

Post war social housing in Vienna and Rotterdam

Governance and spatial lessons from two cities

By Rein Bange

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Source: Photo by author

“Hardlopen leek mij het opiaat van de prestatie­maatschappij, en een marathon de hoogmis. Ik slenterde liever.”

(Running seemed to me the opiate of the performance society, and a marathon its high mass. I preferred to stroll.)

Arjen van Veelen, Rotterdam; een ode aan inefficiëntie, 2022

“Helden bestaan niet, je hebt alleen mensen die ploeteren, mensen die zo goed mogelijk hun best doen.”

(Original written in Norse, English translation: Heroes do not exist; there are only people who persevere, people who do their best.)

– Johan Harstad, Max, Mischa & Tetoffensiven, 2015

The words of Arjen van Veelen and Johan Harstad capture two complementary insights about effort and progress. Van Veelen reminds us that sometimes we must slow down to truly grasp our surroundings—a year-long engagement with this thesis has been precisely such a slow, attentive process. Harstad emphasizes that real progress is rarely heroic; it emerges from steady, persistent effort. Together, these perspectives mirror the work of social and non-profit actors in shaping urban housing: careful, sustained action by those working in the system can over time have a profound impact, even if it goes unnoticed at first glance. This also aligns with the finding that neither of the two social housing models studied in this thesis can be considered superior or ‘heroic’; each has strengths and limitations.

I would like to sincerely thank my two mentors, Lei Qu and Marja Elsinga, for their continuous support, encouragement, and thoughtful guidance throughout this journey. Our many engaging conversations and your constructive feedback have not only improved this thesis, but also shaped my thinking in lasting ways. I am deeply grateful for your time, patience, and trust.

I would also like to thank Wolfgang Amann and the policy employee from the Municipality of Rotterdam for generously sharing their time and expertise during the interviews. Your insights greatly enriched the analysis and broadened the perspective of this research.

Lastly, I would like to thank my friends and family for their support throughout this thesis, whether through proofreading, encouragement, or simply their companionship. We are shaped by those around us, and I am deeply grateful for their presence.

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1

Introduction

In this thesis, I examine affordable housing policy in Rotterdam and Vienna and its spatial and societal outcomes. I do this by focusing on the development and continued governance of post-Second World War projects undertaken in both cities. The goal of the thesis is to apply the insights gained through this comparison to develop a renovation plan aimed at improving the resilience and quantity of the affordable housing stock in that neighbourhood. The resilience of social housing is understood as a key component in addressing the long-term shortage of affordable housing.

Introduction

The issue of affordable housing

The housing crisis in the Netherlands has been extensively covered by Dutch media. A growing population, decreasing average household size, and a lag in new housing construction have all contributed to a shortage of available homes. In fact, last year saw the highest year-on-year increase in average rent prices in over 30 years (CBS, 2024).

The shortage of housing is particularly apparent when we look at affordable housing. As more people are priced out of the unregulated housing market due to overall shortages, the demand for affordable housing has increased significantly. However, the social housing sector—which provides a large share of the affordable housing supply—has not been able to keep up with this rising demand.

This increasing pressure on the social housing sector becomes an especially interesting subject for study when we look at the broader context of the issue. Of particular interest is the lack of an effective public discourse regarding the problem, a failure of policy to address the issue, and issues with liveability within social housing neighbourhoods, especially the early post-war housing stock.

Public discourse

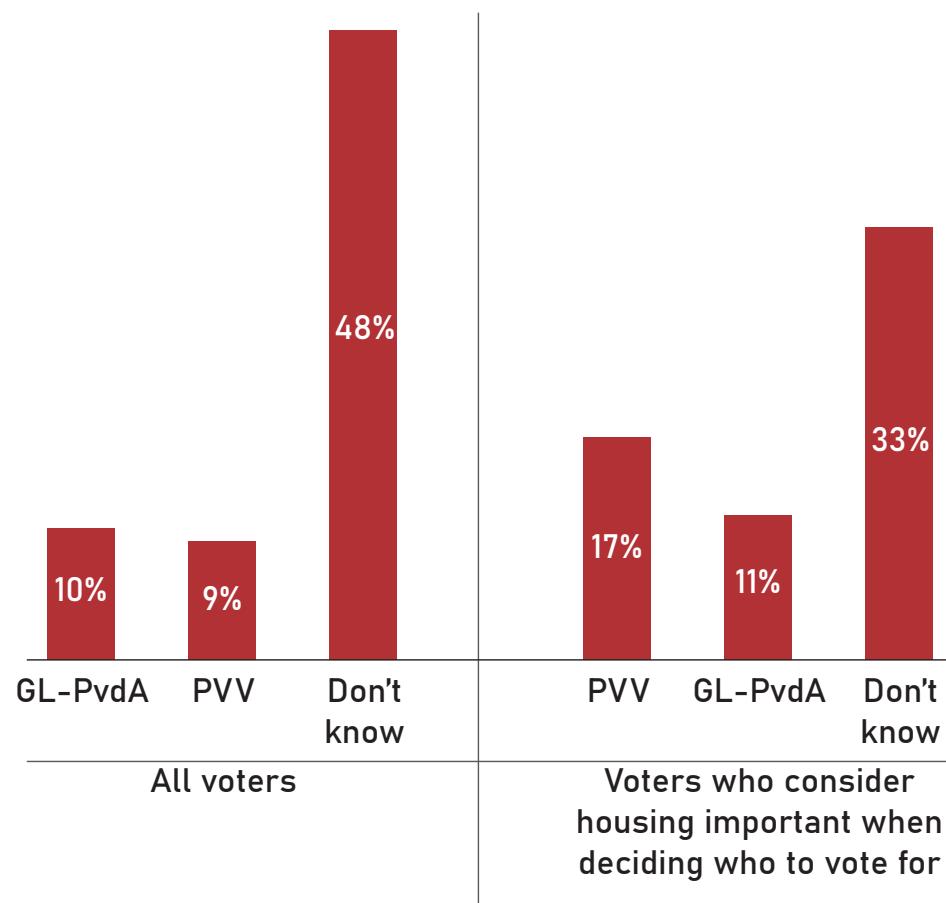
The imbalance between the perceived importance of affordable housing and its actual political prioritisation in the Netherlands becomes clear when we look at recent opinion polling. In recent months, housing has consistently ranked among the top three issues that voters consider most important when choosing a political party (Ipsos, March 2025).

However, in February, it was also the issue about which voters felt the least informed—48% said they didn't know which party had a housing programme (Ipsos, February 2025). After the national elections of 2023, the housing market was the issue the public most wanted the new government to address

(Ipsos, Post-Election Survey).

The disconnect between how important people believe the housing crisis is and how underdeveloped their ideas about potential solutions are highlights

What party has the best ideas about housing?



Source: Ipsos, 2025

Introduction

a lack of public understanding of the historical processes that have contributed to the current situation in the Netherlands.

Curent policy

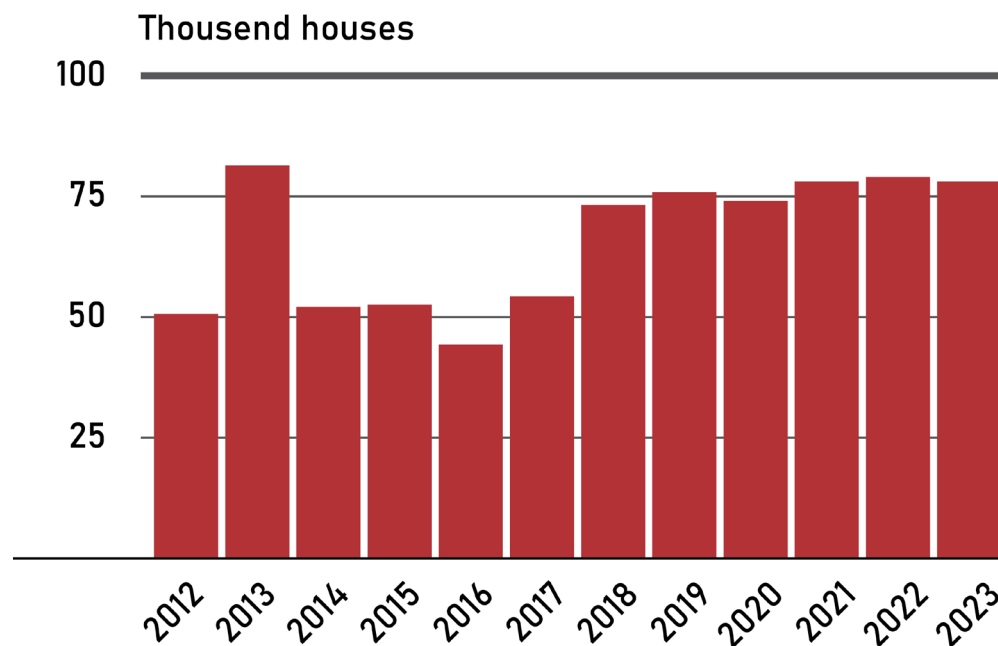
Current strategies to address the housing crisis have failed when measured against their own stated goals. Two policy documents are particularly relevant in this context: the Woningwet 2015 (Housing Act 2015) and the Nationale Omgevingsvisie (Environmental Planning Act). The Woningwet 2015 restricts the scope of activities for social housing associations. Specifically, it requires them to allocate 92.5% of their dwellings to households eligible for state rent assistance (Woningwet 2015, Article 48). This aligns with the EU's "level playing field" policy on government subsidies, ensuring that public support is directed towards low-income groups. As a result, a greater proportion of the housing stock managed by associations is reserved for low-income households.

However, Van Gent and Hochstenbach (2020) argue that this policy has led to increased residualization (meaning that only those from lower socio-economic backgrounds now qualify for social housing. In extreme cases, this can lead to socio-economic segregation within housing estates) and has constrained the financial capacity of housing corporations to invest in new developments or improvements.

The Nationale Omgevingsvisie (National Environmental Vision) aims to streamline the planning system to accelerate housing development. However, the most recent monitoring report from the Monitor Nationale Omgevingsvisie (2024) shows that the target construction of 100,000 houses per year has not been achieved. Up until 2019, housing construction was increasing annually. Since then, the number of new homes built has stagnated at around 75,000 per year, and this figure is expected to decline further, as the issuance of building permits has decreased since 2021.

Liveability

Houses built in the Netherlands



Source: Monitor Nationale Omgevingsvisie, 2024

Liveability in neighbourhoods with large amounts of social housing, especially housing built in the early post-war period, is under pressure. Statistical analysis published in the Leefbaarheidsbarometer 2.0 (2014) shows that in the Netherlands there is a statistically significant correlation between a higher portion of social housing in an area, and lower perceived Liveability. They also find a significant correlation between the portion of housing built in the early post-war era and lower perceived value. Statistical calculations with house prices show similar results.

This lower liveability in post-war social housing areas is a problem in and of itself, as lower Liveability results in lower living quality. But especially relevant is the negative impact lower Liveability can have on the long-term availability of social housing. Boelhouwer and Priemus (2013) theorize that

Introduction

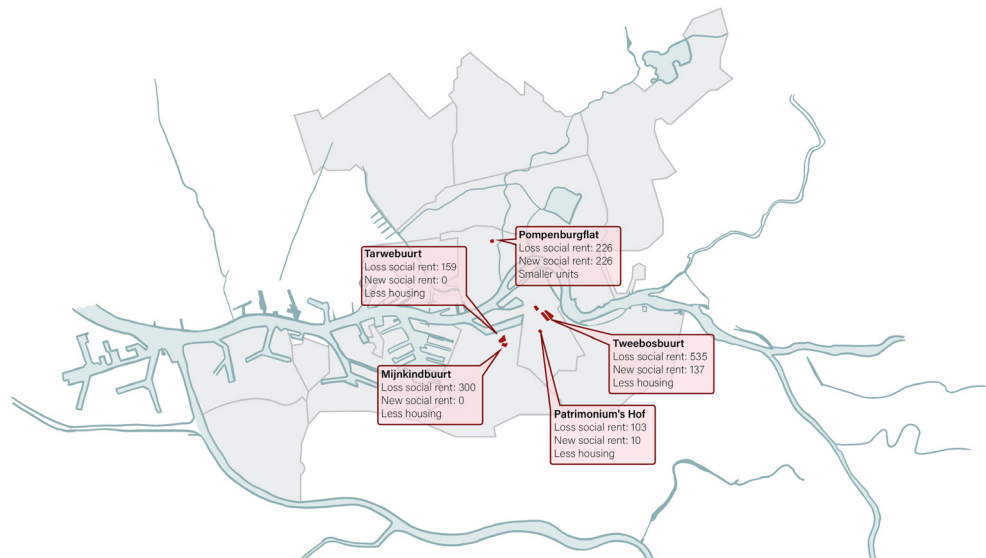
the public perception of social housing neighbourhoods as places with low Liveability made housing corporations an easy target for austerity measures, thereby limiting the future availability of social housing. The relationship between liveability and the management of social housing will be further explored in the theory section of this thesis.

Introduction

Rotterdam

Rotterdam has historically been a workers' city. To house the workers of the large shipping harbour, impressive social housing developments were built. In recent years, however, the city has become more expensive to live in, with Rotterdam seeing the highest year-on-year increase in average rent prices in the Netherlands (CBS, 2024).

Large demolitions of social housing stock Rotterdam



Source: Image by author

The city government has leaned into this shift by adopting a housing policy that aims to reduce the percentage of social housing in Rotterdam (Rotterdamse Woonvisie, 2023). This development has led to growing tensions, culminating in public responses such as the *woonprotest* (housing protest). These dynamics make Rotterdam an especially compelling case study for examining the spatial and policy dimensions of affordability and liveability.

Introduction

Vienna

Vienna is often cited as a beacon of social housing and progressive housing policy, both in the media and in academic literature. For instance, The Guardian reports that Vienna has become one of the world's most liveable cities through its commitment to social housing (Oltermann, 2024), while Förster and Menking (2018b) provide a detailed architectural and policy-oriented analysis of the qualities of the Viennese system in The Vienna Model 2.

Vienna is also noteworthy for the empirical results of its housing system. For example, Vienna's rent per square metre is among the lowest of major cities in Europe (Deloitte Property Index, 2024), at around a third of the cost per square metre of Rotterdam. This thesis will critically examine if lessons could be learned from Vienna, and if so, how they could be implemented in Rotterdam.



Source: Photo by author

Introduction

Post-World War II neighbourhoods

The decision to focus on neighbourhoods built during the reconstruction years after World War II was made for two main reasons: firstly, Vienna and Rotterdam both suffered extensive damage to their existing housing stock. Because of this, both cities were facing many of the same pressures, such as a lack of housing and a devastated economy. This gives us a similar starting position for both cities.

Secondly, the choice of neighbourhoods built around 1950 allows for the study of their development over time. As this thesis is particularly interested in the long-term effects of the spatial and governance aspects of affordable housing, and the resilience of design and governance systems, the long-term view offered by older neighbourhoods is critical.

Rotterdam after World War 2

Source: Unknown author, public domain



2

Theory and Methodology

In this part of the thesis the research approach is layed out. It has the following sub chapters:

Research Questions

Ethical Positioning

Theory

Methodology

Research Question

Main Research Question:

How can lessons from the design and governance of post-war social housing Neighbourhoods in Vienna and Rotterdam support the future resilience of these Neighbourhoods in Rotterdam?

Sub-Research Questions:

- 1 What governance structures influenced the design and subsequent development of post-war social housing Neighbourhoods in Vienna and Rotterdam?
- 2 What spatial qualities—including the quality of relevant services—do the post-war Neighbourhoods in Vienna and Rotterdam exhibit today?
- 3 What lessons regarding urban planning and management can be learned by examining the different ways in which the studied Neighbourhoods in Rotterdam and Vienna have developed?
- 4 How could the lessons regarding design and governance be implemented spatially in a Neighbourhood in Rotterdam?

Ethical Positioning

At the heart of my thesis is the ethical position that housing is a right. This right to housing has been recognised by numerous institutions, including the Dutch government (Grondwet, Article 22), the Council of Europe (European Social Charter, Article 31), and the European Parliament (Resolution 20210114IPR95632). However, the question of how to protect this right is still very much debated.

The EU has long held the position that housing assistance from the state should not interfere with the free market. This stance has led the Dutch government to limit which income groups housing associations can cater to (Priemus & Gruis, 2011).

Here we can see the conflicting ethical views on housing: on the one hand, housing is seen as a human right, while on the other, it is viewed as a market that should not be interfered with by government interventions. The starting point of this thesis is that housing is a basic human right, and that policy should be shaped to effectively facilitate access to housing for all—whether that is through the market, the state, or non-profits. No preferential treatment will be given to either of the systems.

Theory and Methodology

Academic context

Housing affordability

Pittini (2012) discusses the state of affordable housing in the EU, beginning with an overview of how affordable housing is defined. Among other definitions, she refers to the standard that considers housing affordable when it costs less than a certain percentage of the occupant's monthly income. She highlights a stark disparity: individuals earning less than 60% of the median income typically spend over 40% of their disposable income on housing, whereas those earning above that threshold spend less than 20%. This illustrates that the affordability crisis is most severe in the lower-income segment. Additionally, Pittini identifies the rise in owner-occupied housing—often at the expense of social housing—as a key factor contributing to the shortage of affordable homes.

Social housing

The role of social housing in providing affordable and liveable housing is well established, and in the Netherlands dates back to the introduction of the Woningwet (Housing Law) of 1902. Recent academic discourse in the Netherlands discusses how recent policy has impacted this.

Priemus and Gruis (2011) point out that economic laws aimed at protecting the level playing field have pushed the Dutch government to target its social housing only at the poorest segment of Dutch society. This limits the ability of the social sector to provide affordable housing for middle-income households, thereby restricting its overall capacity to address housing affordability.

Boelhouwer and Priemus (2013) highlighted the dangers posed to the Dutch housing sector by policy changes and, in particular, budget cuts. They also pointed to the negative public perception of social housing—in part attributed to perceived poor-quality living environments—as a contributing

factor to the severity of the cuts to the social housing sector. This underscores the interconnection between the quality and quantity of social housing stock.

Liveability and Resilience

For the maintenance of a stable and good affordable housing stock, construction is only part of the story. What happens after construction is at least as important. A key indicator for how well a place of living is functioning is liveability. How well a neighbourhood can ensure liveability over time can be understood as that neighbourhood's resilience. This resilience is key to a neighbourhood's long-term success.

Aedes (2023) gives a definition of resilience: “the degree of interdependent self-sufficiency of the people and organisation (residents, police, schools) [within a neighbourhood]” (translated from Dutch). They thus focus on the social aspect of resilience, hence I will from now on use Social Resilience to describe this type of resilience. This is a great starting point for the discussion on the resilience of neighbourhoods, but it leaves out some relevant topics.

While there are many different lenses through which one could approach the topic of resilience, not all are relevant for this study. Two key concepts that are missing in the definition of Aedes that are necessary to include if we want to examine the long-term success of a neighbourhood are the resilience of the built environment and the resilience of the governance structures.

The resilience of the spatial structure should be understood as the ability of the built environment to facilitate the flourishing of the community that inhabits it over time. This includes how well the built environment is able to adapt to changes in requirements over time. In the interest of brevity I will from now on refer to this type of resilience as Spatial Resilience.

Governance resilience should be understood as the ability of managing

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institutions—whether they be private, government, or non-profit to maintain themselves through the social changes that occur with the passage of time. Although tailored to the needs of this thesis, these components of resilience are in line with other definitions of urban resilience in the academic field. In their review paper on definitions of urban resilience, Meerow, Newell, and Stults (2015) give the following definition of urban resilience:

“Urban resilience refers to the ability of an urban system—and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales—to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity.”

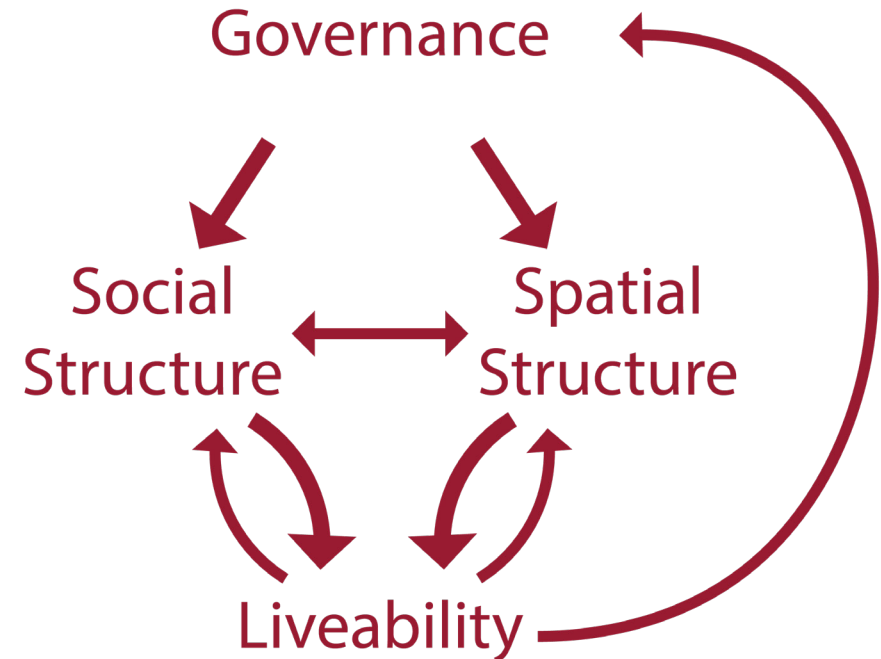
This definition also includes social and spatial dimensions, but is broader than is needed for this thesis, as it also includes ecological aspects. The key aspects of urban resilience focused on in this thesis are Liveability, Spatial Structure, Social Structure, and Governance.

Liveability, Spatial Structure, Social Structure, and Governance are all linked with each other, with Liveability, Spatial Structure, and Social Structure forming a triangle that influences each other, while Governance facilitates the others, while also being influenced indirectly by liveability. See image on the right.

To understand these concepts, we must examine the relations between them. High liveability influences Social Structure by attracting those with larger social capital to the neighbourhood, who can help shoulder some of the burden of maintaining the neighbourhood. The strong social network of high Social Structure can make a neighbourhood more liveable, as these networks fulfil the social needs of the inhabitants.

Social Structure can also influence Spatial Structure through community initiatives like the creation of small community gardens, or the general maintenance of public space. The reverse is also true: good public space

Resilience framework



Source: Drawing and framework by author

design or the inclusion of community spaces in the neighbourhood program can help foster Social Structures.

Resilient Spatial Structure, as stated, facilitates liveability, as a well-built environment adapts to the needs of its inhabitants. The opposite is also true, as those living in high liveability environments are more likely to

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invest back into the built environment, by maintaining it, or even with small additions to the environment like planting flowers on their balcony and thereby adding to the green quality of the built environment.

Governance has more of a facilitating function, as it can support the development of a neighbourhood. This can happen through improvements to the public space, like the addition of a new playground fostering more community contact. Good maintenance facilitated by resilient governance is also crucial to properly maintain Spatial structures.

To conclude, urban resilience in this thesis is defined as the ability of urban governance, social structures, and spatial configurations to remain functional despite changes in their broader context, either because these structures are robust enough to absorb external pressures or because they are capable of adapting to new conditions.

As social structures cannot be directly produced, but instead emerge under conditions shaped by effective governance and spatial configurations, the analytical sections of this thesis examine these contexts while reflecting on their impact on the social domain.

Comparative studies

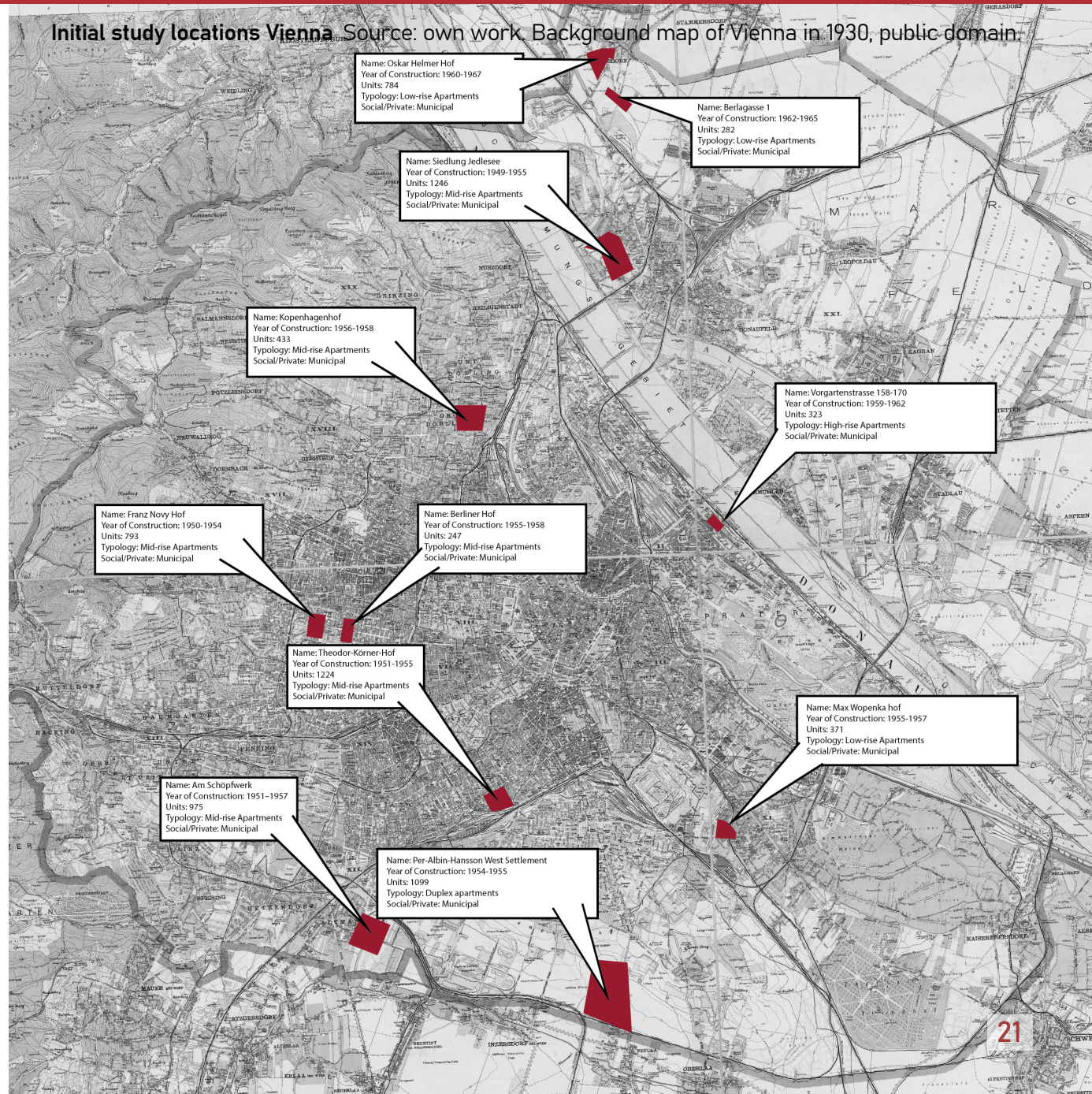
Comparative studies are often used to gain deeper insights into the effects of policy. A notable example is the study by Kadi and Lilius (2022). Through the use of a multi-dimensional framework that considers the various layers of governance in Helsinki and Vienna, they find that although the two cities have very different policies regarding social housing, both have successfully maintained the strength of their social housing sectors.

The academic value of this thesis lies in the comparative analysis between Rotterdam and Vienna, and in the examination of both the spatial qualities and the governance structures that have enabled and sustained them. This holistic approach to social housing—integrating physical design with institutional context—has not yet been applied in a comparative study.

Theory and Methodology

Methodology Overview

This thesis consists of three main parts: an information-gathering phase, where both cities are examined individually; an analysis chapter, in which both cities are examined together and best practices are described; and, lastly, a design and communication chapter, in which lessons from the analysis chapter are used as the basis for a spatial design for a neighbourhood in Rotterdam, and the results of the thesis are communicated to a wider audience. The research goals and methods are expanded upon further in this chapter.



Theory and Methodology

Governance Analysis

In the Governance Analysis part of the thesis, sub-question 1 will be answered. Below is a detailed overview of the sub-question will be addressed.

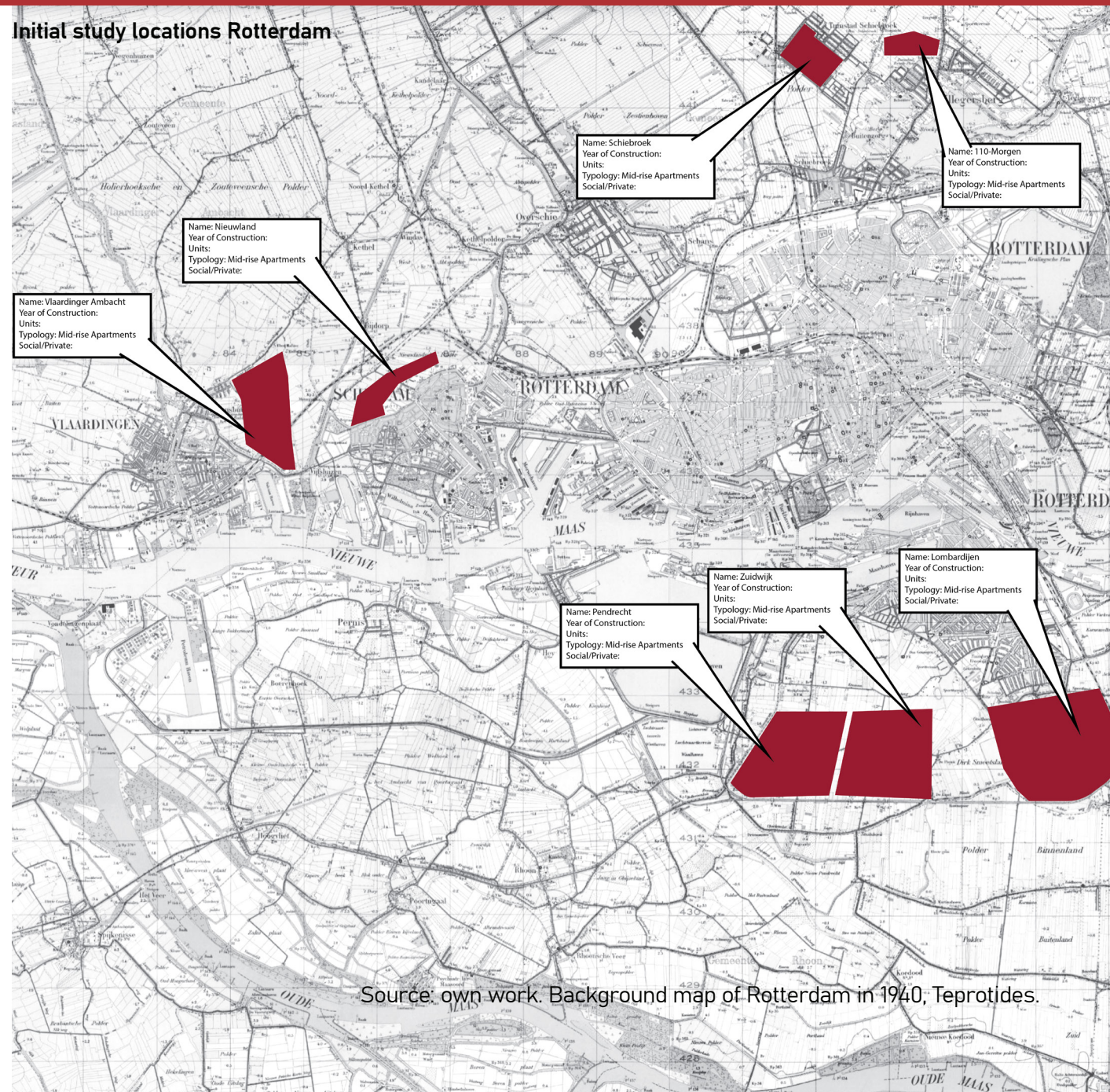
Sub-question 1: What governance structures influenced the design and subsequent development of post-war social housing neighbourhoods in Vienna and Rotterdam?

This research question will be answered through a thorough study of relevant policy documents, including both currently active policies and historical policy frameworks. In addition, scientific literature on social housing governance will be used to complete the picture of the underlying dynamics. Lastly, interviews with experts will be conducted to gain a comprehensive understanding of the dynamics at play.

This chapter focuses on three main aspects:

- The operational structures.
- The financial model.
- The social goals and outcomes.

Findings in this chapter will influence the spatial attributes examined in the next chapter, and vice versa.



Theory and Methodology

Spatial Analysis

In the Spatial Analysis part of the thesis, sub-question 2 will be addressed. Below is a detailed overview of the research approach.

Sub-question 2: What spatial qualities—including the quality of relevant services—do the post-war neighbourhoods in Vienna and Rotterdam exhibit today?

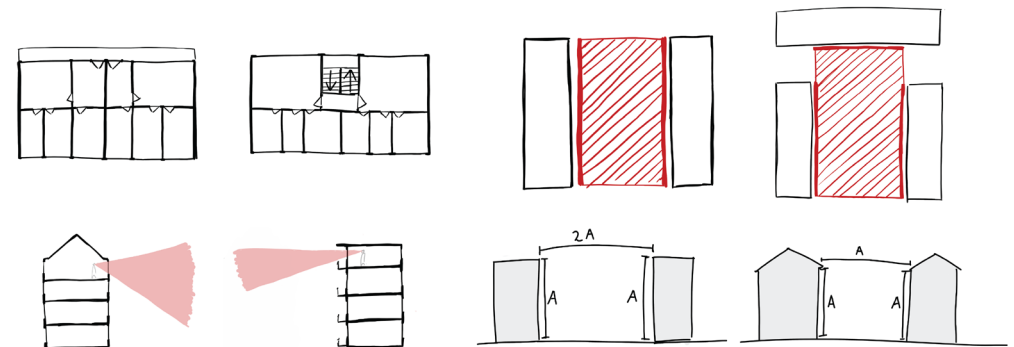
To answer this research question, two neighbourhoods in Vienna and two in Rotterdam will first be selected. This selection will be based on perceived liveability data gathered from a large number of post-Second World War social housing developments in both cities. Based on the results of this analysis, one neighbourhood in Rotterdam and one in Vienna will be selected as the primary case studies for the remainder of the thesis.

The spatial quality of these neighbourhoods will then be assessed through site visits, multi-scalar mapping, and spatial analysis informed by urban design literature on good urban form.

As part of this investigation, key changes that have occurred in the neighbourhoods over time—both in terms of use and spatial configuration—will be mapped and analysed. Once these changes are identified, the governance structures and policies discussed in the previous chapter that caused or facilitated these transformations will be referred back to.

As stated previously, the research process in this chapter has a bidirectional relationship with the governance analysis chapter. Relevant findings in either chapter may therefore lead to further investigation in the other.

Examples of analytical sketches



Source: Drawings by author

Theory and Methodology

Pattern Language

Sub-question 3: What lessons regarding urban planning and management can be learned by examining the different ways in which the studied neighbourhoods in Rotterdam and Vienna have developed?

To answer this research question, I will develop a pattern language based on the findings from the previous chapters. This pattern language will include the best practices identified in both Rotterdam and Vienna. Unlike the original pattern language developed by Christopher Alexander, the pattern language in this thesis is multidimensional: it incorporates governance, spatial design, and social structures.

Design and Communication

In the gathering part of the thesis, sub-question 4 will be answered. Below is an overview of how this will be done.

Sub-question 4: How could the lessons regarding affordability and liveability be implemented spatially in a neighbourhood in Rotterdam?

To answer this research question, I will propose a spatial design for one of the studied neighbourhoods in Rotterdam. In this design, I aim to improve the liveability of the neighbourhood while increasing the availability of social housing. Throughout the design process, I will implement lessons identified in the previous chapter to enhance the neighbourhood in three key areas: liveability, affordability, and resilience.

The design will seek to improve the neighbourhood in these three dimensions while preserving as much of the quality of the existing spatial and social fabric as possible. The tools used will include, depending on the findings from the previous chapter, densification, infrastructure improvements, better facilities, and enhancements to the urban design.

The proposed changes in the neighbourhood will then be reviewed to identify the policy and governance adjustments required—not only to implement these changes, but also to ensure that the neighbourhood remains resilient and adaptable in the face of future challenges.

Theory and Methodology

Summary

Below is an overview of the sub-research questions and how they will be answered.

Sub-research question

Main method

What governance structures influenced the design and subsequent development of post-war social housing neighbourhoods in Vienna and Rotterdam?

Study of city governance systems through literature study and interviews with professionals and experts.

What spatial qualities—including the quality of relevant services—do the post-war neighbourhoods in Vienna and Rotterdam exhibit today?

Spatial study of neighbourhood design; historical analysis of the neighbourhood; governance analysis. Study of city government documents on key indicators of liveability; analysis of average rent prices compared to income;

What lessons regarding urban planning and management can be learned by examining the different ways in which the studied neighbourhoods in Rotterdam and Vienna have developed?

A pattern language will be developed based on information gathered in the previous two chapters

How could the lessons regarding affordability and liveability be implemented spatially in a neighbourhood in Rotterdam?

Design study of the built environment and exploration of the governance needed to achieve the long-term success of the design.

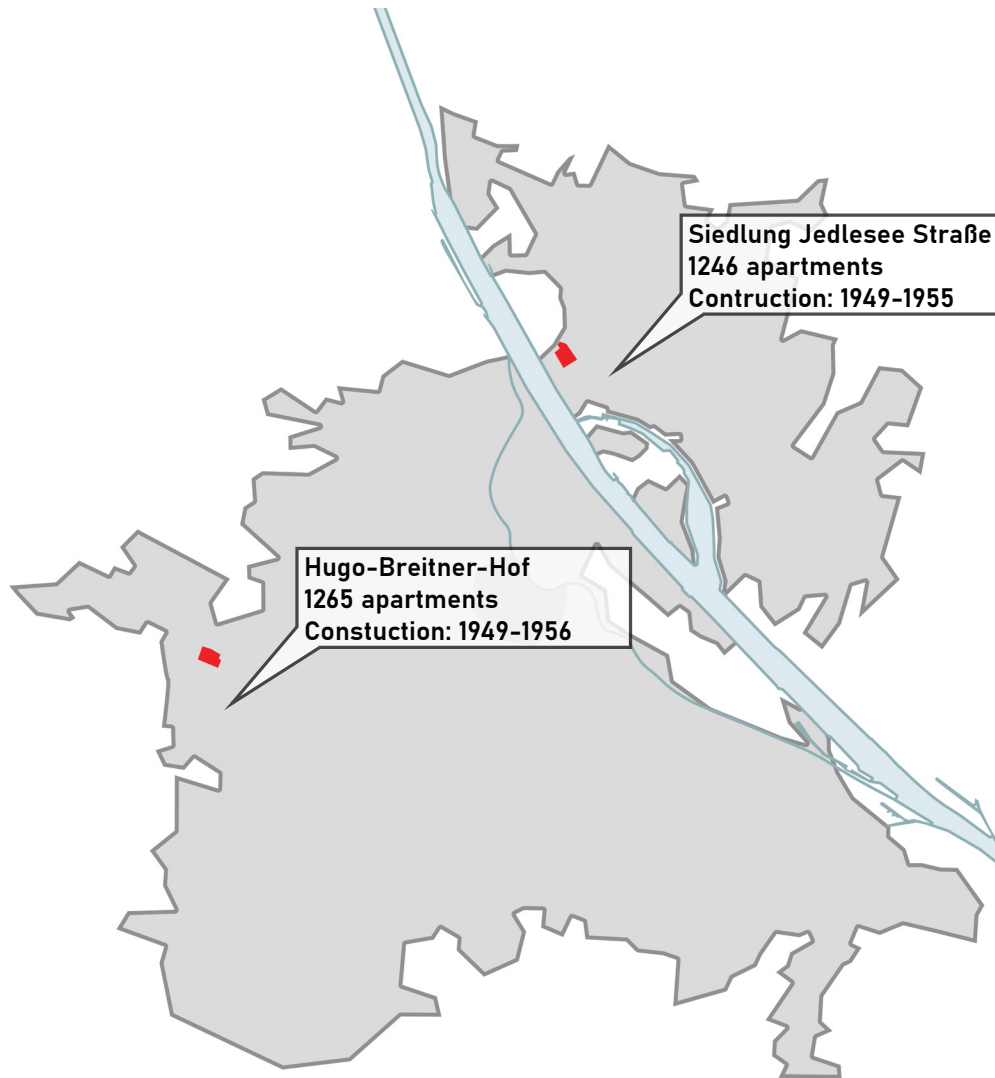
3

Selection of Neighbourhoods

For this study, two neighbourhoods in Vienna and two in Rotterdam were selected. A selection of only two neighbourhoods cannot be representative of the whole city, as both cities are large and diverse. Therefore, the aim of the selection process was to identify two neighbourhoods in each city that differ from each other in such a way that as many lessons as possible can be drawn from them. In other words, the selected neighbourhoods should have different strengths and weaknesses, allowing for analysis of these contrasting characteristics. The selection process is described in this chapter.

Selection of Neighbourhoods

Locations Vienna



Source: Drawings by author

Selection Process Vienna

To select the neighbourhoods for further analysis, a large list of residential projects constructed during the relevant period was first compiled. In Vienna, the municipal housing agency website was used to gather this information. This website maintains a page for all social housing estates built for the municipal housing association. These pages are, however, not effectively ordered. ChatGPT was therefore used to provide links to all housing complexes built in the post-war period.

Data from the municipal website was compiled into an Excel sheet (attachment 1). The first criterion of the selection process in Vienna was the scale of the project. The focus of this thesis is on the neighbourhood scale; therefore, all housing projects consisting of only a single building or block were filtered out. This left 5 projects of around 1,200 apartments and 3 projects of around 700 apartments.

The next step in the process involved collecting more data. The goal in this step was to select two neighbourhoods in Vienna with different strengths and weaknesses. Perceived quality, as reported by inhabitants of the neighbourhoods, was chosen as the most relevant metric. The best data set on this in Vienna is the *Lebensqualität in 91 Wiener Bezirksteilen* (Quality of Life in the 91 Viennese District Sections) report. This is the only report on perceived quality of life that operates at a smaller scale than the district level. For this report, about 1 percent of the population was surveyed on their opinion of various qualities of the neighbourhoods.

Qualities relevant to the quality of the urban space, services, and social fabric were selected.

In the end, the Hugo-Breitner-Hof in the district section Ober Baumgarten-Hugo-Breitner-Hof and the Siedlung Jedlesee in the district section Jedlesee-Schwarzlackenau were chosen for their different strengths and weaknesses. All selection data can be found in the appendix.

Selection of Neighbourhoods

Locations Rotterdam

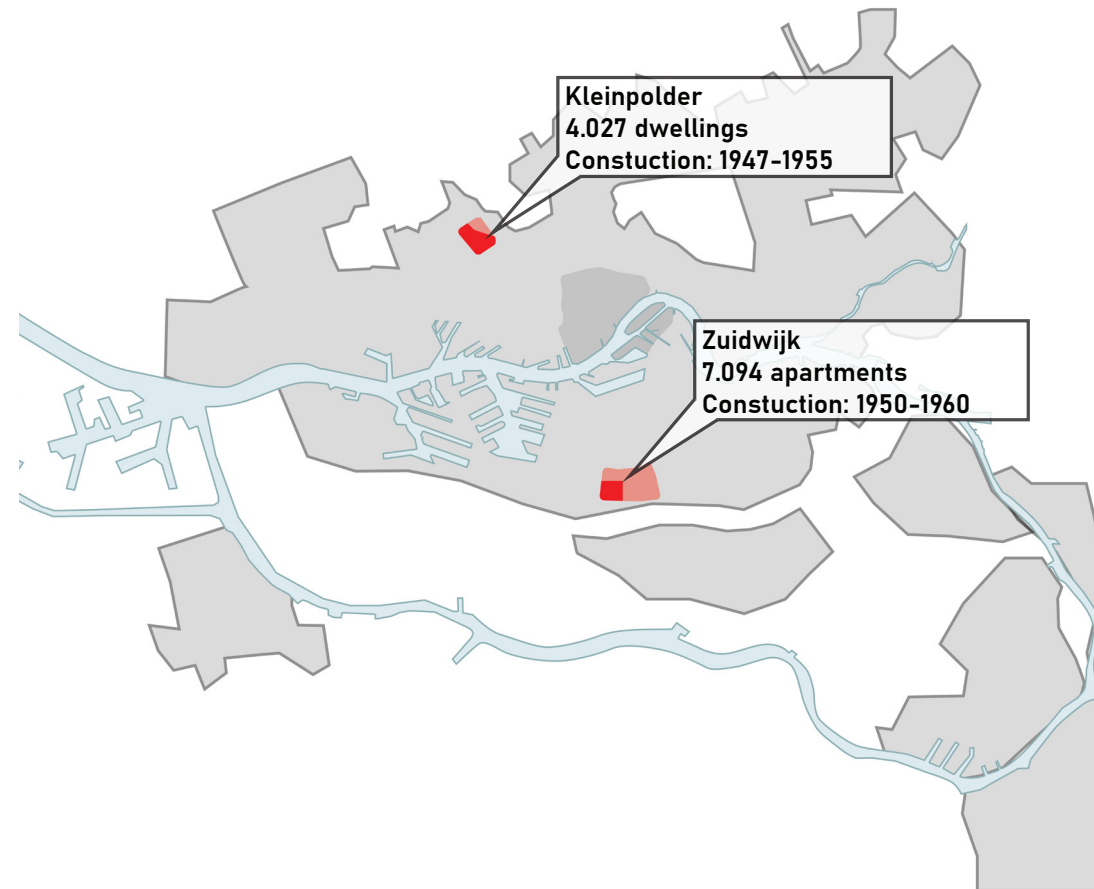
Selection Process Rotterdam

In Rotterdam, the first step was again the compilation of a large list of social housing projects from the post-war period. This time, Topo Tijdreis was used to find new urban developments in Rotterdam. This list was then cross-referenced with data from Alle Buurten to identify neighbourhoods with large amounts of social housing.

This resulted in a list of five large housing projects from the post-war period. The projects consist of between 5,000 and 8,000 apartments. The large scale of the developments in Rotterdam can be explained by the fact that they were all greenfield expansions, whereas the new projects in Vienna were all within the existing urban fabric, thus limiting their scale.

In Rotterdam, the goal of the last step in the selection process were again to have a diverse duo of neighbourhoods with different qualities and weaknesses. To identify this, inhabitant perceived quality was gathered from the municipal website Wijkprofiel.Rotterdam.nl. Data from this website, similar to the data that was used in the Vienna study, was utilized. In some cases, data had to be averaged to match the data for Vienna—for example, the satisfaction scores for passive green space and active green space were combined by averaging to give a single green space satisfaction number.

Using this data on perceived quality, one neighbourhood on the north side and two on the south side of Rotterdam were identified. Due to their different nature, there was a preference for a neighbourhood pair with one situated on the north side and one on the south side of the river. One of the neighbourhood pairs was thus chosen as Kleinpolder. This meant that the last choice was between the two neighbourhoods on the south side: Zuidwijk and Pendrecht. Both neighbourhoods scored very similarly and were therefore both interesting study locations. However, Pendrecht was designed by the same urbanist as Kleinpolder, so to increase the diversity of the final neighbourhood pair for Rotterdam, Zuidwijk was chosen. All selection data can be found in the appendix.



Source: Drawings by author

4

Governance Analysis

In this chapter, I will analyse the governance structures and goals of social housing systems in Vienna and Rotterdam. This will be approached through three sub chapters: organizational structures, financing structures, and social goals and allocation. Finally, I will summarise the lessons learned from the two systems.

Governance Analysis

Organisational structures Vienna

The social housing sector in Vienna is made up of municipal housing and limited-profit housing associations (LPHAs). Together, these sectors account for around 41 percent of Vienna's housing stock, with municipal housing comprising approximately 220,000 dwellings (21 percent) and LPHAs 200,000 dwellings (20 percent) (Statistik Austria, 2024).

Municipal housing was initiated after the fall of the Austro-Hungarian Empire in 1919 and was financed directly by the government.

After the Second World War, Limited-Profit Housing Associations (LPHAs) were introduced as an additional option for social housing construction. Over time, they gradually outpaced municipal housing in terms of construction, culminating in the cessation of municipal housing construction in 2004 (City of Vienna, n.d.a).

The municipality maintains strong control over LPHA construction through its land management system. A 1 percent income tax is levied to support a housing fund (Amann, personal communication, 2025). The municipality then issues tenders for new construction on that land and decides which projects can be built based on jury-selected social, economic, and environmental criteria. (City of Vienna, n.d.b).

Due to a rising housing shortage, the municipality restarted its housing construction program in 2015. Currently, it is planning to construct around 4,000 new dwellings in addition to those developed by LPHAs, the first of which were handed over to tenants in 2019.

Municipal housing association is not allowed to sell housing stock. Limited-profit housing associations are allowed to sell housing stock. Renters who played more than 85 Euro per square meter in upfront cost have a right to buy. LPHA's therefore avoided going over this limit (Amann et al., 2024).



Source: Photo by author

Governance Analysis

Organisational structures Rotterdam

In the Dutch social housing system, multiple layers of government collaborate with housing associations to provide affordable housing in high-quality neighbourhoods. This governance structure is formalised through the Nationale Prestatieafspraken 2025-2035 (2024), which identify three national and three local actors:

At the national level, the central government plays a facilitating role through large-scale spatial planning and by supporting social housing finance, including the backing of housing loans. The Association of Dutch Municipalities (VNG) translates national policy objectives to the regional level and supports municipalities in their implementation. Aedes, the national association of housing associations, assists its members by translating national policy into actionable strategies at the local level.

At the local level, municipalities are responsible for developing local housing strategies and facilitating housing associations in achieving these goals. Housing associations are required to deploy their investment capacity in line with public housing objectives. Tenant organisations play a formal role in participation and decision-making processes within the social housing sector.

From a financial perspective, this structure reflects a clear shift in responsibility. Whereas housing associations previously received direct subsidies, public support is now channelled through housing allowance paid directly to tenants by the national government. Municipal housing companies, which play a dominant role in Vienna's social housing system, have become almost non-existent in the Netherlands. By 2012, fewer than twelve municipal housing companies remained in operation, none of which were active in large municipalities.

Instead, the Dutch social housing system is structured around independent, non-profit housing associations. After the Second World War, these asso-

ciations were used by the national government as instruments to address the housing shortage and stimulate economic recovery (see the financial chapter). Since the 1980s, however, policy reforms have aimed to increase the financial and organisational independence of housing associations from the state.

In Rotterdam, the social housing sector is dominated by several large housing associations, most notably Woonstad Rotterdam (approximately 57,000 dwellings) (Van Deursen, 2023), Havensteder (around 45,000 dwellings) (Havensteder, n.d.), and Woonbron (approximately 45,000 dwellings) (Woonbron, n.d.). Although these associations are head-quartered in Rotterdam, around 44% of their housing stock is located in neighbouring municipalities. In this respect, Dutch housing associations resemble the limited-profit housing agencies (LPHAs) operating in Vienna. However, unlike Vienna, Rotterdam lacks a municipally owned housing sector. Housing associations own approximately 43% of the total housing stock in the municipality, amounting to roughly 140,000 dwellings (Statistieken Gemeente Rotterdam, 2025).

The municipality of Rotterdam maintains close relations with the social housing organisations operating in the city, due to their long-term presence and involvement in neighbourhood management (interview with policy expert, Municipality of Rotterdam). Because social housing is subject to an income cap, the development of rental housing for the middle-income segment is largely dependent on for-profit institutional investors. These investors typically sell their rental stock before major renovations become necessary to maximise returns, which leaves the municipality without a stable long-term partner for middle-income rental housing.

The large number of stakeholders has raised difficulties, particularly with regard to increasing density through adding floors to existing buildings. The municipality sees this as a key way to address the housing shortage, but results have been limited. Key obstacles include parking norms, minimum housing sizes, lift requirements, and associated land ownership changes.

Governance Analysis

The municipality has identified this problem and established an “optopre-gisseur” (floor adding director). Laws have already been passed to make parking norms and minimum housing sizes more flexible. In addition, the municipality is working together with housing associations on specific densification projects. Subsidies from the national government are available to make these projects more viable. The past difficulties in this area are clearly visible when we look at renovations in the two neighbourhoods, as no densification through optoping has taken place.



Source: Photo by author

Governance Analysis

Financial structure Vienna

As stated previously, the Municipality of Vienna is no longer a major direct constructor of new social housing. However, the establishment of the Wohnfonds Wien in 1985 and the subsequent acquisition of developable land by the municipal government enabled the city to retain control over new construction. The fund leverages its close proximity to the city's zoning department to purchase agricultural land at below-market prices and subsequently sells it to the Limited-Profit Housing Agencies (LPHA). In addition, new legislation aimed at combating land speculation mandates that two-thirds of land converted from agricultural to residential zoning must be sold for no more than €200 per square meter of usable floor space, whereas market prices can reach up to €1,800 per square meter (Amann, personal communication, 2026).

Vienna's housing policy is funded through a 1% income tax, although this revenue is not earmarked for a specific purpose (Amann, personal communication, 2026). New construction of LPHA housing is financed through multiple capital sources. Low-interest loans from the municipality and private lenders cover the majority of construction costs, supplemented by equity from the LPHA and tenant contributions. In Vienna, low-inter-

est loans account for approximately 25% of a project's construction cost although this varies between projects (Kössl, 2022). Direct grants of up to 35% of the construction cost can also be issued by the municipality for specific projects (City of Vienna, n.d.b).

Rent levels for LPHA projects are set before construction begins, based on the estimated costs of investment, interest payments, maintenance, and administration. Rents must cover these expenses on an estate-by-estate basis, meaning that a loss on one estate cannot be offset by profits from another. Setting rents in advance also creates a strong incentive to avoid cost overruns, since any additional costs cannot be passed on to future tenants (Amann et al., 2024).

Of note is that rents decrease after the financing of a project's construction has been paid off. New legislation to effectively utilize this very inexpensive housing stock in a socially targeted way is currently being discussed (Amann et al., 2024). These rules regarding long term rent highlight that under the LPHA model investments by state institutions are guaranteed to have a positive social impact over the lifetime of the building.

Vienna's focus on the mid- to high-income segment of LPHA housing has a broader impact than its market share suggests. A 2023 study by Michael Klein et al. found that the limited-profit housing market has a substantial dampening effect on the for-profit market. On average, the study shows that a 10% increase in the share of LPHA housing results in a 5% decrease in rents in the private rental sector (Klein et al., 2023).

Another report by Klien and Streicher (2021) shows that lower rents benefit not only individual tenants but also the Austrian economy as a whole. They estimate that reduced housing costs contribute between €600 million and €1 billion annually to the Austrian economy, through increased consumer spending and reduced government expenditure on housing allowances.

Table 3: Typical financing mix in Vienna

	Cost per square metre (in Euros)	Total cost for 10,000 square metre development (in Euros)	Share of total cost
Public loan (1% interest, 35 years)	600	6,000,000	26%
Bank loan (2.5% interest, 30 years)	1,335	12,850,000	56%
LPHA equity	350	3,500,000	15%
Tenant equity (down payment)	65	650,000	3%
Total	2,300	23,000,000	100%

Source: Kössl, G. (2022)

Governance Analysis

Financial structures Rotterdam

In contrast to the Vienna case, housing policy in the Rotterdam case is primarily shaped at the national rather than the municipal level. As the case study concerns an older neighbourhood, it is relevant to examine how the financial structures governing social housing have evolved from the time of its construction to the present.

Subsidies

In the aftermath of the Second World War, the Dutch government faced both a severe housing shortage (CBS, 2025) and a stagnating economy. Subsidies within the housing sector were used to address both challenges simultaneously (Enquêtecommissie, 1988, p. 20). Initially, this was achieved through object-based subsidies. For government-approved social housing projects, both a rent sufficient to recover investment costs and a socially acceptable rent level were determined, with the state covering the difference over the usable lifespan of the building. This system effectively guaranteed housing associations a positive return on investment when constructing approved social housing, leading to a rapid increase in construction output.

However, this system proved fiscally unsustainable. Because subsidies were paid over the entire lifespan of buildings, total government expenditure steadily increased and reached almost 2 percent of Dutch GDP by 1986 (Enquêtecommissie, 1988, p. 21). Combined with the broader shift towards market-oriented policy frameworks in Europe during this period, this led to a major reform of the subsidy system. Housing associations were to become less dependent on the national government, and subsidies were redirected from housing providers to tenants. As a result, the Dutch social housing system transitioned from object-based subsidies to demand-based subsidies in the form of income-dependent housing allowances.

Under this system, subsidies are paid directly to tenants to cover the

difference between the regulated rent of a dwelling and what is deemed an “affordable” rent. Consequently, lower rent levels reduce the amount of subsidy the government is required to pay. Since the government also regulates the maximum annual rent increase, limiting rent increases has become a politically popular means of implementing budgetary cuts. In effect, the government can improve its fiscal position by restricting the capacity of housing associations to generate returns on their investments. It is important to note that such measures reduce the income of housing associations by more than the government saves in subsidies, as tenants simultaneously pay lower rents.

More broadly, it is notable that homeowners receive substantially higher levels of public support than renters. Mortgage interest deduction is projected to cost the Dutch state €11.3 billion (approximately 1 percent of GDP) in 2026, compared to €6.5 billion in projected expenditure on rent allowances (Ministerie van Financiën, 2025a; Ministerie van Financiën, 2025b).

Land costs

Housing associations are legally restricted from making long-term land acquisitions under the Housing Act (Woningwet). They are only permitted to purchase land if construction is expected to commence within five years (Aedes, 2024a). In Rotterdam specifically, land prices for social housing more than doubled between 2023 and 2024 (Aedes, 2024b), reaching €250 per square meter (De Raad van de gemeente Rotterdam, 2024). This change in policy stands in stark contrast to the Viennese approach, where extensive measures are taken to reduce land costs for limited-profit housing associations. At the time the municipality estimated that this would result in 205–305 less social housing dwellings being built until 2030. Social housing associations noted that much of the effect would of the price increase would only be felt in the long term and therefore commissioned their own study that found that there would be 660–980 less dwellings constructed. (Havensteder et al., 2023)

Governance Analysis

Tax

In the aftermath of the 2008 financial crisis, social housing associations have been required to pay more tax. Since 2008, they have been subject to corporate income tax (Vpb). This tax burden has increased in recent years, especially now that interest on loans—on which social housing associations rely to meet construction targets—can no longer be fully deducted from taxable profit. Currently, social housing associations pay approximately €0.8 billion in corporate tax. This amount is expected to almost double to €1.5 billion in 2029 (Aedes, 2025).

In addition to this, a special tax for social housing associations was introduced in 2014: the “verhuurdersheffing” (landlord levy). In 2020, the tax amounted to a total of €1.9 billion (Ministerie van Financiën, 2020). When the scale of the housing shortage became apparent, the national government abolished the tax from 2023 onwards (Eerste Kamer der Staten-Generaal, 2022).

These two taxes, combined with the increase in land prices charged for social housing previously discussed, highlight that Dutch political culture has increasingly viewed the social housing sector as a source of funding to close budget gaps in the last decades. The lack of a direct link between the amount of money extracted from the social housing sector and the financial pain felt by voters may have contributed to this dynamic.

Construction

Low maximum rent levels, combined with rising construction costs, have resulted in a situation in which housing associations lose, on average, €0.66 for every euro invested in new social housing construction (Ortec Finance, 2025, Table 5). According to the same report, non-social housing built by housing associations also results in a net loss, although to a lesser extent, with housing associations losing €0.38 for every euro invested. Part of this difference results from the report’s assumption that housing associations

will demolish one unit of their existing housing stock for every new social housing apartment they build.

As a result of these unprofitable investment returns, new social housing developments must be financed through surpluses generated by the existing housing stock. This financial structure significantly discourages new construction by housing associations.

The consequences of this misalignment between financial structures and policy objectives are reflected in low realization rates for planned construction. A 2025 government report shows that of the housing construction projects included in housing associations’ budgets for the years 2018, 2019, and 2020, only approximately 60 percent were realized within the timeframe of the approved budgets (Inspectie Leefomgeving en Transport, 2025, Table 2).



Source: Photo by author 37

Governance Analysis

Social goals and allocation Vienna

Income limits

In Vienna, income limits for access to social housing are set at a relatively high level. As a result, approximately 75 percent of the city's population qualifies for social housing (City of Vienna, 2025). Exact thresholds depend on household composition but generally range between €50,000 and €125,000 in net annual household income.

EU state aid compliance

Despite the broad accessibility of social housing in Vienna, the system has not been required to fundamentally alter its structure in order to comply with EU state aid and competition regulations. Amann et al. (2024) argue that, although income limits are generous, they nonetheless correspond to a target group that can reasonably be defined as serving a public service. In particular, they highlight policy objectives such as social mixing and the prevention of residualization as central elements of this public service rationale.

In addition, supply-side subsidies in the Viennese system are structured in such a way that they must be fully passed on to tenants through cost-based rents. As a result, subsidies do not provide an undue advantage to housing providers themselves, thereby mitigating the risk of market distortion and aligning the system with EU state aid requirements.

Other barriers to access

While income thresholds are generous, access to Viennese social housing is constrained by several non-financial eligibility requirements. To qualify for municipal housing, applicants must have been registered at their current Viennese address for at least two years. This residency requirement excludes not only recent arrivals but also individuals in unstable

housing situations, who are often among the most vulnerable population groups. Furthermore, applicants must either hold Austrian citizenship, be third-country nationals with at least five years of permanent residency, or possess recognized refugee status (Friesenecker & Kazepov, 2021, p. 83).

In the limited-profit housing sector, access is further restricted through the requirement of a substantial tenant down payment. The size of these down payments varies by project but generally represents a significant upfront cost. Although the down payment is refunded upon departure—subject to an annual depreciation of 1 percent, meaning 80 percent is repaid after 20 years—it nonetheless creates a significant barrier for lower-income households with limited savings (Kösssl, 2022).

Resulting social composition

The exclusionary effects of these access barriers become evident when examining the social composition of social housing tenants. In both municipal and limited-profit housing, the lowest-income quintile is under-represented, accounting for only 15 per cent and 9 per cent of tenants, respectively. By contrast, the housing sector in which the lowest-income quintile is most strongly represented is the time-limited private rental market, where they constitute approximately 20 per cent of renters (Litschauer & Friesenecker, 2022, Figure 4.2).

A similar pattern is visible with regard to households of non-Austrian descent. In municipal and limited-profit housing, they account for only 14 per cent of tenants, whereas in the private rental sector this share rises to 42 per cent (Litschauer & Friesenecker, 2022, Figure 4.2). This disparity highlights a structural lack of access to social housing for more vulnerable population groups.

According to Wolfgang Amann (own interview), these barriers are partly intentional. They are designed to select stable tenants, as vacant dwellings result in lost rental income for the municipal housing provider. In addition,

Governance Analysis

political pressure—particularly from right-wing opposition parties—has played a role in limiting access to municipal housing for migrants.

Policy response

The Municipality of Vienna has acknowledged that its social housing system, and limited-profit housing in particular, insufficiently serves the lowest-income groups. In response, the city introduced the SMART housing program, which focuses on smaller dwellings with higher levels of public subsidy. These units feature relatively low maximum down payments, and the municipality provides low-interest loans to help lower-income households cover the remaining upfront costs. Since 2022, 50 percent of new limited-profit housing developments are required to fall within the SMART housing category (Wohnfonds Wien, 2022).

Despite these limitations, the focus on middle- and higher-income households within the Viennese social housing system delivers clear affordability and liveability benefits for these groups, as reflected in the city's relatively low average rent of €10.50 per square meter (Deloitte, 2024, pp. 30–31).

Social programs and liveability

Tensions between residents have been identified as a potential threat to the long-term viability of Vienna's municipal housing stock. In response, the city established Wohnpartner, an organization employing approximately 150 staff members dedicated to conflict mediation and community development. Wohnpartner also operates nine neighbourhood centres and organizes social activities aimed at strengthening community cohesion and improving quality of life within municipal housing estates (Wohnpartner – Social Housing, n.d.). According to Amann (own interview), these interventions constitute “a success story” in maintaining social stability within Vienna's large-scale social housing developments.



Governance Analysis

Social goals and allocation Rotterdam

Income limit

Eligibility for social housing in the Netherlands is determined primarily by household income. A policy change enacted in 2011 requires that 90 percent of dwellings allocated by housing associations be assigned to households with an income below €34,085 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2011). An earlier parliamentary study showed that prior to this reform, only 76 percent of social housing allocations went to households within this income bracket (Tweede Kamer der Staten-Generaal, 2010). The same study indicated that at the time, only 43 percent of Dutch households earned less than the proposed income threshold (then €33,000, adjusted to €34,058 in 2011).

EU state aid compliance

This stricter income limit was introduced in order to comply with EU state aid and competition law. Whereas Vienna and Austria more broadly framed their wide target groups for municipal and limited-profit housing as Services of General Economic Interest (SGEI), the Dutch government largely accepted the European Commission's interpretation that social housing should primarily serve low-income households. As a result, access to Dutch social housing was significantly narrowed.

Marja and Lind (2013) analyse the changes resulting from efforts to comply with European Union regulations on state aid in Sweden and the Netherlands. They argue that the reforms implemented in the Dutch system effectively marked the end of the unitary rental market, in which for-profit and non-profit housing providers competed within the same regulatory framework. This development contrasts sharply with the Viennese model, where non-profit and for-profit actors continue to operate within a relatively integrated rental system. Vienna therefore remains closer to the unitary end of the housing market spectrum (Amann et al., 2024).

Marja and Lind further note that middle-income households are among the primary losers of the Dutch reforms. Following the tightening of eligibility criteria, they are excluded from social housing, while home-ownership or market-rate rental options remain financially inaccessible.

In addition, the authors highlight the inherent tension created by governance reforms that require non-profit housing providers to operate more in line with market principles, while simultaneously expecting them to fulfil a social mission focused on vulnerable households. They conclude with the observation that “providing housing to the lowest-income groups will never be a profitable market activity.” This insight is reflected in the findings of the earlier financial analysis chapter of this thesis, which demonstrate the structural financial difficulty encounter in the construction of new social housing.

Results in Rotterdam

The shift in policy had major implications for the municipality of Rotterdam. At the time, 56% of the housing stock within Rotterdam consisted of low-cost housing. Due to the change in policy, the socially managed portion of this housing was now only accessible to low-income households. The municipal Woonvisie of that time states that this has a “suction effect.” The main goals noted in the then-active Woonvisie were the attraction of households with a modal or higher income, social climbers, and “young potentials” (Interview, policy expert, Municipality of Rotterdam).

When we look at the spatial situation in the case-study neighbourhoods in the next chapter, we can clearly see the results of these policy priorities. In the aftermath of 2011, social housing in both neighbourhoods was demolished and replaced with row houses. This resulted in less dense neighbourhoods in terms of dwellings.

Policy has more recently shifted, with the current housing vision aiming to maintain the absolute number of social housing units. Although this will still reduce the relative share of social housing due to an overall increase in the housing stock (Rotterdamse Woonvisie, 2023), the diversification strategy

Governance Analysis

now stipulates that approximately 35% of dwellings within neighbourhoods should consist of social housing (personal communication, policy employee of the municipality of Rotterdam).

Social housing agencies, which have a statutory mission to provide affordable housing to financially less well-off households, therefore often seek to maximise the share of social housing they are permitted to develop in discussions with the municipal spatial planning department. As a result, they do not fully utilise the 10% of units they are allowed to rent outside the social segment when developing new projects, even though these units are financially less loss-making (personal communication, policy employee of the municipality of Rotterdam).

Allocation and priority

In Rotterdam, approximately 60 percent of the city's inhabitants are eligible for social housing based on income criteria (Keete, 2024). As in many Dutch municipalities, social housing is allocated primarily on the basis of waiting time, through a regional waiting list shared with eleven other municipalities in the Rotterdam region. Priority may be granted through a formal declaration of urgency. Eligibility for urgency status includes, among other criteria, the inability to afford the current dwelling due to income loss or divorce while raising children, unsafe living conditions resulting from domestic abuse, or the need to relocate closer to a family member requiring care (Stichting Urgentiebepaling Woningzoekenden Rijnmond, n.d.).

In addition, immigrants who have been granted refugee status receive priority access to social housing. Nationwide, 20 percent of social housing allocated to starters—households not moving from another social housing dwelling—was assigned to households containing one or more people with refugee status. Furthermore, 2.2 percent of the total social housing stock is inhabited by households with one or more status holders. This share increases to 7.8 percent when households containing refugees who have since obtained Dutch citizenship are included (Centraal Bureau voor de Statistiek, 2025b).

Resulting social composition

The outcome of this allocation system is a strong focus on lower-income and socially vulnerable groups. As early as 2009, 40 percent of social housing residents belonged to the lowest 20 percent of income households in the Netherlands (Elsinga & Wassenberg, 2014, Table 2.4). This is up from 22 percent in 1981 (Elsinga et al., 2014) (Given the tightening of income limits following the 2011 policy reform, this proportion is likely to have increased further. This suggests that, compared to the Viennese model, the Dutch social housing system is more effective at serving the poorest segments of society.

It is noteworthy that the housing market in Rotterdam is, on average, more expensive than its Viennese counterpart, with an average rent of €19.20 per square meter in Rotterdam compared to €10.50 in Vienna (Deloitte, 2024, pp. 30–31). One possible explanation is that social housing in the Netherlands, which is strongly targeted at lower-income groups, does not exert the same price-dampening effect on the private rental sector as has been observed in Vienna and Austria more broadly.



Source: Photo by author

Governance Analysis

Conclusions

It is clear that the Dutch and Viennese models both have distinct strengths and weaknesses. The Viennese model is characterized by clear financial structures aimed at making new housing construction financially viable. In Vienna, the main beneficiaries of the social housing system appear to be lower- and higher-middle-income households, who constitute the largest share of municipal and LPHA tenants respectively. The system seems successful in keeping rent levels for these groups relatively low, even when they reside in the private rental sector. The comparatively low average rent levels become particularly evident when compared to those in other large European cities.

However, lower-income households are not effectively served by either municipal housing or LPHA providers and instead remain largely dependent on the private rental market.

The focus on middle- and even upper-middle-income households of Austrian descent within Vienna's housing system may help explain its high level of political support, as these groups hold significant political influence.

The Dutch model, by contrast, lacks cohesion between its policy objectives and the financial structures used to finance their implementation. This misalignment has constrained new housing construction, which consistently falls short of stated targets.

At the same time, the Dutch model does effectively cater to lower-income and more vulnerable groups in society. The absence of direct benefits for a large share of wealthier Dutch households may help explain the periodically limited political and public support for social housing.

Whether a social housing model that combines the strengths of the Viennese and Dutch systems is possible is, in light of current housing shortages and the ambitious plans of the national government, more relevant than

ever. However, this question lies beyond the scope of this thesis, and no definitive answer can be provided here.

Governance Analysis

Governance structures

	Rotterdam	Vienna
Type of social housing system	Independent non-profit housing associations	Municipal Housing Associations and Limited-Profit Housing Associations
Size of association	The largest associations own between 40,000 and 60,000 dwellings.	Municipal Housing Associations own 200,000 dwellings.
Practical implications	The independent housing associations are less susceptible to sudden shifts in the political climate.	The municipal housing agency is very dependent on the political climate. As the Social Democratic Party has been the largest party in city governments since the Second World War, this has not led to instability.

Governance Analysis

Allocation

	Rotterdam	Vienna
Basic system	Based on time on waiting list. Waiting list available for all legal residents below income threshold.	Based on waiting list. Waiting list only applicable for legal Viennese residents living for more than two years at the same address.
Priority	Priority for those in need, more limited criteria, quicker access.	Priority for those in need (elderly, starters, overcrowding). Main criteria still apply.
Practical implications	The current social housing system predominantly serves lower-income households, whereas higher-income groups are comparatively less represented. There was, therefore, a need to diversify by changing ownership structures and typologies.	Lowest income group under-represented in social housing. Lower-middle income groups over-represented. For diversification, typology changes and ownership changes are not needed.

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Financial structures

	Rotterdam	Vienna
Subsidies	No direct subsidies for housing associations. Only subsidies for low-income renters managed by the national government.	Object subsidies are provided by the municipality in the form of low-cost land, low-interest loans, and grants.
New Construction Financing	New construction is financed through loans backed by WSW, ultimately backed by the state, with an interest rate of around 3 percent (WSW, 2024).	New construction of municipal apartments is financed by the municipal government. New construction of Limited-Profit Housing (LPH) is financed through public loans, bank loans, LPHA equity, and prospective occupant equity.
New construction viability	New construction of social housing has a negative return on investment	New construction of LPHA's is mandated to recover expenses.
Land buying program	Housing associations can only buy land they plan to build in the coming 5 years.	Long-term land acquisition is carried out through the Wien-Wohnfonds. Land is sold for €200 per square metre of usable space, which is well below market rates.

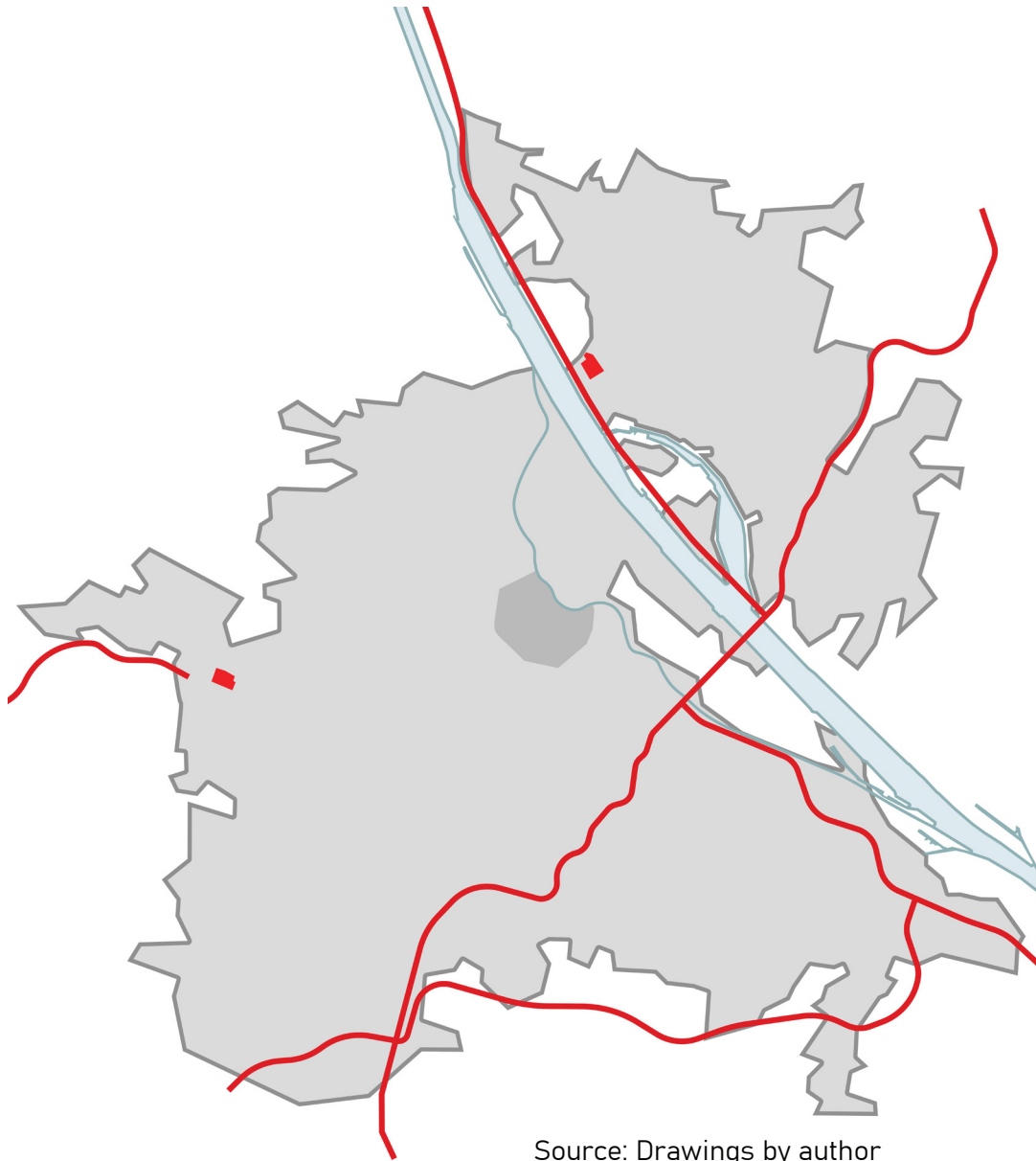
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Spatial Analysis

In this chapter, the spatial design of the selected neighbourhoods in Rotterdam and Vienna is explored across multiple scales. We begin by situating each neighbourhood within the wider urban context and then gradually zoom in to the street level, supported by photographs collected during field trips.

Spatial Analysis: City scale

Highways Vienna



Source: Drawings by author

Location of the selected neighbourhoods

Both neighbourhoods in Vienna have easy access to highways, which facilitates travel by car.

Of note is the lack of a circular highway in Vienna. Although there are urban highways, there is no circular route around or through the city. Instead, the city relies on large arterial roads. This results in a high volume of cars at street level in certain areas of the city. On the other hand, the negative effects of highways through the city are less pronounced, as these large arterial roads leave the urban fabric relatively intact and are crossable on foot.

The lack of a circular arterial road can partly be explained by the fact that Vienna has expanded relatively little since the large-scale adoption of the automobile (Winiwarter et al., 2013). It was thus easier to adapt the fabric of large avenues to increased traffic, rather than demolish large amounts of built-up areas for new highways.

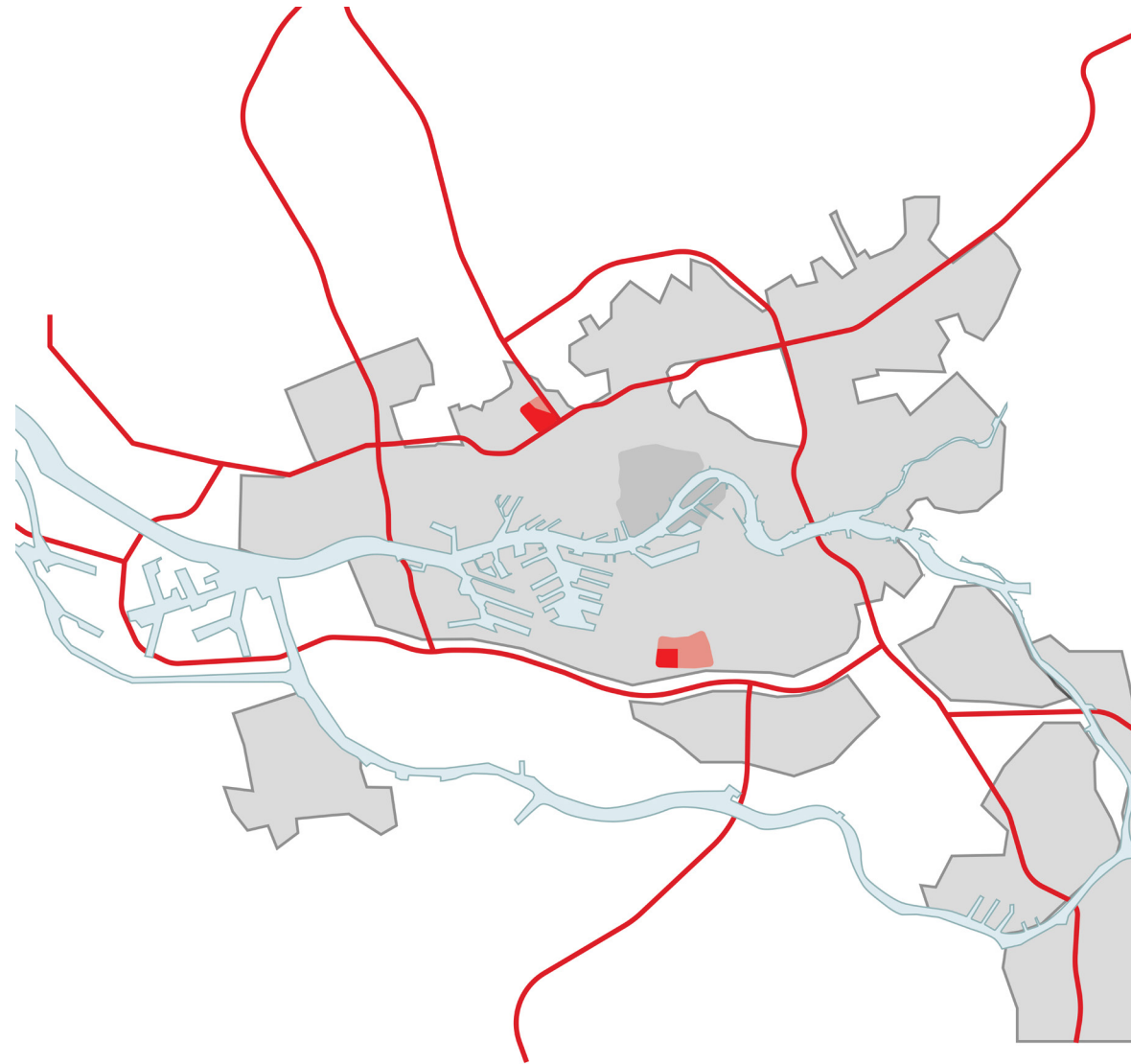
Spatial Analysis: City scale

Location of the selected neighbourhoods

Both neighbourhoods in Rotterdam are located next to highways, with access ramps within five minutes' drive from the neighbourhoods. This facilitates high car mobility.

Of note is the large number of highways. Central to this interconnected network is a ring road. These highways could be built relatively easily, as the areas they run through were largely undeveloped at the time of construction.

Hihways Rotterdam



Source: Drawings by author

Spatial Analysis: City scale

Public transit map Vienna



Location of the selected neighbourhoods

Here we can see the high-capacity transit arteries in the city of Vienna. Hugo-Breitner-Hof is situated alongside the heavy rail corridor towards Linz. It is also served by the subway, with it being close to the terminal station of Hütteldorf.

In contrast, Siedlung Jedlesee is only accessible by heavy rail, and even then to a limited extent, as the closest station, Floridsdorf, is over 20 minutes away on foot.

Source: Drawings by author

— Railway
— Metro

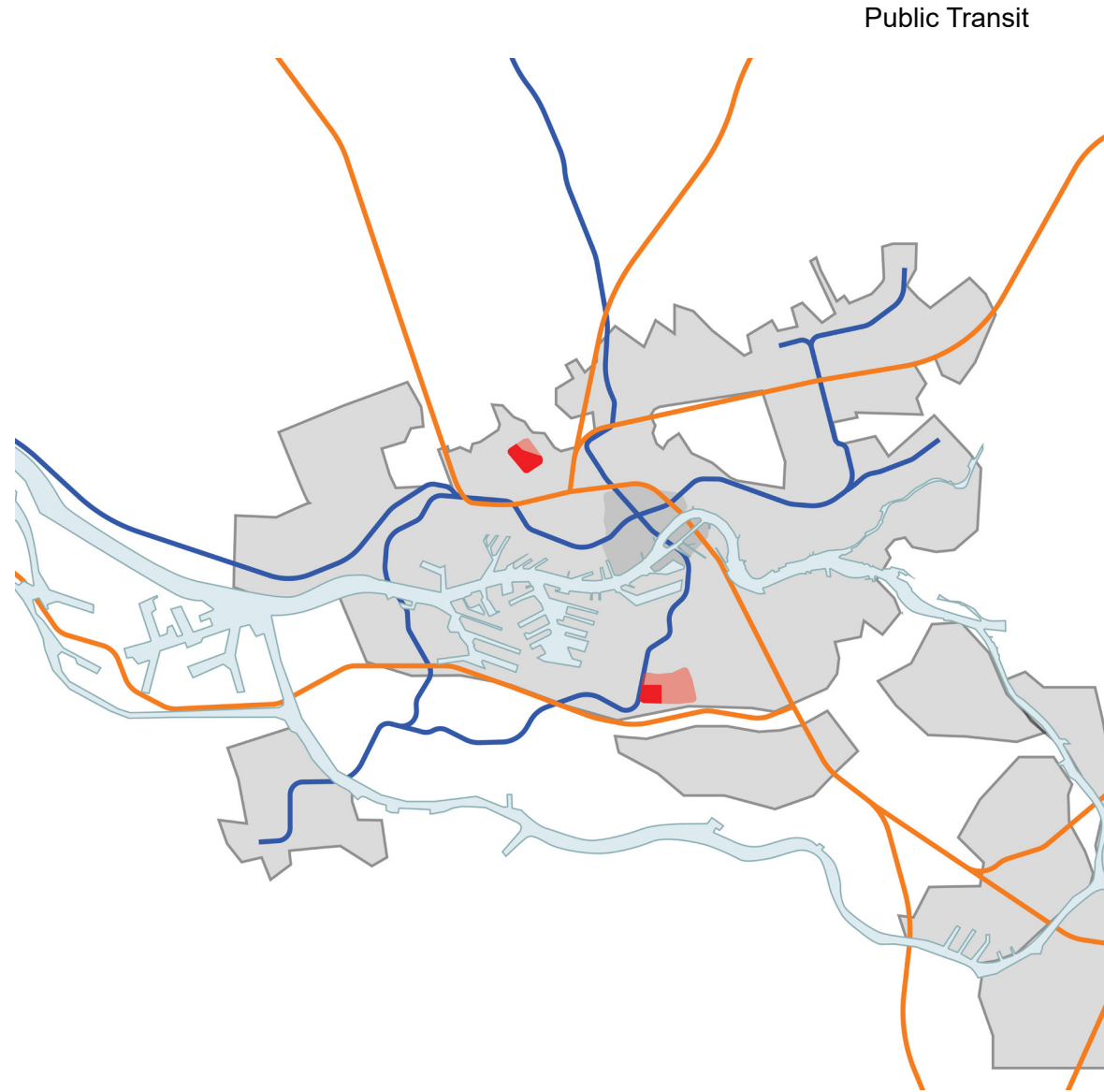
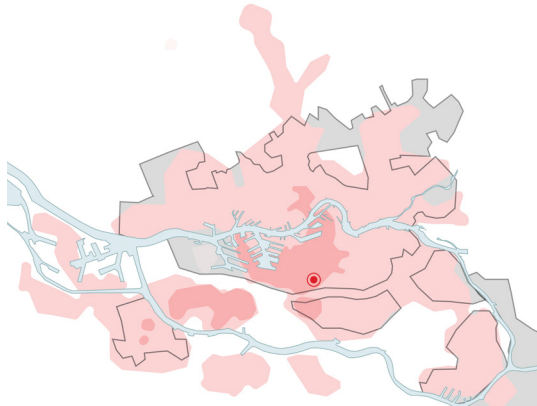
Spatial Analysis: City scale

Location of the selected neighbourhoods

Zuidwijk is located close to a freight rail line and a metro line. The lack of a heavy rail connection is mitigated by the frequency of the metro line, which offers fast, direct connections to the city centre and the main train station every 7 minutes, even during off-peak hours.

Kleinpolder is, however, less well served by high-capacity transit. There is no metro stop, and the closest railway station is Rotterdam Centraal, which is 14 minutes away by bike and 45 minutes away on foot.

30 and 60 Minute public transit reach

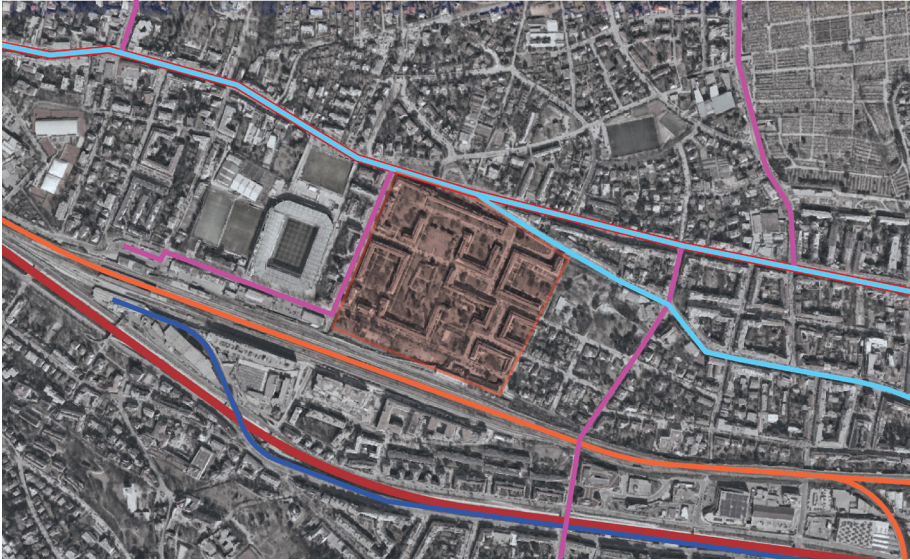


— Railway
— Metro

Source: Drawings by author

Spatial Analysis: District scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedlesee Straße 79-95



Source: Drawings by author

Infrastructure

When we zoom in, we can again see that Hugo-Breitner-Hof is well connected by public transit, with trams, buses, and rail connections running alongside it. Siedlung Jedlesee has only bus connections. The difference in quality of service is also reflected in the levels of satisfaction with public transit in the neighbourhoods.

By car, however, Siedlung Jedlesee's location near a major highway interchange offers better accessibility than Hugo-Breitner-Hof has. Interestingly though, this did not result in significantly higher car ownership levels, with Siedlung Jedlesee having 45 cars per 100 inhabitants versus the 40 of Hugo-Breitner-Hof.

- Highway
- Main road
- Bus
- Tram
- Metro
- Rail

Spatial Analysis: District scale

Infrastructure

On closer examination, we see that the local transit in Zuidwijk is quite good, with trams, buses, and a metro line going through or around it. Kleinpolder, in contrast, only has one bus route going through it.

By car, however, Kleinpolder has better accessibility due to its close proximity to a large highway interchange.

Again, we can see that the difference in the quality of infrastructure is also reflected in the satisfaction with public transit and, in this case, also car ownership, with Kleinpolder having 65 cars per 100 inhabitants, while Zuidwijk only has 40 cars per 100 inhabitants.



Kleinpolder

Source: Drawings by author

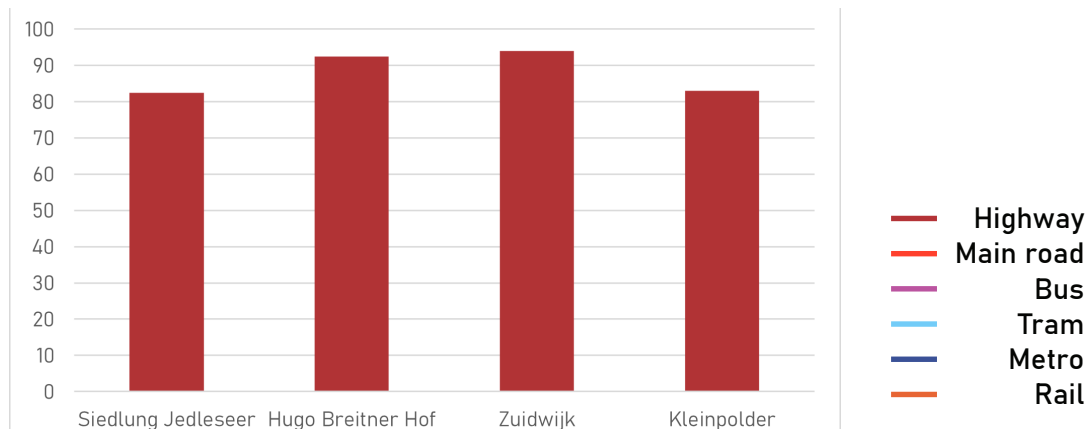


Veldenbuurt Zuidwijk

Source: Drawings by author

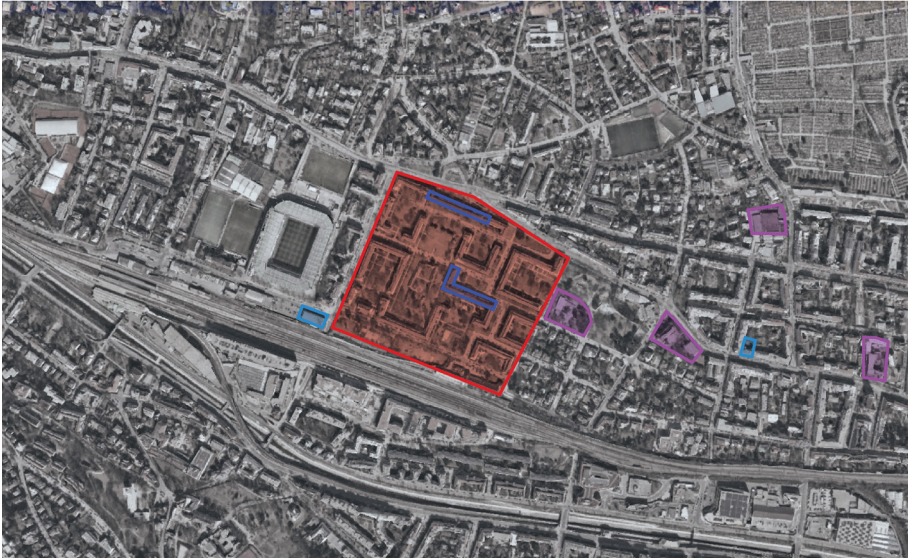
Satisfaction with connection to public transit.

Source: Troger et al. 2012, Wijkprofiel 2025.



Spatial Analysis: District scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedlesee Straße 79-95







Source: Drawings by author

Services

When we look at services in Vienna, we can see that the facilities within the neighbourhood are relatively sparse. In the case of the Hugo-Breitner-Hof, we see two locations with shops: one on the edge along a main road and one in the middle of the neighbourhood along a plaza. In the case of the Siedlung Jedlesee Strasse, we do not see any shops within the neighbourhood.

However, when we look at the surroundings, the story is very different. In both cases, the social housing neighbourhoods are situated in earlier city fabric. This fabric is more diverse, with many education and shopping facilities. For both neighbourhoods, this means that a trip to the closest shop or school is less than 10 minutes.

Although both neighbourhoods have access to shopping and school facilities within walking distance, only the Hugo-Breitner-Hof has shops integrated within it, and thus benefits from the increased safety and liveliness that those bring.

-  Study area
-  Mixed Use
-  Shopping
-  Education

Spatial Analysis: District scale

Kleinpolder

Services

When we look at the neighbourhoods in Rotterdam, we see two different stories:

Kleinpolder has shops and education facilities, mainly along its north-eastern edge. There are also many shops close by along the main street between Rotterdam and the old centre of Overschie. This forms the local centre of the larger Overschie neighbourhood, with mixed-use buildings, a restaurant and supermarkets.

The situation in the Veldenbuurt is very different. Here there are no shops within the neighbourhood. There is, however, a main street with shops on one side of it running through the larger neighbourhood of Zuidwijk. There are also two clusters of supermarkets, one of which is within 5 minutes of walking from the Veldenbuurt, and many educational facilities in Zuidwijk.

Both cases in Rotterdam have access to the daily necessities within a walkable distance. Only Kleinpolder has shops within the neighbourhood, and thus profits from the safety and liveliness those bring.



Source: Drawings by author

Veldenbuurt Zuidwijk

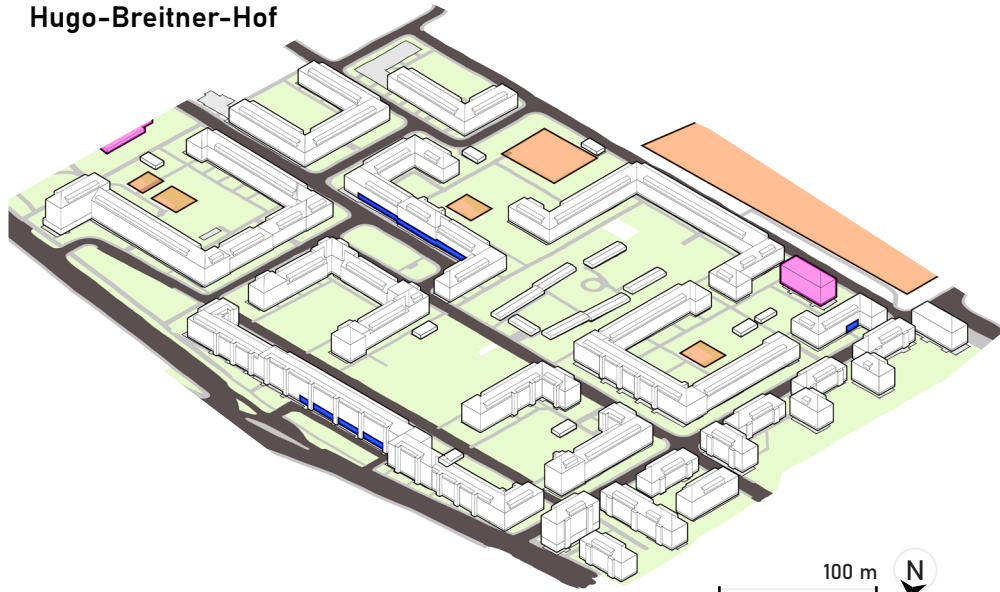


Source: Drawings by author

- Study area
- Mixed Use
- Shopping
- Education

Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

- Healthcare
- Shops
- Playground
- Sports centre
- Education
- Community centre



Services Vienna

At Hugo-Breitner-Hof, we can see a strong integration of youth facilities and shopping facilities. Playgrounds are scattered throughout the neighbourhood and are well integrated into the built environment, with smaller playgrounds located between the housing blocks, providing social control, and larger playgrounds for older children or family activities situated around the edge of the estate. There are also daycare centres for the youngest children.

Shops are located along the main road at the edge of the estate and at a central, plaza-like space. The buildings housing these shops stand out by being taller or by their architectural detailing. This creates focal points within the neighbourhood.

One facility that has closed down is a senior/disabled co-dependent living facility located in the middle of the central park. Here, a smaller courtyard surrounded by single-storey buildings was created. This courtyard was intended to stimulate interaction between the inhabitants and thereby encourage co-dependence. The last inhabitant moved out during the most recent renovation in 2007 (Abiral, 2022). The buildings were closed because, due to their low density, they were deemed not worth the investment required for renovation. There are plans to build a multi-storey building with a similar function on the site, but these plans are currently stalled due to permitting requirements (Amann, personal communication).

Playground in Hugo-Breitner-Hof

Source: Photo by author

Spatial Analysis: Neighbourhood scale

Kleinpolder

Services Rotterdam

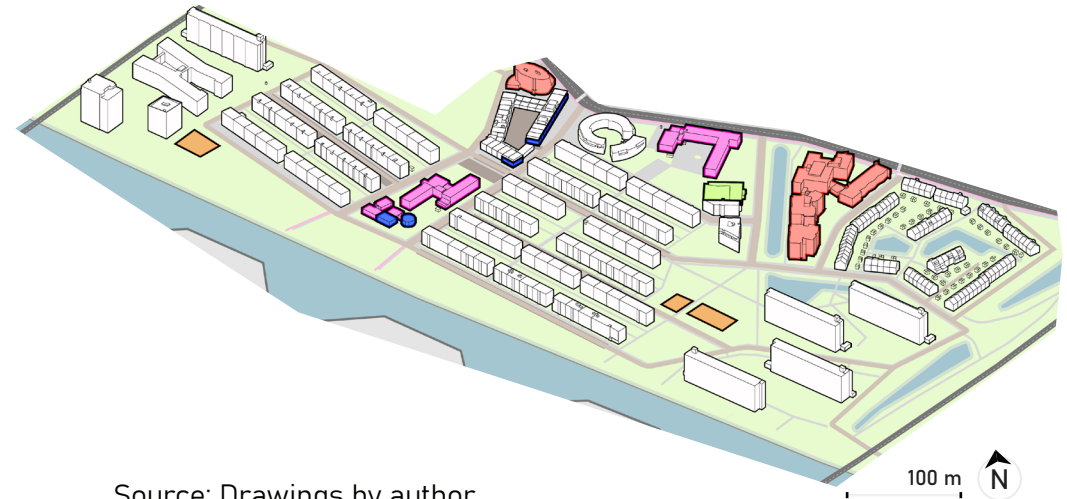
The social housing estate in Kleinpolder has a lot of facilities integrated within it. Playgrounds are located in the large and open green spaces. This offers a lot of space for the children to play, but has the disadvantage that there is less social control from the surrounding buildings.

There are two educational centres in the neighbourhood: one high school and one for vocational education. The school for vocational education is especially interesting, as it has a bike shop and a café run by its students that serves the neighbourhood.

Other shops and cafés are located at the northern edge of the neighbourhood. Among other shops, a pet shop, a bakery, and a barber can be found here.

There are two health-related services located within the neighbourhood: one assisted living home for the elderly and one local health centre with a general practitioner.

Rounding off the facilities, we find a sports facility in the form of a swimming pool in the centre of the neighbourhood.



Source: Drawings by author

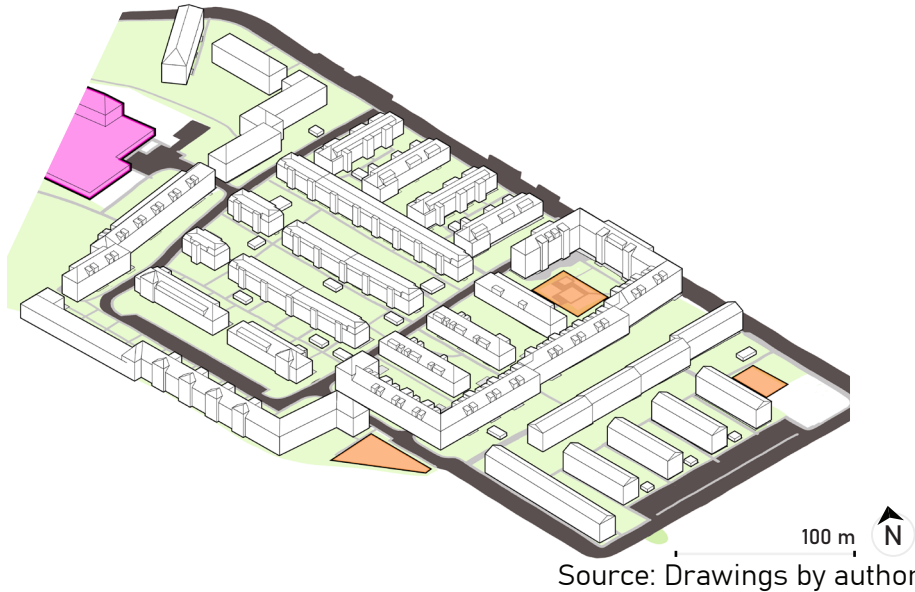


Playground in Kleinpolder
Source: Photo by author

- Healthcare
- Shops
- Playground
- Sports centre
- Education
- Community centre

Spatial Analysis: Neighbourhood scale

Siedlung Jedlesee Straße 79-95



- Healthcare
- Shops
- Playground
- Sports centre
- Education
- Community centre

Services Vienna

In contrast to the Hugo Breitnerhof, Siedlung Jedlesee has less integrated services within the neighbourhood. There are playgrounds in the eastern part of the housing project, one of which is especially well integrated, being nestled in a small plaza with buildings surrounding all sides, offering a high degree of social control.

Within ten years of the completion of the housing estate, a large high school and a childcare centre were built on the western side of the neighbourhood.

Apart from this, there are no facilities in the neighbourhood. In terms of convenience for the inhabitants, this is not a problem, because there are shops on the main street just outside the neighbourhood. However, it does leave the neighbourhood very mono-functional, resulting in challenges like empty streets during working hours — something Jane Jacobs discusses in *The Death and Life of Great American Cities*.

Playground in Siedlung Jedlesee
Source: Photo by author



Spatial Analysis: Neighbourhood scale

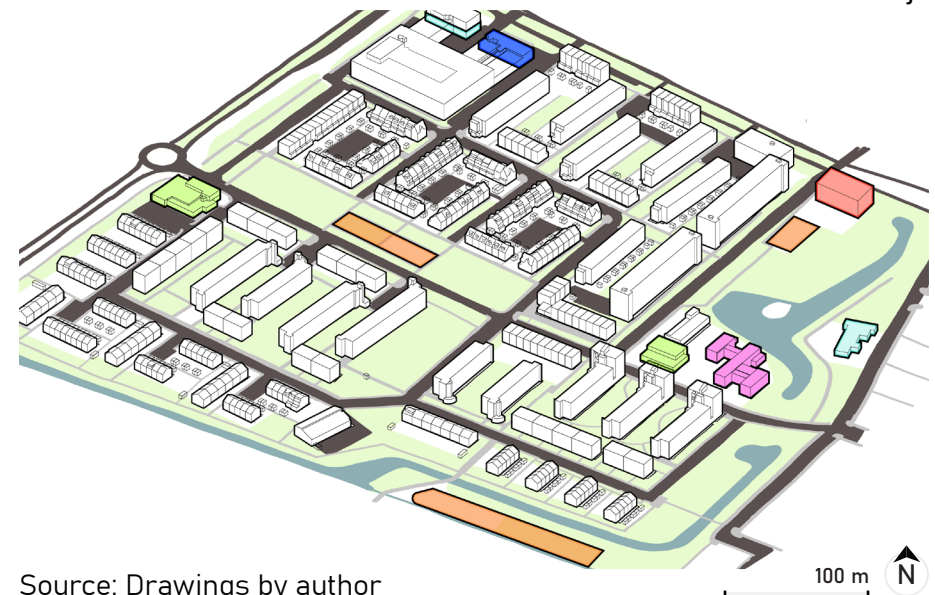
Services Rotterdam

A large amount of services are integrated in the neighbourhood. Smaller playgrounds are scattered throughout, with larger ones on the edge of the housing estate. The larger playgrounds are great for older kids or family trips, while the smaller playgrounds, integrated into the urban fabric, can be great places for children to play independently of their parents. There is also a high school on the eastern side of the neighbourhood.

There are two community centres located within the neighbourhood. One is targeted at the general public and includes a local library, and the other is targeted at young mothers, offering a place for mothers and children to connect.

In addition to this, there are two sports facilities — one gym and one boxing association. These sports facilities and community centres offer plenty of opportunities for connection for the inhabitants of the neighbourhood.

Veldenbuurt Zuidwijk



Source: Drawings by author

- Healthcare
- Shops
- Playground
- Sports centre
- Education
- Community centre

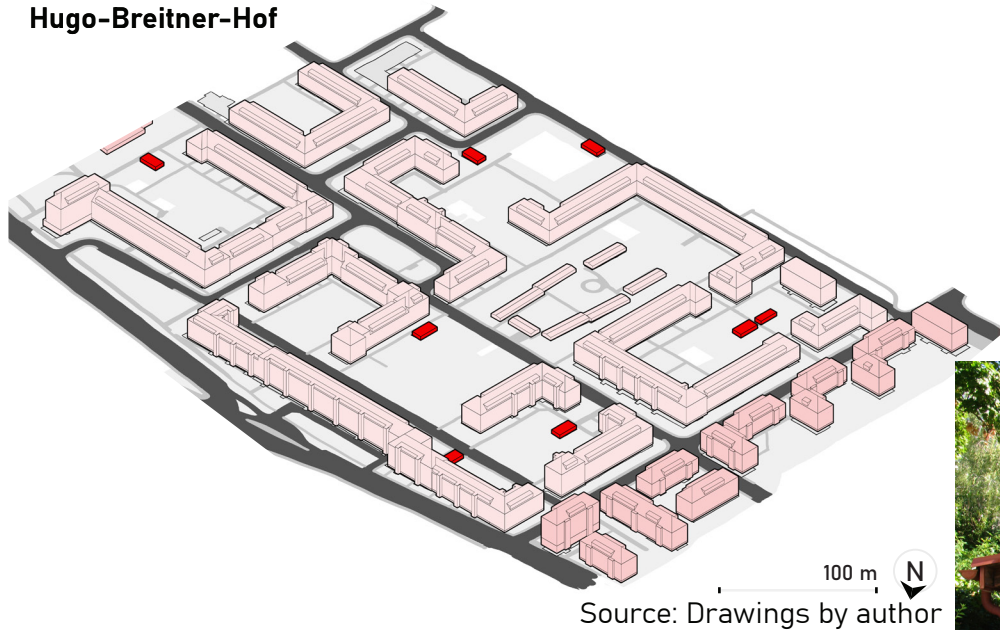


Community centre in Kleinpolder

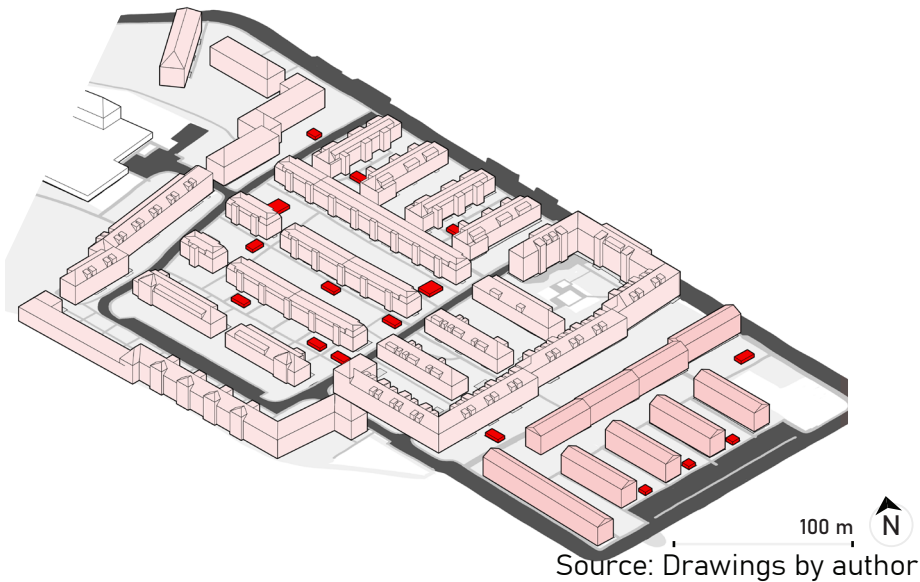
Source: Photo by author

Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Siedlung Jedlesee Straße 79-95

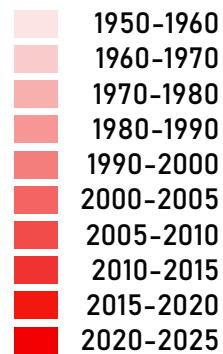


Year of construction Vienna

Both neighbourhoods in Vienna have seen very little new construction since their original construction dates. Only small utility buildings for waste collection and small bicycle sheds have been added throughout the neighbourhoods. In the Hugo-Breitner-Hof, a new primary school was constructed at the edge of the neighbourhood. This rigidity is the result of the municipality's no-demolition and no-selling policy.



Left: New garbage shed in Hugo-Breitner Hof
Below: New garbage shed in Siedlung Jedlesee
Source: Photo by author



Spatial Analysis: Neighbourhood scale

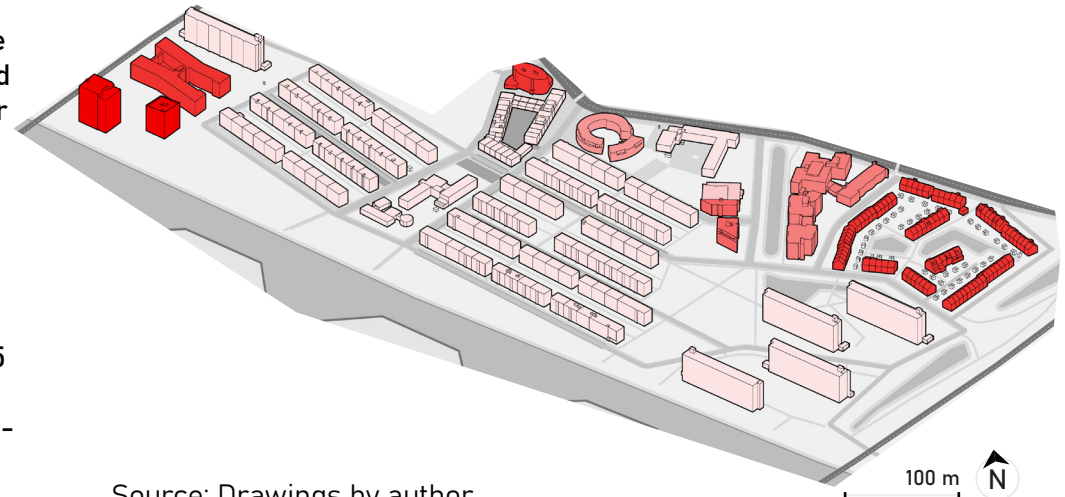
Kleinpolder

Year of construction Rotterdam

Kleinpolder and the Veldenbuurt in Zuidwijk underwent significant redevelopment between 2010 and 2015. In both neighbourhoods, social housing flats were demolished and replaced with lower-density single-family homes. This resulted in a reduction of both the total number of dwellings and the overall usable floor space.

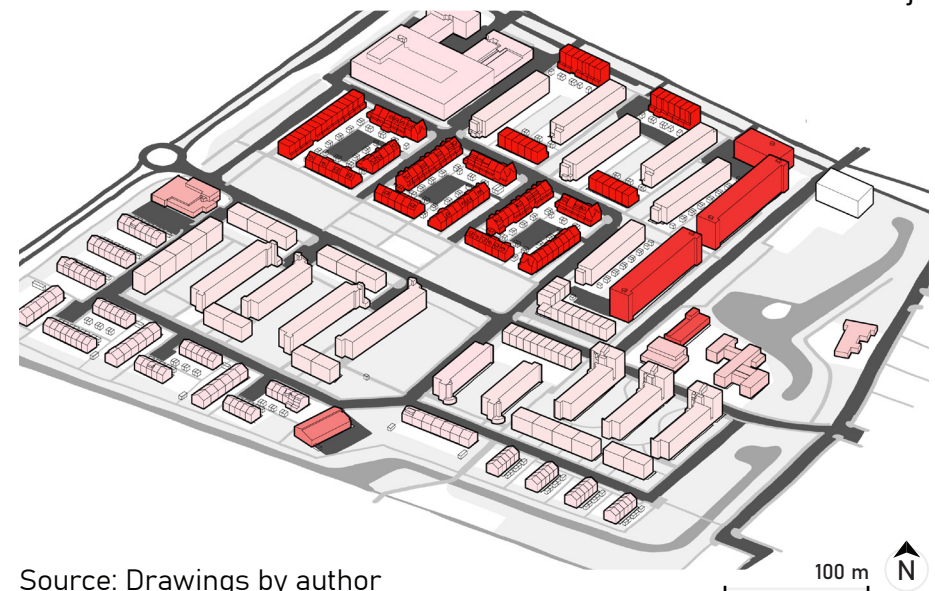
As discussed in the analysis chapter, these projects formed part of broader municipal policy, partly influenced by the tightening of national eligibility criteria for social housing in 2011 (personal communication with policy employee, Municipality of Rotterdam). From that year onward, housing associations were required to allocate 90% of their stock to households earning less than €34,085 annually (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2011), in line with European Union state-aid regulations (Tweede Kamer der Staten-Generaal, 2010). The narrowing of the target group contributed to redevelopment strategies aimed at social diversification, often through demolition and tenure restructuring.

In addition to demolition projects, several qualitative improvements to public space were introduced, particularly in Kleinpolder, where a health centre and an assisted living facility for the elderly were constructed. These additions enhanced local service provision, even as the overall housing density declined.



Source: Drawings by author

Veldenbuurt Zuidwijk



Source: Drawings by author



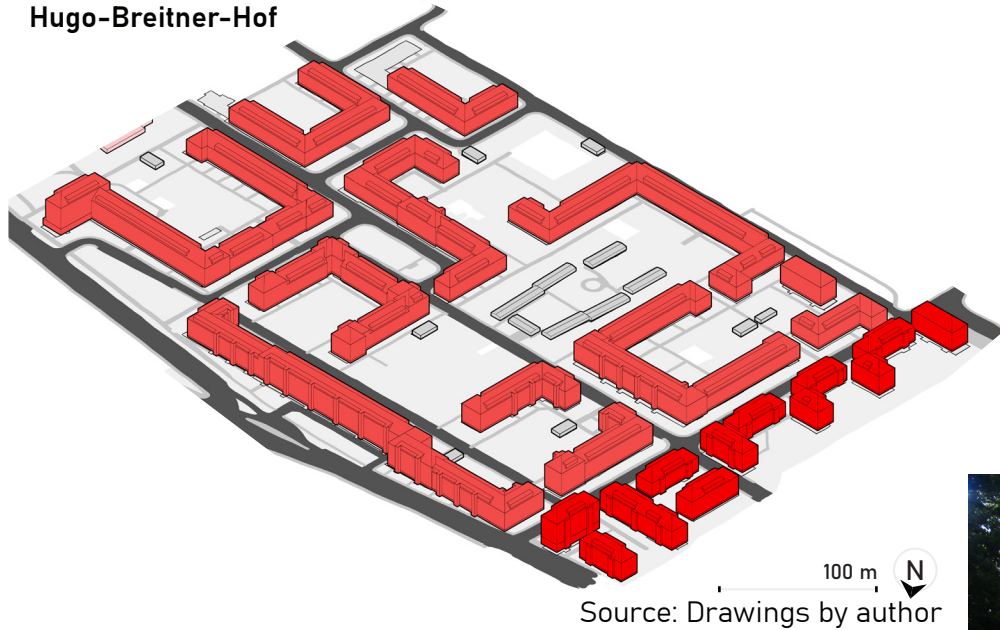
New construction in Zuidwijk.

Source: Photo by author

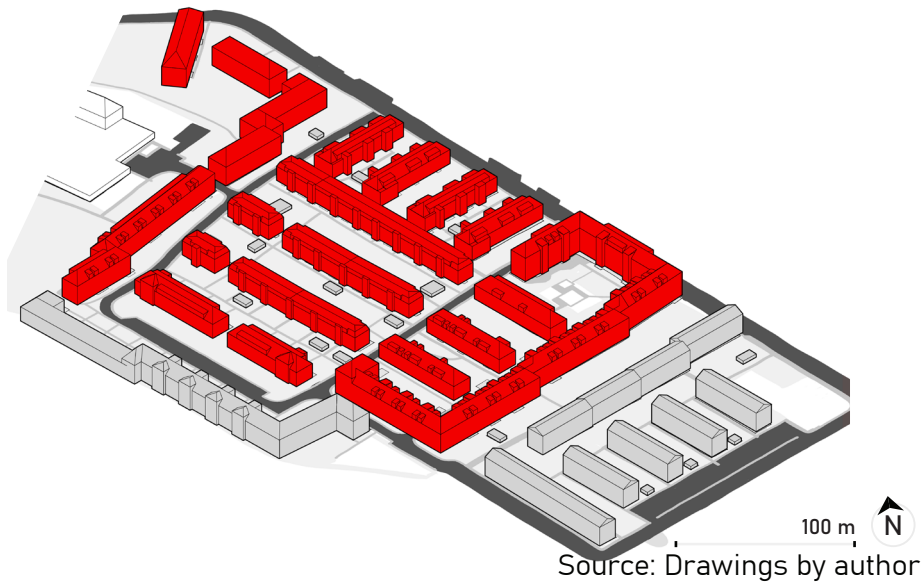
- 1950-1960
- 1960-1970
- 1970-1980
- 1980-1990
- 1990-2000
- 2000-2005
- 2005-2010
- 2010-2015
- 2015-2020
- 2020-2025

Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Siedlung Jedleseestraße 79-95



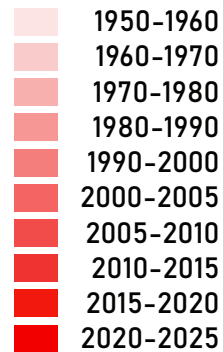
Major reconstruction Vienna

Both neighbourhoods analysed in Vienna have undergone extensive renovation and reconstruction. These interventions focused on increasing housing capacity and improving accessibility for residents with reduced mobility. Additional dwellings were created by converting and extending the gabled roofs, while elevator shafts were added to improve vertical access.

Importantly, these additions were carefully integrated into the architectural composition of the buildings. The extra floor was incorporated within the existing roof structure, and the newly added elevator shafts introduced a rhythmic articulation to the façades.



Left: New attic apartments and elevator shafts in Hugo-Breitner-Hof.
Below: New attic apartments and elevator shafts in Siedlung Jedleseestraße.
Source: Photos by author.



Spatial Analysis: Neighbourhood scale

Kleinpolder

Major reconstruction Rotterdam

In Kleinpolder, only one part of the neighbourhood has undergone major renovations. These renovations altered the façades of the buildings, increased the amount of available outdoor space for apartments, and diversified the types of apartments offered. Apartments were combined to create more space for families, and some units were adapted for assisted living, in cooperation with a local healthcare provider (Woonstad Rotterdam, 2021; Natuurlijk in Over-schie, 2021).

In addition to this, space was made available for a community centre. It is clear that the focus of this project was on diversifying apartment types and improving the quality of the building exteriors. No additional floors were added to increase the availability of social housing.

In Zuidwijk, five apartment buildings were thoroughly renovated. The main intervention was the addition of a front door and a porch opening onto the street for the ground-floor

Below: Renovation in Kleinpolder.

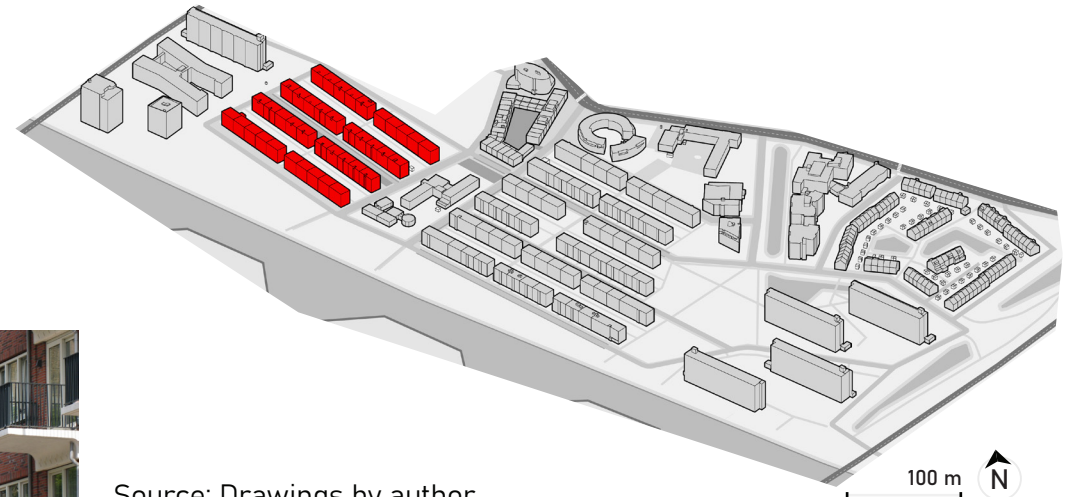
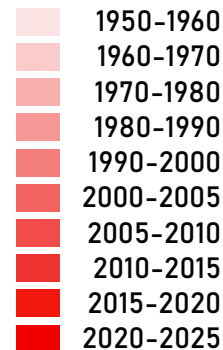
Source: Photo by author.



apartments. This was done to encourage contact between residents and thereby improve social cohesion in the neighbourhood (Zijdekwartier Architecten, 2011).

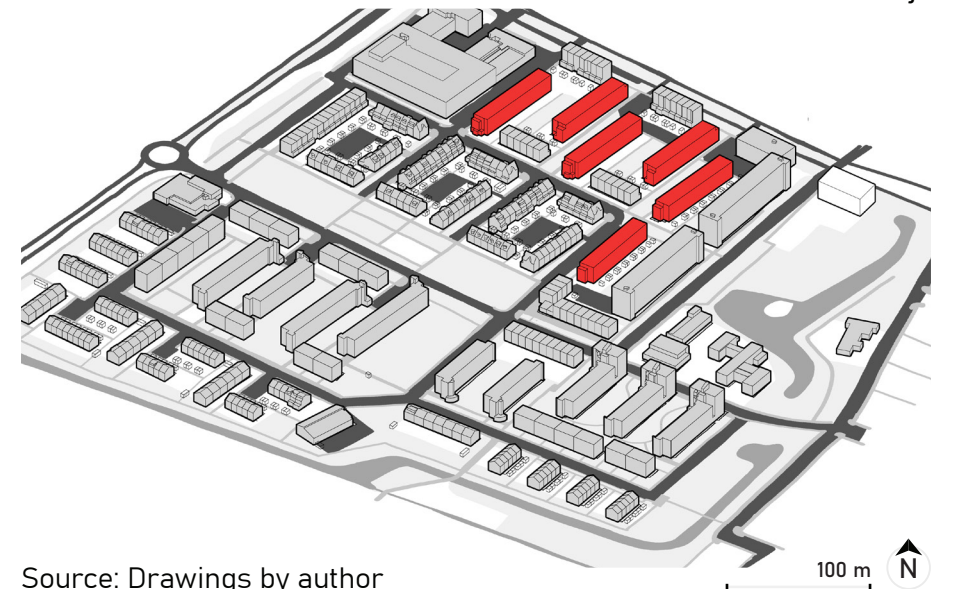
Left: New porch access to apartments in Zuidwijk.

Source: Photo by author.



Source: Drawings by author

Veldenbuurt Zuidwijk

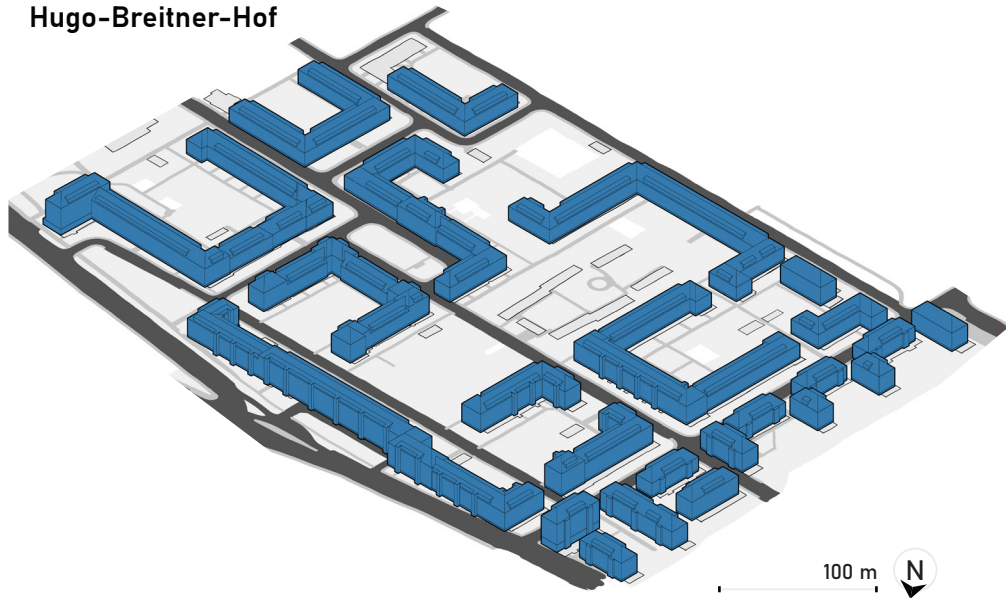


Source: Drawings by author



Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof

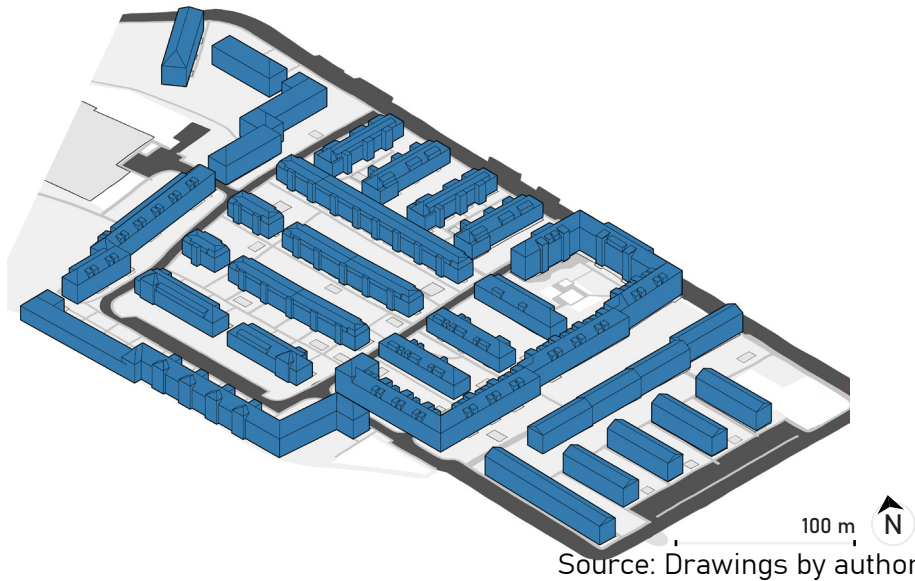


Source: Drawings by author

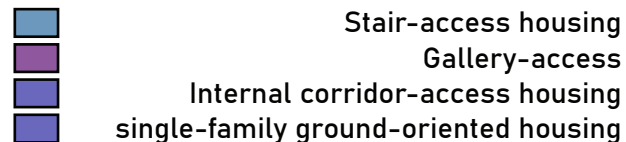
Typology Vienna

In Vienna, in both neighbourhoods all buildings are stair-access housing. There are no buildings with other typologies. This was already the case during the initial construction (except for the now closed elderly co-living apartments in the centre of the Hugo Breitnerhof) and no diversification has taken place since. As described in the governance chapter, a very large part of the Viennese population is eligible for municipal social housing, so in contrast with the Dutch case, no diversification of inhabitants through diversification of typologies was needed.

Siedlung Jedleseestraße 79-95



Source: Drawings by author

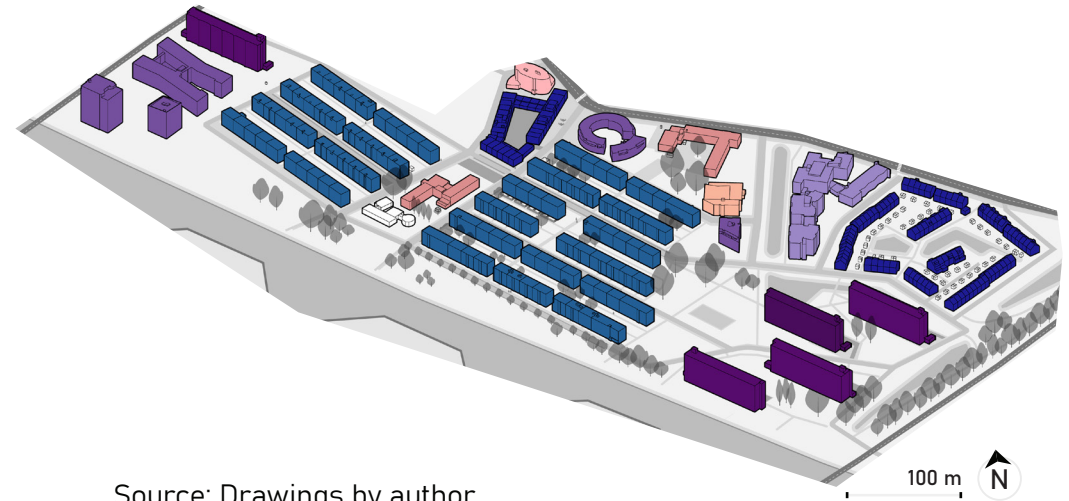


Spatial Analysis: Neighbourhood scale

Typology Rotterdam

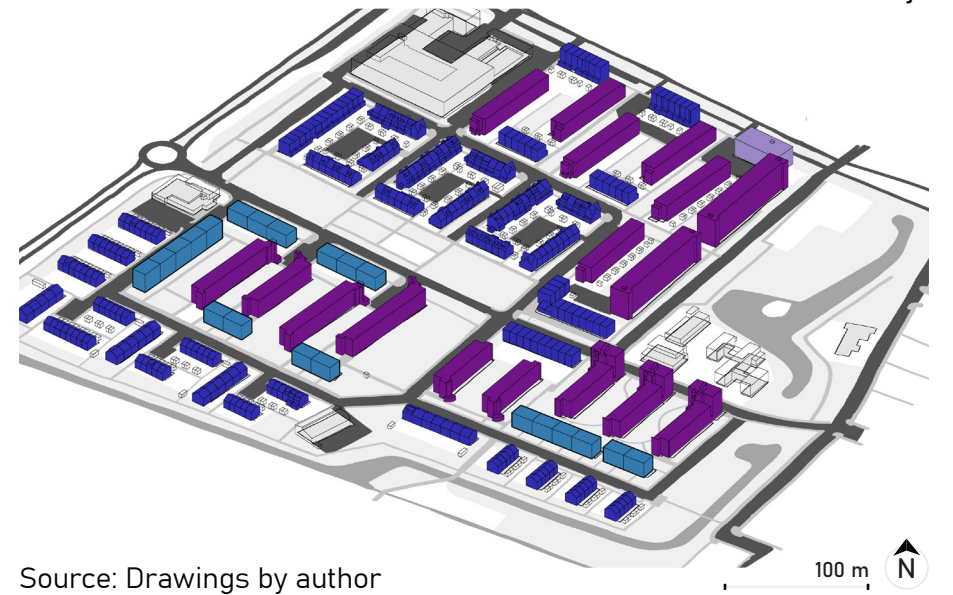
The neighbourhoods in Rotterdam were already more diverse in terms of typologies: Kleinpolder and the Veldenbuurt both contain stair-access housing and gallery-access apartment buildings since their initial construction. In addition, Kleinpolder also contains single-family ground-oriented housing along its edge. During renovations, the typologies became even more diverse, with internal corridor-access housing and additional ground-oriented housing being added at the expense of stair-access housing and gallery-access apartment buildings.

Kleinpolder



Source: Drawings by author

Veldenbuurt Zuidwijk



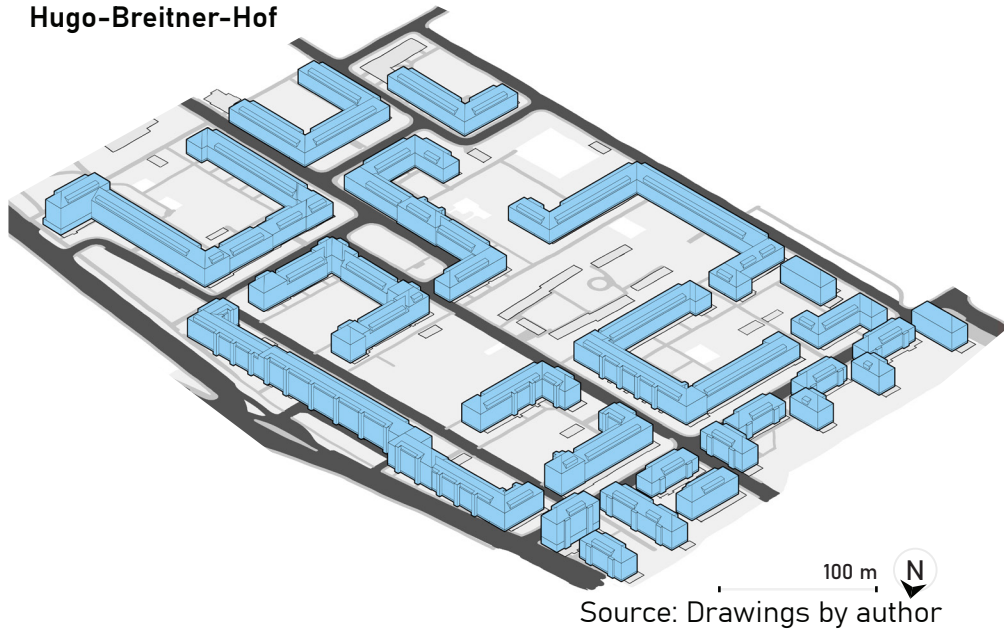
Source: Drawings by author

- Stair-access housing
- Gallery-access
- Internal corridor-access housing
- single-family ground-oriented housing



Spatial Analysis: Neighbourhood scale

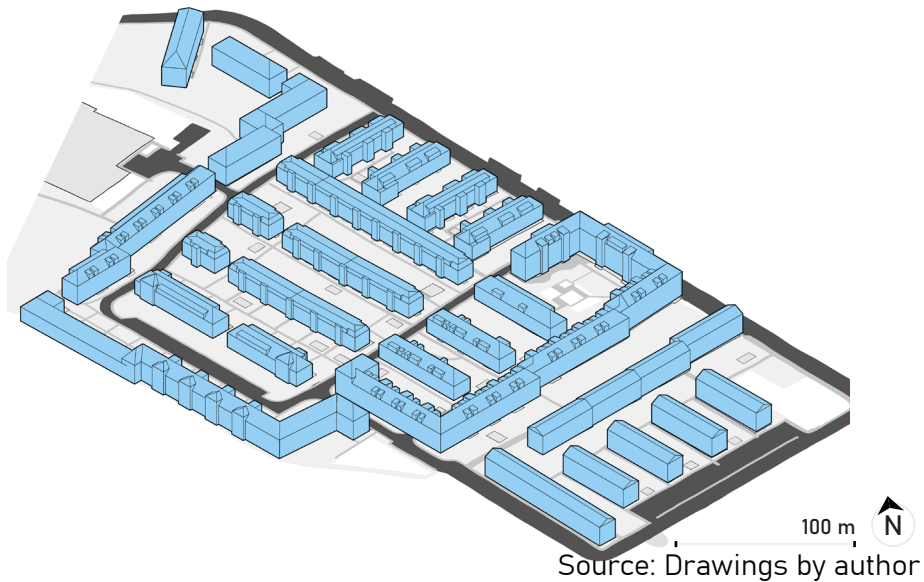
Hugo-Breitner-Hof







Ownership Vienna

All buildings in the two analysed neighbourhoods in Vienna are owned by the municipality through its social housing agency. This was the case during construction and has remained the same, as no demolition, rebuilding, or selling of housing stock has taken place. The centralised ownership of the buildings may have eased the difficulty of planning, permitting, and financing the densification through the addition of apartments in the attic/gable roof that has taken place in these neighbourhoods.

Siedlung Jedlesee Straße 79-95



-  Housing corporation
-  Homeowners' association
-  Private homeowner
-  Municipal housing agency

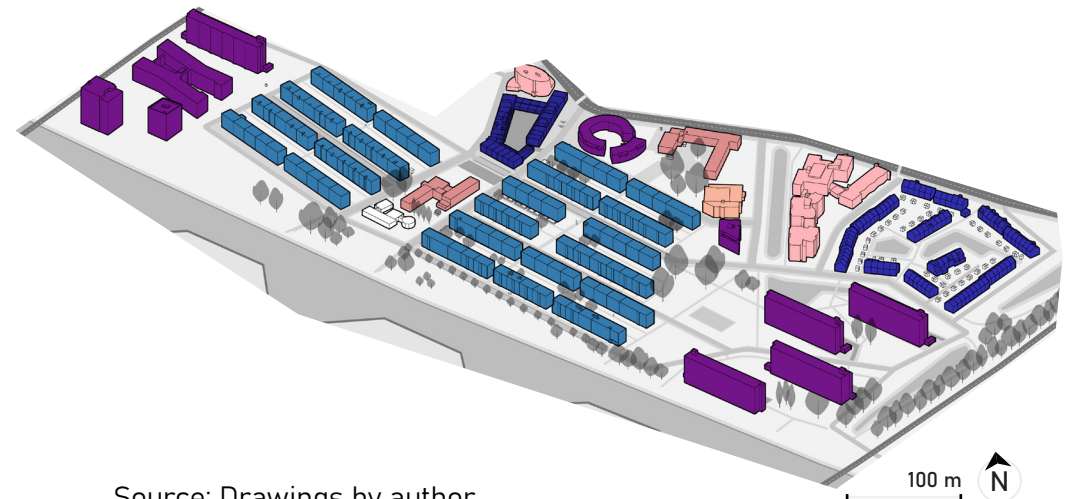
Spatial Analysis: Neighbourhood scale

Ownership Rotterdam

In Rotterdam we see a much more diverse range of ownership structures. At the time of construction, most of the housing was owned by social housing associations, although in both neighbourhoods there was already some owner-occupied housing. The proportion of owner-occupied housing increased after the social housing law change in 2011, with the explicit goal of reducing the amount of social housing in the city and attracting higher-earning families (personal communication, policy worker at the municipality of Rotterdam). In addition to demolitions, the social housing associations were also encouraged to sell part of their housing stock, leading to buildings managed by homeowners' associations (VvE's).

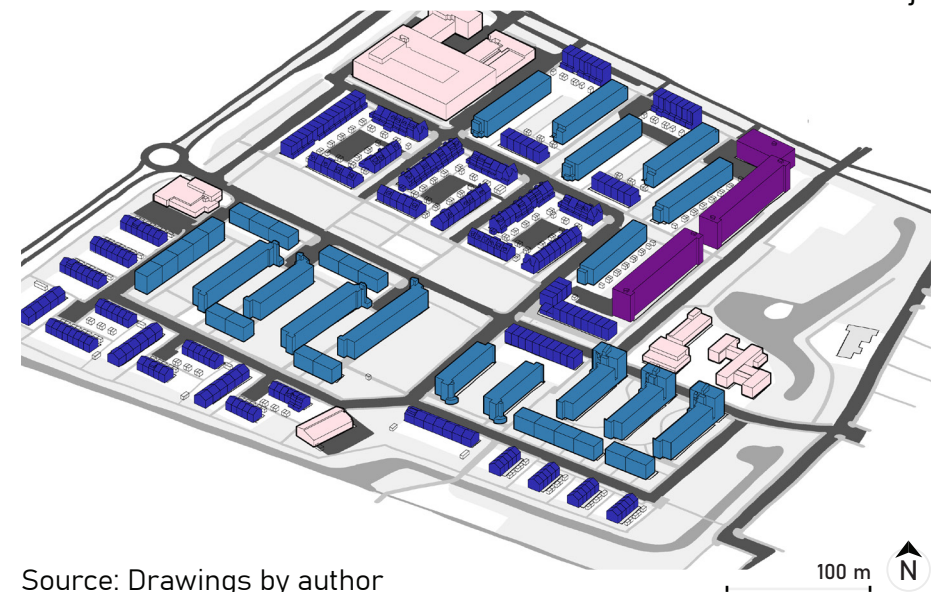
The large number of stakeholders and regulatory bodies required to implement densification, which results from this more fragmented ownership structure, has in the past hampered densification efforts in Rotterdam (personal communication with a policy employee of the municipality of Rotterdam) and may explain why no densification has taken place in the two locations studied in Rotterdam. As stated in the governance chapter, the municipality is aware of these difficulties and is implementing solutions to streamline the process.

Kleinpolder



Source: Drawings by author

Veldenbuurt Zuidwijk



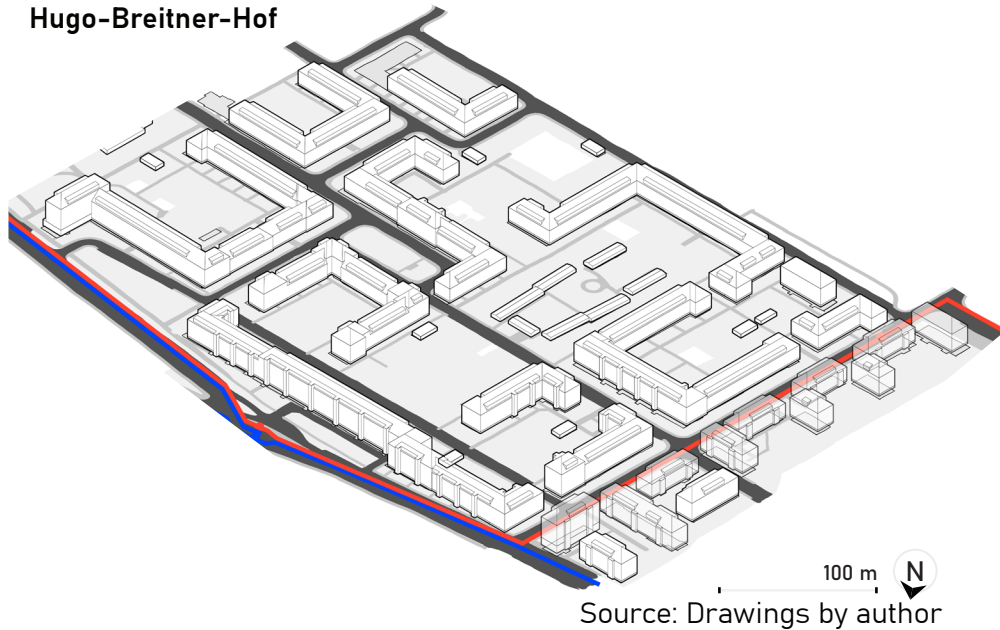
Source: Drawings by author

- Housing corporation
- Homeowners' association
- Private homeowner
- Municipal housing agency



Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



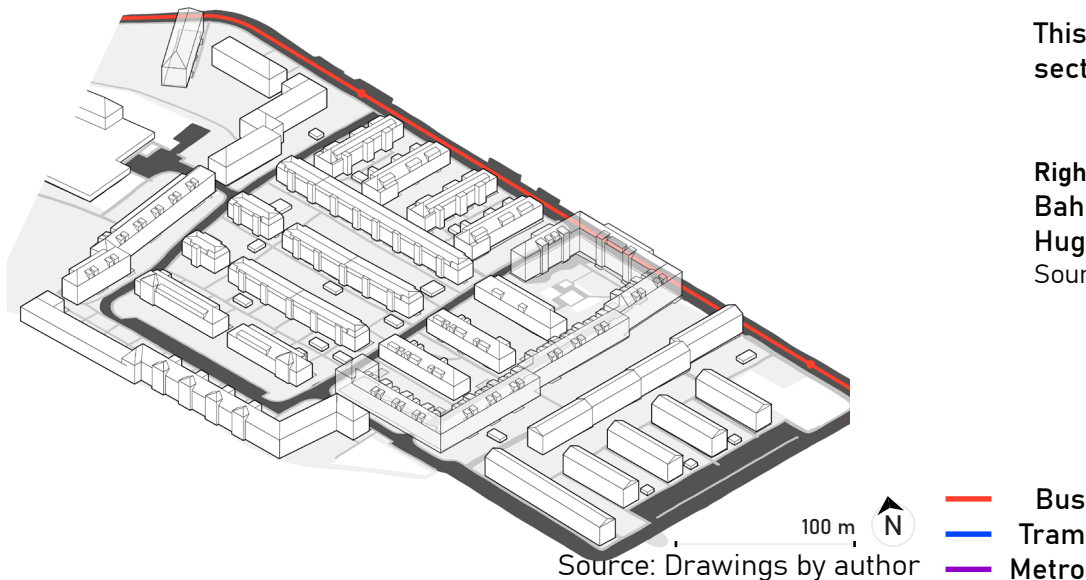
Local scale public transit Vienna

Hugo-Breitner-Hof is well served by public transit, with two tram lines running directly alongside the neighbourhood and a bus line running through the western side of it. This bus line connects directly to the transit hub of Hütteldorf Bahnhof, which sees rail, metro, and bus service. This hub is also easily reached on foot, as it is only a 13-minute walk between it and the central plaza of the Hugo-Breitner-Hof.

The good connectivity by public transit is reflected in the high score that the district section Ober Baumgarten-Hugo-Breitner-Hof received in the city-wide survey.

Siedlung Jedlesees, in contrast, is only served by a single bus line. The closest transit hub, Franz-Jonas-Platz, can be reached by taking this bus or by walking for 25 minutes. Due to the nature of this walking route — which crosses a major highway and runs alongside a main road — the perceived distance feels even greater.

Siedlung Jedlesees Straße 79-95



This low connectivity explains the low score that inhabitants of the district section Jedleseer-Schwarzlackenau give to public transit.

Right: Railway to Hütteldorf Bahnhof as seen from the Hugo-Breitner-Hof
Source: Photo by author.



Spatial Analysis: Neighbourhood scale

Local scale public transit Rotterdam

Kleinpolder is only serviced by a bus route. This line does, however, offer very good service, with buses every 10 minutes even outside of peak times. This bus goes to the closest public transit hub, Rotterdam Centraal, taking about 12 minutes. The station can also be reached by bike in about 15 minutes. The bike parking facilities at Rotterdam Centraal make this a very convenient option.

In the city survey, Kleinpolder scored poorly on public transport satisfaction. This is likely because buses are generally seen as uncomfortable and lower-quality transit.

The Veldenbuurt in Zuidwijk is served very well by public transit, with a metro station directly next to it. This metro station is well served, with metros leaving towards the city centre every 5 minutes, even outside of peak times. The centre of Rotterdam takes about 10 minutes to reach, and Rotterdam Centraal about 15 minutes by metro.

The good service provided by the metro is reflected in the high score public transit received in the neighbourhood survey of Zuidwijk.

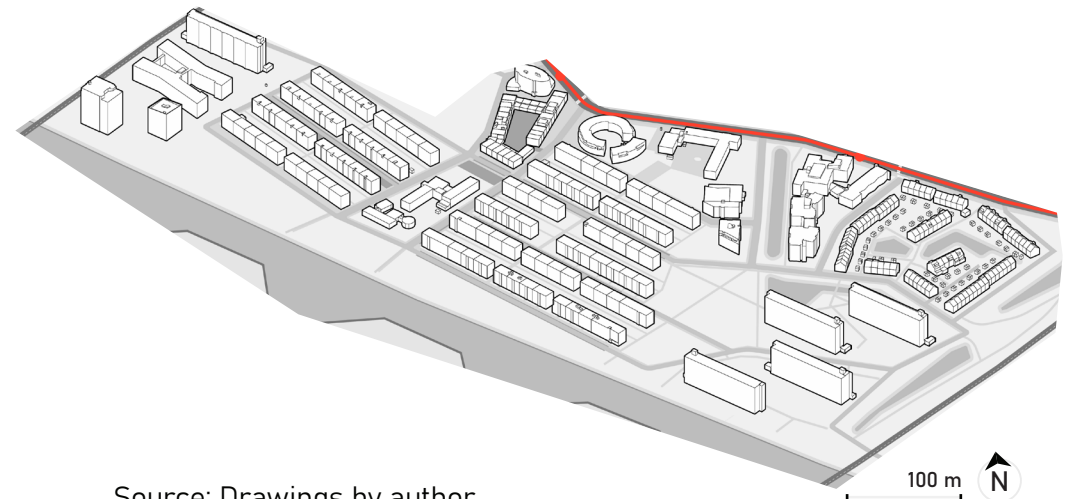
Left: Bus in Kleinpolder.

Right: Metro as seen from Zuidwijk.

Source: Photo by author.

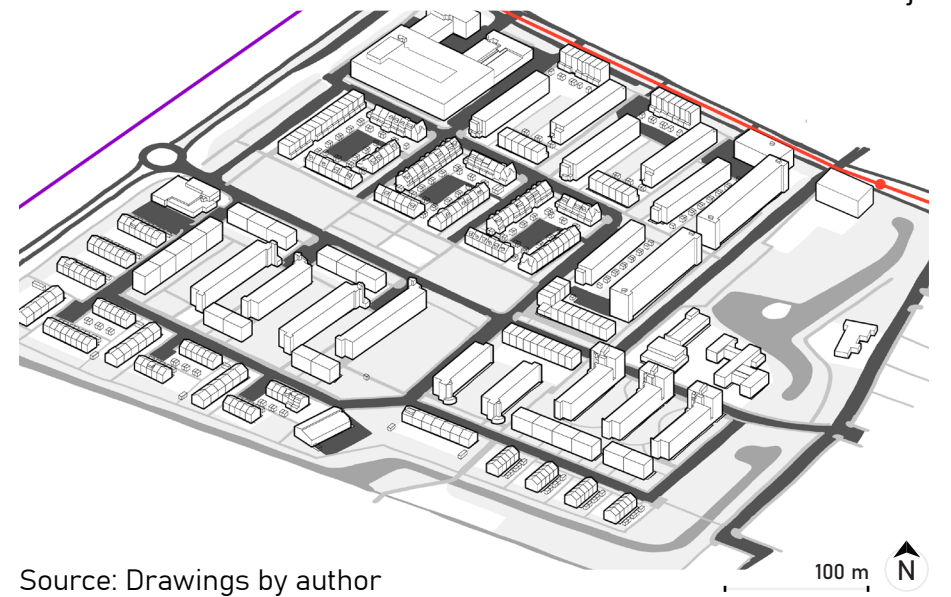


Kleinpolder



Source: Drawings by author

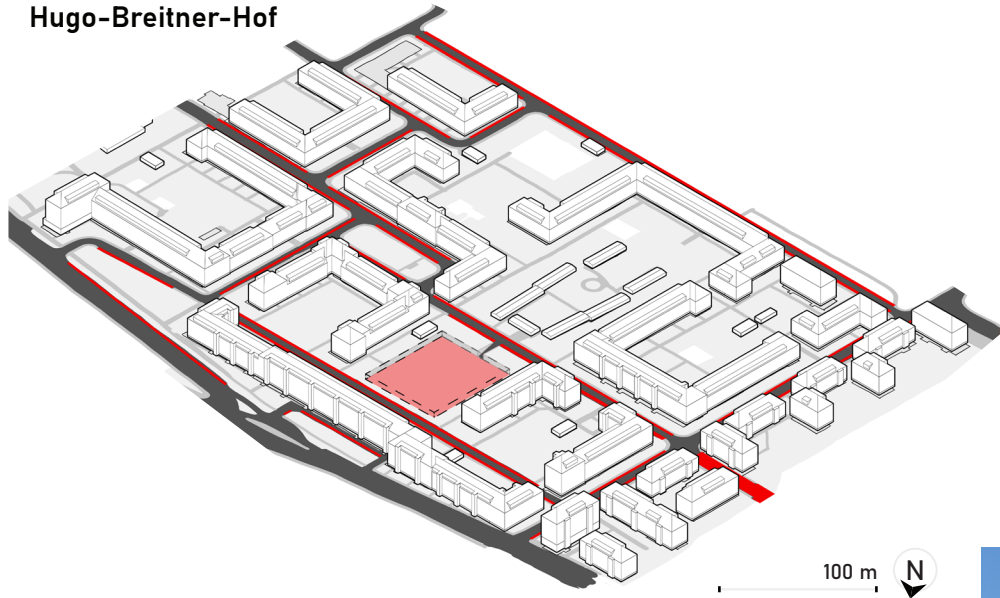
Veldenbuurt Zuidwijk



Source: Drawings by author

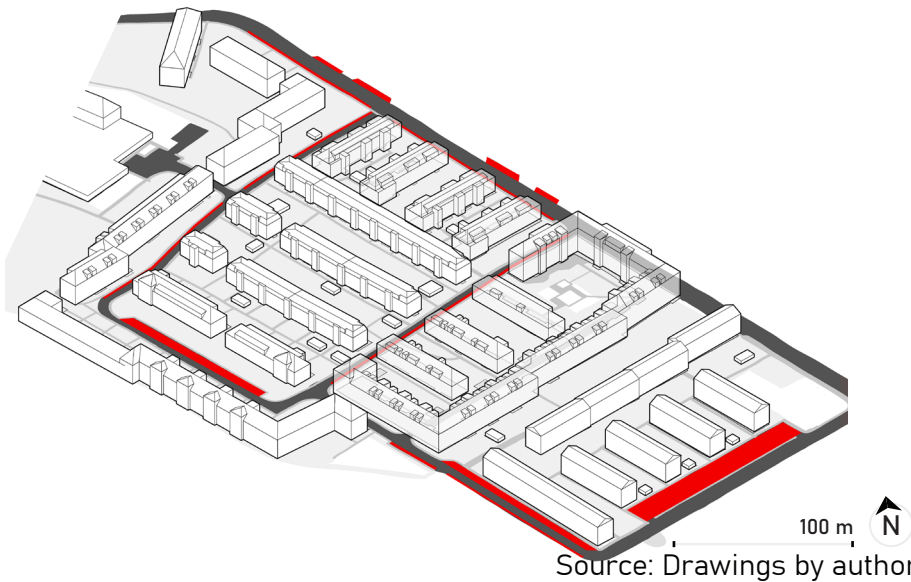
Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedlesee Straße 79-95



Source: Drawings by author

Parking overview neighbourhoods Vienna

In the Hugo-Breitner-Hof, parking is arranged along the limited streets accessible to cars and in a major underground parking garage beneath the main neighbourhood green space. Although there are quite a lot of cars along the streets, the large parts of the neighbourhood inaccessible to cars still mean that vehicles do not dominate the public space.

In Siedlung Jedlesee, cars are also parked along the roads accessible to them. In this case, however, parking is usually limited to only one side of the road, minimising how much they dominate the space. There are, however, three large surface-level parking lots, where the quality of the public space suffers due to the number of cars and the large areas of grey, paved surfaces.



Left: Main surface parking location in Hugo-Breitner-Hof.
Below: One side of street parking in Siedlung Jedlesee.
Source: Photos by author.



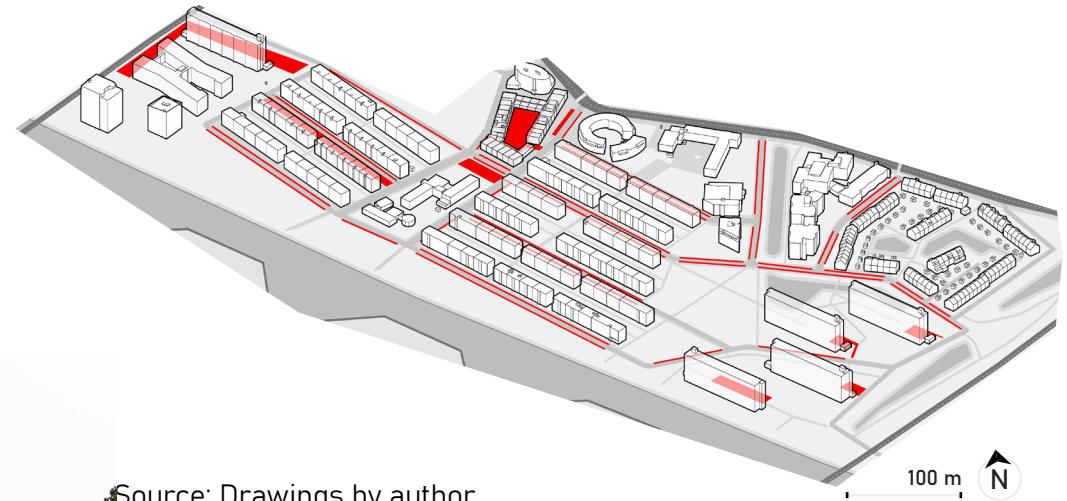
Spatial Analysis: Neighbourhood scale

Kleinpolder

Parking overview neighbourhoods Rotterdam

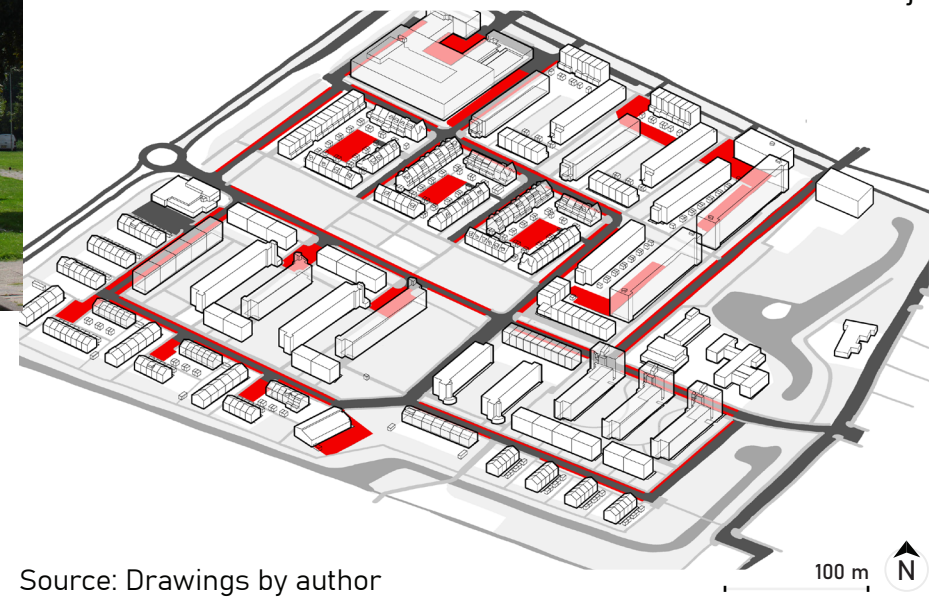
In Kleinpolder, parking is arranged along both sides of all streets. In addition to this, there are also parking lots in the interior courtyards of the blocks of terraced houses. As slow traffic also flows through the streets lined with cars, parking dominates the perceived street scape.

In the Veldenbuurt in Zuidwijk, the majority of the parking is located in the interior courtyards of the terraced houses or in parking lots next to apartment complexes. In addition to this, there is also parking space along the streets. However, streets without parking, or streets with cars only on one side, give the space a less car-dominated feel than Kleinpolder.



Source: Drawings by author

Veldenbuurt Zuidwijk



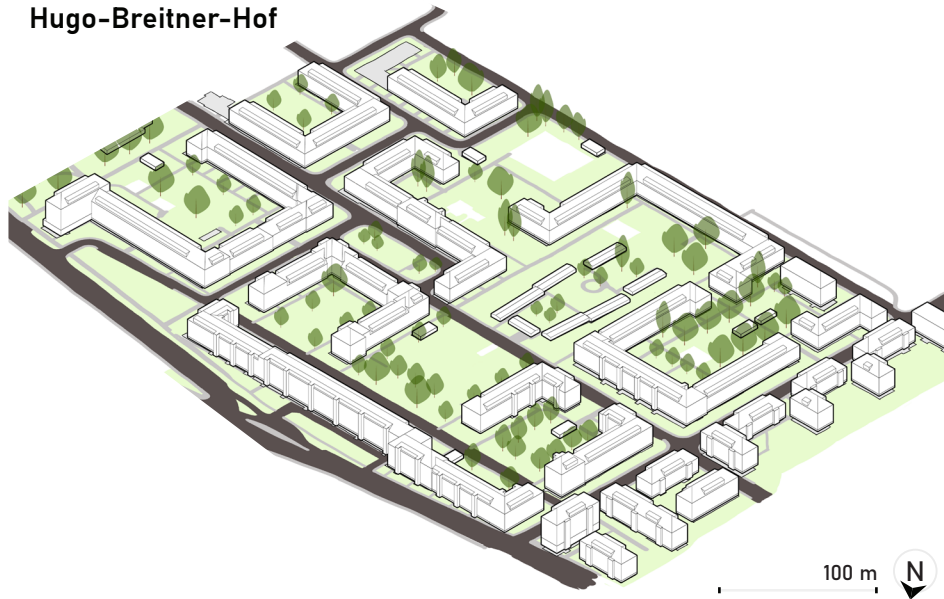
Source: Drawings by author

Right: Parking in Kleinpolder.
Below: Parking in Zuidwijk.
Source: Photos by author.



Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedlesee Straße 79-95



Source: Drawings by author

Green space overview neighbourhoods Vienna

Both neighbourhoods in Vienna feature extensive green spaces. However, large areas remain underutilized, with open grass fields and scattered trees being very common. From both a social and ecological perspective, these spaces could be used more effectively.



Left: Green courtyard in Hugo-Breitner-Hof.
Below: Green playground in courtyard in Siedlung Jedlesee.
Source: Photos by author.



Spatial Analysis: Neighbourhood scale

Green space overview neighbourhoods Rotterdam

Similar to Vienna, the neighbourhoods in Rotterdam also feature extensive green spaces. Open green fields are again very prevalent, although water structures add diversity to the natural landscape and add to the quality of the public space.

Right: Green unused space between buildings in Kleinpolder.

Below: Green space and buildings along canal (On the left, outside picture) in Kleinpolder.

Source: Photos by author.

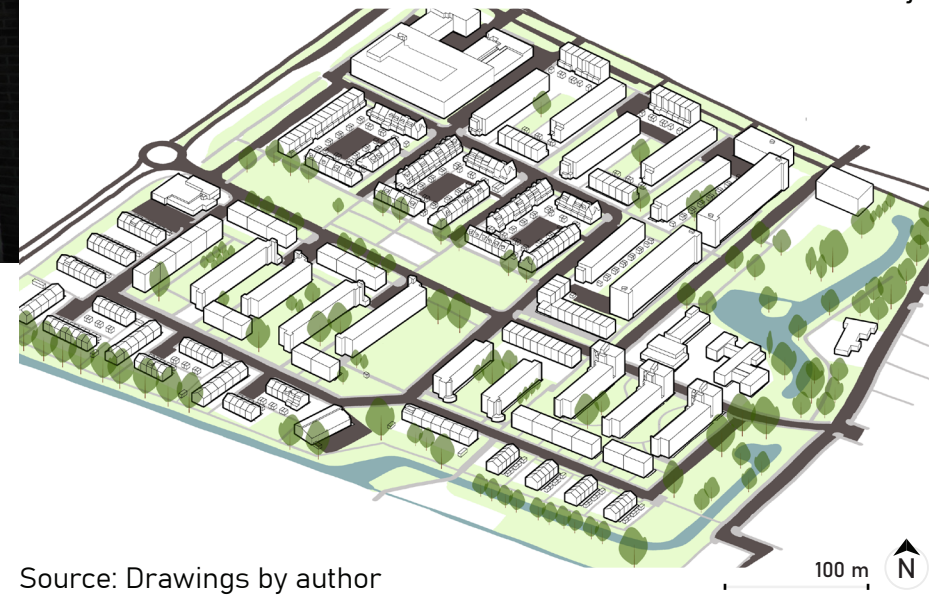


Kleinpolder



Source: Drawings by author

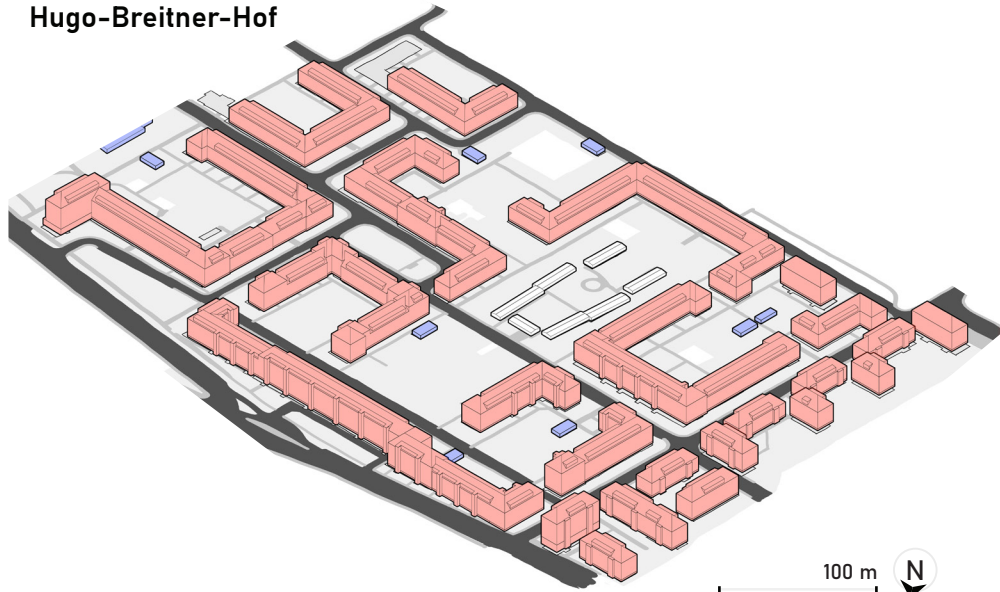
Veldenbuurt Zuidwijk



Source: Drawings by author

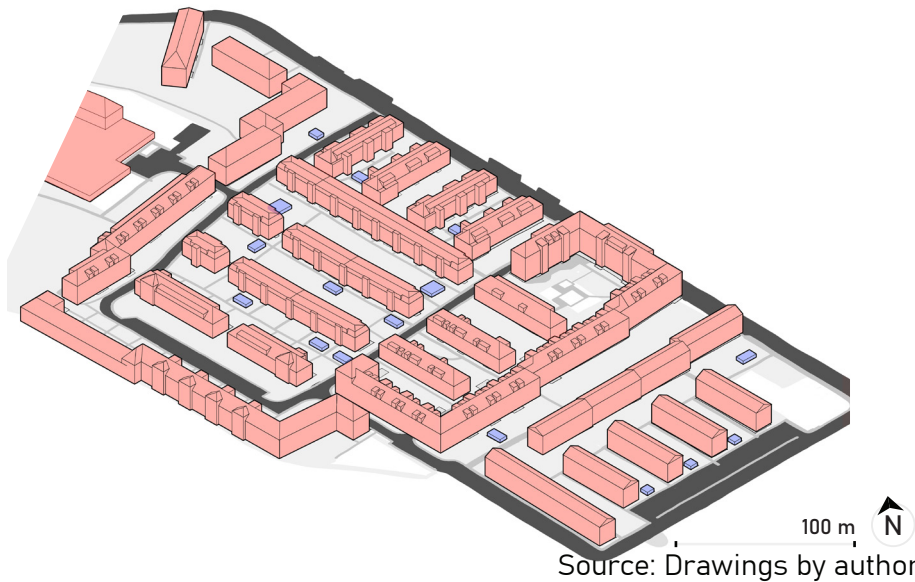
Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedlesee Straße 79-95



Source: Drawings by author

Roof type Vienna

All buildings built during the initial construction phase of the Hugo-Breitner-Hof and the Siedlung Jedlesee have gabled roofs. Later additions, like the childcare centre in the Hugo-Breitner-Hof and the garbage and bike storage buildings in Siedlung Jedlesee, have flat roofs.

Many of the buildings follow the tripartite composition of base (sometimes a small foundation layer, sometimes a large arched promenade), shaft (the main body of the buildings where the standard apartments are situated), and capital (the gabled roof), formalized by Louis H. Sullivan.

Note how well the roof layer and the first floor layer work together in the Hugo-Breitner-Hof.



Red Gabel roof
Blue Flat roof

Left: Gable roof with attic apartments in Siedlung Jedlesee.

Below: Tripartite composition with shops and attic apartments in Hugo-Breitner-Hof.

Source: Photos by author.

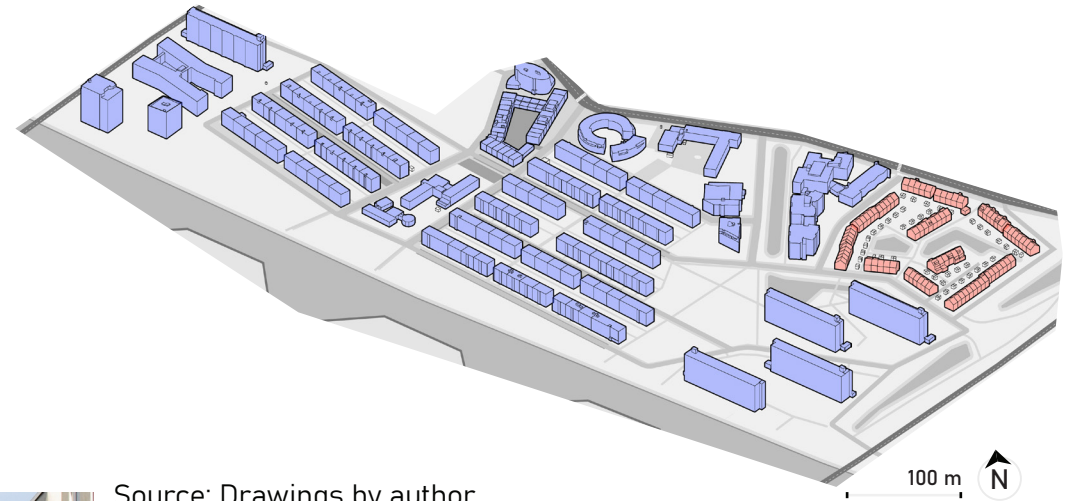


Spatial Analysis: Neighbourhood scale

Roof type Rotterdam

In Kleinpolder and Veldenbuurt, all buildings except some terraced housing along the edge of Veldenbuurt were constructed with flat roofs. This gives the space less of a traditional appearance. The buildings also do not follow the tripartite composition, making the space feel less grounded.

Kleinpolder



Right: Uniform flat roof building in Kleinpolder.

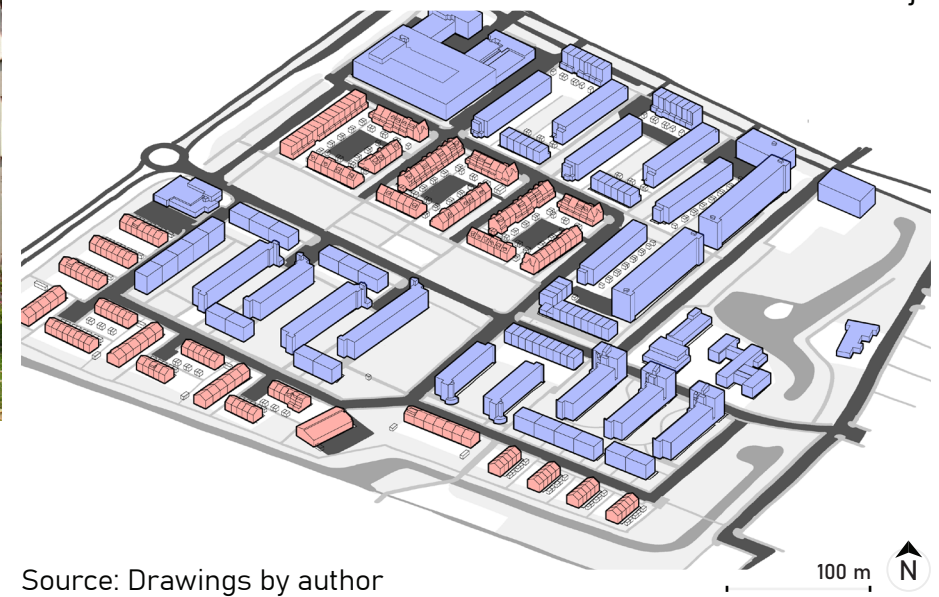
Below: Uniform flat roof building in Zuidwijk.

Source: Photos by author.



Source: Drawings by author

Veldenbuurt Zuidwijk

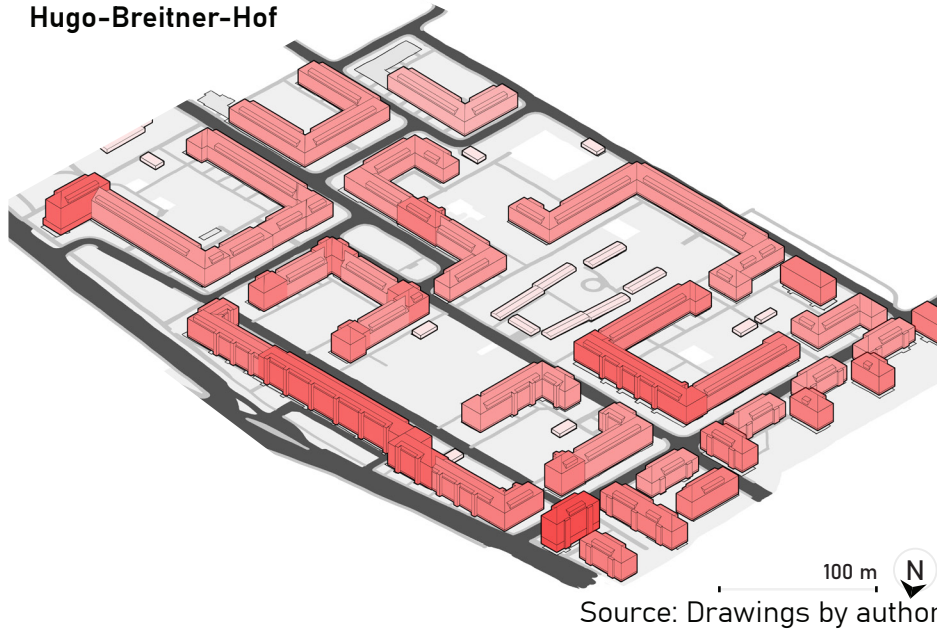


Red square: Gabel roof
Blue square: Flat roof

Source: Drawings by author

Spatial Analysis: Neighbourhood scale

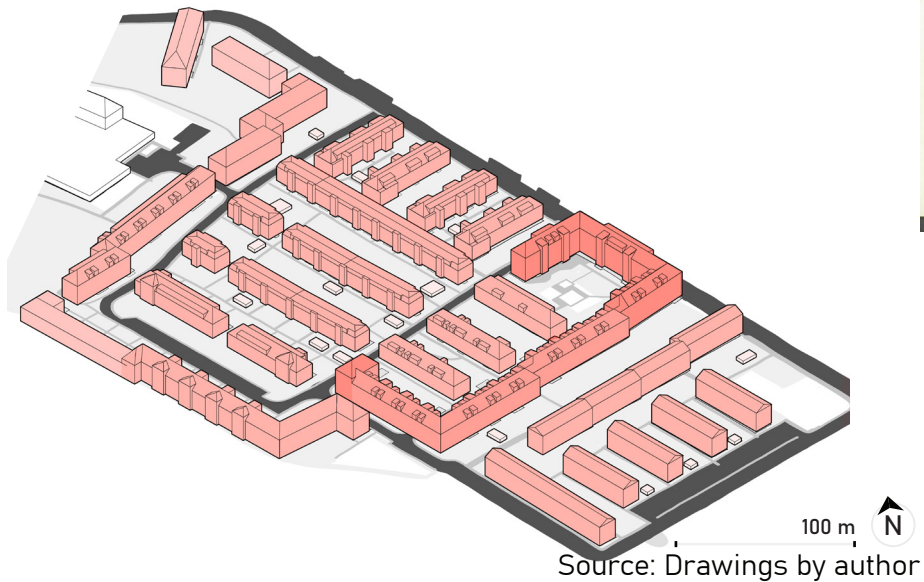
Hugo-Breitner-Hof



Building height Vienna

In both neighbourhoods in Vienna, building height is very uniform, with only relatively small accents on important places like building block corners and main streets. This gives the neighbourhoods a very cohesive spatial quality.

Siedlung Jedlesee Straße 79-95



Left: Normal height building and tall building on corner in Hugo-Breitner-Hof.

Below: Medium height building in Jedlesee.

Source: Photos by author.

- 1 story
- 2 stories
- 3 stories
- 4 stories
- 5 stories
- 6 stories
- 7 stories
- 8 stories
- 9 stories
- 10 stories

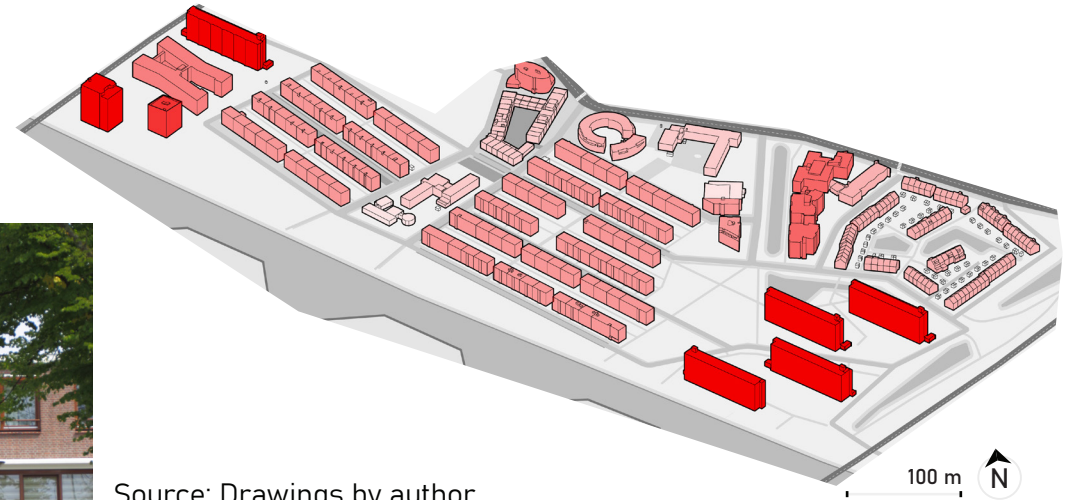


Spatial Analysis: Neighbourhood scale

Kleinpolder

Building height Rotterdam

Building height in Rotterdam is more diverse, with some buildings having 10 floors in both neighbourhoods, while others are 2-floor row houses. In both neighbourhoods, the majority of the housing is around 4 stories tall. These differences in building height give the neighbourhoods a less cohesive feel. A benefit is that they offer more types of housing, which attracts a more diverse set of residents.



Source: Drawings by author



Right: Building height differences in Zuidwijk.

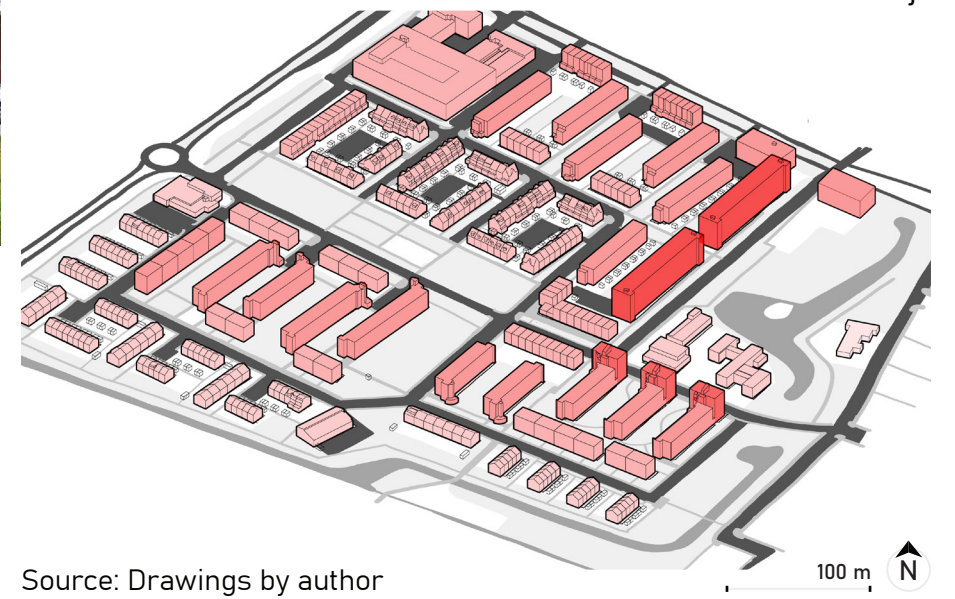
Below: Building height differences in Kleinpolder.

Source: Photos by author.



Veldenbuurt Zuidwijk

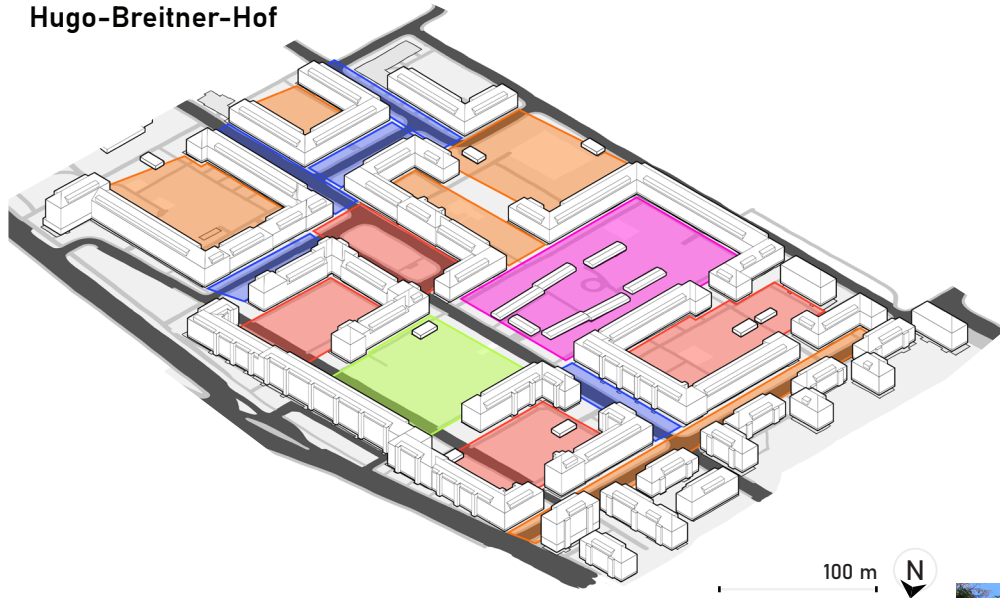
- 1 story
- 2 stories
- 3 stories
- 4 stories
- 5 stories
- 6 stories
- 7 stories
- 8 stories
- 9 stories
- 10 stories



Source: Drawings by author

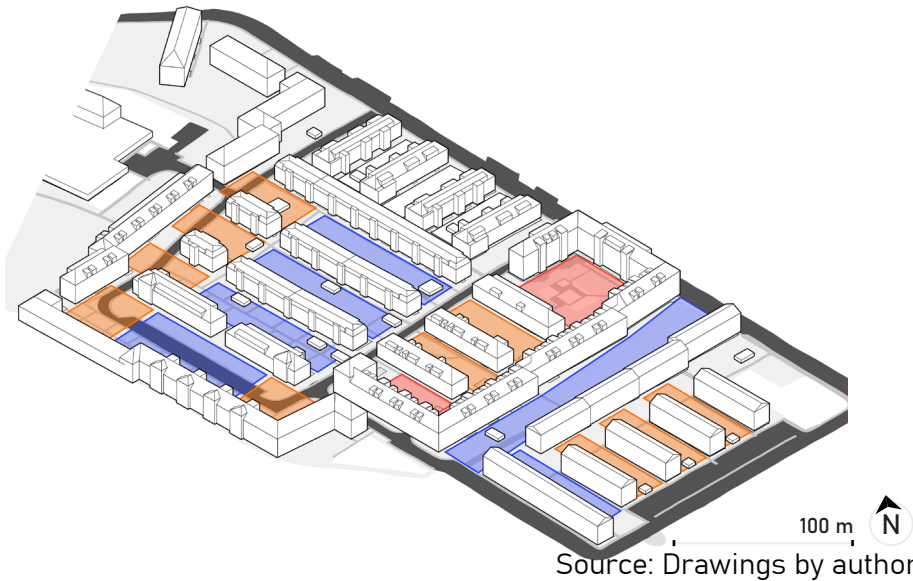
Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedleseestraße 79-95



Source: Drawings by author

Types of public spaces Vienna

In both neighbourhoods in Vienna, we can see many spaces enclosed on three or even four sides by building façades. This not only gives a protected feeling, but it is also beneficial for public safety, with many façades resulting in a large number of "eyes on the street."



Left: Main square in Hugo-Breitner-Hof.
Below: Green hof like space in Jedleseestraße.
Source: Photos by author.



- Four walls
- Three walls
- Two walls
- Open field
- Undefined space

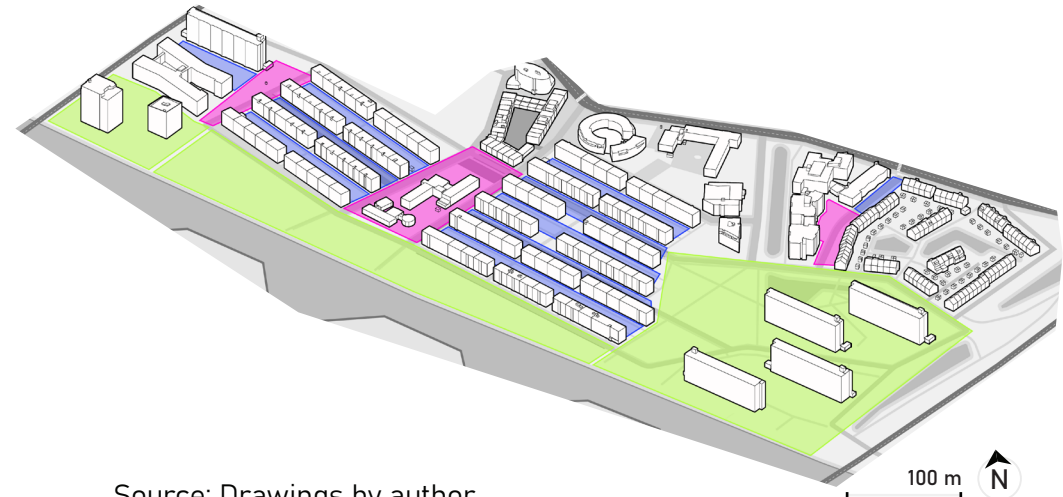
Spatial Analysis: Neighbourhood scale

Types of public spaces Rotterdam

Rotterdam, on the other hand, has more open fields, and two walled spaces are more prevalent. These can add quality, as they give a very spacious feel; especially the waterfront in Kleinpolder has great unused potential in this regard.

These open spaces can, however, also be alienating due to their lack of features. The lack of boundaries of a space can also make it feel less safe, as there is less social control from neighbouring buildings.

Kleinpolder



Source: Drawings by author



Left: Open space along canal in Kleinpolder.
Below: Undefined space in Kleinpolder.

Source: Photos by author.



Left: Semi courtyard in Zuidwijk.

Source: Photo by author.

- Four walls
- Three walls
- Two walls
- Open field
- Undefined space

Veldenbuurt Zuidwijk

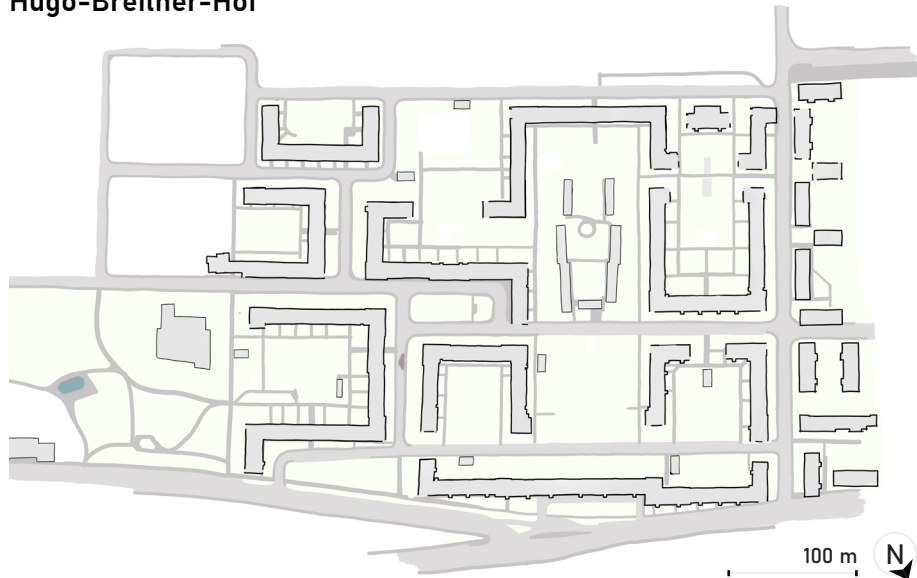


Source: Drawings by author



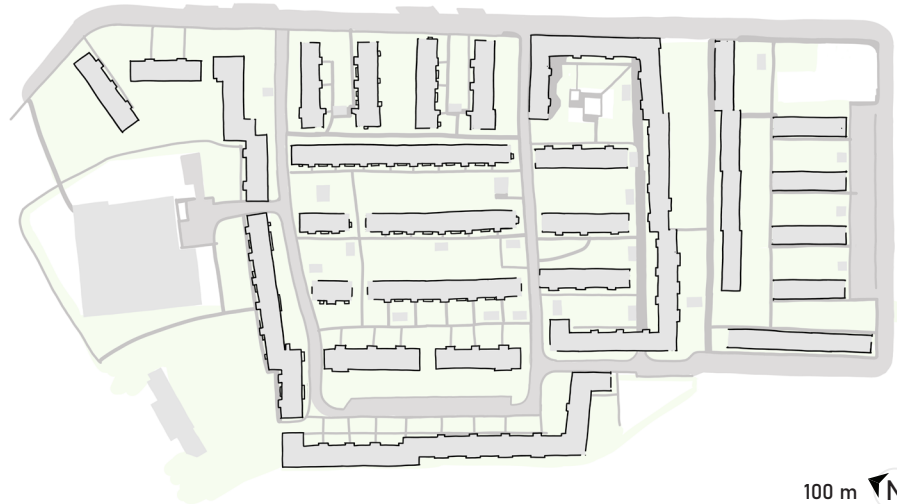
Spatial Analysis: Neighbourhood scale

Hugo-Breitner-Hof



Source: Drawings by author

Siedlung Jedleseestraße 79-95



Source: Drawings by author

Active façades Vienna

It is clear that a lot of attention went into the façade design in the two neighbourhoods studied in Vienna. Almost all parts of the façades have some place of interaction, whether it is a window or a door. Even the sides of buildings have windows. Where a large space without windows exists, the space is often used for art. This adds to the sense of place. The only areas with empty façades in the analysed neighbourhoods are later-built additions to the Siedlung Jedleseestraße.

These active façades improve the quality of the public space, as they break up the otherwise large surfaces and make the buildings feel more human in scale. In addition to this, they contribute to safety, as the windows allow for “eyes on the streets” (Jane Jacobs).



Left: Art windows and entrance on otherwise in-active side façade in Hugo-Breitner-Hof. Below: Balcony's, entrances and art in Jedleseestraße.

Source: Photos by author.



Spatial Analysis: Neighbourhood scale

Active façades Rotterdam

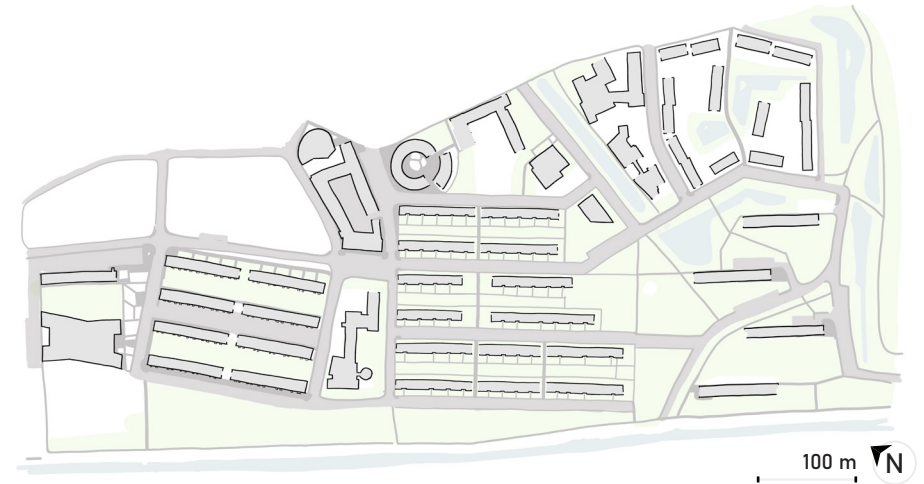
In Rotterdam, we can see more non-active façades. These come mainly in two forms: the sides of buildings often have fewer or even no windows, and, in the case of new construction low-rise row houses, parking lots in the centre of the block are surrounded by only high yard fencing. This results in situations where social control is lower or even lacking entirely.

Right: In-active side façade in Kleinpolder.
Below: Building height differences in Zuidwijk.
Source: Photos by author.



□ Active facade
■ Closed facade

Kleinpolder



Source: Drawings by author

Veldenbuurt Zuidwijk



Source: Drawings by author

Preliminary conclusions Spatial Analysis

Renovation and redevelopment

	Rotterdam	Vienna
Right to sell	Housing associations were encouraged to sell housing stock.	Municipal housing associations are not allowed to sell housing stock. Limited-profit housing associations are permitted to sell housing stock. Renters who paid more than €85 per square metre in upfront costs have a right to buy. Limited-profit housing associations therefore avoided exceeding this limit.
Neighbourhood rejuvenation	Combined effort of housing associations, private developers, and municipal government.	Effort of municipal housing association.
Practical implications	Diverse typologies after renovation with diverse ownership structures: private ownership, and a mix of private and social rent.	Largely unchanged neighbourhoods with maintained levels of social housing.

Preliminary conclusions Spatial Analysis

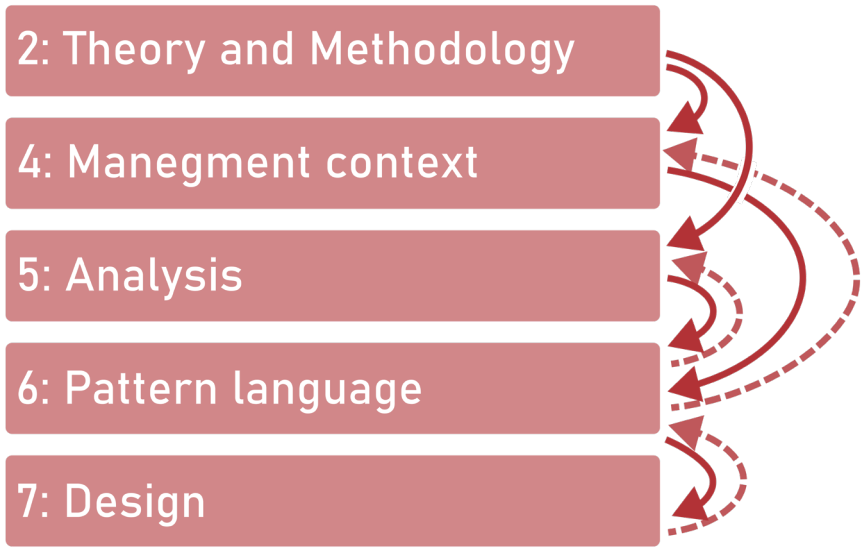
Spatial Findings



	Rotterdam	Vienna
Social housing availability	No densification has occurred; redevelopment to meet diversification targets has led to dwellings and especially less social housing being available in the neighbourhood than at initial construction.	Densification has taken place in both neighbourhoods. Redevelopment has increased the amount of social housing available compared to the initial construction phase. Additionally, the no-sale policy has preserved the existing social housing stock.
Level of services	A more adaptable approach to the governance of social housing neighbourhoods has led to a higher level of services in that neighbourhood, as space became available for new services.	A more rigid approach to governance has stopped new services from settling in the neighbourhood.
Building typologies	A more adaptable approach to the governance of social housing neighbourhoods has very diverse types of housing. Different typology's and ownership structures, including private rent and owner occupied, are aimed at different target groups.	A more rigid approach to governance has blocked diversification of building typologies. All buildings in the neighbourhood are still social rent

6

Pattern language

In this chapter, I use a pattern language, first developed by Christopher Alexander in 1977, to organize the lessons learned from the previous two chapters. The pattern language serves as a bridge between the analytical part of this thesis and the design section. Each pattern indicates where it was observed in the analysis, and in the design chapter, the patterns used for each intervention are clearly identified. The accompanying infographic highlights the central role of the pattern language. The full set of patterns can be viewed on the following page.




Next step based on 
 Explicit back reference 

The main area of intervention is highlighted by a large letter "M" for management, and color is used to emphasize it.

The small "S" and small "C" below it show that this pattern has an impact in the Space and Social domains.

M	Mixed use buildings	S C
---	---------------------	--------

Description: Mixed-use buildings efficiently use space, allowing each area of the building and neighborhood to be used for what works best in that location. (Ground floors can be used for shops, while the floors above can be used for housing, effectively doubling the use of space).



Related to: 13, Distinct first floor layer, 8, Integration of facilities in neighborhood fabric. 3, Diverse services in neighborhood. 15, Meeting places

Source: Own work, Source: Hugo Breitner Hof, Vienna and Zuidwijk, Rotterdam - Services pages

Patterns related to this pattern shown here

Source of the pattern is found here

Pattern language

Goal of Pattern language

Pattern language was originally developed as a fixed set of design rules, interconnected within a coherent system. In this thesis, however, pattern language is employed differently: as a tool within a research process. The interrelated structure of the pattern language aligns well with the research set-up of this study, in which various aspects of the built environment—both physical and organisational—are examined.

This also highlights a key distinction between my use of pattern language and its original formulation. Whereas the original approach focused solely on spatial aspects, the version developed in this thesis also bridges the social and governance domains.

As stated, the main goal of this thesis is to provide insights into how post-war social housing neighbourhoods can be developed to improve both liveability and the availability of affordable housing. Key to this objective is the long-term resilience of these neighbourhoods.

In the theoretical part of this thesis, a framework for resilient neighbourhoods is established. Within this framework, liveability, spatial structure, and social structure form a mutually reinforcing system, in which each element directly influences the others. Governance plays a facilitating role within this system, supporting and maintaining these structures over time, while also being indirectly influenced by the level of liveability within the neighbourhood.

The pattern language developed in this thesis builds directly on this framework. It translates the relationships between social, spatial, and governance structures into concrete spatial and governance interventions, based on the findings of the analytical chapters. These interventions operate within both the built environment and management structures. Social resilience emerges under the appropriate spatial and governance conditions and cannot be directly engineered. The patterns therefore focus on foster-

ing social resilience by creating the spatial and governance conditions that enable resilient communities to develop.

In doing so, the patterns synthesise lessons from both Rotterdam and Vienna, translating these insights into strategies for the Rotterdam case study. As such, the pattern language forms the key link between analysis and design, ensuring that the proposed interventions are grounded in observed practices while contributing to the long-term resilience of postwar neighbourhoods.

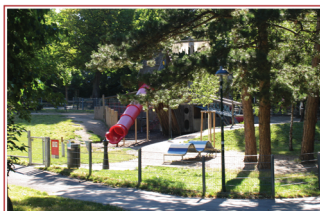
Pattern language

Pattern language

M 1: Active participation of the neighbourhood in projects

C
S

Description: The local community could be actively engaged in improving the neighbourhood by making them responsible for implementing and maintaining improvements. This will increase the connection between the inhabitants of the neighbourhood and the place they helped improve.



Achieved by: Housing agencies can encourage the formation of local initiatives by promoting and facilitating them. Small start-up funds and space-use rights can be used for this.

Related to: 24, Places for young to play on their own. 27, Spots for community gardens.

Source: Input from mentor

M 2: Cohesion between policy and financing

C
S

Description: Policy goals and financial means could be aligned. Ambitions goals without a clear path to financing could be avoided.



Achieved by: Making problem owners (Government institutions in the case of housing the vulnerable) in part financially responsible for solving them.

Related to: 10: Increase housing availability. 14: No/limited loss on new construction

Source: Own work, source: Financial structure chapter Rotterdam and Vienna case

M 3: Cohesion in financing different governance structures

C
S

Description: Financing structures could be shaped so that one party (currently the national government) cannot save money by making the other party (Currently housing associations) more financially vulnerable.



Achieved by: Reforming the subsidy arrangements so that government policy aimed at making housing associations more financially stable lowers the amount of subsidy due, not the other way around.

Related to: 10: Increase housing availability

Source: Own work, source: Financial structure chapter Rotterdam and Vienna case

M 4: Collaboration between housing associations and care providers

C
S

Description: Social housing providers and healthcare providers could work together to ensure people can live on their own when possible, while also receiving assistance when needed.



Achieved by: Housing associations could have sufficient local know-how and connections to form partnerships with local care facilities. Decentralisation of management can support this.

Related to: 7, Growing old in place. 11, Increase housing diversity

Source: Own work, Source: Kleinpolder, Rotterdam – Renovation and services pages

M 5: Diverse services in neighbourhood

S
C

Description: Neighbourhoods could have different services and uses integrated within them. This offers services close by for residents and attracts people throughout the day, maintaining eyes on the street. The result is a more lively and safer neighbourhood.



Achieved by: Spatial management could be able to adapt to the changing needs of a neighbourhood and facilitate the introduction of new services in the neighbourhood when required.

Related to: 13, Mixed use. 12, Integration of facilities in neighbourhood fabric.

Source: Own work, Source: Zuidwijk, Rotterdam – Services page

M 6: Good public transit

C
S

Description: Good public transit could be accessible from the neighbourhood, as this opens up job opportunities for its inhabitants and decreases car dependency.



Achieved by: Constructing new transit financed through densification

Related to: 28, Super-block. 21, Minimize cars in public space. 25, Slow transit.

Source: Own work, Source: Zuidwijk, Rotterdam and Hugo Breitner Hof, Vienna – District scale infrastructure, Parking, Local public transit pages

M 7: Growing old in place

C
S

Description: An effort could be made to ensure that elderly residents live comfortably in the neighbourhood, with or without moving to specialized housing. This avoids breaking up social networks and thus improves social cohesion and liveability.



Achieved by: The neighbourhood could offer housing types for different stages of life, with larger family dwellings, smaller units for smaller households, and assisted living options for the elderly.

Related to: 11, Increase housing diversity. 4, Collaboration between housing associations and care providers.

Source: Own work, Source: Rotterdam, Kleinpolder – Services, renovation, new construction pages

M 8: Higher rent social/ no profit segment

C
S

Description: A additional higher segment with a similar target group as the Vienna LHPA could be introduced. Construction for this target group could be more financial sustainable.



Achieved by: Rent caps for new construction build by social housing associations could be set higher. The rent can be lowered once the investment loans are paid of.

Related to: 14: No/limited loss on new construction. 2: Cohesion between policy and financing. 9: Housing for those in need

Source: Own work, source: Financial structure chapter Rotterdam and Vienna case

Pattern language

M 9: Housing for those in need C S

Description: Social housing could be allocated in such a way that those in need are able to use it



Achieved by: Clear policies aiming (Part) of the social housing stock to the most vulnerable

Related to: 8: Higher rent social/no profit segment

Source: Own work, source: Social goals and allocation chapter Rotterdam and Vienna case

M 10: Increase housing availability S C

Description: Effort could be made to increase housing availability during renovation to ensure that more people gain access to the high quality that social housing can provide.



Achieved by: Housing associations could feel (market or governance forces) a financial incentive to densify, especially in cities with a housing shortage.

Related to: 30: Visible roof layer.

Source: Own work, Source: Vienna – Major reconstruction page

M 11: Increase housing diversity C S

Description: The types of housing could be diverse so that people with different income levels and in different stages of life can live in the neighbourhood. This can improve the liveability of the neighbourhood and, on a larger scale, social cohesion.



Achieved by: Housing of different luxury levels could be constructed in the neighbourhood.

Related to: 7: Growing old in place. 4: Collaboration between housing associations and care providers.

Source: Own work, Source: Both neighbourhoods, Rotterdam – Reconstruction and year of construction pages

M 12: Integration of facilities in neighbourhood S C

Description: Effort could be made to ensure engagement between large facilities (such as healthcare or schools) and the neighbourhood they are embedded in.



Achieved by: Practical schools could set up small businesses where students can further hone their skills. These would also serve as communal focal points.

Related to: 13: Mixed use buildings. 5: Diverse services in neighbourhood.

Source: Own work, Source: Kleinpolder, Rotterdam – Services page

M 13: Mixed use buildings S C

Description: Mixed-use buildings efficiently use space, allowing each area of the building and neighbourhood to be used for what works best in that location. (Ground floors can be used for shops, while the floors above can be used for housing, effectively doubling the use of space).



Achieved by: During renovations or new constructions, the ground floor of buildings can be made available for uses other than residential purposes.

Related to: 18: Distinct first floor layer, 12: Integration of facilities in neighbourhood fabric. 5: Diverse services in neighbourhood. 20: Meeting places

Source: Own work, Source: Hugo Breitner Hof, Vienna and Zuidwijk, Rotterdam – Services pages

M 14: No/limited loss on new construction C S

Description: New construction by Social housing associations could be more financially sustainable in order to stimulate new construction by social housing agency.



Achieved by: Rent caps for new construction built by social housing associations could be set higher. The rent can be lowered once the investment loans are paid of.

Related to: 2: Cohesion between policy and financing 8: Higher rent social/no profit segment

Source: Own work, source: Financial structure chapter Rotterdam and Vienna case

S 15: Active facades C

Description: Façades could be active; this makes the street feel more lively and improves both perceived and actual safety. Active façades also improve the quality of public space.



Achieved by: When (re)designing façades, points of engagement (doors and windows) could be placed in such a way as to maximize the connection between the inside and outside.

Related to: 24: Places for young to play on their own. 23: Own front door.

Source: Own work, Source: Vienna – Active façades page

S 16: Active living C

Description: The spatial design could be arranged to encourage active living. This will help improve the health and quality of life of the inhabitants.



Achieved by: There could be places that encourage active living throughout the neighbourhood. These can include attractive parks, good cycling infrastructure, or spaces where healthy hobbies can be practiced.

Related to: 27: Spots for community gardens. 25: Slow transit.

Source: Own work, Source: Both cities – Better cycling in Rotterdam; More inviting streets in Vienna; Green spaces pages

Pattern language

S 17: All buildings unique C

Description: All buildings could have a unique feature, such as a piece of art or a colour in the exterior design. This increases the sense of place, making the area easier to navigate and fostering a stronger connection to it.



Achieved by: All buildings can be made unique through the use of accent colours, differences in façade materials, and the placement of art, among other things.

Related to: 26, Social housing PR.

Source: Own work, Source: Jedleseesiedlung, Vienna – Active façades page

S 18: Distinct first floor layer C

Description: Buildings could have a clearly visible first floor, especially when that layer houses a different function than the rest of the building. It is also in line with tripartite theory, improving public space by giving buildings a more harmonious design.



Achieved by: Different materials for façade composition could be used for the first floor layer of a building.

Related to:

Source: Own work, Source: Hugo Breitner Hof, Vienna – Roof type page

S 19: Hof-like plazas C

Description: When designing the built volumes of a residential neighbourhood, buildings could be arranged in such a way that courtyards emerge between them. These courtyards function as focal points and, due to their enclosed nature, form very safe spaces (eyes on the street).



Achieved by: When adding new housing to the neighbourhood, it could be placed in locations that shape the space in such a way that new, enclosed areas are created.

Related to: 24, Places for young to play on their own; 21, Meeting places

Source: Own work, Source: Booth locations in Vienna – Types of public spaces page

S 20: Meeting places C

Description: Meeting places (playgrounds, sports facilities, community centres) could be included in neighbourhood design. These meeting places can help foster a sense of community.



Achieved by: During redesigns of the neighbourhood, space could be made available for functions other than housing. This can be used for community facilities, commercial activities, or public amenities.

Related to: 29, Usable green spaces. 19, Hof-like plazas. 13, Mixed use buildings.

Source: Own work, Source: All neighbourhoods: Good and bad examples; In Vienna as plazas; In Rotterdam as community centres – Green space and services pages

S 21: Minimize cars in public space C

Description: Cars could be stored in such a way that they do not dominate the street-scape. This will improve the quality of public space.



Achieved by: Parking minimums could be reduced, especially if good public transit is available. Cars could also be stored underground.

Related to: 6, Good public transit. 22, Narrow streets.

Source: Own work, Source: Hugo Breitner Hof and Jedleseesiedlung, Vienna – Parking page

S 22: Narrow streets C

Description: Space for cars on the street could be narrow to discourage speeding and to make the street less of an obstacle for slower traffic.



Achieved by: When redesigning streets, the amount of space allocated to them could be minimized. This could be achieved by using one-way streets.

Related to: 21, Minimize cars in public space. 25, Slow transit.

Source: Own work, Source: Booth neighbourhoods, Vienna – Basic overview page

S 23: Own front door C

Description: Apartments on the ground floor could have their own front door. This improves the quality of public space and increases the number of spots where interactions can occur.



Achieved by: During reconstructions buildings on the first floor of an apartment block could be given their own front door. Public space could be made available for a bench or plants.

Related to: 15, Active façades. 18, Distinct first floor layer.

Source: Own work, Source: Zuidwijk, Rotterdam – Renovation page

S 24: Places for young to play on their own C

Description: Special attention could be given to creating spaces that are safe for children. Neighbourhoods can then become places where children learn independence.



Achieved by: Playgrounds could be built in places with a lot of social control, for instance in the middle of a hof. These places could be reachable without crossing dangerous streets.

Related to: 19, Hof-like plazas. 22, Narrow streets. 15, Active façades. 1, Active participation of the neighbourhood in projects.

Source: Own work, Source: Booth locations in Vienna – Types of public spaces page and services pages

Pattern language

S 25: Slow transit C

Description: Slow transit could be encouraged by providing for pedestrians and cyclists. This will increase the number of eyes on the street (public safety) and decrease car dependency.



Achieved by: Bike paths could be direct, save and interesting to bike though. Pedestrian paths could feel safe (eyes on the street) and interesting.

Related to: 6, Good public transit. 22, Narrow streets.

Source: Own work, Source: Both cities: Better cycling in Rotterdam. More inviting streets in Vienna - Green spaces pages

S 26: Social-housing PR M C

Description: Social housing and its history could be celebrated in the public space design of the neighbourhood. This leads to higher recognizability of the neighbourhood and, in the long term, improves the image of social housing in general.



Achieved by: Information plaques about the neighbourhood can be installed. The names of the complex and the institutions responsible for its creation can also be displayed on the buildings.

Related to: 17, All buildings unique.

Source: Own work, Source: Both neighbourhoods, Vienna - Basic overview page

S 27: Spots for community gardens C

Description: Excess green space could be used for community gardens, which can function as communal focal points. The active engagement of inhabitants with their environment also fosters a connection to the place.



Achieved by: Green space owned by the housing association could be made available for use by local community. The housing association could also promote the formation of these community.

Related to: 29, Usable green spaces. 16, Active living. 1, Active participation of the neighbourhood in projects.

Source: Own work, Source: Small-scale projects in Hugo Breitrner Hof - Green spaces page

S 28: Super-block C

Description: Neighbourhoods could function as super-blocks, discouraging through-traffic by cars. This improves physical safety and enhances the quality of the public space.



Achieved by: Traffic routing in the interior of the neighbourhood could be done in such a way that though traffic is not possible

Related to: 6, Good public transit. 24, Places for young to play on their own.

Source: Own work, Source: Jedlese Siedlung, Vienna - Basic overview, Parking page

S 29: Usable green spaces C

Description: Green spaces could be usable as play or recreational areas. Green spaces without active use are best avoided, as they do not add much quality to the public space and require intensive maintenance.



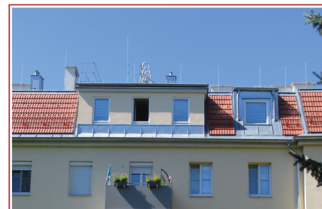
Achieved by: Meeting places could be added in attractive places such as parks or courtyards. Entrances of buildings can also function as meeting places if built in an attractive way.

Related to: 20, Meeting places.

Source: Own work, Source: All neighbourhoods - Green space page

S 30: Visible roof layer C

Description: Buildings could have a visible roof layer; this gives spaces a more traditional and communal feel. It is also in line with tripartite theory, improving public space by giving buildings a more harmonious design.



Achieved by: The roof-layer could be made of a other material. The effect can be improved by changing the shape of the building on top floor, by a setback or a inclined roof.

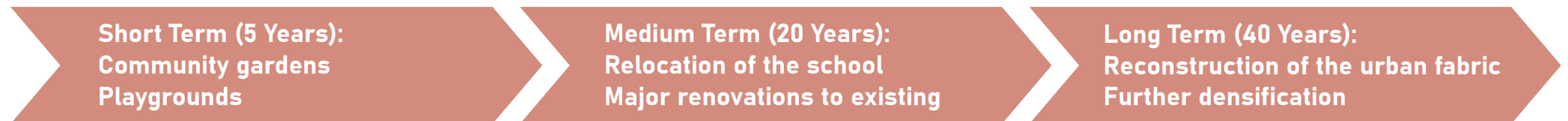
Related to: 18, Distinct first floor layer. 10, Increase housing availability.

Source: Own work, Source: Vienna - Roof type page

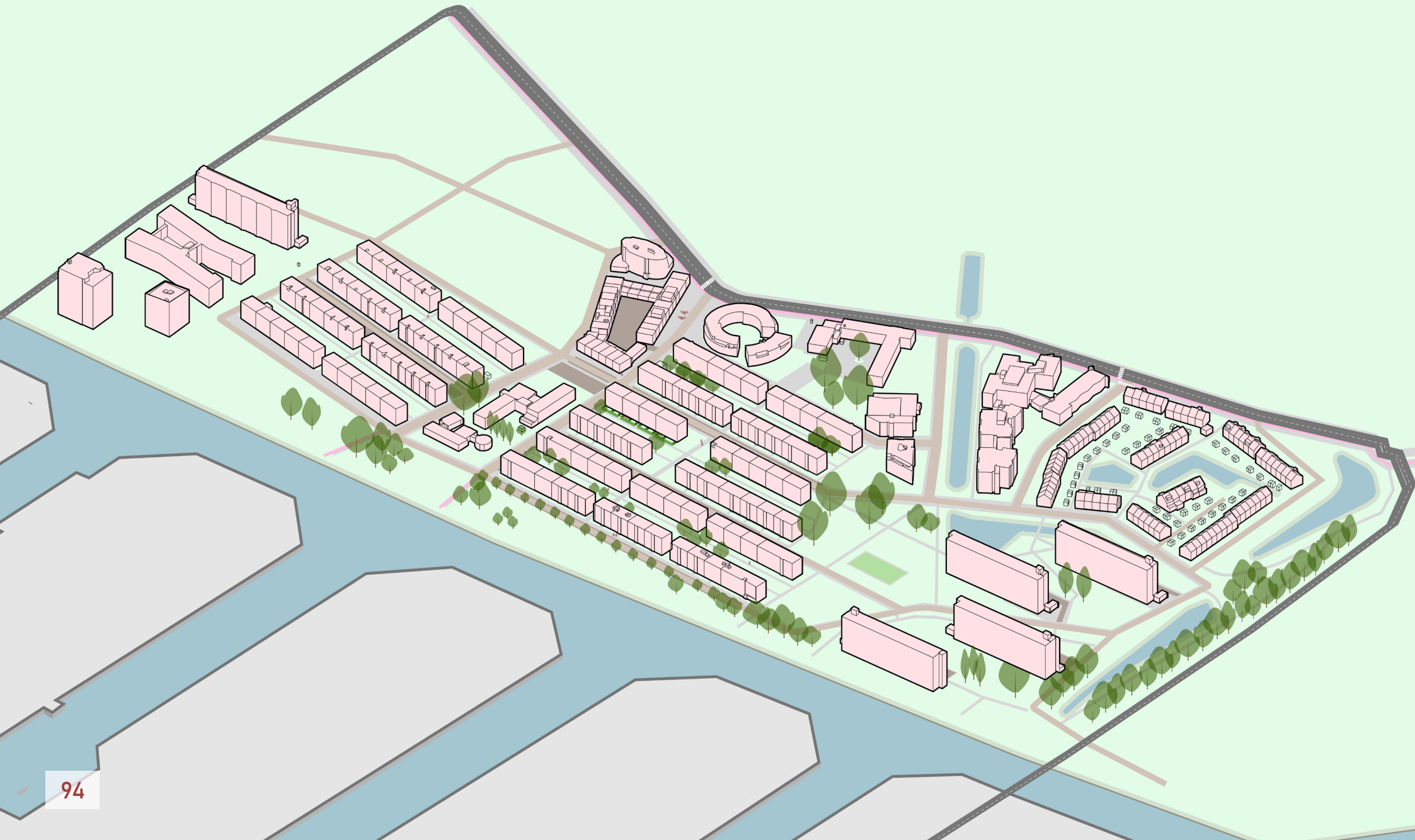
7 Design

In line with the focus of this thesis, the design for the Kleinpolder presented here seeks to enhance the long-term liveability of the neighbourhood. To this end, the design is structured into five discrete steps that can be implemented as opportunities or needs arise. These steps are categorized as short-, medium-, and long-term interventions. Each step provides a meaningful improvement to the neighbourhood in its own right and has been conceived in such a way that the area will not appear incomplete if only a portion of the overall plan is realized. This structure ensures flexibility and enables the design to adapt to evolving needs and broader societal developments. The remainder of this chapter discusses these steps in the order in which they are most likely to be implemented.

In the design I propose I have taken in to account the interests of the stakeholders like the current residents. No major demolition of the existing housing stock is proposed. The design is not meant for implementation, its a thought experiment to test the findings of this thesis, and highlight possibility.



Design: Current situation



Design: Current situation

In addition to the analysis carried out in the previous chapters, two additional observations influenced the design process.

Neighbourhood of Islands

The neighbourhood is currently composed of nine distinct islands, each characterised by very different typologies and separated from one another by undefined spaces. At the centre of Kleinpolder stands a large educational facility that blocks the through-connection between the two linear shared-staircase apartment sections of the neighbourhood. In addition, extensive undefined open areas separate the high-rise parts of the neighbourhood from the medium-rise areas. A design approach focused on public-space quality and slow mobility is therefore necessary to address these spatial barriers.

Floor Space Index map of Kleinpolder



Map of barriers in Kleinpolder

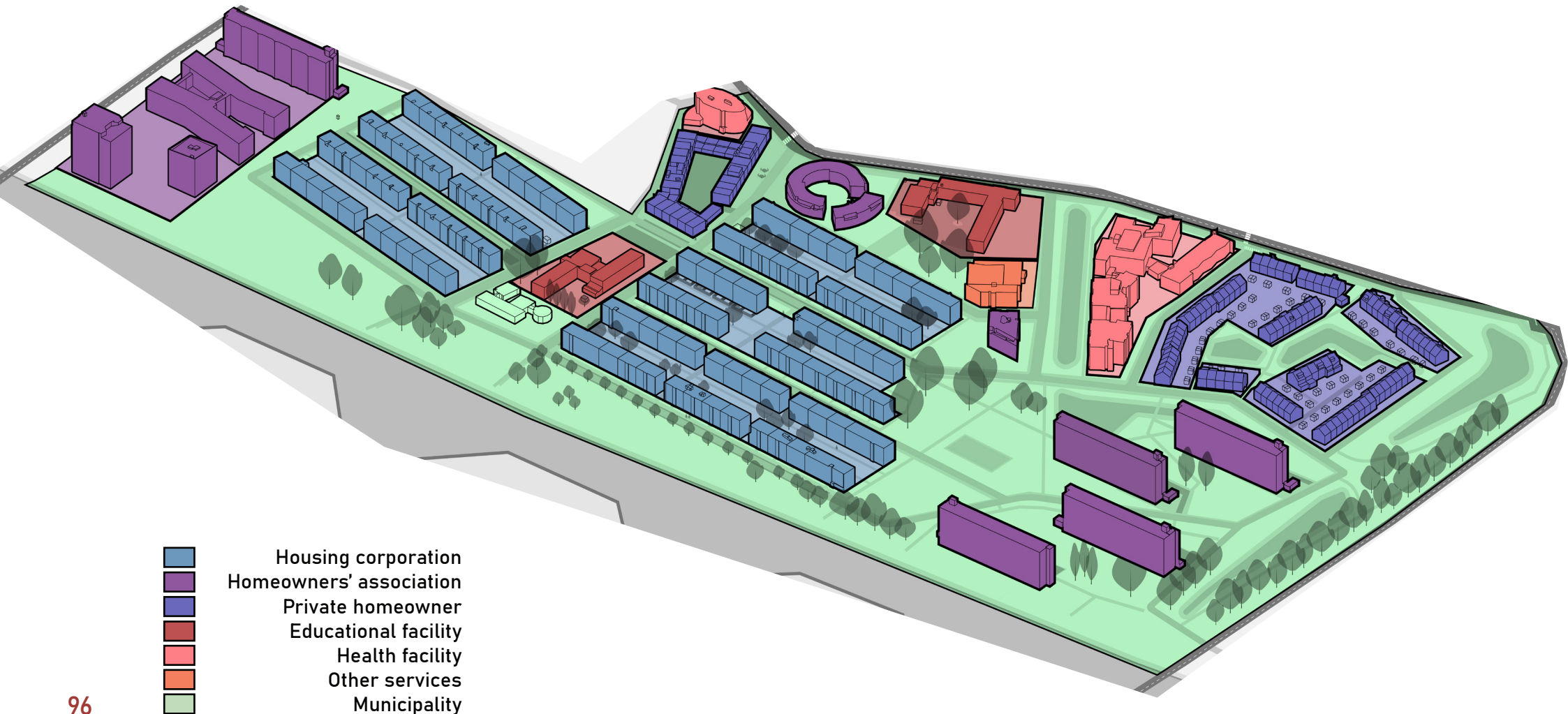
Density

Density in Kleinpolder is low compared with the other neighbourhoods analysed in this thesis. When measured using the Floor Space Index (FSI), these differences become apparent. Kleinpolder has an FSI of 0.65, while the Hugo-Breitner-hof and the Jedleseer Siedlung have FSIs of 0.78 and 1.05 respectively. This difference can be partly explained by Vienna's focus on increasing density during renovation—an approach not applied in the Dutch case. In fact, one of the most recent interventions replaced shared-staircase apartment blocks in the eastern part of the neighbourhood with low-density row housing, resulting in an FSI of 0.33. The part of the neighbourhood with the lowest FSI is the educational facility at its centre, which has an FSI of 0.27, with much of its surrounding open space underutilised.

Given this low FSI within a city facing a housing shortage, the neighbourhood presents a clear opportunity for densification.

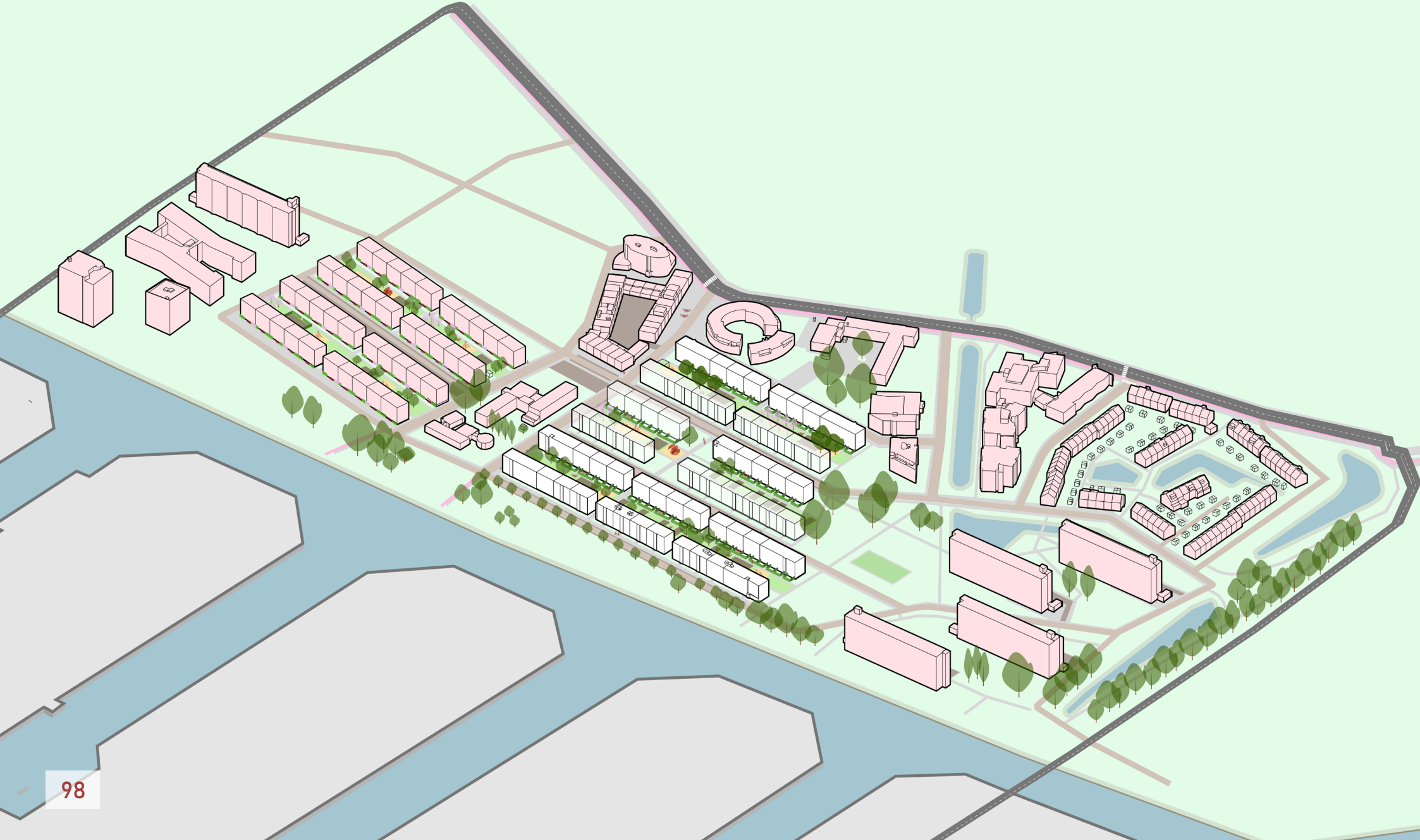
Design: Current situation

Land ownership



Design: Current situation

Design: Short Term



Design: Short Term

Low-Hanging Fruit

The first phase of the redevelopment focuses on interventions that can be implemented quickly to enhance the neighbourhood. To improve both public-space quality and safety, maximum heights for hedges and fences will be established. This ensures that public spaces remain visible from the ground floor, fostering a more open and secure atmosphere within the inner courtyards. Apartments with a front door directly on a sidewalk will get 50cm of space to use for benches and plants. This will improve public safety, spatial quality and will foster connections between residents.

The publicly accessible areas between the buildings will be made available to local communities, who may apply to use the spaces for urban agriculture, playgrounds, or other community-driven initiatives. These communities will improve the social cohesion in the neighbourhood

Improved public spaces



Current situation,
Source: Photo by author

Better use of public green space



Stakeholders

Current residents

The space given to renters offers an opportunity to improve quality of life but also comes with responsibility over that space.

Nearby residents

Nearby residents benefit from the improvements to the public space when they walk or bike by.

Housing Association

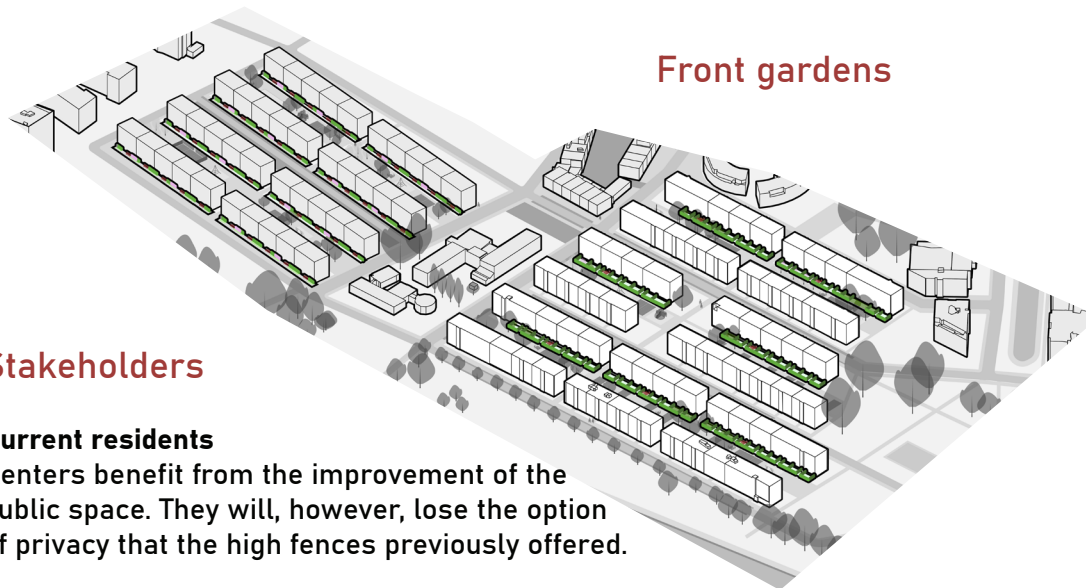
The Housing Association owns the property and must implement the intervention. If successful, the property becomes easier to manage.

Land Use

The Housing Association owns the land, allowing for easy implementation of local initiatives.

Financing

As the land is already owned by the Housing Association, start-up costs are quite low. When the initiatives are operating, these communities can become easy points of contact between the Housing Association and the inhabitants.



Front gardens

Stakeholders

Current residents

Renters benefit from the improvement of the public space. They will, however, lose the option of privacy that the high fences previously offered.

Nearby residents

Nearby residents also benefit from the improvements to the public space when they walk or bike by.

Housing Association

The Housing Association owns the property and must implement the intervention.

Municipality

The municipality owns the sidewalk in some areas and therefore must allow renters to use 50 cm of that space for the intervention to be fully implemented.

Land Use

The Housing Association owns the space and can allow local initiatives to use the land.

Financing

As the intervention is only regulatory, there are no financial costs.

Patterns used:

15: Active façades: This pattern is used because the back porches of the social housing blocks currently form a barrier between the public and private space. It is used to form a private-public boundary zone that promotes social interaction between those in their porch and those on the street, and in order to facilitate more social control by opening sightlines from first-storey windows to the streets.

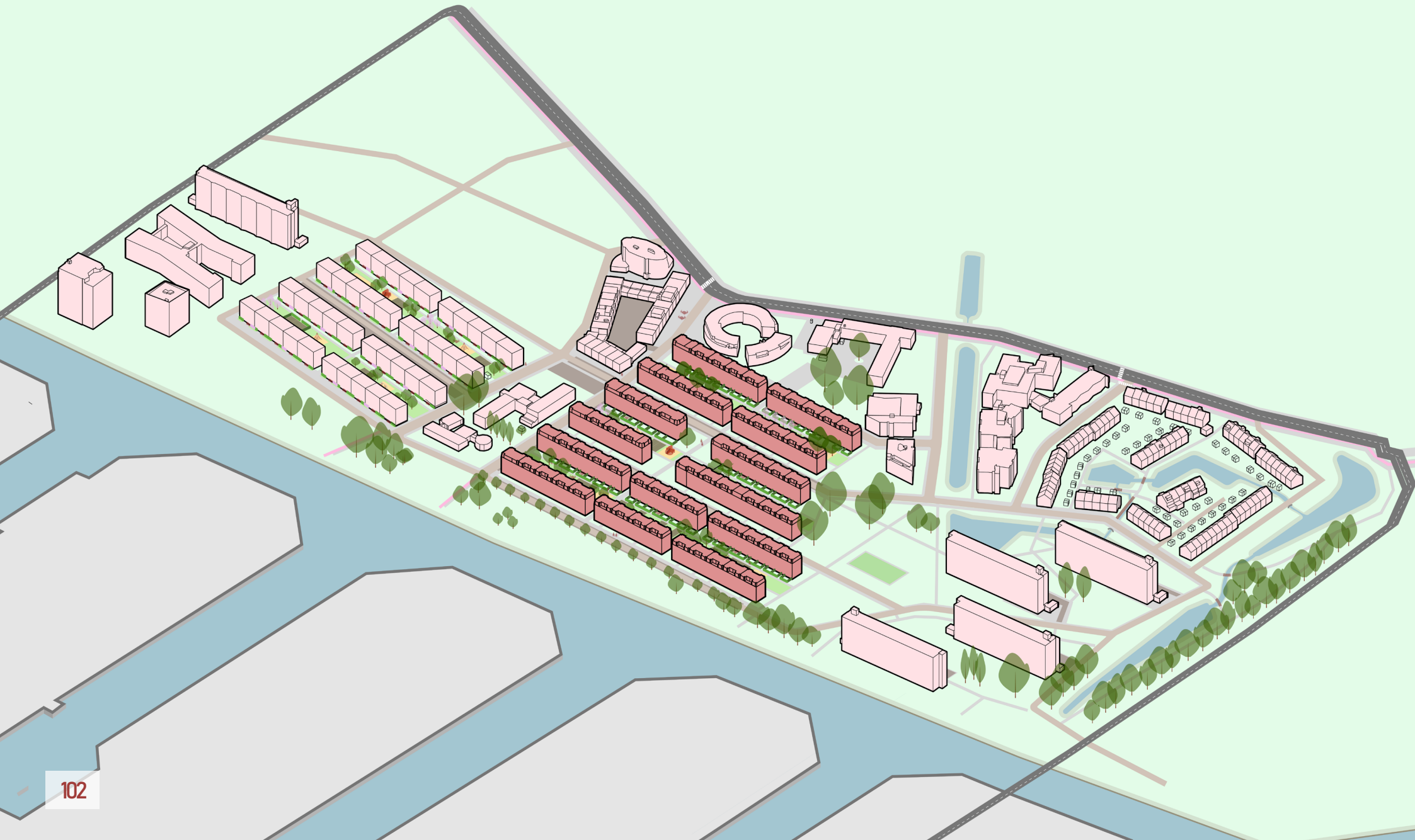
16: Active living: The active living pattern is promoted through the use of multiple patterns related to it, namely the places for young people to play, the spots for community gardens and the usable green space. These patterns promote more physically active activities in daily life, which will in turn improve the quality of life within the neighbourhood.

24: Places for young to play: New playgrounds are implemented because there is a lot of unused green space between the buildings. Places for young people to play are implemented through the addition of new playgrounds within the semi-courtyards between the social housing buildings. These playgrounds will not only improve the lives of the children who are able to play in them, but can also form meeting points for parents who bring their young children, and can thus promote social resilience.

27: Spots for community gardens: Community gardens are implemented because there is a lot of unused green space between the buildings. They will improve the social cohesion of the neighbourhood.

29: Usable green space: Usable green space is implemented because there is a lot of unused green space between the buildings. It is implemented through the use of the related patterns community gardens and places for young people to play.

Design: Medium Term



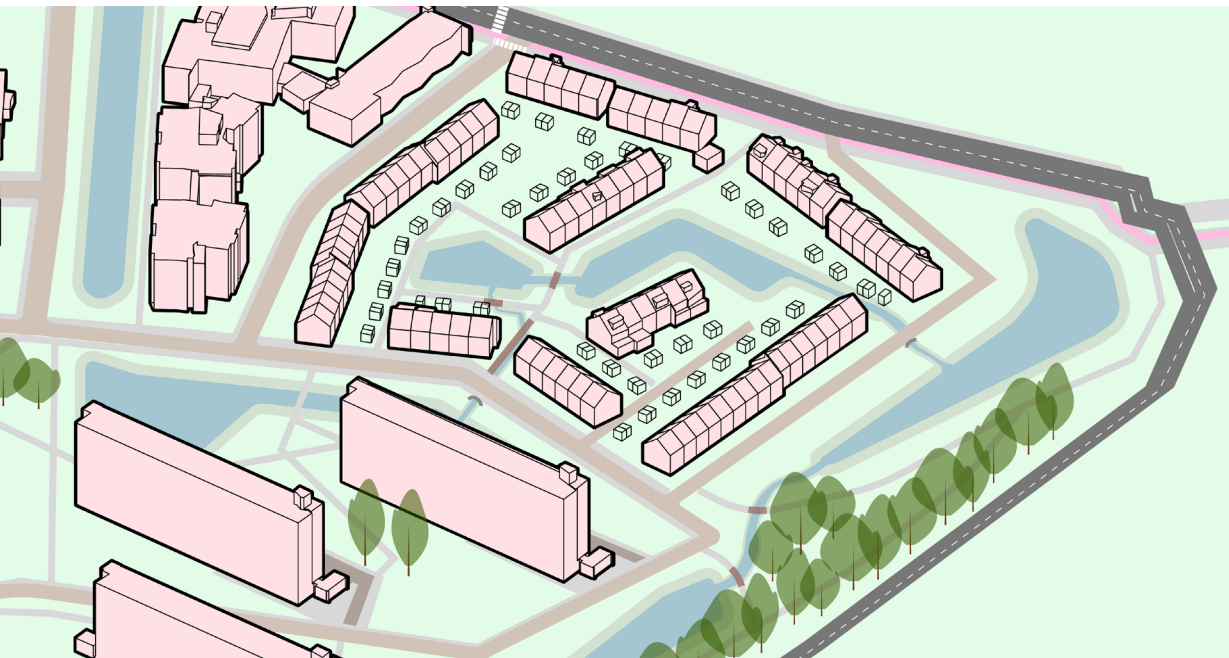
Design: Medium Term

First Major Renovation

The shared-staircase apartments in the southern part of the neighbourhood have not yet undergone major renovations to their façades and roofs. These buildings will require extensive work in the coming decade. When these renovations take place, an additional floor will be added to each building, which should be visually distinct from the existing façade. This intervention will help alleviate the housing shortage and enhance the quality of public space. Increased density will also support local shops within the neighbourhood.

In addition, the row-house section of the neighbourhood will be better integrated with its surroundings by opening the currently underground connections between the ponds. Exposing the water to air and sunlight will improve water quality, while walking paths integrated with these new water connections will create

Connected ponds by row-houses



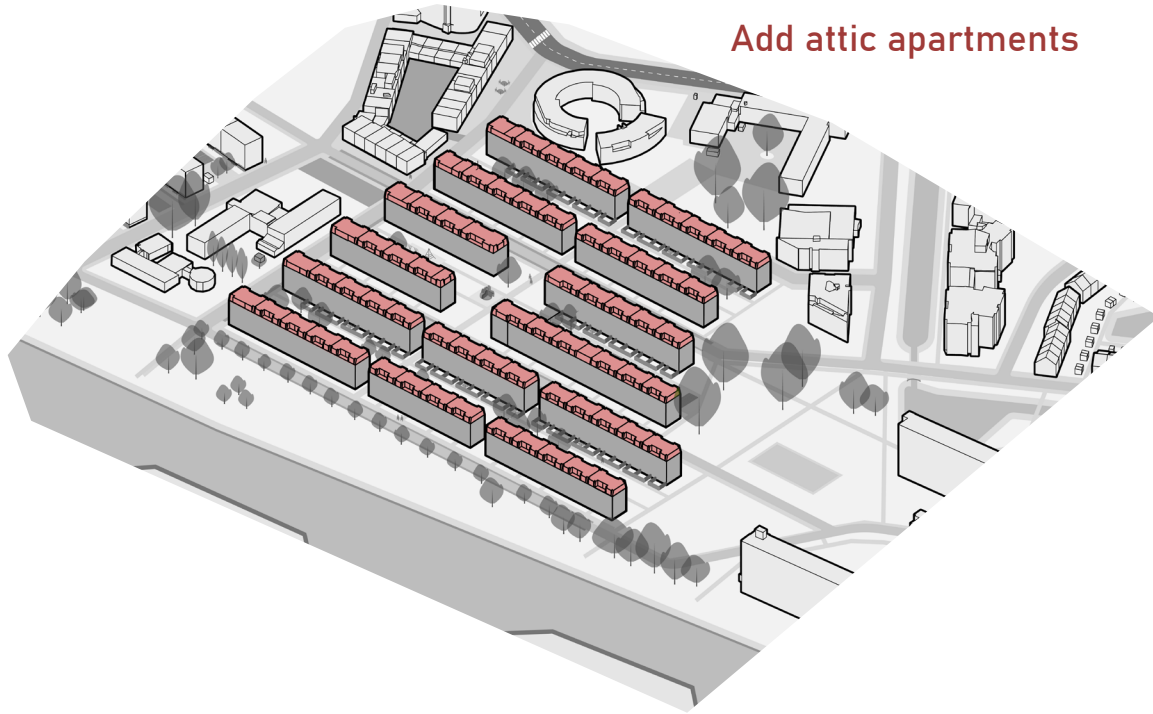
Visible addition of living space on the roof

Source: Photo by author

inviting spaces for afternoon strolls. As a result of this intervention, the ponds' spatial qualities will become an asset for the entire neighbourhood.

Design: Medium Term

Add attic apartments



Stakeholders

Potential new residents

New residents would benefit from additional available apartments, especially if the housing crisis is still ongoing at the time of construction.

Current residents

Current residents can benefit from a livelier neighbourhood that results from densification. Construction can, however, create a nuisance for current inhabitants, even when managed well.

Shop owners

New residents can become new customers for the shops.

Housing Association

Housing associations own the buildings that would be densified and therefore have to initiate the new construction.

Land Use

The Housing Association owns the building and could therefore add an extra floor.

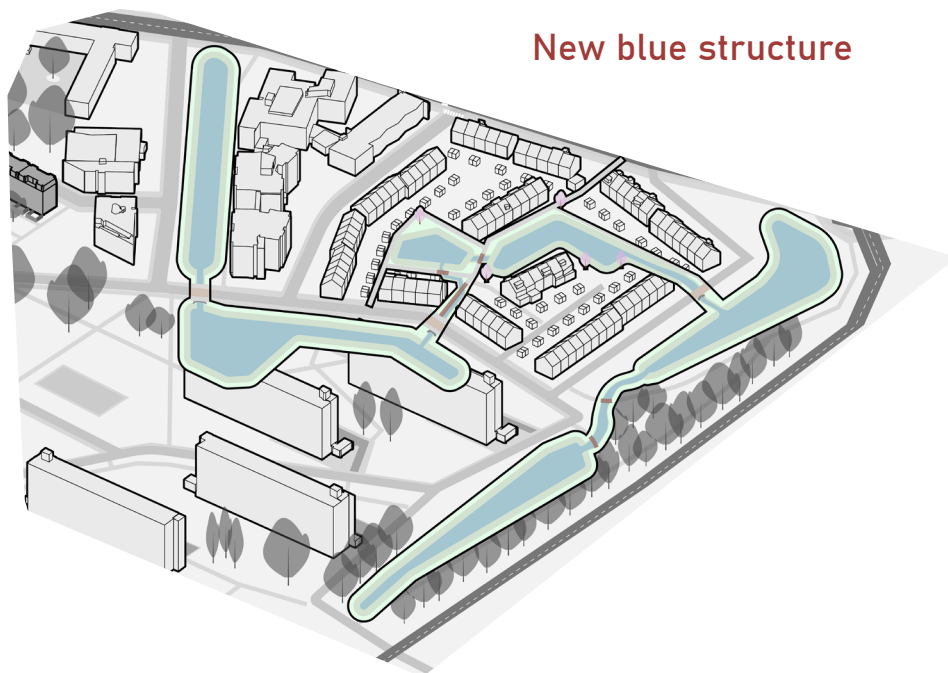
Financing

Currently, there is no strong monetary incentive for increasing housing stock in general, nor specific incentives for densification. In fact, housing associations lose more than 60% on investments in new low-income housing, according to a report from ORTEC Finance (2025). Policy should be adjusted to encourage the development of new housing, especially in existing urban areas.

Governance

Densification efforts often run in to problems with land rights and regulation. The municipality is addressing this so the issue should hopefully be solved by the time of the intervention.

Design: Medium Term



New blue structure

Stakeholders

Homeowners next to the water

The homeowners will benefit from the improvements to the public space. The space will, however, become less private.

Nearby residents

Nearby residents benefit from the improvements to the public space when they walk or bike through.

Municipality

The municipality owns the space where the intervention will take place. The improvements in water quality and biodiversity help the municipality reach its goals.

Land Use

The municipality owns the land and can therefore implement the intervention.

Financing

Public funds for improvements in water quality and biodiversity can be used for the intervention.

Patterns used:

2: Cohesion between policy and financing: This pattern is implemented because, in the current state, the financial situation regarding the construction of new social housing is a severe obstacle to achieving housing construction goals.

11: Increase housing availability: This pattern is implemented in order to alleviate the housing shortage in Rotterdam and to improve liveability by making businesses and investments more available due to the increasing population.

25: Slow transit: This pattern is implemented in order to stimulate more interactions on the street by those walking or biking to their destination. It will also encourage more active living and will thus contribute to living quality. In this stage, it is implemented through improvements in the public space design in the single-family ground-oriented housing part of the neighbourhood.

29: Usable green spaces: Usable green space is again implemented because of the under-utilised green space.

30: Visible roof layer: The visible roof layer is implemented in order to improve the aesthetic qualities of the built environment. It works well together with increasing housing availability through the addition of an extra floor layer.

Design: Medium Term



Design: Medium Term

From Barrier to Connection

The educational complex in the middle of the neighbourhood dates from the 1960s. As the building currently functions as a barrier between the northern and southern parts of Kleinpolder, and has a very low FSI, it should be replaced.

A new school will therefore be constructed in the open space in the southern part of the neighbourhood. The move to a new location allows for the construction of the new school while the old school still operates. In addition to housing the school, the new building will also accommodate a community centre, as well as shops and cafés operated by students, as is already the case today.

Architecturally, the new school building should be clearly distinct in order to serve as a landmark for easy navigation and to strengthen the neighbourhood's sense of place. The sections that

New connections within the neighbourhood



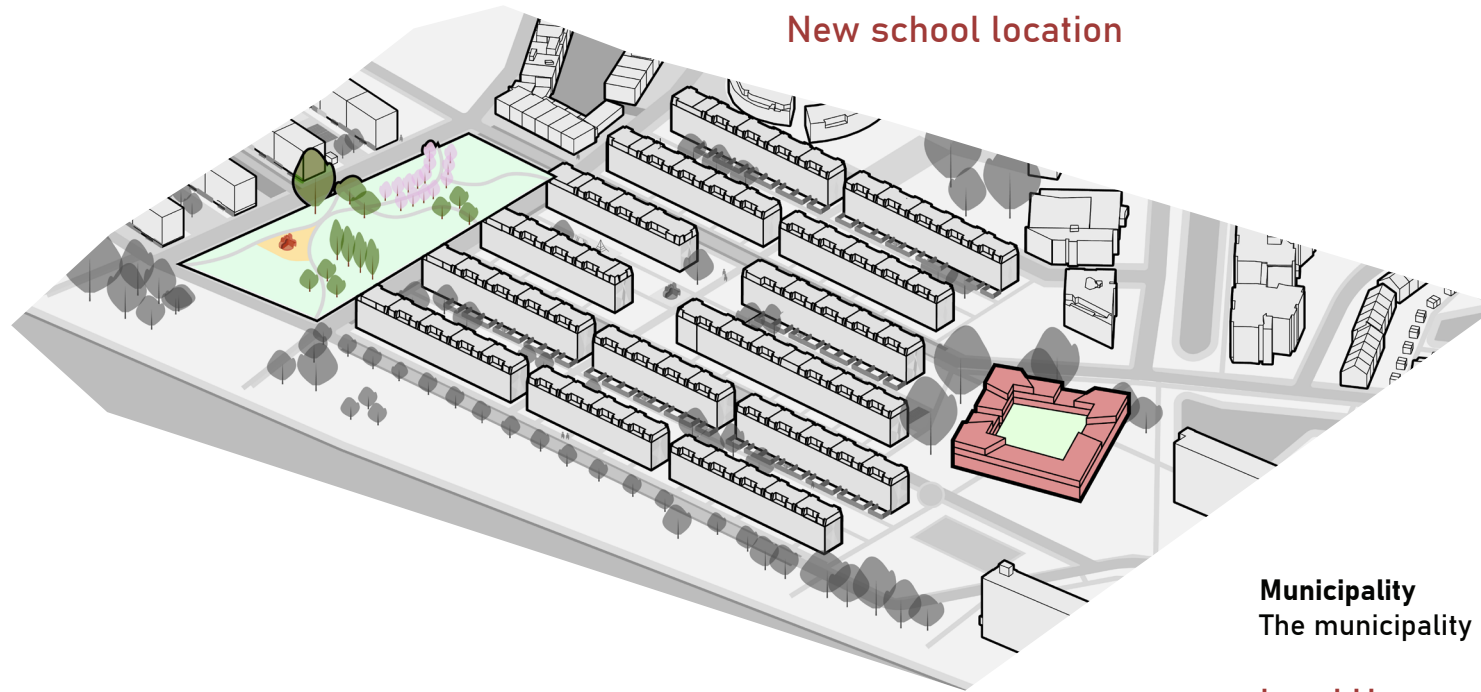
Reference image: Community/sport centre Het Anker, Zwolle

Source: Photo by author

are open to the public, such as the community centre and the shops, will feature an open and inviting façade.

With this intervention, two spaces that previously acted as barriers will become points of connection. The new park at the former school location will link the green spaces between the shared-staircase housing blocks, while the new school will serve as a connecting point between the medium-rise and high-rise parts of Kleinpolder.

Design: Medium Term



Stakeholders

Students of the school

A new school can improve the level of education. The move, however, can interrupt the functioning of the school.

School staff

School staff will also benefit from the new school.

Shops near the new park

Shops can get extra customers due to traffic generated by the park.

Residents near the new park

Residents benefit from the improvements to the public space that the new park will bring.

Municipality

The municipality must allocate space for the new school.

Land Use

The municipality owns the land where the school will relocate, facilitating an easy process.

Financing

The project is likely reasonably easy to finance, as the current school is nearing the end of its lifespan. Budget will be available for renovation or replacement.

Design: Medium Term

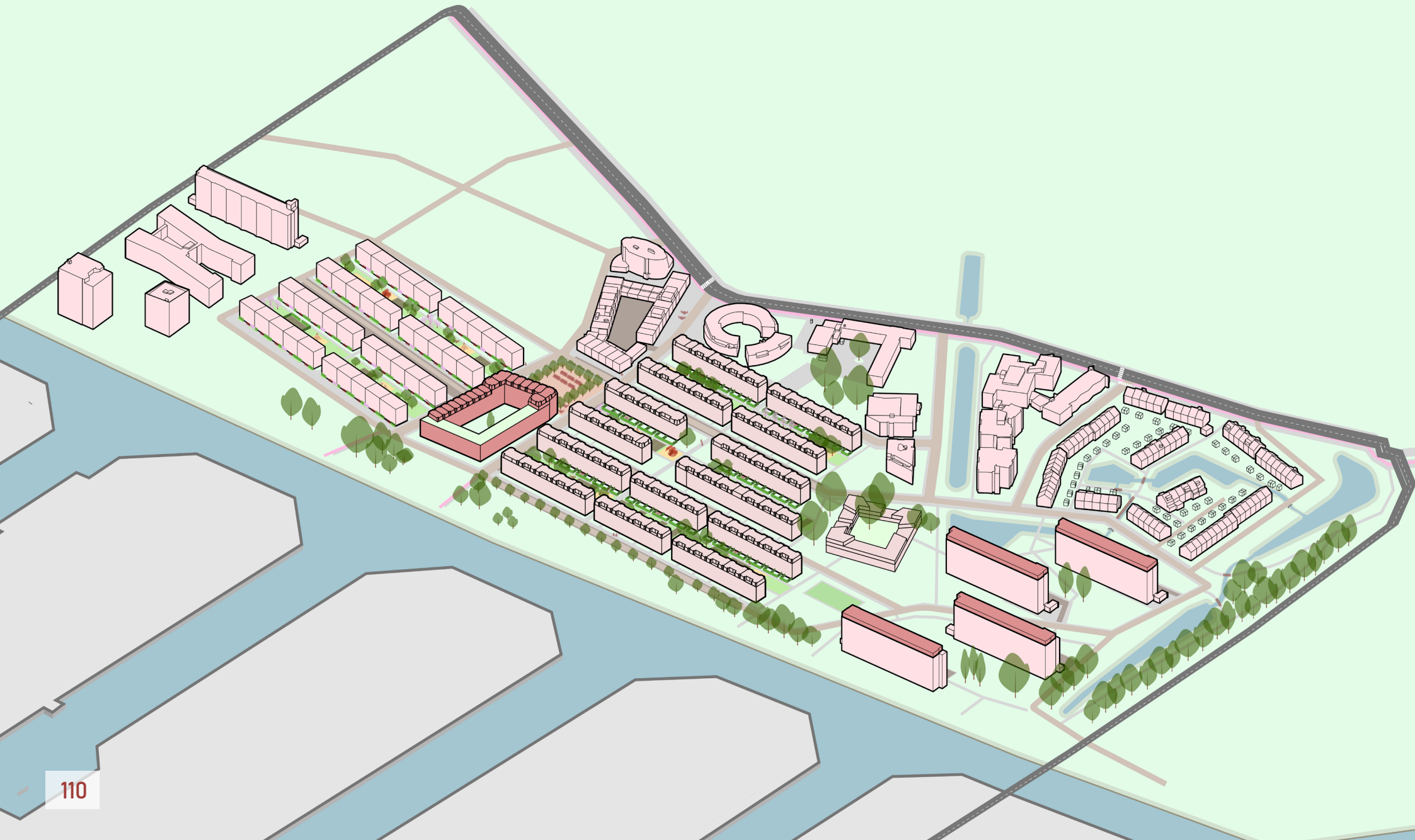
Patterns used:

12: Integration of facilities in the neighbourhood: Extra facilities are integrated into the neighbourhoods for the convenience of its residents and in order to improve life on the street by offering more destinations for slow transit.

25: Slow transit: Slow transit is again implemented in order to stimulate more interactions on the street by those walking or biking to their destination. It will also encourage more active living and will thus contribute to living quality. In this stage, it is implemented alongside the improvement of public space design by the construction of a new central park and a new landmark school for easy orientation.

29: Usable green spaces: Usable green space is again implemented because of the under-utilised green space. In this stage, a new park is constructed.

Design: Long Term



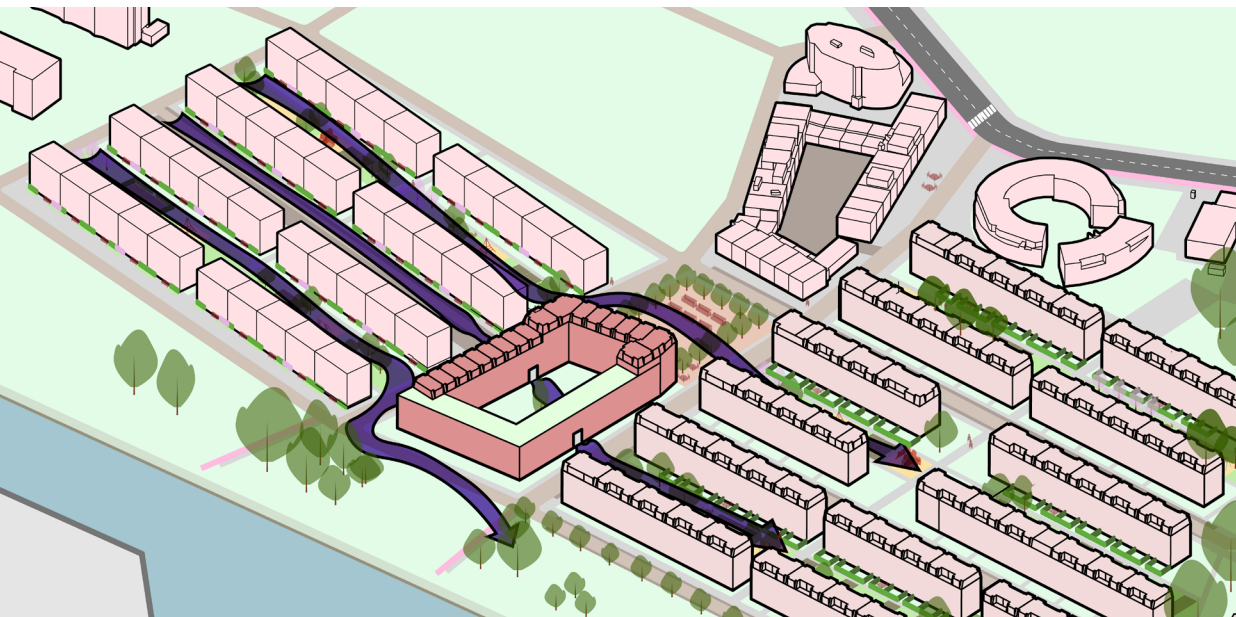
Design: Long Term

A New Block

If housing availability remains an issue in Rotterdam, a new housing block could be constructed on the open space left by the former schools. This building will improve the quality of the public space between the existing shared-staircase housing blocks by defining it with a clear boundary, and it will be designed to guide people either around it or through it. By intentionally interrupting sightlines, the building encourages slow movement and invites users to explore the area.



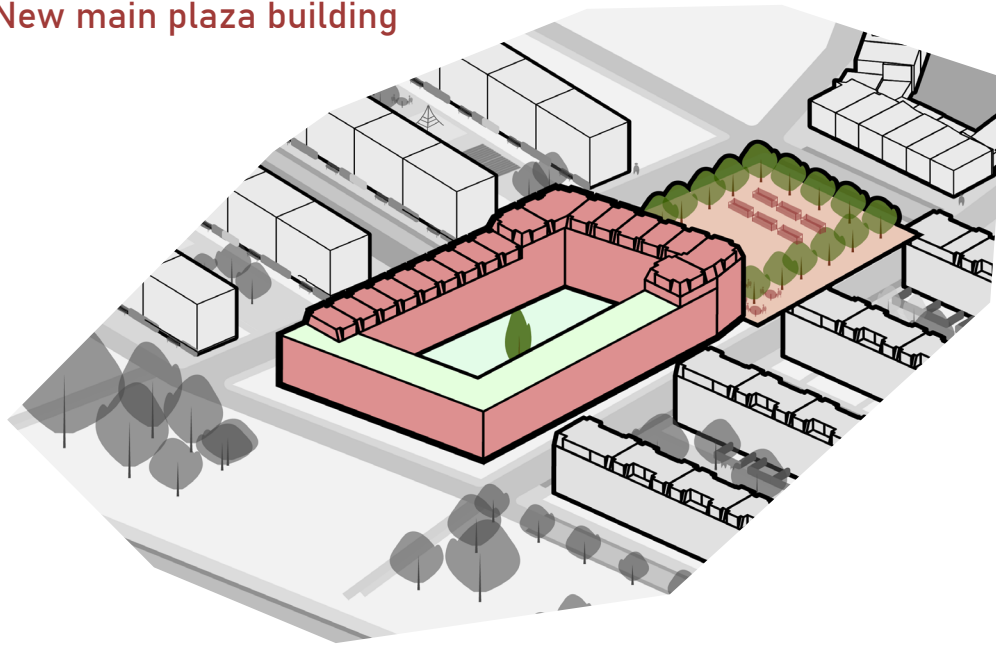
New connections within the neighbourhood



Current situation next to school

Source: Photo by author

New main plaza building



Stakeholders

New residents of housing

New residents would benefit from additional available apartments, especially if the housing crisis is still ongoing at the time of construction.

Current residents of the neighbourhood

Current residents can benefit from a livelier neighbourhood that results from densification. Construction can, however, create a nuisance for current inhabitants, even when managed well.

Business owners along the plaza

The plaza will generate traffic and customers, and can become a terrace, further driving revenue.

Housing Associations

Housing associations could build new housing.

Municipality

The new apartments can help the municipality reach its housing construction targets. The municipality will also control the land.

Land Use

The area where the new plaza and building block will go is currently owned by the school but will be exchanged for the new school location with the municipality. From a land ownership perspective, this project is therefore straightforward and reasonable.

Financing

The difficulty of financing new construction largely depends on the type of development. Due to the site's proximity to the centre of Rotterdam, a profitable private development is likely to be feasible. However, if the project is realised as social housing—that is, as new rent-controlled apartments—it is currently highly unprofitable. The ability to build for a broader target group could improve the financial viability of new construction. At the same time, private developments carry the risk of being unaffordable. In addition, their focus on short- to medium-term profits makes them less suitable as long-term partners for the municipality than social housing agencies have proven to be.

Patterns used:

8: Higher rent in the social/non-profit segment: Higher rent in part of the non-profit sector is used to finance the new construction of housing.

11: Increase housing availability: Increasing housing availability is done again to alleviate the housing shortage, and in order to improve the neighbourhood through a stronger base for services and by increasing 'eyes on the street'.

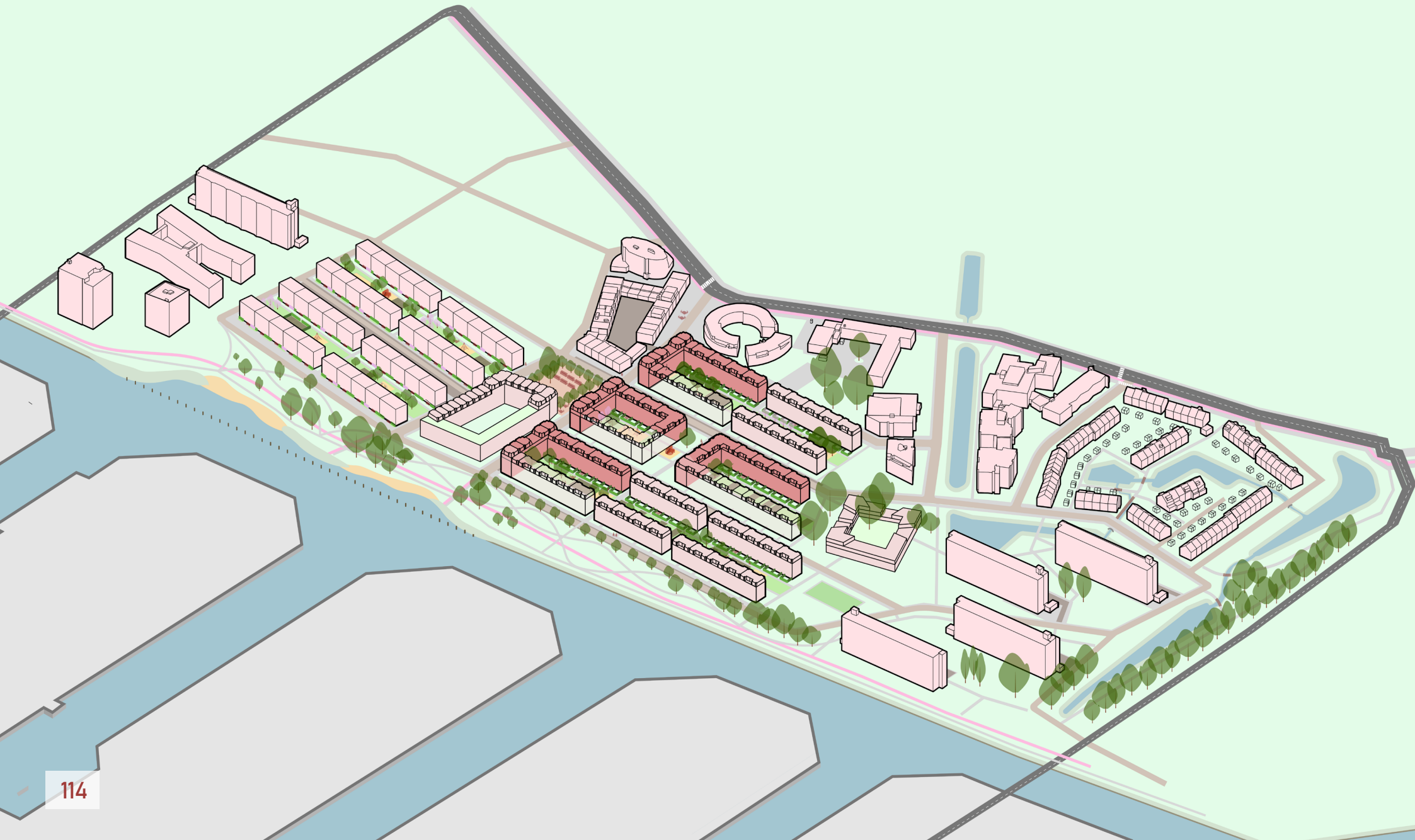
13: Mixed-use buildings Mixed-use: Buildings are introduced to meet the new demand caused by the increased housing density. Mixed demand will make efficient use of space by having housing above shops and cafés. Mixed-use also improves the liveliness of the street by generating traffic throughout the day.

14: No/limited loss on new construction: This pattern is used to facilitate the new construction of housing in the neighbourhood.

15: Active façades: Active façades are used to improve the perceived and actual safety in the neighbourhoods and to improve the quality of the public space.

19: Hof-like plazas: Hof-like plazas are introduced to improve perceived and actual safety in the neighbourhood and to enhance the quality of the public space.

Design: Long Term



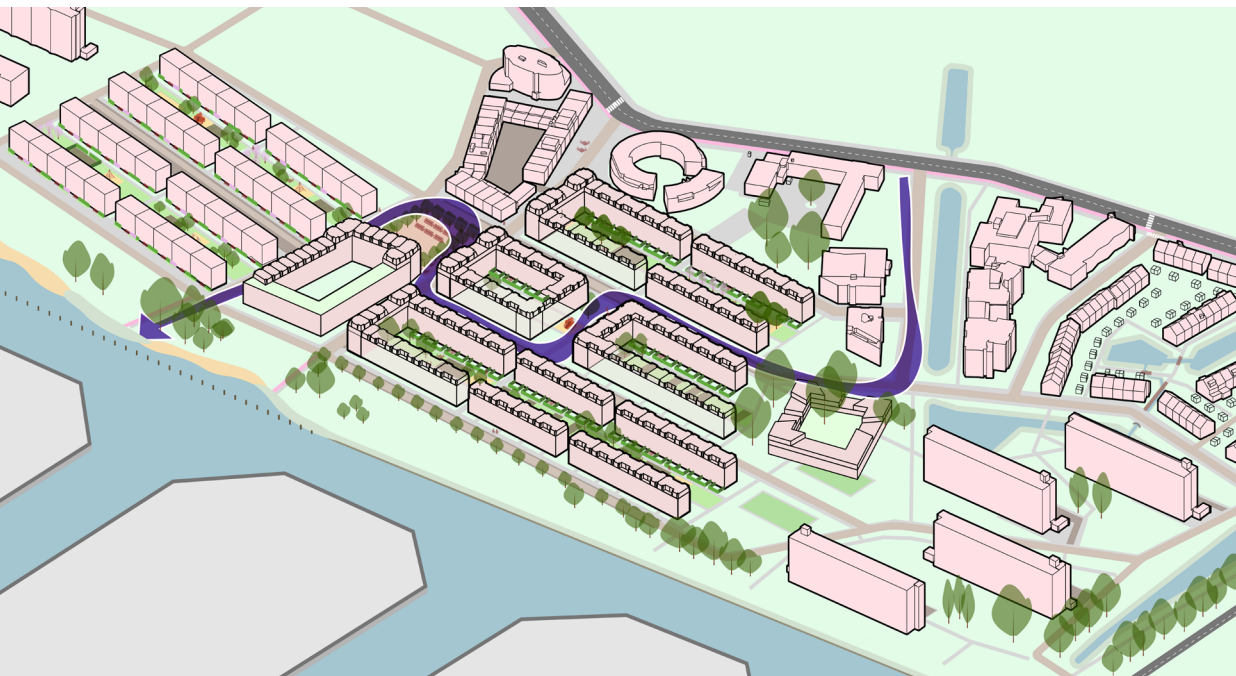
Design: Long Term

Further Densification

If the housing shortage persists, more extensive interventions in the existing urban fabric should be carried out. The shared-staircase housing will be reconstructed to form (semi-)closed blocks. These housing blocks will have active façades on all sides, thereby improving public safety. Shops on the lower floors—supported by the increased customer base resulting from higher density—will enhance the liveliness of the neighbourhood and function as focal points for the local community.

The public (semi-)courtyards will provide suitable spaces for playgrounds, as they will benefit from a high degree of natural supervision from the surrounding buildings. These courtyards will also create interesting routes through the neighbourhood for slow traffic, thereby encouraging pedestrians and cyclists to make use of them.

New route within the neighbourhood



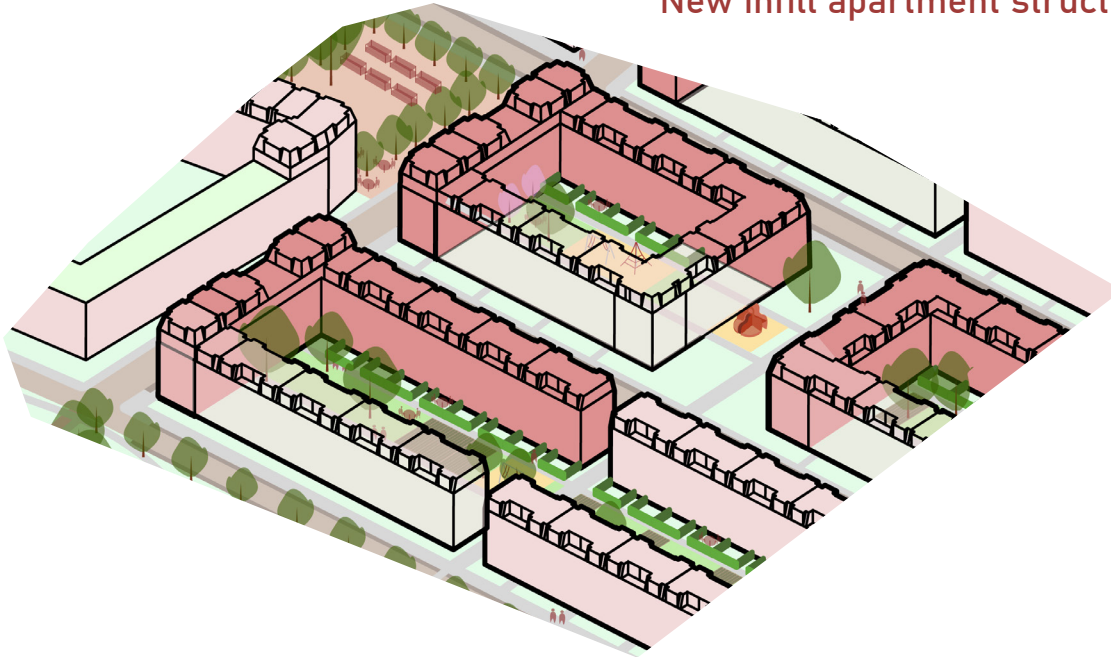
Reference image: mixed use

Source: Photo by author

These spaces will become inviting spaces for afternoon strolls. As a result of this intervention, the ponds' spatial qualities will become an asset for the entire neighbourhood.

Design: Long Term

New infill apartment structures



Stakeholders

New residents of housing

New residents would benefit from additional available apartments, especially if the housing crisis is still ongoing at the time of construction.

Current residents of the neighbourhood

The new building can improve the liveliness of the neighbourhood; on the other hand, construction may be a nuisance for those living nearby.

Business owners along the plaza

Additional housing will bring more customers to the local businesses.

Housing Associations

Housing associations can construct and manage the new apartments.

Municipality

The new apartments can help the municipality reach its housing construction targets.

Land Use

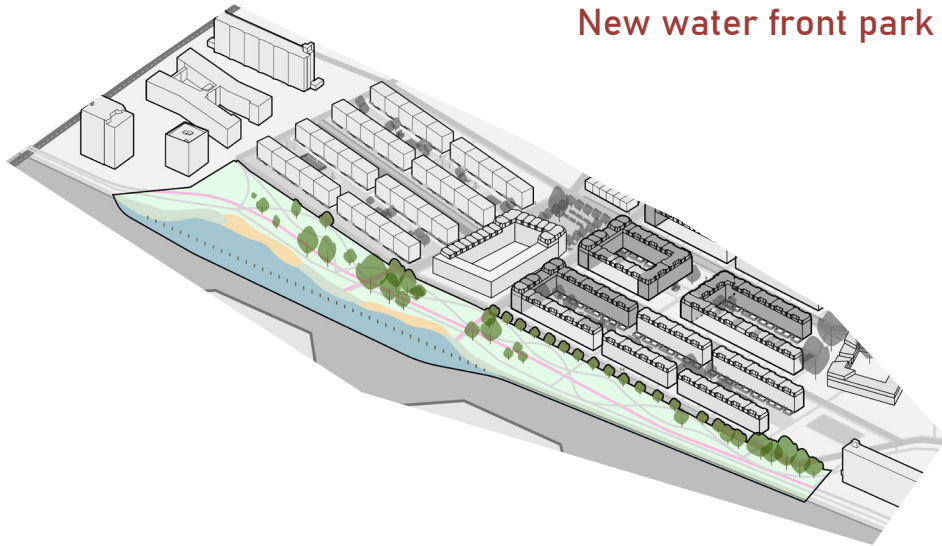
The area where the new plaza and building block will be located is currently owned by the school but will be exchanged for the new school location with the municipality. From a land ownership perspective, this project is therefore straightforward and reasonable.

Financing

As these buildings will need to integrate with existing structures, development costs are likely to be higher—potentially even higher than those associated with constructing a building block in the park. The challenges identified in the previous step are therefore also present here, to an even greater degree.

Design: Long Term

New water front park



Stakeholders

Current residents of the neighbourhood

Current residents can benefit from the improvements to the public space created by the new park.

Business owners in the neighbourhood

Additional housing will bring more customers to the local businesses.

Municipality

The municipality owns the space where the intervention will take place. The improvements in water quality and biodiversity help the municipality reach its goals.

Land Use

The municipality owns the land and can therefore implement the intervention.

Financing

Public funds for improvements in water quality and biodiversity can be used for the intervention.

Patterns used:

Same as in previous long term step:

- 8: Higher rent social/non profit segment**
- 11: Increase housing availability**
- 14: No/limited loss on new construction**
- 15: Active façades**
- 19: Hof like plazas**

Design: Conclusion

Opportunities

Spatial

The studied neighbourhood in Rotterdam already possesses several valuable qualities: ample green space, a waterfront, and some existing mixed-use development. Its proximity to the city centre suggests strong housing demand, which could further enhance the neighbourhood through both densification and direct improvements. Densification could increase patronage of local shops and provide additional financing opportunities for public space improvements.

The school building, currently the most under-utilized site in terms of ground use and serving as a barrier between the two halves of the neighbourhood, is approaching the age at which major reconstruction will become necessary. This creates opportunities for strategic relocation or re-development that could enhance both connectivity and spatial functionality.

Governance

Institutions such as the municipality and the social housing association are actively working to improve neighbourhoods and address the housing shortage. Examples include ongoing renovations, the establishment of a community centre, and municipal financial support for local initiatives. These engaged stakeholders are valuable partners in securing the long-term liveability and resilience of the neighbourhood.

Obstacles

The neighbourhood changes proposed here are largely dependent on the actions of a wide range of stakeholders. Residents, social housing associations, private investors, and municipal and national governments all influence the success of the project.

A key challenge, particularly for steps involving new construction, is the unprofitability of new social housing development, as described in the governance analysis chapter of this thesis. If this issue is not addressed at the national level, social housing agencies have limited capacity to mitigate the housing and affordability crisis in Rotterdam and the Netherlands more broadly.

Another obstacle is the current municipal housing strategy, which mandates that the absolute number of social housing units in the city should not increase and sets a neighbourhood target of only 35% social housing. Under these conditions, new construction will largely depend on for-profit investors, who are likely to either build to sell or rent only until the optimal selling moment arises—often just before major renovations are required. This approach poses challenges for long-term liveability and affordability, as the municipality lacks a long-term partner invested in improving the neighbourhood. Housing developed under such a model is unlikely to ensure sustained affordability in the same way that non-profit or tightly regulated limited-profit housing can.

A limited-profit housing model, similar to the Vienna system, could serve as a long-term investor for middle-segment housing, but proposals for such a model may not be politically feasible in the current Dutch context.

8

Conclusion, Discussion & Reflection

In this chapter, the key findings of the thesis are presented. First, the main research questions are addressed concisely. This is followed by a more detailed discussion of the broader conclusions and implications of the study.

Conclusion

Answers to research questions

1. What governance structures influenced the design and subsequent development of post-war social housing neighbourhoods in Vienna and Rotterdam?

In Vienna, a centralized governance system combined with a strict no-sell policy for municipally owned housing has resulted in neighbourhoods with minimal changes to their urban fabric over time. This centralization has likely facilitated the efficient implementation of densification efforts within municipal housing areas.

By contrast, Rotterdam follows a more decentralized governance model, where housing corporations, institutional developers, and owner-occupiers all participate in the redevelopment process. This has led to highly diverse neighbourhoods, both in terms of housing typologies and the provision of local facilities. This decentralized nature has on the other hand also obstructed densification efforts.

2. What spatial qualities—including the quality of relevant services—do the post-war neighbourhoods in Vienna and Rotterdam exhibit today?

The neighbourhoods in Vienna and Rotterdam exhibit distinct spatial qualities. Viennese neighbourhoods retain a more uniform and traditional design, featuring consistent architectural elements and clearly defined public spaces. Dutch neighbourhoods, having undergone substantial redevelopment, display a broader mix of housing types and integrated local services. This results in greater variety in building typologies and facilities, but also reflects the fragmented decision-making processes inherent in Rotterdam's decentralized governance approach.

3. What lessons regarding urban planning and management can be learned by examining the different ways in which the studied neighbourhoods in Rotterdam and Vienna have developed?

Policies intended to ensure that social housing reaches those most in need can sometimes have unintended consequences. In Rotterdam, national policy changes led to the demolition and sale of large parts of the social housing stock in the studied neighbourhoods, contributing to reduced density and increased reliance on private housing.

In Vienna, policies aimed at securing long-term, stable tenants for a broader target group have created resilient neighbourhoods, but they also risk under-serving the most vulnerable households. These cases illustrate the importance of carefully aligning governance objectives, eligibility rules, and market interventions to avoid negative side effects in both social equity and spatial development.

4. How could the lessons regarding design and governance be implemented spatially in a neighbourhood in Rotterdam?

Several qualities observed in the studied neighbourhoods can be spatially adapted to Rotterdam. Improvements such as more active public spaces and small-scale mixed-use elements can be implemented without major reconstruction. Architectural features like the courtyard designs found in Vienna would require more extensive interventions, although partial adaptations could still enhance connectivity and spatial quality.

Addressing the absence of institutions capable of providing long-term affordable housing for the middle-income segment, however, would require substantial changes to the Dutch governance system.

Conclusion

Governance

The Viennese and Dutch models of social housing each exhibit distinct strengths and weaknesses. The Dutch model is particularly effective in facilitating access to housing for the most vulnerable groups in society. However, new developments are persistently hindered by a mismatch between policy ambitions and the financial resources committed to their implementation. As a result, housing construction consistently falls short of stated targets.

The Viennese model, by contrast, is accessible to a broader target group, which reduces the need for extensive social diversification programmes at the neighbourhood level. The inclusion of a higher market segment within the LPHA system means that housing providers are both able and required to develop financially self-sustaining projects. This has enabled them to consistently meet construction targets. At the same time, households with a low socio-economic status face significant financial and institutional barriers to entry and remain largely dependent on the short-term private rental market.

Initial Spatial Design

Although the neighbourhoods analysed in this study were all constructed in the immediate aftermath of the Second World War, significant differences exist in their spatial configurations. The Viennese neighbourhoods are characterised by a more traditional urban design, featuring gabled roofs and clearly defined squares that function as spatial focal points. In contrast, the neighbourhoods in Rotterdam reflect modernist planning principles, with flat-roofed buildings and more linear spatial structures.

Despite these differences, important similarities can also be observed. All neighbourhoods contain substantial amounts of green space and limit through-traffic by cars. However, the more traditional spatial layout of the

Viennese neighbourhoods appears to offer advantages in terms of spatial quality, legibility, and perceived public safety.

Spatial Development

The spatial analysis reveals two main differences in the long-term development trajectories of the neighbourhoods in Vienna and Rotterdam. First, the spatial structure, building typologies, and functional mix of the Rotterdam neighbourhoods have changed significantly since their initial construction. Large parts of the social housing stock were demolished and replaced by privately rented or owner-occupied row housing in order to facilitate social diversification. While this redevelopment improved aspects of public space quality by enabling the introduction of new services and amenities, it also resulted in a reduction of the social housing stock.

In Vienna, by contrast, no buildings within the studied neighbourhoods were sold or demolished, in line with policies governing municipally owned social housing. This policy is consistent with the limited need for diversification through redevelopment, as social housing is accessible to a broad segment of the population.

Second, the Rotterdam neighbourhoods experienced a reduction in density over time, as multi-storey apartment buildings were replaced by lower-density single-family housing. During earlier renovation phases, densification strategies—such as the addition of extra floors—were not implemented. Although densification has recently become a policy priority, efforts to facilitate this process remain ongoing.

In Vienna, density has increased through the maintenance of the existing housing stock combined with densification through the addition of attic apartments. This approach has not only contributed to alleviating housing shortages but has also improved neighbourhood liveability by increasing the customer base for local services and amenities.

Conclusion

These differences in outcomes are a direct result of the policy differences between the two cities. The right to sell of social housing providers and the allowable income groups, and subsequent efforts to diversify have played a very large role in the spacial development of the neighbourhoods.

Design

Lessons learned from the spatial form and facilities in all neighbourhoods can, to a relatively large extent, be used to improve spatial design in Rotterdam, especially regarding interventions in public space. Good governance practices are likely harder to implement, as they depend even more than spatial interventions on a large set of mutually supportive institutions and regulations.

Crucially, these findings demonstrate that pattern language as a design and reseach tool is well suited to addressing the complexity of post-war neighbourhood development, as it is able to capture and translate the interdependencies between spatial, social, and governance structures. Rather than prescribing fixed design solutions, the pattern language enables the formulation of interventions that respond to these relationships, making it an effective tool for guiding strategies aimed at improving liveability, affordability, and long-term resilience.

Key Challenges

In the Dutch context, new construction by social housing associations is often financially un-viable. Combined with the municipal target of maintaining a minimum share of 35% social housing within neighbourhoods, this means that future densification efforts will largely depend on private investors. Long-term planning with regard to affordability and liveability is more challenging under these conditions, as private investors frequently sell housing assets before the first major renovation cycle in order to maximise finan-

cial returns.

In addition, successful densification through vertical extensions—necessary to address ongoing housing shortages—remains heavily dependent on the effectiveness of current efforts to streamline planning and approval procedures.

Discussion

Limitations of the Study

The conclusions and recommendations presented in this thesis are shaped by several limitations. First, the research is based on a limited number of case-study neighbourhoods, which restricts the generalisability of the findings. While the comparison between Vienna and Rotterdam offers valuable insights, broader national and macro-economic factors may also have influenced the observed outcomes.

Second, the study focuses primarily on governance structures and spatial development, without conducting an in-depth financial or macro-economic analysis of implementing alternative housing models. As such, the feasibility of introducing cost-based middle-segment rental systems in the Dutch context requires further institutional and financial examination.

Third, causal relationships between governance differences and spatial outcomes, although strongly suggested by the analysis, cannot be established with complete certainty. Path dependency, demographic change, and broader housing market dynamics also have contributed to the divergent trajectories observed in the two cities.

Further Research

This study raises the question of whether the introduction of cost-covering rental housing, similar to the LPHA model in Vienna, can offer benefits beyond increased construction capacity. An important area for further research concerns the potential value of socially oriented, long-term housing providers in the middle segment of the housing market.

In contrast to private investors, such providers are more likely to retain housing stock over extended periods, thereby enabling long-term affordability, consistent maintenance, and stable neighbourhood development. Further research could examine whether the presence of such actors in the middle segment contributes to more resilient housing markets and neigh-

bourhoods, and how this compares to predominantly market-led provision.

Particular attention should be paid to the institutional conditions required to prevent mission drift and to ensure that investments in the middle segment do not undermine the provision of low-rent social housing.

Reflection

Societal Relevance

Housing is inherently political and ethically charged. Decisions regarding access to housing, eligibility criteria, tenure structures, and spatial planning directly influence life chances, social mobility, and spatial inequality. For this reason, research into social housing governance extends beyond technical policy analysis and engages with broader societal questions concerning equity, inclusion, and long-term urban development.

Although this thesis is unlikely to directly influence national policy debates, it contributes to the academic and professional discourse by combining governance analysis with long-term spatial development. By tracing how institutional frameworks shape neighbourhood trajectories over several decades, it demonstrates how governance structures can produce unintended spatial and social outcomes. In particular, the study highlights how eligibility rules, financial constraints, and the right to sell social housing have significantly influenced the development of Rotterdam's post-war neighbourhoods.

The comparative perspective with Vienna further underscores the importance of institutional stability, land policy, and cost-regulated rental systems in maintaining long-term affordability. The LPHA model illustrates how non-profit, cost-based rental housing can sustain construction capacity while retaining housing stock over time. This suggests that socially oriented, long-term housing providers can play a stabilising role in housing markets, particularly when supported by coherent governance structures.

Rather than prescribing a singular policy solution, this thesis highlights the structural conditions under which social housing institutions can contribute to long-term affordability, neighbourhood stability, and spatial quality.

Ethical Considerations in Spatial Design Proposals

This thesis includes a spatial design proposal for a neighbourhood that has already experienced substantial redevelopment and forced relocation of residents. Proposing spatial interventions in such contexts raises important ethical considerations.

Design is not a neutral exercise. Spatial proposals implicitly prioritise certain groups, densities, and forms of use over others. In the context of social housing — which disproportionately accommodates vulnerable households — the ethical responsibility of planners and designers is particularly significant.

The design developed in this study was intended as an analytical tool to explore spatial opportunities and governance constraints rather than as a prescriptive blueprint. However, any real-world redevelopment process would require meaningful participation of existing residents as well as consideration of potential future residents. Especially in neighbourhoods with a history of displacement, participatory processes are essential to ensure democratic legitimacy and social justice.

The ethical reflection therefore highlights the tension between analytical spatial exploration and the normative implications of planning interventions. Future research and practice should ensure that governance innovation and spatial transformation are accompanied by inclusive decision-making processes.

9

References

AI acknowledgement: AI has been used to improve grammar and spelling, and in the case of the wienerwohnen.at to navigate the website as the website lacks a comprehensive inventory of all housing projects mentioned on the website. All text were originally written by the author unless marked as quote.

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10 Appendix

Here the data gathered on the neighbourhoods in Vienna and Rotterdam can be found

Appendix 1 Data on post ww2 social housing neighborhoods in veinna

name	built year	Apartments	Neighbourhood number	type	Overall satisfaction with the residential area	Safety in the residential area	Connection to public transport	Shopping
Hugo Breitner Hof	1949-1956	1265		Low-rise 1403 Apartments	47,5	72,5	92,5	72,5
Siedlung Jedleseee	1949-1955	1246		Mid-rise 2106 Apartments	77,5	72,5	82,5	72,5
Theodor-Körner-Hof	1951-1955	1224		Mid-rise 502 Apartments	37,5	67,5	92,5	87,5
Salvador Allende Hof	1963-1968	1154		1102	62,5	57,5	87,5	82,5
Per-Albin-Hansson-Siedlung West	1954-1955	1099		Duplex 1005 Apartments	67,5	67,5	87,5	87,5
Am Schöpfwerk Alt	1951-1957	866		1202 Mid-rise Apart	47,5	57,5	92,5	62,5
Franz Novy Hof	1950-1954	793		Mid-rise 1603 Apartments	37,5	62,5	92,5	87,5
Oskar Helmer Hof	1960-1967	784		Low-rise 2101 Apartments	72,5	72,5	77,5	77,5
Kopenhagenhof	1956-1958	433		Mid-rise 1902 Apartments	67,5	82,5	92,5	82,5
Max Wopenka hof	1955-1957	371		Low-rise 1101 Apartments	42,5	67,5	92,5	82,5
Berlagasse 1	1962-1965	282		Low-rise 2101 Apartments	72,5	72,5	77,5	77,5
Mühlweg 43	1963-1965	273		Mid-rise 2101 Apartments	72,5	72,5	77,5	77,5
Berliner Hof	1955-1958	247		Mid-rise 1603 Apartments	37,5	62,5	92,5	87,5
Ernst Reuter Hof	1954-1955	200		Mid-rise 1201 Apartments	37,5	62,5	92,5	82,5

Source: Adapted from Troger et al. (2012)

Appendix 1 Data on post ww2 social housing neighborhoods in veinna

name	buit year	Apaatments	Nabourhood number	type	Proximity to green spaces	Offers for sporting activities	Overall housing satisfaction	Average
Hugo Breitner Hof	1949-1956	1265	1403	Low-rise Apartments	87,5	57,5	77,5	72,5
Siedlung Jedlesee	1949-1955	1246	2106	Mid-rise Apartments	92,5	62,5	77,5	76,78571429
Theodor-Körner-Hof	1951-1955	1224	502	Mid-rise Apartments	57,5	32,5	72,5	63,92857143
Salvador Allende Hof	1963-1968	1154	1102		92,5	72,5	87,5	77,5
Per-Albin-Hansson-Siedlung West	1954-1955	1099	1005	Duplex Apartments	92,5	77,5	87,5	81,07142857
Am Schöpfwerk Alt	1951-1957	866	1202	Mid-rise Apart	82,5	47,5	77,5	66,78571429
Franz Novy Hof	1950-1954	793	1603	Mid-rise Apartments	77,5	62,5	72,5	70,35714286
Oskar Helmer Hof	1960-1967	784	2101	Low-rise Apartments	92,5	42,5	87,5	74,64285714
Kopenhagenhof	1956-1958	433	1902	Mid-rise Apartments	92,5	67,5	82,5	81,07142857
Max Wopenka hof	1955-1957	371	1101	Low-rise Apartments	87,5	57,5	72,5	71,78571429
Berlagasse 1	1962-1965	282	2101	Low-rise Apartments	92,5	42,5	87,5	74,64285714
Mühlweg 43	1963-1965	273	2101	Mid-rise Apartments	92,5	42,5	87,5	74,64285714
Berliner Hof	1955-1958	247	1603	Mid-rise Apartments	77,5	62,5	72,5	70,35714286
Ernst Reuter Hof	1954-1955	200	1201	Mid-rise Apartments	77,5	47,5	62,5	66,07142857

Source: Adapted from Troger et al. (2012)

Appendix 1 Data on post ww2 social housing neighborhoods in veinna

name	buit year	Apaatments	Nabourhood number	type	Under 30	Over 60	people without Austrian or EU/EFTA citencenchip	People with university degy	Motor vehicles/100 inhabitants
Hugo Breitner Hof	1949-1956	1265	1403	Low-rise Apartments	32	26	20	12	40
Siedlung Jedlese	1949-1955	1246	2106	Mid-rise Apartments	32	25	16	8	45
Theodor-Körner-Hof	1951-1955	1224	502	Mid-rise Apartments	37	19	30	14	38
Salvador Allende Hof	1963-1968	1154	1102		33	23	16	6	45
Per-Albin-Hansson-Siedlung West	1954-1955	1099	1005	Duplex Apartments	28	38	15	3	42
Am Schöpfwerk Alt	1951-1957	866	1202	Mid-rise Apart	38	20	28	8	33
Franz Novy Hof	1950-1954	793	1603	Mid-rise Apartments	36	20	32	10	33
Oskar Helmer Hof	1960-1967	784	2101	Low-rise Apartments	35	19	10	10	52
Kopenhagenhof	1956-1958	433	1902	Mid-rise Apartments	32	26	17	19	37
Max Wopenka hof	1955-1957	371	1101	Low-rise Apartments	37	20	30	7	34
Berlagasse 1	1962-1965	282	2101	Low-rise Apartments	35	19	10	10	52
Mühlweg 43	1963-1965	273	2101	Mid-rise Apartments	35	19	10	10	52
Berliner Hof	1955-1958	247	1603	Mid-rise Apartments	36	20	32	10	33
Ernst Reuter Hof	1954-1955	200	1201	Mid-rise Apartments	36	19	32	10	31

Source: Adapted from Troger et al. (2012)

Appendix 1 Data on post ww2 social housing neighborhoods in veinna

Buurt	Woningen Tot	Apaatments Social	% Of total	Overall satisfaction with the residential	Safety in the residential area	Connection to public transport	Shopping	Kijkgroen	gebruik groen	Proximity to green spaces
Schiebroek	8274	4219,74	51	107	101	91	90	91	78	84,5
hillegersberg-noord (110-Morae)	4129	1445,15	35	162	137	84	93	94	80	87
Pendrecht	5590	3130,4	56	35	41	88	96	90	75	82,5
Zuidwijk	7094	4611,1	65	56	34	94	94	93	81	87
Kleinpolder	4027	2496,74	62	73	111	83	84	92	73	82,5

Source: Adapted from Wijkprofiel Rotterdam, n.d. and AlleCijfers.nl, n.d.

Appendix 1 Data on post ww2 social housing neighborhoods in veinna

Buurt	Woningen Tot	Binnen sport	Buiten sport	Offers for sporting activities	Overall housing satisfaction	Under 25	Over 65	People with a migration background	People with university or a advanced job education (HBO) deen	Motor vehicles/ 100 inhabitants	0-15
Schiebroek	8274	71	75	73	87	31,58048495	17,67455448	44	38	35,91002045	3500
hillegersberg-noord (110-Moroen)	4129	44	68	56	139	30,87697929	23,50791717	26	65	46,43118149	1735
Pendrecht	5590	35	71	53	65	25,70866142	12,55905512	77	13,1	35,67716535	1625
Zuidwijk	7094	35	71	53	57	29,36708861	17,10669078	67	17,1	39,18264014	2510
Kleinpolder	4027	50	53	51,5	68	30,58752271	18,71592974	66	23,1	64,55481526	1690

Source: Adapted from Wijkprofiel Rotterdam, n.d. and AlleCijfers.nl, n.d.

Buurt	Woningen 0-15 Tot	15-25	65+	tot	Column1	Column2	
Schiebroek	8274	3500	1905	3025	17115	5797	349
hillegersberg- noord (110- Moroen)	4129	1735	800	1930	8210	3708	104
Pendrecht	5590	1625	1640	1595	12700	4228	303
Zuidwijk	7094	2510	1550	2365	13825	4995	422
Kleinpolder	4027	1690	835	1545	8255	3657	1672

Source: Adapted from Wijkprofiel Rotterdam, n.d. and AlleCijfers.nl, n.d.

Appendix 1 Data on post ww2 social housing neighborhoods in veinna