

Domestic Cartographies: A Post-Occupancy Ethnographic Assessment of Barcelona's Social Housing Strategies, 2015–2023

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Abstract

The lack of affordable housing remains a major problem in Spain. Following the decline in public and affordable housing production caused by the economic, political, and social crisis of 2008, efforts to produce public housing were reactivated in the mid-2010s, gaining increasing importance. In Barcelona, housing policies have played a central role in recent political discourse, particularly with the tenure of housing rights activist Ada Colau (2015–2023). With traditional approaches failing to address the housing emergency, the local government introduced five new procurement strategies to increase the affordable housing stock. These involve new forms of council housing, delegated developments, limited-profit investments, zero-equity housing cooperatives, and urban refurbishment. This article uses a mixed methods approach to analyse these strategies. The analysis spans all design phases, from inception to construction, and includes post-occupancy evaluations. Methods include typological analysis, expert interviews, and spatial performance analysis using ethnographic methods and inhabitant interviews. The results evidence the importance of diversifying procurement models, tailoring approaches to different user profiles, and enhancing emerging opportunities by including new stakeholders in the development process.

Keywords

affordable housing; Barcelona Housing Plan; cooperative housing; emergency shelters; housing policies; post-occupancy evaluation; social housing

1. Introduction: Reconsidering the Evaluation of Public Housing Policies

Despite a steady production of public housing since the 1960s, access to housing represents one of the biggest urban and social problems in Spain. Housing policies in Spain have long promoted speculative real estate

development and privatisation of the public housing stock, creating links between property ownership, social status, the building industry, and national economic development (Colau & Alemany, 2012). This has resulted in a shortage of affordable housing, particularly affecting young and vulnerable groups (Ajuntament de Barcelona, 2017). Only approximately 2% of Barcelona's housing stock is publicly owned, with 98% remaining in the private property market (Observatori Metropolità de l'Habitatge de Barcelona, 2018a, 2018b). A substantial increase of 148% in housing prices from 2000 to 2018 compared to only a 3% rise in wages has led to personal economic insecurity and, at the urban level, social exclusion, urban segregation, and gentrification (Observatori Metropolità de l'Habitatge de Barcelona, 2018a, 2018b). During the same period, 60,000 foreclosure evictions (Observatori DESC, 2020) have led to a shift in the way in which housing is perceived: from a source of security to one of emotional instability.

In 2015, a citizens' platform led by the housing rights activist Ada Colau created Barcelona en Comú (Barcelona in Common), a municipalist organisation which won the local elections that year and made housing its municipal policy focus. In 2016, they declared a housing emergency and developed the *Plan for the Right to Housing in Barcelona 2016–2025* to respond to the requirements of Law 18/2007 from 2007. Both the plan and law aimed at an increase in the proportion of affordable housing in the city from 2% to 15%, translating into new 90,000 subsidised housing units (Burón & González de Molina, 2023). To achieve this and overcome the limitations of traditional procurement, Barcelona en Comú revised the two existing housing strategies and created five new ones (Table 1).

Table 1. Barcelona's affordable housing production strategies, organised by developer and building status.

	Public production	Delegated development	Private promotion with public grants
New buildings	Municipal Institute of Housing and Renovation's (IMHAB) council housing production IMHAB industrialised council housing production*	Foundations and Zero Equity Cooperatives (FFZEC) Agreement* Public-private partnership: Habitatge Metròpolis (Barcelona's affordable housing production)*	—
Refurbishment	Retrofitting purchased buildings*	—	Mobilisation of empty housing Urban regeneration of vulnerable areas*

Note: * Municipal strategies developed after 2015.

In December 2021, Barcelona's City Council and the Catalan Architects Association commissioned the architects and researchers Ibon Bilbao and Caterina Figuerola to undertake an evaluation of the public housing strategies and policies since 2015 (Figuerola & Bilbao, 2023). This article further develops the analysis of the case studies used in that evaluation.

Public housing policies are commonly evaluated quantitatively in terms of housing supply and qualitatively by analysing built plans: as an outcome and not as a process. However, this approach—which includes former periodical evaluations (Communication Department of the Barcelona Municipal Housing and Renovation Institute, 2019; Falagán, 2019b; Trilla i Bellart, 2006)—does not capture the impact of different

stakeholders' involvement in procurement processes nor problems or opportunities arising from these interactions. Moreover, these evaluations do not analyse how users interact with their spaces and perceive them, which are, however, key criteria that should inform housing procurement and evaluation. The need to evaluate space-use performance has become especially evident since the outbreak of Covid-19, which fostered debates around the capacity of domestic space to effectively respond to user needs and activities.

With the aim of re-evaluating the process and outcome of Barcelona's public housing policies from 2015 to 2023, this article poses the following questions: First, considering the diversity of housing strategies, how effective are they in addressing the housing deficit? What opportunities arise for meeting different user needs through the inclusion of new housing developers and procurement models? Second, how can user-centred post-occupancy evaluations (POEs) provide new insights for decision-making in public housing policy? And in order to facilitate that, which new evaluation criteria should be considered?

2. Methods

To build on the previous evaluation of public housing policies, the methods employed and the scope of their analysis were partially expanded. This resulted in two parallel analyses presented in this article, each with individually specific methods.

First, an analysis of the project gestation from conception to completion, including management, design evolution, stakeholder insights, and construction until first inhabitation, was undertaken using the following research methods in addition to a review of Figuerola and Bilbao (2023):

- Interviews and regular meetings with municipal housing agencies, i.e., the Housing Department of Barcelona City Council (Vanesa Valino, head of cabinet) and the Gerencia de Vivienda (Javier Buron, housing manager; Joan Recases; housing manager associate): They provided an overview of the strategies and contacts with municipal departments that supplied data on housing supply.
- The analysis of 21 case studies and their development: This involved comparing early ideas and competition plans, intermediate stages, tests and dead-ends, and as-built plans. Technical information and data regarding the duration of phases and stakeholder involvement were requested from designers and developers.
- Two debates with all stakeholders involved in public housing procurement in Barcelona including the local government, designer teams, delegated developers, construction companies, and the Catalan Architects' Association: The first debate focused on new housing and the second on refurbishment projects, both were structured around the issues of participant experience in the different phases of strategic and design development, with consideration given to qualitative design parameters (typological innovation, industrialisation, environmental parameters, maintenance), procedural parameters (design competitions, user roles, unexpected problems encountered) and inhabitation evaluation (learning and maintenance).

Second, a POE to collect data on user experience and domestic space performance was conducted using the following research methods:

- Annotation and recording of the current state of the homes: 16 inhabited floor plans were drawn as "domestic cartographies" and compared to the pre-inhabited plans provided by the project designers.

- Photographic survey: First, comparable photographs of dwellings in the same building were taken to analyse different ways of appropriating the same domestic space. Second, photographs of common spaces in the buildings were taken to describe their use and evaluate their functioning. Third, exterior photographs of the buildings in their current state were taken to study their urban context and compare them.
- 66 at-home structured interviews with residents: They were asked three questions corresponding to three scales of inhabiting, from general to specific—"How is your neighbourhood/building/house?" This avoided conditioning answers and differed from the closed nature of questionnaires in allowing users to elaborate on what they considered relevant. Interviews lasted 30 minutes on average.

These methods combine POEs and ethnographic methods. The work builds on previous ethnographic POE housing studies (Arnold & Graesch, 2002; Arnold et al., 2012; Khajehzadeh & Vale, 2016). A POE focuses on building performance after a period of occupation (Meir et al., 2007; Roberts et al., 2019) and can generate value for municipal governments through learning loops (Brioso et al., 2018). Most commonly, a POE analyses energy consumption, user satisfaction, indoor environment quality, productivity, etc., using defined assessment protocols (Li et al., 2018). On the other hand, exploratory walkthroughs enable the evaluation of spatial efficiency in relation to spatial comfort, circulation, and spatial arrangement (Sanni-Anibire et al., 2016; Seve et al., 2023), complementing user interviews and photographic surveys.

In POEs, outcomes are typically presented through descriptions, pictures, or diagrams, rather than through ethnographic post-occupancy redrawing. However, the redrawing of architectural plans and other projections provides specific knowledge (Jacoby, 2016; Lima & Vieira, 2017) and is an essential tool for architectural and spatial thinking, especially regarding spatial and social relationships (Evans, 1989). If "inhabiting means to leave footprints" (Benjamin, 1972, p. 183), then furniture and objects are more than behavioural elements that allow for the use of space by linking it with its occupants (Bourdieu, 1979; Sanni-Anibire et al., 2016). Thus, "domestic cartography" constitutes the mapping of houses through architectural drawings that include detailed representations of objects and furniture, which act as a projection of inhabitants' subjectivities in space, revealing not only activities but also memories, preferences, identities, and spatial conflicts. In the domestic cartographies presented, any technical or constructive element that the inhabitant does not perceive is expressly erased, while the representation of the dwelling has been extended towards the shared space connected to dwelling access. The direct comparison between what was planned (design project floor plan) and what is being produced (inhabited floor plan), together with the photographic comparison of rooms sharing a common design, occupied differently in dwellings within the same building, facilitates a direct discussion of adaptability, appropriation, and privacy that theoretical research does not permit.

2.1. Case Study Selection

All case studies were municipal housing produced in the period 2015–2023. In 2023, 68.11% of the 13,489 flats proposed by the municipal government were achieved (Table 2). While 5,469 dwelling units resulted from traditional housing models, new models delivered 3,719 units.

There are completed units for all strategies except for the public–private partnership model, which only started in 2021. Vulnerable areas of urban regeneration are not included in this study as they do not add new public housing units. To analyse the remaining five strategies, 16 buildings were selected as case studies

Table 2. The status of the seven strategies in 2023.

Strategy/status	Completed units in 2023 (dwellings or accommodation units)**	With approved planning	Progress (completed and approved)
Traditional strategies prior to 2015			
IMHAB council housing production	1,112	2,610	5,469
Mobilisation of empty housing	1,747	No planning; depends on opportunities, based on the right to first refusal	
New housing strategies after 2015			
IMHAB industrialised council housing production	54	324	3,719
FFZEC Agreement	156	918	
Public-private partnership (Habitatge Metròpolis Barcelona)	0	762	
Retrofitting purchased buildings	1,505	No planning; depends on opportunities, based on the right to first refusal	
Vulnerable areas of urban regeneration	2,306	No planning; depends on vulnerable case detection programmes	No new units*
TOTAL	6,881	4,614	68.11% (9,188/13,489)

Notes: * This strategy serves private communities and individuals who benefit from refurbishment subsidies, thus improving existing housing stock, but does not create new public housing units; ** while “housing” is defined by the national Código Técnico Edificación and regional (Catalonia) habitability (Generalitat de Catalunya, 2012), “accommodation” is regulated by the endowment accommodation (Generalitat de Catalunya, 2014, 2020) and has less restrictive comfort standards designed for short-period stays; progress is calculated as achieved/aimed housing units (based on Ajuntament de Barcelona, 2017). Source: Authors’ work based on data provided by the Municipality of Barcelona and the Gerència d’Habitatge in December 2022.

(Table 3). Six case studies with different housing procurement models are analysed in detail in this article, framed by a discussion on their development strategies—traditional strategies (IMHAB council housing production and mobilisation of empty housing)—and new strategies—industrialisation (IMHAB industrialised council housing production), delegated production (FFZEC Agreement and public-private partnership), and refurbishment (retrofitting purchased buildings).

An average of three visits were made for each case: The first two provided an initial contact and generated confidence, and data was collected on the third.

Table 4 specifies the number of visits made, users contacted, and interviews conducted. Depending on the ownership and management scheme of buildings, different methods were employed:

1. Regular rental social housing, with the building managed directly by users: Before any visits were made, IMHAB, the owner, leafleted the building to request user collaboration. This approach proved ineffective,

Table 3. Case studies analysed.

Project and address	Developer	Architects	User		Tenure		Dwelling units	Gestating period (months)	Total area (m ²)	Budget (€)
			User profile	User time of stay	Tenure regime	User regime				
Traditional strategies prior to 2015										
IMHAB council housing production										
Sancho de Ávila II (Infanta Isabel str., 9–11)	IMHAB	Baas–Jordi Badia	General applicants	75 years, renewable	Surface right	Usufructuary	68 units	156	15,196	15,028,844
Glòries (Bolivia str., 45–49)	IMHAB	Bonell i Gil/Peris + Toral	Elderly	5 years, renewable	Rental	Social renting	105 units	114.5	26,740	27,939,918
Can Fabra (Parellada str., 7–11)	IMHAB	Roldán + Berengué	Young people	5 years, renewable	Rental	Social renting	44 units	122.5	4,252	4,677,200
Josep Pla (Pere IV str., 455–457)	IMHAB	Estudi Massip-Bosch	General applicants	Indefinite	Purchase	Ownership	51 units	119	8,919	15,139,000
			Elderly	5 years, renewable	Rental	Social renting	27 units			
Bon Pastor (Biosca str., 17–25)	IMHAB	Pascual–Ausió	General applicants	Indefinite	Purchase	Ownership	61 units	88	11,540	8,649,554
Quatre Camins (Infanta Isabel str., 9–11)	IMHAB	Ravetllat Ribas	Elderly	5 years, renewable	Rental	Social renting	44 units	101	4,833	4,842,565
Tànger (Tànger str., 38–42)	IMHAB	Coll–Leclerc	General applicants	7 years, renewable	Rental	Social renting	47 units	95	5,570	5,995,631
			Social emergency	5 years, renewable	Rental	Social renting	20 emergency shelters			
Mobilisation of empty housing										
Floridablanca (Floridablanca str., 106)	IMHAB	IMHAB technical services	General applicants	7 years renewable	Rental	Social renting	18 units	33	8,748	7,122,182.36
Poble-sec*	Fundación Hàbitat3	Caterina Figuerola	Social emergency	3 years	Surface right	Temporary accommodation	2 units	15	147.87	71,606.00

Table 3. (Cont.) Case studies analysed.

Project and address	Developer	Architects	User		Tenure		Dwelling units	Gestating period (months)	Total area (m ²)	Budget (€)
			User profile	User time of stay	Tenure regime	User regime				
Casa Bloc Residential Home* (de la Residència str., 10)	Fundación Hàbitat3	Estudi fàbric	General applicants	7 years, renewable	Surface right	Social renting	15 units	52	1,120	614,083.18
			Social emergency	5 years, renewable	Surface right	Temporary accommodation	2 units			
Gran de Gràcia*	Fundación Hàbitat3	Fundación Hàbitat3 technical services	Social emergency	3 years	Rental	Temporary accommodation	1 unit	0**	56	0**
Independència (Independència str., 287)	IMHAB	IMHAB technical services	Social emergency	Undetermined	Rental	Temporary accommodation	10 units	0**	620	0**
New housing strategies after 2015										
IMHAB industrialised council housing production										
Allotjaments de Proximitat Provisionals (APROP) Ciutat Vella (Nou de Sant Francesc str., 10)	IMHAB + Municipal Institute of Social Services	Straddle3 + Eulia Arkitektura + Yaiza Terré	Social emergency	5 years, renewable	Surface right	Temporary local accommodations	12 emergency shelters	32.5	816	1,042,402.89
FFZEC Agreement										
La Balma (Espronceda str., 131–135)	Sostre Civic Housing Cooperative	Lacol + laBoqueria Taller	Cooperativists	75 years, renewable	Surface right	Cession of use	20 units	62	2,347	2,725,622.14
Cirerers (Pla dels Cirerers str., 2–4)	Sostre Civic Housing Cooperative	Celobert	Cooperativists	75 years, renewable	Surface right	Cession of use	32 units	69	2,745	3,741,200
Retrofitting purchased buildings										
Encuny (Encuny str., 7)	IMHAB	MSA+A	General applicants	7 years, renewable	Rental	Social renting	114 units	New building, purchased	8,000	5,818,676.89 (purchase prize)

Notes: * The address is kept private upon request of the owner; ** no adaptation works were necessary, the properties were handed over in perfect condition; “tenure regime” refers to the legal framework of the entity that manages the ownership, while “user regime” to users; units are housing unless otherwise specified; the case studies presented in this article are in yellow.

as only 6% of residents had read the information before the first visit. The approach was changed to include an initial “cold call” visit to propose a day to visit the dwelling. A second visit was conducted for data collection. During a third visit, exterior photographs were taken. In some cases, a fourth visit was necessary to complete access to all dwellings.

2. Buildings under professional management (municipality or foundations) or in which users receive municipal social assistance: The person responsible for the management of the building contacted specific inhabitants. A first visit was used for data collection and a second for exterior photographs.
3. Housing cooperatives, where the community is cohesive: First contact was made with the person representing the cooperative, who would share the collaboration proposal with the community. A first visit for data collection was conducted and a second was to take exterior photographs. A third visit was necessary to complete access to all dwellings.

Table 4. Case study fieldwork: Number of visits and method used to access the dwellings (1, 2, and 3 as defined above).

Dwelling	Approach	Number of visits	Contacted users	Interviews (no. edited in video)
Traditional strategies prior to 2015				
IMHAB council housing production				
Sancho de Àvila II	1	4	29	4 (2)
Glòries	2	2	9	5 (2)
Can Fabra	1	3	10	5 (1)
Josep Pla	1	3	23	6 (1)
Bon Pastor	1	3	14	6 (1)
Quatre Camins	2	2	8	8 (2)
Tànger	1	4	20	7 (2)
Mobilisation of empty housing				
Floridablanca	1	3	10	2 (1)
Poble-sec	2	2	1	1 (1)
Casa Bloc	2	2	2	2 (1)
Gran de Gracia	2	2	1	1 (1)
Independencia	2	3	2	2 (1)
New housing strategies after 2015				
IMHAB industrialised council housing production				
APROP Ciutat Vella	2	2	3	3 (1)
FFZEC Agreement				
La Balma	3	3	6	4 (1)
Cirerers	3	3	21	6 (1)
Retrofitting purchased building				
Encuny	1	3	30	5 (2)
TOTAL		44	189	66 (21)

Note: Case studies presented hereafter are shadowed in yellow.

3. Findings

This section presents the six selected case studies grouped by developer: housing developed by IMHAB, delegated developments, and retrofitting purchased buildings.

3.1. Housing Developed by IMHAB

3.1.1. IMHAB

Since 1927, IMHAB (formerly Patronat Municipal de l’Habitatge) has been the municipal developer responsible for the procurement and management of new public housing. New buildings are developed through two public and consecutive competitions for design teams and construction companies. Residents are assigned from the Register of Applicants for Social Housing in Barcelona, the eligibility criteria for which include an income threshold, no registered property ownership, and being a citizen of Barcelona. These criteria were employed to target different groups: general applicants (Sancho de Ávila II), social renting derived from the municipal social services (Tànger building), elderly people (Glòries [Figure 2] and Quatre Camins), young people (Can Fabra), and people relocated due to urban transformation (Bon Pastor).

To increase public housing stock long-term, these homes are offered for rent or through the “right of surface” (users own the flat for 75 years, after which it returns to the public administration, who retain control over the land throughout), but no longer for sale (as is the case elsewhere in Spain). This adds to the complexity of maintenance and management. CEVASA, a leading private rental housing developer in Spain, estimates that the cost of maintenance over 75 years will be equivalent to 140% of build costs, more than doubling the required investment levels.

This strategy is explified with Tànger building (Figure 1) and Glòries case study (Figure 2).

Comparing architects’ hypothetical drawings with inhabited situations shows that the day area is occupied very differently from how it was planned. In all cases, the position of the dining table and sofa have been exchanged to move the table closer to the light. The sofa, the living room cupboard, and the TV are much larger than expected, forcing the users to position the couch lengthwise—parallel to the kitchen counter—creating proximity which sometimes results in interference between the kitchen and other daily life activities. The insertion of the gallery, a passive climate control element, reduces the floor area of the room, but also its adaptability and makes it difficult to fit the users’ furniture. However, the gallery is also the place that users customise and occupy the most. In the analysed flat, it became the pet’s room. Privacy is controlled through different textile elements and objects, both in the access threshold and the gallery.

Observations by the inhabitants, Tànger:

- Neighbourhood scale:
 - Positive opinions:
 - > Welcoming existing residents.
 - > Process of pedestrianisation of the surrounding public space and proliferation of green areas.



Figure 1. Tànger case study, targeting general applicants and social emergency groups. On the left, the floor plans as built (top) and post-occupancy (below) are presented. On the right, the photographs are by Adrià Goula ([a], in Figuerola & Bilbao, 2023, p. 93) and Maite Caramés ([b, c, d, f], in Figuerola & Bilbao, 2023, pp. 87 [f], 88 [c], 89 [d], 93 [b]); [e] courtesy of Maite Caramés, 2022.

- Negative opinions:
 - > None expressed.
- Building scale:
 - Positive opinions:
 - > Originality in the organisation of the common access spaces to the dwellings: They facilitate neighbourly relations and allow activity and visual control at the same time.
 - > Use of all building levels: Lobby and corridors for meetings and conversation and deck as a solarium.
 - > Aesthetically highly valued: Pride about living in an awarded building.
 - > Mutual support network among neighbours.
 - Negative opinions:
 - > Dwellings are allocated to people with different life situations, which sometimes results in cohabitation issues.
- Dwelling scale:
 - Positive opinions:
 - > Practical and easy daily maintenance: Correct dwelling size.
 - > Initial problems adapting to a flat smaller than their previous one; however, they consider it suits their current needs.
 - Negative opinions:
 - > Quality and maintenance of some materials could be improved.
 - > Dining room and terrace are small when compared to the kitchen.

The uses and furniture layout were not changed upon inhabitation, except for the inclusion of the bidet, added at the request of users. User appropriation is very evident in the photographs, extending along the walls and making the most of the centrifugal plan towards the corners.

Observations by the inhabitants, Glòries:

- Neighbourhood scale:
 - Positive opinions:
 - > A feeling of welcome, affection, and care.
 - > Good relationship with local businesses, which was highly valued during the pandemic.
 - > Very good public transport network.
 - > Open and airy spaces, with a good proportion of green areas.
 - Negative opinions:
 - > Noise pollution problems at night due to leisure activities.
- Building scale:
 - Positive opinions:
 - > Daily interaction with a small number of people.
 - > The activities organised by the centre to promote social contact.
 - > The infrastructure of common spaces facilitates social contact and the organisation of community activities.
 - > Use of the whole building throughout the year.



Figure 2. Glòries case study, designed for elderly people. On the left, the floor plans as built (top, redrawn) and post-occupancy (below) are presented. On the right, the photographs are by Adrià Goula ([a], in Figuerola & Bilbao, 2023, p. 35) and Maite Caramés ([b–g], in Figuerola & Bilbao, 2023, pp. 40 [d, e], 41 [c, f], 45 [b], front page [g]), 2022.

- Negative opinions:
 - > The management of the building is outsourced, which generates: (a) problems with maintenance efficiency; (b) a difficult conversation with the owner, IMHAB; (c) over-bureaucratisation (the need to continuously justify the use of certain common areas).
- Dwelling scale:
 - Positive opinions:
 - > They feel cared for.
 - > Delighted, perfect for older people: They claim the same quality of proposal for young people.
 - > It offers them all the comforts they need. It guarantees privacy or a voluntary relationship with little effort.
 - Negative opinions:
 - > None expressed.

3.1.2. Mobilisation of Empty Housing

As a complementary strategy to new construction, in 2005, the municipal government of Joan Clos created a programme of collaboration with private owners of empty homes. Specifically, the aim was to incorporate dwellings that do not comply with habitability requirements, but where owners cannot afford the necessary refurbishment. In exchange for financial support (up to €20,000 per unit), the dwelling becomes part of the public rental stock for three years with a possibility of extension for three more. The administration not only acts as an intermediary but also as a guarantor between private owners and users, offering technical, legal, and social support to both. The dwelling can be managed by the city council (Floridablanca, Independència) or delegated, as in the Habitat3 Foundation's Empty Flats Programme (Poble-sec, Casa Bloc [Figure 3], and Gran de Gràcia). These refurbishments are adapted to different frameworks: For example, Independència works with tourist licences for social renting, providing temporary accommodation for people previously housed by the City Council's Social Services, while Gran de Gràcia provides housing for homeless people as a first step in their rehabilitation.

The uses and furniture layout were not changed upon inhabitation. Remarkably, what changes is the role played by the objects, fabrics, and auxiliary furniture, as well as the intensity of use and occupation of the terrace, equivalent to the bedroom or living room.

Observations by the inhabitants, Casa Bloc:

- Neighbourhood scale:
 - Positive opinions:
 - > Easy accessibility.
 - > Proximity trade.
 - > The activities programmed by the community facilities.
 - Negative opinions:
 - > None expressed.
- Building scale:
 - Positive opinions:
 - > Peace of mind.



Figure 3. The Casa Bloc case study houses general applicants and social emergency groups. On the left, the floor plans as built (top, redrawn) and post-occupancy (below) are presented. On the right, the photographs are by Adrià Goula ([a], courtesy of Adrià Goula) and Maite Caramés ([b–e], in Figuerola & Bilbao, 2023, pp. 197 [e], 199 [c, d], 201 [b]), 2022.

- > Good coexistence but close relationship with few neighbours.
- Negative opinions:
 - > The building entrance area was not fully refurbished.
- Dwelling scale:
 - Positive opinions:
 - > Surface area and distribution appropriate to needs.
 - > Easy daily maintenance.
 - > To be the first dwellers.
 - Negative opinions:
 - > None expressed.

In addition to these two strategies, and given the urgent need for affordable housing, the Government of Barcelona en Comú implemented five new strategies in 2016 (Table 1).

3.1.3. IMHAB Industrialised Council Housing Production

This strategy aims to shorten the duration of public procurement through industrialisation. It has been implemented through two types of projects: public tender for industrialised housing and APROP.

3.1.3.1. Public Tender for Industrialised Housing

As explained by Melero (2023), director of technical services at IMHAB, the existing conventional system of IMHAB council housing production separates the two key agents in the process—the architects and the construction company—which extends the project period and limits technological innovation. A key strategic change since 2020 is to hold a single competition for both design and construction phases, forcing a conversation between architects and building companies and encouraging material and structural innovation.

3.1.3.2. APROP

APROP (Figure 4) housing was created by the Social Innovation team of the Social Services of the Barcelona City Council (not the Housing Department) to provide a provisional solution for evictees, by temporarily (a maximum of five years) relocating them in the same area to preserve their community ties. Given the lack of development plots for housing, this programme provides demountable buildings on plots intended for public facilities. APROP is a model of industrialised housing that aims to shorten construction times and reduce carbon emissions. To overcome restrictions in planning regulation, they are not classified as “housing” but as “accommodation.” This distinction is key for the use of containers, as the regulations are less strict in the definition of spaces and minimum dwelling sizes, allowing a minimum usable floor area of 15 m² for one-person housing units and 25 m² for two occupants, far below the 40 m² minimum dwelling standard. Although APROP Ciutat Vella was seen as a suboptimal solution for emergency shelters and caused controversy, the negative connotations of the container were hidden behind a new façade.



Figure 4. APROP Ciutat Vella, proximity social emergency shelters. On the left, the floor plans of one shipping container unit as built (top, redrawn) and post-occupancy (below) are presented. On the right, the photographs are by Adrià Goula ([a], in Figuerola & Bilbao, 2023, p. 115) and Maite Caramés ([b–f], in Figuerola & Bilbao, 2023, pp. 119 [f], 120 [c, d], 121 [e], 123 [b]), 2022.

Observations by the inhabitants, APROP Ciutat Vella:

- Neighbourhood scale:
 - Positive opinions:
 - > Tranquillity.
 - > Proximity trade.
 - > Being able to remain in the neighbourhood.
 - Negative opinions:
 - > None expressed.
- Building scale:
 - Positive opinions:
 - > Singular appearance.
 - > The management and monitoring team.
 - Negative opinions:
 - > None expressed.
- Dwelling scale:
 - Positive opinions:
 - > Sufficient floor area for needs.
 - > Easy daily maintenance.
 - > They are not aware of being inside a container.
 - > The threshold between the two façade envelopes: A welcoming space that connects with the street.
 - Negative opinions:
 - > Area of the dwelling and the small storage area in the single-module housing.

The restricted dimensions of containers restrict user adaptability of the spaces. However, this limitation is addressed by enhancing the external areas. The walkway leading to the accommodation has vegetation and creates a space that fosters social relationships, and the threshold between the two façade envelopes becomes a domestic corner and a privacy control filter.

3.2. Delegated Developments

Aware of its limitations, Barcelona's City Council established a very uncommon collaboration with third-party agents for delegated developments. They involved both the third sector (FFZEC Agreement) and public-private partnerships of limited benefit (Habitatge Metròpolis Barcelona, which has not yet completed any projects). In both cases, the partners act as developers through a "right of surface."

3.2.1. FFZEC Agreement

In 2014, a prototype agreement between housing cooperatives and the municipality was signed under the mandate of Xavier Trias (Carrer Princesa and la Borda), which later became a municipal strategy under Colau's government in 2015 (including Cirerers; see Figure 5). This new system is based on the community land trust model. By keeping a strong link to the neighbourhood, users can be incorporated at the beginning of the design phase, which gives them the opportunity to benefit from their own decisions, support

innovative construction methods (for example, using cross-laminated timber), promote sustainability (environmental strategies), and make typological changes (common areas and spaces). Buildings are understood as social units that foster community development. Hence, housing is designed with a focus on community areas and not individual dwellings, opting for shared-use spaces in the building. This shift requires new design tools and novel typological solutions to comply with regulations conceived for traditional housing units (Avilla-Royo et al., 2021).

The design of the house incorporates common spaces as a natural extension of private space, with generous corridors on each landing where shared objects, such as laundry machines, are placed. Each dwelling unit is designed as an open space where the arrangement of furniture and objects defines the function of each part. In this sense, the inhabited floor plan aligns with the planned one, with the only change being the position of the dining table, now placed in the centre of the space due to the size of the sofa. The terrace has a floor area that allows for a diversity of uses, as evidenced by the number and type of elements found there.

However, in one case, the bed has been moved to the main façade (Figure 5f). Users decided to connect the day area with the collective spaces and to bring the rest to the more private façade. The role of the kitchen as a filtering mechanism between day and night areas may be questioned, but the dimension of the unitary space shows that it permits the appropriation of the space in various ways.

Observations by the inhabitants, Cirerers:

- Neighbourhood scale:
 - Positive opinions:
 - > A politically aware neighbourhood with proactive people.
 - > Proximity to the mountains, better air quality.
 - > Sound comfort, bird sounds.
 - > Ideal place to grow old.
 - > Ground floor dedicated to community activities linked to the social and solidarity economy.
 - Negative opinions:
 - > None expressed.
- Building scale:
 - Positive opinions:
 - > A way of life manifesto.
 - > They were able to participate in its strategic development and co-design.
 - > It is designed for community, with well-sized communal spaces.
 - > Open to the neighbourhood: It is implemented with respect for its morphology.
 - > It fosters relationships that consolidate a community that cares.
 - Negative opinions:
 - > None expressed.
- Dwelling scale:
 - Positive opinions:
 - > Fulfils everything they need: Adequate private area that complements the communal area.
 - > Solutions to housing problems are addressed collectively.
 - > The door is almost always open.



Figure 5. Cirerers cooperative housing case study. On the left, the floor plans of one shipping container unit as built (top, redrawn) and post-occupancy (below) are presented. On the right, the photographs are by Adrià Goula ([a], in Figuerola & Bilbao, 2023, p. 149) and Maite Caramés ([b–f], in Figuerola & Bilbao, 2023, pp. 152 [e], 153 [d], 154 [c, f], 157 [b]), 2022.

- > The community facilitates comfort.
- Negative opinions:
 - > None expressed.

3.3. Refurbishment

To complement the mobilisation of the empty housing strategy, two types of programmes were created: retrofitting purchased buildings and vulnerable areas of urban regeneration. The refurbishment strategies start by assessing the state of buildings that, due to a lack of legal obligations or regulations, have not been maintained by owners and tenants. While retrofitting purchased buildings operates at a building scale, vulnerable areas of urban regeneration projects address both the condition of housing and nearby public space without creating new public housing.

3.3.1. Retrofitting Purchased Buildings

In 2016, the City Council developed a new strategy to purchase and refurbish housing, facilitated through IMHAB. This approach is based on the right of first refusal and the “extraordinary and urgent measures for the mobilisation of housing resulting from foreclosure processes” (Generalitat de Catalunya, 2015). To enhance the positive social impact, priority was given to poorly maintained buildings with socially or economically vulnerable inhabitants or areas affected by gentrification processes—An example is Raval, a complete microsurgical refurbishment of a building with 17 dwellings. On the other hand, Encuny (Figure 6) exemplifies the purchase of a newly built—but never inhabited—student residence equipped with communal spaces.

Observations by the inhabitants, Encuny:

- Neighbourhood scale:
 - Positive opinions:
 - > None expressed.
 - Negative opinions:
 - > They are on the edge of an industrial area, with no housing nearby.
 - > 10 years have passed without services or local commerce.
 - > Streets with very little traffic; feeling of insecurity.
- Building scale:
 - Positive opinions:
 - > None expressed.
 - Negative opinions:
 - > Virtually no relationships between neighbours.
 - > Conflict between neighbours: Complicated personal situations.
 - > They have never been able to access the outdoor common areas.
- Dwelling scale:
 - Positive opinions:
 - > Perfect floor area and layout for a single-person.
 - > The price they pay for rent.

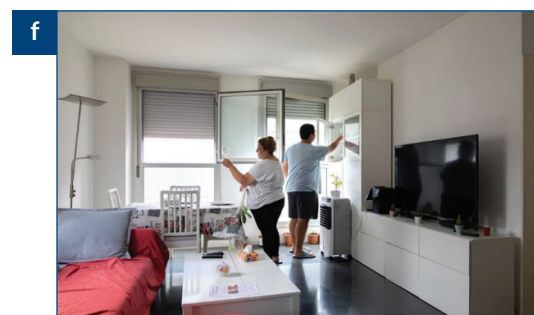
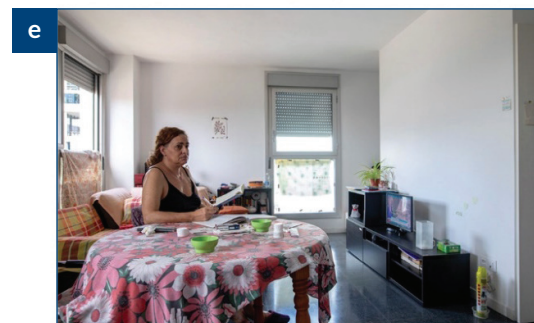
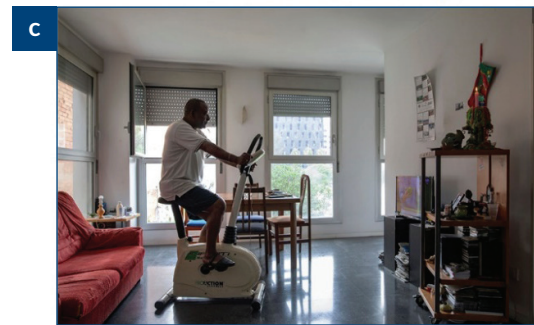
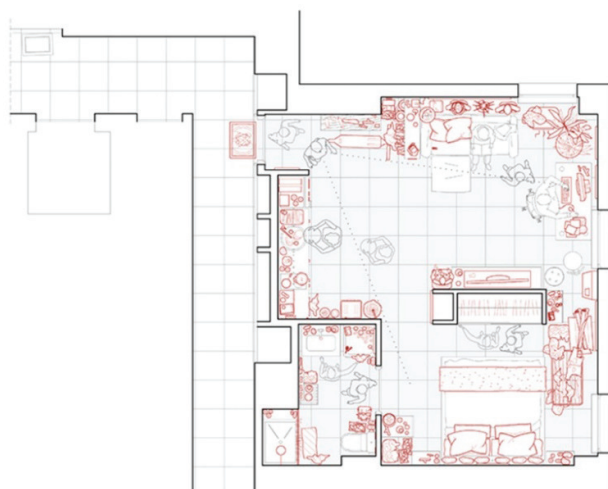
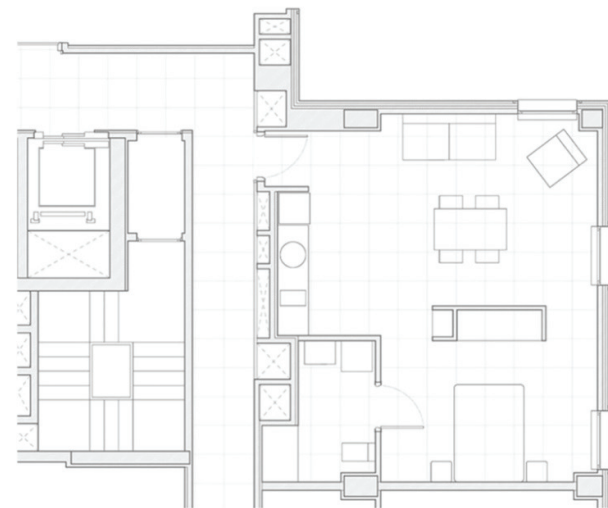


Figure 6. Encuny case study. On the left, the floor plans of one shipping container unit as built (top, redrawn) and post-occupancy (below) are presented; although designed as a student residence, the access corridor as relational space was minimised. On the right, the photographs are by Adrià Goula ([a], in Figuerola & Bilbao, 2023, p. 106) and Maite Caramés ([b–e], in Figuerola & Bilbao, 2023, pp. 108 [b, d], 109 [c, e], 2022).

- > The duration of the contract
- Negative opinions:
 - > Difficult for two people to live together.
 - > Over-connected areas.
 - > Lack of privacy between the bedroom and the day area; doors to partition the home are needed.
 - > Lack of balconies/terraces.

On the inhabited floor, the staircase has been removed as the lift is used almost exclusively. From there to the entrance of the house, the size of the corridors is reduced, which prevents informal encounters. As stated by inhabitants, the lack of visual and acoustic filters between the day and night areas negatively affects coexistence when there are two occupants. The mapped dwelling is inhabited by a single person; it is an extreme case of individuality with no dining table. In this case, the spatial continuity between day and night areas is positive: Even the passageways are occupied by objects and the continuous perimeter of the façade is filled with furniture and objects. A large part of the activities has naturally shifted to this perimeter.

The flats were allocated to dwellers with diverse profiles and lifestyles, resulting in minimal coexistence and, in many cases, conflicts, prompting IMAHB to classify communal areas as contentious and order their closure, although some users propose to open them. This is the only case study with a permanent security guard who conducts twice-daily inspections.

4. Discussion

4.1. Urban Layout

A mapping of housing strategies in Barcelona reveals the implementation of affordable housing policies across all districts, avoiding the concentration of developments in peripheral or low-income areas (Figure 7). However, depending on local needs or land availability, specific strategies are more prevalent in some neighbourhoods, highlighting the adaptability of strategies to the specific neighbourhood needs or context. For instance, in the vulnerable areas of urban regeneration, 78% of the 2,306 units are concentrated in three districts: 748 in Sant Martí, 650 in Nou Barris, and 402 in Sant Andreu. Over 80% of 3,722 units planned for new IMHAB development are in five of the 10 districts involved: Sant Andreu (877), Sant Martí (773), l'Eixample (572), Sants-Montjuïc (476), and Nou Barris (427), in contrast with other areas such as Les Corts (68) and Sarrià-Sant Gervasi (57). The planned IMHAB industrialised council housing production (378) is mostly concentrated in the districts of Sant Andreu (126) and Sant Martí (193).

All projects have been built in the compact city except Encuny, where users have been critical of their loose and fragmented urban fabric. An important consideration at the urban scale is the potential for a positive relationship between the building and its surroundings. In this context, users acknowledged that the neighbourhood completed their habitat, especially in the case of the elderly in Glòries and Casa Bloc, where local shops and services provided daily amenities and personal care. In this respect, the function allocated to the ground floor of social housing schemes is essential. Ground-floor dwellings generate a hermetic façade relationship to the surroundings due to privacy problems, but when facilities or common areas are located on the ground floor, it becomes a positive driving force for the neighbourhood, as in the case of the Glòries

Primary Care Centre, cooperative commerce in Cirerers, or the municipal service office in APROP Ciutat Vella or Tànger.

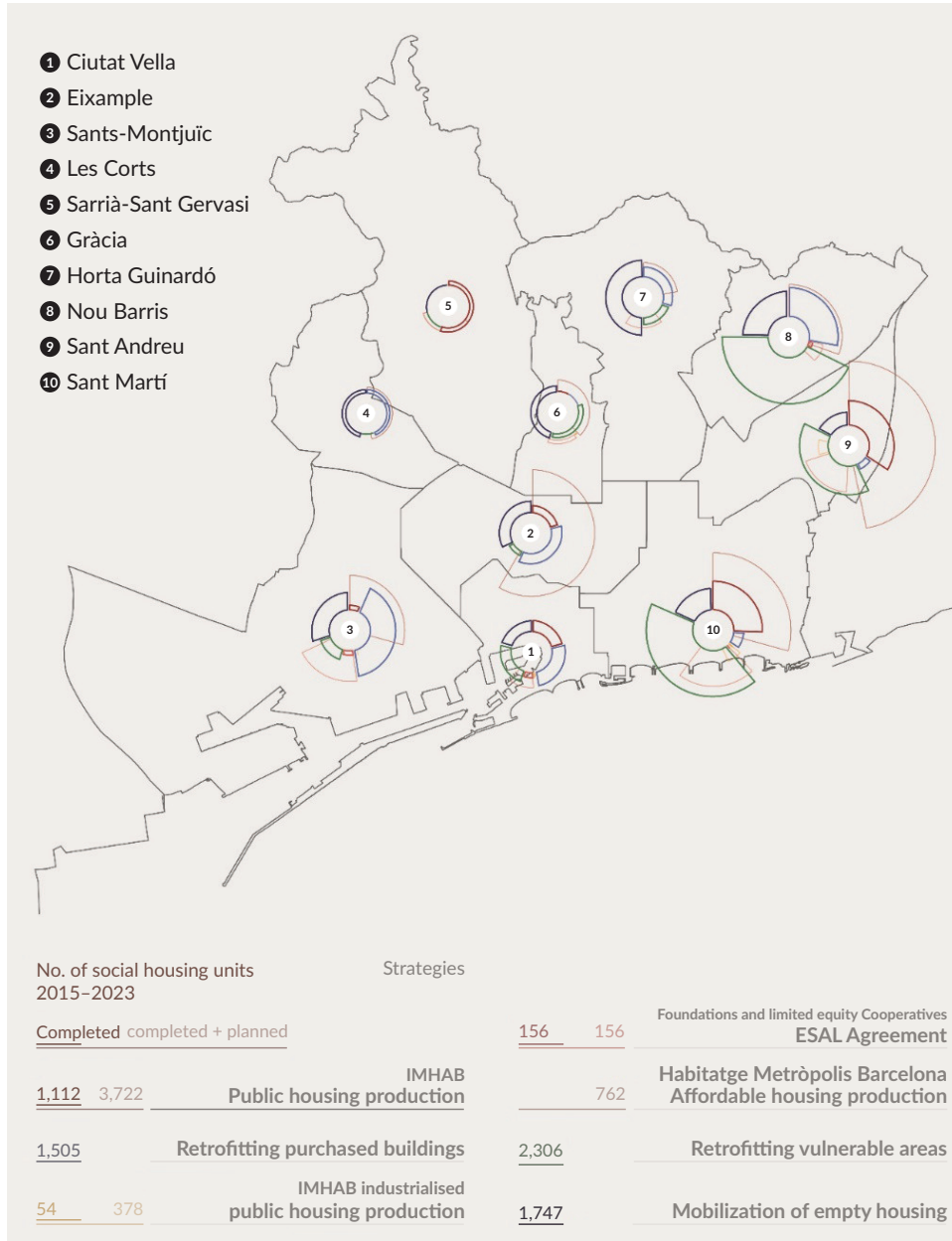


Figure 7. Affordable housing policies in Barcelona, organised by the 10 administrative districts of the city.

4.2. Timeline

A timeline (Figure 8) was used to analyse the time required to analyse the time required to produce housing under each of the available procedural frameworks, both in total and by phase. The new insight that this analysis provided was highly appreciated by the municipal government and housing agencies. As evident, the economic crisis of 2008 and the Covid-19 pandemic in 2020 clearly delayed ongoing processes. Concerning IMHAB council housing production, the standard period from project start to handover is almost

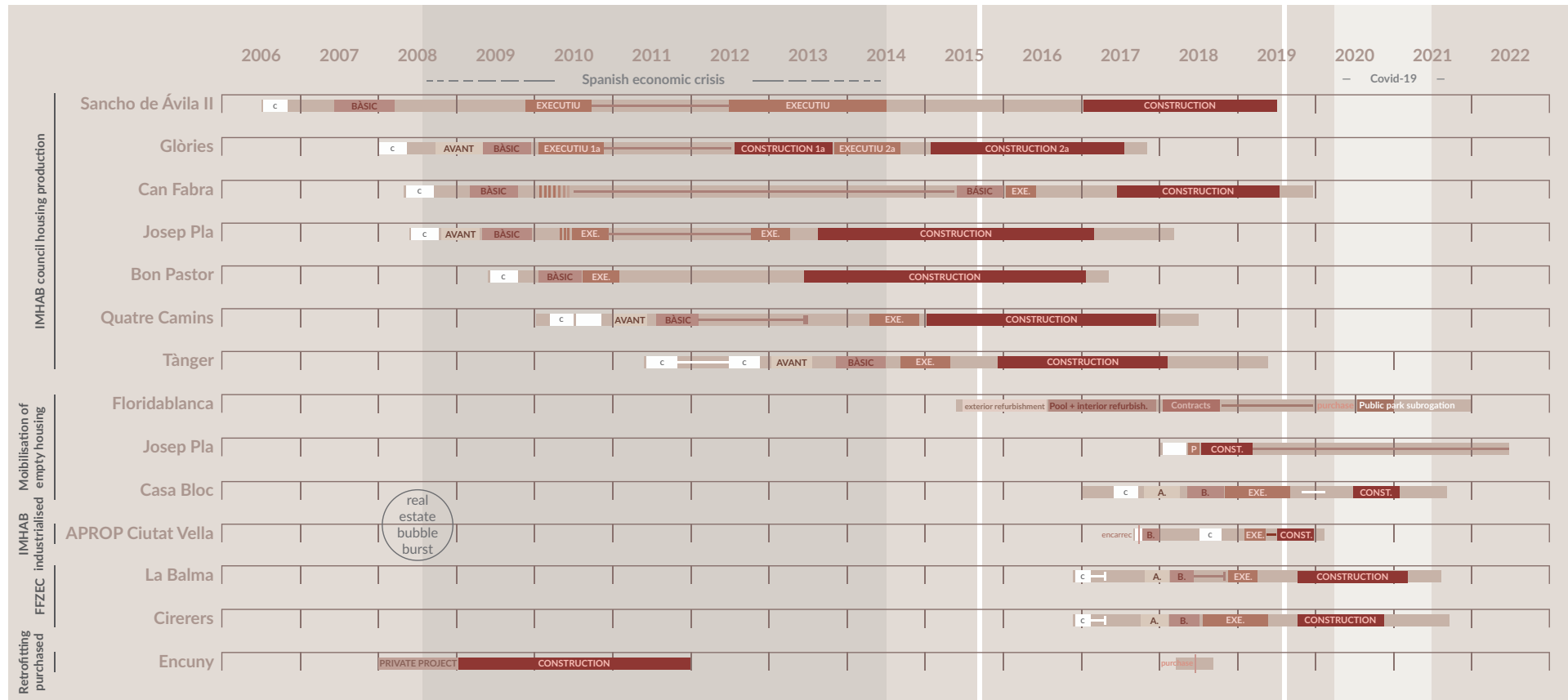


Figure 8. Timeline of the 16 buildings presented as examples of the five strategies. Notes: The cases of Gran de Gràcia and Independència are not shown because they did not involve construction work. *Avantprojecte*, *Projecte Bàsic*, and *Projecte Executiu* are the names of design stages in Spain.

10 years. This is not much more efficient than cooperative housing production which is often criticised for longer project periods due to the involvement of users in decision-making processes. However, delegated production (cooperative housing buildings La Balma and Cirerers) shortens the lead time to five years, and employing industrialised systems reduces lead times to three years, reducing the strategic and design development period by 35% (Melero, 2023). Refurbishment strategies can vary from the minimum time of purchase management (a few months; Encuny) to four to six years in the case of comprehensive refurbishment (not analysed in this article).

4.3. POE

4.3.1. User Priorities

This study highlights the importance of incorporating users and lifestyles in the evaluation of housing policies. Methodologically, the open questions in the interview allowed users to focus on what they considered most important.

At the neighbourhood scale, users highlighted the importance of a compact city and connection with facilities. Representative cases are Glòries, where the neighbourhood offers care services to the elderly residents, or APROP Ciutat Vella, which allows residents to be rehoused in their neighbourhood until permanent housing is found.

At the building level, users first highlighted the importance of common spaces and the extension of the dwellings towards shared areas. Secondly, they emphasised the possibility of relationships with neighbours and the ability to socialise with them, along with the need for privacy control. Cirerers is the most extreme case in this regard, as users perceive their private space as a complement to the communal space. In intermediate situations, such as Tànger, communal access areas serve as a place for relationships to be cultivated and remind inhabitants of building typologies that previously characterised the neighbourhood. A negative example is Encuny, which meets all desirable standards but suffers from community conflicts. This shows that the home extends beyond the front door and that the context—community, neighbourhood—in which the home is located is crucial.

At the dwelling level, the most commonly valued quality was the peace of mind from having their basic housing needs met. The adequate number of rooms per floor and dimensions of the space were also valued. The elderly in Glòries and residents of Tànger appreciate the little effort and time needed to keep their homes tidy and clean. Interestingly, the comments on aesthetics (“pretty” and “ugly”) were not significant; instead, emphasis was placed on the practicality of cleaning and maintenance of the materials.

It is worth noting that the only case which did receive criticism was Cirerers. Since users were involved in the project since the strategic development phase, they could anticipate—and address—future problems.

4.3.2. Researcher and Developer Priorities

An important issue in affordable housing provision is adaptability, which was analysed using post-occupancy plan drawings. Of the case studies presented here, apart from APROP Ciutat Vella, the most inflexible scheme

is Tànger, where the inhabitants are restricted in uses and furniture layouts by the limited floor areas and narrow dimensions. In contrast, Glòries and, to a lesser extent, Encuny have more generous floor areas that are organised circularly, which changes the perception of the space. All case studies assign a use to each space derived that correlates with standard dimensions. The exception is Cirerers, which allows inhabitants a freer appropriation of the flat, enabling them to sectorise the dwelling according to their preferences. Remarkably, no user asked for more space or an extra room in their dwelling. Other issues that have not been addressed but have been the subject of academic analysis include the gender perspective, the clothing cycle, the food cycle (Falagán, 2019a), the incidence of geometric formalisation, technological adequacy, hierarchisation of rooms, work and storage spaces, resource management, and energy use (Montaner et al., 2013).

5. Conclusions

The study evidences the importance of housing strategy diversification, which has led to a considerable increase of 68% in the number of housing units developed in Barcelona. However, housing procurement has been slower than expected, partially explained by the Covid-19 pandemic, but with an overall progress rate reaching 68.11% of the housing target numbers (9,288 out of 13,489 units). A diversification of housing strategies increased the number of stakeholders, such as delegated promoters (foundations, housing cooperatives, private developers), and made it possible to provide a greater range of homes serving diverse user needs, leading to new legal and technical processes. Additionally, these new strategies opened the possibility of experimentation in construction (industrialisation, new materials such as cross-laminated timber, reuse of containers), typology (shared spaces in cooperative housing), and post-occupancy management (self-management in housing cooperatives). Now that some of the initial administrative and logistical challenges of designing and launching new housing models have been overcome, it is reasonable to expect an acceleration of housing production by the new procurement strategies if policies are continued. However, the targets set out by the municipality may not be fully achieved.

At an urban scale, social housing was delivered through different strategies in all city districts and integrated social housing within the existing city. This has fostered synergies between existing and new users and activities. Coupled with high-quality design and construction, this approach has prevented the stigmatisation of social housing and created a sense of pride and belonging among users.

Barcelona's restricted possibilities for urban growth have limited the availability of land for new public housing. In 2015, it was estimated that Barcelona could only build 20,000 new social housing units (Ajuntament de Barcelona, 2017). In the next few decades, Barcelona will inevitably have to shift towards the refurbishment and incorporation of private housing to generate a supply of affordable homes, for which the current strategies are setting the groundwork. The accommodation of specific user needs is important, particularly for vulnerable groups. In parallel, it will become imperative to address the metropolitan dimension of housing, considering the impacts of placement and distribution in terms of land use and mobility infrastructure. This raises the challenge of scalability of strategies currently implemented in Barcelona (1,600,000 people as of 2019) to its metropolitan area as a whole (36 municipalities, 3,300,000 people).

Regarding research methods, the results achieved emphasise the importance of using a mixed methodology approach that incorporates expert analysis and ethnographic work, as well as understanding housing as a process and therefore, requiring evaluation of both its strategic and design phase and inhabitation stage.

This approach to housing as a process is something that this research seeks to underscore. The various methods employed have provided complementary information and enabled conclusions to be drawn about the design process and procedural decisions. In addition, they provide insights on which to base a series of recommendations for developers, policymakers, and designers, as follows.

5.1. Neighbourhood Scale

Choosing the right location for social housing is paramount in establishing a positive mutual impact between the building and the neighbourhood. A concentration of public housing in expanding neighbourhoods, situated on municipal peripheries should be avoided.

The ground floors of social housing blocks should be reserved for the provision of related public or communal activities (with a positive urban impact) rather than dwellings which often have privacy problems.

5.2. Building Scale

Users have a strong desire to connect with each other through shared spaces (Bon Pastor and Tànger). The common distribution of two dwellings per landing, traditionally aimed at minimising spaces for socialising, should be avoided. Generous corridors enable informal social contact and can host complementary domestic activities, but privacy should be maintained.

Furthermore, roofs (*terrats*) can be recovered as communal spaces for collective use (Glòries) and provide for functions such as laundry, leisure, and rest.

Incorporating areas for shared activities and uses scattered throughout the building makes them more accessible to all neighbours (Cirerers).

The social mix of inhabitants should be considered before inhabitation (Encuny) and, to facilitate better coexistence, temporary support by social services should be included (APROP).

5.3. Dwelling Scale

The comparison between the hypotheses of use in the architect's floor plans and the inhabited floor plans allows for several conclusions to be drawn. Housing should encourage greater flexibility of appropriation. In most cases, the position of the bed is fixed within the room, as is the position of the sofa in the living room. Floor areas and dimensions should be increased to accommodate different uses and layouts. Areas with uses left undefined are important, as they remain open for user interpretation and enable unexpected activities.

In the design development phase, there is a tendency to include very few pieces of furniture and objects in planning drawings, which actually shape possibilities for different activities and uses of space. Seating furniture drawn by architects is limited to chairs, sofas, and armchairs. However, benches, chaise-longues, pouffes, and many other pieces of furniture are what residents actually own and use.

The small furniture that is commonly drawn in plans during the design phase does not match reality. The sofas and TVs chosen by users are often very large. These findings bear similarities to past observations concerning the size of parking spaces, where regulations have been adapted to accommodate larger cars. In the same way, the size of living rooms should be reviewed.

The relationship between the kitchen and the dining room should be open to adaptation by users and include movable elements. A closed and separated kitchen reduces opportunities for interaction within the home, while a completely open kitchen conditions the space with its presence (activity, noise, smells).

Regulations should stipulate the provision of a space for drying clothes, which should be outside but unseen from the street. In the case studies presented here, observations of such spaces included insufficient sizing (Tànger) and difficulty or discomfort of access (Glòries). In Cirerers, some flats opt for a folding clothesline, which is placed on the terraces in the sun and takes up space, despite the large communal clothesline in front of the flats.

Regulations should also consider outdoor spaces (such as terraces and balconies) and intermediate spaces (such as galleries) as essential. These should be big enough to be considered exterior or semi-exterior rooms. These spaces should contain elements that enable users to control their privacy and exposure to weather.

There is a lack of space to facilitate the maintenance of the house, such as storage space for cleaning equipment and a washing area to accommodate large items (bags and backpacks, shoes, etc.). This space could be individual or collective if provided per floor.

Pets live in over half of the visited flats, a reality not contemplated by developers nor by the regulations, which should be revised. Each dwelling should have allocated storage space, which could be located in the common areas of the building.

As a final thought, it is important to show gratitude to users who have been involved in the research and, indirectly, improved housing policies. In the case of this research, they did so selflessly, with the main expressed motivations of having professional pictures and a post-occupancy drawing of their house and leaving their testimony. Each of the 66 users was given a copy of the book by Figuerola and Bilbao (2023) in which they could find their portrait and their home redrawn.

As future steps, we propose a re-analysis of these case studies to include topics that we consider important, such as gender perspectives, energy and waste management, the food and cooking cycle, and the clothing cycle. Given that users can be swayed by market norms which overlook issues that experts consider crucial, pedagogical activities are key to bringing users into conversations about the value of qualitative spatial dynamics and ways to claim them as fundamental for their living spaces.

Finally, these case studies should be re-evaluated in 10 years to understand their evolution and include cases that are currently in the strategic planning and development phase. Additionally, a typological and qualitative follow-up analysis of the dwellings would allow us to compare and discuss the standards of each strategy.

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Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

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