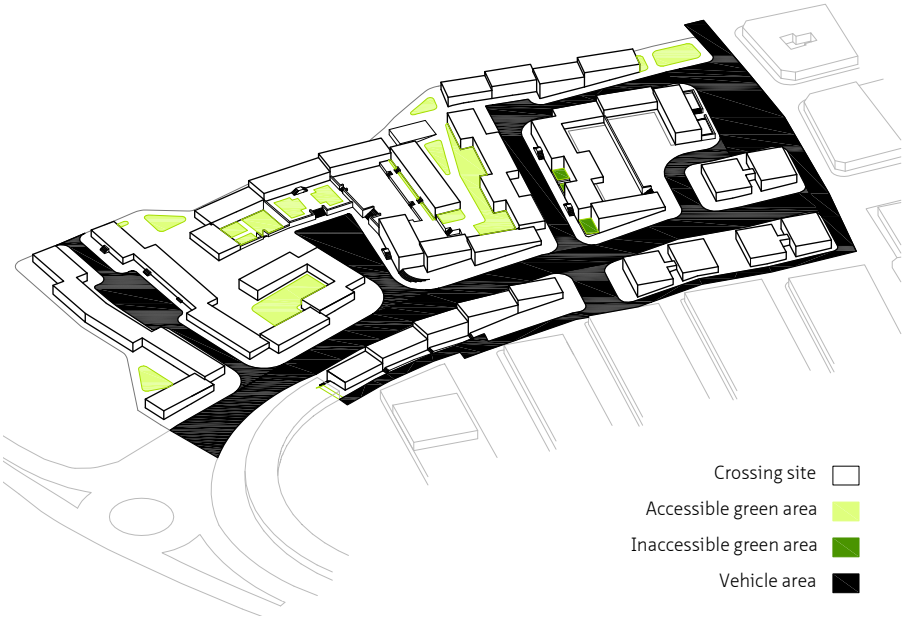

Platforms



## 4.3.2 Functionality of external space / Spatial connections

Ground floor Amenities Installations Green area Commercial Site Crossing site



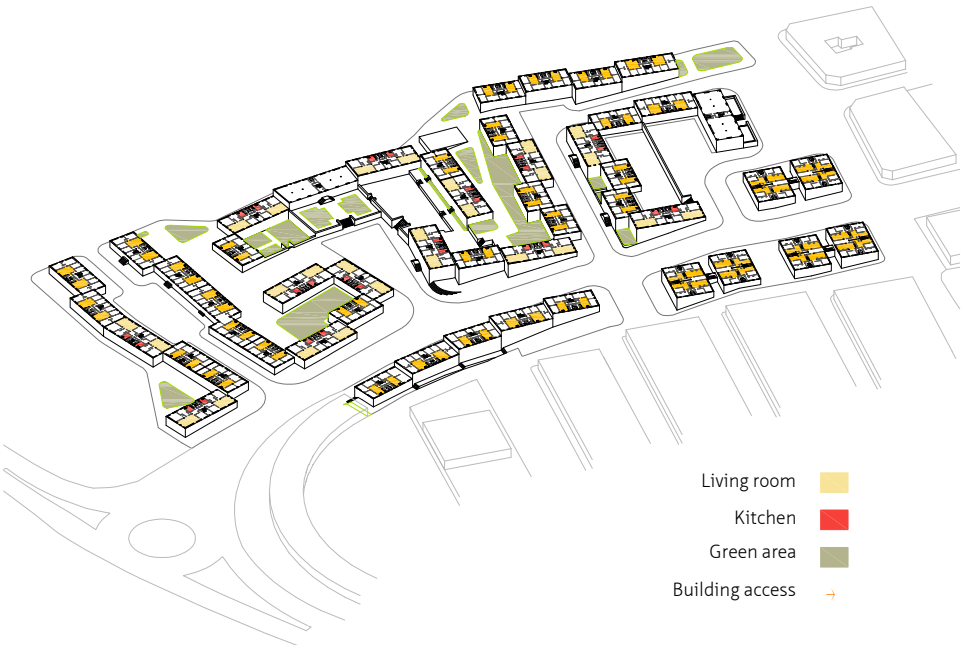
Cross section AA´

Living room Kitchen Summer shadow Winter shadow

Visual control area Area without visual control



Green Area Impassable Permeable edge Slope Building access

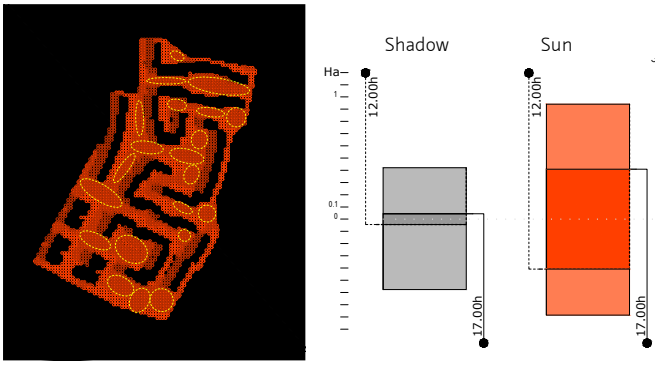


Summer solstice June 21st


| WEATHER | JUNE | DECEMBER |
|---|---|---|
| TEMPERATURE (C) | | |
| Average | 16.7 | 10.35 |
| Maximum | 23.9 | 18.7 |
| Minimum | 11.9 | 1.8 |
| % Relative humidity | 86.5 | 81 |
| Wind speed (m/s) | 5 | 5.2 |
| Sunny hours | 220 | 93 |
| Sunlighting | 51 | 21.5 |
| Rainfall (l/m2) | 44 | 99.6 |
| RAIN DAYS | | |
| < 0,1 mm/day | 9.5 | 17.5 |
| < 1 mm/day | 6 | 14 |
| < 10 mm/day | 2 | 4 |
| < 30 mm/day | 0 | 0 |

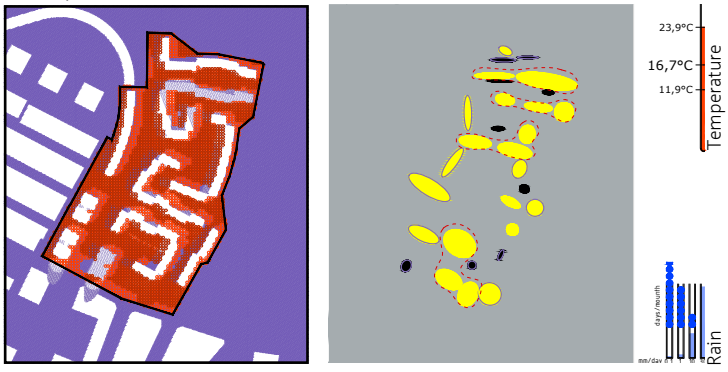
* Source: Meteo Galicia 2006

Sunlighting 12:00h 17:00h Solar overlapping




Prevailing wind

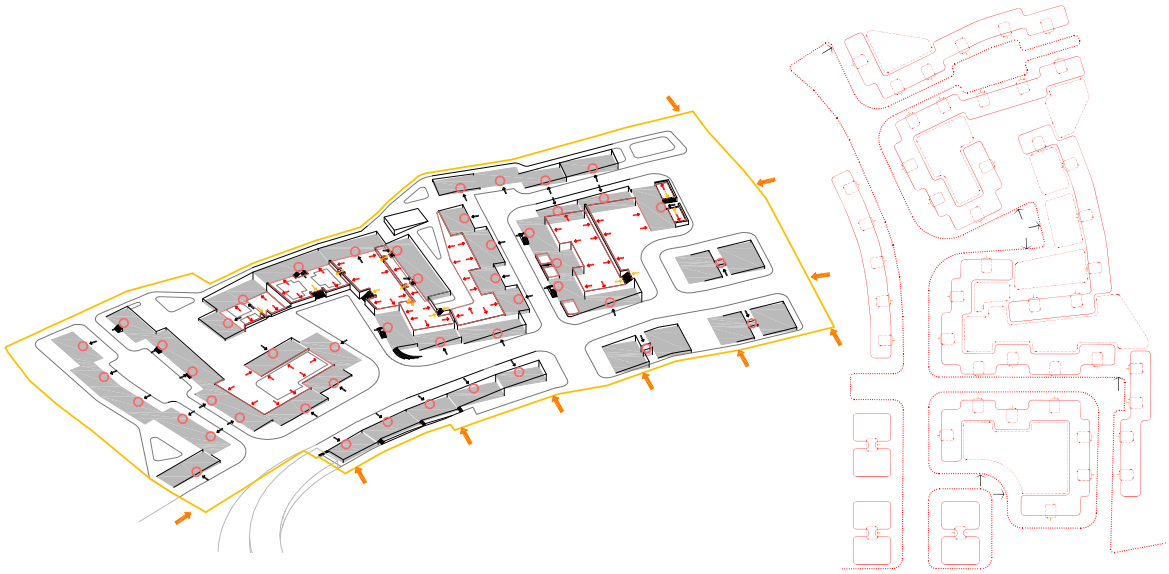

Results June 21st Wind Sun Shadow The best conditions

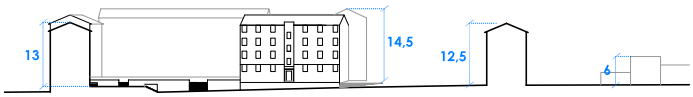


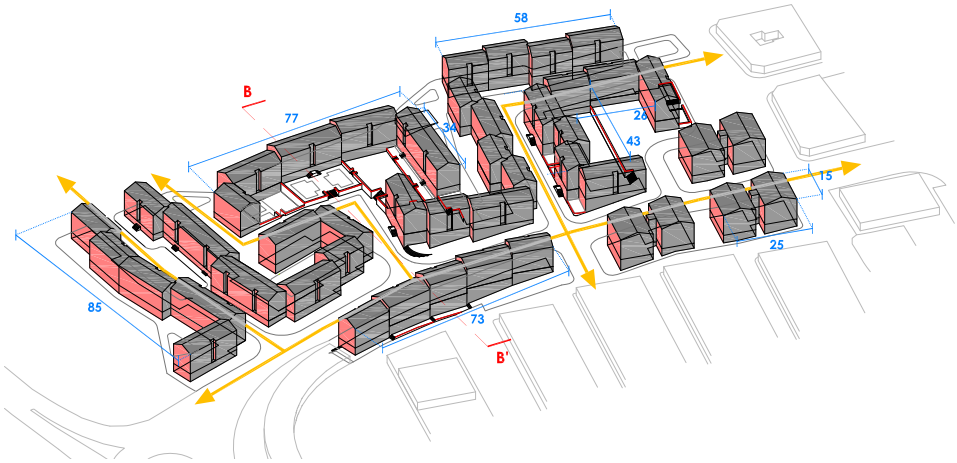

Winter solstice December 21st
12:00h
17:00h
Sunlighting
12:00h
17:00h
Solar overlapping
Shadow
Sun
Ha
12.00h
17.00h
12.00h
17.00h
Results December 21st
Wind
Sun
Shadow
The best conditions
18,7°C
10,35°C
1,8°C
Temperature
Rain

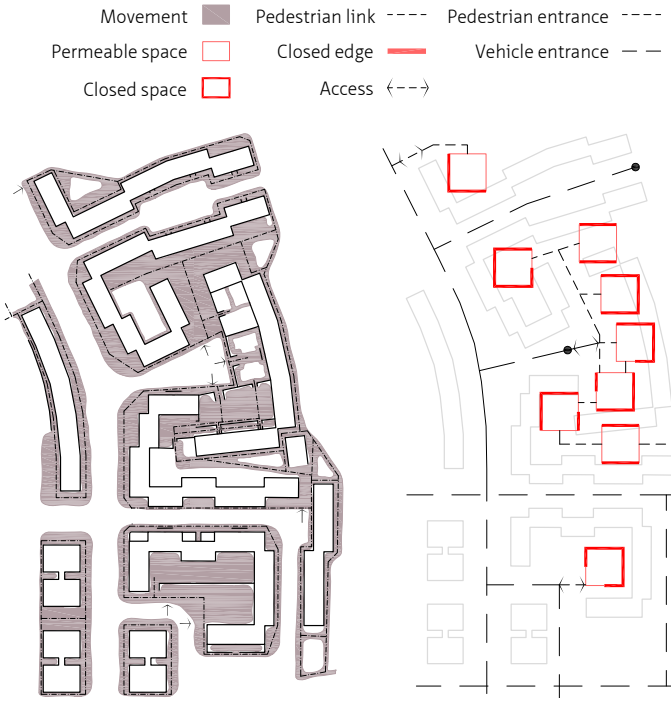
## 4.3.3 Spatial Quality / Accessibility, Permeability

Accesible
Less accesible
Accesible unusable
Inaccesible
Closed edge
Open edge
Front door acess
External acess
Private
Community
Accessible to public
Public
Access

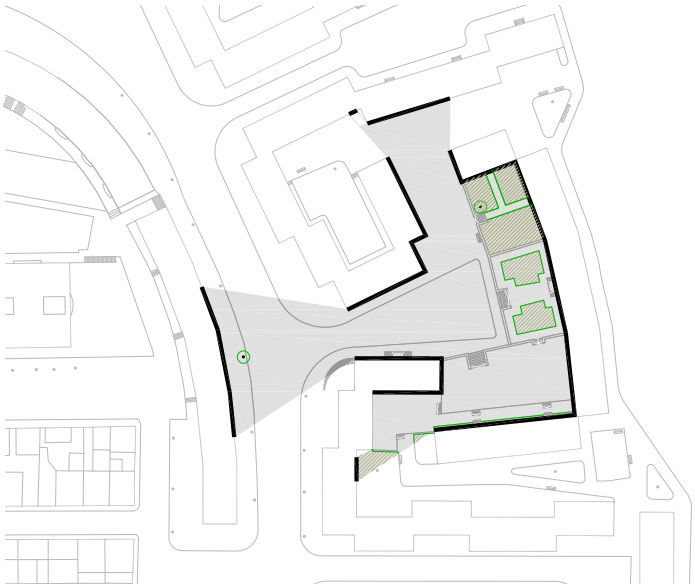




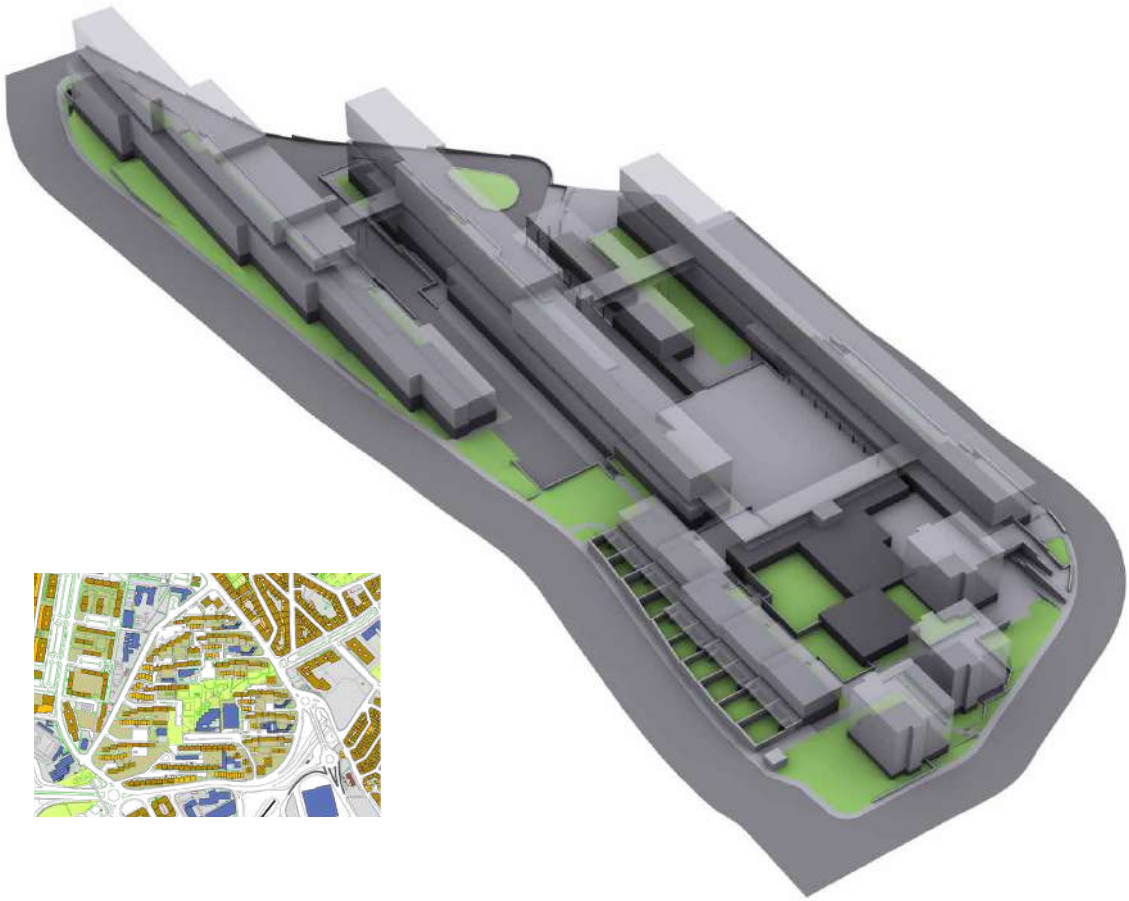





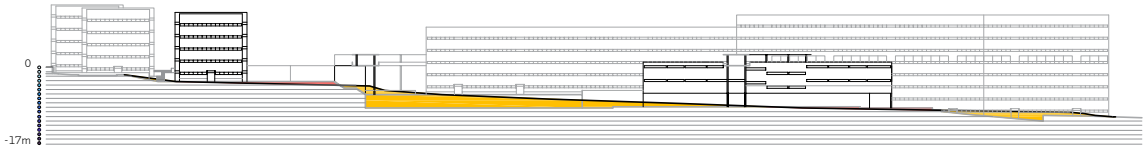

Visual relation area



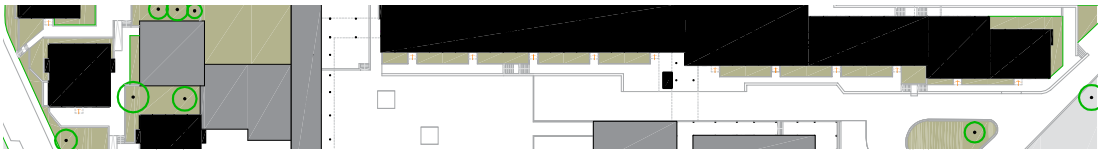
## 4.3.1 Layers of formal structure



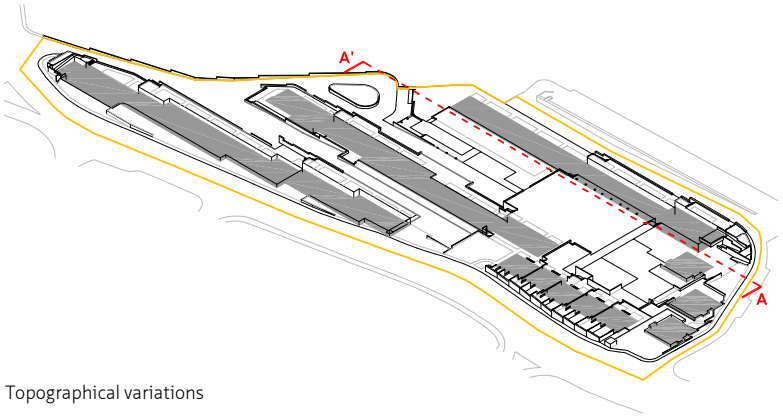




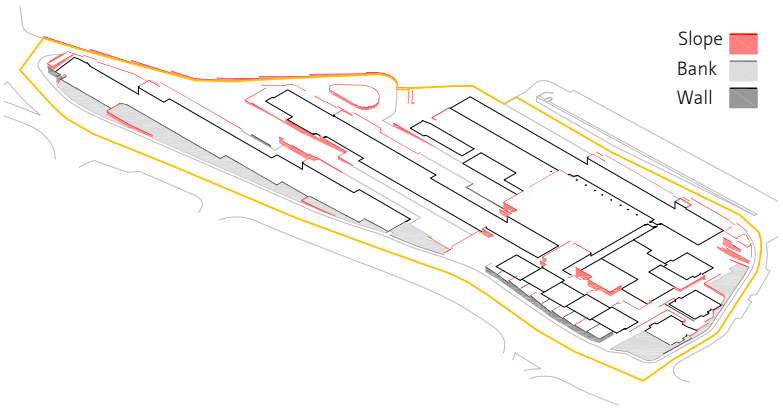

Levelled area Embankment



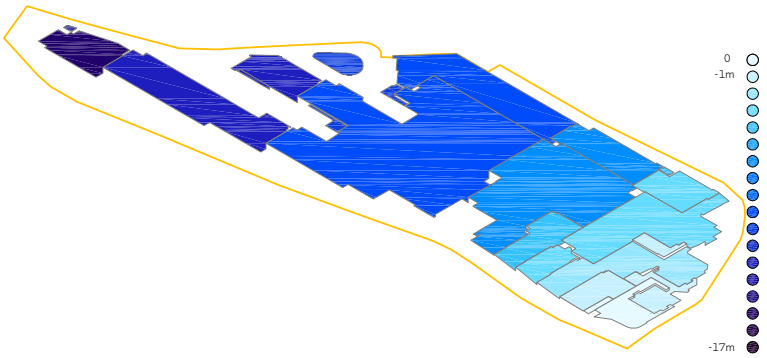
Edges



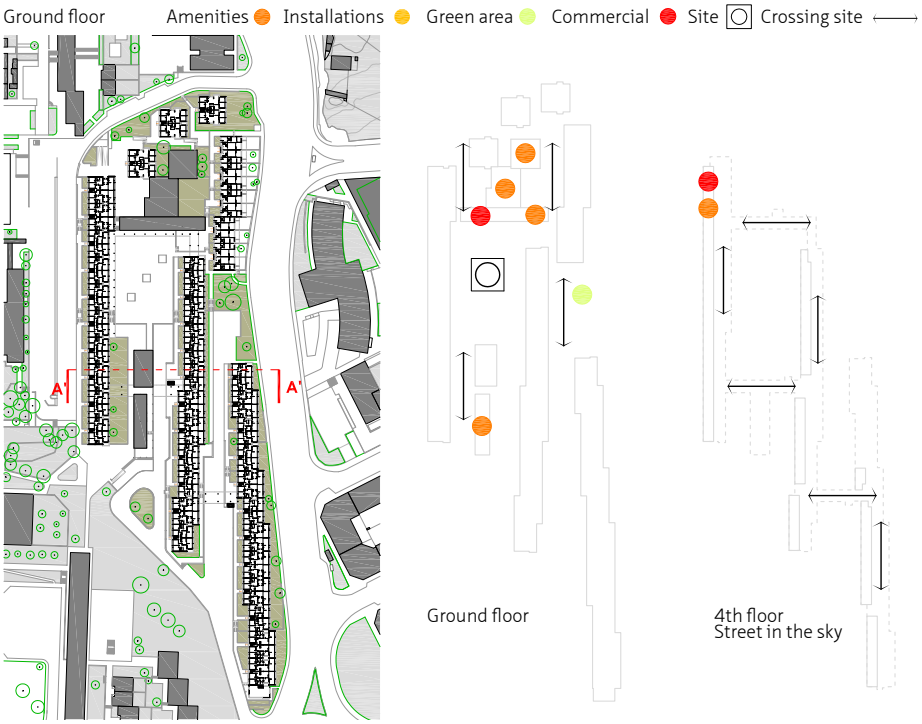

Topographical variations

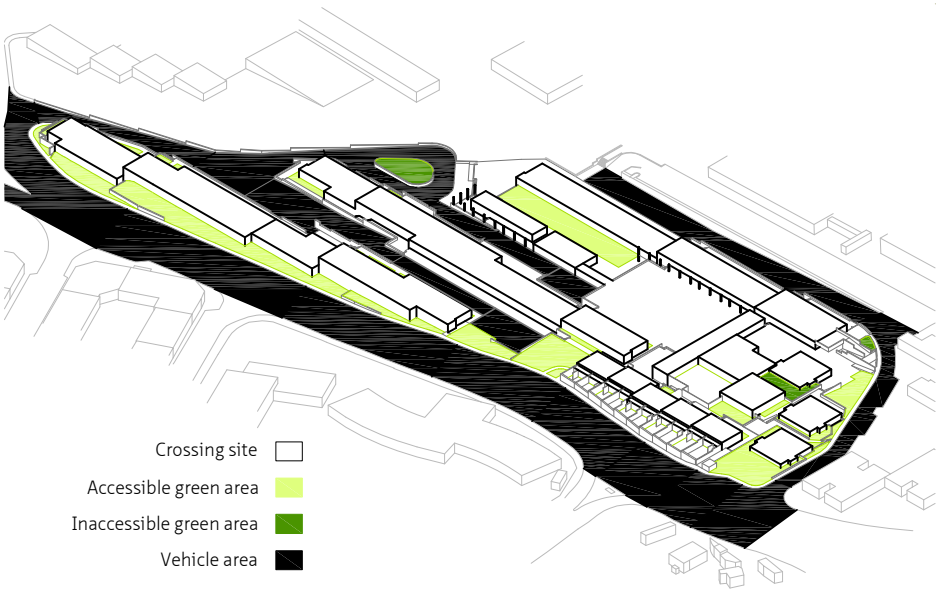



Platforms



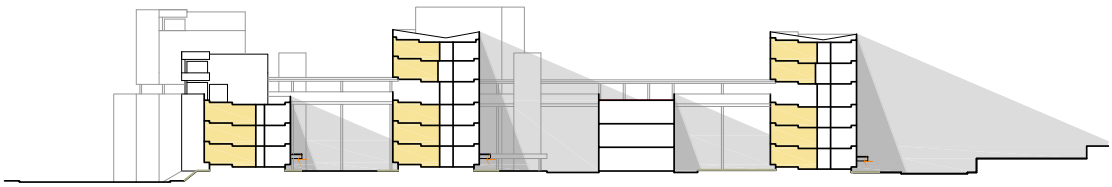
## 4.3.2 Functionality of external space / Spatial connections



Cross section AA´

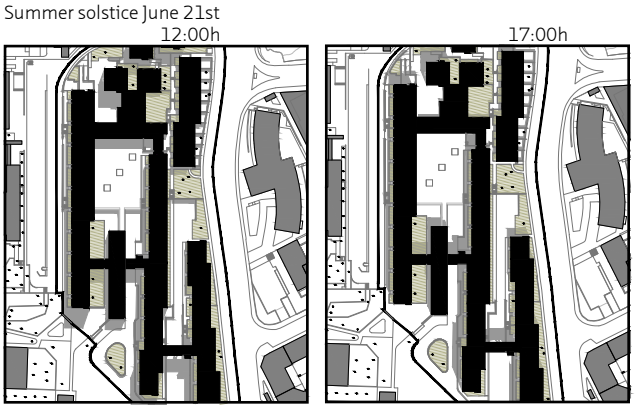
Living room Kitchen Summer shadow Winter shadow



Visual control area Area without visual control

Green Area Impassable Permeable edge Slope Building access

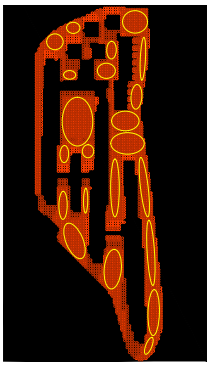
Summer solstice June 21st

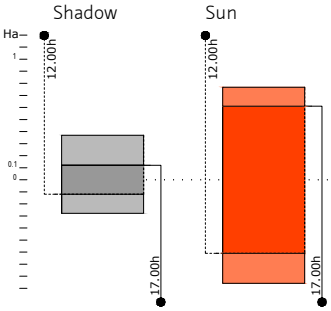



| WEATHER | JUNE | DECEMBER |
|---|---|---|
| TEMPERATURE (C) | | |
| Average | 16.7 | 10.3 |
| Maximum | 23.9 | 18.7 |
| Minimum | 11.9 | 1.8 |
| % Relative humidity | 86.5 | 81 |
| Wind speed (m/s) | 5 | 5.2 |
| Sunny hours | 220 | 93 |
| Sunlighting | 51 | 21.5 |
| Rainfall (l/m2) | 44 | 99.6 |
| RAIN DAYS | | |
| < 0,1 mm/day | 9.5 | 17.5 |
| < 1 mm/day | 6 | 14 |
| < 10 mm/day | 2 | 4 |
| < 30 mm/day | 0 | 0 |

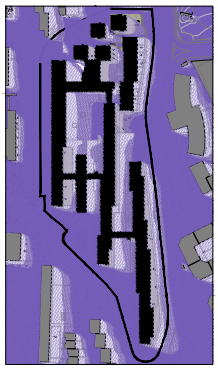
* Source: Meteo Galicia 2006

Sunlighting 12:00h 17:00h Solar overlapping

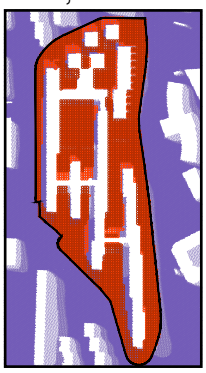




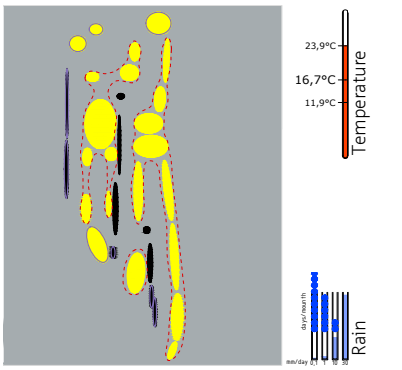

Prevailing wind NNE



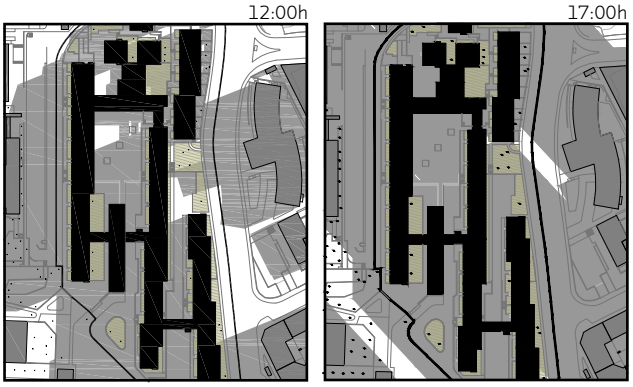
Results June 21st



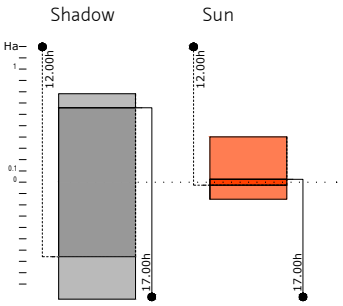
Wind Sun Shadow The best conditions



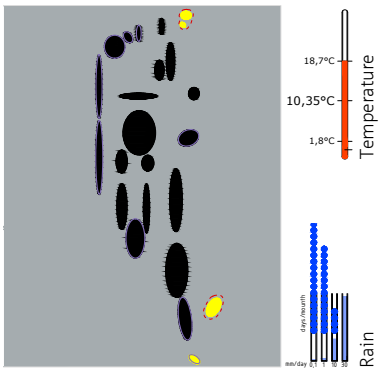
Winter solstice December 21st




Sunlighting 12:00h 17:00h Solar overlapping

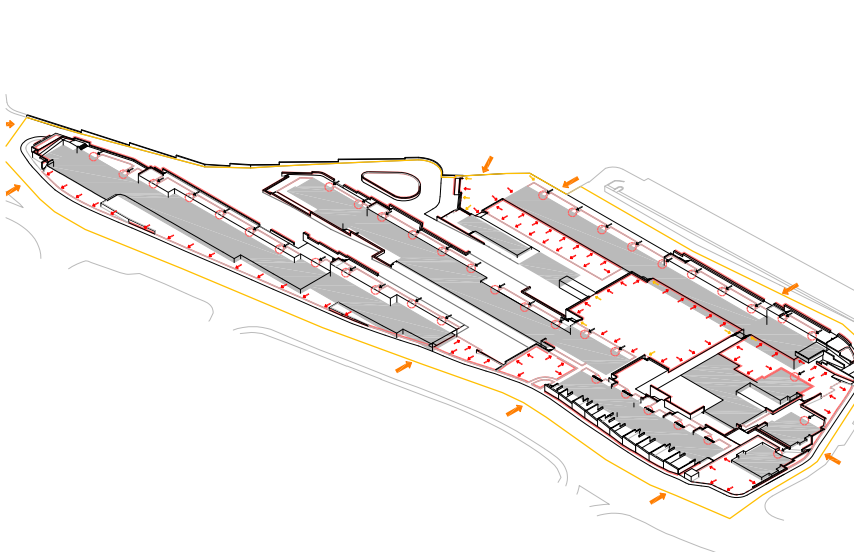


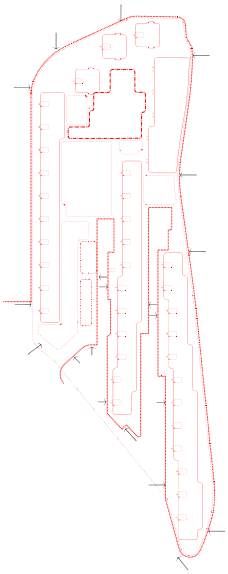

Results December 21st Wind Sun Shadow The best conditions

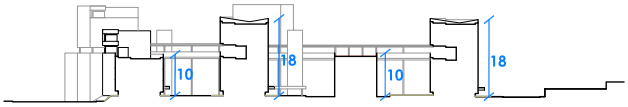


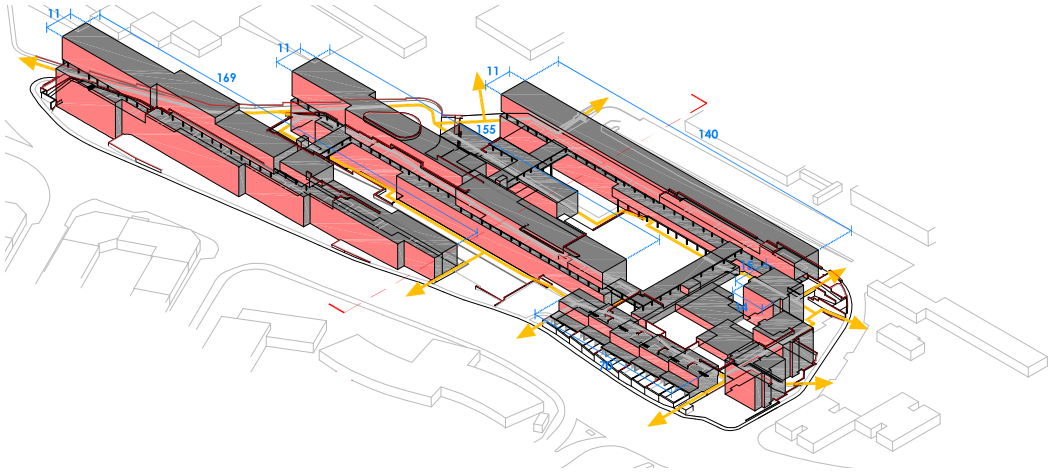
## 4.3.3 Spatial Quality / Accessibility, Permeability

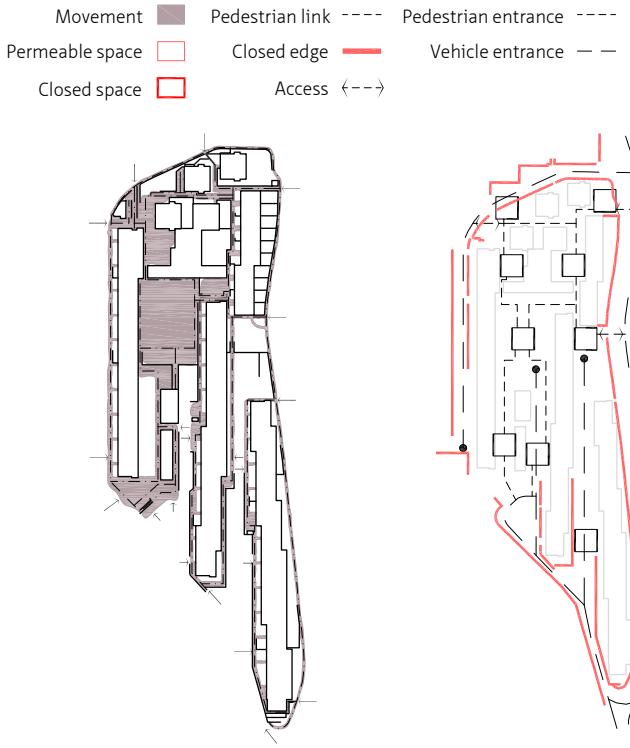
Accesible
Less accesible
Accesible unusable
Inaccesible
Closed edge
Open edge
Front door acess
External acess
Private
Community
Accessible to public
Public
Access



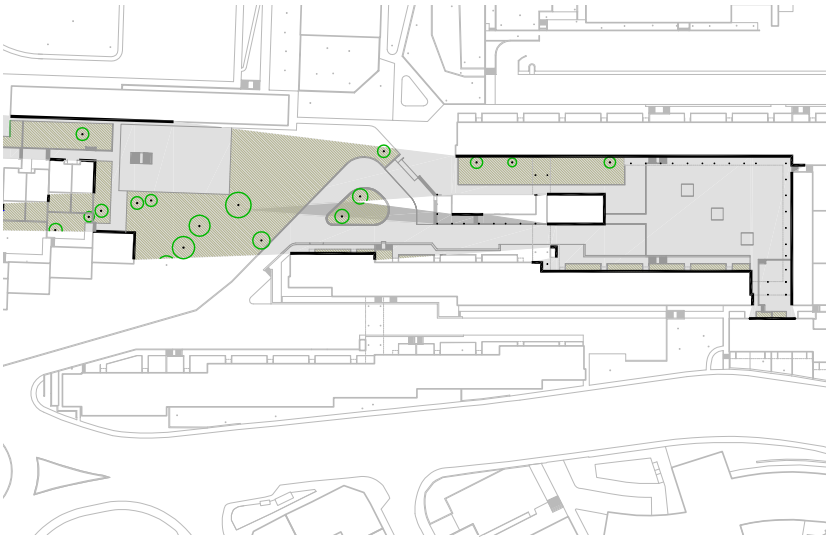




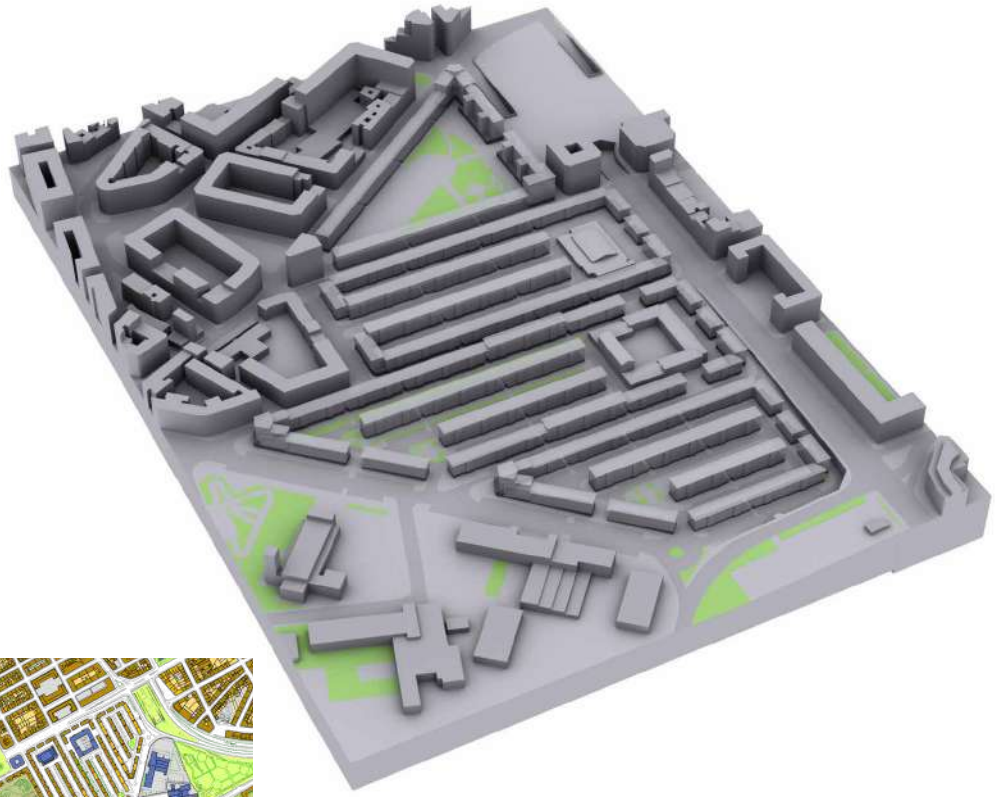



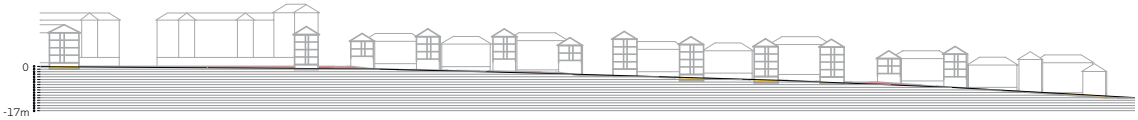



Visual relation area

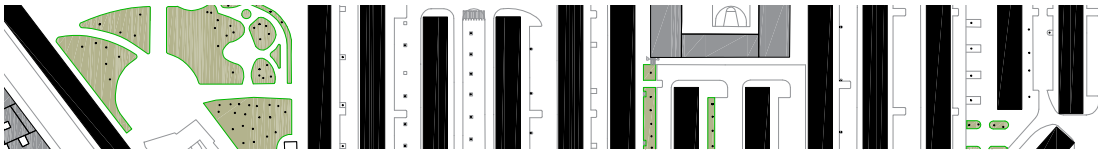


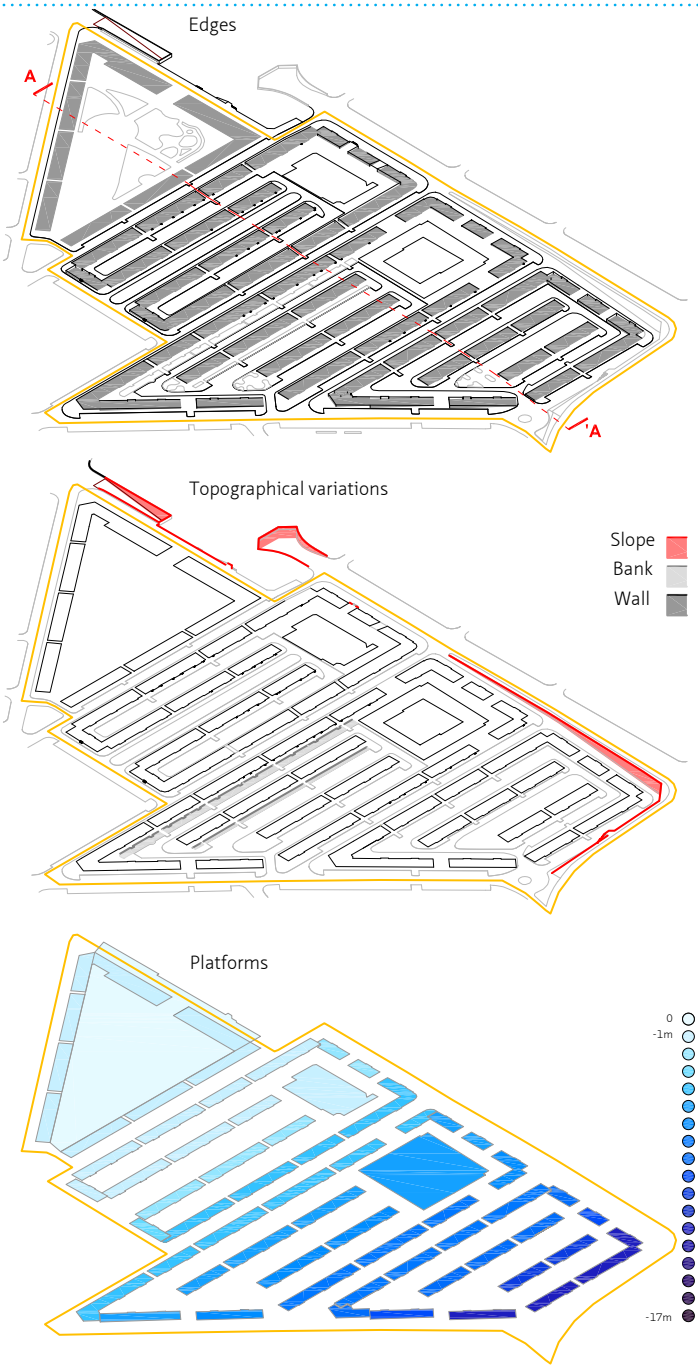
## 4.3.1 Layers of formal structure



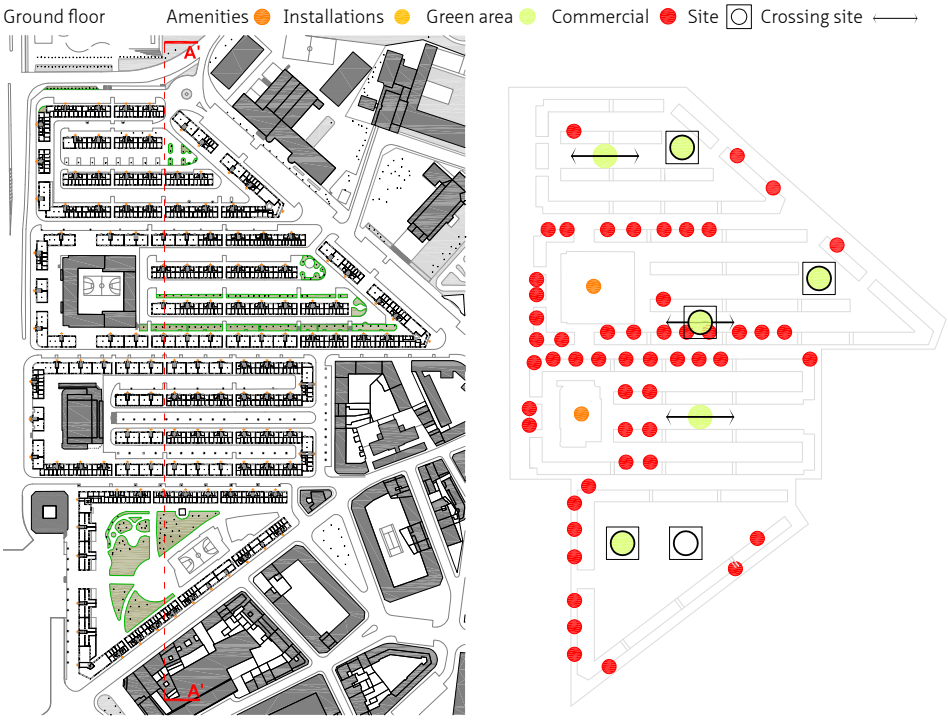


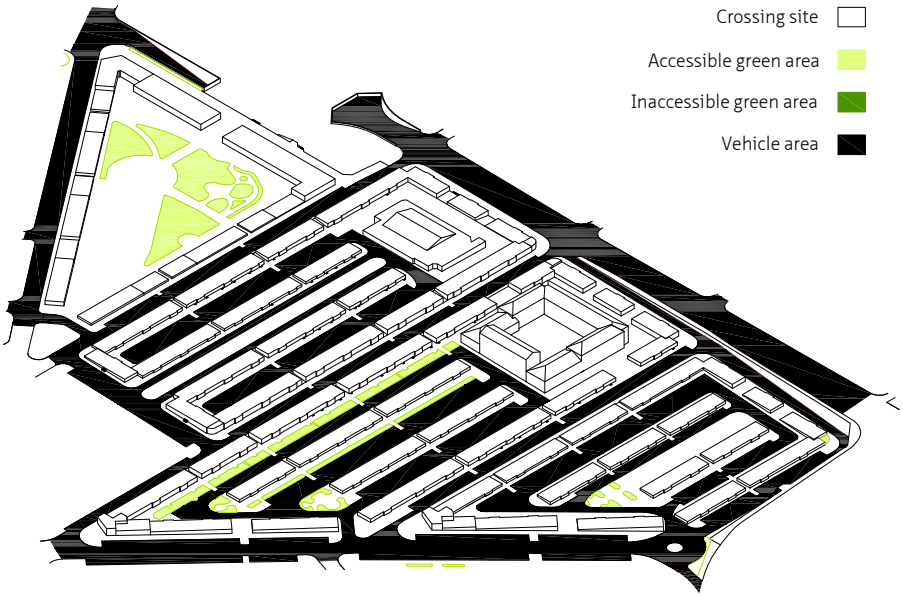

Levelled area Embankment




Edges
A
A
Topographical variations
Slope
Bank
Wall
Platforms
0
-1m
-17m

## 4.3.2 Functionality of external space / Spatial connections



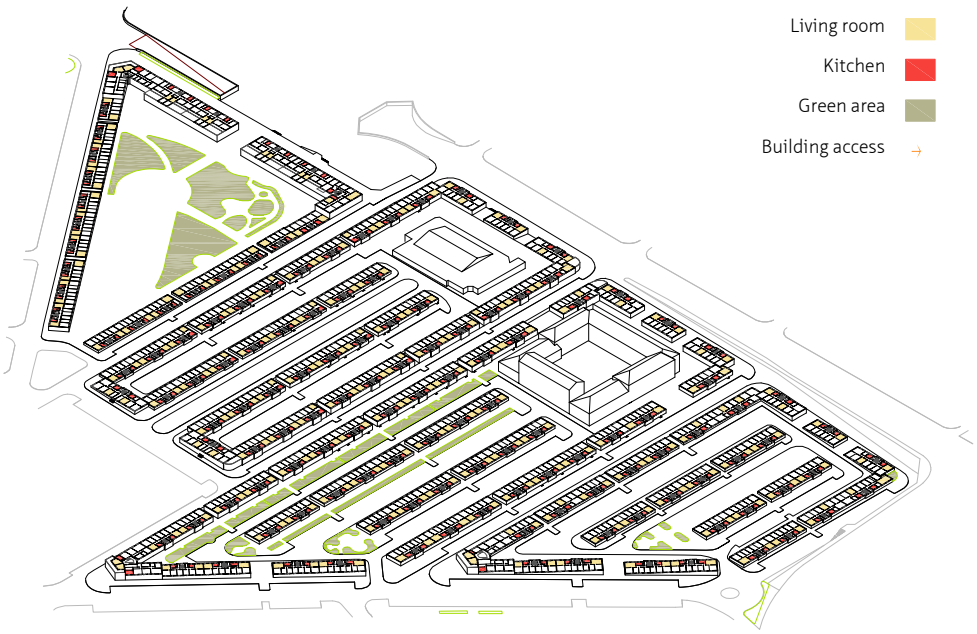



Cross section AA´

Living room Kitchen Summer shadow Winter shadow

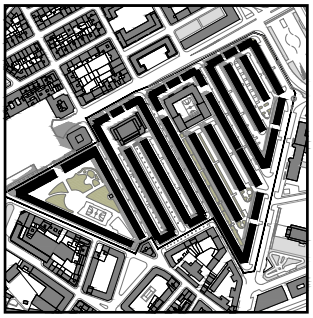
Visual control area Area without visual control

Green Area Impassable Permeable edge Slope Building access

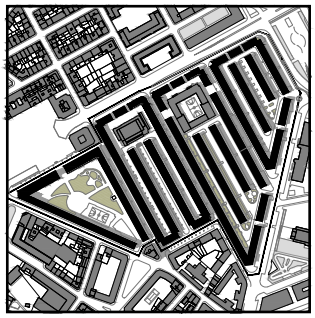


Summer solstice June 21st

12:00h



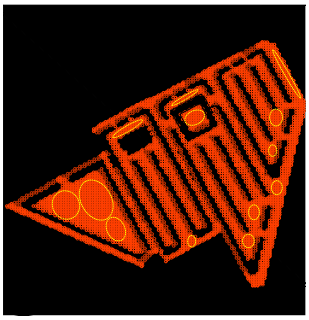
17:00h

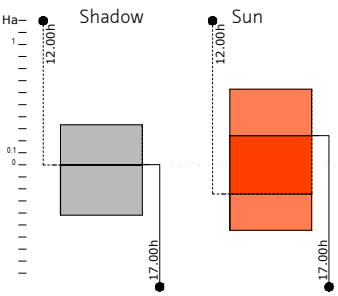


| WEATHER | JUNE | DECEMBER |
|---|---|---|
| TEMPERATURE (C) | | |
| Average | 18 | 9.8 |
| Maximum | 30.4 | 20.1 |
| Minimum | 11.6 | -0.7 |
| % Relative humidity | 78.5 | 80 |
| Wind speed (m/s) | 3.2 | 3 |
| Sunny hours | 225.1 | 84.8 |
| Sunlighting | 49.5 | 31 |
| Rainfall (l/m2) | 92 | 144 |
| RAIN DAYS | | |
| < 0,1 mm/day | 10.5 | 22.5 |
| < 1 mm/day | 9 | 15.5 |
| < 10 mm/day | 4 | 6 |
| < 30 mm/day | 0.5 | 0.5 |

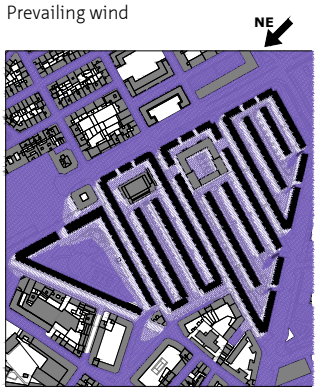
* Source: Meteo Galicia 2006

Sunlighting 12:00h 17:00h Solar overlapping

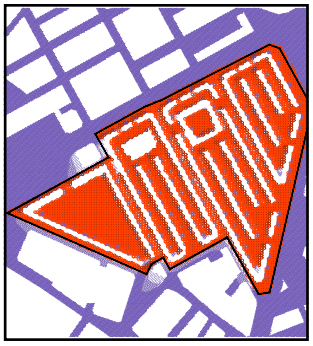


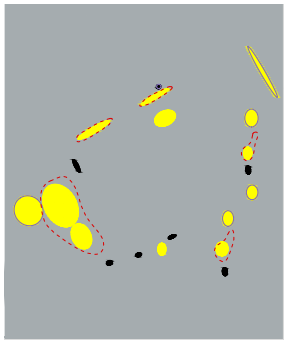



Prevailing wind



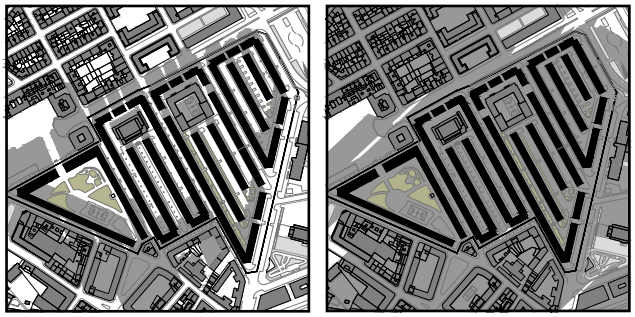

Results June 21st Wind Sun Shadow The best conditions



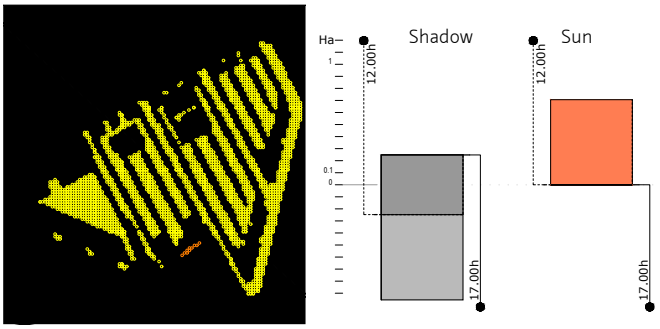


Winter solstice December 21st

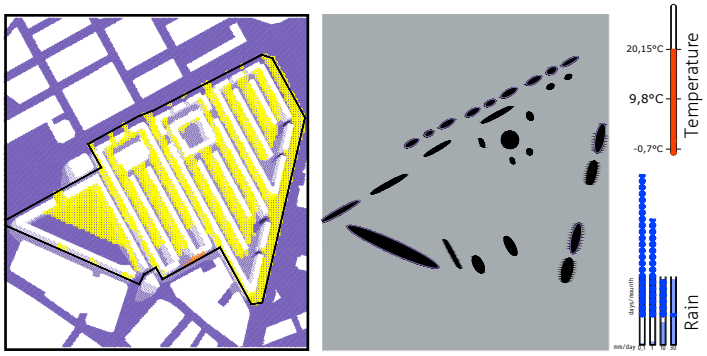
12:00h 17:00h



Sunlighting 12:00h 17:00h Solar overlapping

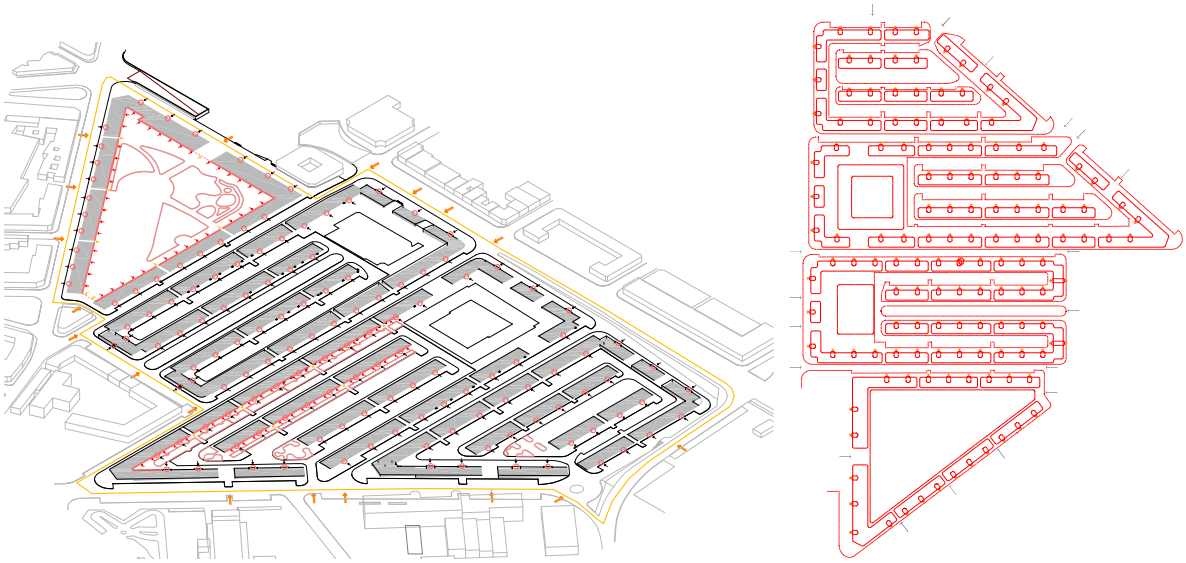


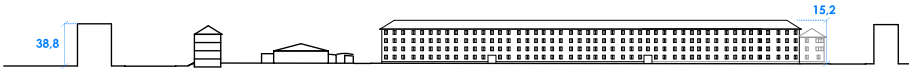

Results December 21st Wind Sun Shadow The best conditions

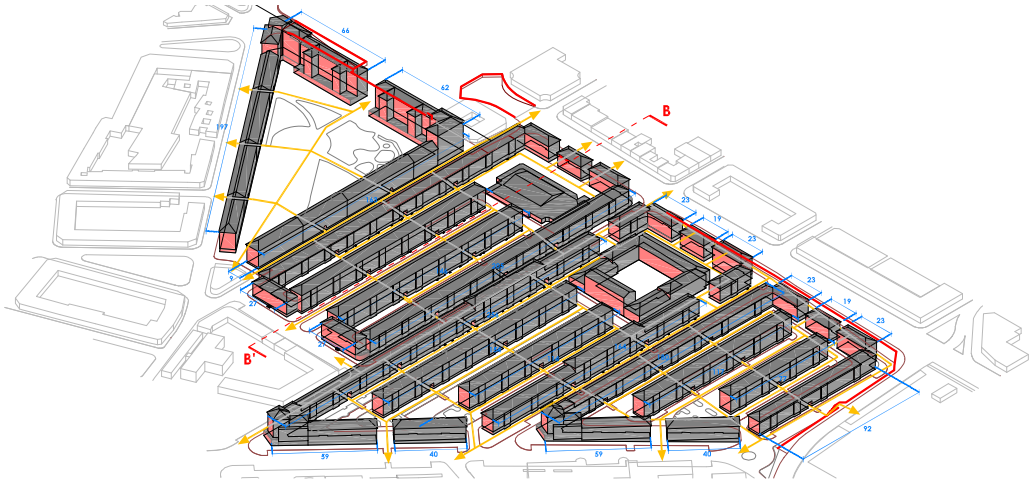


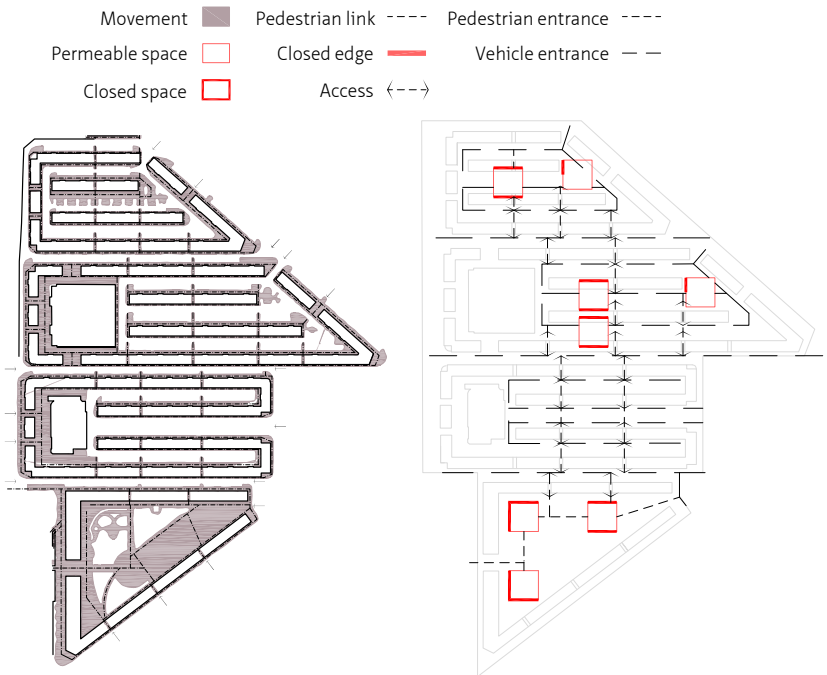
## 4.3.3 Spatial Quality / Accessibility, Permeability

Accesible
Less accesible
Accesible unusable
Inaccesible
Closed edge
Open edge
Front door acess
External acess
Private
Community
Accessible to public
Public
Access

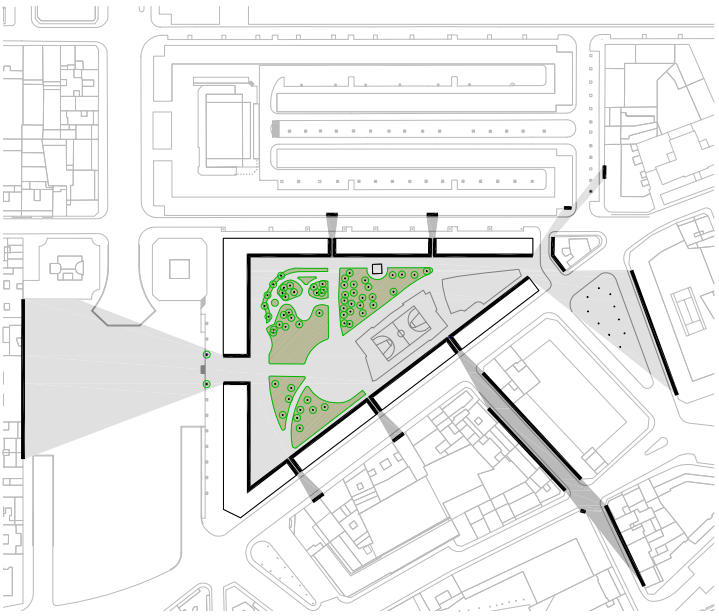




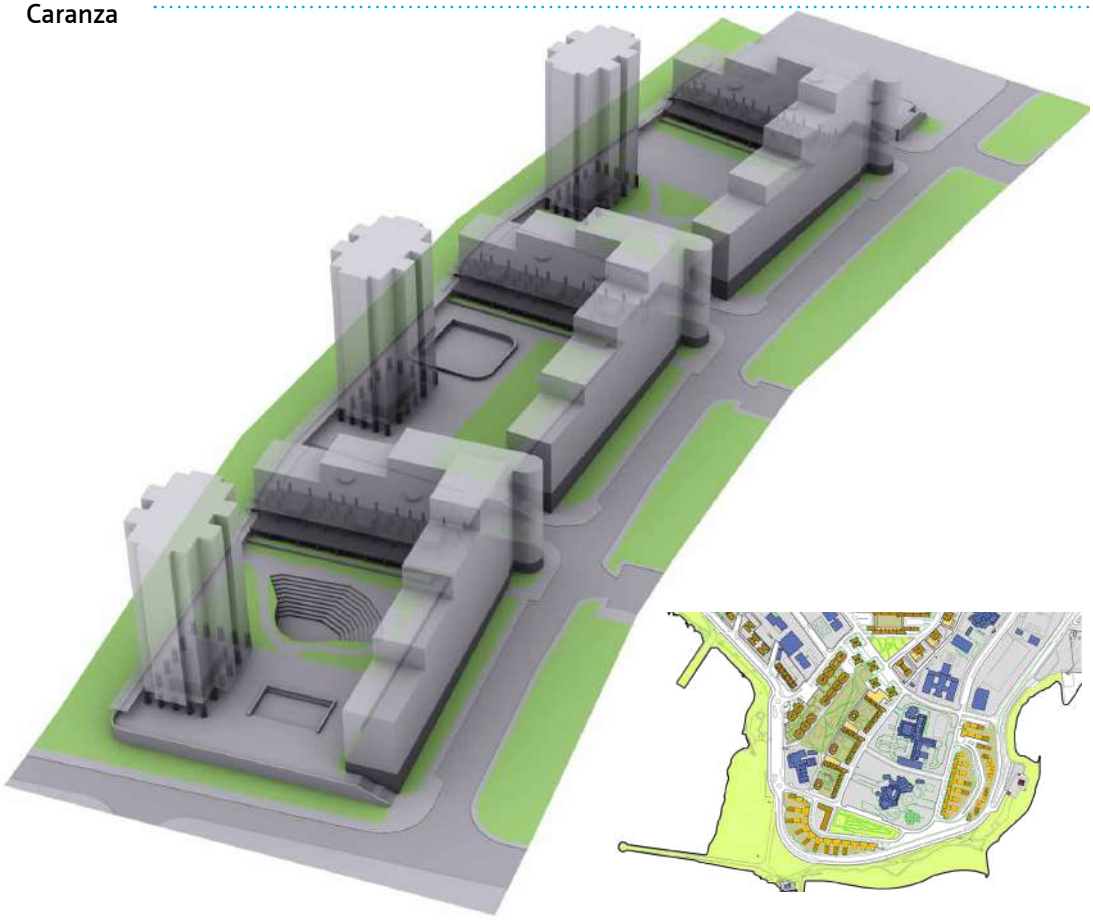





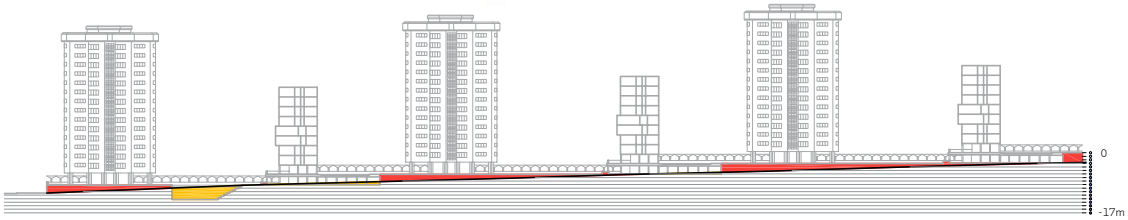

Visual relation area



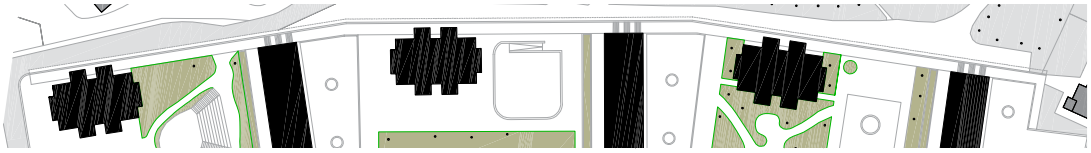
## 4.3.1 Layers of formal structure



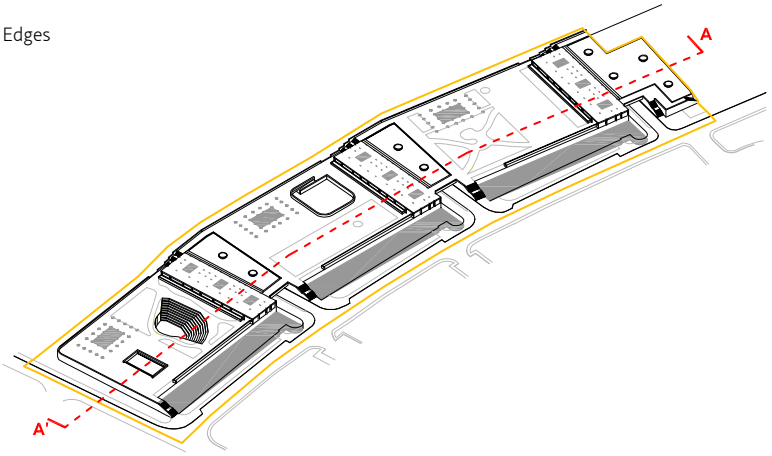




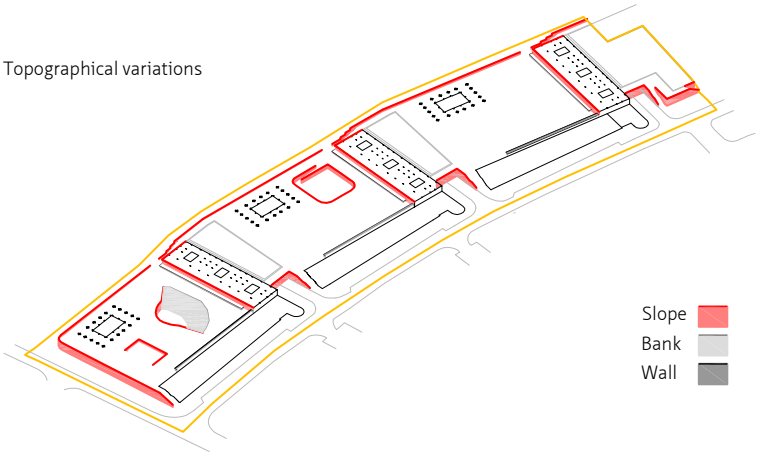

Levelled area Embankment



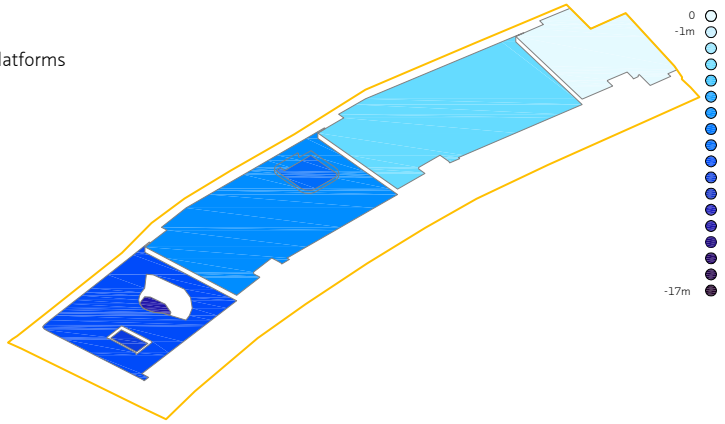
Edges



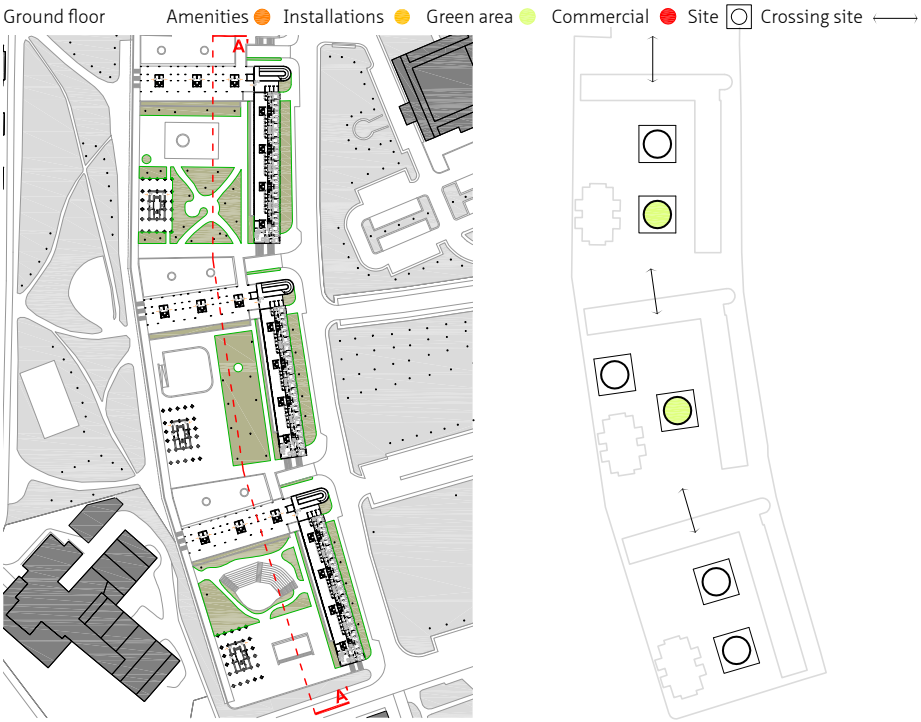

Topographical variations

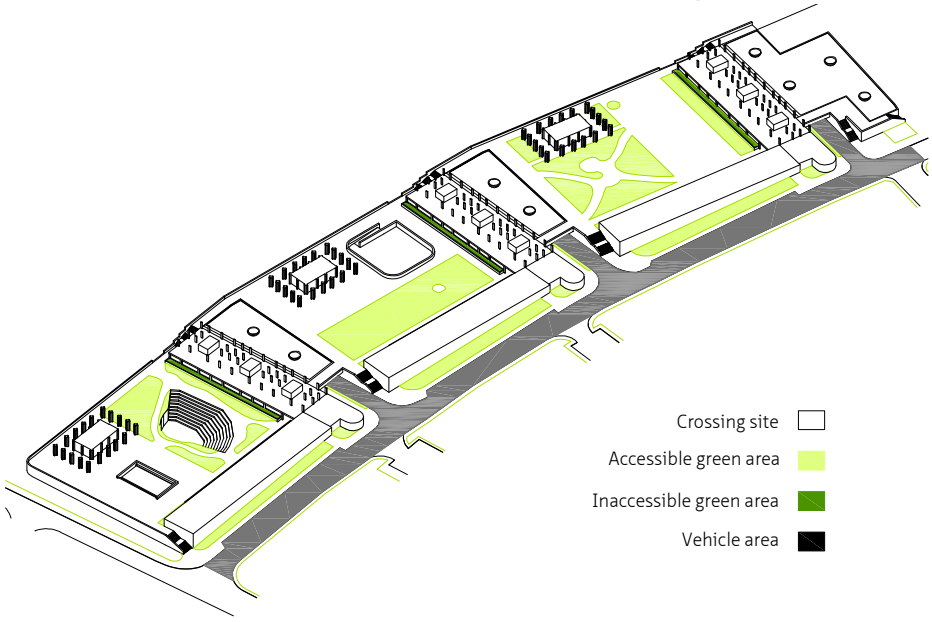



Platforms



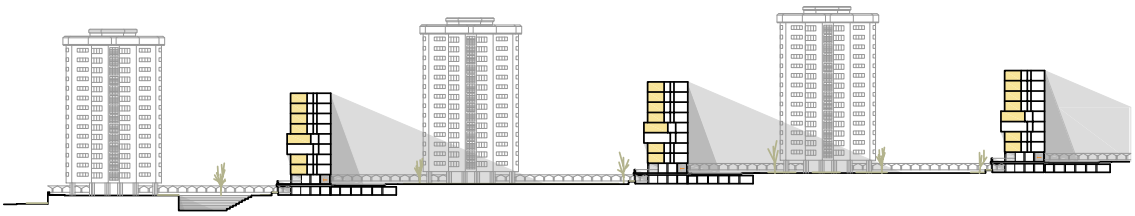
## 4.3.2 Functionality of external space / Spatial connections



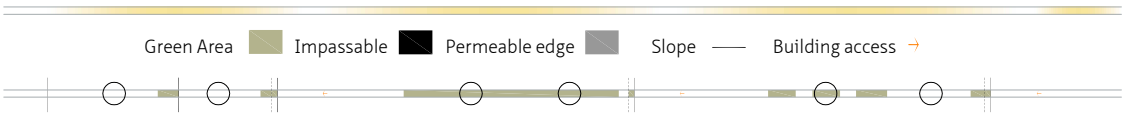



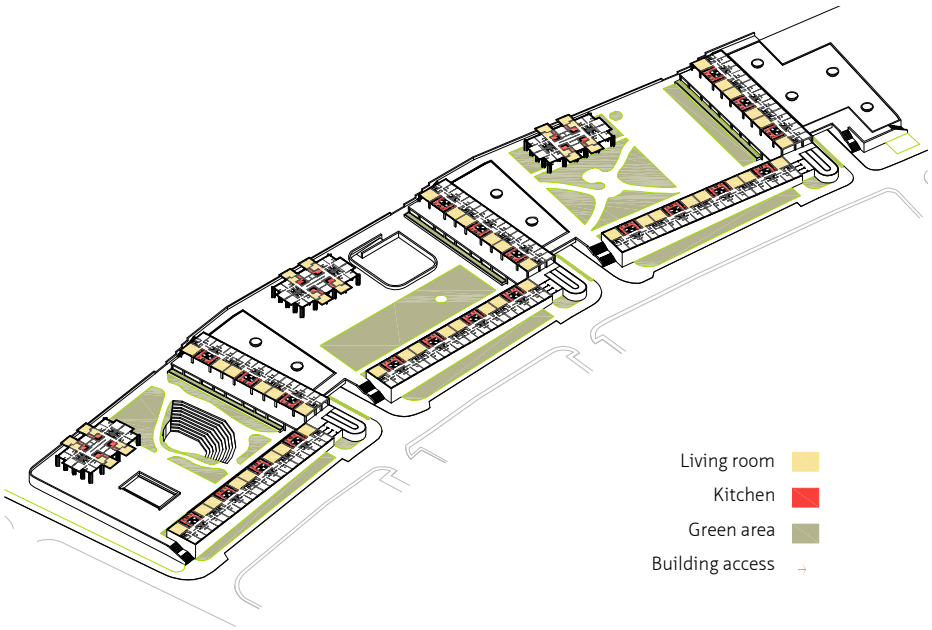
Cross section AA´

Living room Kitchen Summer shadow Winter shadow



Visual control area Area without visual control

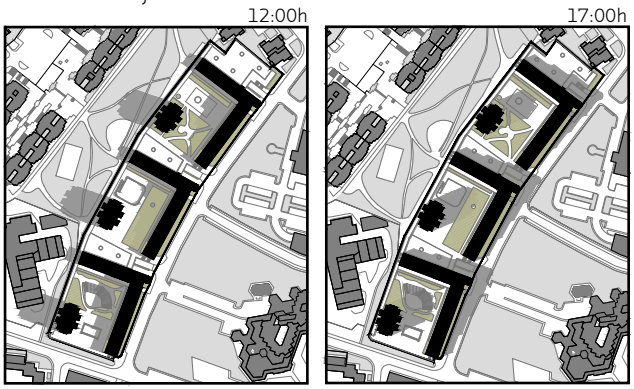


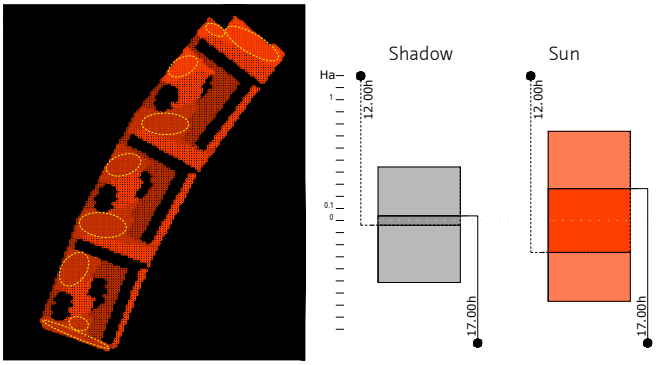
| WEATHER | JUNE | DECEMBER |
|---|---|---|
| TEMPERATURE (C) | | |
| Average | 18 | 9.8 |
| Maximum | 30.4 | 20.1 |
| Minimum | 11.6 | -0.7 |
| % Relative humidity | 78.5 | 80 |
| Wind speed (m/s) | 3.2 | 3 |
| Sunny hours | 225.1 | 84.8 |
| Sunlighting | 49.5 | 31 |
| Rainfall (l/m2) | 92 | 144 |
| RAIN DAYS | | |
| < 0,1 mm/day | 10.5 | 22.5 |
| < 1 mm/day | 9 | 15.5 |
| < 10 mm/day | 4 | 6 |
| < 30 mm/day | 0.5 | 0.5 |

* Source: Meteo Galicia 2006

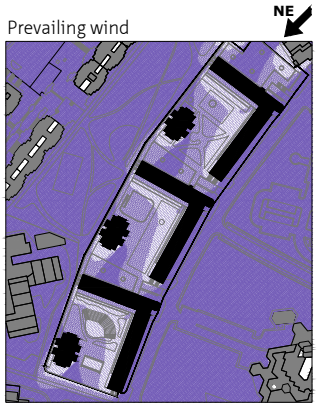
Summer solstice June 21st



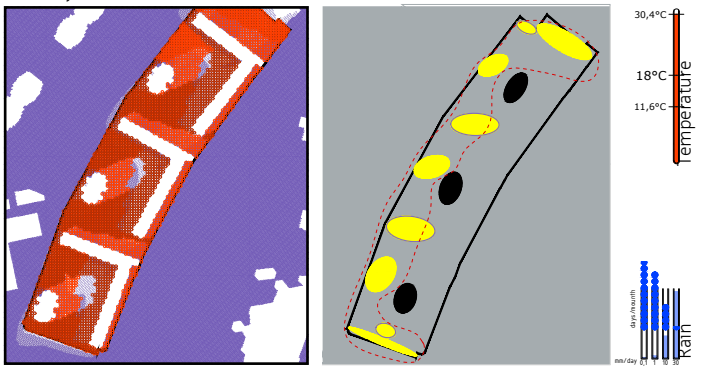

Sunlighting 12:00h 17:00h Solar overlapping



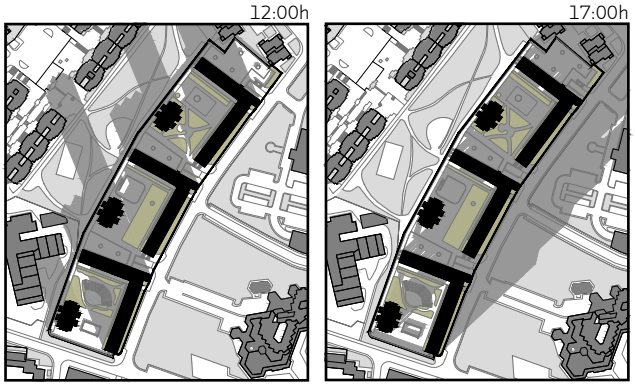

Prevailing wind



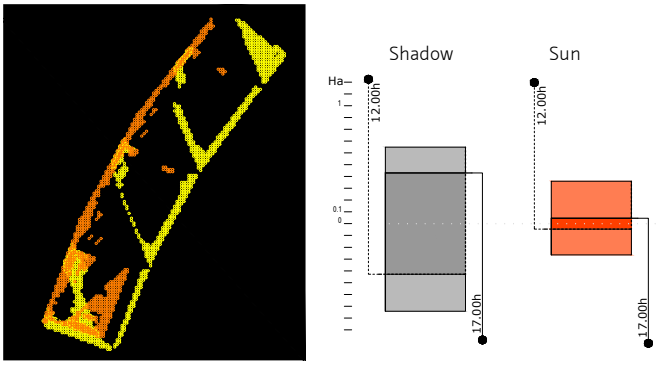

Results June 21st Wind Sun Shadow The best conditions



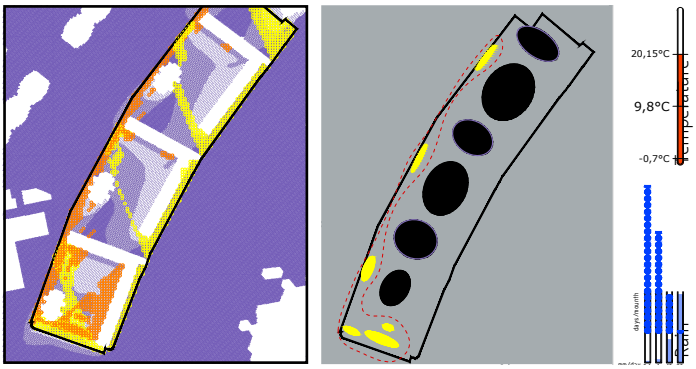
Winter solstice December 21st




Sunlighting 12:00h 17:00h Solar overlapping

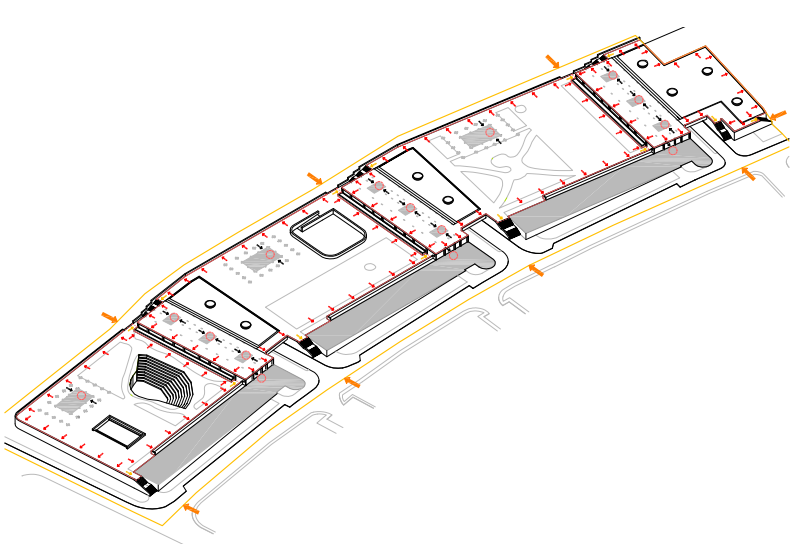


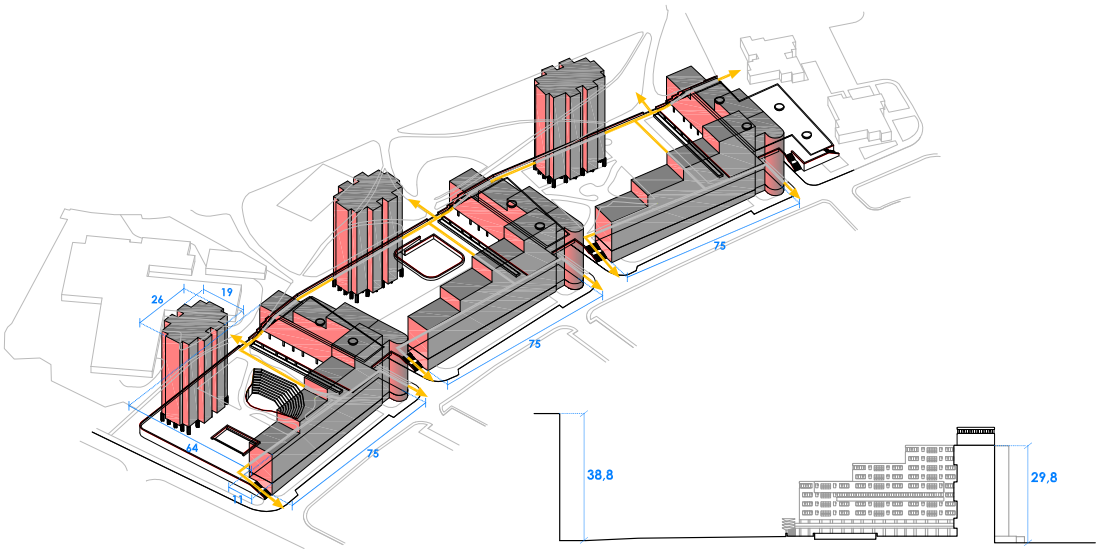

Results December 21st Wind Sun Shadow The best conditions

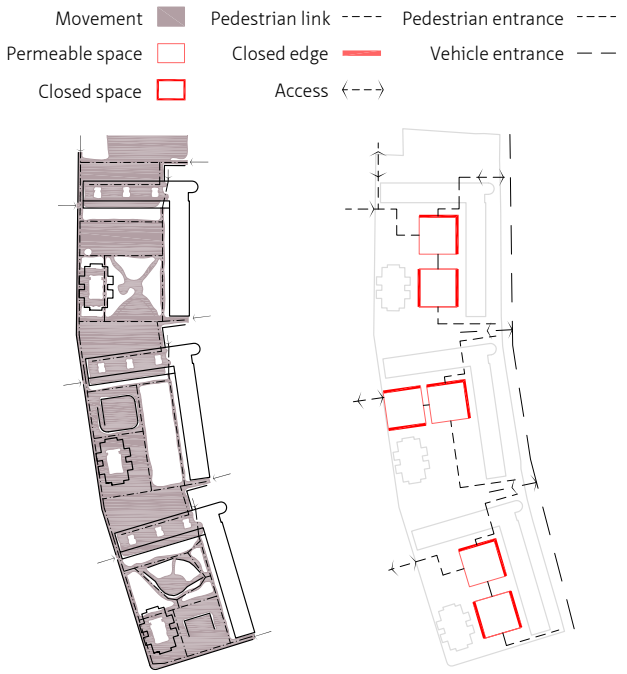


## 4.3.3 Spatial Quality / Accessibility, Permeability

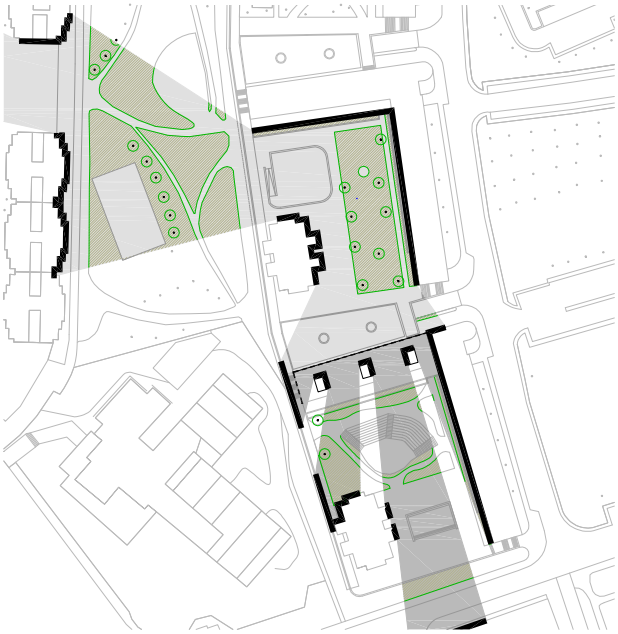
Accesible
Less accesible
Accesible unusable
Inaccesible
Closed edge
Open edge
Front door acess
External acess
Private
Community
Accessible to public
Public
Access



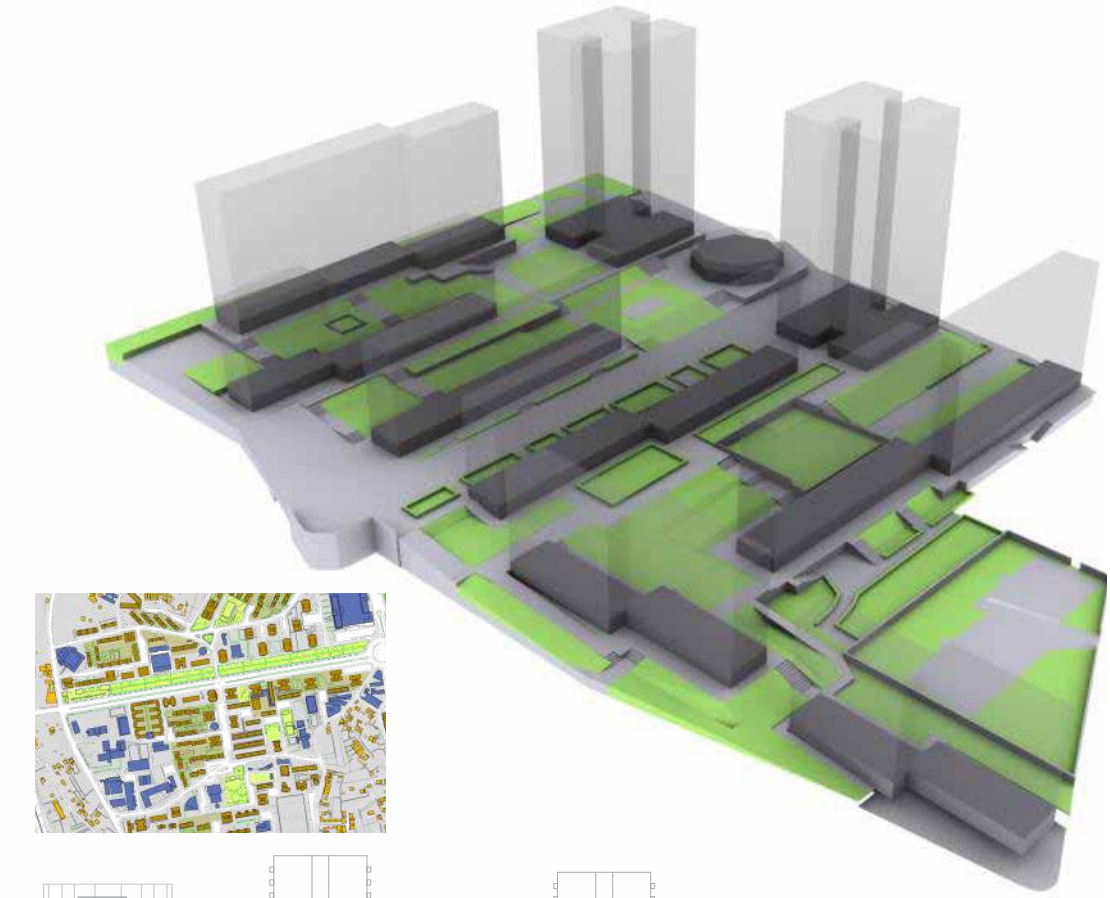




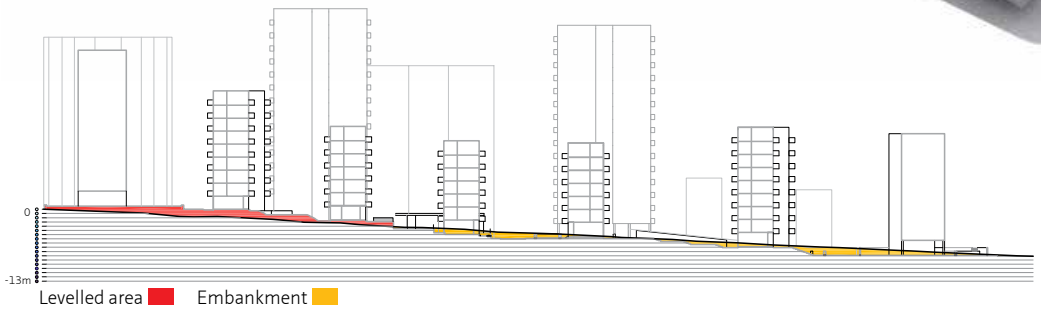

Visual relation area

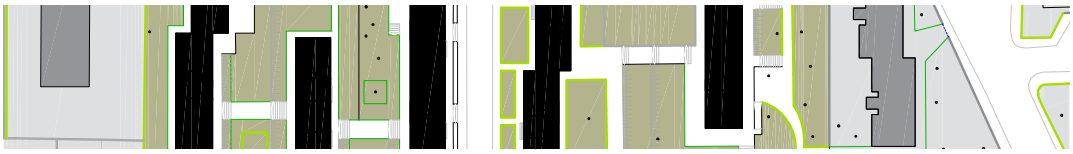


## 4.3.1 Layers of formal structure

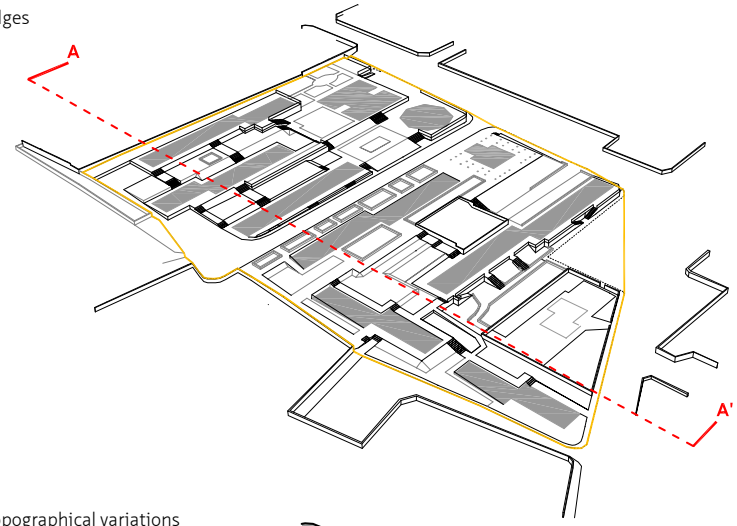




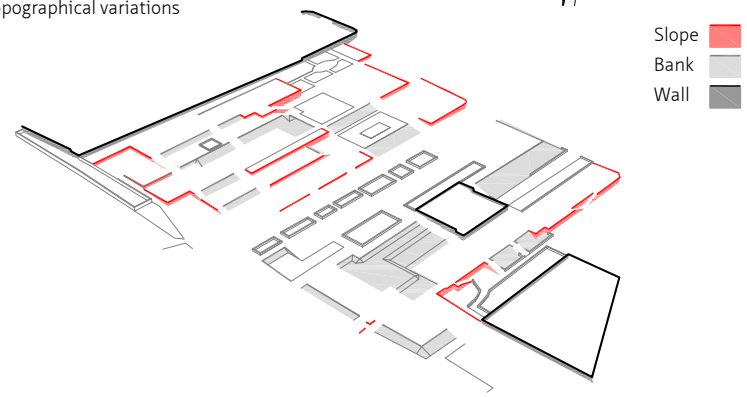


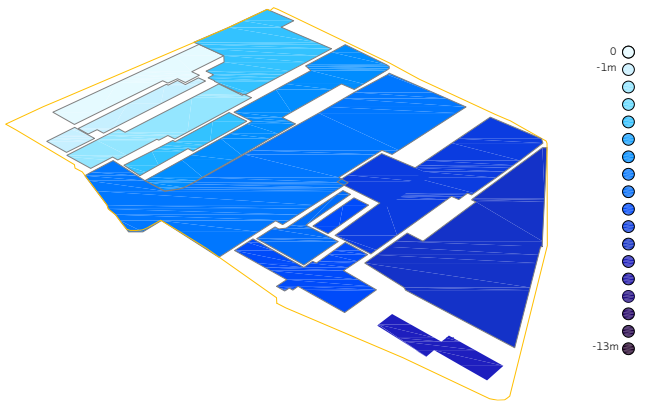
Edges



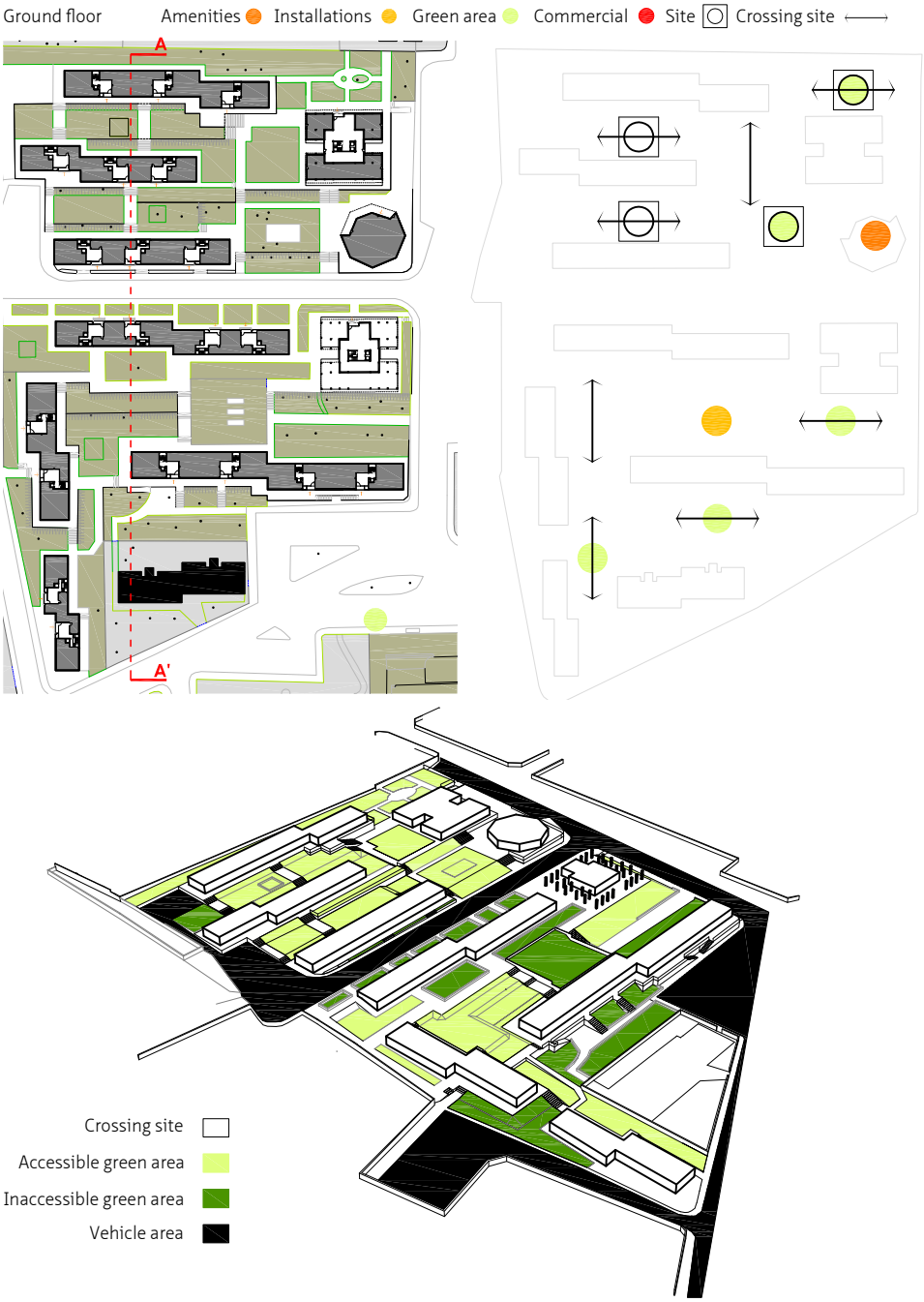

Topographical variations




Platforms

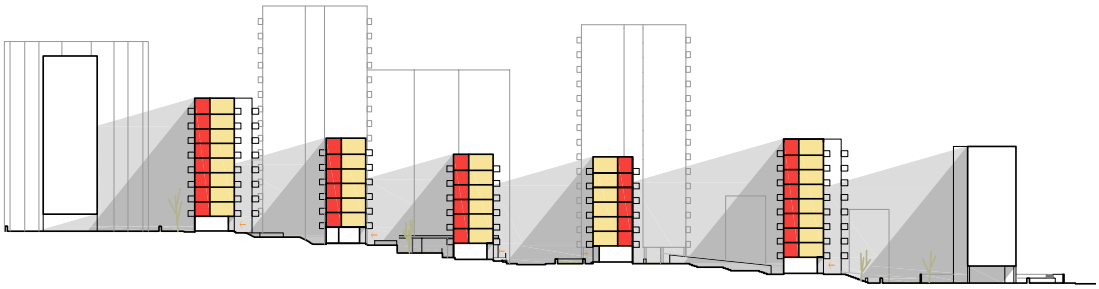


## 4.3.2 Functionality of external space / Spatial connections



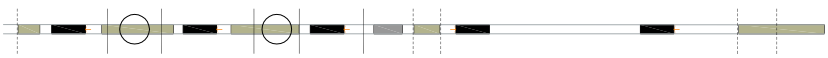
Cross section AA´

Living room Kitchen Summer shadow Winter shadow



Visual control area Area without visual control

Green Area Impassable Permeable edge Slope Building access

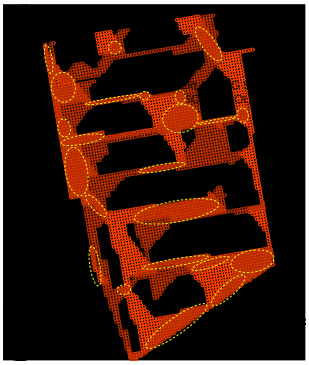


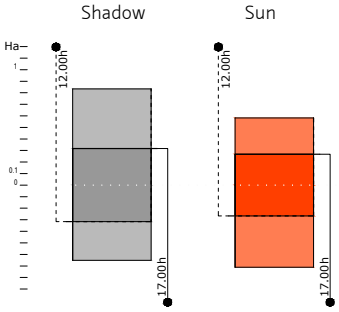
| WEATHER | JUNE | DECEMBER |
|---|---|---|
| TEMPERATURE (C) | | |
| Average | 19 | 11.2 |
| Maximum | 30.5 | 18.3 |
| Minimum | 13 | 3.5 |
| % Relative humidity | 73 | 73 |
| Wind speed (m/s) | 2.8 | 3.3 |
| Sunny hours | 260 | 115 |
| Sunlighting | 60 | 42 |
| Rainfall (l/m2) | 56 | 166 |
| RAIN DAYS | 16.5 | 42 |
| < 0,1 mm/day | 8 | 18.5 |
| < 1 mm/day | 6 | 15 |
| < 10 mm/day | 2 | 8 |
| < 30 mm/day | 0.5 | 0.5 |

* Source: Meteo Galicia 2006

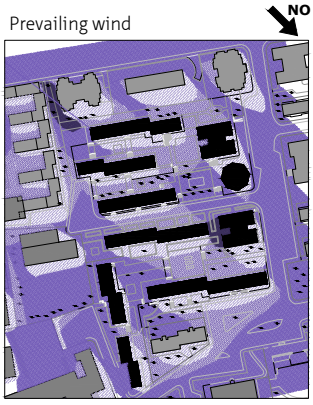
Summer solstice June 21st


Sunlighting 12:00h 17:00h Solar overlapping

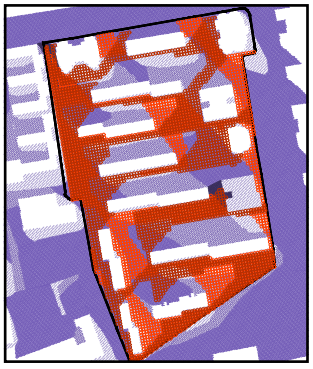


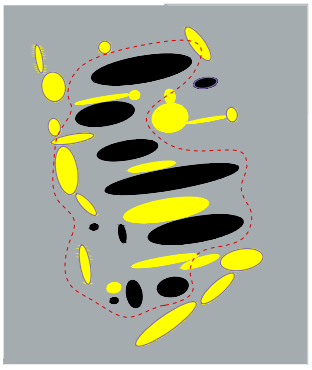


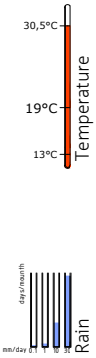

Prevailing wind




Results June 21st Wind Sun Shadow The best conditions

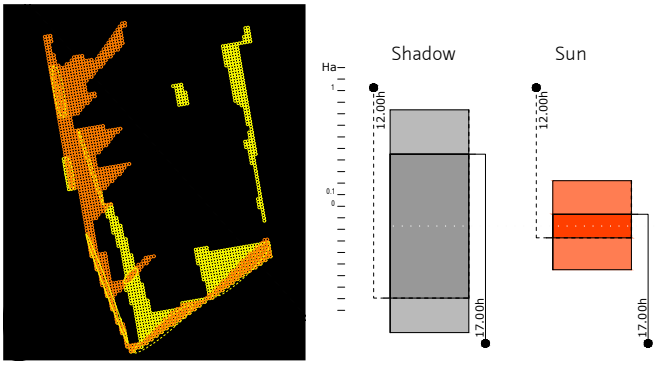




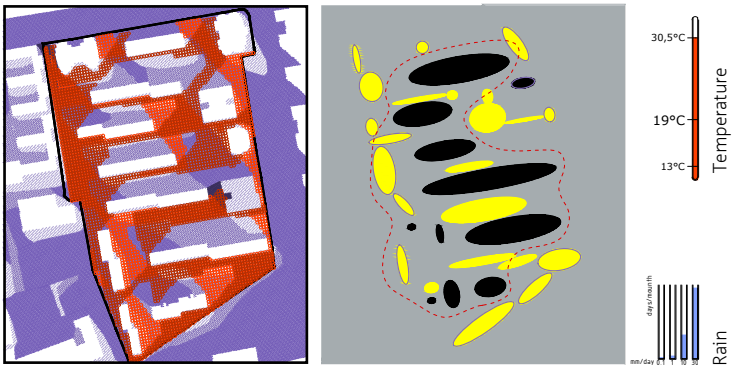


Winter solstice December 21st


Sunlighting 12:00h 17:00h Solar overlapping

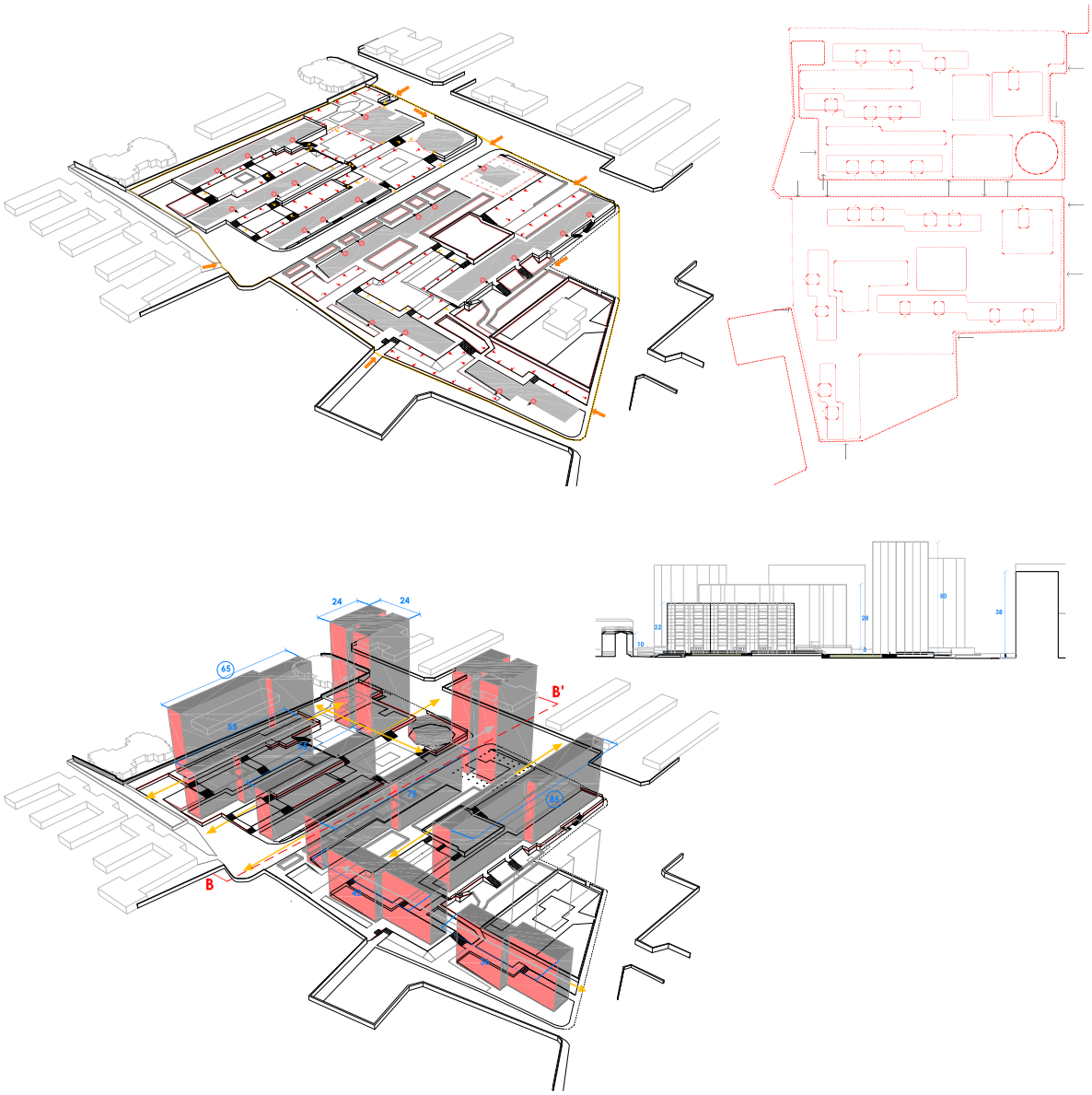


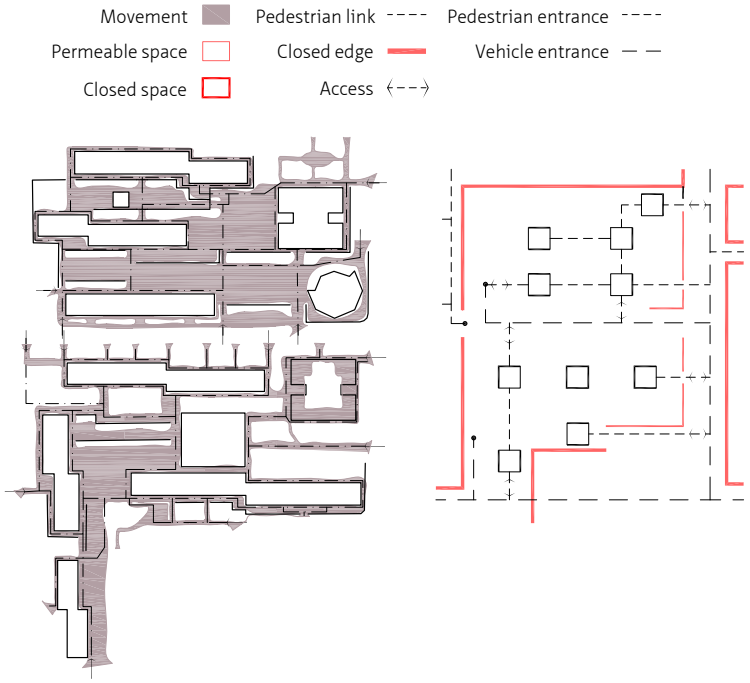

Results December 21st Wind Sun Shadow The best conditions



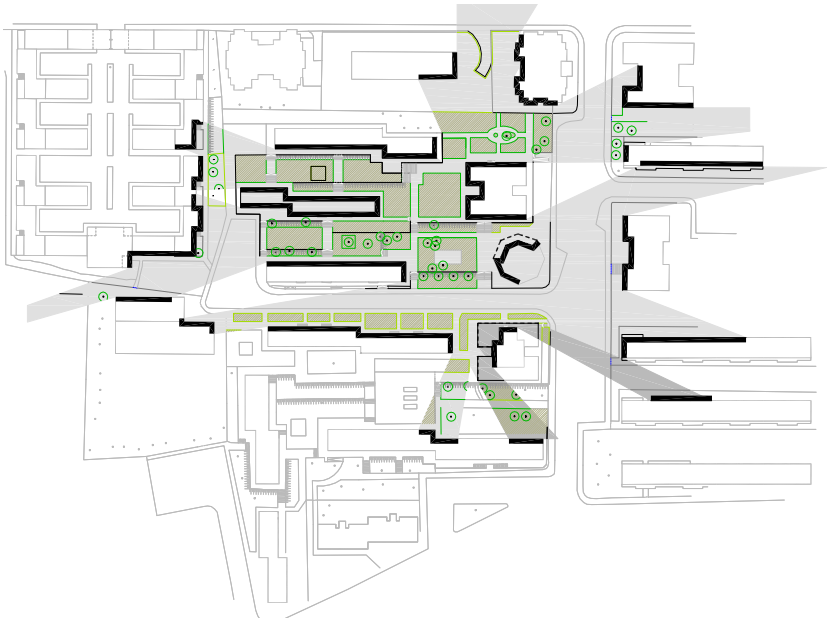
## 4.3.3 Spatial Quality / Accessibility, Permeability

Accesible
Less accesible
Accesible unusable
Inaccesible
Closed edge
Open edge
Front door acess
External acess
Private
Community
Accessible to public
Public
Access






Visual relation area



### 4.3.3 Strategies for the formation of community space. Particular Conclusions

The result of the evaluation of the planning strategies of the external space in the housing estate offers three conclusions related to the form and the planning of the open space, its functionality, and the quality of the spaces inside the estate.

**1. The large housing estates studied are usually comprised of several neighbourhood units or groups of buildings with different volumes and typologies with open community spaces for pedestrian use inside. The small housing estates are not so diverse in terms of the form and arrangement of the open space inside them, but they do share the influence of the topography and the use of terracing that produces edges with varying levels on their perimeter and between buildings.**

The neighbourhood units that comprise the majority of large estates are formed by a group of parallel linear blocks and towers delimiting open community spaces that are generally located in a central zone for pedestrian use. The unitary character of these neighbourhood units is established from the configuration of a plot of land of their own, limited by the access road network, car parks, and the open community space that define the perimeter of contact with other neighbourhood units. The separation between linear blocks and towers determines the width of the community spaces within the neighbourhood units, forming streets, rooms or transit points. These community spaces are the result of adapting the complex to the topography by means of levelled areas and/or embankments, resulting in edges with varying levels between each block and their immediate surroundings, which are resolved by means of walls, slopes, ramps, stairs, and between these and the access road to the complex. This tiering of the community space in terraces establishes a sequence of fragments that are not always properly interconnected, contributing towards the isolation of the whole, of part of the buildings or the spaces further away from the road. In the small estates, there is not so much diversity in terms of the volume and typology of the buildings, nor so much complexity between their parts, although they do share the influence of the topography and the use of tiering on terraces that leads to different levels on their perimeter and between buildings, acting as a support for the buildings and the community open space, which tends to be less varied and less fragmented, and related to the access road network.

This can be seen in neighbourhood unit nº3 of the Barrio das Flores, formed by 5-storey towers, single-family semi-detached homes, and large linear staggered blocks of between 3 and 9 floors, whose ends form access streets and a paved open community space, related to the spaces around the towers and the perimeter amenities. The staggering of the blocks and the community open space is the result of the levelled areas of the original terrain, resulting in edges with gradients on the perimeter and between each building and the platform on which they are located. This tiering of the terraced space structures

a sequence of fragments that isolates the central space of the neighbourhood unit from the rest of the estate, reinforced by the unitary character offered by the linear blocks and the access road on the edge of the plot. Caranza's second residential unit, with L-shaped blocks ranging from those with ground floors and 4 upper floors and 12 floors, and towers with ground floors and 14 upper floors, is organised into three areas that form a U-shaped space with the block. This acts as a base, absorbing the differences in height, as a result of small embankments that create differences in height between each area and around the perimeter. This perimeter edge isolates the whole and limits its connection with the surroundings, giving it a unitary character. Sector 3 of Coia has linear blocks with ground floors and 6 upper floors or ground floors and eight upper floors, and towers with ground floors and 15 upper floors, the highest of which are arranged around the perimeter with the blocks in parallel, delimiting spaces between blocks and a central green space divided into different areas. These areas are the result of small levelled spaces and embankments that create different levels between each block and their adjacent spaces, in a sequence of platforms connected by stairs and slopes that limit the connection between buildings, particularly those that are farthest away from the access road to the complex.

**2. Inside the neighbourhood units being studied, the majority is community open space comprised of a series of areas on different levels, transit areas between buildings, a few green areas, and some small amenities. This community space generally has good visual control from the community spaces of the dwellings, although its poorly-defined nature and difficulties of accessibility limit its functionality and the spatial connection between the different parts of the neighbourhood unit.**

This can be seen in neighbourhood unit no. 3 of the Barrio das Flores, with a central paved space, garage roof, crossing site and an area with commercial and social facilities which can only be accessed by pedestrians via streets, covered galleries and staircases that connect them to the towers, amenities and homes on the eastern perimeter, located on different levels between transit areas and residual green areas. At the top there is a gallery that originally had a commercial function and connects the three linear blocks with covered walkways and spaces on parts of the building's roof. The relationship between the housing and the exterior space is the same in all the blocks, with the living rooms facing south, and the bedrooms and entrances to the buildings facing north, allowing visual control over the street space and the interior spaces.

In Caranza's neighbourhood unit nº2, the community spaces are three independent areas with limited accessibility and pedestrian use, connected by stairs. Each of the spaces has a spatial organization that combines green areas and transit areas in different ways on the same level. Each area has two open sides, one corresponding

to the ground floor of the entrance to each block from which there is a view of the next area, and the other with a gallery situated beneath the entrance to the block and occupied by commercial premises that are currently unused. In the residential units, the kitchens and living rooms of the blocks and towers have views towards the interior of the neighbouring unit, offering visual control.

In Coia, the sector studied is divided into two parts with different spatial organization, functionality and accessibility. In the part situated to the north of the access road, the central area is more a space than a place of transit, due to its spaciousness, its connection with the street and the social amenities, the trees, street furniture, and the accessibility from its perimeter to all the buildings, with their entrances and community spaces allowing for greater visual control. In contrast, in the southern zone part of the central space is not accessible: it is fenced-in, sloping, and occupied by amenities, with the entrances to the buildings leading from the access roads, establishing two types of community spaces. One is of a more residual nature that functions as the interior of the block related to the kitchens, and the other as a green space in front the entrance to the buildings, with a view from the lounges.

In the small estates, the street is the element through which the community space is organized. This can be as a boulevard, a green space and an open area in parts with wider streets or inside a large block, with amenities and small shops, lounges and kitchens on the same façade that make visual control easier, as in Recimil. Or otherwise as a passage that leads into the interior of a block with exclusively residential use, lounges with views on the edge of the project or into the interior of the block, and uneven gradients in the entrances to the dwellings that make it difficult to reach them, as in María Pita.

**3. The community open space inside the neighbourhood units studied has greater spatial quality when its accessibility is not limited by fragmenting it into different levels and associating it with stairs, when it facilitates movement between different areas, and when there is connectivity with its surroundings, when it has favourable sunshine and climate protection conditions, and when it is not perceived as an enclosed space with limited permeability and under visual control, all of which detract from its spatial attractiveness.**

This can be seen in the Barrio das Flores neighbourhood unit no. 3, with a central pedestrian space with limited accessibility, which can be accessed via stairs, either from the streets with wheeled access from the linear blocks or from the single-family homes, towers and amenities on the perimeter, all of which are connected by ramps at different levels. With the exception of this central space and the raised gallery, the rest are perceived as enclosed spaces, delimited by the 140-169m longitudinal blocks with façades of

heights between 10-18m, or by small transit areas around the amenities and towers on the perimeter. The houses have favourable sunlight, climate and view conditions, with the buildings located on the sunniest slope and the linear blocks displaced in parallel serving as barriers for protection against the wind, hindering the permeability, visual control and movement between the different areas, making the space less attractive.

In Caranza's neighbour unit nº2, each of its three spaces has a direct entrance from the access road and are connected externally by stairs to each of the previous and subsequent spaces. The degree of visual control in each area is limited to a side opening, perceived as an enclosed space determined by the façades of the block 16 to 40m in height and 75m in length and the covered spaces, both by the more permeable ones, such as the open ground floor of the entrances to the residential blocks and the covered passageway of the stairs between different areas, and in the more enclosed ones, such as the porticos of the old commercial premises and the entrance to the tower. The building is oriented towards the views and receives a good amount of sunlight, but causes shaded areas in the middle of the spaces that coincide with the windy zones, while the sunniest areas are the ones that are most affected by the increased flow and turbulence of the wind, which reduces their climatic comfort.

In Coia, the sector studied is divided into two parts with different accessibility, permeability and connectivity. The central space situated to the north is accessible from the access road around the social amenities and by means of a ramp around the tower building. The rest of the space is accessed by stairs that connect green areas and spaces separated by walls and slopes at different heights, between 1.5 and 2.5m, associated with the dwellings with entrances via sidewalks from the access road or on the same level as the central space. The degree of visual control, permeability, connectivity and climatic comfort of the central space is greater than in the spaces between blocks, due to the enclosed nature of their façades, the directionality that determines the length and height of the building, less sunlight and a greater proportion of shade. This enclosed and residual character can be seen more clearly in the interior space of the block in the southern zone, delimited by linear blocks measuring between 75 and 85m in length and 22-28m in height, with limited accessibility and connectivity.

In the small estates, the open community space is connected to the street, clearly in the case of Recimil, where it has good accessibility, with the spaces connected to walkways between blocks that are perpendicular to the streets and boulevards that facilitate internal movement. However, in María Pita a large part of the space is undefined, with uneven areas associated with staircases that make it difficult to reach the houses. Both have favourable sunlight conditions, although a large part of the interior space is perceived as enclosed and under visual control, which reduces its spatial appeal.

## § 4.4 Chapter Conclusions

This chapter has shown that the space between buildings in the housing estates conditions their current configuration and the urban fabric of their surroundings. Therefore, the final conclusion that corresponds to what was observed in the chapter can be grouped into these two arguments based on the particular conclusions, as follows:

**1. The distribution of the built elements and open spaces of the housing estate and its surroundings affects their spatial cohesion.**

- The supporting structure of the current urban form of the housing estates and their surroundings is formed by different types of layouts, buildings and degrees of privacy in the open space, with discontinuities in the interior and on the edge of the estate, while in the urban fabric of its surroundings they allow for greater spatial coordination and cohesion.
- Half of the open space in the surroundings of the housing estate and on its edge is private, comprised of plots without buildings, or plots with isolated or low-density constructions, where the open space predominates over the built space, which impedes its spatial cohesion.
- In the surroundings of the housing estates, spatial cohesion improves when density, spatial continuity and compactness are increased, as provided that they are accompanied by a configuration of the urban form that allows for integration between its different parts.
- The surface occupied by the open spaces in the housing estates is not uniform: the different arrangement of the built elements and of the public and private space modifies the continuity and connection between its parts, obtaining a better integration in spaces with a mixture of typologies, high density, and delimited open community space.
- The public space in the housing estate and its surroundings is scarce: generally it is located on the edges of the estate, making it possible to interconnect some of its parts to integrate them with the buildings, which has helped to improve the spatial cohesion with its surroundings.
- Most of the community space of the urban fabric around the housing estates is located in its interior, comprised of unoccupied open spaces within each plot or between blocks. Their undefined character limits the integration of the space between buildings.
- Inside the large housing estates, where there is a range of amenities, these encourage the use of the space and movement from the different parts of the estate to this area, improving connectivity, although not to a sufficient degree to

overcome the lack of integration between parts of the housing estate, on its edge and with its surroundings, which prevents its spatial cohesion..

**2. The configuration of the space between buildings in the housing estate and its surroundings influences the quality of the spaces for social interaction.**

- The private open space in the environment of the estate and on its edge is fragmented, with extensive and irregular boundaries, which hinder its spatial cohesion.
- Inside the housing estate, the public open space is scarce, and serves to structure parts of the estate and varies between linear and central forms. In the linear form it serves as an internal connection for the estate or as a crossing site and space between parallel blocks. In the central form, it constitutes the space linked to a neighbourhood unit or a large space on a neighbourhood scale, where if open space predominates over the buildings, it can be perceived as residual.
- Inside the housing estates, there are open spaces that were planned but not created, which are mainly community in nature, with a fragmented spatial character, diffuse boundaries, confused ownership, and with problems of connection with the buildings and road traffic, which limits the integration of the space between buildings and its connection with the estate as a whole.
- The large housing estates are made up of neighbourhood units or groups of buildings with different volumes and typologies, most of which have open community space for pedestrian use inside them. The small estates are not so diverse in the form and arrangement of the open space inside. But both types share the influence of the topography and the use of terracing, which leads to edges with different gradients on their perimeter and between buildings, hindering their integration and limiting their spatial cohesion.
- Inside the neighbourhood units, most of the open community space consists of a series of areas at different levels, passageways between the buildings, few green areas and only a few amenities. This community space generally has good visual control from the common spaces of the housing, but its poorly defined character and the difficulties of accessibility limit its functionality and the spatial connection between the different parts of the neighbourhood unit.
- The community open space inside the neighbourhood units has a greater spatial quality when its accessibility is not limited, fragmenting it into different levels and connecting it with stairs, when it facilitates movement between different areas and there is connectivity with its surroundings, when it receives a sufficient amount of sunlight and offers protection from the weather, and when it is not perceived as a confined space with limited permeability and under visual control, which detracts from its spatial attraction.

# 5 The space of opportunity

# 5 The space of opportunity

## Introduction

The previous chapters have explained the process and consequences of the spatial transformation of Galician cities from the construction of public housing estates to their current configuration. In order to complete the account of how they influence the transformation of the city and its open spaces, this chapter explores at the possibilities for improvement.

The chapter is divided into four sections, the first of which deals with the criteria for intervention in urban areas, in order to observe the degree to which the improvement of open spaces is present in the concepts, institutional framework and practices that promote urban regeneration. Studying how and where European urban regeneration policies are applied reveals the aspects in which they have intervened, which spaces of opportunity have been identified, how they have been dealt with, and the degree of improvement obtained in their operability. In the second section, the current conditions of the case studies of the thesis are observed and compared in a summary graph, which helps to detect constraints and to identify spaces of opportunity where action can be taken to solve them. In the third section, the spaces of opportunity in the case studies, within the housing estates, on its edge and in its surroundings, are determined, listing the main constraints to be solved and the potentialities that would allow their regeneration. The fourth section defines urban regeneration guidelines for housing estates, a framework for discussion from which to begin to establish intervention proposals, influenced by the spatial values that should be considered by public policies and their financing (managerial actions) and by the decision-making of those who implement or manage projects (operability).

As part of the main research question (p.58) in relation to the recommendations that contribute to a better cohesion of the spaces integrated in the public project, this chapter shares the parameters used in the analysis of the case studies, answering the question of what conclusions can be drawn from the comparison of the case studies, which spaces of opportunity are found in the case studies, and what is the framework for discussion from where to start establishing intervention proposals for the physical regeneration of the housing estate based on the improvement of the spaces of opportunity.

### Why is this study necessary as a part of the thesis?

In this thesis, the study and application of intervention criteria in housing estates is relevant, due to their importance in the regeneration of the current urban structure. For this reason it is essential to evaluate their formative potential in the urban fabric at the scale of the estate and in the city, because it allows us to observe the improvement of the relationship between private, community and public open spaces from their components.

Establishing recommendations that help to achieve a better cohesion of the open spaces in the housing estate, on its edge and in the city is fundamental for making proposals for its regeneration, helping to think about how the formal and functional transformation of the built elements and open spaces allows the space to be reorganised and activated. This is done by observing how this transformation takes place and its possible improvement in current urban regeneration projects in Europe, reviewing its structuring value, recognising in them and in the case studies the spaces of opportunity upon which to act. Finally, to reflect in guidelines for intervention in the estates the framework for discussion of the proposals, articulating the physical and temporal diversity presented in previous chapters, which in this chapter is revealed in terms of its operability in the projects of the Galician case, and which by extension should be useful in the cases of intermediate cities with a rural base and slow growth such as those in Galicia (p.40).

### What will I be able to see in the spaces of opportunity?

In the introduction to the first chapter (p.37), spaces of opportunity have been defined as those with a certain lack of definition, vacant and residual spaces lacking spatial coherence, located within the housing estate, on its edge and in relation to the city. This thesis considers that it is in these spaces where the possibility exists today to correct the physical obsolescence of the estate, taking into account that intervening in them can bring about a change of model in the way the city is built, by valuing rehabilitation and urban recycling as opposed to continuous growth and extensive land occupation.

The spaces of opportunity in this chapter are defined on the basis of the formal, functional and spatial quality of the case studies at each scale, identifying limitations and potential spaces within the housing estate, at its edge and in its surroundings, where action can be taken to improve its spatial cohesion. They constitute a fundamental component to be taken into account in urban regeneration policies and projects, for repairing physical elements (urban, architectural and environmental), in which the improvement of open spaces is a condition that can favour the correct evolution of an urban area, and are a decisive accompaniment to the social and economic aspects in order to acquire an integral perspective of the interventions.

### What am I going to be able to see in the guidelines for the regeneration of estates?

In the introduction to the first chapter (p.38), guidelines for the regeneration of housing estates were defined as a framework for discussion from which to begin to establish proposals for intervention. In this thesis these proposals are presented as hypotheses for the improvement of the physical aspects of the estate and its surroundings: they envision possibilities for the future in the spaces of opportunity that are found at all scales, and represent an attempt to represent a future transformation of the space in its permanent adaptation. They are not a manual or a programme to be applied independently to replace a design process that should be participatory, but rather an aid to the decision-making process in the design, planning and management over time of an urban regeneration project. The guidelines contain the area of intervention, the spatial configuration, the managerial actions and the operability of the intervention proposal in each opportunity space, which makes it possible to appreciate how they are implemented in the framework of public policy, recognising the spatial values that it must consider and the actors that must validate them, with the aim of maintaining the continuity of the urban regeneration project over time and at all scales, to achieve the improvement of open spaces and spatial cohesion in the regeneration of the estate.

### What is sought in the final summary of the analysis? (methodology)

In the summary of the analysis of the case studies, the current conditions of the estate and its parts are summarised on four different scales, represented in a graph with a centre and two rings, which helps to detect constraints and identify spaces of opportunity where action can be taken to resolve them. The first scale is located in the centre of the diagram, representing the value of the parameters that configure the form, functionality and quality of the open spaces inside the small estates and in the neighbourhood units of the large estates studied. These parameters are used to assess parts of the estate and not the whole, because these neighbourhood units usually have different characteristics from each other, bringing together the specific functions of the estate in relation to the open spaces and its spatial connections. Meanwhile, the spaces that serve as a nexus to the neighbourhood units are explained by the conditions of their supporting structure and the arrangement of the built elements, as well as those of the estate's edge and surroundings. Consequently, the second scale represents the estate as a whole and is located in the ring around the centre of the graph. The third ring includes the scale of the edge in outlines and that of the surroundings of the estate.

The values of each parameter represented in the summary graph are obtained from the analyses in chapter 4, taking the data calculated there and completing them in the rest of the scales in a table, in order to obtain a representation of the current state of each case, in the neighbourhood unit, within the estate, at its edge and in its surroundings. The morphological value of the past influences the value of the current status, which is why it is recognised in previous chapters, and although it is not reflected as a measure in the diagram, it is contained in its spatial differences, making it possible to explain those legacies that now limit or facilitate an urban regeneration.

## § 5.1 Intervention practices in obsolete housing estates

This section studies: 1/ the value of spatial cohesion in urban regeneration policies in Europe, 2/ the implementation of European urban regeneration policies, and 3/ intervention practices in obsolete housing estates, in order to ascertain which spaces of opportunity are recognised in their implementation and how they influence the regeneration of housing estates.

### 5.1.1 What is this section about?

In order to study intervention practices in obsolete housing estates it is necessary 1/ to observe the European urban regeneration policy, considering it as a general framework in which urban development is favoured in the different EU countries, 2/ to observe the main national urban regeneration policies (France, UK, Netherlands), considering them as a specific framework that in its application offers different types of physical intervention in open spaces (private, community and public), which encompasses the spaces of opportunity of housing estates and neighbourhoods with public housing. This broadens and facilitates the possibility of comparison with the Spanish cases and allows for 3/ the creation of a particular framework within which to recognise the value of intervention in spaces of opportunity and to establish the results in the urban regeneration of housing estates.

Studying the value of spatial cohesion in urban regeneration policies in Europe reveals how the use of public space is determined as a structuring element to achieve spatial cohesion. This makes it possible to identify the aspects on which urban regeneration policies have intervened, which spaces of opportunity have been identified, and how they have been treated.

By studying the implementation of urban regeneration policies in different European countries it is possible to see 1/ which managerial actions are used, i.e. what is the influence of the spatial values considered in public policies on the design of public space and spatial cohesion, 2/ what their operability is like, i.e. what is the consequence of the decision making processes of those who implement or manage the projects (governments, municipalities, neighbours), and 3/ the result of the spatial configuration, i.e. what is the outcome of the managerial actions and the operability in the project for private, community and public open spaces, in itself, in relation to its edges and to the city. This makes it possible to observe how the application of urban regeneration policies influences the spaces of opportunity, in order to know when and how their results are positive or negative.

By studying the intervention practices in obsolete housing estates in Spain, we observe the result of managerial actions and the operability in the project of public, community and private open spaces, in itself, in relation to its edges and in the city. This makes it possible to ascertain the aspects on which urban regeneration policies intervene, which spaces of opportunity have been identified and how they have been addressed. The aim is to observe to what extent the improvement of open spaces and its capacity to favour articulation, integration and spatial cohesion is present in the concepts, in the institutional framework that promotes urban regeneration policy and in the projects that have been carried out.

### 5.1.2 What is the role of this section in the chapter?

In this thesis, the study of urban regeneration policies is important because their application is necessary for the improvement of obsolete housing estates in intermediate cities of slow growth such as those in Galicia. Studying in this section the result of managerial actions and operability of the main urban regeneration policies in different European countries and over time, allows us to establish which intervention criteria prevail in their application, what they contribute to the improvement of estates, which places are identified as spaces of opportunity and how they have been addressed. This enriches and helps in the identification of the spaces of opportunity of the case studies of the thesis and in the definition of the spatial and planning recommendations for their improvement, which are developed throughout this chapter.

Managerial actions and the operability of urban regeneration policies are studied in France, the United Kingdom and the Netherlands as the first European countries with this type of public policy, observing how, over time, the different policies consider open spaces and spatial cohesion on the scale of the estate and the city, who executes or manages the projects, what is the consequence of their decisions, and what is the result that is implemented in the projects. This is accompanied by representative examples that make it possible to identify the spaces of opportunity on which action is taken, and how articulation, integration and spatial cohesion are achieved or limited, within the estate, on its edge, and in relation to the city.

This forms a general framework in which it can be seen that in the application of the different policies, processes of 1/ renovation, 2/ rehabilitation and 3/ recycling have generally been used, from which to observe managerial actions and the operability of urban regeneration policies in Spain over time, with the specific aspects provided at the regional level accompanied by representative examples of Madrid and Barcelona, where the greatest number of cases and the most singular have occurred.

### 5.1.3 Spatial cohesion as a determining factor in urban regeneration policy

The European Union promotes the concept of Integrated Urban Regeneration with the *Leipzig Charter* (2007), recommending greater use of policies that favour integrated urban development and that pay special attention to less favoured neighbourhoods within the overall context of the city. Under the influence of the Europe 2020 strategy to use the potential of European cities to overcome the economic crisis, policies for the recovery of the built assets and the existing city are established as a priority, and the *Toledo Declaration* (2010) promotes the idea of the city as a functional whole and its parts as components of the urban organism, defining as integrated urban regeneration the processes that include the physical actions developed in this thesis (on public space and building), social and economic, whose objective is to develop and balance the complexity and diversity of social, productive and urban structures, promoting greater environmental eco-efficiency, and where the improvement of open spaces and its urban form are fundamental factors in achieving spatial cohesion in the city and between its parts. This balanced, sustainable and integrated approach to urban development is developed with the *Pact of Amsterdam* (2016) and the subsequent creation of the *European Urban Agency*.

This thesis shares this integral approach, focused on the study of open spaces, taking into account that public space is a structuring element of the urban fabric and a determining factor in the process of spatial cohesion, as it favours accessibility, continuity and permeability within the city and between its parts. Therefore, in the improvement of the housing estates studied, public space should be understood as a network of public spaces (Pinto & Remesar 2015, p.10), as a set of articulated elements and not as a sum of isolated spaces.

While there has been a great diversity in the methods of intervention, financing, regulation, competition and public-private actors involved in the regeneration projects of obsolete neighbourhoods in Europe (Álvarez & Roch 2010, p. 53), in general all of them have acted mainly on physical aspects and in an isolated manner, emphasising intervention in open spaces, but also in buildings, housing and/or infrastructure, without integrating the whole problem on the different scales of the neighbourhood, in the interior, on its edge, in its surroundings and in the city. Therefore, these policies and their implementation should consider public space as the agent that promotes spatial cohesion, understood as a basic concept guiding urban interventions in comprehensive urban regeneration projects. They should also promote integrated regeneration as a principle of overall urban development strategies, taking it into account in policies that encompass the planning of the city as a whole, in order to improve the overall efficiency of the urban system and the integration of the different parts of the city into the urban fabric.

### 5.1.4 Urban regeneration. Renewal, rehabilitation and recycling

In Europe, the concept of urban regeneration is framed in the debate between transformation and conservation of the inherited city, where until the last quarter of the 20th century it was mainly carried out through renovation and reconstruction actions oriented towards making real estate profits, encompassing the replacement, adaptation and transformation of existing urban fabrics, obtaining a physical improvement generally accompanied by gentrification, due to the replacement of the resident population by one of greater resources (Castrillo et al. 2014, p.133), which leads to a loss of diversity, social mix, value of the inherited urban structure and the opportunity to improve the spatial cohesion of neighbourhoods based on the existing fabric, with articulation between its parts and with its surroundings.

The discussion on how to intervene in obsolete housing estates began to take shape in France, the United Kingdom and the Netherlands in the 1970s, with public policies encompassed under the term 'urban renewal'. This is a term used to group together interventions in central areas (historical centres or traditional city districts), as well as those interventions for social improvement and housing in disadvantaged areas, of which the housing estates studied in this thesis form a part. The different policies implemented since then have generally used 1/ renovation, 2/ rehabilitation and 3/ recycling processes separately or in combination, producing different results at different scales depending on the country and the particular conditions of each case, which are of interest in this study in order to observe the value given to public space as an agent that promotes spatial cohesion.

**RENOVATION**. Urban renovation processes result in the removal of most of the existing buildings and their replacement by new ones (Moya & Díez de Pablo 2013, p.119). They are usually carried out when the recovery of the intervened area is not viable, incorporating new uses. This process usually includes actions in the public space of remodelling the urbanisation, which implies maintaining or transforming the urban structure, making it necessary to adapt the public space to the new situation.

**REHABILITATION**. Urban rehabilitation processes result in actions of conservation, extension and refurbishment of buildings, and reuse and redevelopment of public spaces (Cervero 2016, p.133). This can also include specific actions consisting of total or partial demolition, renovation or construction of new buildings, provided that this does not substantially alter the character of the whole. This type of intervention implies a greater conservation of the building and the urban structure of the intervened area, but not necessarily of its material integrity, which may be transformed or altered depending on the criterion according to which the intervention is carried out.

**RECYCLING**. The objective of a recycling intervention is to replace "unplanned obsolescence" with "planned regeneration" (Chacón 2012, p.92), through the requalification of open spaces and buildings. This is done by substituting part of its components to be continuously transformed and readapted to different needs, introducing a new life cycle through the improvement of the habitability and comfort conditions of the dwellings, the increased flexibility of their interior programming, the incorporation of a greater diversity of exterior spaces and the renewal of the image of the whole, using identity as an activator of recycling. This type of intervention entails the conservation of the building and the urban structure of the intervened area by reorganising its use.

### 5.1.4.1 Urban regeneration in France. Renovation, "residentialisation" and recycling

The first public urban regeneration policies in France did not define the way to intervene in open spaces, but combined physical and social actions, particularly in estates ("grands ensembles") built between the 1950s and 1970s with problems of physical degradation, unemployment and delinquency. In their application, government and municipalities focused on correcting deficiencies in housing and lack of facilities, with the *"Habitat et vie sociale"* (HVS) programme of 1977 and the *"Développement social des quartiers"* (DSQ) programme of 1981, in which the lack of definition of regulations left the solution to the integration and improvement of public-community space and its relationship with private space in the hands of designers, restricting it to the estate, resulting in a lack of articulation between its parts and with its surroundings.

FIG. 5.1 *ZUP Montreynaud, 1966-2012*

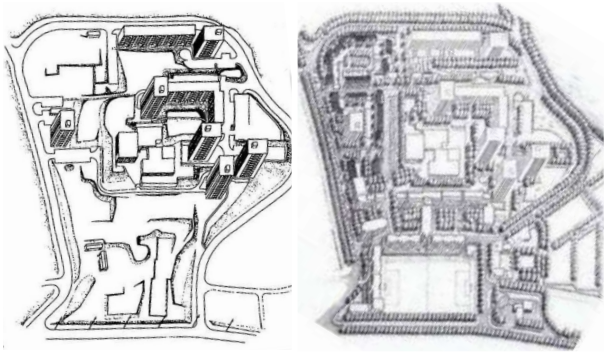


FIG. 5.2 *Saint Saëns,1979. Before and after the renovation project*

This can be seen in the Saint-Saëns neighbourhood (ZUP Montreynaud) in Saint Étienne , renovated by Devillers and Chemetov in 1982, a unique case of improvement and reclassification of public spaces within the estate through a new layout with streets, squares, facilities and new residential typologies. The interior open spaces of

the estate are recognised as spaces of opportunity, in particular the community and public open spaces, which are developed by defining their use and delimiting them through a new urban grid that maintains the existing housing and complements it with new residential typologies. By limiting the intervention to the interior of the estate, no consideration is given to the spaces of opportunity on its edge, which are still made up of interstitial spaces related to the road, spaces with rural areas and vacant spaces between the different parts of the estate and with other neighbourhoods. Therefore, the possibility of improving connectivity and accessibility on a neighbourhood and city scale is lost, maintaining the estate's isolated character and lack of spatial cohesion.

Since then, the most common approach in French urban regeneration policy has been the renovation of neighbourhoods with the demolition of part or all of the buildings and the rehousing of their residents, on the understanding that destruction ends the problem when what it achieves is to move it from its original location or keep it in the same place (Donzelot 2012, pp.228-229), losing the opportunity to improve the spatial cohesion of neighbourhoods based on the existing fabric, with the interconnection between its parts and its environment.

From policies focused on the neighbourhood scale of the 1980s and early 1990s, the mid-1990s saw a shift to policies that sought to address the problem of run-down neighbourhoods at the urban scale, through socio-economic improvements and connectivity with the city, using public transport to correct their isolation, and at the neighbourhood scale by improving the management of services, renovating buildings and open spaces through demolition. These city policies (*"politique de la Ville"*) were first implemented through city contracts (Cdv) with city councils in 1989, through a programme of major city projects (GVP) and urban regeneration operations (ORU), in which the treatment of open spaces in the estates is considered as an improvement of their aesthetic aspect without defining their structuring role, which leaves it up to the town councils to resolve the interconnection between the neighbourhood and the city, and up to the planners to resolve the open spaces inside the estates and with their edge.

This can be seen in the Teisseire district of Grenoble, one of the first so-called *"residentialisation"* projects (Cinget et al. 2009, p. 8) carried out by Panerai and Soulier in 1997-2010) which seeks to "abolish the specificity of the large residential blocks, attenuate the differences with the neighbouring districts and rediscover the banal interplay of the urban fabric" (Panerai 2002, p. 58), i.e. to demolish and physically transform the neighbourhood with the intention of enhancing its image by bringing it closer to that of the surrounding neighbourhoods: re-zoning the whole, giving continuity to the urban fabric at its edge, urbanising the open spaces, incorporating a new interior fabric based on streets and squares, and renovating a large part of the buildings, demolishing, building and rehabilitating part of its housing and facilities

to include greater diversity of typologies, uses and programmes. The process also involves recognising as spaces of opportunity the estate's interior open spaces, the public, community and private open spaces, which are dealt with by eliminating their lack of definition, adding a use that improves their spatial quality and articulates them with the different parts of the neighbourhood and on its edge. To achieve this, a new urban grid is incorporated, which modifies the unity of the whole, fragmenting the space by delimiting it with streets, squares and new buildings, new typologies that form residential units with part of the existing buildings. Despite the demolition of a large proportion of the housing, spaces of opportunity are recognised in those that remain, improving their construction and typology, redistributing the interior surface area, increasing it by incorporating new exterior volumes or gardens on the ground floor. The spaces of opportunity on the edge of the estate are also considered, making use of interstitial spaces related to the road and vacant spaces between the different parts of the estate and with other neighbourhoods, thereby improving connectivity, accessibility and spatial cohesion on a neighbourhood scale. Supported by the incorporation of the new public space of the estate into the municipal green infrastructure strategy, all that remains is to have incorporated urban regeneration into the municipal master plan in order to recognise and act on spaces of opportunity at the city scale, interstitial spaces between urban sections, fragments and fabrics that would improve spatial cohesion at the urban scale.

FIG. 5.3 *Green infraestructure, Grenoble-Teisseire*

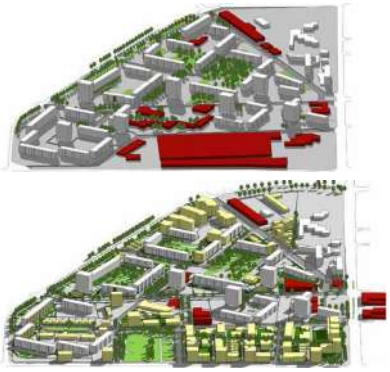


FIG. 5.4 *Teisseire, before and after the renovation project*

From then on, the scope of intervention of city policies concentrated on housing estates from the 1950s-70s and on obsolete neighbourhoods with socio-economic problems, categorised according to the 1995 land law (*Loi Pasqua*) as Sensitive Urban Zones (ZUS), divided into urban re-dynamisation zones (ZRU) and urban free zones (ZFU) covering one or more city councils. The city's policy strategy was revised in 2003 with the new urban renewal law (*Loi Borloo*), which restored the dialogue with the city council and made the integrated approach more flexible. To this end, the National Urban Renewal Programme PNRU 2003-2014 was instituted, which aimed to achieve social

diversity and sustainable development in disadvantaged areas and/or neighbourhoods through urban renewal, rehabilitation and residentialisation, with the improvement of the quality of public space; the restructuring or demolition/reconstruction of existing housing; the rehabilitation, demolition and construction of facilities, and the reorganisation of spaces for economic and commercial activities (Aparicio 2011, pp.95-96). The PNRU continues in the current New National Urban Renewal Programme NPNRU 2014-2024, with a focus on social cohesion and employment through the physical improvement of 200 neighbourhoods, in which public space is considered as a support for the intervention, without defining its structuring character and its interconnection with the interior of the estates, with their edge, and the city.

To manage the PNRU and NPNRU projects, the Agence Nationale pour la Rénovation Urbaine (ANRU) was created in 2003. According to its data as of 15 December 2014, the PNRU 2003-2014 intervened in 490 neighbourhoods, renovating 340,000 homes and building 141,000 new public-private homes. From 2004 to 2018, 42.5% of spending was on new construction, 7.4% on demolition, 13.1% on refurbishment and 4.3% on residentialisation. This gives an idea of the magnitude of the demolition, expenditure, and the loss in terms of the number of dwellings and assets that is involved in addressing the obsolescence of housing estates mainly through demolition and reconstruction, leaving rehabilitation and residentialisation as a complement in a context of growing demand for housing. In many of these projects, the use of open spaces is defined, delimiting community open spaces to make it private, in order to improve the safety of residents and attract other social classes with the aim of achieving social mixing (Chédiac 2009, pp.12-14). The result is often a new type of urban fabric without large residential units and with privacy in community space, as the current permeability between public and community space is seen as an obstacle to its appropriation by neighbours. In contrast to demolition and transformation, there are fewer projects that seek to enhance the value of the existing fabric and its construction through rehabilitation and recycling.

FIG. 5.5 *Grand Parc Bordeaux, before and after the renovation project*

What can be observed in the Grand Parc de Bordeaux (1960) built by the architects Lacaton&Vassal and Druot between 2011-16, in which they change the way of intervening in the estates, associating renovation with reuse instead of destruction, seeking 'Never to demolish, never to subtract or replace, but always to add, transform and reuse' (Lacaton et al. 2007, p.10), taking into account the spaces of opportunity at the scale of the building to improve habitability (by extending the living space, varying the residential programme with open plan and including community uses), demonstrates how the budget needed for demolition can be better spent on the potential of existing spaces, with the improvement, conservation and long-term maintenance of the dwellings and their immediate surroundings. By focusing the intervention solely on the building, the spaces of opportunity at other scales, those existing within the estate, on its edge and on an urban scale, are not recognised and no action is taken to deal with them. Today, they are still made up of open spaces of undefined use, interstitial spaces related to the road network, vacant spaces between the estate and other neighbourhoods, spaces between fragments and urban fabrics. The possibility of improving connectivity and accessibility on a neighbourhood and city scale is lost, maintaining the estate's isolated character and lack of spatial cohesion.

### 5.1.4.2 Urban regeneration in the UK. Renovation and demolition

In the 1980s, British urban regeneration policy encouraged intervention in run-down neighbourhoods through the renovation and replacement of buildings, without defining how to intervene in the open spaces. In its implementation, the government centralised the decision-making process and reduced the power of the municipalities through the Urban Development Corporations, which managed the land and its planning. They were supported by Urban regeneration grants that were offered directly to private developers without the need for municipal approval of the project (Beswick & Tsenkova 2002, pp.12-13), with the aim of involving the private sector in urban development through a process of privatisation of local public services (van der Graaf 2009, p.142), including the sale of social housing stock. This process, which made the planning of projects more flexible, left many of the decisions regarding the development and privatisation of public space in private hands and for the benefit of economic profitability, ignoring the connectivity between the renovated neighbourhoods and their surroundings, which hindered their integration and spatial cohesion.

This can be seen in the process of redevelopment of the former London Docklands, managed by the *London Docklands Development Corporation* between 1981-1998. This was an acknowledged economic success story, where business development and the creation of exclusive residential areas took precedence over the needs of local communities, the redevelopment of their neighbourhoods and the construction of affordable housing. This was particularly the case in the area of Canary Wharf, with an

urban development focused on building and a privatised public space (Fournière 2014, p.9) understood as a series of disconnected fragments, neither in its interior nor on its edge, which hindered integration with its surroundings and with the rest of the city. The project did not recognise the spaces of opportunity, such as those existing on the scale of the original building, in relation to the neighbourhoods on its edge and on an urban scale, still today made up of open spaces of undefined use, interstitial spaces related to the road network, vacant spaces on its edge, and with other neighbourhoods. The result was the loss of the possibility of improving connectivity and accessibility on a neighbourhood scale.

FIG. 5.6 *Canary Wharf (Isle of Dogs), London 1980 - 2008*


FIG. 5.7 *Coin street, London 1984 - 2008*

An alternative case to the state policy of this period is that of Coin Street on London's South Bank, managed by *Coin Street Community Builders*, a neighbourhood company which, since its creation in 1984, has promoted the renewal of the area through connectivity with its surroundings and with the city, opening the neighbourhood to the river through new public spaces that interconnect its different parts (Aparicio & Di Nani 2011, pp.67-68) and promoting the construction of new housing through the *Coin Street Secondary Housing Cooperative*, created in 1987. The project recognises part of the building and the housing estate's interior open spaces as spaces of opportunity. The community, public and private open spaces, whose use has been

redefined by reorganising part of the urban fabric with the creation of a central park that interconnects the space inside the neighbourhood, with new residential typologies built in vacant spaces and the recycling of old industrial buildings for housing and facilities, has allowed for greater integration of the different parts of the neighbourhood and improved spatial quality. By limiting the intervention to the interior of the neighbourhood, the spaces of opportunity at its edge and with its surroundings are not considered, which are still made up of interstitial spaces related to the road network, vacant spaces between the different parts of the neighbourhood and with other neighbourhoods, losing the possibility of improving its connectivity and accessibility on a neighbourhood scale and with the city. It would also be necessary to recognise and act on spaces of opportunity on a city scale, interstitial spaces between urban pieces, fragments and fabrics that would improve spatial cohesion on an urban scale, for which it would be necessary to incorporate urban regeneration projects in the municipal master plan.

From 1990 onwards, the central government addressed the simplification and decentralisation of the urban regeneration process by making municipalities compete for resources, serving as facilitators of public funding (Couch et al. 2011, p.35). The resources invested with the objective of social improvement of the neighbourhoods continued to maintain as a mode of intervention their renovation based on the demolition of a large proportion of the buildings and the redevelopment of the open spaces, which failed to take the opportunity to improve the spatial cohesion of the neighbourhoods based on the existing fabric, with the interconnection between its parts and with its surroundings (Couch et al. 2011, p.35).

This type of intervention did not change after 1997 with the arrival of the Labour government, despite the major changes it introduced in the policy of urban regeneration in run-down neighbourhoods, understanding housing as a social good and public space as a well-designed and green place from where to improve the quality of life and liveability of a neighbourhood (ODPM 2003, p.5). These policies consisted of the "*New Deal for Communities*" Programme 1998-2010, the "*National Neighbourhood Renewal Strategy*" (SEU, 2001) or the "*Sustainable Communities Plan*" (ODPM 2003), supported by reports on the conditions of the cities and how to improve them, such as the "*Task Force on Urban Renaissance*" by Richard Rogers (DETR, 1999) and the White paper "*Our towns and cities: the future delivering an urban renaissance*" in 2000. Control was handed back to local councils over management and planning, increasing investments, counting on citizen participation, and setting the objective of socio-economic improvement supported by physical renovation, with the aim of the regenerated neighbourhoods becoming sustainable communities.

With this concern to make the neighbourhoods a safe and healthy environment, local authorities and neighbours tended to identify open spaces and housing as a problem,

adopting as a solution their destruction and the construction of a new urban fabric based on the existing ones in the surroundings, with streets and medium-low density buildings with gardens, leaving in the hands of the designer the possibility of achieving greater coordination and spatial continuity in the interior and on the edge of the projects, without spatial redevelopment and the elimination of poverty through social mixing being the solution to reducing inequality (Arbaci & Rae 2013, p.476).

FIG. 5.8 *Holly Street estate, London 1988-2020. Before and after the demolition*

This process can be seen in renovation projects such as the Holly Street estate ("The snake"), which was completely demolished in 1988 and replaced with an urban layout consisting of medium-density housing blocks that was completed in 2011, according to the master plan of Levitt Berstein Architects, which reinterpreted the old Victorian pattern without maintaining the continuity with its surroundings, privatising community spaces, with the street and an interior square as the main open spaces for community use. Today its urban pattern resembles that of its surroundings; the coordination between spaces in its interior has improved, but the social problems remain (Fox 2002). In this type of intervention, where demolition predominates, the spaces of opportunity are not recognised at any of its scales, neither in the housing, nor in the interior of the neighbourhood, nor at its edge, losing built assets and the possibility of its improvement through rehabilitation and recycling.

The processes of demolition, renovation and new construction intensified between 2002 and 2011 with the *Housing Market Renewal Initiative* (HMRI) programme, and ended with the arrival of the Conservative government in 2009 and the reduction in funding to housing associations for neighbourhood renovation. One alternative to renovation with demolition was the renovation of Byker, built in Newcastle upon Tyne (1969-1982) according to a design by Ralph Erskine. This was declared a cultural asset (Grade II) in 2007, which has influenced its protection. In 2012 its ownership was transferred from the state to the Byker Community Trust, which, with the participation of neighbours and the support of the municipality, Homes and Communities Agency,

and English Heritage, developed a plan to improve the quality of its housing, services, and open spaces. The buildings were recognised as spaces of opportunity, involving the rehabilitation of the existing housing, and the estate's interior open spaces, in particular the community and public open spaces, which was improved by enhancing its use and the coordination and continuity between its parts. By restricting the intervention to the interior of the estate, the spaces of opportunity on its edge were not considered, and are still today comprised of interstitial spaces related to the road network, industrial zones and vacant spaces. As a result, the possibility of improving connectivity and accessibility on a neighbourhood and city scale was lost, perpetuating a lack of relationship with its surroundings, and limiting its spatial cohesion.

FIG. 5.9 *Byker, Newcastle upon Tyne 1982-2016. Before and after the rehabilitation*

### 5.1.4.3 Urban regeneration in The Netherlands. Renovation with neighbourhood participation

The Dutch Urban Renewal Law (*stedelijkevernieuwing*) of 1977, envisaged for the first time the conservation of large housing estates, their morphology, urban identity and functional use, on the basis of the preservation of the city and the urban landscape (Clarke 2016, p.55), with the quantitative and qualitative reinforcement of the residential function of the urban centre and its surrounding neighbourhoods to improve the quality of life of their inhabitants (Aalbers et al. 2004, p.22), based on the construction of new housing and improving the existing housing for residents with lower incomes. During the 1980s this objective was changed to that of economic improvement, with the intervention focusing on areas with multiple problems of physical, social, and economic decline ("*Probleemcumulatiegebiedenbeleid*" 1982), using renovation through demolition and the construction of new housing, together with citizen participation and improved social relations as a solution to neighbourhood decay.

Both alternatives can be seen in the Bijlmermeer area of Amsterdam, built between 1968-1975. In 1983, in order to tackle the area's physical and social degradation, a programme was drawn up to rehabilitate the buildings in common areas and outdoor

spaces, with the construction of amenities, the improvement of public transport, and social programmes that unsuccessfully encouraged the participation of local residents (Wassenberg 2006, p.194). The social and economic problems worsened in the neighbourhood, and with them the degradation of the open and built-up spaces. In 1992 a new renovation was carried out based on socio-economic measures and the demolition of one quarter of the houses, the sale of another quarter and the improvement of the rest, incorporating new medium and low density residential types, business premises and offices, together with the reorganisation of the open spaces and the mixing of pedestrian and road traffic, forming streets, boulevards and avenues. The intervention eliminated the neighbourhood planned in the 1970s, replacing the existing urban fabric with a new type of fabric divided into small residential units with enclosed open spaces and greater privacy, organised around parks and central or bordering green areas that create differentiated boundaries between their different parts. In this type of intervention, where demolition predominates, the spaces of opportunity are not recognised at any of its scales, neither in the housing, nor in the interior of the neighbourhood, nor at its edge, losing built assets and the possibility of its improvement through rehabilitation and recycling.

FIG. 5.10 *Bijlmermeer, Amsterdam. Demolished and constructed area between 1992-2010*

This type of renovation was carried out at the beginning of the 1990s, with a predominance of physical transformation on the scale of neighbourhoods with social and economic programmes (SocialeVernieuwing), regulated by the Big Cities Policies (Grote StedenBeleid GSB), which promoted integrated actions in the 30 largest cities in the country, with a predominance of demolishing part of the neighbourhoods, replacing them with new housing, and redeveloping the surrounding area. This improved the living conditions of their inhabitants, without increasing the social mix by not attracting people with higher incomes to the neighbourhood (van der Graff 2009, pp.147-148). The idea of mixing residential typologies in order to mix the population, first proposed in GSB-I 1994-1998 in low-income neighbourhoods, continues today, with the assumption that disadvantaged neighbourhoods are segregated

neighbourhoods that need to be disaggregated and "restructured", first physically and then socially (Musterd & Ostendorf 2008, p. 81). In GSB-II 1999-2004, social policies were implemented accompanying this type of physical renovation, which were maintained in GSB-III 2005-2009.

In 2003 a total of 56 disadvantaged neighbourhoods (56 *wijkenaanpak*) were selected from the 30 cities included in the GSB, for the purpose of their integral urban regeneration. In 2007 this was increased to the 40 most disadvantaged neighbourhoods (40 *Krachtwijken, de wijken van Vogelaar*), half of which were included in the 2003 programme, selected according to a combination of social, physical, and inhabitability indicators through contracts with municipal authorities and housing associations. In 2009, the report *"De Baat op Straat"* concluded that it could not be proven that the investments made in the period 2000-2008 had reduced nuisance, insecurity and social deterioration in the neighbourhoods, but that the physical transformations made in the redevelopment of open spaces and in particular in the renovation-rehabilitation of existing housing, the construction of new housing (for more expensive rental prices or ownership) and the sale to private individuals had contributed to the improvement of the neighbourhoods. This brought about changes in the composition of the neighbourhood population, apparently making residents feel more involved in their home and neighbourhood.

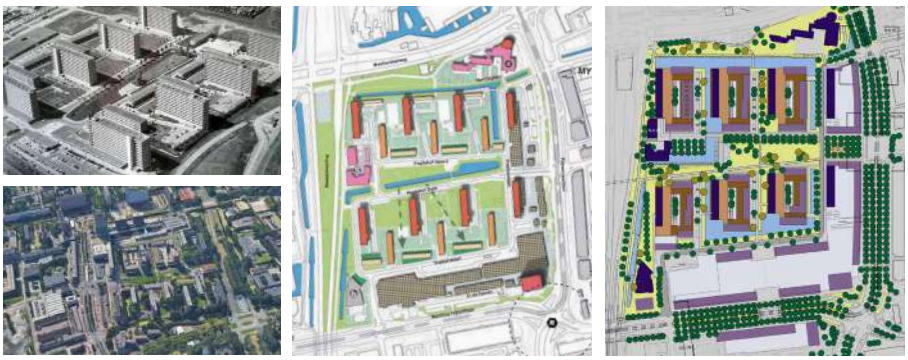


FIG. 5.11 *Poptahof, Delft. Aerial view 1970-2020 and urban development plan 1958-2004*

This can be seen in the comprehensive urban regeneration of the Poptahof neighbourhood (1960) in Delft, managed by the municipality and the *"Woonbron-Maasoevers"* housing association, through a Master Plan carried out by Palmboom and van den Bout in 2004. Its objective was to achieve its physical, social and environmental improvement, with the redevelopment of the internal structure, the redevelopment of the open spaces and the renovation-rehabilitation of part of the buildings without displacing the residents, transforming the open block fabric into a space made up of blocks around an open courtyard with public access. The architects

Molenaar&Co designed the block "Purper" 2008-10, reusing the structure of the existing blocks to reorganise its internal layout, while Change.nl-Mecanoo designed the adjoining block "Amber" 2008-12, based on the demolition of the existing building. These were two different ways of introducing new types of housing and integrating them with community spaces (González & Stouten 2014, p.178), with a more private character inside the block and a more residual character between the blocks, which, although they are organised inside the neighbourhood with the new central public space and the facilities, still lack connectivity at their edges and with their surroundings. This process recognises as spaces of opportunity part of the building and the estate's interior open spaces. The community, public and private open spaces is intervened by redefining its use, delimiting it with an increase in its private use, reorganising part of the urban fabric with new residential typologies and the reorganisation of the central park that serves to interconnect the community spaces within the blocks with the general access road network. By limiting the intervention to the interior of the estate, the spaces of opportunity at its edge are not considered, which are still made up of interstitial spaces related to the road network, vacant spaces between the different parts of the estate and with other neighbourhoods, thereby losing the possibility of improving their connectivity and accessibility on a neighbourhood scale. It would also be necessary to identify and act on spaces of opportunity on a city scale, interstitial spaces between urban sections, fragments and fabrics that would improve spatial cohesion on an urban scale, for which it would be necessary to incorporate urban regeneration projects in the general municipal plan.

The crisis of 2010 decelerated the process of demolition and new construction, with rehabilitation increasing in recognition of the value of these neighbourhoods and the sustainability of this type of intervention, extending it to every part of the country following the revision of the Housing Act in 2015, with adaptive reuse as the norm in an effort to find a dynamic balance between the past and the future (Clarke 2016, p.61). This can be seen in the project for the Kleiburg city block, the last original high-rise building in Bijlmermeer, carried out by NL Architects and XVW architectuur in 2012-2016, which managed to improve it with the minimum possible intervention, avoiding its demolition. This was done by means of a recycling process, replacing part of its components, incorporating flexibility into its residential programme, leaving the interior space of the dwellings free to be readapted according to the needs of the residents, who distributed and completed them themselves, while increasing the connection with their surroundings, widening walkways and making the ground floor more receptive to new uses. This was a type of intervention that revealed how at the building scale, improvements can be carried out at a lower cost, but that in the same way as with the GSB, the scale of the intervention is limited without taking measures that improve its connectivity, accessibility and spatial cohesion with its surroundings and the city (Droste et al. 2008, pp.184-85). By only taking into account the spaces of opportunity at the

scale of the building, the spaces of opportunity at other scales are not recognised and addressed, such as those on the edge and at the urban scale, which are still comprised of open spaces of undefined use, interstitial spaces related to the road network, vacant spaces between the estate and other neighbourhoods, and spaces between urban fragments and fabrics. The result is the impossibility of improving connectivity and accessibility at the neighbourhood level, and spatial cohesion at the city level.

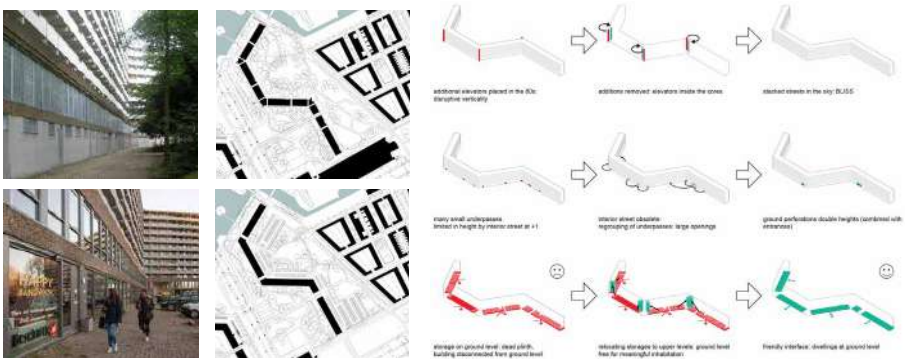


FIG. 5.12 *Kleiburg De Flat, Bijlmermeer. Before and after the residential rehabilitation project 2012-16*

## 5.1.5 The institutional framework and urban regeneration policies in Spain

Since the beginning of the democratic period in 1978, between Royal Decree 2329/1983 on the protection of the rehabilitation of residential and urban heritage, passed during a period marked by a real estate crisis, and Royal Decree Law 2/1985, which sought to boost the construction sector and stimulate private consumption, urban and real estate expansion has remained the main objective of state housing policies in Spain until now. Expansionist cycles and real estate crises have alternated with policies that encourage the recovery of the real estate sector through rehabilitation, which has been abandoned or its importance minimised once the market recovers and can resume its expansionist trend.

The first neighbourhood improvement operations took place at the end of the 1970s and the beginning of the 1980s. These were renovation-rehabilitation projects carried out by local councils through partial plans and internal reform plans (PERI). These plans became more comprehensive in cases in which citizen participation promoted the physical improvement of run-down neighbourhoods with deficits in housing, infrastructure and services. This was the case in the projects promoted by the Programa de Barrios en Remodelación de Madrid (1979-1988), including the neighbourhood of Orcasitas (1957-1965), which involved replacing all of the buildings in stages between 1976-1986, maintaining the population and including the urban redevelopment

of the entire area. The open spaces, road networks and car parks were increased to occupy 80% of the area of the neighbourhood, maintaining the density and number of dwellings, now with a larger surface area and height, which improved their habitability but hindered continuity between the different parts and with the road network by creating large open spaces with no defined use in the interior and on the edges (Cervero & Hernández, 2015). This type of intervention, predominantly consisting of demolition, does not recognise the spaces of opportunity at any of its scales, either in the housing, in the interior of the neighbourhood or on its edge, losing built heritage and the possibility of its improvement through rehabilitation and recycling. By failing to consider the spaces of opportunity related to the open spaces in its interior and on its edge, the possibility of improving its internal articulation, connectivity and accessibility on a neighbourhood scale was lost, maintaining its isolated character and lack of spatial cohesion.

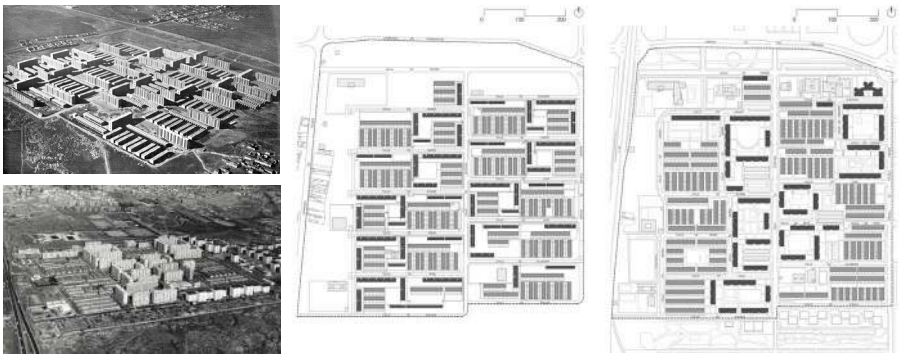


FIG. 5.13 *Orcasitas, Madrid 1959-1986. Before and after the renovation*

In the 1980s, the autonomous regions were transferred responsibility for urban planning and housing, leaving the state administration in charge of regulatory design and taxation. The first state housing plans did not contemplate projects in deteriorated areas, and the new general municipal plans defined a city model based on the recovery of neighbourhoods, with integral rehabilitation areas (ARI) financed by the state and managed by communities and town councils as independent plans. (Hernández Aja et al. 2015, p.5). Most of the actions consisted of rehabilitation, in some cases renovation with demolition, and were carried out in historic centres in order to address the poor condition of the buildings. The few projects that were carried out in housing estates dealt with infrastructures and the urbanisation or redevelopment of streets, with plans for paving, remodelling and repair of the urban layout (Hernández Aja et al. 2015, p.9).

It was not until the 1990s when the state housing plans included the integral rehabilitation areas as an instrument for the rehabilitation of buildings and the redevelopment of open spaces, extending their use during the period 1992-2012, when the improvement of open spaces began to gain importance in the institutional

framework and in its policies, although its treatment generally entailed redevelopment around the building of the intervened areas, limiting the structuring character of public space at different scales.

In the 1990s, three state housing plans were approved, with the integral rehabilitation areas considered as an independent programme and coinciding with the first two European programmes, the Urban Pilot Projects (1989-1996) and URBAN I (1994-1999), giving rise to a greater number of projects in urban peripheries with limited integration of the physical, social and environmental aspects. Actions involving buildings increased, and interventions on the scale of urban and territorial planning began to appear, with an increase in those related to urban design and the improvement of public space, mainly through redevelopment plans. These actions generally emphasised the physical aspect, and when they were carried out at different urban scales, spatial cohesion was not achieved due to the lack of organisation of public space between the different parts of the city.

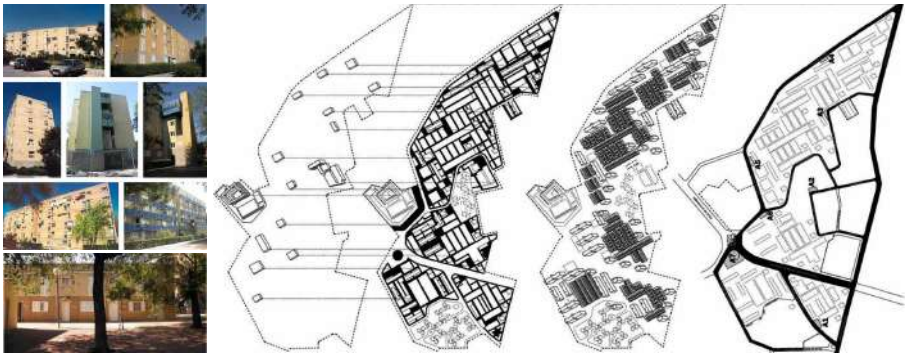


FIG. 5.14 *Caño Roto, Madrid 1994-2004. New amenities, rehabilitation of pedestrian paths, houses and streets*

This can be seen in what is known as the 'Guided Settlement' of Caño Roto (1957-1963), part of a programme of action in degraded areas of the Madrid City Council, with the participation of the regional government and the neighbourhood, which between 1994 and 2004 intervened in the physical aspects of the neighbourhood through the rehabilitation of housing, urbanisation and improvement of infrastructures. The intervention recognises as spaces of opportunity the buildings and spaces on the edge of the housing estate; the deficit of amenities and green areas was reduced, which now took the place of urban voids and shanty towns on the edge; and connections by public transportation to the city were introduced, improving its connectivity and accessibility. Inside the neighbourhood, the space between buildings was not recognised as a space of opportunity, and the intervention was limited to the aesthetic aspect of the open community and public space, without considering its structuring character, maintaining the lack of definition of its use, the lack of articulation between its parts

and its integration with its surroundings. There is a lack of local services, productive and commercial activity, and premises on the ground floor were abandoned, reducing the functional complexity and attractiveness of the public and community space (Cervero & Hernández 2018, p.167).

In the period 2002-2013, three other housing plans and two European programmes, URBAN II (2000-2006) and Urban Initiative (2007-2013), were approved, resulting in actions with a greater integration of physical, social and environmental aspects in obsolete neighbourhoods, including post-war housing estates. There was a greater predominance of rehabilitation over renovation, with a larger number of actions aimed at improving buildings and socio-economic revitalisation, with plans for mobility, redevelopment and improvement of public space and the urban environment.

In any case, the results of the rehabilitation and renovation projects carried out between 1992 and 2012 had little impact in a period marked by urban growth and the construction of new housing, with the rehabilitation of neighbourhoods remaining practically outside the scope of urban planning projects. The total number of dwellings intervened in the ARI represents 1.79% of those built in the same period (Hernández & García 2014, p.185), losing the opportunity to regenerate neighbourhoods and cities in favour of a model that increased the urban space, making the relationship between its parts more problematic.

There were exceptions, such as the project in the neighbourhood of La Mina (1967-73) in Barcelona, which anticipated the physical, social and economic integration that would be sought from 2004 onwards with the Catalonian Neighbourhood Law (*Llei de Barris*). This was a project carried out between 2000-2010 in which the spaces of opportunity were recognised at all scales, in the buildings, within the neighbourhood, on its edges and in its surroundings, using renovation and rehabilitation through a new layout that increased its identity, diversity, complexity, and interactivity within the estate, on its edges and in relation to the city (López de Lucio 2009; Velázquez & Verdaguer 2011). In order to confer a sense of identity, the public use of the central void was activated through the construction of a boulevard, from which the public and community open spaces were interconnected, resized and redeveloped. To facilitate diversity and complexity on a physical, social and economic level, a typological mix was developed with facilities, new housing and the rehabilitation of existing properties, improving their habitability and accessibility, with 80% subsidised housing and 20% free housing, with the aim of obtaining a dense and complex neighbourhood. In order to intensify social interaction and relations, mobility was improved with new types of transport, new facilities were situated in the best locations, seeking to promote neighbourhood mobility from community spaces to the central boulevard and to attract

people from other parts of the city, increasing the neighbourhood's interaction with the rest of the city, its spatial cohesion and its integration with its surroundings.

FIG. 5.15 *La Mina, Barcelona 2004. Before the renovation project*

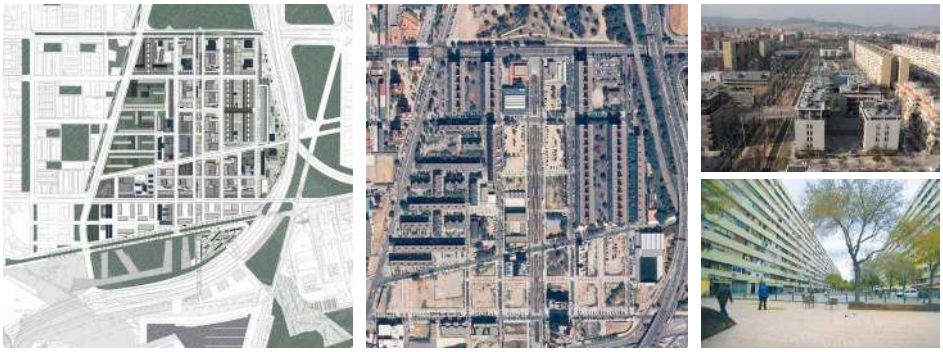


FIG. 5.16 *La Mina, Barcelona 2010. After the renovation project*

At the beginning of the real estate crisis in 2008, Law 2/2011 on the Sustainable Economy was introduced, adding new provisions on the rehabilitation of buildings, and Law 8/2013 on rehabilitation, regeneration and urban renewal, which transferred the integrated urban regeneration of the Toledo Declaration to the country's policies, with the commitment to promote a more sustainable and inclusive city model. These laws were intended to revitalise a slowdown in construction activity, which was only just beginning to recover in 2017 according to ITEC data. However, the percentage of refurbishment work concentrated in the residential sector, which had hardly decreased during the crisis, continued to grow moderately, with only a minimum amount of work being carried out in obsolete neighbourhoods. When it did occur, it focused on aspects related to buildings and the improvement of the urban layout of public spaces within the estates. This limited the role of public space as a structuring element of the urban fabric, as it was unable to configure networks that interconnect the city and contribute to spatial cohesion, generating continuity and improving mobility and accessibility conditions.

## 5.1.6 Intervention practices in obsolete housing estates. Particular Conclusions

The result of studying urban regeneration policies in Europe offers two main conclusions related to the processes of policy implementation, the spaces of opportunity and the scales at which their application is recognised.

**1. In the application of the different European urban regeneration policies, processes of 1/ renovation, 2/ rehabilitation and 3/ recycling have generally been used, separately or jointly, producing different results at different scales depending on the country and the particular conditions of each case, where it can be seen that the greater the integration, connectivity and accessibility generated by the intervention in the open space at different scales, the greater the spatial cohesion of the housing estate.**

The urban **renovation** processes studied predominantly involve the demolition of existing buildings and their replacement with new ones. In this process, actions in the public space usually result in the remodelling of the existing urban layout, which generally involves transforming the urban structure, making it necessary to adapt the public space to the new situation. This causes an increase in the cost of the intervention, and the loss of the built heritage and the opportunity to improve the spatial cohesion of the neighbourhoods based on the existing fabric, with the interconnection between its parts and with its surroundings. With varying degrees of destruction, this can be seen in the French, English and Dutch cases, where there have been a large number of renovations based on the demolition of all the buildings and the complete transformation of the urban structure. In these cases, the pattern of the housing estate is replaced by a reinterpretation of plots based on a clear differentiation between public and private space. This can be seen in cases such as the Holly Street Estate in London, where the estate grid has been replaced by a reinterpretation of the old Victorian grid, and despite the improvement that this entails in the articulation between spaces inside and on its edge, it forms a closed community, with community use of the main open spaces of the streets and the interior square. Another example is Bijlmermeer in Amsterdam, where the neighbourhood grid planned in the 1970s was replaced by small residential units of medium and low density, with open spaces arranged around parks and central or bordering green zones that create differentiated limits between their parts.

In the French and Dutch cases, there have also been examples of neighbourhood renovation through the selective demolition of part of the building stock, complemented by the rehabilitation and even recycling of the existing building stock and redevelopment of the open spaces on the housing estate. In these cases, an attempt has been made to establish a clear delimitation of public, private and community space, restructuring part of or all of the estate's interior fabric on the basis

of streets, squares and new buildings with greater typological diversity. This can be seen in the renovation of Teisseire in Grenoble, through its residentialisation, modifying the unity of the estate by fragmenting the interior space, splitting it up and delimiting it with streets, squares and new types of buildings. It can also be seen in the Dutch case of Poptahof in Delft, where two linear blocks were demolished to build a block with new types of housing and community spaces inside and between blocks, interconnected with the interior of the neighbourhood to a new central public space and amenities.

The urban **rehabilitation** processes studied predominantly involve the conservation and refurbishment of buildings. When there are also actions in the open spaces, they usually result in its requalification, urbanising or redeveloping the space, which implies transforming or altering the material integrity of the urban structure and the organisation of the open spaces in the intervened area. Depending on the criterion applied, this can create an opportunity to improve the spatial cohesion of neighbourhoods based on the existing fabric.

This can be seen in the Spanish case, which is predominated by the rehabilitation of parts of the building, building by building, through the improvement of energy efficiency in façades and roofs, accessibility in common spaces or repairs of structural and constructive defects, which are usually accompanied by the redevelopment of their surroundings when the scale of the project is increased. In this case, or even when the project is exclusively for the redevelopment of open spaces, there is a focus on the physical aspects of the neighbourhood, which tends to improve spatial cohesion by increasing the interconnection between different parts of the estate. This can be seen in Caño Roto in Madrid, where the criterion of the intervention was aimed at the rehabilitation of the housing and the development of the open spaces, which improved its formal and constructive qualities, but by maintaining the lack of definition in its use, limited the interconnection between its parts. This is the opposite to what happened in La Mina in Barcelona, where renovation and rehabilitation were combined to obtain a new layout that increased the spatial cohesion within the estate, at its edges and in relation to the city. In the Dutch and French cases, rehabilitation, whether of the building or of the estate's open spaces, is usually complementary to or accompanied by other processes, generally of renovation with selective demolition and reorganisation of the open spaces within the estate. This can be seen in Poptahof-Delft, where part of its open spaces were redeveloped, with selective demolition and the re-use of the structure of the existing blocks to reorganise their internal layout. It is also the case in the neighbourhood of Saint-Saëns in Saint Étienne, where the rehabilitation has focused on the open spaces within the estate, with their improvement and redevelopment, accompanied by the construction of new residential typologies. In both cases, by failing to intervene in the spaces on the edge of the estate, the possibility of improving its connectivity and accessibility on a neighbourhood scale and with the surrounding area has been lost.

In the case of the urban **recycling** processes studied, these are predominated by the conservation and requalification of the existing buildings, replacing part of their components to reorganise their use and make them more flexible, improving the habitability and comfort of the dwellings, and incorporating greater typological diversity. The interventions carried out in the open spaces are limited to the surroundings of the buildings, reorganising their use. The urban structure of the estate is maintained, which limits its integration with the other parts of the estate, and there are no plans to improve its articulation, connectivity and accessibility with the edge and its surroundings, which limits the spatial cohesion of the estate. This can be seen in the French and Dutch cases, where there have been isolated cases of the recycling of buildings within an estate. This is the case of the Grand Parc in Bordeaux and the Kleiburg urban block in Bijlmermeer, reusing existing spaces to improve their habitability, varying the residential scheme and including new community uses, thereby introducing residential diversity into their housing and immediate surroundings.

**2. By knowing how and where the application of urban regeneration policies has an impact, spaces of opportunity are identified at different scales, inside the estate (in the space between buildings), at its edge and in relation to other neighbourhoods, observing that by addressing their intervention as a whole, a network of public spaces is established that allow for the spatial cohesion of the housing estate in its morphological relationship.**

Spaces of opportunity exist in the public, private and community open spaces within an housing estate or a neighbourhood with public housing. They consist of a series of spaces and passageways between buildings, interior road networks, car parks, spaces around the housing, and green areas with very little definition. This can be seen in the interior open spaces of the neighbourhood of Saint-Saëns in Saint Étienne, whose rehabilitation project redefined the use and delimited the open community and public spaces of the estate in order to achieve a new and better organised urban fabric. This can be seen in the Coin Street estate in London's South Bank, recognising the interior open spaces of the estate as spaces of opportunity, whose use has been redefined, reorganising part of the urban fabric with the creation of a central park that organises the space within the neighbourhood, and new residential typologies built in vacant spaces.

There are spaces of opportunity in constructively and typologically obsolete residential buildings of an estate or a neighbourhood with public housing, in unoccupied ground floors, in obsolete and/or unoccupied dwellings and interior spaces, and in the disused open spaces in their immediate surroundings. This can be seen in the Kleiburg city block in Bijlmermeer, where existing spaces are reused to achieve diversity and flexibility with residential typologies that can be readapted according to the needs of the local residents, introducing new uses on the ground floor, improving permeability and increasing the connection with the immediate surroundings. This has also been

achieved in a different way in the housing blocks of the Grand Parc de Bordeaux, by adding a new façade that expands and varies the existing residential scheme, redefining the living space of the homes.

There are spaces of opportunity in obsolete or derelict facilities, amenities or non-residential buildings within the estate and in obsolete and/or vacant parts of buildings in use. This can be seen in Coin Street on London's South Bank, where former industrial buildings were recycled for housing and facilities, which has allowed for greater integration of the different parts of the neighbourhood and improved its spatial quality. This is also the case in a number of buildings in the Teisseire district of Grenoble, with the renovation or adaptation of commercial premises (market and supermarket) and public facilities, reusing ground floors for the premises of neighbourhood associations, temporarily relocating activities in existing buildings in order to demolish them and then building new ones, as was the case with the library, the social centre and the children's day care centre, losing built heritage and the possibility of improving it through rehabilitation and recycling.

There are spaces of opportunity in the open spaces on the edge of the estate, in the private and community open spaces made up of vacant, disused or obsolete spaces, and in the public open spaces occupied by car parks and the road network that delimits the edge of the estate. This can be seen in the spaces on the edge of the Quartier Teisseire de Grenoble, making use of interstitial spaces related to the road network and vacant spaces between the different parts of the estate and with its surroundings, improving the connectivity, accessibility and spatial cohesion. It can also be seen in the Caño Roto estate in Madrid, where the lack of facilities and green areas has been mitigated by placing them on the edge of the estate, in the site previously occupied by urban wastelands and shanty towns, which improves its integration with the surrounding area.

There are spaces of opportunity in the open spaces around the estate, in relation to other neighbourhoods and to the city: in vacant spaces, disused rural and industrial areas and in urban open spaces with no defined use. This can be seen in the Barrio de la Mina in Barcelona, where spaces of opportunity can be recognised at all scales - in the buildings, inside the neighbourhood, at its edge and in its surroundings, to integrate it into a new metropolitan centrality, improving mobility with new roads and types of transport, completing the urban fabric in the surrounding neighbourhoods, replacing obsolete industrial buildings with housing and facilities, making use of vacant spaces to house a new university campus and parks to connect it with the sea. This encourages mobility amongst the residents, increasing the neighbourhood's interaction with the rest of the city, spatial cohesion and integration with its surroundings.

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**FIGURE 5.2** *Saint Saëns,1979. Before and after the renovation project.* Source: Tomas François. Projets urbains et projet de ville. La nouvelle culture urbaine a vingt ans. In: Les Annales de la recherche urbaine, N°68-69, 1995. Politiques de la ville. Recherches de terrains. p.135 https://www.persee.fr/doc/aru_0180-930x_1995_num_68_1_1906

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**FIGURE 5.4** *Teisseire, before and after the renovation project*. Source: https://philippe-panerai.com/grenoble-teisseire-2/
**FIGURE 5.5** *Grand Parc Bordeaux, before and after the renovation project*. Source: https://www.lacatonvassal.com/index.php?idp=80
**FIGURE 5.6** *Canary Wharf (Isle of Dogs), London 1980 – 2008*. Source: Aerial view of Canary Wharf, October 2008, https://www.robertharding.com/preview/1114-567/aerial-view-canary-wharf-london-skyline-facing-north/
**FIGURE 5.7** *Coin street, London 1984 – 2008*. Source: Fernández Per, Aurora "Small Scale Utopia. The Coin Street's" Case Revista arquitectura COAM 2008, nº354, p.112-114 https://www.coam.org/media/Default%20Files/fundacion/biblioteca/revista-arquitectura-100/2008-2012/docs/revista-articulos/revista-arquitectura-2008-n354-pag109-115.pdf
**FIGURE 5.8** *Holly Grove estate, London 1988-2020*. Before and after the demolition. Source: *Holly Grove estate 1988*, https://www.hackneycitizen.co.uk/2017/11/07/hackney-portrait-of-a-community-1967-2017-book-review-the-hackney-society/and Bernstein
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**FIGURE 5.9** *Byker, New Castle Upon Tyne 1982-2016. Before and after the rehabilitation*. Source: Muncaster, Michael "The inside story of how Newcastle's Byker Wall has dramatically changed over the years" https://www.chroniclelive.co.uk/news/north-east-news/gallery/inside-story-how-newcastles-byker-15187009,
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**FIGURE 5.10** *Bijlmermeer, Amsterdam 1992-2010. Demolished and constructed area between 1992-2010. Bijlmermeer 1970.* Source: Gemente Amsterdam, https://erfgoedstem.nl/behoud-laatste-originele-bijlmerflat-dichterbij/
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**FIGURE 5.11** *Poptahof, Delft. Aerial view 1970-2020 and urban development plan 1958-2004*. Poptahof 1970. Source: Hebly Theunissen Architecten, "DELFT Naoorlogse architectuur en stedenbouw 1940-1970", Gemeente Delft, 2006, p.192
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**FIGURE 5.12** *Kleiburg De Flat, Bijlmermeer. Before and after the residential revamp project 2012-16*. Source: http://www.nlarchitects.nl/slideshow/201/
**FIGURE 5.13** *Orcasitas, Madrid 1959-1986. Before and after the renovation*. Source: Cervero, Noelia "La iniciativa ciudadana, como origen del cambio urbano. La remodelación del Poblado Dirigido de Orcasitas en Madrid", CIUDAD Y TERRITORIO, ESTUDIOS TERRITORIALES, Vol. LII, Nº 204, 2020. p. 277-294
**FIGURE 5.14** *Caño Roto, Madrid 1994-2004. New amenities, rehabilitation of pedestrian pahts, houses and streets*. Source: Ruiz Palomeque, "Rehabilitación integral del poblado dirigido de Caño Roto", UPM 2013, p.21-27
Caño Roto Plan. Source: Calvo, Jose Manuel "El poblado dirigido de Caño Roto. Dialéctica entre morfología urbana y tipología edificatoria" PhD Thesis, UPM 2014, p.328
**FIGURE 5.15** *La Mina, Barcelona 2004*. Before the renovation project. Source: López de Lucio, Ramón "Plan Especial de Reforma y Reordenación del Barrio de La Mina" en "Ordenar el territorio Proyectar la ciudad. Rehabilitar los tejidos existentes" Ministerio de Vivienda, 2008, p. 129
**FIGURE 5.16** *La Mina, Barcelona 2010*. After the renovation project. Source: López de Lucio, Ramón "Plan Especial de Reforma y Reordenación del Barrio de La Mina" in "Ordenar el territorio Proyectar la ciudad. Rehabilitar los tejidos existentes" Ministerio de Vivienda, 2008, p.138
Pictures of La Mina 2010. Source: http://jornetlloppastor.blogspot.com/p/projecte-urba.html

## § 5.2 Study cases reviewed (Comparison between the case studies in the thesis)

This section compares the case studies of the thesis, in order to observe how the current characteristics of their supporting structure, the arrangement of the built elements and open spaces, their form, functionality and spatial quality influence the spaces of opportunity found on the housing estate, on its edge and in its surroundings.

### 5.2.1 What is this section about?

In order to compare the case studies of the thesis, a summary graph of the current state of each case is provided, summarising the analysis carried out in chapter 4. The result condenses in one image the characteristics of the open spaces in the housing estates and their surroundings, which allows the quality of their structure, arrangement, form, functionality and three-dimensional composition to be shown as a whole. This constitutes a working tool that serves to compare the case studies, but above all to identify problems and potentialities, as a starting point for defining proposals for intervention in the urban regeneration projects of the housing estates.

The summary graph is organised by scales (estate, edge and environment) represented in a centre and two rings. The centre of the graph represents the value of the parameters of form, functionality and spatial quality obtained in the analysis of a small housing estate or a neighbourhood unit of a large housing estate. The ring around it represents the scope of the estate with the relationships between its parts, and the ring around it represents the border (the dotted line) and the surroundings. Both rings show the analytical parameters of the supporting structure (percentage of the existing fabric by continuity or open building, its integration and articulation), and of the arrangement of the built elements and open spaces (percentage of public, private and community open spaces, open space per dwelling, public space per dwelling, floor space index, open space index and its connectivity, accessibility and permeability). Interpreting the summary graph helps to detect problems and identify from them the spaces of opportunity where action can be taken to resolve them. This is done by observing the value of the parameters, which allows us to appreciate the formal, functional and spatial quality of each case at each scale, and from their constraints to determine where it is possible to intervene in order to improve them.

All these parameters collected in the graph summary are defined in the analytical framework of the thesis (section 1.6), based on the factors used by López de Lucio (2000) and Carmona (2003). Those of the use of the open spaces of the structure supporting the intervention and of the arrangement of the built elements are related to Carmona's "functional" key and López de Lucio's "functional complexity". In the strategies of formation of exterior space,

the parameters linked to the formal configuration are related to Carmona's "morphology" (urban form, urban layout) and López de Lucio's "spatial continuity", while those that have to do with spatial quality are related to aspects of construction of place (perceptual), density and environmental design, also derived from the "functional" key of Carmona, and clarity in the delimitation and formalisation of space and residential density of López de Lucio.

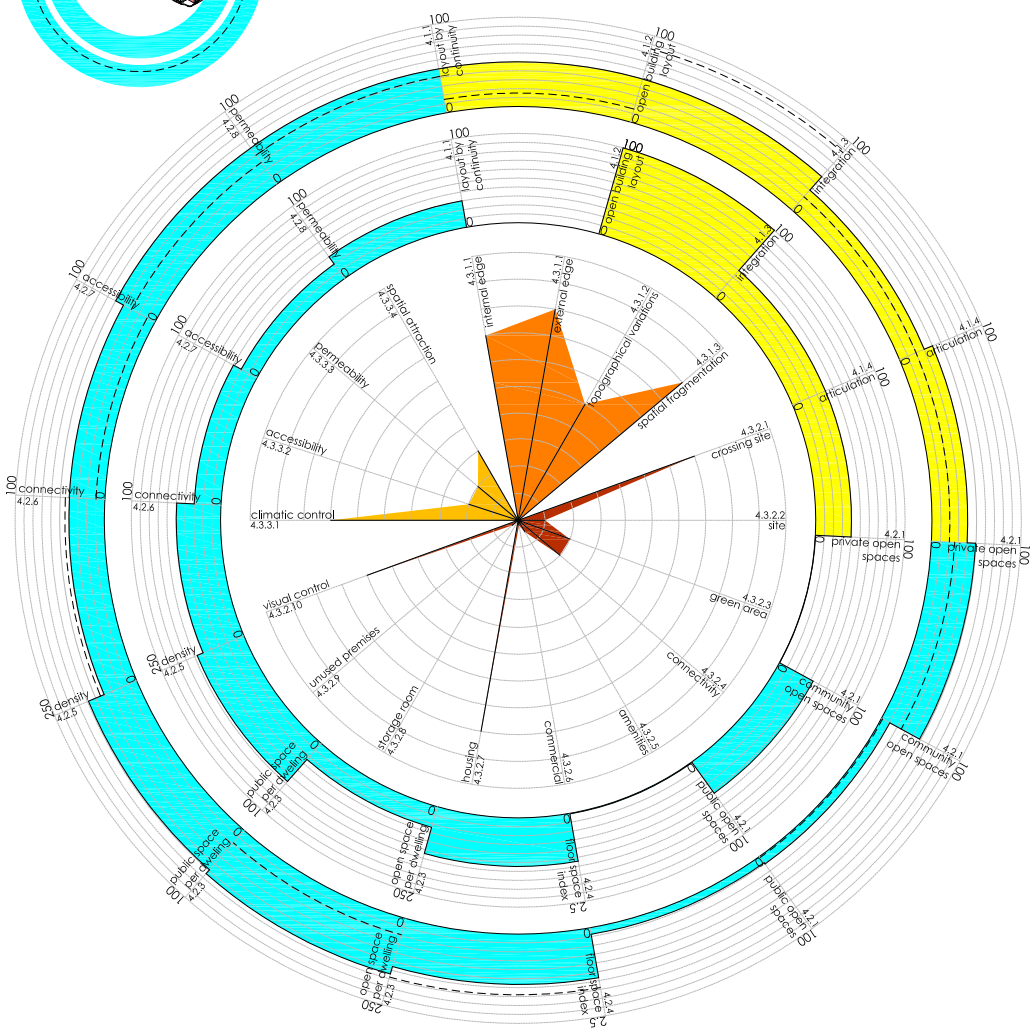
### 5.2.2 What is the role of this section in the chapter?

In this thesis it is important to compare the case studies today in order to reflect on how these residential fragments have shaped the city, since they contain the value of the formative potential of the housing estates in the definition of the urban structure in the periphery and in the city, in the spatial relationship within the estate, at its edge and between the estate and the consolidated city. Comparing the different factors that determine the current urban configuration of the case studies in the open spaces of the housing estate and its surroundings is essential in order to assess its need for recycling and rehabilitation, to identify the spaces that should be part of a process of urban regeneration, and to determine which are the spaces of opportunity in the different scales of intervention and how they could be activated in order to enhance the urban, spatial and environmental resources of the estate and its surroundings.

In Galicia there have not yet been cases of integrated urban regeneration in housing estates and neighbourhoods with public housing. There have been partial improvements characterised by the rehabilitation of the building, generally actions in common elements, with the improvement of energy efficiency and accessibility, many of them managed by the owners depending on the available subsidies, and it is only in the case of public projects that the scale of action has been increased, including the urban development and redevelopment of open spaces. Programmes such as URBAN have focused on the rehabilitation of historic centres (URBAN I in Vigo 1995-99 or URBAN III in Ferrol 2007-2013), but there have also been some cases of interventions in neighbourhoods, such as in Agra del Orzán in URBAN III in A Coruña, with socio-economic and environmental actions, including the improvement of public spaces between blocks of public housing. In addition to this, there have been interventions in small estates, through the ARI programmes, which include projects that have been approved but not yet executed, such as the case studies included in this thesis of María Pita in A Coruña (2015) or Recimil in Ferrol (2016), and exceptionally parts of a large estate, such as the 260 homes of the PEPREI in Coia (2015). However, in any case, these interventions are localised within the estate on physical elements, without extending them to their immediate surroundings and to the city, which limits their results. This makes it necessary to both evaluate their characteristics at different scales, which allows for the graphic description of each case, and to assess the state of the Galician estates as a whole in order to prioritise which need to be intervened and what their opportunities are, making it possible to compare them.

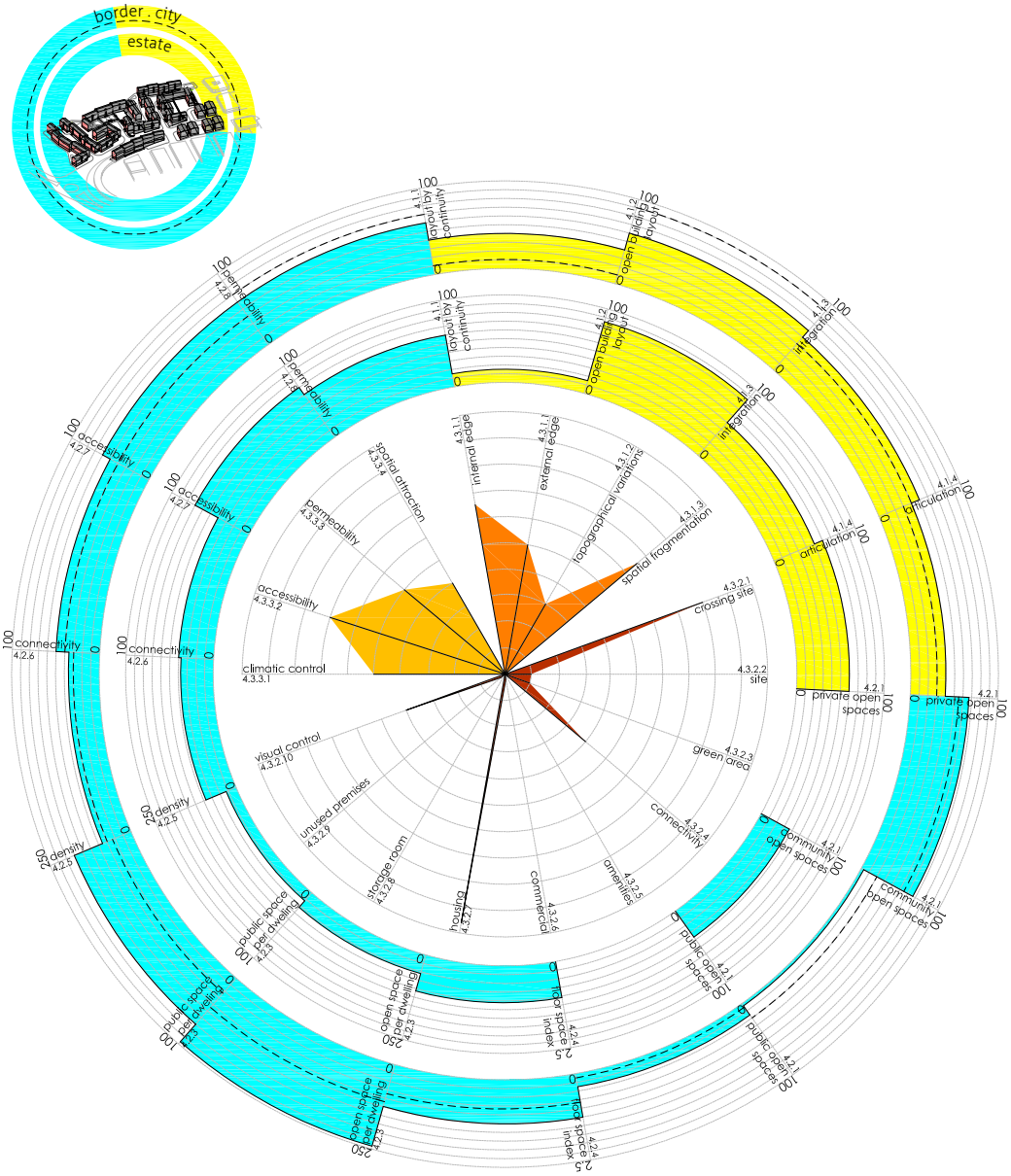
## 5.2.3 Study cases reviewed. Summary graphs

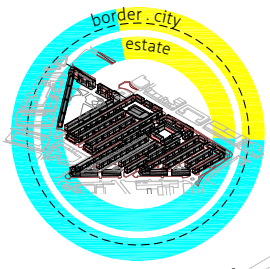
| | BARIO FLORES A Coruña | MARIA PITA A Coruña | RECIMIL Ferrol | CARANZA Ferrol | COIA Vigo |
|---|---|---|---|---|---|
| 4.1 SUPPORTING STRUCTURE | City / Border / Estate | City / Border / Estate | City / Border / Estate | City / Border / Estate | City / Border / Estate |
| 4.1.1. Layout created by continuity (%) | 50 / 15/ 0 | 40 / 10 / 15 | 85 / 70 / 100 | 0 / 0 / 0 | 35 / 15 / 0 |
| 4.1.2. Open building layout (%) | 50 / 85 / 100 | 60 / 90 / 85 | 15 / 30/ 0 | 100 /100 / 100 | 65 / 85 / 100 |
| 4.1.3. Integration (%) | 30 / 20 / 40 | 50 / 40/ 50 | 70 / 30 / 70 | 10 / 10 / 40 | 30 / 20 / 60 |
| 4.1.4. Articulation (%) | 40 / 20 /40 | 40 / 30 / 60 | 70 / 50 / 60 | 10 / 5 / 30 | 30 / 40 / 50 |
| 4.2 BUILT ELEMENTS - OPEN SPACES | City / Border / Estate | City / Border / Estate | City / Border / Estate | City / Border / Estate | City / Border / Estate |
| 4.2.1 Private open spaces (%) | 46.12 /26 /0.25 | 60.52 / 55 / 0 | 45.86 / 23 / 0 | 61.12 / 67 / 21.12 | 55.96 / 72/ 11.09 |
| 4.2.1 Community open spaces (%) | 5.17 / 1.5 / 43 | 3.06 /22 /39.64 | 4.74 / 0 / 0.98 | 11.33 / 11 / 10.42 | 12.45 / 4 / 6.45 |
| 4.2.1 Public open spaces (%) Parks&squares | 14.95 / 0 / 0.7 | 15.59 / 5 / 0 | 6.55 / 12 / 0.1 | 4.13 /11.86 / 1.77 | 11.65 / 19 / 8.61 |
| 4.2.3 Open spaces per dwelling ($m^2$/dw) | 161.2 / 45 / 60 | 242 / 110 / 55 | 257.28 / 30 / 60 | 171,08 /240 /51,2 | 198.2 / 230/75.82 |
| 4.2.3 Public space per dwelling ($m^2$/dw) | 58.8 / 0 / 57 | 70.25 /23 /12.3 | 44.7 / 32 / 60 | 42.33 /15 / 38.55 | 50.8 /86,84 / 56.6 |
| 4.2.4 Floor space index ($m^2/m^2$) | 1.42 / 1.7 / 1.36 | 1.28 /0.8 /1.08 | 1.5 / 2.1 / 1.28 | 0.91 / 0.6 /1.036 | 1.14 / 0.7 / 1.34 |
| 4.2.5 Density (dw/Ha) | 99.4 / 110 /124 | 88 / 73 / 93 | 113.2 /157 / 110 | 72.92 / 20 /84 | 96.26 / 58 / 98 |
| 4.2.6 Connectivity (%) | 40 / 25 / 30 | 55 /40 / 40 | 60 / 35 / 60 | 10 / 10 / 35 | 30 / 40 / 50 |
| 4.2.7 Accessibility (%) | 50 / 30 / 20 | 60 /40 / 70 | 70 / 30 / 55 | 20 / 20 / 30 | 40 / 30 / 50 |
| 4.2.8 Permeability (%) | 50 / 40 / 30 | 60 / 70/ 50 | 80 / 50 / 25i | 30 / 15 / 30 | 30 / 20 / 60 |
| 4.3.1 LAYERS OF FORMAL STRUCTURE | Neighbourhood UV3 | Estate | Estate | Neighbourhood UV2 | Neighbourhood S3 |
| 4.3.1.1 Internal edge / External edge (%) | 80 / 70 | 65 / 50 | 20 / 40 | 50 / 80 | 40 / 30 |
| 4.3.1.2 Topographical variations (%) | 50 | 30 | 20 | 60 | 60 |
| 4.3.1.3 Spatial fragmentation (%) | 80 | 65 | 20 | 40 | 50 |
| 4.3.2 FUNCTIONALITY OF EXTERNAL SPACE | Neighbourhood UV3 | Estate | Estate | Neighbourhood UV2 | Neighbourhood S3 |
| 4.3.2.1 Crossing site (%) | 70 | 80 | 70 | 40 | 20 |
| 4.3.2.2 Site (%) | 10 | 10 | 15 | 30 | 20 |
| 4.3.2.3 Green area (%) | 20 | 10 | 15 | 30 | 60 |
| 4.3.2.4 Connectivity (%) | 20 | 40 | 60 | 20 | 50 |
| 4.3.2.5 Amenities (%) | 5 | 0 | 15 | 0 | 0 |
| 4.3.2.6 Commercial (%) | 2 | 2 | 25 | 0 | 0 |
| 4.3.2.7 Housing (%) | 80 | 96 | 50 | 0 | 0 |
| 4.3.2.8 Storage room (%) | 0 | 0 | 0 | 30 | 100 |
| 4.3.2.9 Unused premises (%) | 3 | 2 | 10 | 15 | 0 |
| 4.3.2.10 Visual control (%) | 60 | 40 | 50 | 40 | 60 |
| 4.3.3 SPATIAL QUALITY | Neighbourhood UV3 | Estate | Estate | Neighbourhood UV2 | Neighbourhood S3 |
| 4.3.3.1 Climatic comfort (%) | 70 | 50 | 80 | 60 | 40 |
| 4.3.3.2 Accessibility (%) | 20 | 70 | 55 | 20 | 30 |
| 4.3.3.3 Permeability (%) | 20 | 50 | 25 | 55 | 50 |
| 4.3.3.4 Spatial attraction (%) | 30 | 40 | 30 | 20 | 50 |

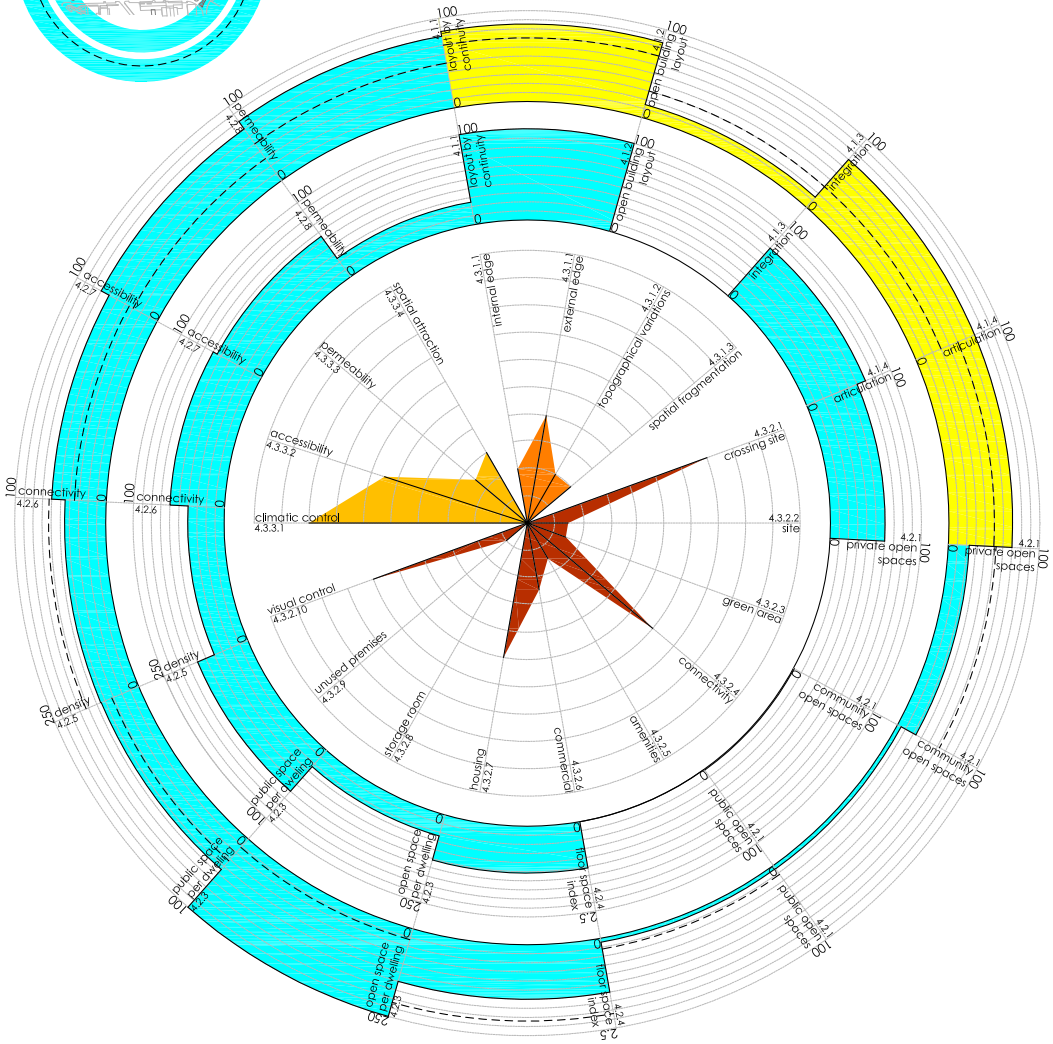

border - city
estate
neighbourhood unit UV2
continuity 4.1.1
open building layout 4.1.2
integration 4.1.3
articulation 4.1.4
private open spaces 4.2.1
community open spaces 4.2.1
public open spaces 4.2.1
local space index 4.2.4
open space per dwelling 4.2.3
public space per dwelling 4.2.3
density 4.2.5
connectivity 4.2.6
accessibility 4.2.7
permeability 4.2.8
internal edge 4.3.1.1
external edge 4.3.1.1
topographical variations 4.3.1.2
spatial fragmentation 4.3.1.3
spatial attraction 4.3.3.4
permeability 4.3.3.3
accessibility 4.3.3.2
climatic control 4.3.3.1
visual control 4.3.2.10
unused premises 4.3.2.9
storage room 4.3.2.8
housing 4.3.2.7
commercial 4.3.2.6
amenities 4.3.2.5
connectivity 4.3.2.4
green area 4.3.2.3
site 4.3.2.2
crossing site 4.3.2.1

## A CORUÑA

**María Pita**

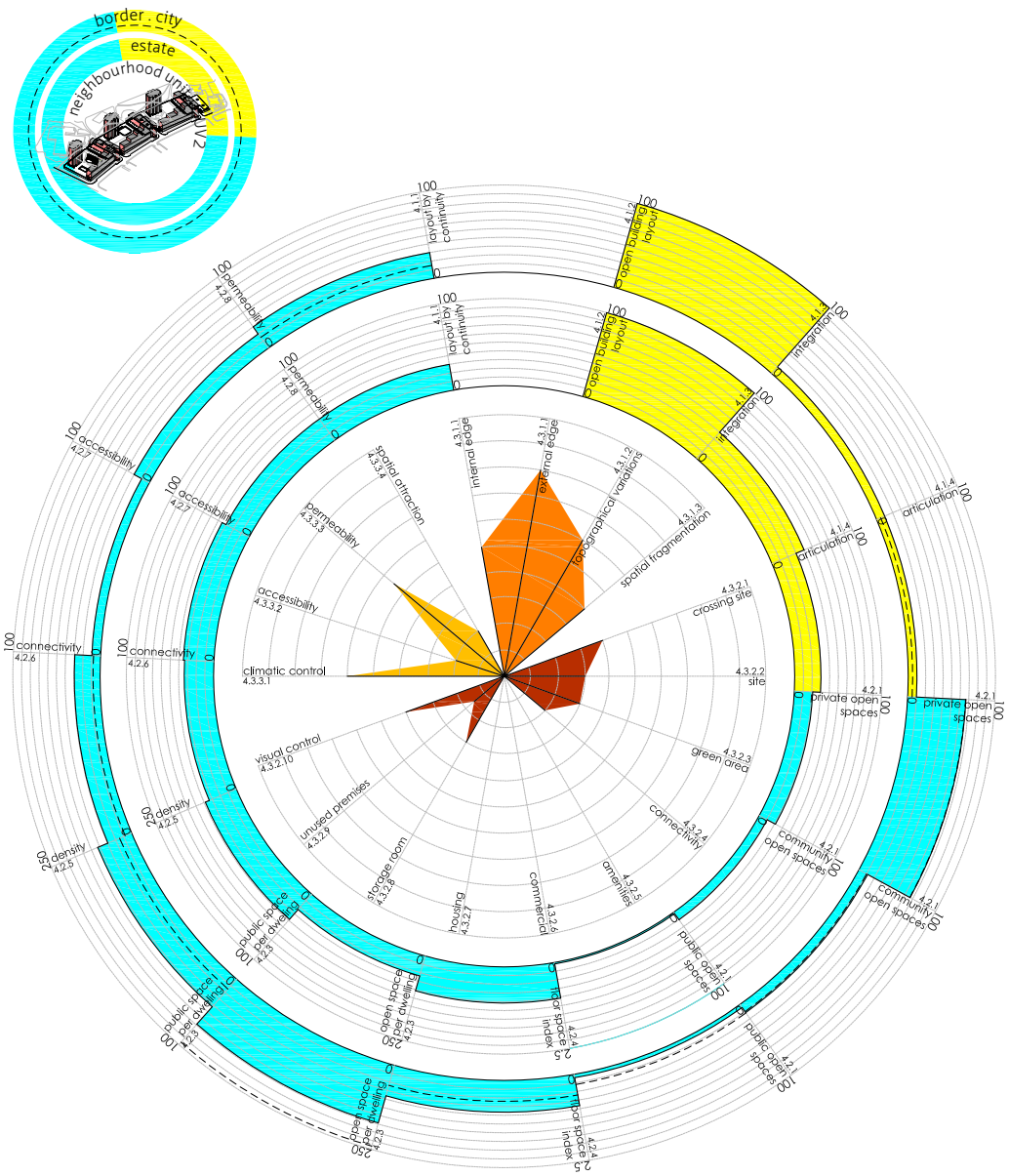


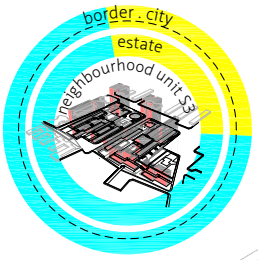

border - city
estate

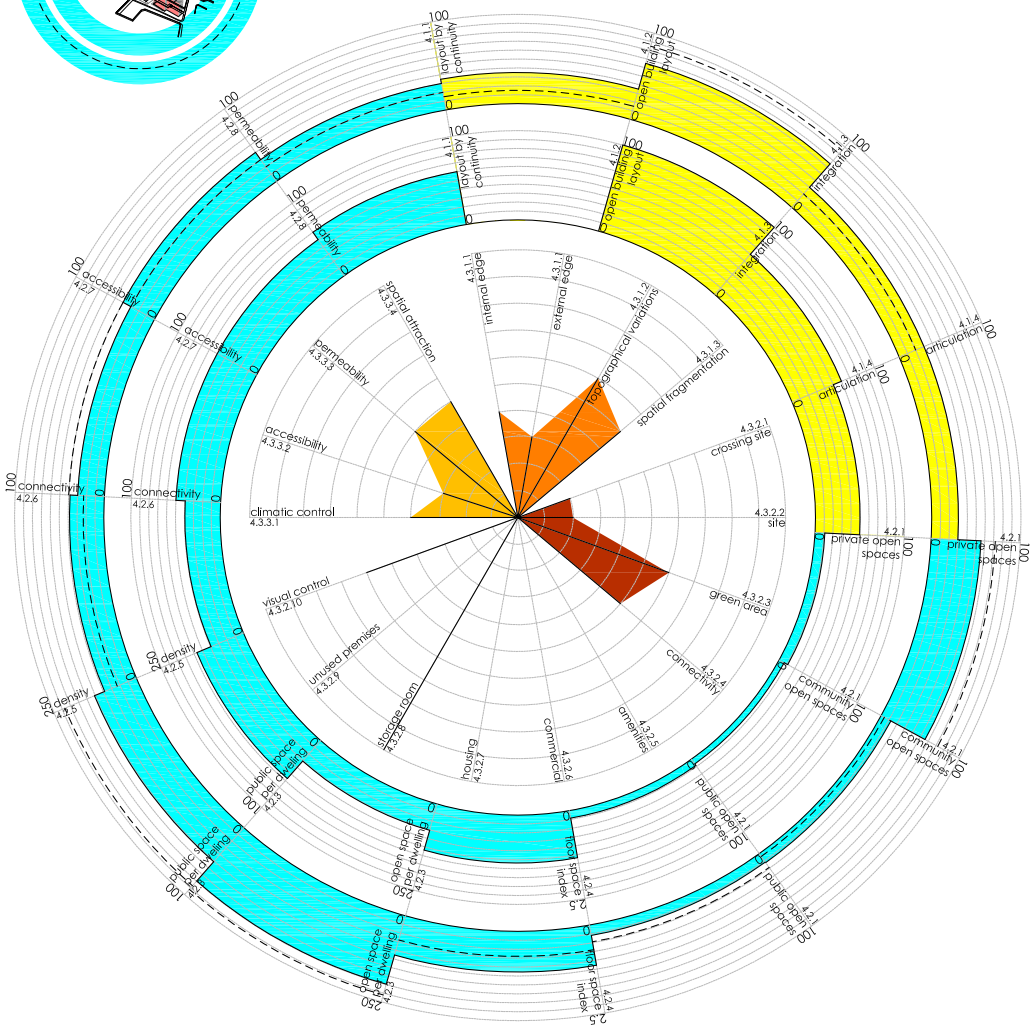

4.1.1 continuity
4.1.2 open building layout
4.1.3 integration
4.1.4 articulation
4.2.1 private open spaces
4.2.1 community open spaces
4.2.1 public open spaces
4.2.3 open space per dwelling
4.2.4 floor space index
4.2.5 density
4.2.6 connectivity
4.2.7 accessibility
4.2.8 permeability
4.3.1.1 internal edge
4.3.1.2 external edge
4.3.1.3 topographical variations
4.3.1.4 spatial fragmentation
4.3.2.1 crossing site
4.3.2.2 site
4.3.2.3 green area
4.3.2.4 connectivity
4.3.2.5 amenities
4.3.2.6 commercial
4.3.2.7 housing
4.3.2.8 storage room
4.3.2.9 unused premises
4.3.2.10 visual control
4.3.3.1 climatic control
4.3.3.2 accessibility
4.3.3.3 permeability
4.3.3.4 spatial attraction

FERROL

## Caranza




border - city
estate
neighbourhood unit S3


continuity
4.1.1
open building layout
4.1.2
integration
4.1.3
articulation
4.1.4
private open spaces
4.2.1
community open spaces
4.2.2
public open spaces
4.2.1
open space per dwelling
4.2.3
floor space index
4.2.4
density
4.2.5
connectivity
4.2.6
accessibility
4.2.7
permeability
4.2.8
internal edge
4.3.1.1
external edge
4.3.1.2
topographical variations
4.3.1.3
spatial fragmentation
4.3.1.4
crossing site
4.3.2.1
site
4.3.2.2
green area
4.3.2.3
connectivity
4.3.2.4
amenities
4.3.2.5
commercial
4.3.2.6
housing
4.3.2.7
storage room
4.3.2.8
unused premises
4.3.2.9
visual control
4.3.2.10
climatic control
4.3.3.1
accessibility
4.3.3.2
permeability
4.3.3.3
spatial attraction
4.3.3.4

### 5.2.4 Study cases reviewed. Particular Conclusions

The outcome of the review of the case studies in the thesis offers two main conclusions related to the spaces of opportunity at the scales at which they are recognised, on the estate (in itself and in its parts) and in its surroundings (on the edge and in the city).

**1. The characteristics of the elements that configure the form, the arrangement of the open space, its functionality and the quality of the spaces in the housing estate and in its parts, condition the types of spaces of opportunity that are found inside the estates, in the buildings and in the poorly qualified, fragmented, degraded and underused open spaces of the small estates, of the neighbourhood units that form differentiated parts of the large estates and in the buildings and open spaces that serve as a link between them.**

There are spaces of opportunity in the open spaces of the housing estate. These include the community open spaces within the neighbourhood units of the large estates, made up of a series of spaces and passageways between buildings, whose poorly defined nature and difficulties of accessibility limit their functionality and the spatial connection between the different parts of the neighbourhood unit, with edges that are often unlevel on their perimeter, between buildings and with their immediate surroundings, which limits their relationship with other parts of the housing estate. This can be seen in the Barrio das Flores, where the space of opportunity inside the residential units is conditioned by the formal configuration of the community open spaces to a greater extent than in the rest of the cases studied. This is due to the different degrees of terracing inside the residential units, which gives rise to varying levels in the interior and exterior edges, to a lesser extent in Coia than in Caranza, and in Caranza than in the Barrio das Flores. While the topographical alteration is similar, they also differ in the percentage of spatial fragmentation, which is greater in the Barrio das Flores. This requires actions that include elements to improve the accessibility, permeability and spatial continuity both in its perimeter and between the different platforms into which it is divided.

These spaces of opportunity are also functionally conditioned by the use of the space between buildings; in the Barrio das Flores it is mostly a transit area, whereas in Caranza the percentage of green zones and buildings is balanced, or in Coia, where this space is mainly occupied by green zones. The connectivity level between the different parts is low in Caranza and in the Barrio das Flores, with different uses on the ground floor: in the Barrio das Flores it is mostly housing and a small proportion of amenities, shops or unused premises; in Coia storage rooms, and in Caranza unused premises. This calls for interventions that increase use through spatial improvement, activity in the open spaces and inside the buildings.

These spaces of opportunity are also conditioned by the spatial quality: unlike UV2 in Caranza, UV3 in Barrio das Flores and sector 3 in Coia, they have a high degree of climatic comfort, which is influenced both by their orientation and the climatic protection elements used in their design. Their level of accessibility, permeability and spatial attractiveness is low due to limited movement, openness and visual control between their parts, particularly in the Barrio das Flores with respect to Coia. This has an impact on the need to improve connections in the open spaces and with the buildings.

In the small housing estates there are also spaces of opportunity conditioned by the form, layout, functionality and quality of the community open spaces, in this case linked to the street or its widening, in passageways leading to the interior of blocks with slopes on the interior and exterior edges, as in María Pita. Or otherwise, integrated on a single level and made up of spaces connected to passageways between blocks and boulevards, as in Recimil. In both cases they offer a high percentage of climatic comfort and accessibility, reducing their degree of permeability and spatial attraction, particularly in Recimil.

There are spaces of opportunity in the open spaces that serve as a link between the neighbourhood units of the large housing estates, with a grid made up entirely of open buildings. These are made up of the interior road network, car parks, spaces around the housing, spaces and green areas that are undefined, fragmented or residual, with diffuse limits and confusion with regards to their ownership. This can be seen in Caranza, where the spaces of opportunity are conditioned by the support structure and the organisation of the built elements, due to the existence of a large amount of open spaces around the neighbourhood units, with a predominance of roads, vacant spaces, unused plots and the private space of the amenities, with a weak internal integration, interconnection, connectivity, accessibility and permeability between its parts. This contrasts with Coia, where the percentage of each of the previous parameters is higher, which results in greater internal integration as the open space between units is delimited and is not excessively fragmented. It also contrasts with the Barrio das Flores, where it is the spatial fragmentation in rooms and unqualified passage areas that conditions the weak internal integration and interconnection between its parts. All of this requires interventions that reduce spatial discontinuities, increasing continuity and proximity between parts, making use of the vacant, obsolete and undefined spaces.

There are spaces of opportunity in residential buildings that are obsolete (in both constructive and typological terms) in the housing estates, in unoccupied ground floors, in obsolete and/or unoccupied dwellings and interior spaces, and in the disused open spaces in their immediate surroundings. This can be observed in all the estates, due to the poor condition and obsolescence of the built blocks, with construction

problems and lack of maintenance. In the neighbourhood of Las Flores and Caranza there is a greater number and diversity of common elements, commercial galleries and disused ground floors, which offer opportunities to implement new services, activities and residential types that increase the diversity of uses, improving the movement between parts and the functional complexity in the open spaces of the estate.

There are spaces of opportunity in the facilities and amenities located within the housing estate, mostly in obsolete, abandoned or in-use commercial buildings and public facilities, in vacant premises and in obsolete and/or unoccupied spaces in non-residential buildings. Their greatest number and diversity can be found in the Barrio das Flores, with empty or underused premises, on the ground floor and in the corridors of open blocks, in isolated buildings and facilities that were never used, such as the parish centre, or where the use was not assigned, such as in the supermarket or the UV3 nursery. The greatest number of large facilities with private open spaces are in Coia and Caranza, while in Caranza and Recimil the majority of commercial premises are unoccupied on the ground floor of residential buildings. Their improvement would increase connectivity and spatial quality, encouraging the use of space, which would help to overcome the lack of integration between the different parts of the housing estate and its surroundings.

**2. The supporting structure of the current urban form, together with the arrangement of its built elements and open spaces, condition the types of spaces of opportunity to be found on the housing estate, at the edge and in its surroundings.**

There are spaces of opportunity in the open spaces on the edge of the housing estate. In the private open spaces made up of vacant spaces, disused or obsolete rural and industrial spaces; in the public open spaces occupied by car parks on the edge of the estate, in the road network that delimits the edge of the estate and in the open spaces adjacent to it; and in the community open spaces between buildings located on the edge of the estate.

This can be seen in Coia, where the space on the edge of the estate is poorly integrated and is made up of a large amount of low-density private open spaces. Its fragmented character, with extensive and irregular boundaries and very low permeability, is configured as a barrier that prevents the continuity of the road in the interface with the estate, limiting accessibility, connectivity with its surroundings and the interconnection with its buildings. In the rest of the estates, except in Recimil, there is also a predominance of open plots with open spaces and low levels of integration on their edges, although their morphology shows differences, more so in María Pita, with a

mixture of open building layouts of estates, vacant plots and plots created by continuity that improve their level of integration and articulation. This happens to a lesser degree in the Barrio das Flores, where there is a greater presence of private open spaces for facilities and the network of estates and infrastructures that limit the articulation. This aspect is accentuated in Caranza, conditioned by the road and its geographical situation, making its integration difficult and reinforcing its image as an isolated area.

Although these parameters are relatively infrequent in the housing estates studied, the possibilities of intervention pose different types of constraints, observing that the space of opportunity is more likely to be activated in unconsolidated or undefined borders, without uses or with the possibility of altering them, as opposed to those limited by road infrastructures or topography.

There are also spaces of opportunity in the open spaces around the estate, in relation to other neighbourhoods and the city; in vacant spaces, rural areas and disused industrial areas, in urban open spaces with no defined use (public, private and community open spaces), and in the network of paths, streets and roads that connect public open spaces (parks and squares), facilities and services in the vicinity, and these with the estates.

This can be seen in all the housing estates studied, as the neighbourhoods around them maintain the legacy of their peripheral, rural, or industrial origin, or as a result of incomplete residential growth. And in spite of the fact that the situation of the housing estates has a central position on the metropolitan scale within the current consolidated urban fabric, the alteration caused by their construction maintains the predominance of open areas with open spaces in their surroundings, slightly improving the index of integration and articulation with respect to the space on the edge of the estate. The morphology of these neighbourhoods in the surroundings of the large estates differs in terms of their integration, with greater constraints in the surroundings of estates such as Coia or Caranza with a high proportion of private open spaces for industrial use, as opposed to those where there is a predominance of residential use created by continuity. However, in this case it also depends on the degree of consolidation; in the area surrounding the Barrio das Flores it is less than in María Pita, where in turn it is less than in Recimil, due to the presence of open spaces of rural origin or infrastructures that reduce connectivity with other parts of the city.

## § 5.3 Spaces for rehabilitating and recycling the contemporary city

This section determines 1/ the combination of spaces of opportunity in which to intervene to regenerate a housing estate, 2/ the spatial, formal and functional constraints that condition the connectivity, organisation and spatial integration of the estate in its surroundings and in itself, making it possible to assess the need for its regeneration, and 3/ the potentiality of the combination of spaces of opportunity that make it possible to assess the feasibility of their regeneration, to identify spaces in which to rehabilitate and recycle the contemporary city by improving the open spaces and spatial cohesion in the estates.

### 5.3.1 What is this section about?

This section consists of a table that should be read horizontally, combining four columns that describe the area of intervention, the spaces of opportunity, the constraints and potentiality that make it possible to assess the possibility and need for regeneration of the housing estate and its surroundings, and form the basis of the discussion framework from where to start establishing intervention proposals. The intervention area is represented in axonometry, related vertically from the city to the buildings on the estate, to make it easier to read and to summarise the type of spaces of opportunity.

In order to determine spaces of opportunity, the formal, functional and spatial quality of the case studies at each scale is observed, which makes it possible to detect constraints and potential spaces within the housing estate, at its edge and in its surroundings, where action can be taken to improve its spatial cohesion. On an urban scale, on the edge and in the surroundings of the estate, spaces of opportunity can be found in its supporting structure and in the arrangement of the built elements and open spaces: in the discontinuities generated in the existing fabrics by their lack of integration and articulation between parts, inside or in the surroundings of the estate where there is a large amount of private or community open spaces that limits spatial continuity and contiguity, where there is a lack of public open spaces to improve it, and in the spaces that limit connectivity, accessibility and permeability, the connection and movement between the estate and its surroundings. Within the estate there are spaces of opportunity in its formal configuration, in the functionality and spatial quality of the open spaces and in its buildings: in the boundaries between parts of the estate that hinder the integration of the space between buildings and the articulation with the estate as a whole, in spaces where topographic variation causes spatial fragmentation, in obsolete buildings and spaces with undefined use, in spaces where accessibility difficulties limit their functionality and connectivity, and in places unprotected from the climate, with limited permeability and low visual control that make them less spatially attractive.

In order to recognise the spatial, formal and functional constraints existing in the housing estate and its surroundings, we observe how their existence conditions the connectivity, organisation and spatial integration of the estate in its interior, on its edge and in its surroundings.

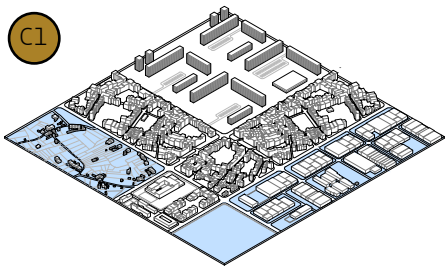
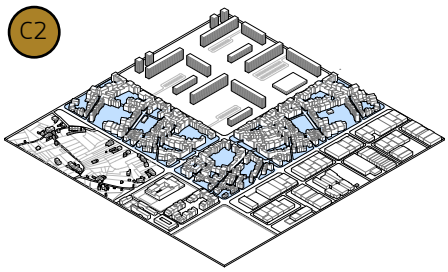
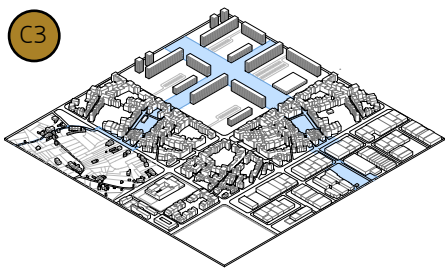
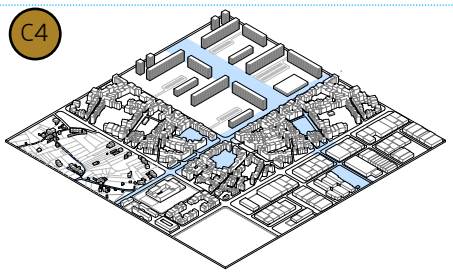
In order to evaluate the potentiality of the spaces of opportunity in the housing estate and its surroundings, we observe the possibilities for improvement and the effects of the intervention on the continuity of the urban fabric, on the creation of public open spaces, on the integration within the estate, on its edge and with the surrounding neighbourhoods, on the increase of connectivity, articulation, permeability, accessibility and spatial quality, on the movement between parts and the functional complexity of the estate's open space, on the promotion of neighbourhood relations and on the use of public and community open spaces.

### 5.3.2 What is the role of this section in the chapter?

In this thesis, spaces of opportunity are defined on the basis of their accumulative historical transformation, recognising structuring characteristics to be taken into account in any process of urban regeneration (p.37). To identify them, we use the analysis at different scales of the case studies, from the city to the dwelling, observing how and where constraints and potential spaces have been generated that over time have allowed their transformation, from their construction to their current state. This is done on the understanding that the intervention in a housing estate must not be isolated from the socio-spatial structure in which it is inserted, it cannot be considered an independent area segregated from its surroundings (urban, social, economic, environmental, etc.), the interrelation with its surroundings and the city as a whole must be contemplated, addressing local and global aspects that include a multi-scale perspective (from the neighbourhood to the city and from the city to the neighbourhood).

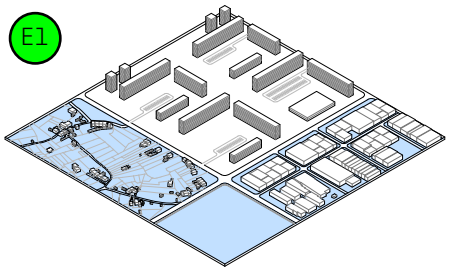
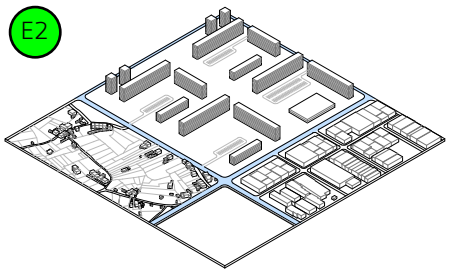
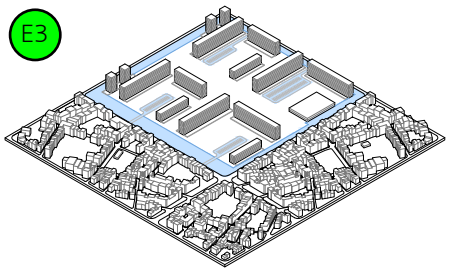
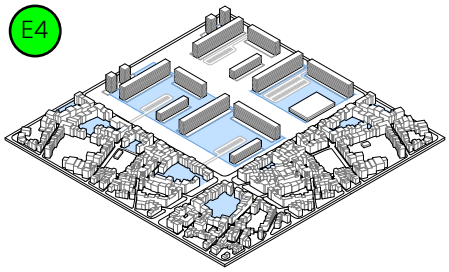
This section identifies spaces of opportunity where it will be proposed to intervene physically in a process of integral urban regeneration of a housing estate, with the objective of its formal and functional improvement in its interior, on its edge and on the scale of the city. The spaces of opportunity are grouped in this section forming a multi-scale interrelationship of spaces that are currently in disuse, obsolete, undefined, vacant or residual, lacking in spatial coherence, and which offer the opportunity to become spaces for social relations, open public, private or community spaces, in which their adaptation to the environment, their genesis and their morphological transformation must be considered as an essential element of their transformation, their rehabilitation and recycling in order to create a city.

CITY SCALE

| AREA | THE SPACES OF OPPORTUNITY |
|---|---|
|   | C1. Vacant spaces, rural areas and disused industrial zones, in proximity to housing estates. |
|   | C2. Urban open spaces around housing estates without a defined use (public, private and community open spaces). |
|   | C3. The network of roads, streets and paths that connect public open spaces (parks and squares) and these with the housing estates. |
|   | C4. The network of roads, streets and tracks that connect the nearby amenities and services and these with the housing estates. |

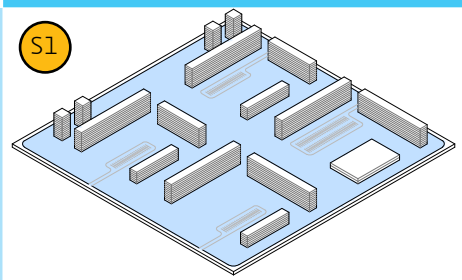
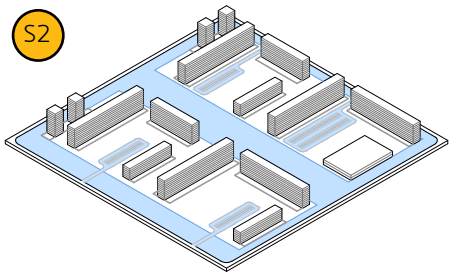
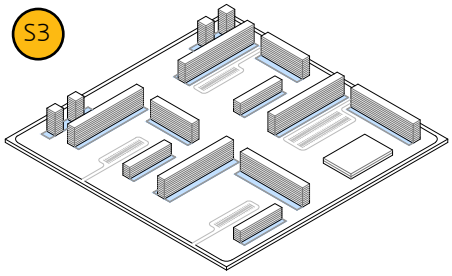
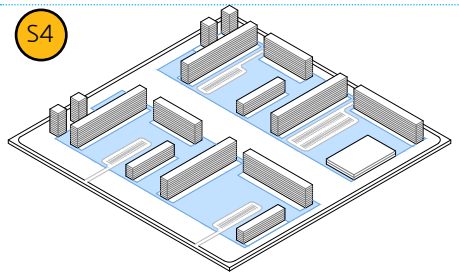
| CONSTRAINTS (problems) | POTENTIALITY (opportunities) |
|---|---|
| C1. The vacant or disused spaces around the housing estate act as a barrier, form spatial discontinuities and condition the spatial integration of the housing estate with the surrounding neighbourhoods. | C1. Acting on vacant or disused spaces close to the housing estates makes it possible to improve the continuity of the urban fabric in their proximity, to integrate it with the surrounding neighbourhoods and to achieve greater spatial cohesion of the estate in its immediate surroundings and with the rest of the city. |
| C2. The presence of open spaces without a defined use around the housing estate, the lack of open space for public use with recreational use (parks and squares) and the lack of articulation between the existing open spaces for public use and those of the housing estate, limits the spatial integration with its surroundings. | C2. Acting in urban open spaces around industrial estates allows for the creation and activation of a greater number of relationship spaces in open spaces with undefined use and their articulation to form a continuous network of public spaces. |
| C3. The lack of articulation between the existing open spaces for public use (parks and squares) and those on the housing estate limits spatial integration with its surroundings. | C3. Establishing connections between public open spaces around the housing estates allows for increased connectivity and articulation between them and their surroundings, to form a continuous network of green spaces. |
| C4. The predominance of road traffic and the lack of pedestrian continuity of the road structure around the housing estate limits connectivity and pedestrian accessibility from the housing estates and their surroundings to the amenities. | C4. Continuing with existing road structures, increasing their use by pedestrians in relation to local amenities and services, allows for increased connectivity, permeability and accessibility between different neighbourhoods and with the housing estate. |

NEIGHBOURHOOD SCALE. EDGES

| AREA | THE SPACES OF OPPORTUNITY |
|---|---|
|   | E1. The private open spaces located on the edge of the housing estate (vacant spaces, disused or obsolete rural and industrial spaces). |
|   | E2. The road network that delimits the edge of the housing estate and the open spaces adjacent to it. |
|   | E3. The public open spaces occupied by car parks on the edge of the housing estate. |
|   | E4. The community open spaces between buildings on the edge of the housing estate |

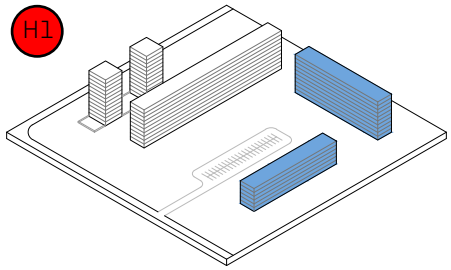
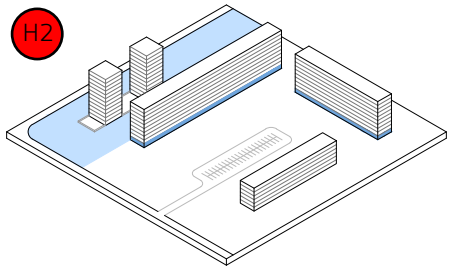
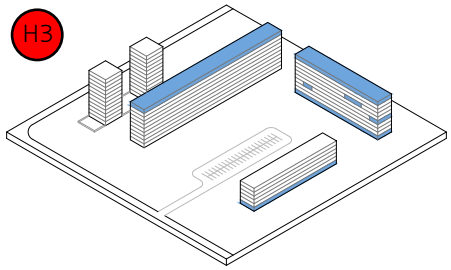
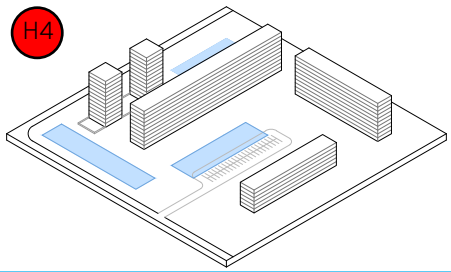
| CONSTRAINTS (problems) | POTENTIALITY (opportunities) |
|---|---|
| E1. The existence of private open spaces at the edge of the housing estate limits the spatial integration with its immediate surroundings. | E1. The improvement or integration of the fragments of open spaces on the edge of the housing estate allows for continuity in the urban fabric, achieving areas of relationship and improving accessibility between the housing estate and its surroundings. |
| E2. The existence of a perimeter road network around the housing estate limits accessibility, permeability and movement between the estate and its surroundings. | E2. Acting on the existing road structures on the edge of the housing estate allows for increased pedestrian use, improving accessibility and permeability between the housing estate and its surroundings. |
| E3. The existence of public open spaces occupied by car parks limits public use of the space, accessibility and movement between the housing estate and its surroundings. | E3. Facilitating the public use of space and eliminating cars on the surface of the community spaces adjacent to the edge and perimeter streets of the housing estate makes it possible to increase the spatial attractiveness and improve accessibility between the estate and its surroundings. |
| E4. The existence of unclassified and underused community open spaces between the buildings on the housing estate or in the surrounding neighbourhoods reduces the spatial quality of the surroundings and limits the articulation between the estate, the open spaces on the housing estate and its surroundings. | E4. Defining the use of the community open spaces on the edge of the housing estate allows for the acquisition of greater spatial quality, resolving its lack of definition with new uses, improving the connectivity between the open spaces around the housing, and linking the space of the estate with those of its surroundings. |

NEIGHBOURHOOD SCALE. SPACE BETWEEN BUILDINGS

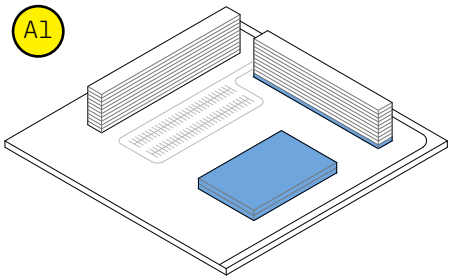
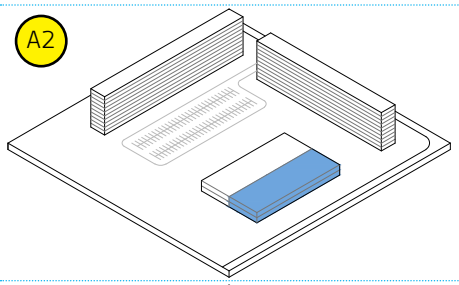
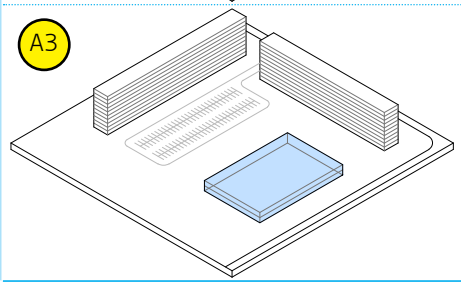
| AREA | THE SPACES OF OPPORTUNITY |
|---|---|
|   | S1. The open spaces inside the housing estate (public, private and community open spaces). |
|   | S2. The public open spaces inside the housing estate |
|   | S3. The private open spaces inside the housing estate |
|   | S4. The community open spaces between the buildings on the housing estate. |

| CONSTRAINTS (problems) | POTENTIALITY (opportunities) |
|---|---|
| S1. The existence of unclassified, fragmented, degraded and underused open space within the housing estate creates confusion between private, public and community spaces, reduces the spatial quality and limits the articulation between the open spaces of the housing estate and its surroundings. | S1. Delimiting the open spaces inside the housing estate, limiting its size and providing it with use, allows it to acquire greater spatial quality, improving the connectivity between the open spaces of the housing estate. |
| S2. The existence of extensive, degraded and underused public open spaces within the housing estate creates confusion between private and community spaces, reduces spatial quality and limits the articulation between the open spaces of the housing estate and its surroundings. | S2. Classifying the public open spaces inside the housing estate, providing it with a diversity of uses (rest and movement areas for different age groups), limiting its size, enhancing its continuity and establishing limits between public and private space, allows it to acquire greater spatial quality, improving the connectivity between the open spaces on the housing estate. |
| S3. The existence of degraded and/or underused private open spaces, corresponding to gardens or green areas within or around different residential areas of the housing estate, creates confusion between public and community space, reduces the spatial quality and limits the articulation between the open spaces of the housing estate and its surroundings. | S3. Defining the use of the private open spaces around the housing, makes it possible to acquire greater spatial quality, solve its lack of definition with new uses, and improve the connectivity between the open spaces around the housing and those of the rest of the housing estate. |
| S4. The existence of community open spaces with limited accessibility, poorly classified and underused between the buildings on the housing estate, reduces the spatial quality around the housing and limits the articulation between it, the open spaces on the housing estate and its surroundings. | S4. Defining the use of the community open spaces within the housing estate allows for the acquisition of greater spatial quality, resolving its lack of definition with new uses and improving the connectivity between the open spaces around the housing and those of the rest of the housing estate. |

NEIGHBOURHOOD SCALE. HOUSING

| AREA | THE SPACES OF OPPORTUNITY |
|---|---|
|   | H1. Obsolete residential buildings (constructively and typologically). |
|   | H2. Unoccupied ground floors in residential buildings and unused open spaces in their immediate surroundings. |
|   | H3. Obsolete and/or unoccupied dwellings and spaces in residential buildings. |
|   | H4. New public-private residential typologies in undefined open spaces. |

| | CONSTRAINTS (problems) | POTENTIALITY (opportunities) |
|---|---|---|
| | H1. The monofunctional housing of the housing estate, with a lack of typological, social, formal and spatial diversity, does not respond to the diverse needs of the current family structures and offers a uniform image of the whole, in addition to the obsolescence of the existing buildings, with construction pathologies, and a lack of environmental comfort and energy efficiency. | H1. Renovating, rehabilitating and/or recycling the existing houses makes it possible to increase the residential diversity, improve the constructive quality and the spatial quality in its environment, increasing the movement between different parts and the functional complexity in the open spaces of the housing estate. |
| | H2. The lack of typological, formal and functional diversity of the existing residential buildings offers a uniform image of the building, which influences the spatial quality of the open spaces around the buildings. | H2. Complementing residential use with other activities (commerce, offices, workshops, etc.), facilitates the diversity of use inside the residential buildings on the housing estate, on the ground floors or in their immediate surroundings, promoting neighbourhood relations and the use of public and community open spaces. |
| | H3. The lack of typological, formal and functional diversity of the existing residential buildings offers a uniform image of the building, which influences the spatial quality of the open spaces around the buildings. | H3. Complementing residential use with shared services within existing or newly constructed residential buildings improves spatial quality by increasing functional complexity and neighbourhood relationships. |
| | H4. The lack of typological, social, formal and spatial diversity of the housing on the housing estate does not meet the needs of current family structures and reduces the connectivity and relationship between parts of the housing estate. | H4. Constructing new public-private residential typologies in undefined open spaces allows for an increase in residential diversity, improving the quality of construction and the spatial quality of its surroundings, increasing movement between different parts and functional complexity in the open space of the housing estate. |

| | AREA | THE SPACES OF OPPORTUNITY |
|---|---|---|
| NEIGHBOURHOOD SCALE. AMENITIES |   | A1. Commercial buildings, obsolete or abandoned public amenities and vacant premises. |
| |   | A2. Obsolete and/or unoccupied spaces in non-residential buildings. |
| |   | A3. Commercial buildings and public amenities in use. |

| CONSTRAINTS (problems) | POTENTIALITY (opportunities) |
|---|---|
| A1. The lack of commercial services and tertiary activities forces residents to move to other areas with commerce and services, reducing urban vitality. This, together with the existence of abandoned commercial premises and areas, reduces the spatial quality, limiting the connectivity and articulation between the different parts of the estate and its surroundings. | A1. Acting on obsolete or abandoned buildings within the housing estates makes it possible to rehabilitate and recycle their space to acquire a new use, promote alternative uses, modify or adapt the use for which it was intended, and at the same time introduce activities that improve the spatial quality and connectivity between the different parts of the estate and its surroundings. |
| A2. The lack of services in the existing amenities limits their use and the presence in the open spaces of neighbours or other residents of the surroundings, diminishing the spatial quality due to the lack of movement between the different parts of the housing estate and its surroundings. | A2. Complementing existing amenities with new uses, sharing spaces and services, both inside the buildings and in their surroundings, favours the efficiency of resources, neighbourhood relations, and connectivity between the different parts of the housing estate. |
| A3. The absence or presence of amenities with no significant urban value or of reference outside the area of the housing estate limits the presence of residents from other neighbourhoods and the need to visit the housing estate. | A3. Relating the use of amenities and services with the outside space, creating spaces of activity in the immediate surroundings, makes it possible to achieve greater spatial quality, by increasing the movement between different parts and the functional complexity in the open spaces of the housing estate. |

## § 5.4 Urban regeneration guidelines for housing estates

This section determines 1/ the spatial configuration resulting from the introduction of improvement measures in the spaces of opportunity, 2/ the managerial actions that should be considered by public policies and their financing to improve the spatial values of the estate and its surroundings, and 3/ the operability of the actors involved in the execution and administration of the projects, in order to establish proposals for the improvement of open spaces and spatial cohesion in the regeneration of the estates.

### 5.4.1 What is this section about?

This section establishes guidelines for the physical regeneration of the housing estate, as a framework for discussion from which to begin to establish proposals for intervention, to be applied to spaces of opportunity on the scale of the estate, on its edge and with the city, influenced by managerial actions (the spatial values that public policies and their financing should consider), and operability (the consequence of decision-making by those who execute or administer the projects: public administrations, neighbours, planners, etc.) in the design of the project for public, community and private open spaces.

The section is divided into two main parts: the first contains a table with the guidelines that should be read horizontally, combining the four cells that describe the area of intervention, the spatial configuration, the managerial actions and the operability of the intervention in each opportunity space. In the table, the scales of the intervention are related vertically from the city to the housing estate buildings, organised as a multi-scale and interrelated whole. The area of intervention is represented in axonometry to facilitate its reading and to exemplify in a synthetic way the type of actions that can take place in each space of opportunity to activate its potential. The second part of this section presents a proposal for the application of the guidelines in one of the case studies of the thesis, the Barrio das Flores in A Coruña, showing through diagrams and photomontages the different spaces of opportunity, the place where an intervention can take place and a proposal for the type of intervention to be carried out at each scale, from the city to the housing estate building, in order to jointly achieve the improvement of open spaces and spatial cohesion in the regeneration of the housing estate.

In order to determine the spatial configuration resulting from the introduction of open spaces enhancement measures in spaces of opportunity, its potential and what would enable it to be activated is recognised. This determines those physical aspects on which to intervene at each scale within an urban regeneration project in a housing estate, and the parameters that influence the capacity to achieve the enhancement of open spaces and favour spatial cohesion.

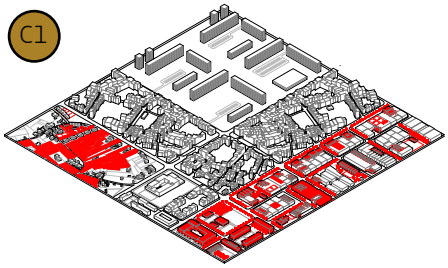
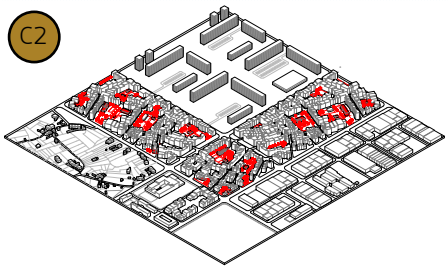
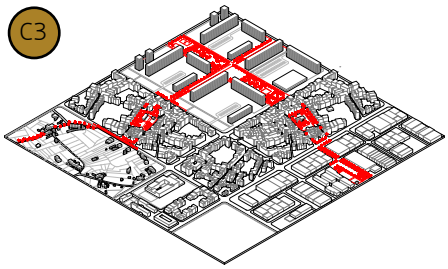
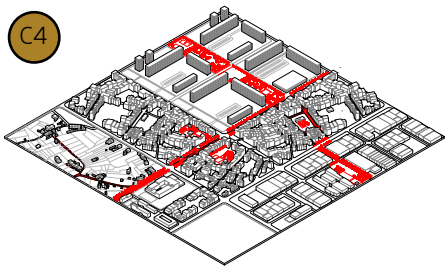
In order to determine the managerial actions, the spatial values that should be considered by public policies and the necessary financing mechanisms to enable projects to improve open spaces at different scales in the areas of opportunity are recognised. This makes it possible to optimise the integral nature of the estate's urban regeneration project, complementing aspects on which sectoral policies intervene in order to relate them jointly at all scales of intervention.

In order to determine how the actors involved in the implementation and administration of the projects should operate, the role and relationships that must be established between them in order to efficiently manage the regeneration of the estate are recognised. This should make it possible to establish consensual decisions between all the actors, in order to validate the applicability of policies, the integration of actions, and the design, development and continuity of projects over time and at all scales of intervention.

### 5.4.2 What is the role of this section in the chapter?

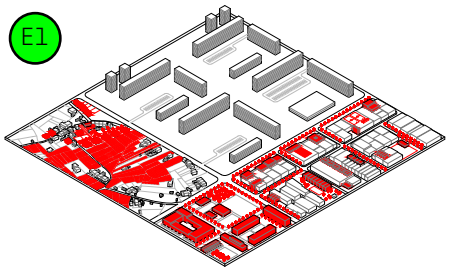
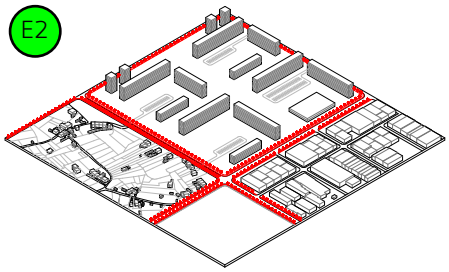
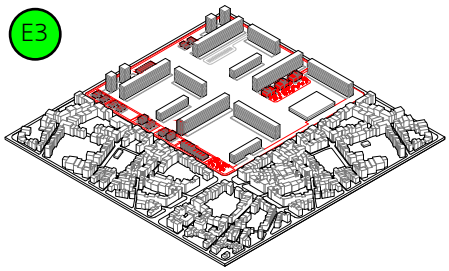
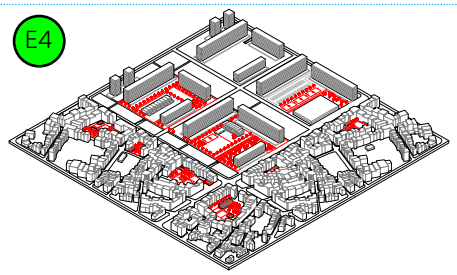
The guidelines make it possible to include the neighbourhood and urban scale as a value in the transformation of the urban project over time, which in this chapter on its future possibilities, shows in this section how to activate the spaces of opportunity found in them. These guidelines serve as an aid to decision-making at an initial stage of the project process for the regeneration of the estate, where the value of the urban design provided by the designers incorporates into the discussion their experience, the value of the past and the present and the decision on the elements that must be taken into account to begin the project process (p.39). This is done by understanding that the urban regeneration project of an estate must be integrated at different scales, bringing together design, planning and management, to act on the physical aspects at the scale of the neighbourhood within an integral action, and be part of the policies that encompass the planning of the city as a whole, because of how they affect its needs, the overall efficiency of the urban system and spatial cohesion.

The guidelines define hypotheses for improvement and change in the future of the estates, taking up the recommendations that have been put into practice in European cases to improve the connectivity, articulation, integration and spatial cohesion of their relationship spaces in the public project. This makes it possible to consider them as an open scheme in which to continue to integrate both future forms of intervention and the decisions that make it possible to implement them. This can be seen in the case chosen to exemplify its application and in the resulting proposal, chosen because of the protected and heritage character of the UV3 in the Barrio das Flores, proposing an intervention based on the rehabilitation and recycling of its spaces, which reactivates its activity, recovering the original one or providing it with an alternative or complementary use that reappraises it in relation to the neighbourhood, its surroundings and the city. The aim is not to represent the example of what should be done, but rather its possibility, understanding that this is one of the many alternatives that can be given in this space now and that will be different over time, due to the proposals of the designers, the resources to finance them, the possibilities for reaching agreements on the measures to be applied, the technical means to implement them and, above all, the needs of the residents.

| | AREA | SPATIAL CONFIGURATION |
|---|---|---|
| CITY SCALE | C1  | C1. Recognise vacant spaces, rural areas and disused industrial zones, in proximity to housing estates, as places where a greater spatial integration between neighbourhoods can be achieved, giving social use to these urban fragments so as to achieve an urban fabric with greater permeability, accessibility and continuity through their diversity. |
| | C2  | C2. Consider the integration of urban open spaces around the housing estates, to form a network of public spaces that increases the spatial articulation between different urban fragments. |
| | C3  | C3. Create a continuous network of green corridors that structure and integrate the existing or potential public open spaces, which are linked by paths, streets and roads that connect the estates with their surroundings, improving their connectivity. |
| | C4  | C4. Create a network of pedestrian corridors, paths and shared streets that connect amenities and services close to the housing estates, increasing connectivity, permeability and accessibility between different neighbourhoods and with the estate. |

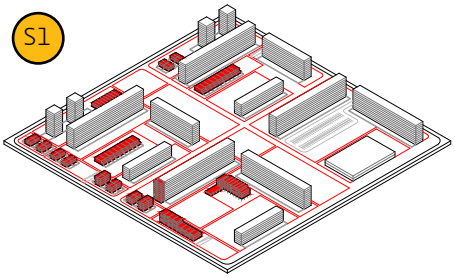
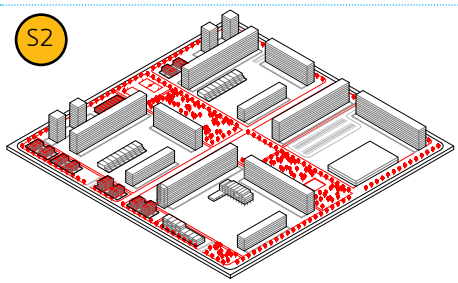
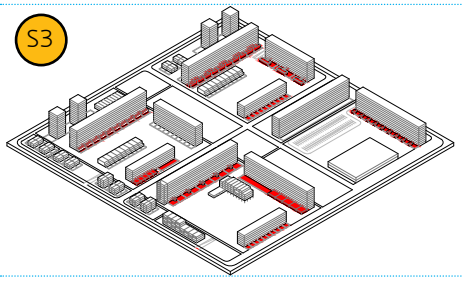
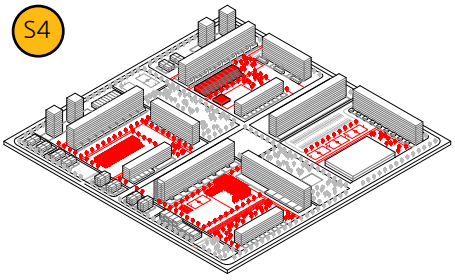
| MANAGERIAL ACTIONS | OPERABILITY |
|---|---|
| C1. Establish regulatory and public-private financing mechanisms for urban regeneration through flexible planning figures that allow for joint action at different scales: in the urban fragment, on its edge and in relation to the infrastructures that connect it to the urban structure. | C1. The local council, in coordination with authorities at different levels, provides administrative support, seeks economic agreements with private investment, and encourages coordination between designers, private owners and neighbourhood associations to make use of the vacant spaces around the housing estates. |
| C2. Recognise in municipal planning the structuring role of urban public spaces. Establishing regulatory and financing mechanisms for the creation of relationship spaces in open spaces with indefinite use and their organisation to form a continuous network of public spaces. | C2. The local council provides administrative and financial support so that the planners can identify and exploit the urban open spaces around the housing estates, with the participation of the neighbourhood associations. |
| C3. Recognise in municipal planning the structuring role of natural networks in which to integrate urban open spaces. Regulating the ownership of the space with assignments of use, exchanges or expropriations to improve its accessibility and use. | C3. The local council and the neighbourhood associations will detect possible connections between green spaces in order to increase the relationship and connectivity between them, the housing estates and their surroundings. |
| C4. Establish regulatory and financing mechanisms for the transformation, rehabilitation or recycling of existing road structures, increasing their pedestrian use, pedestrianizing them or sharing traffic. | C4. The local council and the neighbourhood associations will detect the existing connection networks and centres of daily attraction, seeking to increase connectivity and pedestrian accessibility from the housing estates and their surroundings to the amenities. |

NEIGHBOURHOOD SCALE. EDGES

| AREA | SPATIAL CONFIGURATION |
|---|---|
|   | E1. Consider private space for public use in areas on the urban edge (vacant, rural and industrial spaces), with the aim of achieving areas of relationship from the improvement or integration of fragments of existing open spaces, or as a strategy of densification to give continuity to the urban fabric and improve accesibility between the estate and its surroundings. |
|   | E2. Reduce and control the speed of the roads around the estate (converting the avenues into streets, shared roads or spaces of relationship, modifying the width of the road, increasing the number of pedestrian crossings, eliminating physical barriers, etc.), to allow the improvement of accessibility, permeability and movement between the estate and its surroundings, which facilitates the appropriation of the open space for pedestrians and social life in the streets. |
|   | E3. Create collective car parks close to the homes or attached to their ends, on the surface or underground, with retail premises on the ground floor and homes. To facilitate the public use of the space and the elimination of the car on the surface of the community spaces adjacent to the edge and perimeter streets of the estate, increasing the spatial attraction of the whole. |
|   | E4. Define the use of the community open spaces of the urban fabric on the edge of the housing estate, to provide them with greater spatial quality, resolving their lack of definition with new uses, improving connectivity and articulation with the estate to form a network of public spaces. |

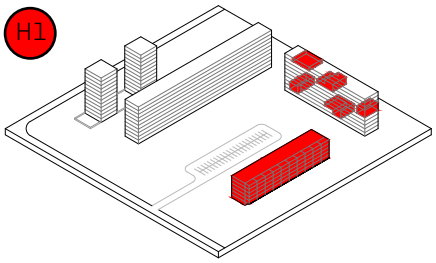
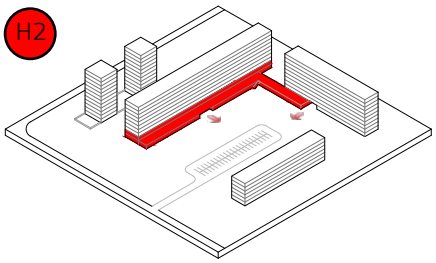
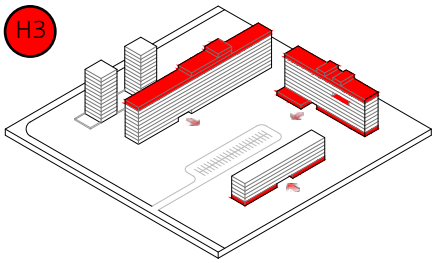
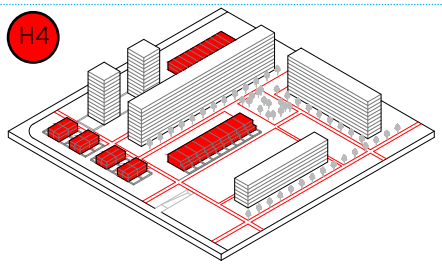
| | MANAGERIAL ACTIONS | OPERABILITY |
|---|---|---|
| | E1. Establish regulatory and financing mechanisms for the public assignment of private space, allowing the change of use and/or the alternative or temporary use of vacant, obsolete or disused spaces, creating a programme of tax incentives for these actions or through an exchange of constructability for the assignment of private space for public use. | E1. The local council, in coordination with the relevant public authorities, provides administrative and financial support, negotiating the transfer of land with private owners, so that the designers can enhance and integrate the private open spaces around the housing estates into the urban fabric, with the participation of the neighbourhood associations. |
| | E2. Establish regulatory and financing mechanisms for the transformation, rehabilitation or recycling of existing road structures, increasing their pedestrian use, pedestrianizing them or sharing traffic. | E2. The local council, in coordination with the relevant public authorities, provides administrative and financial support so that the designers can improve the integration of the road network around the housing estates, with the participation of the neighbourhood associations. |
| | E3. Establish regulatory and financing mechanisms for the transformation of the open spaces dedicated to parking, increasing its pedestrian use, pedestrianizing it or sharing traffic. | E3. The local council, in coordination with the relevant public authorities, residents, technicians and designers, establishes the guidelines for intervention on the open spaces on the edge of the estate, overseeing its execution, monitoring and evaluation. |
| | E4. Establish regulatory and financing mechanisms for the transformation of the community open spaces on the edge of the housing estate, increasing its public use, its permeability and its connection with the network of open spaces on the housing estate. | E4. The local council, in coordination with neighbours and planners, establishes the guidelines for intervention on the community open spaces on the edge of the estate, overseeing its execution, monitoring and evaluation. |

NEIGHBOURHOOD SCALE. SPACE BETWEEN BUILDINGS

| AREA | SPATIAL CONFIGURATION |
|---|---|
|   | S1. Delimiting the open spaces inside the estates, modifying the layout by means of aggregation, subdivision and/or redistribution, with its rehabilitation and recycling and obtaining building plots, makes it possible to achieve greater spatial quality, improving connectivity between the open spaces of the estate, increasing density and constructability through new building types with mixed use. |
|   | S2. Qualifying the public open spaces inside the estate, by means of its rehabilitation and recycling, providing it with a diversity of uses, limiting its size, promoting its continuity and establishing limits between public and private space, makes it possible to achieve greater spatial quality, improving the connectivity between the uses and the open spaces of the estate. |
|   | S3. Defining the use of the private open spaces around the dwelling makes it possible to acquire greater spatial quality, resolve its lack of definition with new uses and improve the connectivity between the open spaces around the dwelling and those of the rest of the housing estate. |
|   | S4. Defining the use of the community open spaces inside the estates, in situations on the edge, of connections between different fabrics, of topographical variation, of reorganization of spaces without use or parking, between residential units and in vacant plots, by building new residential typologies with mixed uses, makes it possible to achive greater spatial quality and to improve the connectivity between the open spaces of the estate. |

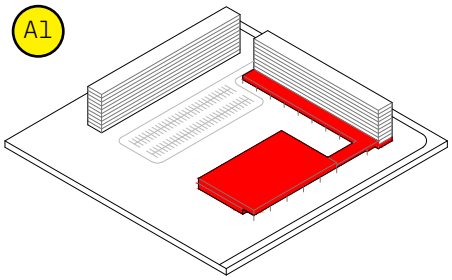
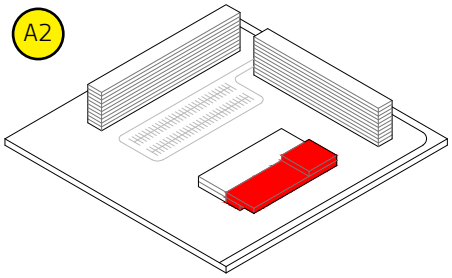
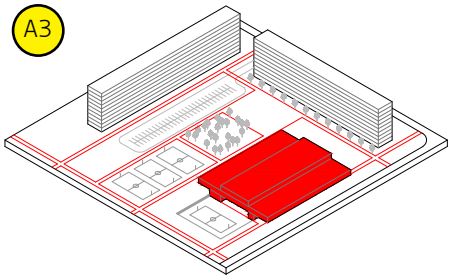
| | MANAGERIAL ACTIONS | OPERABILITY |
|---|---|---|
| | S1. Establish regulatory and flexible financing mechanisms to redistribute and classify public, private and community land on the housing estate, allowing for the incorporation of new public and private uses. With a model of flexible access to financing, funds can be diverted from one item to another in the budget, allowing for the participation of neighbours and the compensation of their work in other actions. | S1. The local council, in coordination with the relevant public authorities, residents, technicians and designers, establishes the guidelines for intervention on the open spaces within the estate, overseeing its execution, monitoring and evaluation. |
| | S2. Establish regulatory mechanisms and flexible public-private financing to classify, delimit and expand public land, forming a network of public spaces on which to arrange activities on the ground floor and organise upond multifunctional nodes that increase movement between parts of the housing estate. | S2. The local council, in coordination with the relevant public authorities, the residents and the designers, defines and administers the use of the public open spaces within the housing estate. |
| | S3. Establish regulatory and flexible public-private financing mechanisms to define the use of private land, maintaining private property or through purchase, expropriation or assignment for public use through tax incentives or exchange of building permits. | S3. The local council, in coordination with the relevant public authorities, the residents and the planners, defines and manages the use of the private open spaces around the housing on the housing estate. |
| | S4. Establish regulatory mechanisms and flexible public-private financing to increase the constructability allowed with the partial occupation of indefinite community open spaces between residential units and on vacant unused plots. | S4. The local council, in coordination with the relevant public authorities, the residents and the planners, defines the use of the community open space within the estate. Once the programmes and needs of the proposed interventions have been decided, they will manage their execution with public-private financing, and in this case with the participation of private companies for their development, monitoring and evaluation. |

NEIGHBOURHOOD SCALE. HOUSING

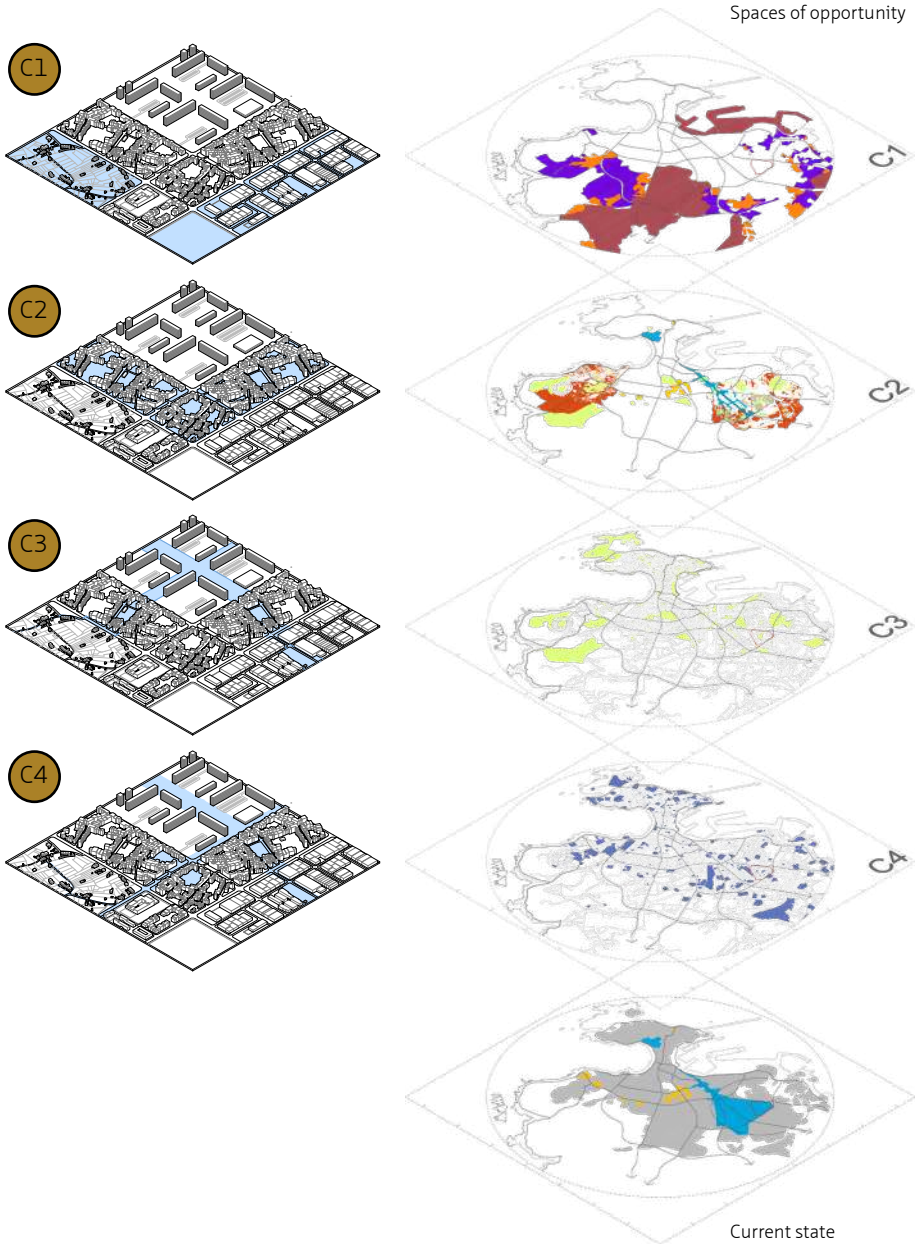
| AREA | SPATIAL CONFIGURATION |
|---|---|
|   | H1. Complementing the existing building on the housing estate with new residential typologies, both publicly and privately developed, helping to increase residential and family diversity, allows for increased movement between parts and functional complexity in the open spaces of the housing estate. |
|   | H2. Incorporating proximity and productive activities in the residential buildings on the estate (e.g., shops, offices, workshops, amenities, etc.), in a way that facilitates diverse uses and mixed ownership, inside the home, on the ground floor or in their immediate surroundings, encourages neighbourhood relations and the use of public and community open space. |
|   | H3. Incorporating shared services inside existing or new residential buildings improves spatial quality by increasing functional complexity, promoting neighbourhood relations, helping to enhance and activate the existing neighbourhood networks on the estate (e.g. the elderly, young people, people at risk of exclusion, single-parent families, etc.). |
|   | H4. Building new public-private residential typologies in undefined open spaces increases residential diversity, improves building quality and spatial quality in their surroundings, increasing movement between parts and functional complexity in the open spaces of the housing estate. |

| | MANAGERIAL ACTIONS | OPERABILITY |
|---|---|---|
| | H1. Make urban planning regulations more flexible in coordination with different administrative tiers in order to make it possible to make public land available for temporary use, transform the interior of existing buildings, improve energy and environmental efficiency, incorporate new residential types and promote accessible housing alternatives under different types of management regimes (e.g., social renting, cooperative, co-housing, etc.). | H1. The public authorities will promote the renovation, rehabilitation, recycling or construction of public-private housing on the site, reaching an agreement with the neighbourhood association or the owners to obtain public funding or to purchase the property, with the participation of private planners and developers. |
| | H2. To make urban planning regulations more flexible in coordination with different administrations and to regulate alternative forms of financing, with tax and administrative benefits, in order to promote the existence of heterogeneous residential typologies, favouring reforms, extensions, horizontal property subdivisions, plot aggregations, or changes of use. Encouraging the rental, transfer or purchase of space for offices, workshops, shops or other uses. | H2. The public authorities will promote the renovation, rehabilitation and/or recycling of part of a building or neighbourhood unit on the housing estate, by means of an agreement with the neighbourhood association or the owner of the property for rental or purchase, with the participation of designers to help enhance it, and of private promoters and individuals for its execution and operation. |
| | H3. Make urban planning regulations more flexible to allow for the diversity of uses and services in the same building or neighbourhood unit. Allowing the horizontal division of properties. Encouraging the rental or purchase of spaces to incorporate new uses and new residential types. | H3. The public authorities will promote the incorporation of shared services in the new construction, renovation, rehabilitation, or recycling of a building or neighbourhood unit on the housing estate, by means of an agreement with the residents' association or the property owner, with the participation of designers to enhance it. |
| | H4. Modify the urban planning regulations in coordination with different administrative tiers in order to enable the use of public land for temporary use, build new residential typologies and promote accessible housing alternatives in different types of management systems (e.g. social renting, cooperative, co-housing, etc.). | H4. The public authorities will promote the construction of public-private housing on the estate, with the participation of private planners and developers. |

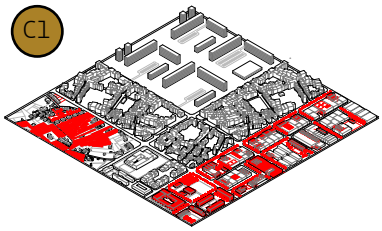
NEIGHBOURHOOD SCALE. AMENITIES

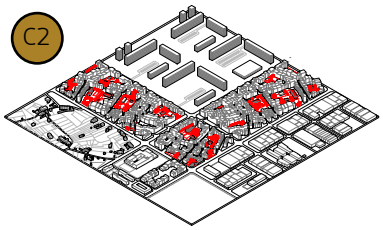
| AREA | SPATIAL CONFIGURATION |
|---|---|
|   | A1. Acting on commercial buildings, obsolete or abandoned public amenities and vacant premises within the estates allows for the rehabilitation and recycling of their space to acquire a new use, promote alternative uses, modify or adapt their intended use, and at the same time introduce activities for different ages that improve the spatial quality and connectivity between the different parts of the estate and its surroundings. |
|   | A2. Creating spaces for shared use in existing equipment and services, adding uses, sharing spaces and services, both inside the building and in its surroundings, favours the efficiency of resources, neighbourhood relations and connectivity between the different parts of the housing estate. |
|   | A3. Connecting the use of the amenities with the outside space: opening the façades, with transparent ground floors, with permeable enclosures, linking waiting spaces or spaces with more activity to the street, and creating spaces of activity in the immediate surroundings, makes it possible to achieve greater spatial quality, by increasing the movement between parts and the functional complexity in the open spaces of the housing estate. |

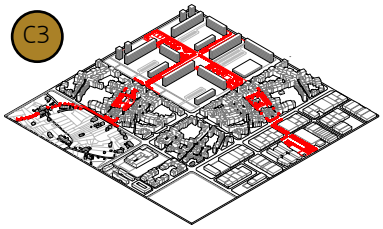
| | MANAGERIAL ACTIONS | OPERABILITY |
|---|---|---|
| | A1. Make urban planning regulations more flexible in order to renew, rehabilitate, recycle or construct buildings within the estate, allowing for changes in use, modification, adaptation, alternative or temporary use, and volumetric and/or spatial transformation. | A1. The public authorities will promote the renovation, rehabilitation and recycling of obsolete or abandoned buildings on the site, drawing up an agreement to obtain public funding or to purchase the property when the property is not public. They will have the participation of planners and residents in order to enhance its value, of public-private developers for its execution, and of these and/or civic entities for its management. |
| | A2. Make urban planning regulations more flexible to allow changes of use in a public structure. Allowing the transformation of its space, by means of aggregation and/or subdivision, and the incorporation of community, public or private spaces. | A2. The local council, in coordination with the neighbours and the planners, establish the guidelines for intervention in the existing amenities and services, managing their execution, monitoring and evaluation, with the participation of private developers and civic organisations in the neighbourhood for their management. |
| | A3. Make urban planning regulations more flexible to allow the temporary use or incorporation into public amenities of community, public or private spaces located in their environment, according to a system of temporary use or sale. | A3. The local council, in coordination with the neighbours and the planners, draws up the guidelines for intervention in the existing amenities and services, managing their implementation, monitoring and evaluation. |

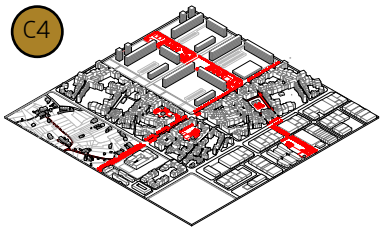

C1
C2
C3
C4
Spaces of opportunity
C1
C2
C3
C4
Current state

Private Open Spaces | Community Open Spaces | Public Open Spaces | Green corridor | Pedestrian | Consolidated city
Vacant spaces | Rural areas | Industry | Amenities | Housing estates 1939-59 | Housing estates 1960-76

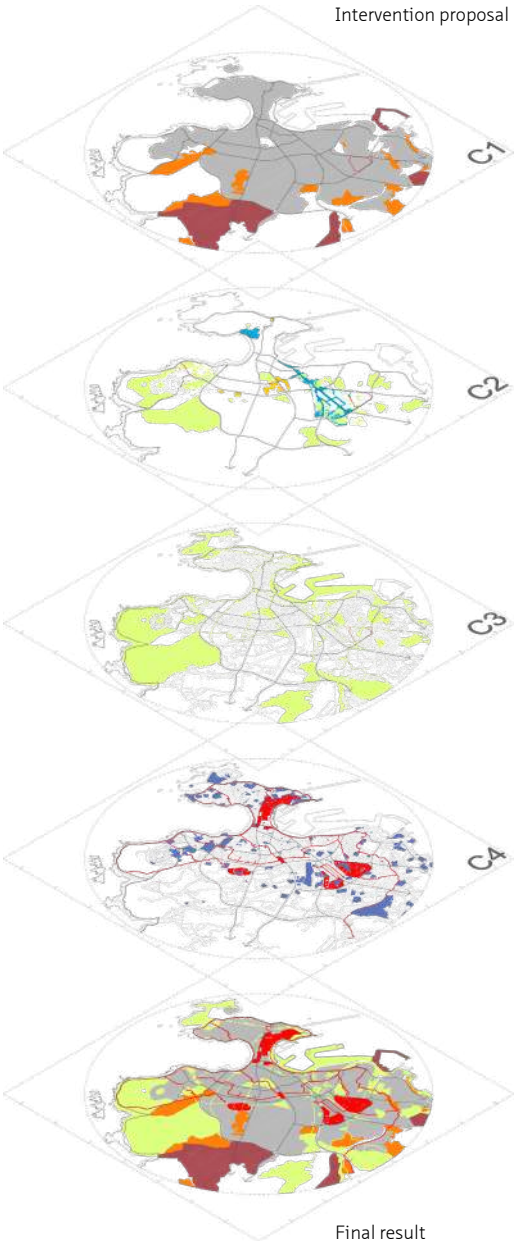


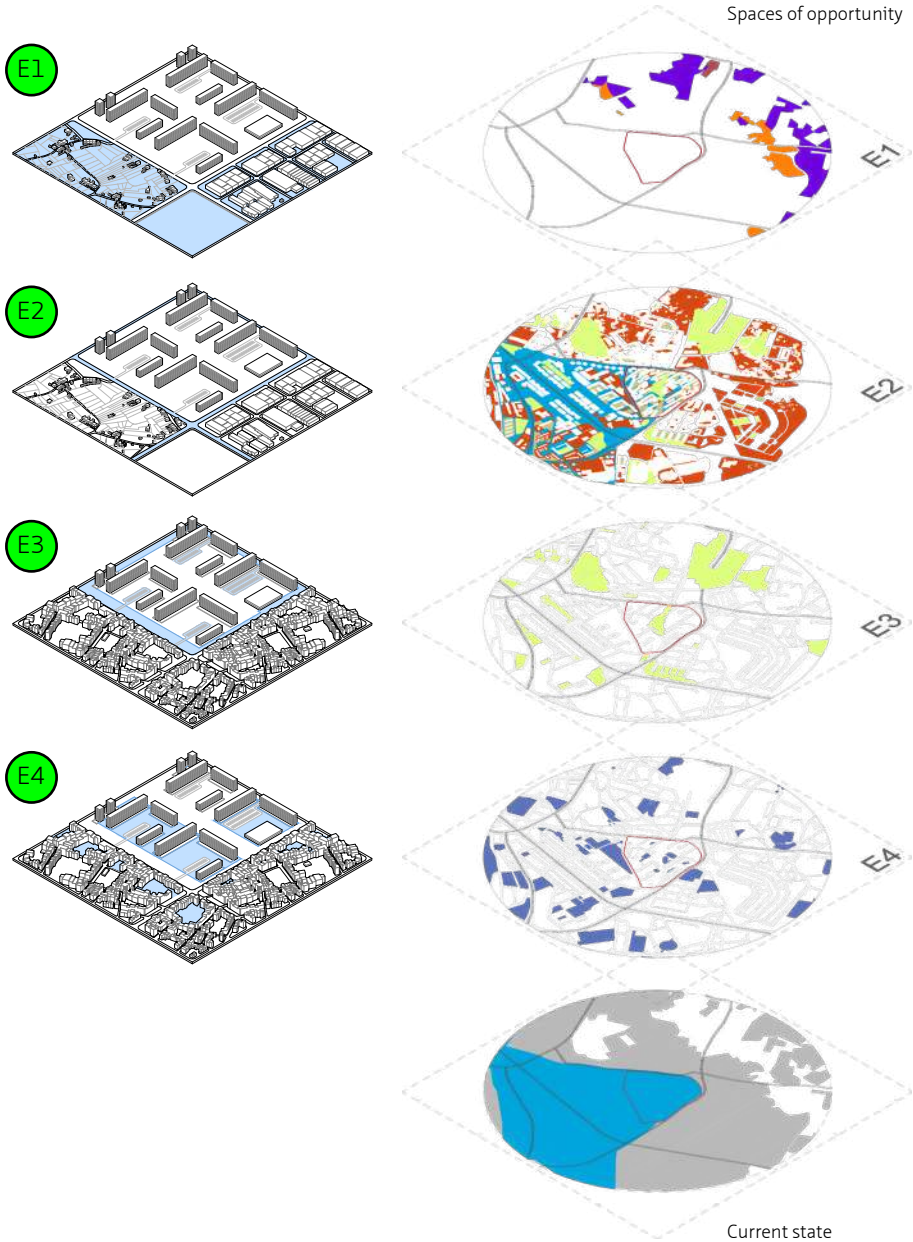



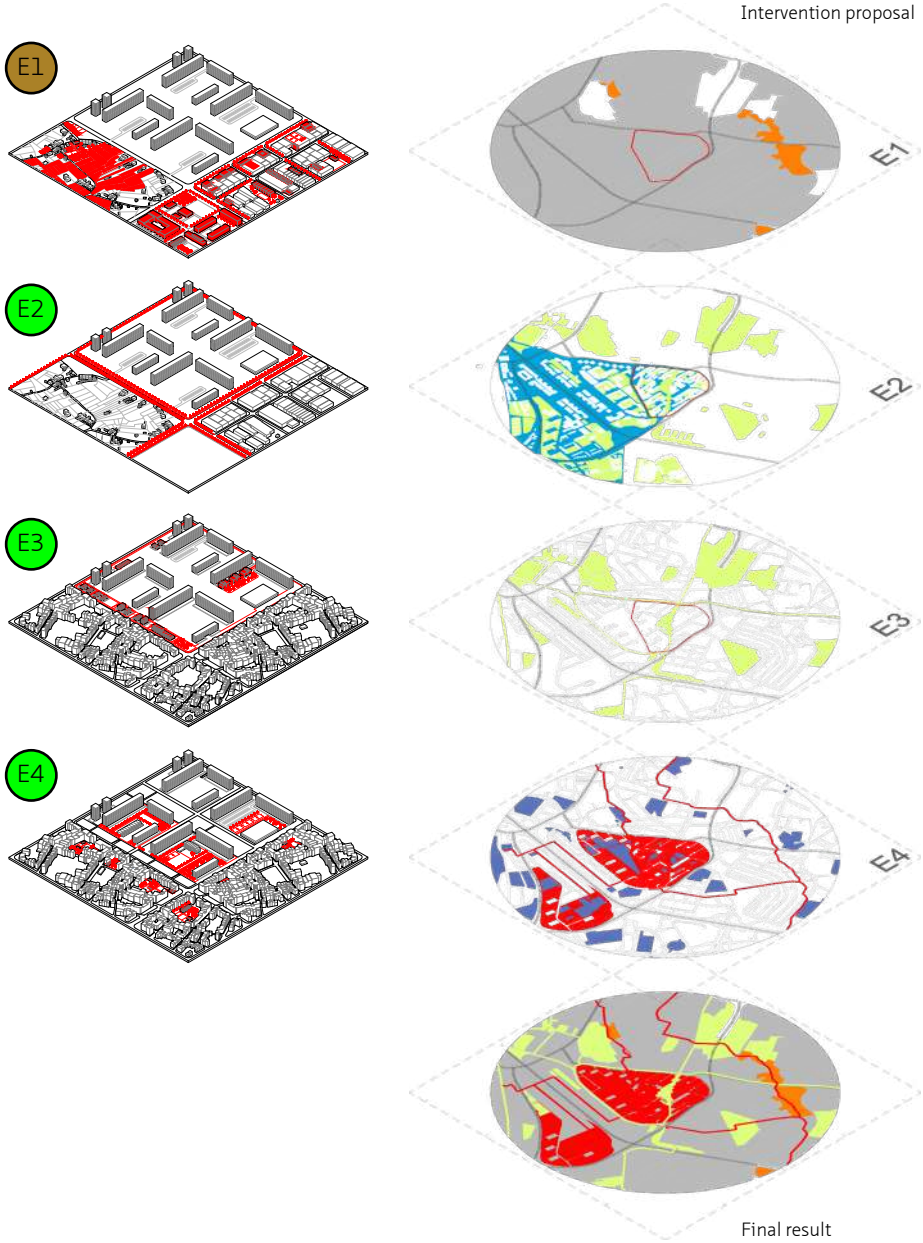

Intervention proposal




Final result


Spaces of opportunity
E1
E2
E3
E4
E1
E2
E3
E4
Current state

Private Open Spaces | Community Open Spaces | Public Open Spaces | Green corridor | Pedestrian | Consolidated city
Vacant spaces | Rural areas | Amenities | Housing estates 1960-76

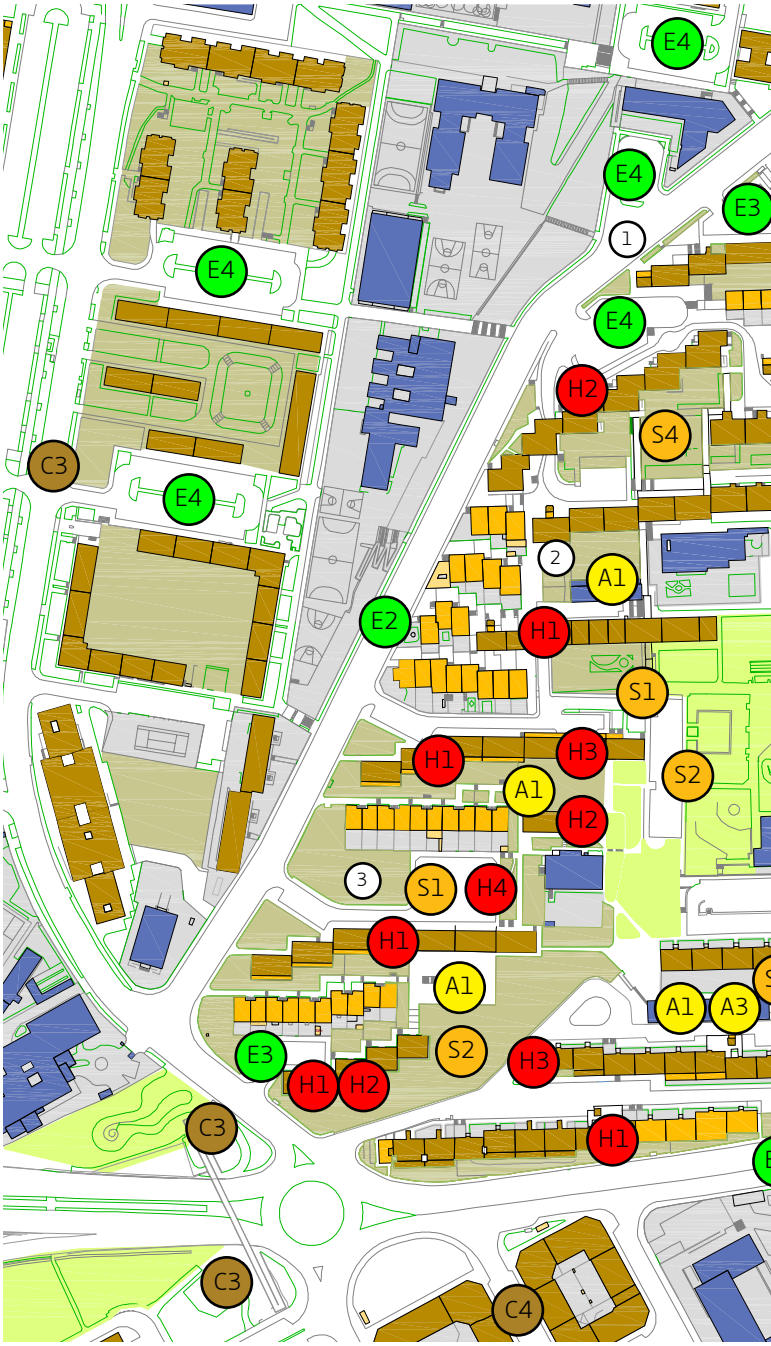



1
Street

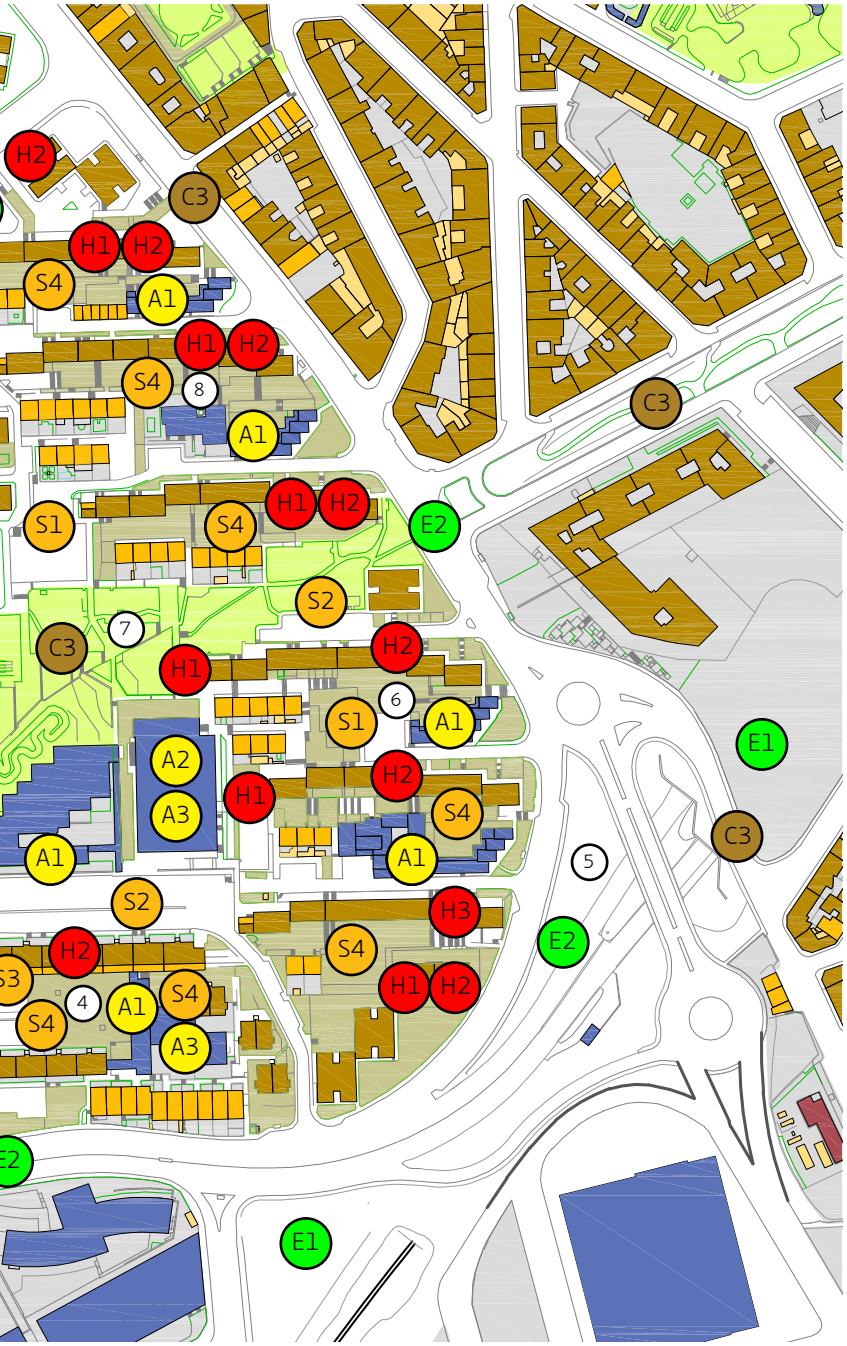

2
UV5


3
UV4


4
UV3

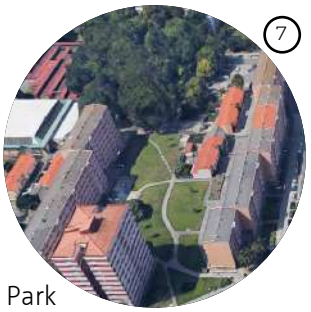

E4
E4
E3
1
E4
H2
S4
C3
E4
2
A1
E2
H1
S1
H1
H3
S2
A1
H2
3
S1
H4
H1
A1
A1
A3
E3
S2
H3
H1
H2
C3
H1
C3
C4

Amenities | Buildings<3floors | Building>3floors | Private Open Spaces | Community Open Spaces | Parks & Squares | Road Network



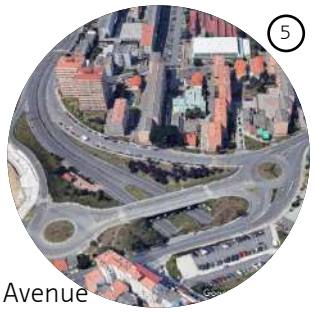


UV1




Park


UV2




Avenue

Public spaces in under-utilised community open spaces and car parks.

Productive activities in existing housing (shops, offices, workshops, amenities, etc.)

New residential typologies in the obsolete spaces of existing housing.

Convert the avenue into a street and a space for relationships.

Complement the existing building with new residential typologies and productive activities on the ground floor.

Transform the Central Park into a natural neighbourhood centre well connected to the residential area and its activities.

Cultural Centre in an abandoned public building.

Extend the day centre and build housing for the elderly in community open spaces.

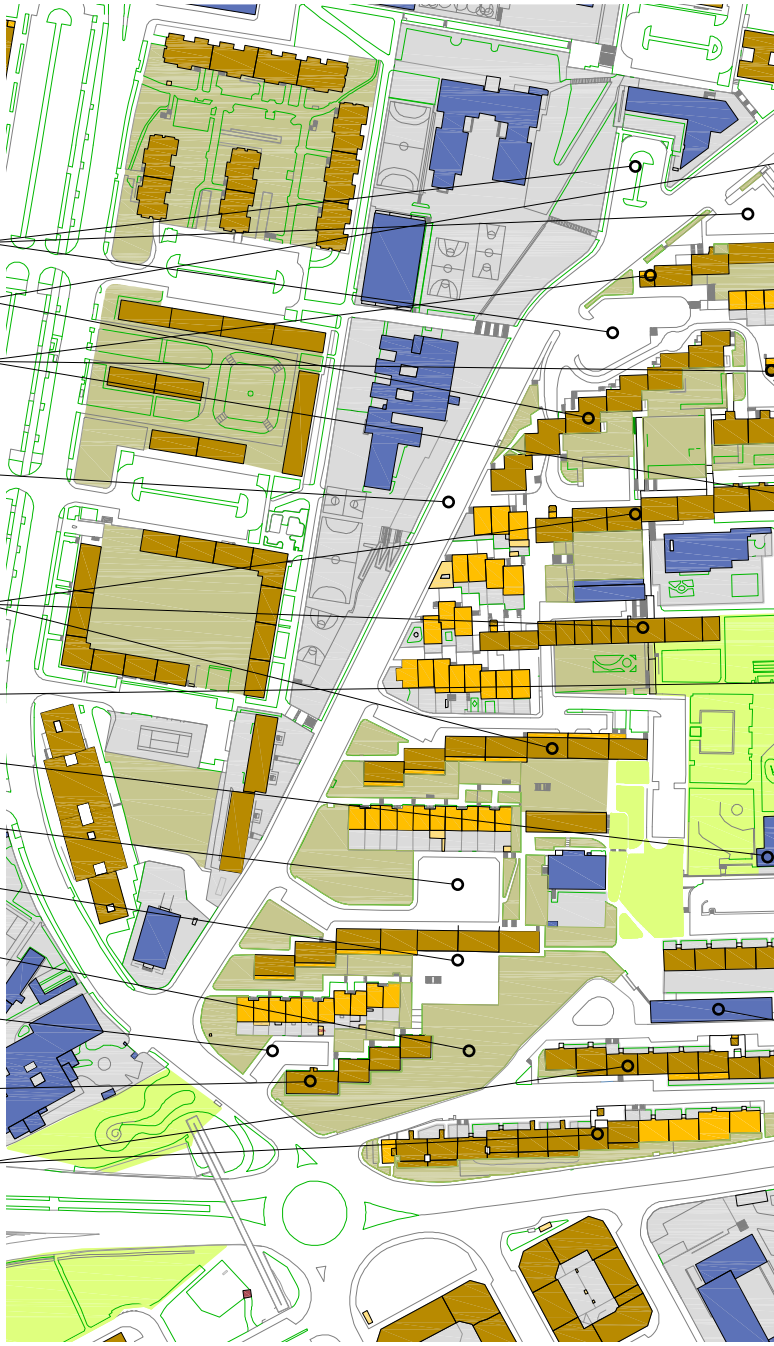
New residential typologies and shared services in obsolete spaces and vacant premises.

Expand the central park in under-utilised public open spaces.

Public spaces in under-utilised community open spaces and car parks.

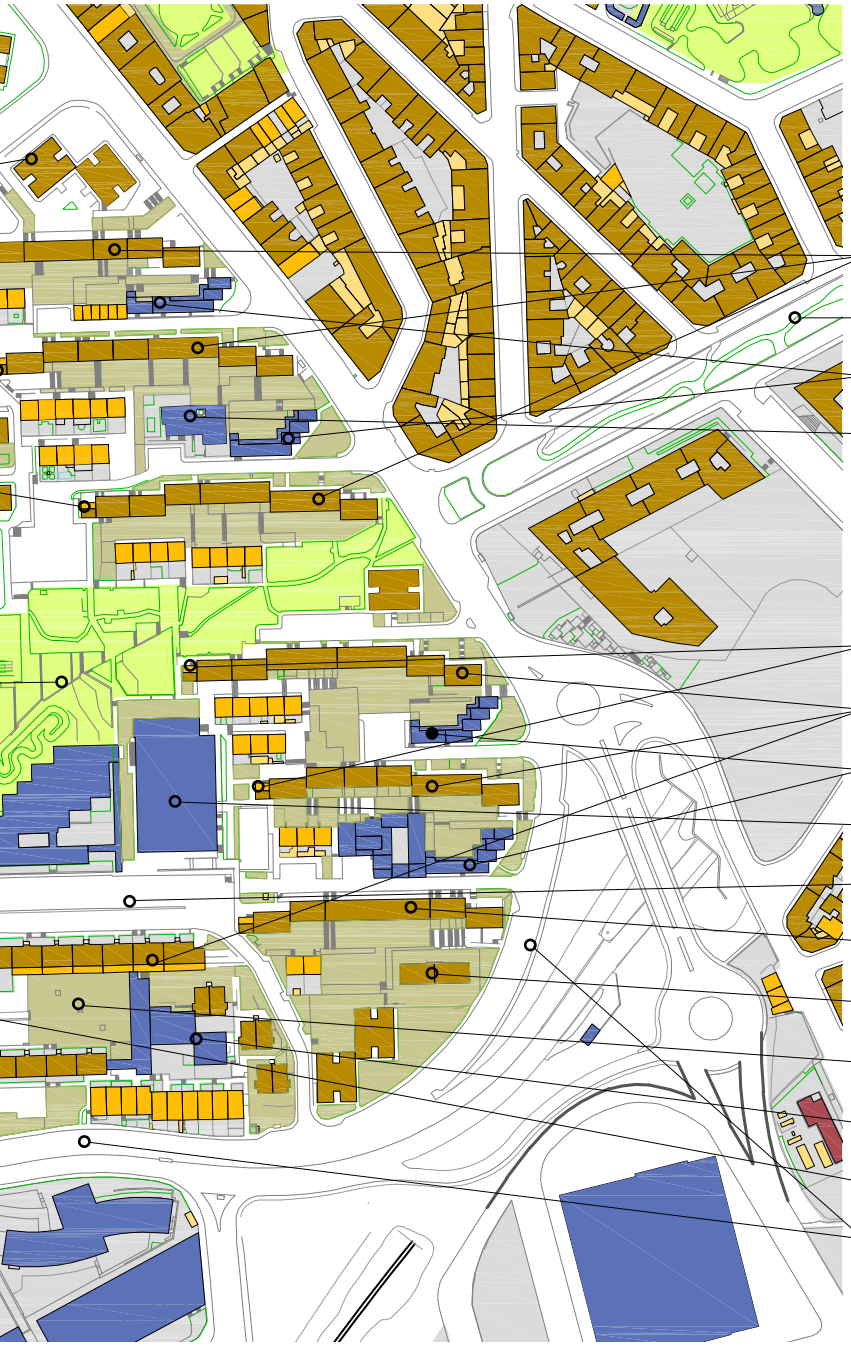
Recycle existing housing with new residential typologies and proximity activities on the ground floor.

New residential typologies and shared services in the disused commercial gallery.



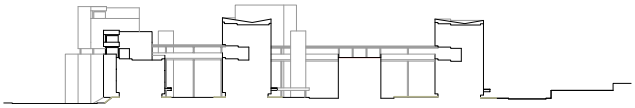
## INTERVENTION PROPOSAL

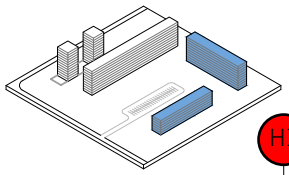
Amenities | Buildings<3floors | Building>3floors | Private Open Spaces | Community Open Spaces | Parks & Squares | Road Network



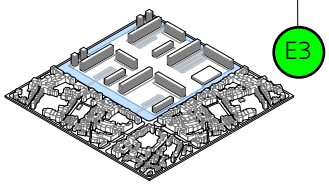
- Complement the existing building with new residential typologies and productive activities on the ground floor.
- Green corridor in the disused oil pipeline.
- New residential typologies with mixed uses in obsolete and disused buildings.
- Extend the existing Women's Centre by introducing more activities, with new residential and mixed used typologies.
- New residential typologies in the obsolete spaces of existing housing.
- Productive activities in existing housing (offices, workshops, amenities, etc.).
- Mixed-use housing for young people in obsolete and disused buildings.
- Refurbish the sports hall with new services that connect its uses with the outdoor space.
- Community gardens.
- New residential typologies and shared services in the disused commercial gallery.
- Recycle existing housing and build new typologies in the community open spaces.
- Market place, market and supermarket under the square.
- New kindergarten that recovers the use of the original project in the public building.
- Public Library in the obsolete and disused public building.
- Convert the avenue into a street and a space for relationships.

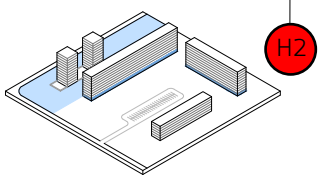
# Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV4-3

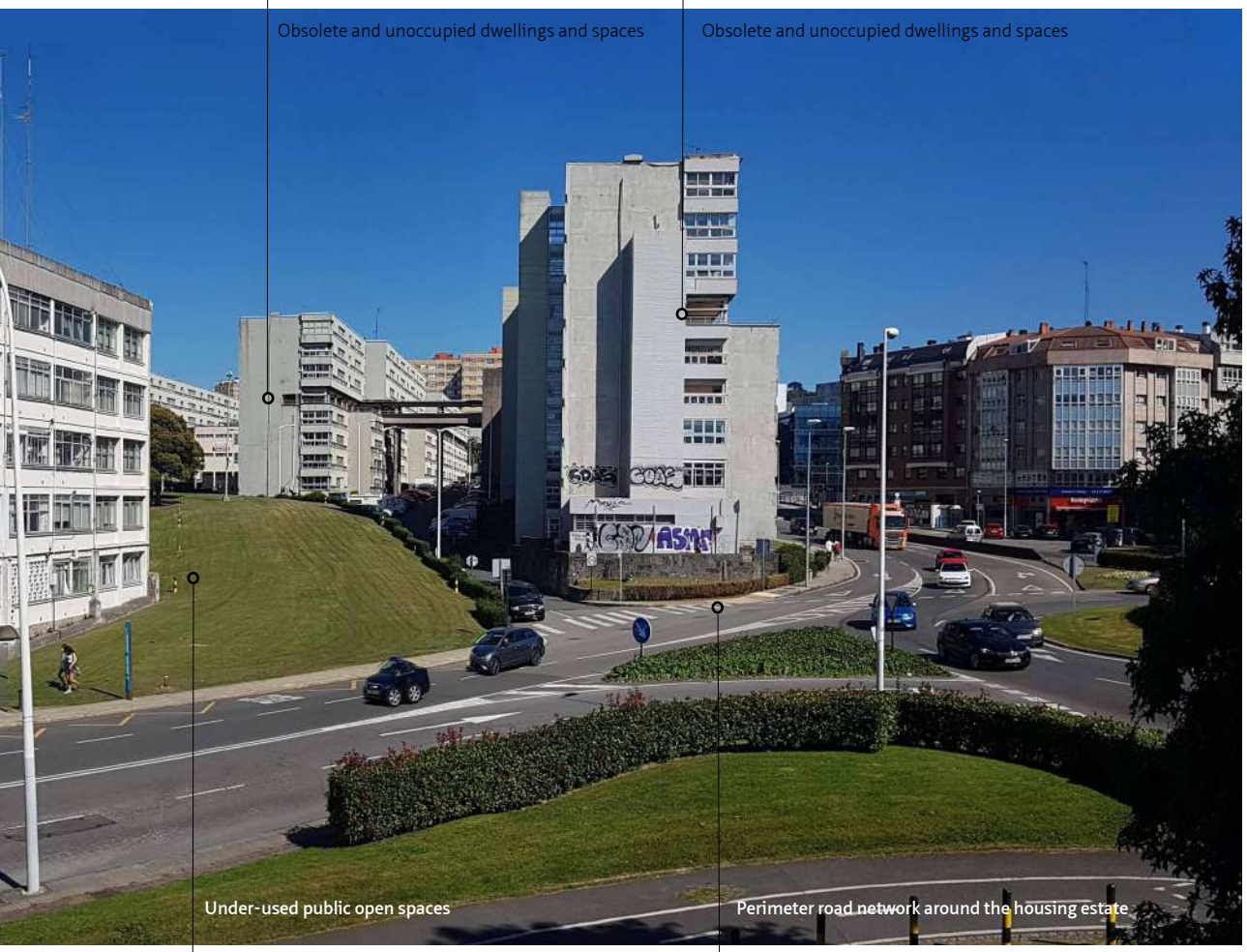




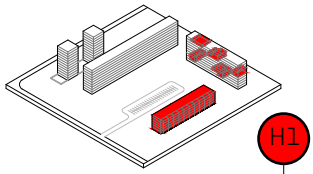




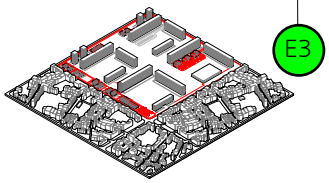



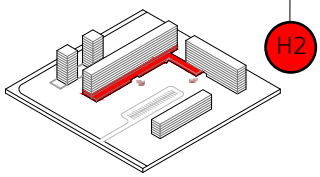

H3
Obsolete and unoccupied dwellings and spaces
H3
Obsolete and unoccupied dwellings and spaces
Under-used public open spaces
Perimeter road network around the housing estate
S2
E2

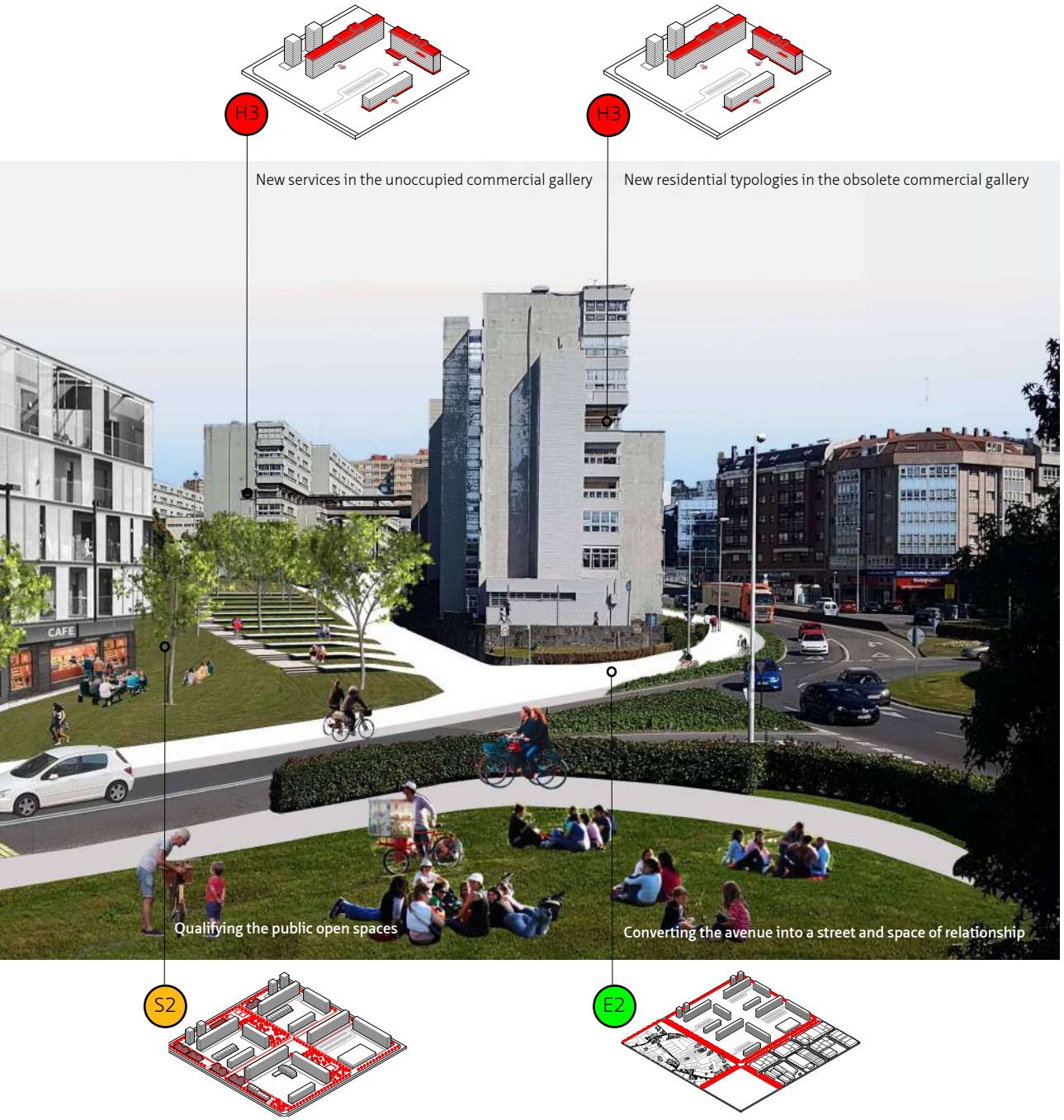
# Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV4-3

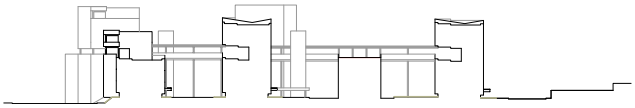




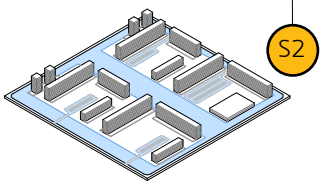



H3
H3
New services in the unoccupied commercial gallery
New residential typologies in the obsolete commercial gallery
CAFE
Qualifying the public open spaces
Converting the avenue into a street and space of relationship
S2
E2




4
Extensive public open spaces


S2


A1
Obsolete public amenities
H3
Obsolete and unoccupied spaces
Cáritas
CENTRO DE FORMACIÓN
"VIOLETAS"
Under-used private open spaces
Disused public amenities
Degraded public open space
S3
A3
S2

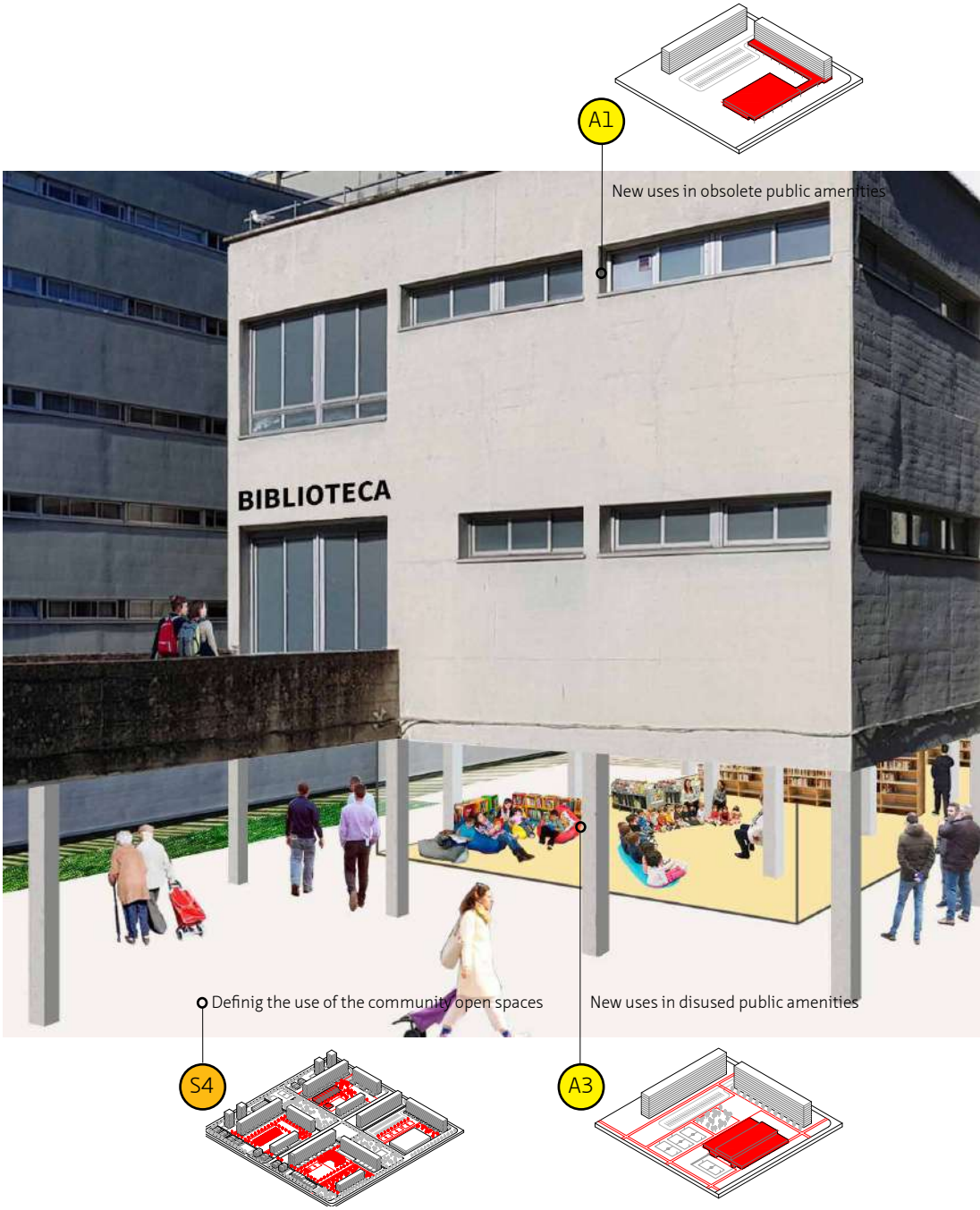

Qualifying the public open spaces
S2


A1
New uses in obsolete public amenities
H3
New services in the existing housing
BIBLIOTECA
MERCADO
Defining the use of the private open spaces
New uses in disused public amenities
Recycling public open space
S3
A3
S2

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3

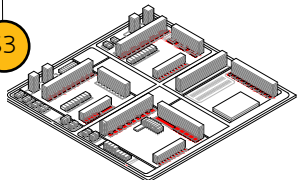

Private open spaces
S3

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3



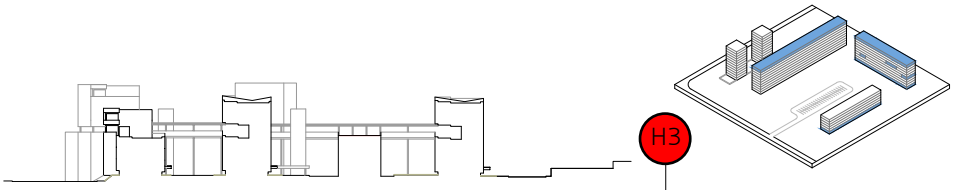
Defining the use of the private open spaces

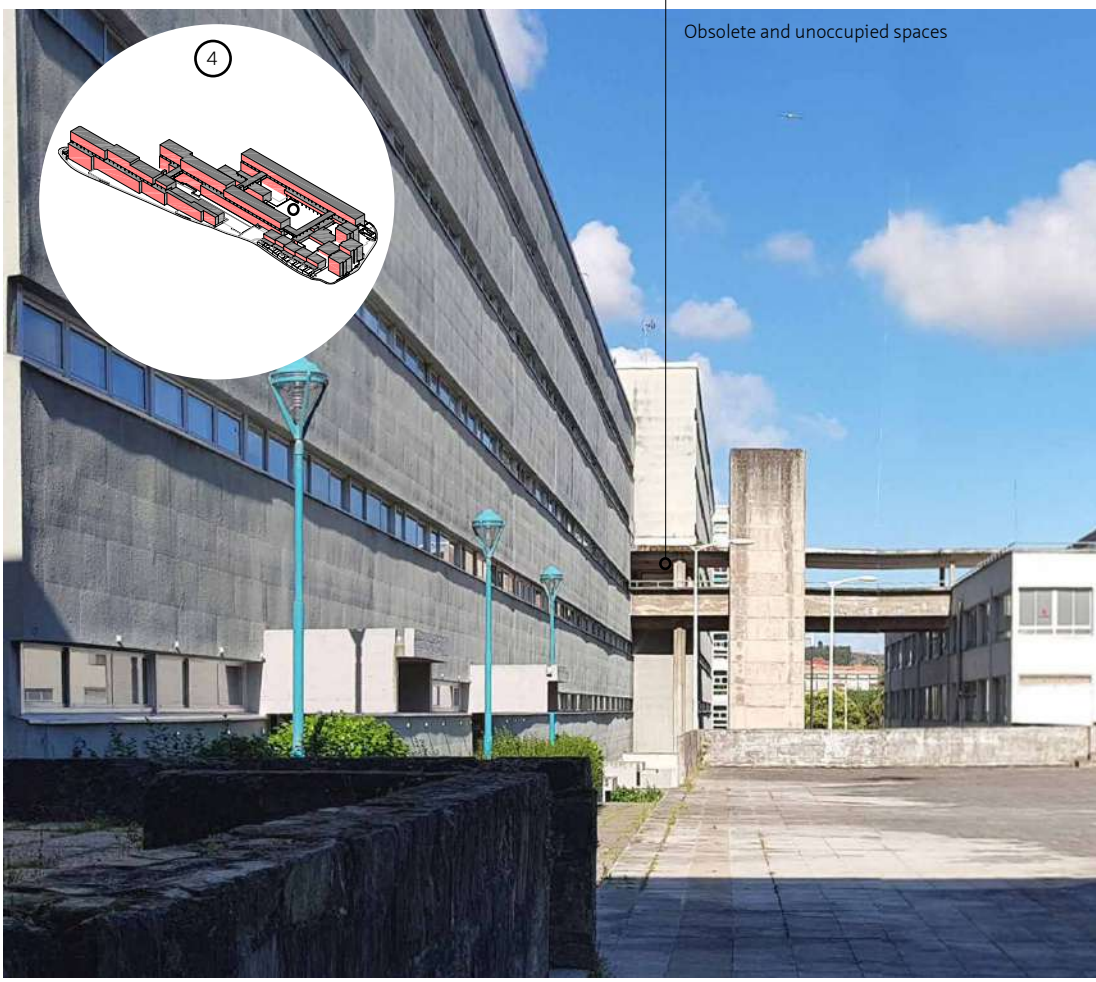
S3

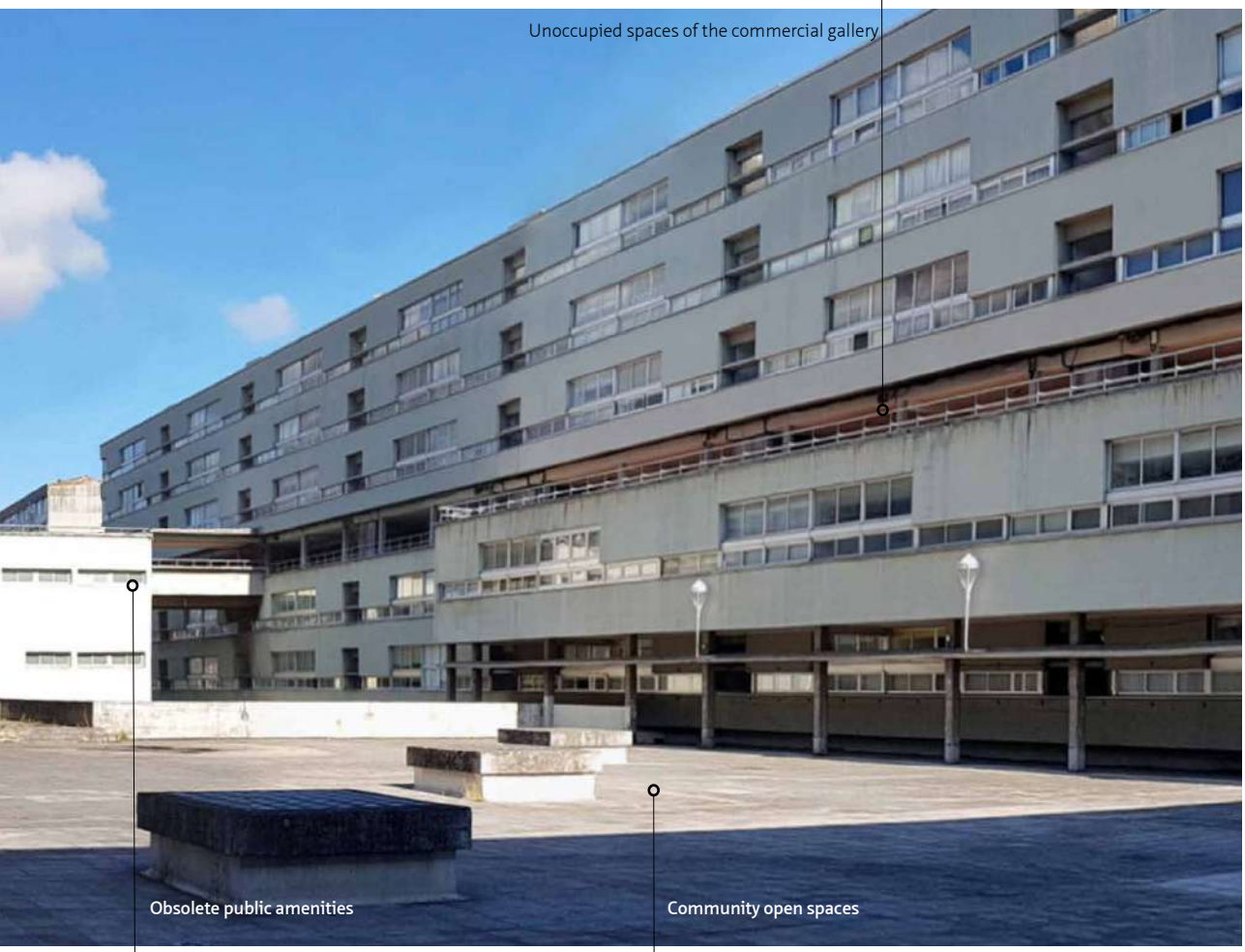


A CORUÑA
Barrio das Flores

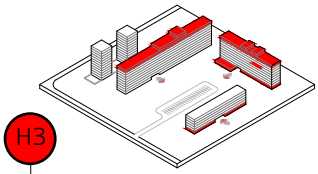
## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3



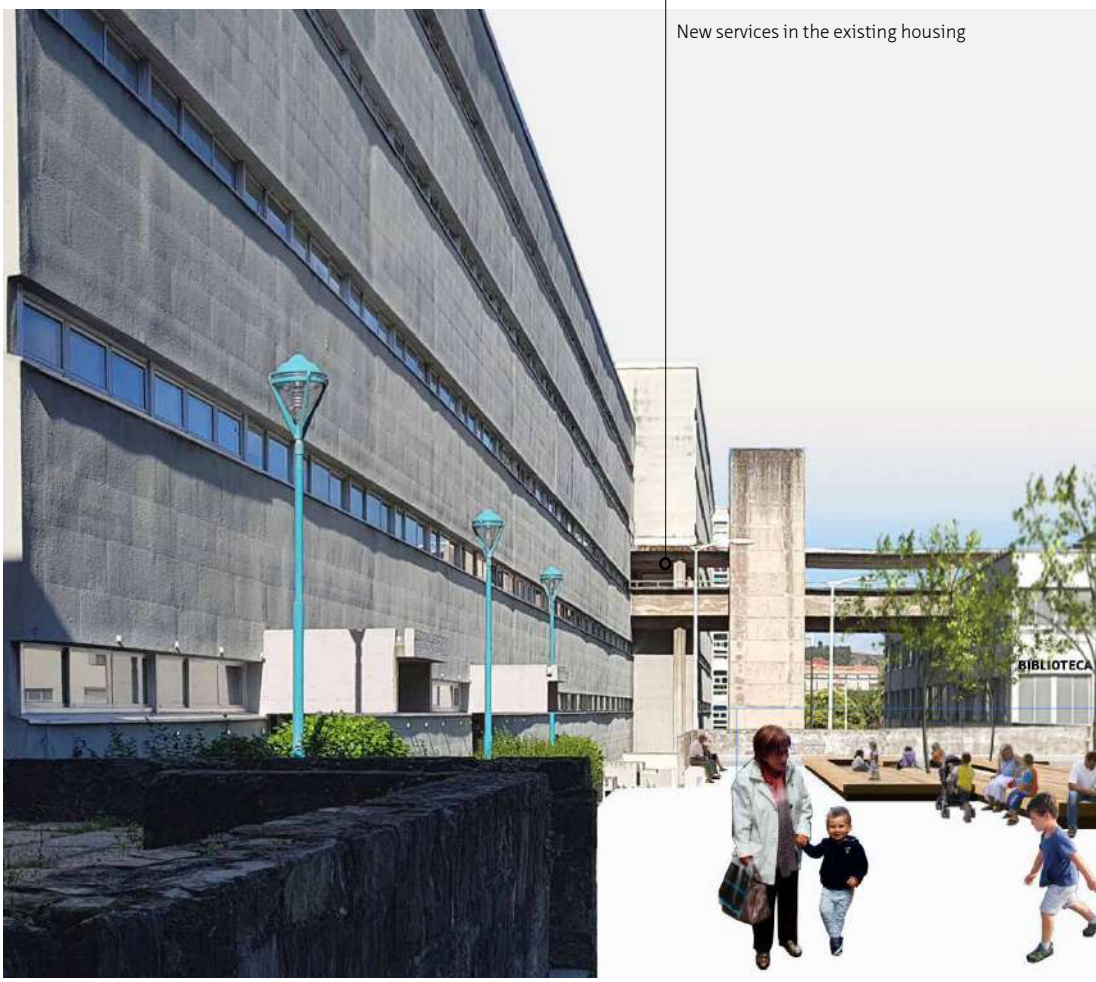




H2
Unoccupied spaces of the commercial gallery
Obsolete public amenities
Community open spaces
A1
S4

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3




New services in the existing housing



H2

Productive activities in the existing housing
(recycling the commercial gallerie)

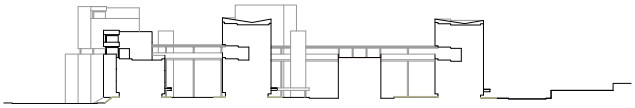
A1

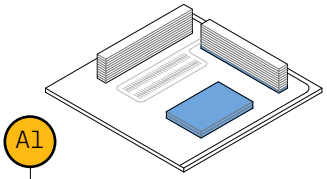
New uses in obsolete public amenities

S4

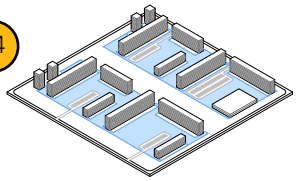
Defining the use of the community open spaces

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3



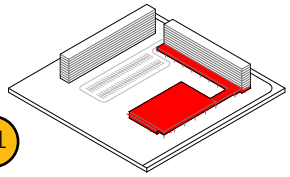


A1

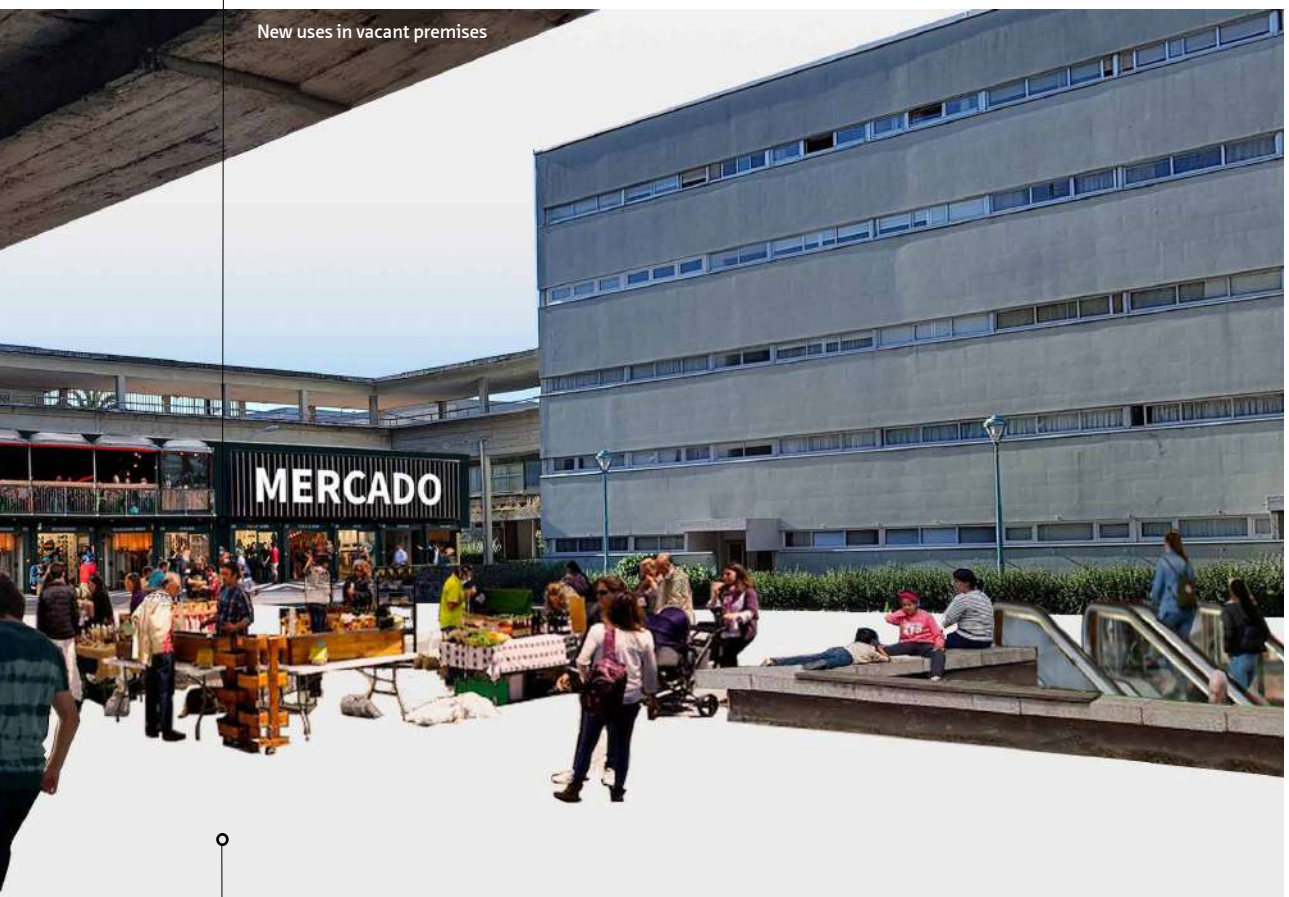
S4


I RUN THIS TOWN

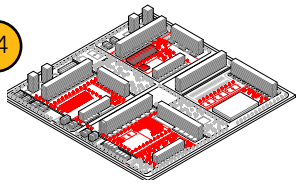


A1

New uses in vacant premises




Defining the use of the community open spaces. New square and market place

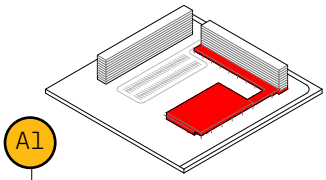


S4

# Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3


H2
Unoccupied spaces of the commercial gallery
B.F.
JAVI
Private open spaces
S3

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3



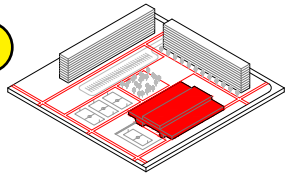
A1

Acting on obsolete premises
(extension of the day care)

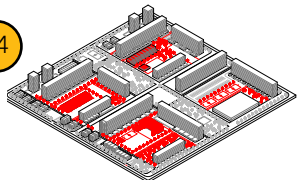

Connecting the use of the new day care with the outside space

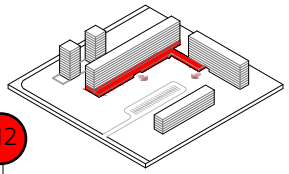
Defining the use of the community open spaces

A3



S4



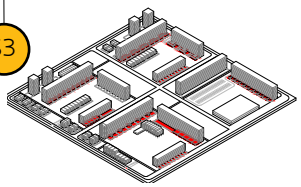


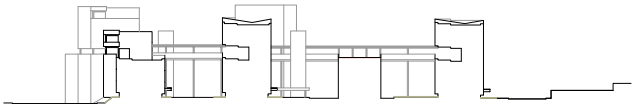
H2

Productive activities in the existing housing
(recycling the commercial gallerie)

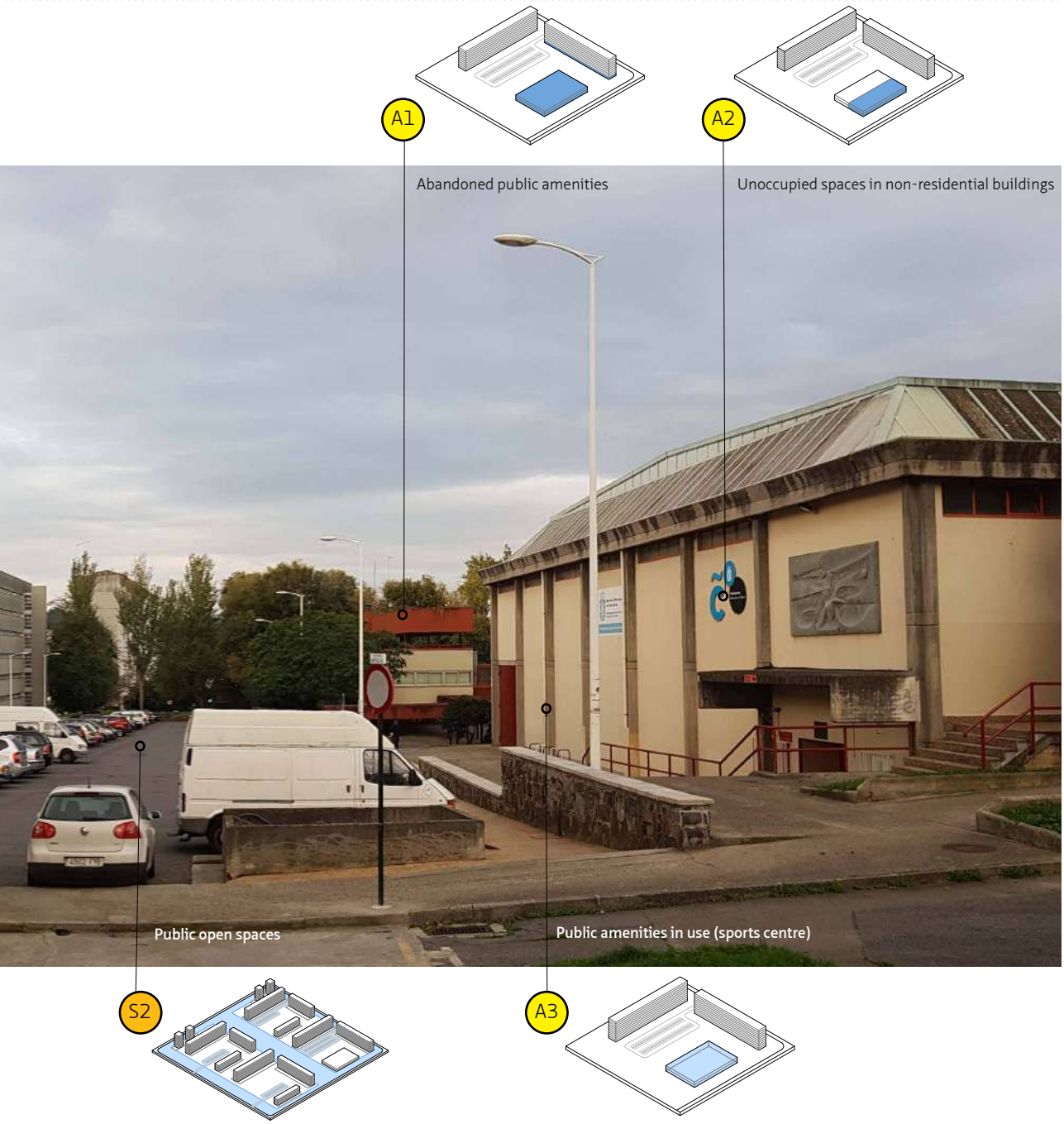
Defining the use of the private open spaces

S3

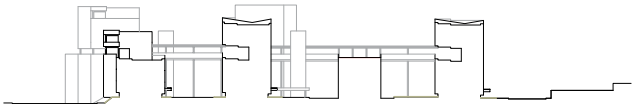




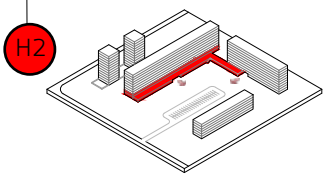

4
Unnocupied spaces of the commercial gallery
H2

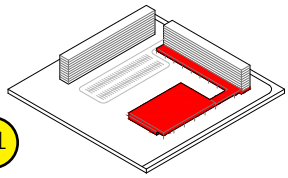

A1
A2
Abandoned public amenities
Unoccupied spaces in non-residential buildings
Public open spaces
Public amenities in use (sports centre)
S2
A3

## Guidelines for the urban regeneration of housing estates. Neighbourhood scale. Unit UV3



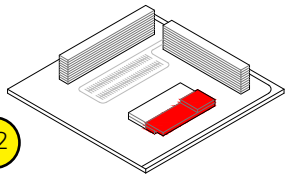
Productive activities in the existing housing
(recycling the commercial gallery)





A1

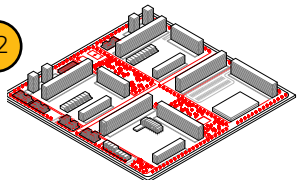
New uses in abandoned public amenities



A2

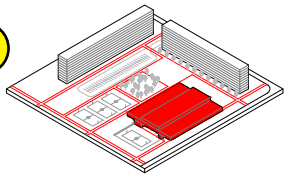
New services in existing public amenities


Qualifying the public open spaces (urban gardens)



S2

Connecting the use of the amenities with the outside space (sports centre)



A3

# 6 Final conclusions

# 6 Final conclusions

## Introduction

This thesis proposes an alternative to urban development other than that based on continuous growth and extensive land occupation, which in Spain, since the real-estate crisis, has highlighted environmental degradation, low standards of quality of life and economic decline, without having provided a solution to the lack of affordable housing. The Covid-19 pandemic has further evidenced the dysfunctions of the housing market, with people living in substandard housing, while more and more homes, premises, buildings, infrastructures, villages and open spaces remain unused, empty, unoccupied or abandoned. The guiding principle in the face of the need for housing continues to be to build more housing, but could it be built without occupying more land, without colonising natural or rural areas: could it not be built and only recycle or rehabilitate something existing, and what if the best solution to urban and territorial development were to decrease rather than to grow?

This thesis shows that housing estates with obsolete structures offer the greatest opportunities to rehabilitate and recycle open spaces and buildings based on the value of their intrinsic qualities, allowing for the introduction of new and efficient typologies in the city core. On a social level, the recycling and adaptive reuse of housing estates would improve the quality of the urban environment, the consolidation of civic networks and the strengthening of social cohesion. At the environmental level, recycling and regeneration would reduce land use for real estate development, infrastructure construction and mobility needs, as well as waste production and energy consumption. These aspects lead to economic and spatial improvements. The renewal of consolidated urban areas is a clear strategy to avoid the need for new growth, the demographic abandonment of existing neighbourhoods, and their social and physical degradation. The rehabilitation and recycling of post-war housing estates in slow-growing intermediate cities and the urban revitalisation of the neighbourhoods in which they were built are relevant to achieve sustainable urban development in a large number of European cities with shrinkage processes, including rural-based cities such as those in Galicia, where the rural fabric that still remains and its legacy have conditioned the urban structure and can condition its future by contributing productive and green value to its development.

The foreword to this thesis began with the words of Secchi (1983): "The city of the future will mainly be made from existing materials, to which something will have been added that reinterprets them, which by acting in their interstices in some way reinvents them", which have encouraged me during my research to look for the value of the past, present and future in the different fragments that make up the city, among which the public housing estates stand out, recognising in the thesis the spaces of opportunity generated by their construction and the transformation of their environment over time, and with them the possibilities for their improvement and that of the city as a whole. An improvement that shares the concept of Integrated Urban Regeneration defined in the Toledo Declaration (2010), which includes social, economic and physical actions developed in this thesis, on public space and building. This takes into account the idea that public space is a structuring element of the urban fabric and a determining factor in the process of spatial cohesion, as it favours accessibility, continuity and permeability in the city and between its parts. In this way, in the proposal for the improvement of the housing estates studied, in the design, in the policies and in their application, public space is considered as the agent that promotes spatial cohesion, forming a network of public spaces that integrate all the problems on the different scales of the neighbourhood, in the interior, on its edge, in its surroundings and in the city. A fundamental aspect of integral regeneration, considered here as a principle of global urban development strategies, in the planning of the city as a whole, to improve the overall efficiency of the urban system and the integration of the different parts of the city into the urban fabric.

These intervention proposals, which must be implemented within the framework of public policy, must take into account that space is defined with the people, that the participation of local actors in the process of urban design and in the construction of public space is fundamental: considering that the spaces of opportunity on which action is taken depend on the active participation of local actors to maintain the continuity of the urban regeneration project over time and at all scales, which is necessary for the achievement of a multi-scale spatial configuration in permanent adaptation; where the value of urban design that designers bring to the discussion incorporates their experience, the value of the past and the present and the decision on the elements to be taken into account to start the project process. In this context, the thesis contributes towards bringing the conditions of design closer together and making its use more accessible to residents, planners and those who execute or administer projects, by proposing a method for evaluating the physical and spatial conditions of the neighbourhood to be intervened, summarised in a working tool with which to identify problems and potentialities, which help to identify areas of opportunity in which to intervene in order to improve them.

## § 6.1 Discussions and limitations

As this research deals with urban transformation and the opportunities for its improvement from a collaborative perspective, based on the rehabilitation and recycling of public housing neighbourhoods, it has been essential to understand the changes that have taken place and the existing relationships between private residential space and urban open space, in order to be able to assess the different degrees of relationship between the public, the private and the community space, and their structuring quality. The search for documentation to show the urban form over time, its subsequent elaboration and the decision making process affecting the parameters to be used in the analysis, how to obtain them and how to represent them, has entailed a great effort. The dispersion and lack of information, the lack of urban and cadastral plans, images, and even of current data and ground plans of the cities, have prolonged the preparation time of the analyses and their elaboration, having to seek ways of representation based on the information obtained. It is to be expected that data availability will increase in the future, existing documentation will be digitised and made accessible as that new IT tools will facilitate cartographic production.

The fact that the study is based on urban morphology intentionally limits the research to the form and space of the housing estates and their surroundings, dealing with the influence of urban form on the quality of space, in order to propose ways of organising their physical space. This approach has allowed for a balance between qualitative analysis and the contextualisation of the findings in relation to the processes of physical and spatial transformation, isolated from other factors such as economic, social or behavioural factors, which it would be interesting to incorporate in the future to broaden the analysis tool, making it coincide with the aspects to be taken into account in the integrated urban regeneration of a neighbourhood.

### The significance of the subject

While the role that cities must play in sustainability and socio-economic equity should be central to the discussion on our relationship with the territory in order to respond to the future challenges that await the natural and built environment and the way it is inhabited, the need for affordable housing and the decision on how and where it should be built should include in its design the influence it has on the resources and the habitability of its surroundings.

In studying the development of cities and the influence of residential form on the quality of urban relational spaces, it can be seen that the revaluation of the intrinsic qualities of the different urban fragments plays a fundamental role in their improvement if we intend to propose an alternative model of development to the continuous consumption of resources. In the European context, where almost 80% of the continent's population lives in cities, and after a century of continuous growth, it is essential to bear in mind that a large part of the future development of our cities is to be found in the existing urban fabric. Therefore, when thinking about those urban fragments that can admit a greater possibility of adaptation and incorporation of new uses at a lower cost, the rehabilitation and recycling of housing estates becomes particularly significant. Not only because of the improvement implied by the recovery of the qualities of an urban fragment, the incorporation of new uses and ways of living, but, above all, because of the opportunities it offers for the improvement of the city as a whole. This is what this thesis proposes, explaining that the design of an urban fragment must be understood in relation to the city and at different scales: in its interior, on its edge and in the city.

## Original findings

The originality of this research lies in the different scales from which the transformation of open spaces in public housing estates is observed over time and which are finally established as an ensemble on which it is necessary to intervene in order to improve the spatial cohesion of the neighbourhoods. Its innovation lies in the way of obtaining and representing the data on which the research is based, from the combination of different morphological elements from plans and aerial photographs from different periods, to the representation of the formal and spatial qualities relating data graphs with representations in two and three dimensions from digital plans, to arrive at the elaboration of an analytical tool that makes it possible to summarise the current condition of the housing estate.

In chapter 2, we observe the value of the models that were put into practice in Europe during the twentieth century from the new way of organising the city from the decomposition and recomposition of its parts in housing-block-neighbourhood, highlighting the process of their relationship with the consolidated city, and how some of these models have been used in Spain and in the Galician case studies, how they have influenced them and what their situation is at a local level, in the housing estate, on its edge, in its surroundings and in the city, explaining what the cities were like before, during and after the construction of the housing estates. In Galicia, the debate on the urban model is restricted to the planning of large housing estates accompanied by the construction of large urban infrastructures to transform the entire city. This model of

extensive growth, with conflicts between local speculative interests and those of the state, has changed, but the need to adapt these cities to their current conditions requires a change in the way of making a city, taking into account the constitutive value of the housing estates in the urban system. This value is what this chapter tries to explain and serves as the basis for the analysis of the case studies.

In chapter 3, the process of historical review at the scale of the neighbourhood is further explored, understanding that the morphological value of the past influences the value of the current situation, as it is contained in its spatial differences, making it possible to explain those legacies that now limit or facilitate urban regeneration. The analytical framework used differentiates each element that constructs the intervention location of the housing estate over time in the rural and urban fabric, making it possible to combine, measure and compare them. This is done by representing the urban transformation seen from the rural space, in order to show the value of the rural fabric: what is colonised, what remains, and what may condition future actions in the development of the urban fabric.

This diachronic study is essential to understand how the construction of the housing estate has influenced the rural fabric and the development of the urban fabric, how the creation of new city fragments affects urban continuity, and which spaces of opportunity have been used or discarded over time to intervene in the estate and its surroundings.

Chapter 4 looks at the current configuration of the space between buildings in the housing estates and their surroundings, starting from the analytical framework used in previous chapters, to explain how the structure of the estate is configured in relation to its edge and its surroundings. The analytical framework is then divided into those parts of the estate or neighbourhood that form a unit with their own character, which allows us to observe how they relate to each other in the estate as a whole and in the surrounding area. The chapter concludes by studying a fragment of those that make up a small estate from the 1940s and 50s, or a neighbourhood unit from the large estates of the 1960s and 70s, making it possible to observe the elements that make up the form, organisation, functionality and quality of the open spaces inside the estate.

This way of observing the current state of a neighbourhood makes it possible to understand its formal and spatial qualities based on its conformation, valuing the qualities of each fragment in itself and at different scales, which in turn makes it possible to propose neighbourhood improvement projects that can be developed based on the fragments that make up the neighbourhood when explained as a whole. By observing whether there are discontinuities between the different parts of the estate, it is possible to explain the causes of the lack of spatial cohesion and continuity within the housing estate and with the urban fabric, and at the same time, it is at this scale that the areas of

opportunity are identified and recommendations are made for improving its structuring, integration and urban cohesion.

Chapter 5 establishes guidelines for intervention in the housing estates, coordinating the physical and temporal multiscalarity presented in previous chapters, to reveal their operability by determining which areas of opportunity are found in them and the framework for discussion to begin to establish proposals for intervention for the physical regeneration of the housing estate. To achieve this, different types of syntheses are related, starting with the intervention criteria in European cases, to determine what they contribute to the improvement of housing estates and how they have been addressed. This is followed by a synthesis of the current state of each case study, to represent in a graph the characteristics of the open spaces in the housing estates and their surroundings, which constitutes a working tool for comparing the case studies in order to identify problems and potentialities. This is the basis for identifying areas of opportunity in the case studies and defining recommendations for their improvement, presented here as an integrated set of scales, with sites for intervention and the different types of intervention that are possible.

### Research applicability

The research carried out for this thesis has been both retrospective and prospective. Past events have been analysed to gain a critical understanding of the contemporary city and the logic of the events that have shaped it. This knowledge can be applied to anticipate future trends, in making decisions about how and where to act, their likely consequences and to address potentially conflicting issues accordingly. In addition, new ways of analysing the influence of urban form on the quality of space have been proposed. It would be desirable that the proposed tool could be further developed to incorporate more precise definitions and a separate interface. In this way, it could be accessible to neighbourhood residents, managers, planners and urban designers seeking to integrate the physical aspects of housing estates from the preliminary stages of decision-making, in participatory processes and as a framework for discussion from which to begin to establish proposals for intervention.

### Replicability

All the procedures and methodologies applied in this thesis have been explained in the first chapter, in the introduction to each chapter and in each section prior to the analysis

carried out. Throughout the research, complementary data are provided to support the explanations with objective evidence that illustrates each step. Its configuration has been devised taking into account the state of the art in urban analysis, in particular the data obtained from archives and which have served as the basis for the digital cartography. This information varies for different cities and in each case study of a housing estate, presenting critical gaps that are expected to be resolved in the future, where the accessibility of historical data can be complemented by a greater amount of geographical information on the current state and recent past.

The proposed method evaluates the formative potential of public housing in the urban pattern, at the scales of the estate, at its edge and in its surroundings, considering the value of the relationship between private, community and public open spaces, from its components and over time. This is the proposed basis for analysing any case, regardless of its place of origin, which allows the study to be replicated in other cities to explain how it fits in with its place of construction, its transformation and its current configuration, observing the areas of opportunity from which to act for its improvement. The particular nature of the Galician case called for a greater effort to analyse the influence of the rural fabric on the urban fabric and on the variation in the design of neighbourhood units, since the time factor influences both their typological variety and the construction of open spaces inside and around the estate.

## § 6.2 Conclusions

The main question of this research is: **What does the public project, housing and open spaces associated with it, contribute towards the spatial cohesion and improvement of the urban structure over time?** In order to answer this question, three sets of complementary questions were posed, on which conclusions have been drawn in the different chapters of the thesis, structuring the research in three main parts:

In the first, by observing how public housing projects have been formed and what their process of urban integration has been like, it is established that the alternatives for building cities during the twentieth century in Europe questioned the urban structure understood as an indivisible whole, using models based on the idea of the city as a sum of parts, as an aggregation of units with collective services. Built on the peripheries, as isolated unitary fragments, lacking articulation and integration with the surrounding fabric, their alternatives and the attention paid to the design of their open spaces differ between regions and over time, which can be seen in medium-sized cities with a rural

base such as those in Galicia, where the slow construction of residential estates varies the way of transforming rural and urban open spaces, in their surroundings and in the city, allowing for the modification of projects before, during and after their construction, which helped to improve their spatial cohesion by taking advantage of spaces of opportunity created in their interior, on their edge and in their surroundings. Even so, the alterations caused by this transformation have still not been repaired, so there is the possibility of reorganising part or all of the city on the basis of the spaces of opportunity created by the existence of the estate.

In the second, by explaining what the open spaces associated with public housing is like, and assessing whether it has served as a nexus between the public, the community and the private, it is established that spatial cohesion in the surroundings of housing estates improves when density, spatial continuity and compactness are increased, provided they are accompanied by a configuration of the urban form that allows for integration between its parts. Within the estate, a better integration is obtained in spaces with a mixed typology, high density and delimited community open space, when the surface occupied by the open spaces is not uniform, and the different layout of the built elements and of the public and private space limits the continuity and coordination between its parts.

And in the third, by making recommendations that help to improve the articulation, integration and cohesion of the open spaces integrated into the public project, it is established that these should be made operational in the collection of spaces of opportunity located inside the estate, on its edge and in relation to the city, in vacant and residual spaces lacking spatial coherence where there is the possibility of correcting the physical obsolescence of the estate to become spaces for social relations (public spaces). To achieve this, the comprehensive urban regeneration project of the estate must be integrated at different scales, bringing together design, planning and management, involving local actors in the urban design process, to decide how to act on the physical aspects at the neighbourhood scale and become part of the policies that encompass the planning of the city as a whole, as they affect their needs, the overall efficiency of the urban system and its spatial cohesion.

## § 6.3 Recommendations for future research

The future has always been here. If we want to look for alternatives to extensive growth, to land consumption, to the need for housing, it is necessary to rethink our relationship with the territory and the city. If we think that we can develop by decreasing or consuming

less, the future lies in what we have already built. And from this point of view, the lines of research that have already been opened up with the recycling and rehabilitation of urban fragments can be extended to explain how to make this possible at all scales.

As for the future of this research in the short term, several lines of research can be continued on the opportunities for urban improvement from the rehabilitation and recycling of neighbourhoods with public housing, the development of tools for their study and which are useful in their design, putting them into practice, and disseminating their results.

It would be interesting to extend the study with more European cases. In Europe today, cases of shrinkage are mainly found in post-socialist countries, northern countries (especially Finland and Sweden) and Mediterranean countries. But there are also cases in other European countries. It would be interesting to study different types of intermediate, slow-growing cities with obsolete neighbourhoods and, in particular, to assess the results of transformations in places with urban regeneration projects.

Another possibility would be to develop the analytical tool, collaborating with designers, planners and researchers from other disciplines to integrate the tool into computer systems and creating a stand-alone version with its own interface, to make it openly available to a wider public.

And finally, testing how and to what extent the guidelines proposed in the research can be integrated into Integrated Urban Regeneration projects by participating and advising on their use as a framework for discussion with those who implement or manage the projects (public administrations, neighbours, planners, etc.), from where it is possible to begin to establish proposals for intervention at the scale of the neighbourhood, on its edge and with the city.

# Acknowledgements

For most doctoral students, the thesis marks the start of their teaching and research work, but in my case, it is an attempt to answer some of the questions that have accompanied my professional and academic life. This has allowed me to re-encounter with the spaces of my memory, to interpret their transformation while imagining their future.

I would like to thank all those who have placed their trust in me and have allowed me to feel, understand and make architecture. And to all those who have shared their experience in teaching, fostering students' curiosity for learning, making other worlds known and sharing their discoveries, one of the motivations to finish this thesis and for which I thank all my students and the colleagues with whom I have shared the workshops on architecture and urbanism projects for the many hours dedicated to imagining better worlds, and to exploring some of the spaces portrayed in this thesis. Their energy and eagerness to improve are an inspiration to me.

To my family, for their generosity and their efforts in offering their time in exchange for my liberty; my parents, who have given everything for their children; my partner Yolanda for her unconditional support; and my son Nuno, who arrived half way through the process of writing this thesis, filling my home with joy. One day he will be able to read the book his father wrote while he played.

To my promoter Dick Van Gammeren, for the support, trust, and friendship he has given me since I worked in his office, and during the years of writing this thesis, in which he has patiently approached Galician housing estates transformations and their opportunities.

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# Curriculum Vitae

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| **2005 -** | Founder and Principal at Toni Garcia + Yolanda Somoza arquitectos<br>www.garcia-somoza.com |
| **2005 -** | Founder and Editor at *edicións espontaneas* Publisher house.<br>www.edicions-espontaneas.com |
| **2004 -** | Associate Lecturer in Architecture, Urban Planning & Design at CESUGA, A Coruña. |
| **2000 - 2004** | Delegate of Spain to CYTED AECID. Ibero-American programme for science, technology and development, Red XIV-E "improve living conditions of rural settlements." |
| **1999** | Design Architect at *De architectengroep*, Amsterdam. |
| **1998-2000** | MSC in Architecture "renewal and redesign city areas" at TUDelft, NL. |
| **1998** | Master in Architectural Rehabilitation, ITG - Galician Institute of Technology. |
| **1997 - 1998** | Provincial Architect in the Tourism Agency of Galicia, Regional Government of Galicia. |
| **1997** | Predoctoral Fellow in the Faculty of Architecture at UNAM, Mexico DF. |
| **1995** | Predoctoral Felow in the Faculty of Architecture and Urbanism at PUC Belo Horizonte, Brasil. |
| **1995 - 1998** | President and Founding partner of *Arquitectura sin fronteras* in Galicia. |
| **1994** | Graduated as an architect from the Escola Técnica Superior de Arquitectura da Coruña, Spain, and École nationale supérieure d'architecture de Lille, France, with 1st class honours. |

# List of Publications

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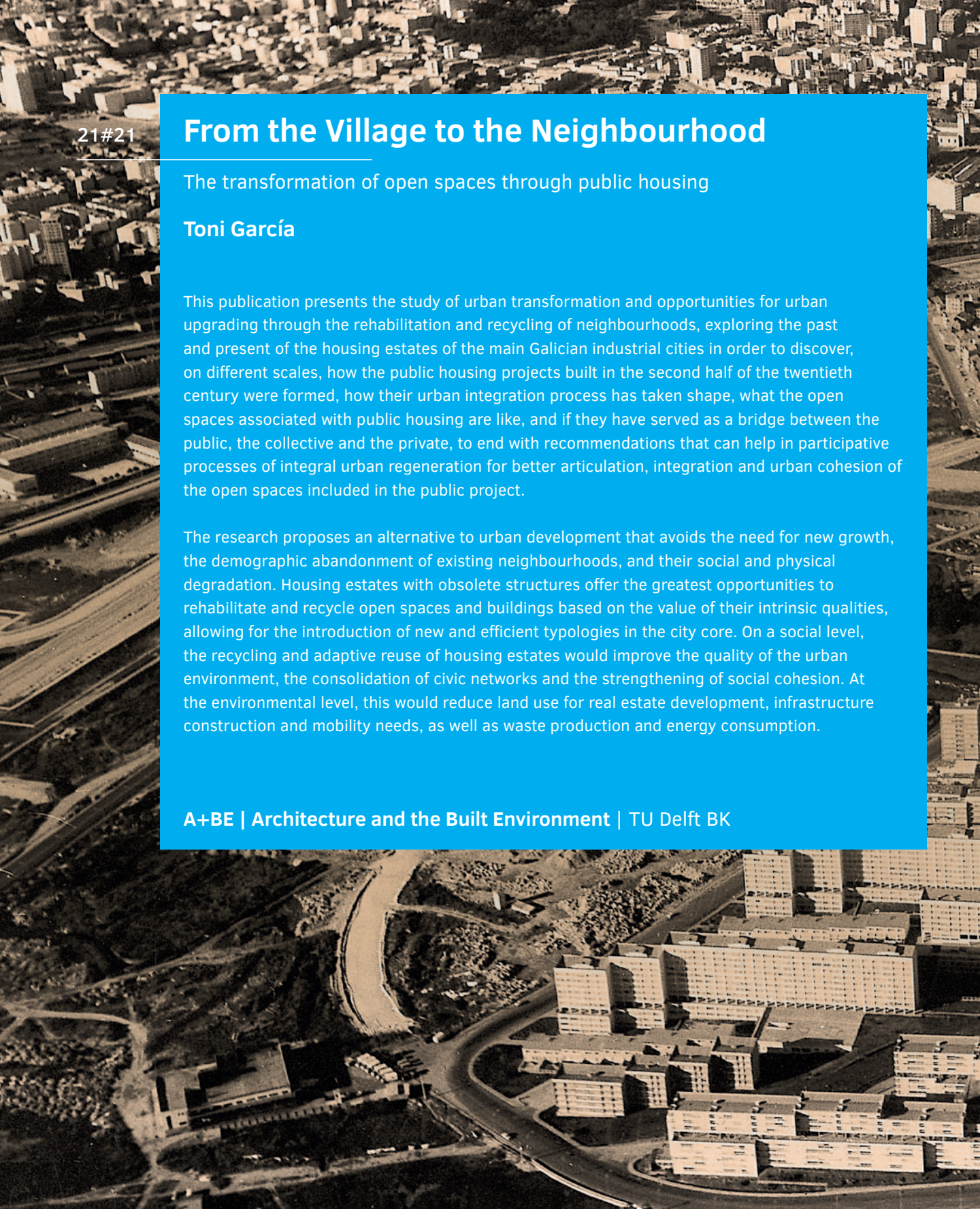

21#21

# From the Village to the Neighbourhood

## The transformation of open spaces through public housing

**Toni García**

This publication presents the study of urban transformation and opportunities for urban upgrading through the rehabilitation and recycling of neighbourhoods, exploring the past and present of the housing estates of the main Galician industrial cities in order to discover, on different scales, how the public housing projects built in the second half of the twentieth century were formed, how their urban integration process has taken shape, what the open spaces associated with public housing are like, and if they have served as a bridge between the public, the collective and the private, to end with recommendations that can help in participative processes of integral urban regeneration for better articulation, integration and urban cohesion of the open spaces included in the public project.

The research proposes an alternative to urban development that avoids the need for new growth, the demographic abandonment of existing neighbourhoods, and their social and physical degradation. Housing estates with obsolete structures offer the greatest opportunities to rehabilitate and recycle open spaces and buildings based on the value of their intrinsic qualities, allowing for the introduction of new and efficient typologies in the city core. On a social level, the recycling and adaptive reuse of housing estates would improve the quality of the urban environment, the consolidation of civic networks and the strengthening of social cohesion. At the environmental level, this would reduce land use for real estate development, infrastructure construction and mobility needs, as well as waste production and energy consumption.

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