DASH International Conference

# New forms of Affordable Housing Adapted to Climate Change in the city of Porto

*Regeneration of the public space of municipal housing*

Belgrade, Serbia • 28 – 29 October 2026

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DASH
Deliver sAfe and Social Housing

Porto.
Domus
Social

# New forms of Social Housing adapted to climate change in the city of Porto

## Regeneration of the public space of municipal housing

I. Domus Social activity

II. Overall context

III. Short historical context

IV. Regeneration of public space of municipal housing



# 20 years in making Porto a home.

Domus Social is a company of the Municipality of Porto. Created in 2004, it is responsible for the management and promotion of the public housing stock, as well as the maintenance and conservation of all municipal buildings, equipment and infrastructures.

## I.Domus Social Activity

# and we manage:

Public Housing Stock

**50** neighbourhoods

**227** scattered buildings

Approx. **13 000** houses

Around **30 000** residents

**12%** of the municipality's population

+ **205** municipal buildings

Including **60 schools** and **18 health centers**

# 1.

# **Projects** & Works

## In numbers:

Two decades of interventions and an investment of over 305 M €

With an average annual investment in rehabilitation of 15.6 M €

## Rehabilitation

Rehabilitation of the envelope of public housing buildings to promote their durability.

Recovery of vacant buildings in the city and their integration into the social housing stock.

Requalification of the public space surrounding social housing neighbourhoods.

## Construction

Development of sustainable and accessible projects that respond to new social and environmental demands.

# 2.

# Maintenance

In numbers:

Average of 5k € maintenance interventions per quarter.

## Maintenance and conservation

Maintenance interventions in municipal social housing, scattered buildings and other municipal public buildings (schools, health centres, cultural spaces, etc.)

## Civil protection interventions

Interventions in emergency situations, such as shoring, removal of materials at risk of falling, demolitions, among others.

# 3.

# Management of the Housing Stock

In numbers:

Average of 300 houses delivered per year.

Average rent of 74 € ( Minimum of 12.45 | Maximum of 488 € )

Rent payment default rate of 3.43%

Around 70 000 face-to-face and phone consultations per year.

Application of the Regulation for the Management of the Municipality of Porto's Housing Stock.

Development of innovative projects in the social area.

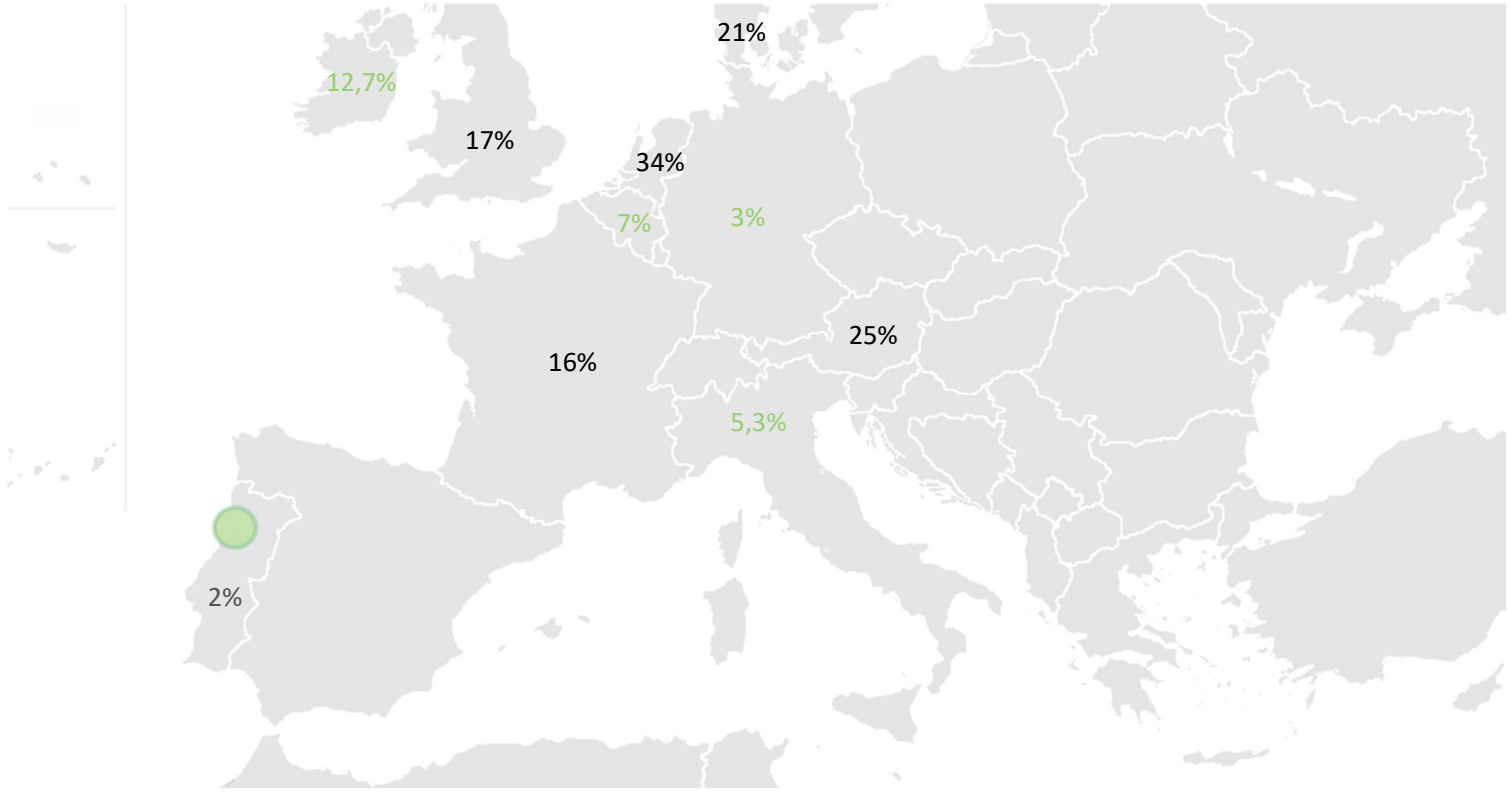
Continuous contact with residents through a single service line and the Municipal Tenant Office (GIM).

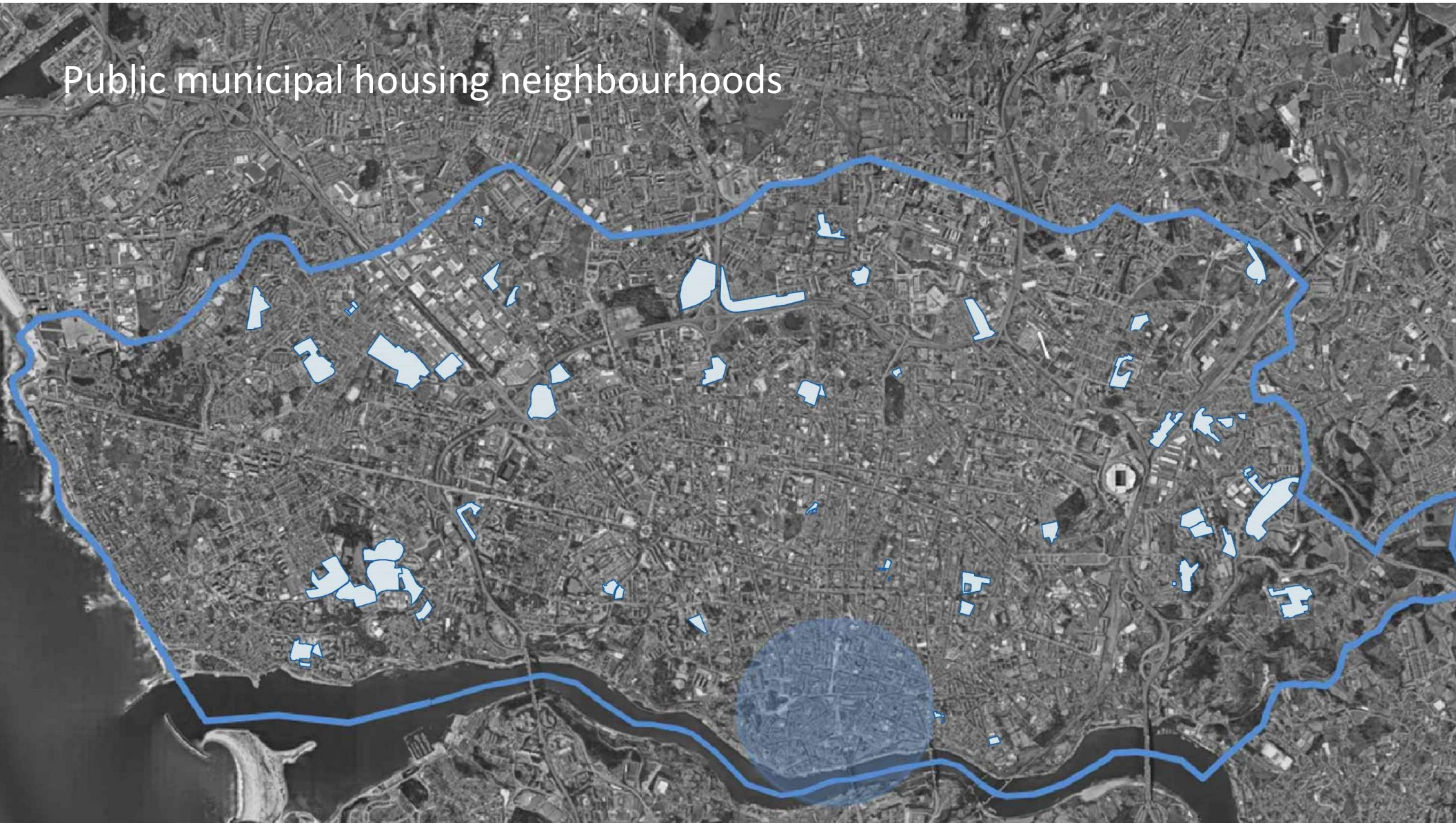
# II.Overall context

New forms of Social housing adapted to climate change in the city of Porto
Regeneration of the public space of municipal housing

In Porto 13% of the housing stock is municipal public housing classified as supported rental dwellings and represents

11% of public housing dwellings in Portugal.




Public municipal housing neighbourhoods

# III.Short historical context


until 1956
Pereiró
1956
São João de Deus
1944
1953
Rainha Dona Leonor
1940
Duque de Saldanha
1951
São Vicente de Paulo

# “Islands” of Porto




## 19th century

Housing provision by private iniciative

(the “islands” and the working-class neighbourhoods)

## 20th century

First public-private partnerships in Porto

Neighbourhoods of “O Comércio do Porto” - 1899-1905

Construction of 3 neighbourhoods

# “Economic houses” program



## 1910

Implementation of the Republic rent “freeze” in Porto and Lisboa

## 1918

First legal dispositions for the construction for social housing

(Decreto-Lei n.º 4.137 de Abril de 1918)

## 1926

Estado Novo

“economic houses” program

“resoluble ownership” scheme

# “Economic houses” program

Duque de Saldanha (1940)

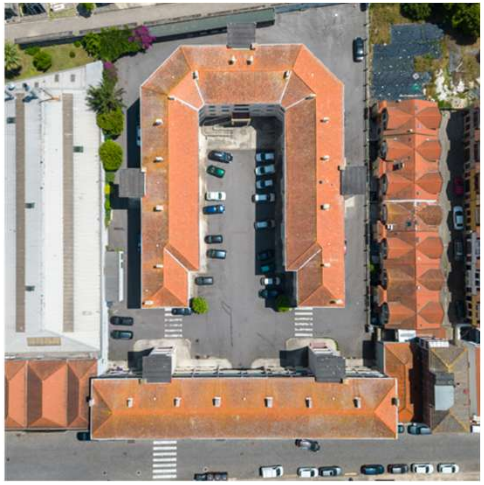
São João de Deus (1944)

Rainha D. Leonor (1953)

S. Vicente de Paulo 3.ª fase (1958)

Pereiró (1955)



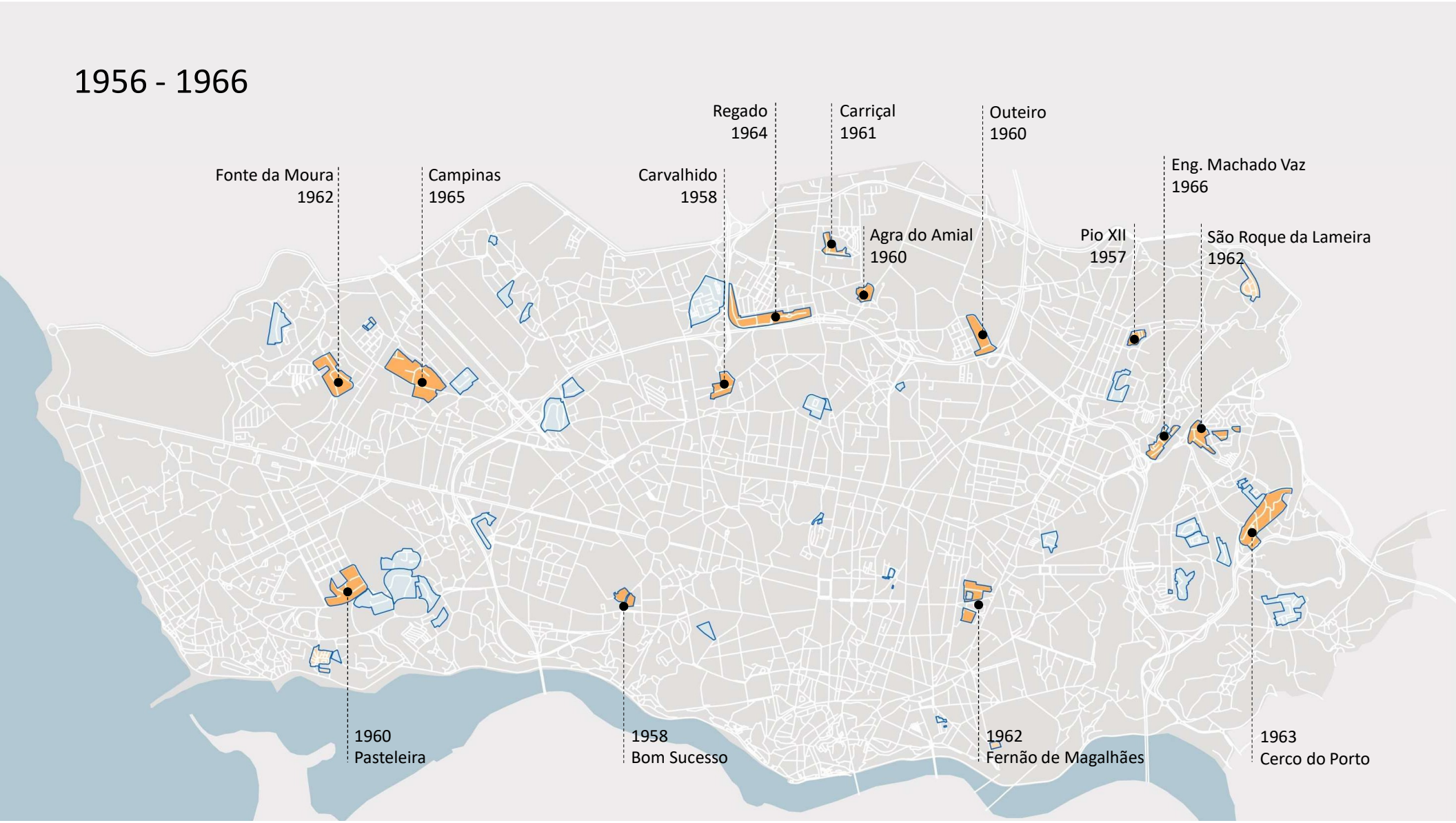




low density and vicinity

[economic houses 1940s-... + Garrett Plan (1952)]

# 1956 - 1966


Fonte da Moura
1962
Campinas
1965
Carvalhido
1958
Regado
1964
Carriçal
1961
Outeiro
1960
Agra do Amial
1960
Pio XII
1957
Eng. Machado Vaz
1966
São Roque da Lameira
1962
1960
Pasteleira
1958
Bom Sucesso
1962
Fernão de Magalhães
1963
Cerco do Porto

# “Improvement Plan”



## 1956/7-1966

Plan of Improvements for the City of Porto

13 neighbourhoods built 6.072 dwellings

(15 - 20% population transferred from the city centre to the “expansion areas”, then peripheral)

## 1969

Creation of the Housing Promotion Fund

social housing [Improvement Plan, 1956]



**Agra do Amial (1960)**

**Bom Sucesso (1958)**

**Campinas(1965)**

**Carriçal (1961)**

**Carvalhido (1958)**

**Cerco do Porto (1963)**

**Eng.º Machado Vaz (1966)**

**Fernão de Magalhães (1962)**

**Fonte da Moura (1964)**

**Pasteleira (1960)**

**Pio XII (1957)**

**Regado (1964)**

**S. Roque da Lameira (1962)**

# 1967 - 1971


Aldoar
1966
Francos
1967
Bom Pastor
1974
Contumil
1977
1970
Dr Nuno Pinheiro Torres
1970
Monte da Bela
1973/1981
Falcão
1973
Lagarteiro



Aldoar (1968)

Aleixo

Bom Pastor (1974)

Contumil (1977-87)

Dr. Nuno Pinheiro Torres (1970)

Falcão (1973)

Francos(1967)

Lagarteiro (1973-77)

Monte da Bela (1970)

São João de Deus


1972 - 1999
Choupos
1998
Ramalde
1979
Central de
Francos
1981
Santa Luzia
1981
Vale Formoso
1982
1988
Mouteira
1978
Lordelo do Ouro
1993
Condominhas
1982
Bessa Leite

# Housing Programmes: new construction and rehabilitation

1993 | Special Rehousing Program – PER

Targeted to people in the metropolitan areas of Lisbon and Porto living in “non-conventional” dwellings

In Porto between 1994 and 2008 were built 9 neighbourhoods and 806 dwellings

In 2003 it spread, for the first time, to the rehabilitation of the interior space (unoccupied houses):

Near 1.350 built and rehabilitated dwellings in Porto

2004 | Funding Program for Access to Housing – PROHABITA

Near 6.500 rehabilitated dwellings in Porto

2013 | Rehabilitate to Rent

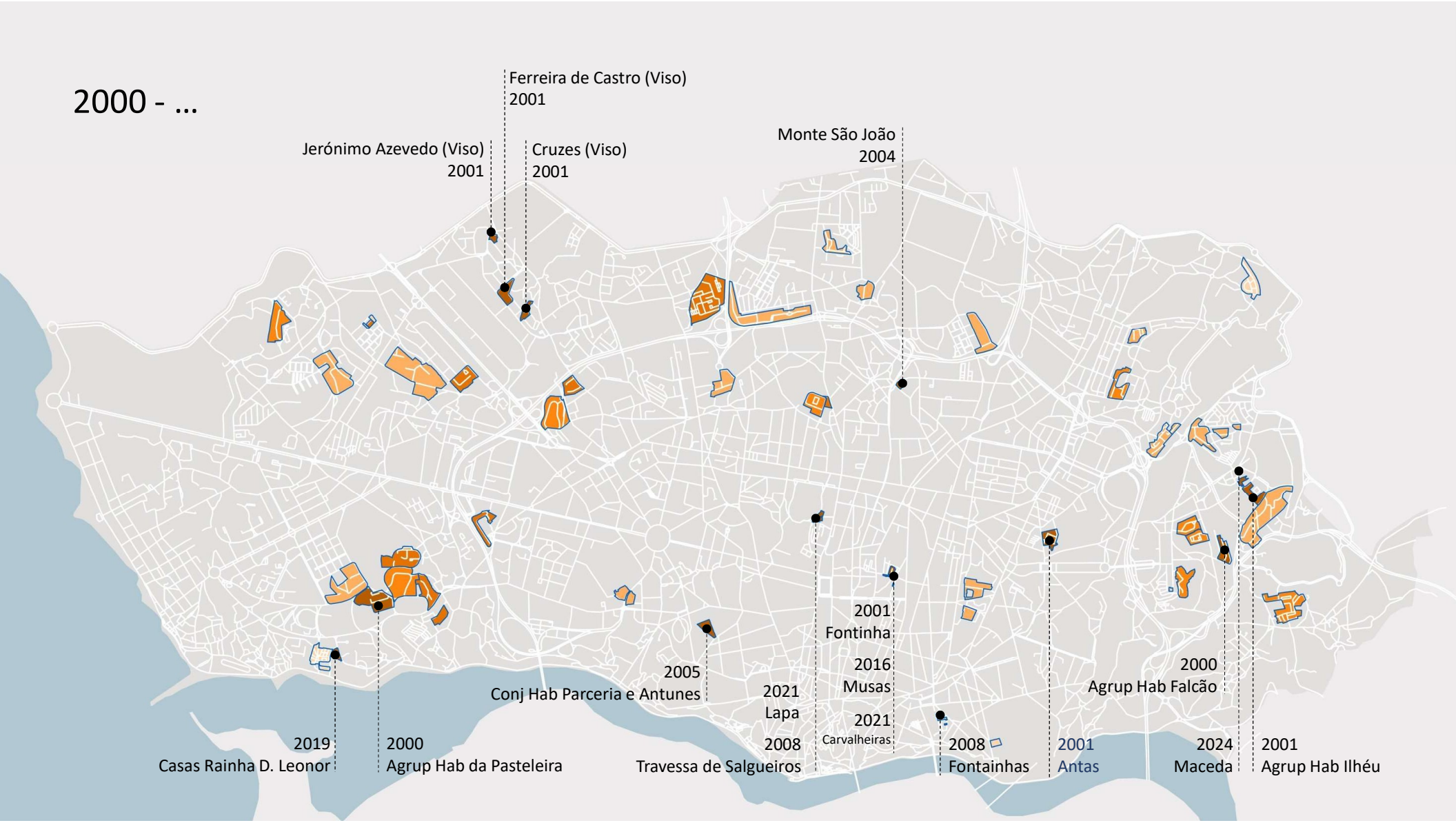
Near 1.150 rehabilitated dwellings in Porto

2018 | New generation of housing policies

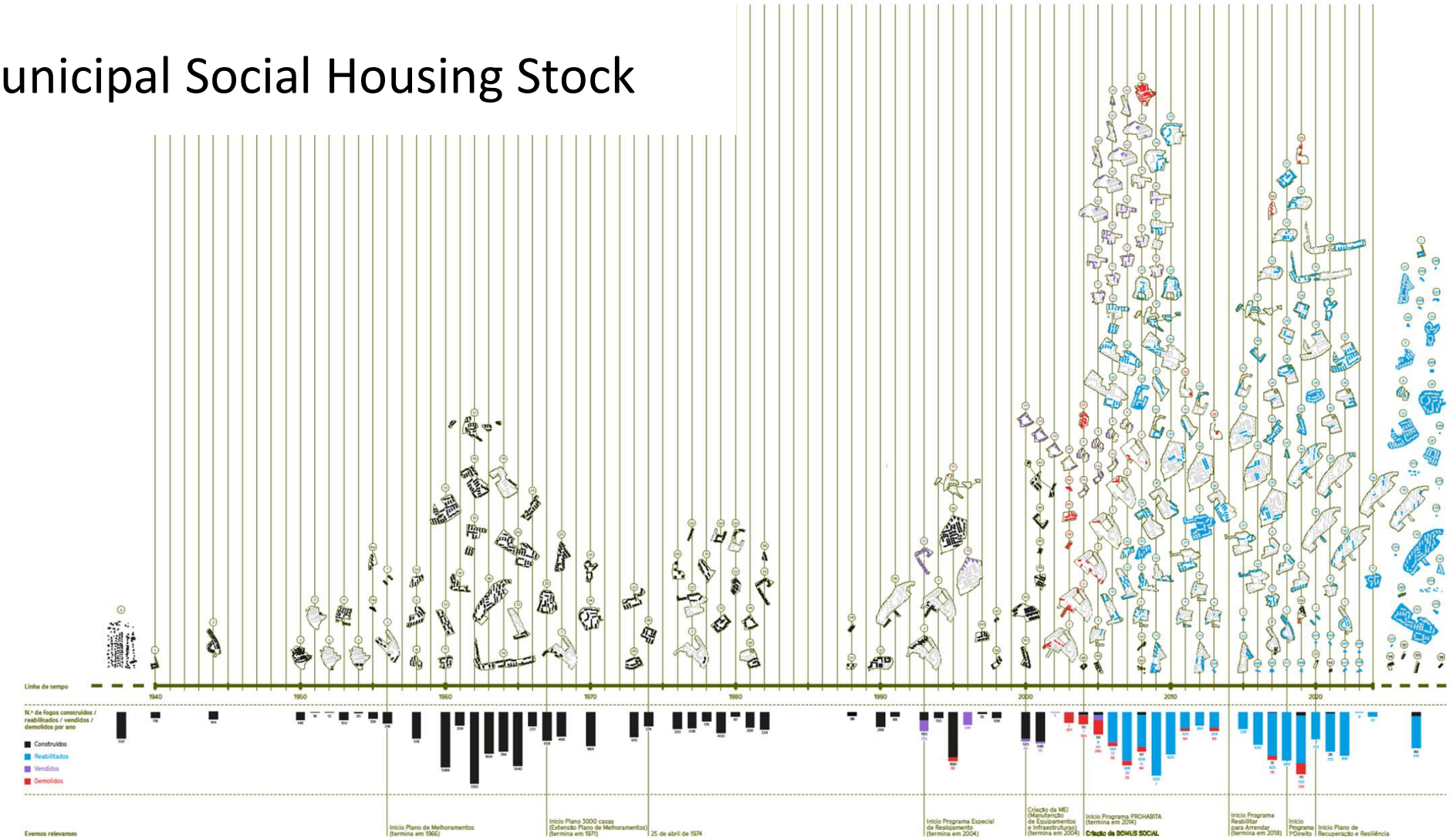
regulation [PDM, 1993; PER-1990s-2000s]



# 2000 - ...


Ferreira de Castro (Viso)
2001
Jerónimo Azevedo (Viso)
2001
Cruzes (Viso)
2001
Monte São João
2004
2001
Fontinha
2016
Musas
2021
Carvalheiras
2005
Conj Hab Parceria e Antunes
2021
Lapa
2008
Travessa de Salgueiros
2019
Casas Rainha D. Leonor
2000
Agrup Hab da Pasteleira
2008
Fontainhas
2001
Antas
2000
Agrup Hab Falcão
2024
Maceda
2001
Agrup Hab Ilhéu

# Municipal Social Housing Stock



# IV.Regeneration of public space of municipal housing



## . 2030 Municipal Climate Action Plan of Porto **(PMAC)**

(the Strategic and operational planning document, provided for in the Climate Framework Law, which defines the main lines of climate action by the Municipality in two macro-objectives:

- Achieve carbon neutrality by 2030;
- Increase the city's resilience to the expected worsening of extreme weather events.

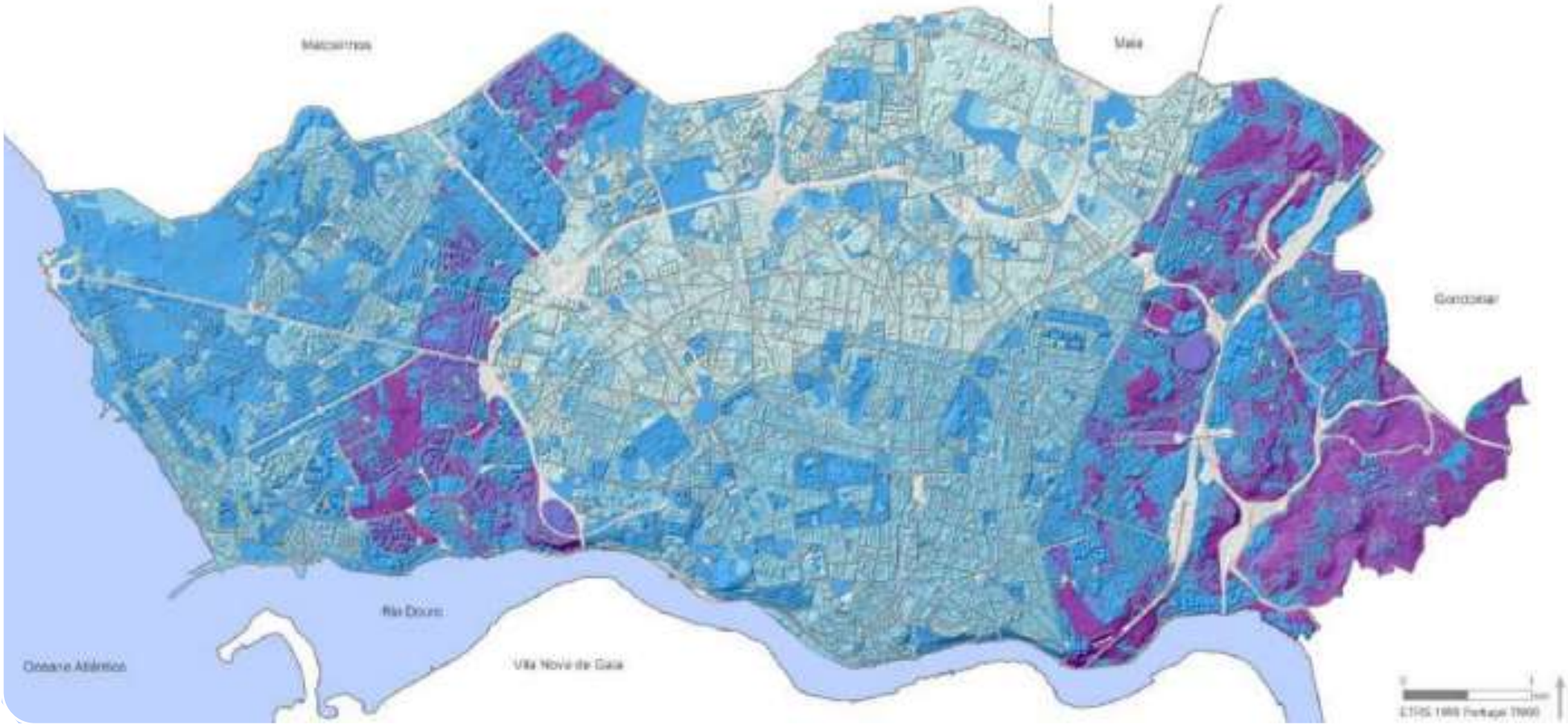
Climate change mitigation involves a 30% reduction in primary energy consumption.

Critical areas due to bioclimatic discomfort (extreme heat) in summer
(from not at all critical to extremely critical), Monteiro et al., 2022



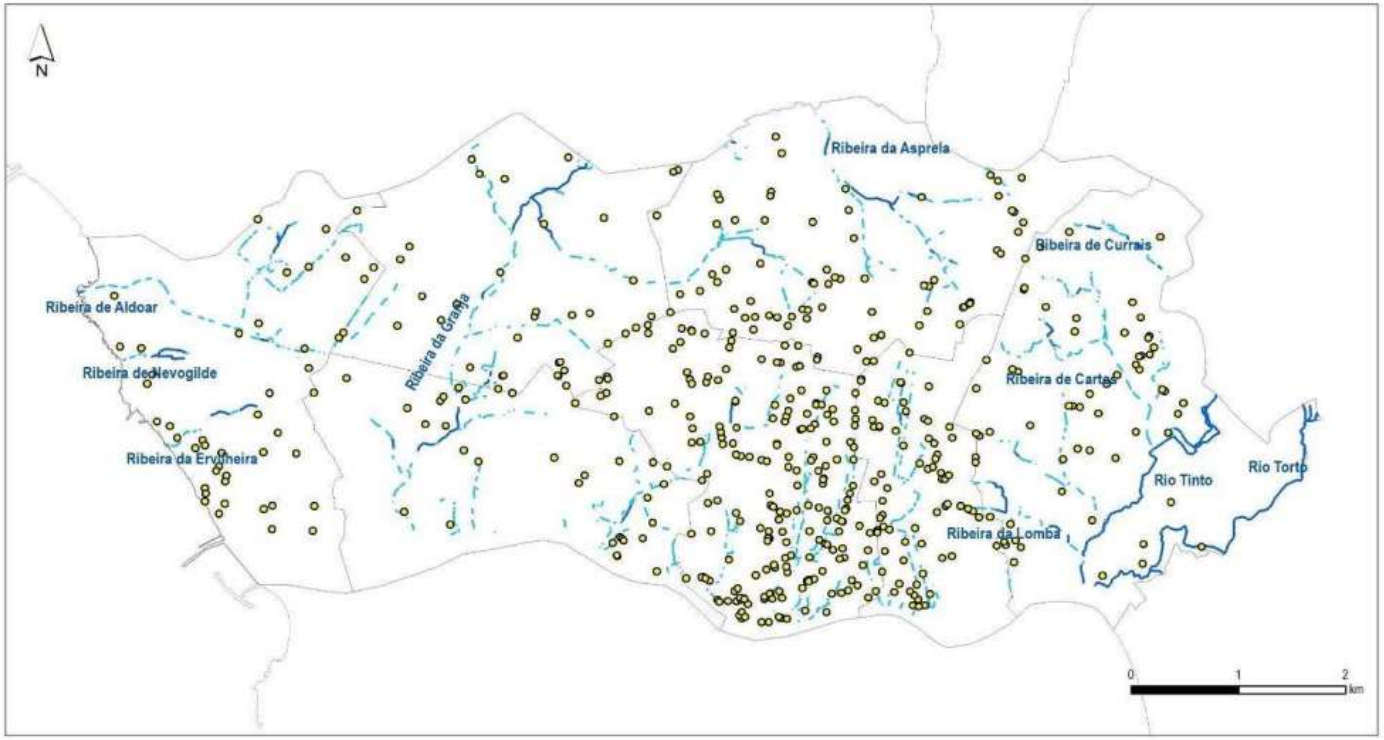

© Plano Municipal de Ação Climática do Porto 2030 (preliminary version for public consultation 08/04/2025)

Critical areas due to bioclimatic discomfort (extreme cold) in winter (from not at all critical to extremely critical), Monteiro et al., 2022




© Plano Municipal de Ação Climática do Porto 2030 (preliminary version for public consultation 08/04/2025)

Record of occurrences related to urban flooding between 2018 and 2023, according to data from the Firefighters Brigade.




Legend:
- Record of urban flood occurrences

Water lines
- Surface
- Underground pipes

© Plano Municipal de Ação Climática do Porto 2030 (preliminary version for public consultation 08/04/2025)

Table 6. Proportion of the population exposed to climate risks (estimated %), as calculated by Simbiente in the preparatory work for PMAC (2024).

| Climate Risks | Estimation of total population at risk | Needy population | Children and elderly |
|---|---|---|---|
| Extreme heat | 41 – 50% | 2.5% of families in a situation of severe housing shortage<br><br>43% of buildings in need of repair (3% very dilapidated)<br><br>0.28% of the population is homeless | 11 – 20% |
| Extreme cold | 31 – 40% | | < 10% |
| Storms | 41 – 50% | | N/A |
| Droughts | < 10% | | N/A |
| River floods | < 10% | | < 10% |
| Urban floods | 31 – 40% | | 11 – 20% |
| Mass Movements | < 10% | | < 10% |
| Coastal Overtopping | < 10% | | < 10% |
| Coastal Erosion | < 10% | | < 10% |

Table 10. Climate risk assessment for Porto by reference periods (present, 2041-2070 and 2071-2100).

| Climate events | Probability | Severity | Risk Level | | | Risk Trend |
|---|---|---|---|---|---|---|
| | | | Present | Medium term (2041/2070) | Long term (2071/2100) | |
| Extreme heat | Moderate | Moderate | Moderate | High | Critical | ↑ |
| Extreme cold | Moderate | Moderate | Moderate | Moderate | Low | ↓ |
| Storms | Moderate | Moderate | Moderate | High | High | ↑ |
| Droughts | Low | Low | Low | Moderate | High | ↑ |
| River floods | Moderate | Moderate | Moderate | High | Moderate | → |
| Urban floods | Moderate | Moderate | Moderate | Moderate | Moderate | → |
| Mass Movements | Moderate | Moderate | Moderate | Moderate | Low | ↓ |
| Coastal Overtopping | Moderate | Moderate | Moderate | High | Critical | ↑ |
| Coastal Erosion | Moderate | Low | Low | Moderate | Critical | ↑ |

Legend:



Very Low Moderate Critical

© Plano Municipal de Ação Climática do Porto 2030 (preliminary version for public consultation 08/04/2025)

## Buildings:

Promote sustainability, efficiency and comfort of buildings

## Green structure:

Make the soil permeable and implement NbS (infiltration, $CO_2$ sequestration and heat island mitigation)







## interventions types

. New construction
. Rehabilitation
. Public space requalification

# Challenges

. Right to the city and to adequate housing

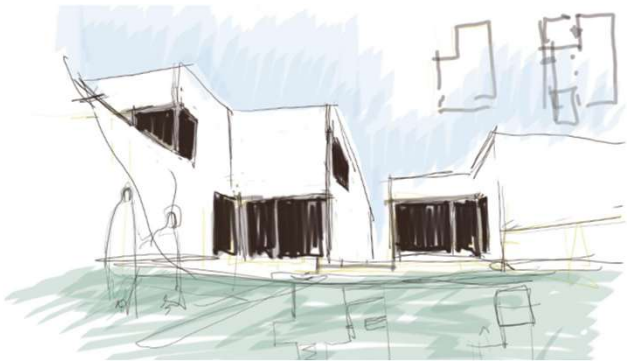
. Design of appropriate solutions adaptable over time and use

. Rehabilitate the “old” with “new” dimensions: confort, accessibility, energy efficiency, social integration

. Recycle, reuse, retrofit for public housing built in heritage buildings








3D visualization, by DEPA

# New forms of Net-zero (+20)

## Social housing in the city of Porto

"Carvalheiras stage II", a case study

. Heat pump;
. Solar factor of the glazed aperture;
. Glazed apertures protection;
. Thermal insulation;

. The construction solution using passive measures made it possible to reduce heating needs by more than 60%;
. Cooling needs addressed by introducing light-coloured exterior protection
. AQS through heat pump

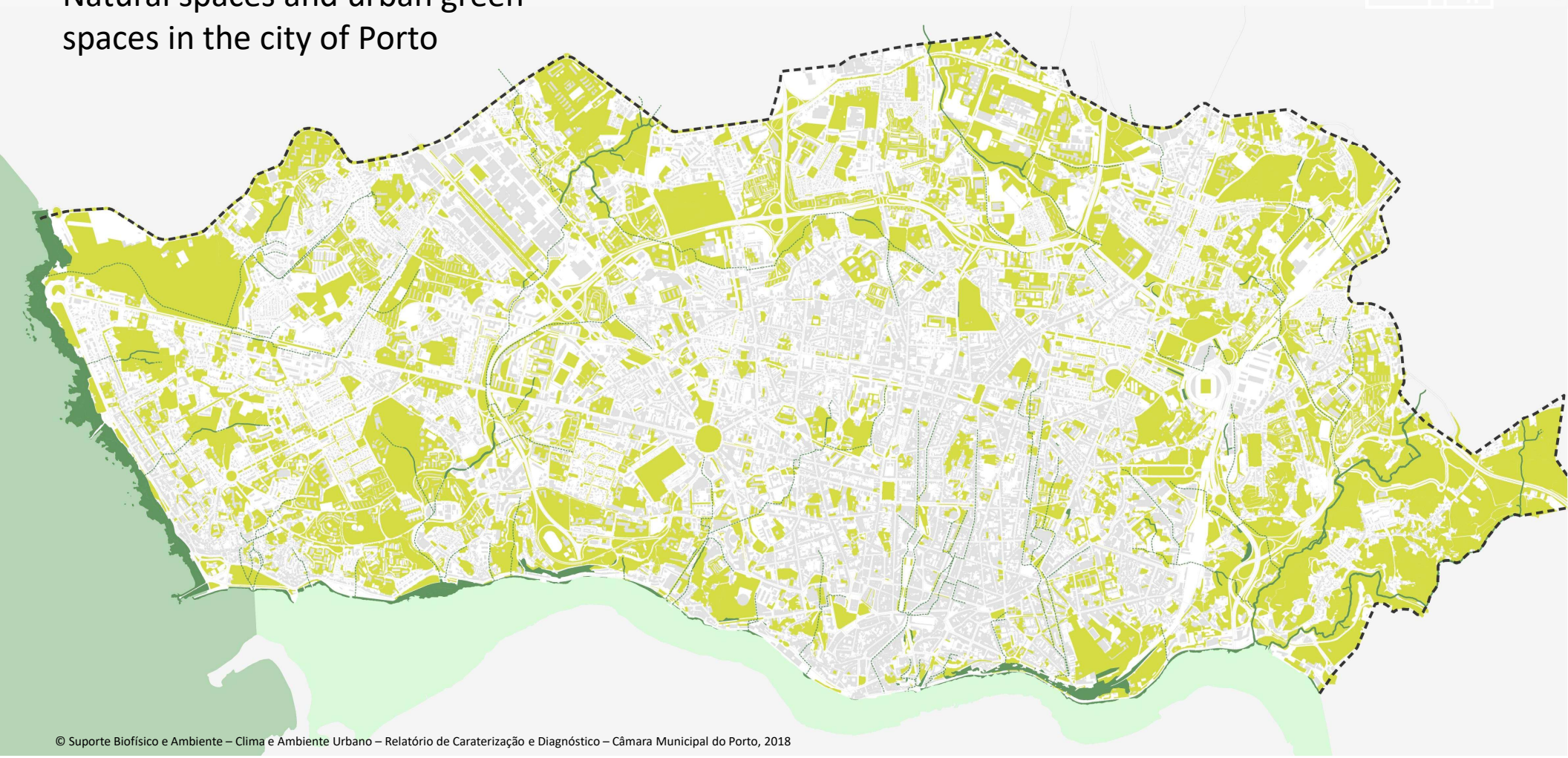


# Carvalheiras stage II

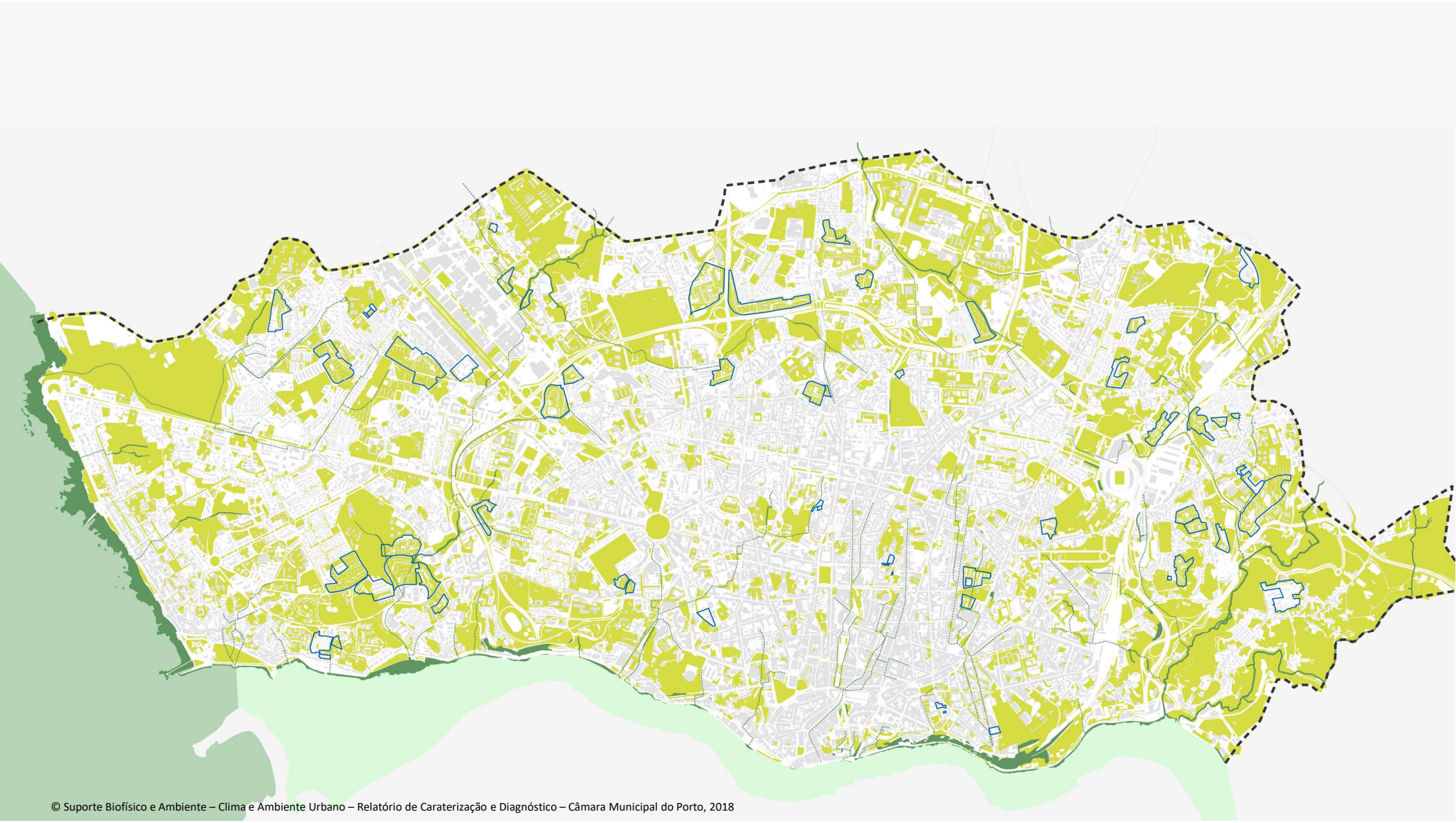
## Collective exterior spaces, opportunities

. To permeabilize - water drainage
. Public areas - to rest and enjoy
. Private areas - for planting and growing

# Natural spaces and urban green spaces in the city of Porto



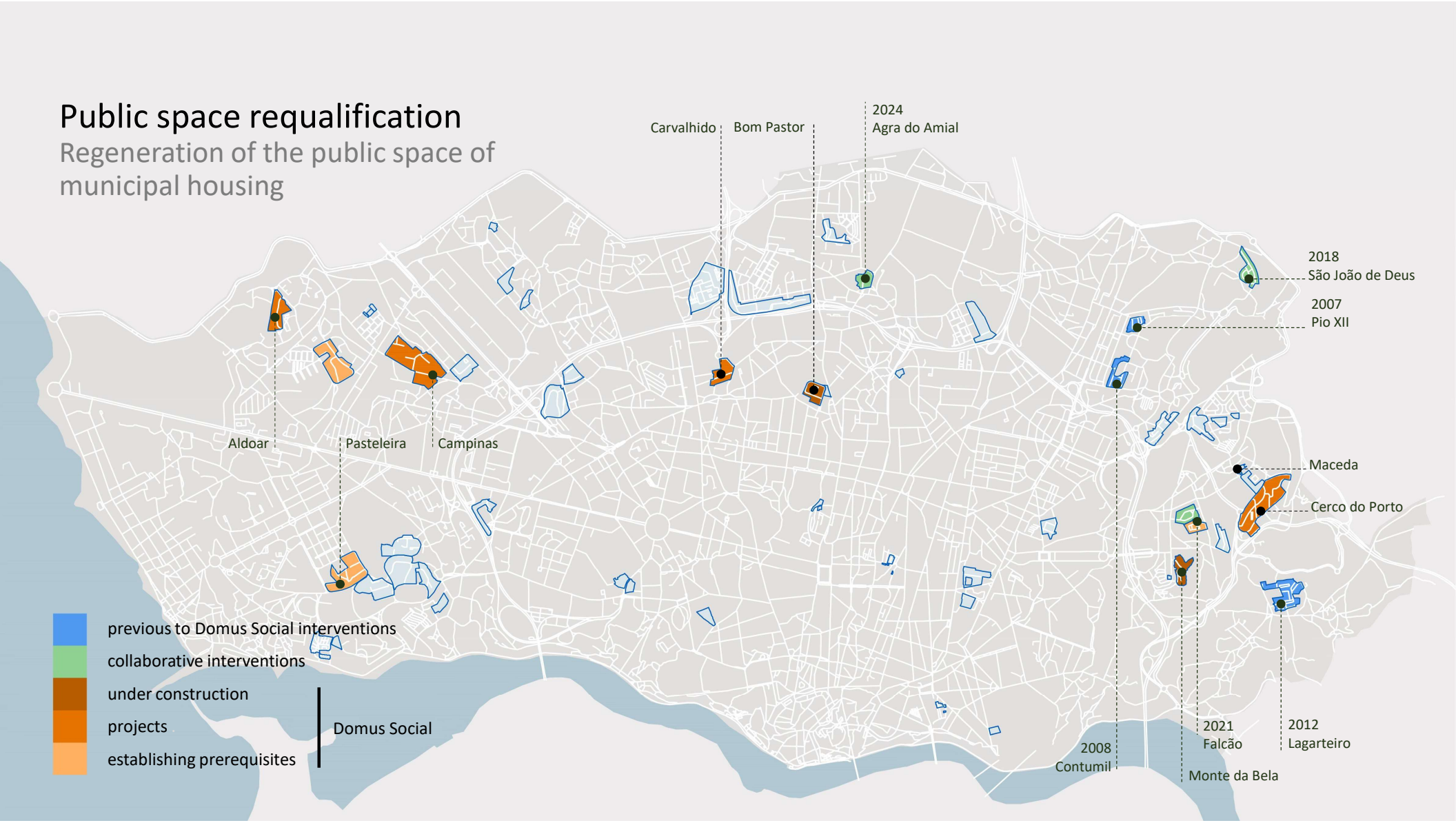
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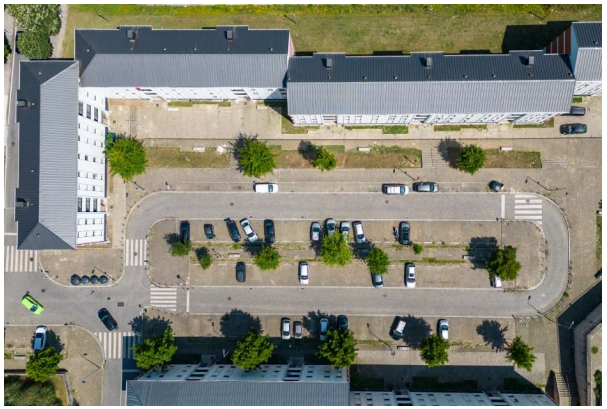
# Public space requalification

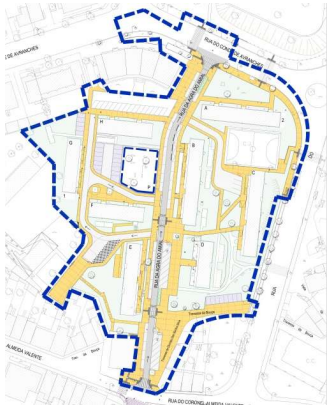
## Regeneration of the public space of municipal housing











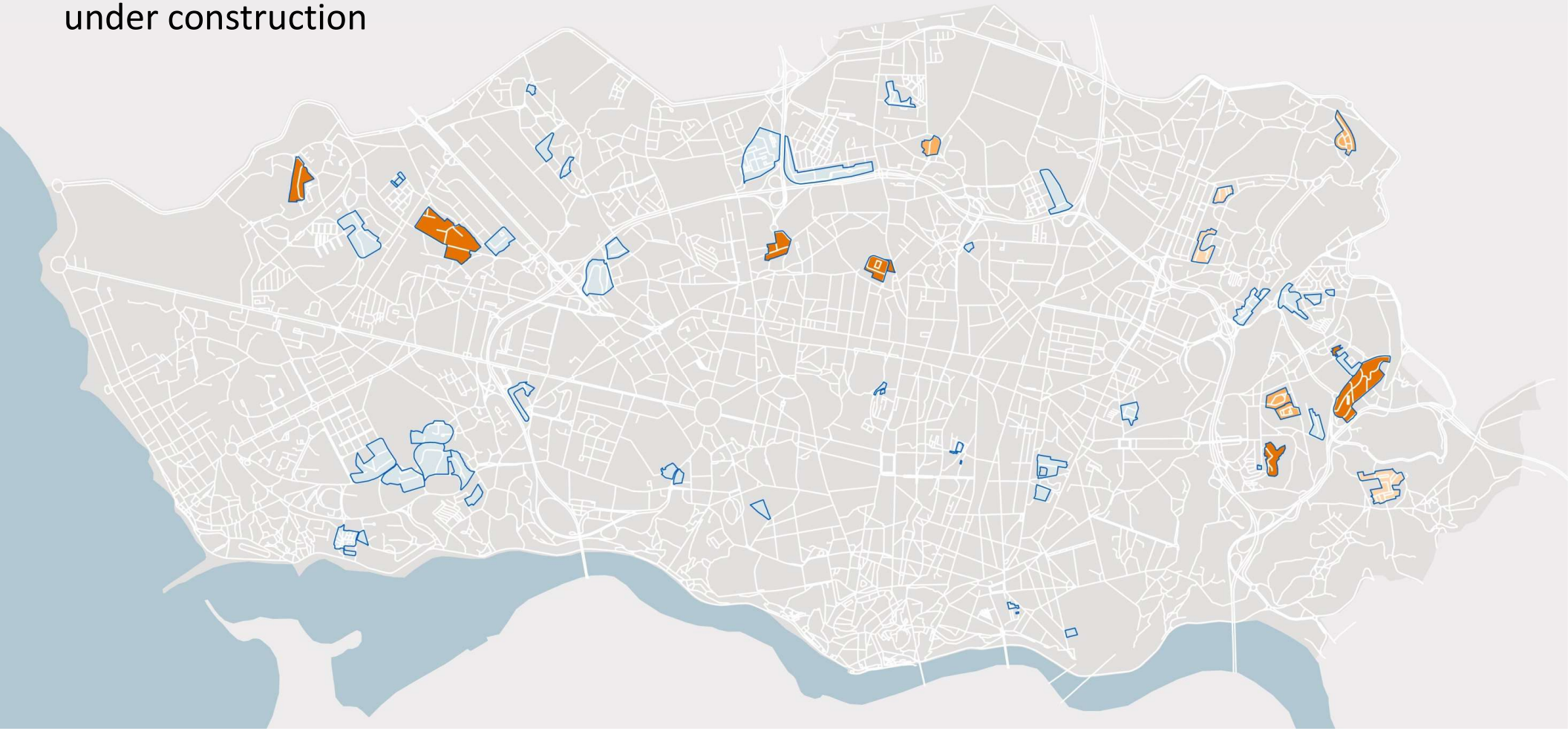








Domus Social projects in progress and under construction



Aldoar



Bom Pastor



Carvalhido



Campinas



Cerco do Porto



Falcão



Maceda



Monte da Bela



## Signs of urban and environmental disqualification and inadequacy





# Signs of urban and environmental disqualification and inadequacy

. Fragmented and discontinuous relationship with the surrounding urban grid;

. Poor surrounding urban frontages (neighbouring plots with irregular extensions and garage openings towards the public space);

. Lack of structure and hierarchy of the neighbourhood public space design;

. Mismatch between the designed routs and the ones people, informally, walk on;

. Improper use and occupation of the pedestrian and green areas by motor vehicles;

. Functional undefinition of some public areas in the neighbourhood;

. Insufficient management and maintenance of the public space by public entities;

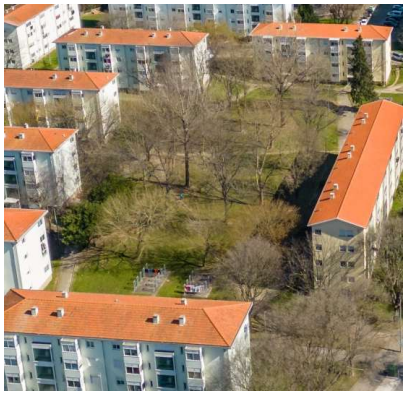
. Improper use and occupation of the building's boundary spaces;

. Acts of vandalism of common property;

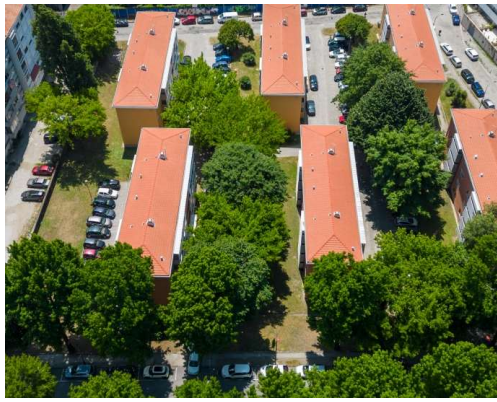
. Enhanced insecurity by the urban and environmental degradant appearance.

# Qualities of municipal housing neighbourhoods







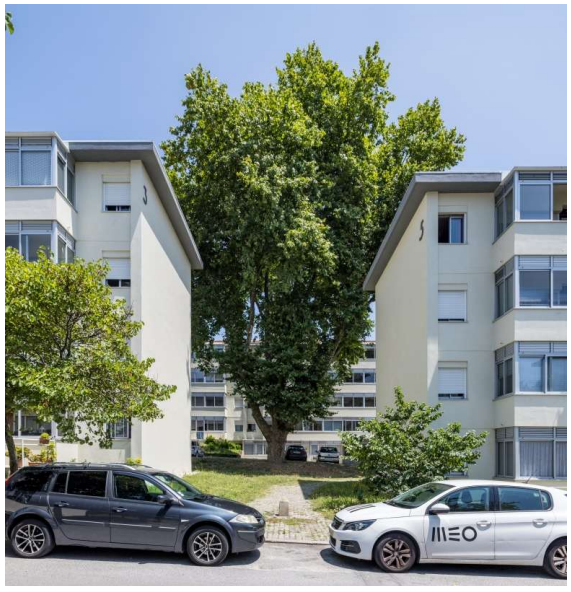
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# General principles of public space intervention

# General principles of public space intervention



1960 | Pasteleira

© Arquivo Histórico do Porto



2023 | Pasteleira

© João Ferrand Fotografia



# General principles of public space intervention

- integration with the urban fabric
- cohesion and social inclusion
- accessibility
- biodiversity
- water efficiency
- circularity of materials, equipment and solutions
- mobility

1961 | Inauguração do Bairro de São Roque da Lameira

© Arquivo Histórico do Porto

# Specific principles of the urban space



1961 | São Roque da Lameira

© Arquivo Histórico do Porto

# Specific principles of the urban space

. Urban space design

. Parking spaces

. Public transport, emergency vehicles access and refuse collection

. Drainage collection

. Green space design

. Urban equipment and related buildings

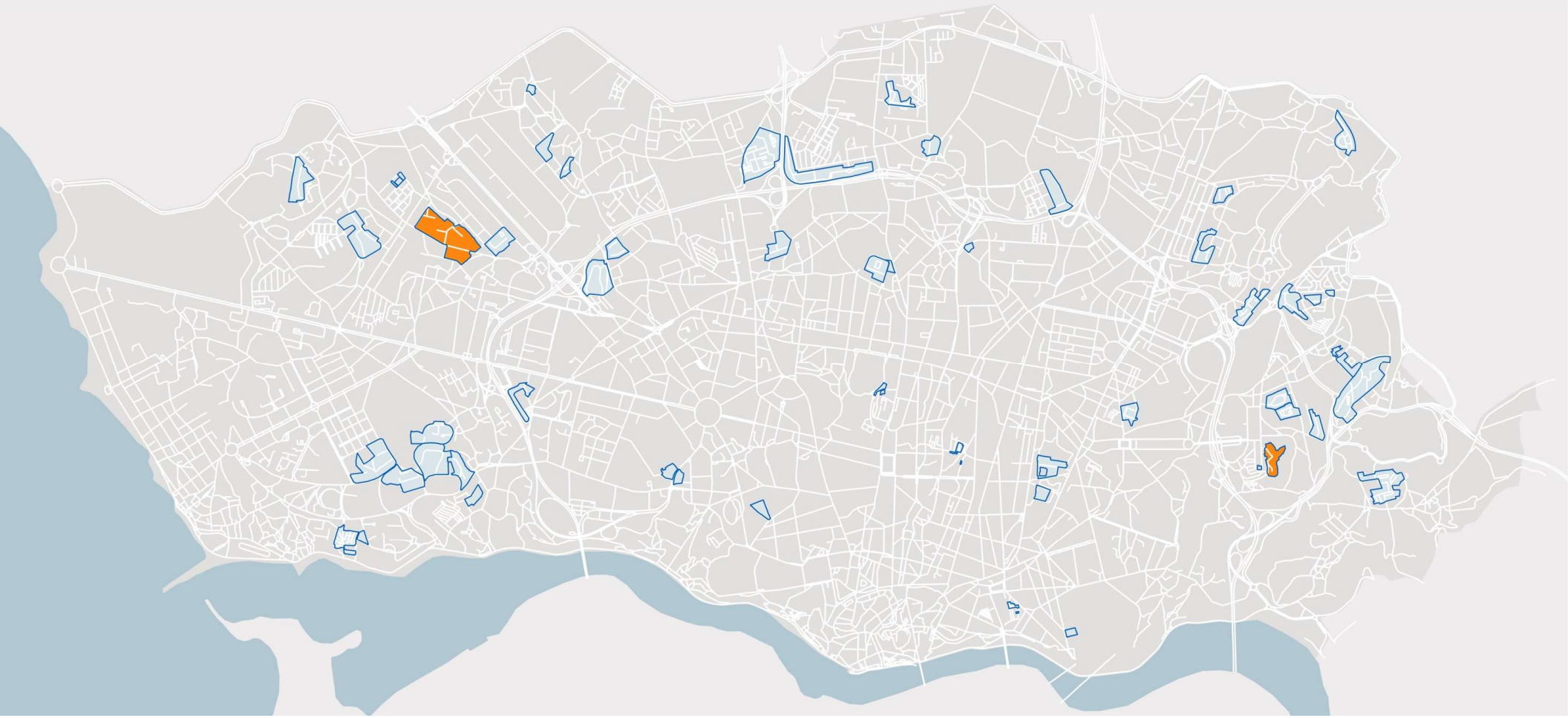
. Materials

. Urban furniture

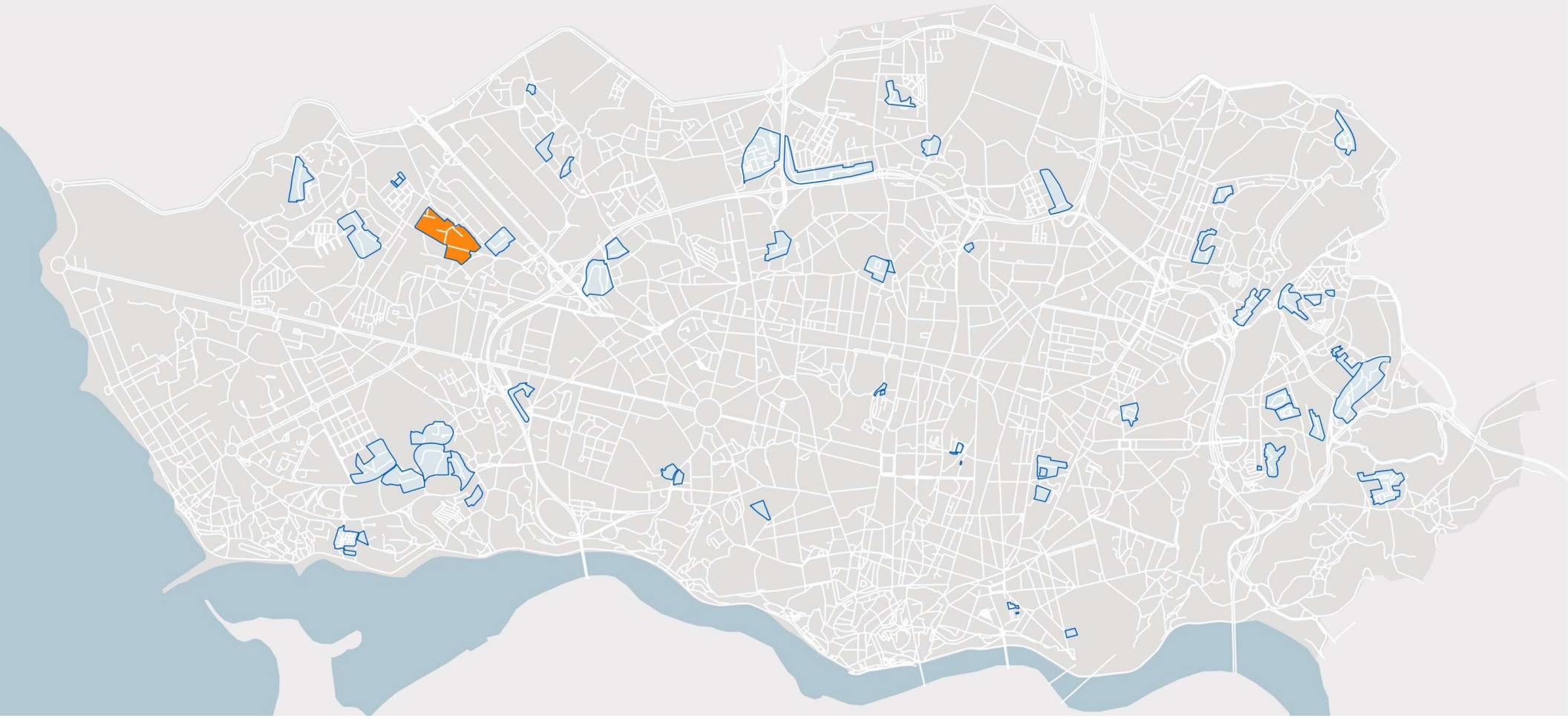
. Wayfinding signage

. Infrastructure

# Regeneration of the public space - 2 examples



Campinas





1966 | Vista aérea Campinas

© Arquivo Histórico do Porto

| | |
|---|---|
| year (construction) | 1965 |
| Program | Plano de melhoramentos da Cidade do Porto (Improvement Plan for the city of Porto) |
| project author | Vasco Mendes |
| area | 84.600,00 m² |
| no. buildings | 31 |
| access system | vertical cores |
| no. dwellings | 900 |
| no. inhabitants | 1969 |



2023 | Campinas

© João Ferrand Fotografia

## Building rehabilitation

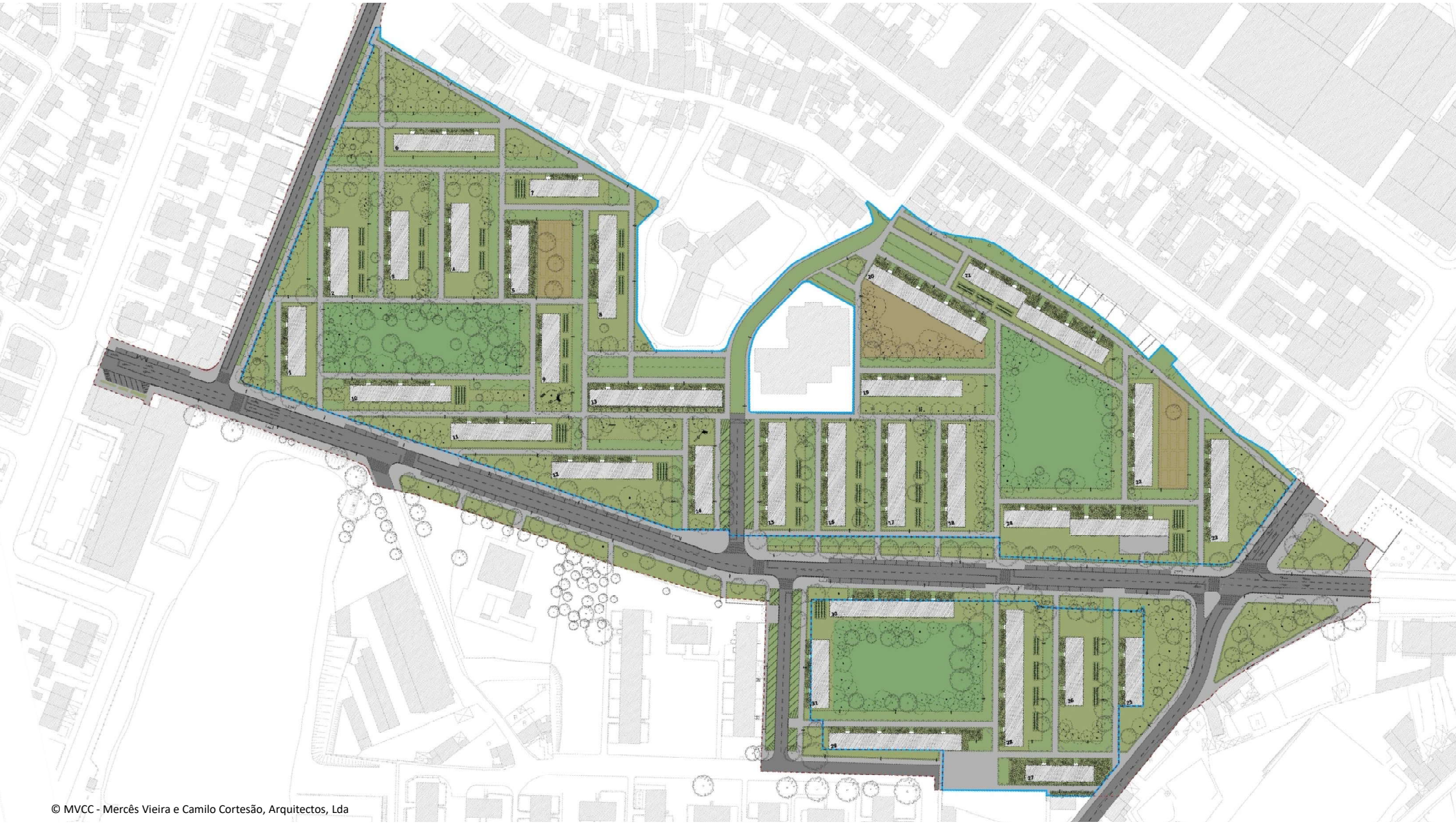
year (construction) 2005 | 2006 | 2010 |2017 | 2018

project author Geada – Consultoria, Ficalização e Projeto Lda | …

## Regeneration of the public space

year (construction) 2020 - …

project author MVCC – Mercês Vieira e Camilo Cortesão, Arquitectos, Lda



© MVCC - Mercês Vieira e Camilo Cortesão, Arquitectos, Lda




© MVCC - Mercês Vieira e Camilo Cortesão,

Monte da Bela






© Arquivo Histórico do Porto

# Monte da Bela

| | |
|---|---|
| year (construction) | 1967 |
| Program | Plano de melhoramentos da Cidade do Porto (Improvement Plan for the city of Porto) |
| project author | Rui Paixão |
| area | 24.000,00 m² |
| no. buildings | 7 |
| no. dwellings | 236 |
| no. inhabitants | 530 |



2023 | Monte da Bela

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## Building rehabilitation

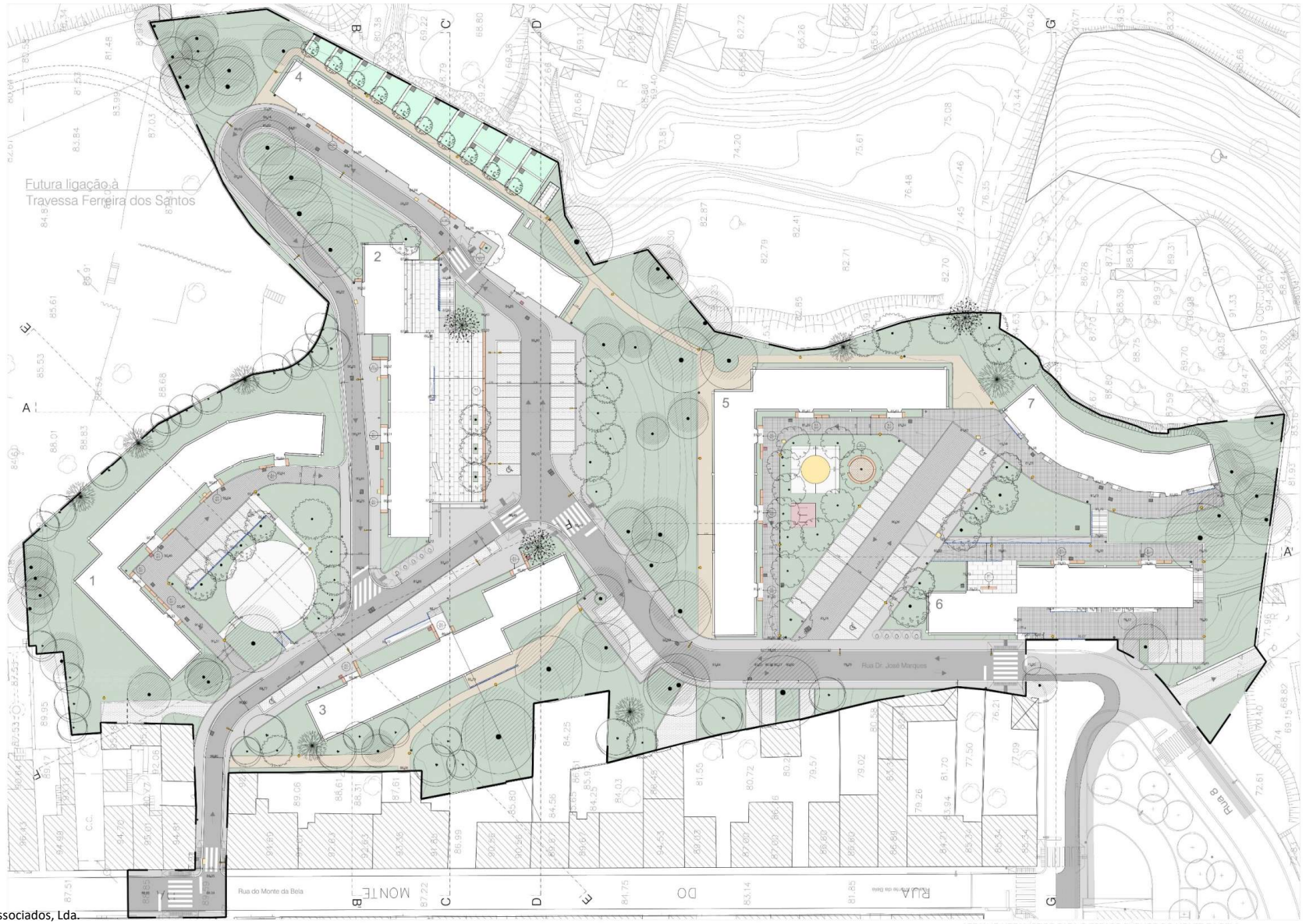
year (construction) 2021

project author Menos é Mais Arquitectos Associados Lda

## Regeneration of the public space

year (project) 2019 - …

project author JFCG, Arquitectos Associados, Lda.




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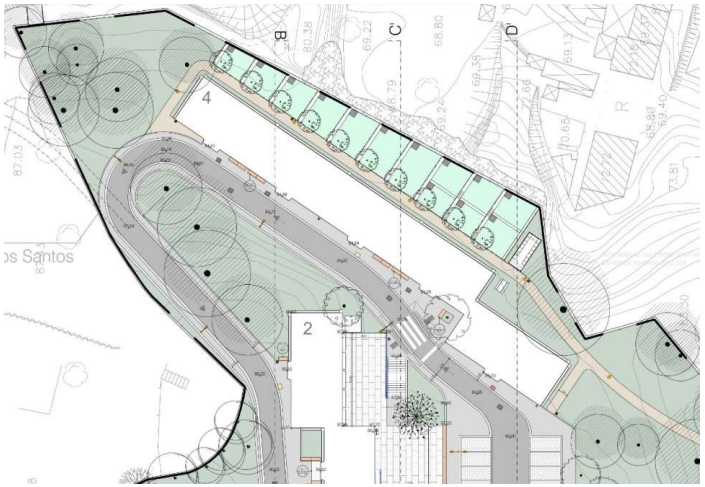



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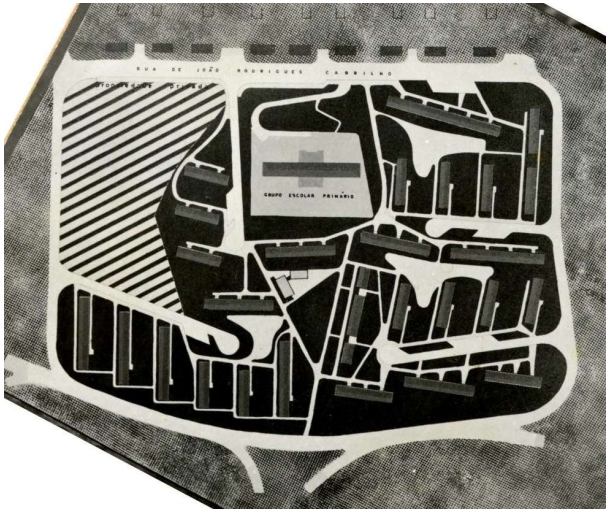
2019 | Monte da Bela
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# Allotments

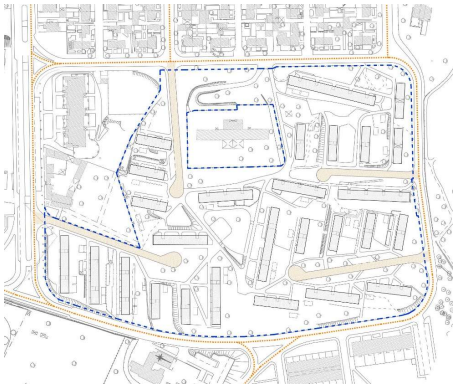



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# Pasteleira



2024 | Pasteleira
© Domus Social



1960 | Plano de Melhoramentos - Pasteleira
© Arquivo Histórico do Porto

| | |
|---|---|
| year (construction) | 1960 |
| Program | Plano de melhoramentos da Cidade do Porto (Improvement Plan for the city of Porto) |
| project author | Alberto Rosmaninho \| Miguel Reimão Pinto \| Vasco Mendes \| Rui Paixão |
| area | 61.500,00 m2 |
| no. buildings | 27 |
| access system | vertical cores \| gallery distribution |
| no. dwellings | 609 |
| no. inhabitants | 1518 |

## Buildings rehabilitation

| | |
|---|---|
| year (construction) | 2023 |
| project author | EIN.DZ – Consultores, Lda |

## Regeneration of the public space

| | |
|---|---|
| year (construction) | ... |
| project author | |


18





**Thank you for your attention**

1960 | Plano de Melhoramentos - Pasteleira
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Porto. Domus Social