

REVISITING
THE
MILLION
HOMES
PROGRAM

ADDRESSING SEGREGATION IN
THE MODERNIST SPACE
CONFIGURATION THROUGH A
CASE STUDY OF HJÄLLBO

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CHALMERS

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MPDSD: Architecture and Planning Beyond Sustainability

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ABSTRACT

KEY WORDS

SPACE SYNTAX ANALYSIS, SPATIAL SEGREGATION, MILLION HOMES PROGRAM, URBAN CONFIGURATION, MODERNIST PLANNING IDEALS.

The Million Homes Program (MHP) was a political initiative to build one million new dwellings between 1965 and 1975. Based on modernist ideals, and in the spirit of the industrialisation of the construction industry, the project successfully improved the living standard of urban dwellings. Simultaneously, the MHP areas faced considerable criticism from early on. Today, these areas are often stigmatised, and affected by segregation.

Measures to counter segregation tend to focus on breaking social-economical groupings by introducing new tenure or ownership structures, by construction, or by social interventions concentrated on one area or neighbourhood. The urban form is, however, often ignored. In this study, it is argued that segregation happens on a city scale and that the urban form plays a crucial role in the segregation patterns as it determines the physical connections in a city.

Simultaneously, modernist planning ideals pose considerable structural challenges as the street network configuration causes space and area segregation. Critique has prompted calls for the complete demolition and redevelopment of MHP areas for decades. However, in the interest of sustainability and the well-being of residents, such

radical measures are not a viable solution. Instead, this study advocates for sustainable interventions within and in connection to the MHP areas, recognising and preserving their existing qualities, such as green spaces and open areas.

Applying spatial analysis techniques, this research focuses on a case study of Hjällbo in Gothenburg to explore local circumstances and network-based interventions. These interventions address the challenges of adapting modernist urban planning ideals to contemporary and future urban environments.

The study consists of three interlinked parts. The first part deals with the general background of modernist city planning ideals and challenges, along with the local circumstances in Hjällbo. The second part focuses on interventions in the network configuration and their design in Hjällbo. The third part examines the materialisation of the new centralities. The aim is to develop and test a methodology to effectively tackle segregation challenges from a long-term perspective. Through a design case study, the alternative planning strategy is tested to pave the way for a planning procedure that addresses the root causes of segregation.



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Fig. 1. Facades, details and paths in Hjällbo.

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STUDENT BACKGROUND

MASTERS

2022-2024

Key projects for sustainable development in a local context

Social-ecological urbanism

Design and Planning for Social Inclusion

INTERNSHIPS

Chalmers
Summer 2023

January 2024

BACHELORS

Architecture
2019-2022

Human ecology and environmental science
2016-2019





Fig. 2. SCULPTURE BY PATH, HJÄLLBO.

CHAPTER I

INTRODUCTION

This chapter includes a framing of the thesis including a problem description, aim, research questions and delimitations.

INTRODUCTION AND PROBLEM DESCRIPTION

Swedish cities are becoming increasingly segregated, with living standards varying drastically within the same city or area, affecting the available resources, health, and quality of life of the inhabitants (Legeby, Berghauser Pont and Marcus, 2015b). However, a single area cannot be described as segregated; instead, the entire city experiences segregation, but the detrimental effects of segregation vary between areas and socio-economical groups. Legeby (2010) argues that segregation also includes access to people of diverse backgrounds and a diversity of amenities, in short, how people can move around. In contemporary planning, interventions to counter segregation is a prioritised issue. Still, urban form and design, apart from housing, are rarely included in the measures taken, and interventions are focused on a local realm rather than addressing the full complexity of the city (Legeby, 2010).

Areas originating from the MHP make up a substantial portion of Sweden's total building stock and tend to carry a stigmatized reputation, withstanding the worst of segregation's adverse consequences. Built initially to challenge alienation and support socio-economically "weaker" inhabitants, many of the MHP areas of today have a higher concentration of this very group (Göteborgs stadsledningskontor, 2023). Furthermore, the configuration of modernist planning has proven to give weak support for urban social life as these areas tend to be disconnected from the rest of the city and lacking concentrated movement patterns, offering weak support for social

life within the area (Marcus, 2007). Investment in the public space has also been limited, and the debate of the MHP is often affected by prejudices, with voices being raced to demolish or change the social structure of entire areas to press a restart button (Johansson, 2012). In my view, such an approach is not viable from a social, ecological, or economic standpoint and contradicts the essence of sustainability. At the same time, this thesis does not argue that these areas should be excluded from development. Instead, a different approach is needed, where the area's complexity and the value of a functioning public space is taken into consideration. The solution going forward should rather be an adaptation of the modernist urban planning principles to the needs of present and future urban environments.

The focus on the public space and urban form is relevant as it is where urban life happens. Urban life, in turn, is dictated by accessibility and movement (Hillier, 1996). This thesis intends to show that the anti-segregation initiatives thus need to be based on the study of the physical environment and focusing on the public space.

"Places are not local things. They are moments in large-scale things, the large-scale things we call cities. Places do not make cities. It is cities that make places."

Hillier, 1996, p.151

In this quote, Hillier addresses the complexity and interconnectivity of a city and the need for a multiscale perspective when working with places. The spatial configuration of a place strongly impacts the life lived in an area, and in the MHP areas, it has been the subject of debate and criticism (Legeby et al., 2015a). Yet, interventions addressing the spatial network and urban form have been neglected in Swedish anti-segregation planning (Legeby 2010). Instead, the focus of architectural interventions, has been confined to housing policies regarding forms of ownership (private or public rental, condominium housing or home ownership) and dwelling types and characteristics (such as building heights and apartment size).

Most current planning proposals addressing the MHP areas suggest new development in the form of the construction of new buildings (see Reuter Metelius et al., 2022). This thesis position is sceptical of the effectiveness of such measures as they do not address the configuration of space. Simply adding new housing to an area with inadequate service amenities does not address the root cause of the problems. This thesis will instead focus on how to challenge the disconnectedness of the network configuration locally as well as on a city scale to find efficient new connections and improve the quality and definition of public space. By enhancing the general interconnectedness of suburban areas, those areas can benefit from what the surrounding area has to offer, hence lessening the difference to the inner city. A polycentric city structure challenges

the idea of a single attractor and allows for investments to be spread over the network. From a local perspective, a more connected network within the area would ease exchange between different sections and potentially increase connections between people of diverse backgrounds. Being a more connected area, locally as well as globally, has significance for local life and creates new potential in the urban space (Marcus, 2007).

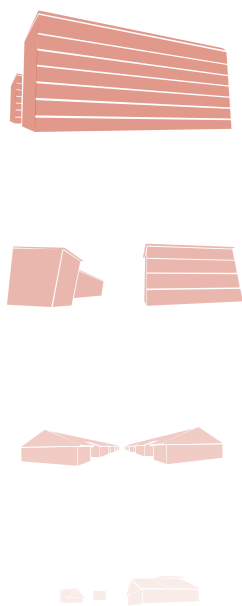


Fig. 3.
Typologies in
Hjällbo

AIM

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



Fig. 4,5,6. The UN SDGs 11, 10 and 9, official logos (United Nations, n.d).

This thesis aims to bridge the gap between social segregation and urban morphological studies on the one hand and city planning practice on the other. It is furthermore a critique of the current planning practice, that overlooks the role of the street configuration as a determinant of urban public qualities. Based on research on segregation and urban morphology by Ann Legeby, amongst others, the project aims design and demonstration a structure of work. To achieve this, I aim to shed light on the MHP structure. Hjällbo, in the northern part of Gothenburg, serves as a case study of an exemplary MHP project. The primary focus is on identifying and addressing urban network challenges while preserving the qualities of the area.

The spatial structure of the whole area is addressed by looking at the urban network, thereby paving the way for a new local context. This gives the area an opportunity for alternative development that tackles the fundamental challenges of disconnectedness rather than merely adding new housing. The outcome involves various scale interventions on the urban structure of Hjällbo and surrounding areas that can serve as a spatial guideline for addressing segregation challenges from the urban planning perspective rather than the housing perspective.

SUSTAINABILITY

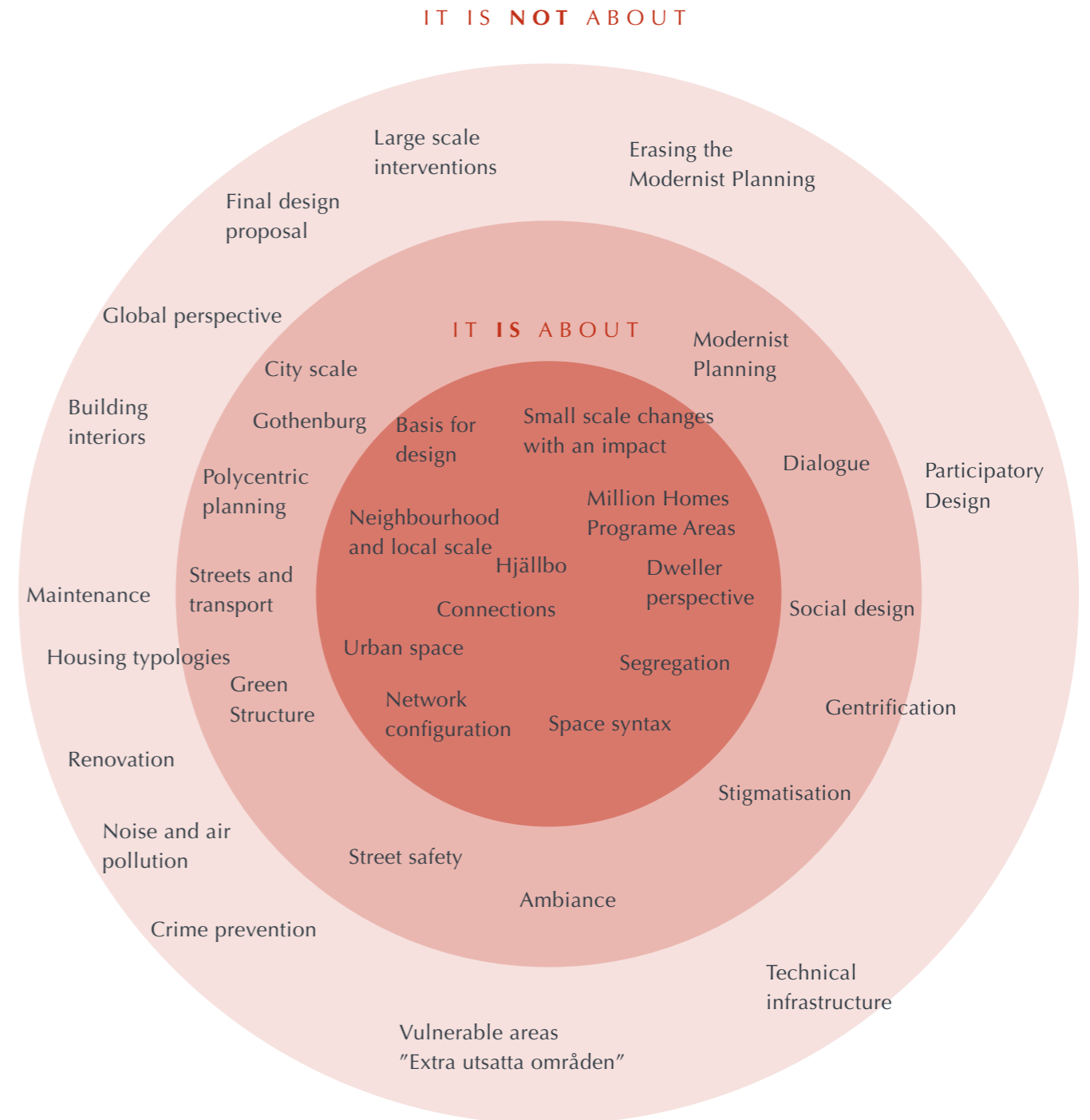
The project addresses sustainability on multiple levels, primarily by advocating for the preservation of existing structures as an alternative to demolition. Furthermore, it challenges stigmatisation of low-income areas and the uneven distribution of resources and investments in these communities. The project primarily aligns with SDG 11,

Sustainable Cities and Communities, which promotes equal access to amenities and sustainable development in low-income communities (United Nations, n.d). Additionally, my research addresses inequalities in the distribution of amenities and advocates for equality, directly supporting SDG 10's objective of reducing inequalities (United Nations, n.d). Finally, the emphasis on urban networks and development aligns with SDG 9, Industry, Innovation, and Infrastructure, which encourages innovative infrastructure and urban development practices (United Nations, n.d).

DELIMITATIONS

This thesis is intended as a design case study exploring the possibilities of a space analysis-based city planning approach. The results should not be viewed as a design proposal but rather as a case study of design interventions. The study focuses on feasible interventions in street configuration, exploring how the design of space can respond to new centralities. Emphasis is placed on the streets rather than the buildings, only touching on the interfaces between them; exploring typologies is therefore not a theme of the study. The thesis addresses the MHP with interest and does not intend to erase the mark of the era but rather adapt it to contemporary lifestyles. The focus is on tackling segregation, with gentrification emerging as a topic of discussion. Likewise, participatory design processes are encouraged but have not been an integral part of the thesis.

DELIMITATION GRAPH



Delimitation graph

RESEARCH QUESTIONS

Main question:

HOW WOULD AN ALTERNATIVE PLANNING APPROACH TACKLE SPATIAL SEGREGATION IN THE MHP AREAS, ADDRESSING URBAN FORM AND SPATIAL CONFIGURATION?

Sub questions:

What are the main spatial challenges of the MHP when adopting it to a contemporary context?

How can space analysis tools be employed to design interventions in MHP areas, using Hjällbo as a case study, that addresses the urban network challenges?

READING INSTRUCTIONS

The thesis consists of four parts

CHAPTER 1 INTRODUCTION

The general outline and premises for the thesis are drawn in the part you have just taken part in. The starting point and motivation for the thesis are presented.

CHAPTER 2 DISCOURSE

Here, I dig deeper into the foundations of the thesis. A background of the MHP planning is given. After that, the theoretical framework is provided, defining segregation and how it links to urban form. Space syntax is explained as the thesis's fundamental theoretical and methodological structure. Finally, the thesis methodology is presented.

CHAPTER 3 ANALYSIS

In this chapter, the analysis of citizen dialogue, site visits and development plans in Hjällbo are analysed along with space syntax analysis of the current and planned development of Hjällbo and its surroundings.

CHAPTER 4 DESIGN

The final chapter contain a breakdown of the design outcomes and a design case-study of Hjällbo. Followed by a discussion of the process, and the potential for an alternative workflow when addressing MHP areas.



Fig. 7. DETAIL IN ENTRANCE, HJÄLLBO.

CHAPTER II

DISCOURSE

This chapter provides a breakdown of the discourse and methodology. Hjällbo and the MHP are explained and contextualised, space syntax and the approach for this thesis are described, and the structure of the study is presented.

BACKGROUND

In the 1960s, the Swedish economy was booming, and industrialism paved the way for new inventions. Simultaneously, there was a shortage of workers, which resulted in a rationalisation of the building industry and increased immigration. Urbanisation, immigration, and many youths requiring housing led to housing shortages in urban areas. With overcrowding and poor housing conditions, the need for a diversified housing market, offering better standards and different-sized housing, was clear. This sprouted what was to become the “Record Years” and the MHP (Hall, 1999). The MHP started in 1965 with a goal to build 1 million new dwellings within ten years (Johansson, 2012). The proposition read: “The population shall be provided healthy, spacious, well planned and appropriately equipped housing of good standard at a fair price” (Prop. 1967:100. Authors translation). The prerequisites for the program were industrialised and large-scale production, governmentally funded and general subsidies, and non-profit building. During the Record Years, 1961- 1975, 1,4 million new dwellings were constructed.

In 1970, Sweden reached a financial stagnation and a halt in urbanisation at the same time as the group of youth diminished. Therefore, the need for the MHP stagnated, with housing surplus and empty apartments, causing a change in production to single-family homes (Hall, 1999). Suddenly, the public was offered the opportunity to choose where to live. Consequently, the reputation of an area became important, causing some areas to

be stigmatised (Theselius, 1993). The MHP areas were stigmatised early on and faced heavy criticism, spanning into today. The early critique regarded, to a considerable extent, the outdoor environment and design of the public spaces and aesthetics, describing it as monotonous and too large-scale (Hall, 1999; Legeby et al., 2015a.). Other witnesses acknowledge the qualities of the areas underserving their bad reputation (Johansson, 2012).

THE IDEALS

The MHP was based on modernist planning ideals including the Neighbourhood unit. These ideals consisted of separated city parts for specific social groups or functions and traffic separation, where motorised traffic was to be kept separated from the pedestrian movement (Legeby et al., 2015a.). The result was largely car-free housing estates surrounded by large-scale infrastructure, and under passages and bridges where the modalities meet (Stähle et al., 2020). The areas were designed to specific sizes, open spaces ratio and ideals for centrum planning, primarily catering to families with children and a vehicle-dependent lifestyle. Furthermore, sunlight and fresh air was promoted resulting in more open configurations replacing the dense urban block structures (Legeby et al., 2015a.).

THE RESULTS

In the report’s series, *Dela[d] stad* [Divided cities] Legeby et al. (2015a;2015b) describe the challenges in the MHP areas as spatial. The reports deal with the impact of spatial

planning and patterns of movement, on the standard of living and its influence on segregation on a city scale. The reports will serve as important insight and guideline for this thesis. The problems with the MHP areas that are highlighted are; not offering beneficial pre-conditions for public activity and hindering of the exchange between neighbouring areas. Thereby, limiting the mix of people from diverse backgrounds through the spatial configuration of the area. The shape and structure of the urban network can create both proximity and distance beyond the geographical distance. Additionally, it affects the distribution of resources, hence the social capital and development over time, making such interventions crucial when dealing with an urban environment. When these conditions are paired with limited resources, they seriously limit inhabitants’ opportunities (SOU 2020:46). Despite being a key factor in the success of urban planning, spatial configuration is an overlooked work field, resulting in counterproductive redevelopment measures (Franzén, 2009).

MHP areas are often described as segregated, where housing segregation can be linked to polarisation and social instability, leading to inequality and a dismantling of social welfare (SOU 2020:46). Here, architecture can have a direct impact due to its power over the public space and connections. In the MHP areas, interventions aiming to break segregation often have a local focus and have over the years since their construction resulted in a wide range of interventions, from large-scale

re-development or demolition to careful renovations. Early improvements to address the homogeneity and latent environments focused primarily on façade improvements, playgrounds, outdoor environment and decoration. Work was also, in some places, successfully put into improving citizens’ involvement and participation in the decision-making process with a positive impact on the general well-being (Legeby et al., 2015a). Over the years, development within and linked to MHP areas has sometimes changed the preconditions of the area. Some of these interventions are; introduction of large-scale shopping markets competing with the local markets or new development outside of the area which affects movement patterns and access to services. Changes in administrative borders and school policies also influence the local structure. In some places, the large-scale interventions consisted of renovations or demolition and tenure transformation from rented to privately owned, causing a complete change in inhabitants. Overall, few interventions have focused on the spatial structure of the MHP areas, even though it has been the focus of criticism by scholars and the public both within Sweden and internationally (Marcus, 2007).

This thesis has dived deeper into the preconditions of the MHP, in general, and of Hjällbo in particular, to identify spatial qualities and challenges as to develop plausible interventions.

THEORY

This section contextualise the discourse of this thesis by explaining segregation and its relation to urban form and the MHP. Furthermore, the concept of space syntax and

its role as an analytical tool, when working with spatial segregation, is explained. Lastly, design principles for improved public space are presented.

SEGREGERA [-grege´ra] verb
- avskilja; hålla isär olika folkgrupper:
en segregerad förort

“Segregate, to separate; keep apart different ethnic groups: a segregated suburb.” The definition of segregate in the Swedish dictionary SAOL. The definition links segregation to a housing area and ethnicity (Svenska Akademiens ordlista, 2015).

The dictionary definition of segregation is a separation of groups of individuals, relating it to ethnicity. As such, segregation can be defined as a socio-economic phenomenon involving poverty, unemployment, and ethnicity. A segregated society is, in short, a society with unequal access to resources (Integrationsverket, 2004). By defining borders between diverse groups in society, a social hierarchy or power dynamic is created, affecting the interaction between said groups (SOU 2020:46). The use and definition do, however, vary (SOU 2020:46).

The terms residential segregation and housing segregation are used in literature about the built environment. Both refer to the physical separation of the built form and focus on the statistical information related to the buildings. As a result, interventions are made on a building scale when applying this approach, ignoring the spatial layout of the built environment (Legeby, 2010).

SEGREGATE verb (by race, sex etc)
- to keep one group of people apart from another and treat them differently, especially because of race, sex, or religion:
a segregated school/society

Definition of segregate from the Cambridge dictionary (n.d.). The definition relates segregation first to discrimination and secondly to residential areas and ethnicity.

Legeby (2010) uses interplay segregation to describe the possibility of interaction (or interplay) in public space, and analysis that includes the location, accessibility, and movement in urban spaces. This thesis will use interplay segregation since it better captures the totality of urban life, not only the residence. When talking about segregation in this thesis, I hence refer to interplay segregation.

Segregation is commonly used as a description of a particular area or neighbourhood. Legeby (2010) argues that the description is sometimes stigmatising as it gets linked to a lack of education, prominent levels of unemployment, high dependency on welfare subsidies, problems with crime, alcohol and drug abuse and a high consolidation of ethnic minorities, portraying the area in an unfavourable manner. The MHP areas are often referred to as segregated or deprived areas (see SOU 2020:46). In this thesis,

segregation is instead understood from a city perspective, where no specific area is segregated, instead the city is segregated as a whole.

SEGREGATION IMPACT

In the act of dividing the city, segregation has a negative impact on society as it excludes parts of the population by granting different access to resources and opportunities depending on one’s home address. As a result, segregation affects societies negatively as it creates polarisation between groups and an unsafe environment with increased crime as well as threatening economic growth and challenging democracy (Integrationsverket, 2004).

On an individual level, segregation hinders integration and, by extension, creates unequal living conditions as access to, e.g. the labour market is affected as segregation restricts movement in and through space (Integrationsverket, 2004). Access to and through public space determines accessibility, subsequently causing areas with lower accessibility to be more dependent on local resources. Areas with fewer resources consequently become more vulnerable to having less accessibility to the rest of the city. In contrast, individual affluent neighbourhoods might, in some aspects, benefit from the segregation (SOU 2020:46).

Franzén (2009) highlights the importance of treating segregation as a city issue rather than an area-specific problem. This is acknowledged in segregation research since segregation is predetermined by the urban form, making all parts of the city a

part of the problem (Franzén, 2009; Hillier & Vaughan, 2007).

The link between segregation and urban form will be explained in the following section. As segregation increases the distinction between different areas it results in popular neighbourhoods obtaining a more exclusive character and less attractive areas receiving a socioeconomically disadvantaged population, including a higher number of immigrants (Legeby, 2010).

SEGREGATION AND URBAN FORM

From the discussions on segregation, it can be concluded that the urban form is more than just a neutral backdrop to urban life. When addressing segregation issues, however, it is often treated as such (Franzén, 2009; Marcus, 2007). As expressed by Hillier and Vaughan:

“The social city is either side of the physical city: it brings it into existence, and then acts within the constraints it imposes.”

Hillier and Vaughan, 2007, 206

There is, hence, a dual relationship between urban form and urban life where urban form draws the limits and offers the possibilities for urban life.

In contemporary descriptions, segregation is commonly portrayed as a social issue re-



Fig. 8. A problem description with focus on social status and social interactions results in interventions with a focus on residents.

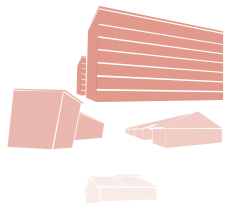


Fig. 9. A problem description with focus on typologies lead to interventions with a focus on buildings.

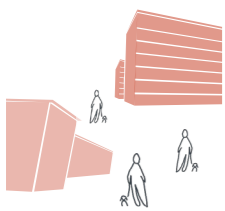


Fig. 10. A problem description with focus on the use of public space brings interventions with a focus on urban form.

lated to the social structure of a place, such as ethnicity, income levels and unemployment rates. Even though the social structure is an important aspect of segregation, it doesn't capture the full image (Franzén, 2009; Marcus, 2007). This is important to note as the problem description impacts on what solutions and possible interventions are proposed since it predetermines the focus of any action plan. (Legeby, 2010). In this thesis, the focus is therefore on the urban form as a playing field for integration and segregation.

Legeby (2010) describes a city as a combination of three layers: an infrastructural layer including streets and paths, a built layer of buildings and a social layer consisting of the population. The infrastructural layer makes up the base for the others that, in turn, determine how a building relates to other buildings, a neighbourhood relates to other neighbourhoods and areas to the rest of the city. The configuration of the streets is the system of links between places and thereby makes up the basis for movement, which in turn makes up most of the urban life (Hillier and Vaughan, 2007). The network can create both proximity and distance depending on its configuration (Marcus, 2007). If the network, and thus the movement, is disrupted it implies that distinct functions are separated from each other. It is hence not only the location that matters but also the relation between places, namely the space

“The constitution of space is governed by how the buildings (i.e., entrances and windows) relate to public space (streets, paths, parks, etc.) and this may influence on how secure, attractive, or interesting the paths are perceived.”

Legeby, 2010, 88

relations. As an extension, it can be said that different urban designs create different preconditions for urban life by isolating or including an area via the street network (Hanson, 2000).

Preconditions can, hence, be set not only by the layout of the streets but also by the relations between entrances, buildings, and roads. By extension it dictates the possibility for spontaneous interactions between neighbours as well as locals and non-locals (Hanson, 2000).

The street configuration eases or hinders accessibility to others as well as to resources in the city. Spatial configuration can be discussed on distinct levels of movement, such as local movement within a neighbourhood or global movement within the city or region. A place can hence be locally well connected but disconnected from the surroundings and vice versa.

“For example, how the built environment through its configuration can influence and create patterns of movement, patterns of co-presence in public space, as well as influence the accessibility to resources in the city.”

Legeby, 2010, 81

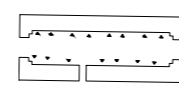


Fig. 11. Lack of support of the streets.

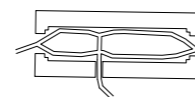


Fig. 12. Traffic separation.

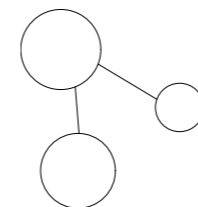


Fig. 13. Enclaves.

SEGREGATION AND THE MILLION HOMES PROGRAMME

The MHP was conceived as a social initiative aimed at addressing housing shortages and improving housing quality in the central parts of cities. It successfully achieved these goals, the program, however, yielded unintended consequences in its approach to overcoming vulnerability as it contributed to the first wave of segregation in the 1960s (Andersson 2007). From the beginning, segregation was perceived as a natural result of increased immigration, yet the risks of social exclusion quickly became evident (Legeby, 2010).

The Modernist planning ideals, rooted in the neighbourhood planning strategies that made up the basis for the MHP planning, were in turn based on an idea of separation of functions and uses, often with the new areas being internally car-free but surrounded by road barriers, with parking buffering between the buildings and the roads. The traffic separation caused movement within, to, and around the neighbourhoods to be separated from each other (Klasander, 2001). This creates neighbourhood enclaves with local services but disconnected from their surrounding (Klasander, 2001). Consequently, each enclave becomes reliant on services from within and for the population to support the continuation of these services, as few passersby are present to care for the space. This becomes especially harmful in areas with a population with less financial resources as there is less capital to stimulate the functions (Legeby, 2010).

Ultimately, the structure of modernist planning resulted in areas that were cut off from the rest of the city, causing segregation. From within the areas, the built structure tends to lack connection to the street and provides limited privacy in the inner parts, thereby erasing the hierarchise and clear boundaries between the private and the public space.

Consequently, the structure provides neither privacy nor commons, thus hindering activities in both spheres and leaving ample ambiguous space (Minoura, 2019). Furthermore, the buildings offer weak support for the street as entrances to each street are few (Minoura, 2019). The structure, as such, resulted in a shift, changing how people go about their day (Hanson, 2000). In conclusion, modernist and neighbourhood planning resulted in a decrease in urban life as the movement was scattered over a larger area with ambiguous limits of movement, consequently limiting the accessibility to others.

Even as there are many similarities in the structure and idea behind the MHP areas, they differ in local circumstances and conditions (Legeby, 2010). It is therefore important to always look at the local conditions when forming interventions, while acknowledging the systematic tendencies and challenges.

SPACE SYNTAX

SPATIAL CONFIGURATION is the relation, in form of paths, streets etc. between spaces (Hillier and Vaughan, 2007).

THEORY OF NATURAL MOVEMENT is the theory that the configuration of streets in itself guides movement (Hillier and Vaughan, 2007).

“However much we may prefer to discuss architecture in terms of visual styles, its most far-reaching practical effects are not at the level of appearances at all, but at the level of space. By giving shape and form to our material world, architecture structures the system of space in which we live and move. In that it does so, it has a direct relation – rather than a merely symbolic one – to social life, since it provides the material preconditions for the patterns of movement, encounter and avoidance which are the material realization – as well as sometimes the generator – of social relations.”

Hillier & Hanson, 1984, ix

WHAT IS SPACE SYNTAX

Bill Hillier and Julienne Hanson initially coined the space syntax concept in the early 1980s as a tool to understand the spatial configuration of built environments and their impact on human behaviour (Hillier & Hanson, 1984). At its core, space syntax proposes that the spatial configuration of a built environment influences social interactions, movement patterns, and other behavioural aspects (Marcus, 2007). It seeks to uncover the relationships between spatial layout, accessibility, and activities within a given space (Hillier & Hanson, 1984). Overall, space syntax offers valuable insights into the relationship between spatial layout and human behaviour, informing the design of buildings and cities that are more conducive to social interaction, wayfinding, and overall liveability. (Hillier & Vaughan, 2007).

The street is understood as the city’s core, providing space for co-presence and movement, two key features of public interaction. The focus on the social, instead of types and characteristics, distinguishes space syntax from other morphological approaches and provides an insight into segregating urban structures (Franzen, 2009).

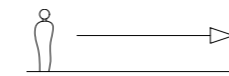
Overall, space syntax helps us understand how the layout of a building or a city affects how people use it. It is helpful for city planners and architects since it allows us to design with intention and create spaces that perform accordingly.

HOW IT WORKS

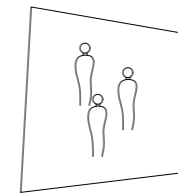
Hillier and Vaughan (2007) state that Space syntax is built on two principles. The first entails that humans and the environment engage in three distinct forms: movement that is primarily linear, along streets and paths, inter-human interaction, that mainly takes place in a convex space, where each point can see every other point, like squares, and finally, the view from any point make up a unique field of vision of varying shape and visibility, also called an isovist, effecting our experience of the former two (Hillier & Vaughan, 2007).

The second principle states that space will appear differently depending on where you are positioned and how the different spaces are configured (Hillier & Vaughan, 2007). Space is not only about the properties of the individual space but rather about how they interact (Hillier & Hansson, 1984).

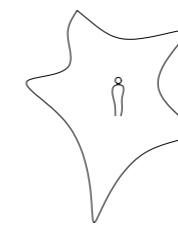
Fig. 14. Adopted from Hillier and Vaughan (2007)



Linear space



Convex space



Isovist

Space syntax analysis involves creating graphs representing spatial layouts, such as axial maps for cities or justified graphs for buildings. Nodes represent spaces or street segments within the environment, and lines represent connections between them, such as openings or intersections (Hillier & Iida, 2005). The analysis takes factors beyond metric distance into account, the number of turns and the angle of turns, which, to a greater extent than metric distance, influence human movement (Hillier & Iida, 2005). Highly integrated spaces with more direct connections tend to be more accessible and experience higher levels of movement. Thus, choice of path is not only based on what the shortest route is, but also on the structure and morphology of the path (Hillier & Iida, 2005). The space syntax model has, therefore, been weighted to account for these factors, providing a close estimation of movement in public space (Hillier & Vaughan, 2007).

Space syntax provides a quantitative prediction of movement and is, therefore, a powerful tool for urban planning as it can analyse and predict the outcome of changes in urban space. As such, it enables analysis of access to amenities as well as access to others, hence predicting the potential for urban life (see Hillier & Hanson, 1984, Hillier & Iida, 2005; Marcus, 2007; Legeby, 2010).

PLACE SYNTAX

Place syntax analysis expands upon the principles of space syntax by integrating the measurement of attractions alongside

distance. It offers valuable insights into the accessibility of different urban features and contributes to the development of more comprehensive architectural models of cities (Marcus, 2007).

“Using accessibility, a widely used spatial analytic measure defined as the relative ‘proximity’ of one place to other places, the place syntax tool uses space syntax measures of distance travelled (rather than the typical ‘as the crow flies’ measure) and/or amount of axial lines (which can be seen as a measure of how easy the distance is to navigate) to take account of how directly accessible the function is for the population available to use it.”

Marcus, 2007, 258

Place syntax tool (PST) is a specialised software tool, available as a plugin for QGIS, that integrates the accessibility research in Place syntax to measure physical accessibility to urban functions like local markets and parks. Unlike traditional distance measures, PST incorporates space syntax measures of distance travelled and/or the number of axial lines to assess how accessible a function is for the population. It relies on precise plot-detailed or address-point data on urban functions for analysis. PST analyses accessibility to urban space and specific content within it. This approach provides a more nuanced understanding of geographical data, allowing for representations of accessibility within a certain radius (Stavroulaki et al., 2023).

MEASUREMENTS

Hillier and Vaughan (2007) describe two primary forms of movement in the urban space: every trip is made up of movement through space and to a destination, hence a to- and through-movement. A main street has more through-movement than a back street since it connects to more paths. Furthermore, we are more likely to travel to a place that is near rather than far. The places closer to many other streets are thus more likely to have higher to-movement. As logical as the theory may seem, the intuitive answer does not always correspond with the measured results. (Hillier & Vaughan, 2007).

ANGULAR INTEGRATION is a measurement of accessibility of to-movement. In other terms, it assesses the proximity of each street segment to all others based on angular distance (weighted as previously mentioned). Resulting in a value of how accessible it is from all other segments in the configuration (Stavroulaki et al., 2023).

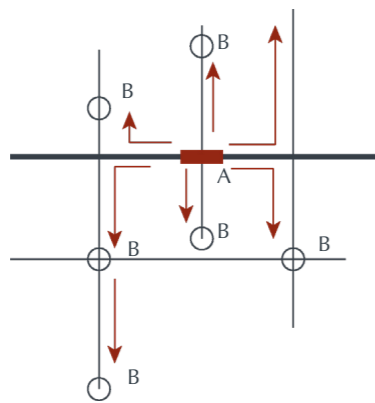


Fig.15. Angular integration is how easy it is to get from one street segment to any other. E.g. getting from A to B.

ANGULAR BETWEENNESS is a measure of accessibility for through-movement, meaning how often the analysed segment is part of the shortest path between different segments in the analysed network. In other words, how many of the shortest paths connecting pairs of street segments, in the network pass through each segment (Stavroulaki et al., 2023).

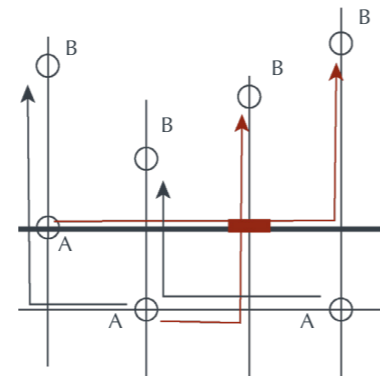


Fig. 16. Angular betweenness analyses how often one path is part of the shortest path when moving from A to B.

Integration gives an estimate of how easy it is to get from one street segment to any other, whereas betweenness analyses how often one path is part of the shortest path. Together, these measurements indicate the potential flow of people in each segment.

Urban accessibility primarily depends on the street network and the existence of services or other attractors (points of interest). For example, insufficient connectivity and lack of health facilities both hinder access to healthcare. Interventions can address either or both, depending on

what is missing. Two measures are applied in PST: Attraction distance and attraction reach (Stavroulaki et al., 2023). In this thesis Attraction Distance is employed.

ATTRACTION DISTANCE looks at the angular or network-distance to the closest attractor of interest, e.g., the nearest park from each street segment (Stavroulaki et al., 2023).

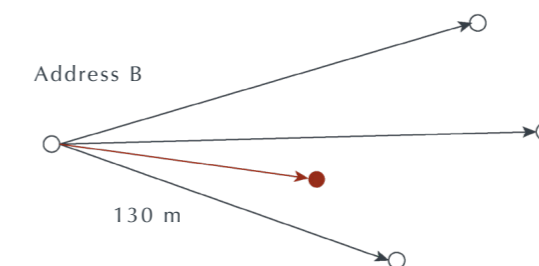
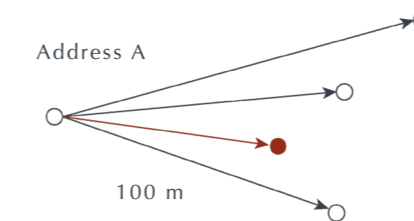


Fig. 17. Attraction distance is the distance from an address point to the closest, e.g. park. Adapted from Legeby et al. (2015c).

A SOCIAL CITY – MATERIALISATION OF A NEW CENTRALITY

In this section, theories by Minoura, Gehl, and the “Smarta Gatan design guide”, are brought in to complement the space syntax analysis. In effect, they are utilised to materialise the new connections and adapt existing situations to the new centralities. Franzén (2009) notes that even though space syntax deals with socio-spatial relations, it does not take into consideration the specific implications of the spaces, nor does it reflect how the social use is defined by the built-up area. Other complementary theories are required, the once guiding this thesis will be presented in the following section.

ting the possibilities for social interaction. Furthermore, segregation and the urban environment affect who people see and meet in their everyday lives, which in turn can foster or hinder a higher tolerance of others (Sennett, 1992). Gehl (2010) emphasises the presence of others as the most essential quality of a space as people attract more people, and activities make the space more attractive.

Gehl (2010) divides the activities in urban space into the following three categories:

NECESSARY ACTIVITIES relate to everyday tasks and past-times and are more or less compulsory. Examples include going to work/school, running errands or waiting for the bus. A majority of the activities in this category are related to walking. In general, individuals have limited power over these activities and influences from the surroundings are thereby limited.

OPTIONAL ACTIVITIES include most recreational activities, such as taking a walk, sunbathing, or standing and taking in a view. These activities are highly dependent on time, weather and foremost, place. They also primarily take place in attractive exterior environments.

SOCIAL ACTIVITIES refer to the spontaneous interactions between people. This includes activities such as children playing, communal activities and conversations or greetings, as well as passive interactions such as seeing and hearing others. These activities are linked to the other two as they

establish the preconditions for co-presence, which in turn creates the opportunity for social interaction.

In urban spaces of inadequate quality, the usage is often restricted to necessary activities. The time spent in the space is limited, since people will hurry up to spend less time in a space of mediocre quality. Spaces of good quality, on the other hand, create preconditions for all activities and invite people to spend more time in the space, independent of the activity (Gehl, 2010).

Gehl (2010) further divides the level of interaction from low intensity (seeing and hearing others) to high intensity (close friendships). Urban life gives an undemanding opportunity to see and interact with others. On an individual level, this counteracts loneliness and, as a society, creates bonds and understanding between individuals who otherwise would not have met. The low-intensity contact also provides an environment where other interaction can happen.

Ultimately, attractiveness of a space comes back to the preconditions provided by urban space. To help design qualitative urban spaces, Gehl (2010) has provided design principles that help create human-to-human interactions. The theories and design principles presented by Gehl will serve as guidelines for redesigning the public spaces in Hjällbo.

Fig. 18. Activities in urban space (Gehl, 2010).



Fig. 19. Level of interaction (Gehl, 2010).



High intensity/
Friends



Low intensity/
Passive contact -
seeing or hearing
others

DESIGN PRINCIPLES FOR ATTRACTIVE URBAN SPACES

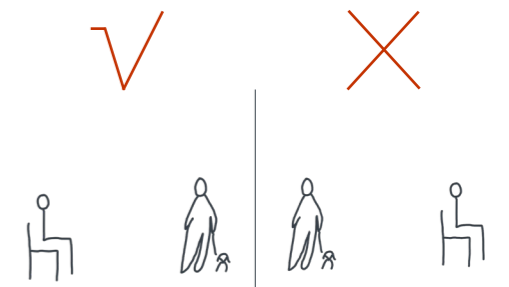


Fig. 20. **FACE THE ACTIVITY** – Place outdoor seating so that it faces the activity of passers-by, etc.

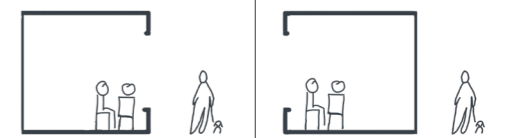


Fig. 21. **FACE THE ACTIVITY** – Let the windows and openings in the facade face the street to increase this low-intensity form of interaction.

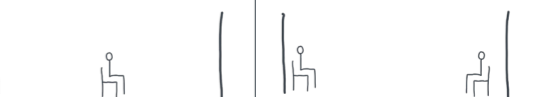


Fig. 22. **HAVE THE BACK PROTECTED** – Place seating so that it has the back against something to increase the user's comfort.

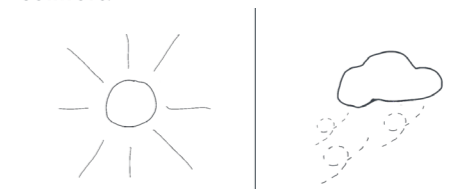


Fig. 23. **PROVIDE SHELTER** – A sunny spot protected from weather and wind is more likely to get used.

SMART STREETS – MORE THAN STREETS

The Design Guide for Smart Streets [Designguide för Smarta Gator] (from here on referred to as Smart Streets) (Ståhle et al., 2020) is a comprehensive resource on road infrastructure that advocates for streets' social functions by emphasising their potential as social spaces beyond transportation. For this thesis, they will serve as a basis when designing interventions of the street network in Hjällbo.

GOOD STREETS FOR A CONTEMPORARY LIFE

Increased transportation demand and urban density require prioritisation of walking, cycling, and public transport (Ståhle et al., 2020). Environmental changes demand better water and heat management, with streets, trees, and greenery playing crucial roles. Socially, unsafe streets prioritised for cars contribute to sedentary lifestyles and exacerbate societal trends such as segregation. Future changes require streets to integrate neighbourhoods, prioritise safety, and accommodate diverse lifestyles (Ståhle et al., 2020).

According to the design guide, good streets prioritise pedestrian comfort and vitality, featuring active ground floors with street-facing windows and entrances, seating areas, and greenery (Ståhle et al., 2020; Gehl, 2010). Enhanced safety is achieved through traffic-calming measures and pedestrian and bike-friendly infrastructure (Ståhle et al., 2020).

PRINCIPLES FOR SOCIAL STREETS

In this section a description of the key features from the design guide (Ståhle et al.,

2020) follows. With a focus on the distinct functions of the street that will serve as principles for the design work of this thesis.

PEDESTRIAN AREAS AND CROSSWALKS:

Pedestrians should take precedence in design, with a focus on vulnerable groups like children, the elderly, and individuals with disabilities.

- Paths should be safe and easily accessible, with space for rest, and functional in all weather conditions.

- Sidewalks should be provided on both sides of roads and wide enough for more than one person walking (min. 3m).

- Pedestrian crossings should be straight and short, or provide a median refuge.

CYCLING AREAS:

- Continuity and connectivity in the cycling network is essential.

- Separate one-way bike lanes should be provided.

MOTORISED TRAFFIC:

Requires safe integration with other users through measures such as:

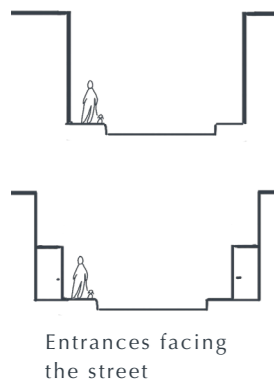
- reduced vehicle speed
- few and narrow lanes (3 meters),
- increased commercial activities along the roads,
- narrowing down or meandering lanes
- and, dedicated lanes for public transport should be provided.

In essence, the streets should be built for multimodality, providing safe passage for different modes of traffic. Furthermore, they should give space for ecosystems, including stormwater management and biodiversity preservation, as well as social functions,

Fig. 24. Hierarchies



Fig. 25. Street life

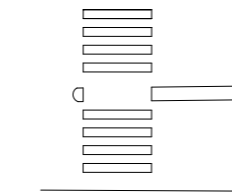


Entrances facing the street

Fig. 26. Pedestrian comfort

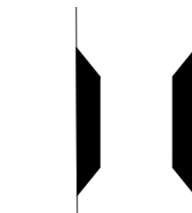


Seates should be provided along the path



Median refuge to cross between sidewalks

Fig. 27. Speed reduction

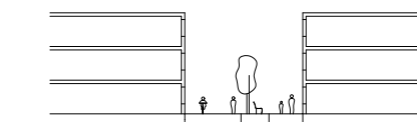


Narrowing down of lane

such as benches along the paths. This can be provided in flexible spaces between the road and the pedestrian paths. The road should be adaptable over time and able to be temporarily transformed.

The guide (Ståhle et al., 2020) presents four types of streets that should be present in a city.

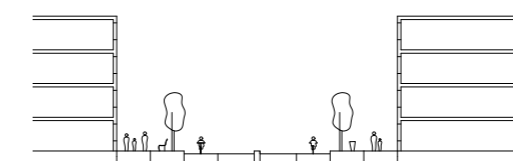
LOCAL STREETS



PEDESTRIAN- SPEED STREET

Fig. 28. Where all modes of transport share the same space, at a max speed of 10km/h and should make out a majority of the streetscape. It should be located in areas where children move frequently but with low traffic intensity. The entrance to the street should be clearly marked out and the drivable surface should be 3 m and meander. Preferably, it has one-way access.

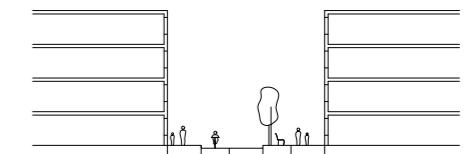
MAIN STREETS



MULTI-SPEED STREET

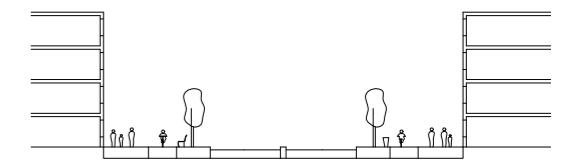
Fig. 30. Consists of three lanes in each direction, one for pedestrians (minimum 3m wide), one shared for cyclist and car traffic (3m wide and speed limit at 20km/h) and one for larger vehicles, including public transport (3,25 m and speed limit at 40 km/h). Public transport stops are placed between the two car lanes, and street parking is avoided. Flexible space with greenery separates pedestrians and other modes of transport. The multi-speed street functions like a boulevard.

To support the street the distance from the street to the building and distance between entrances depend on the location and are pinpointed in Smart Streets (Ståhle et al., 2020). In a central location entrance should be set back max 2 m and at 10m interval, whereas in a less central location the setback can be up to 3m and entrances up to 20 m apart (Ståhle et al., 2020). The entrance frequency relates to the plot structure where a variation can help promote a diversity in businesses (Hill, 2020).



LOW-SPEED STREET

Fig. 29. Pedestrian paths are provided on separate sidewalks, 3m in width. All other vehicles share space, with a max speed of 20 km/h and a two-way, 5m wide access lane. This should be the second most common street in the network. Flexible spaces are placed along the pedestrian paths and should include green space. Potentials for high cyclist movement.



HIGH-SPEED STREET

Fig. 31. Central lanes are for higher speeds, including public transport (3,25 m wide and a speed limit at 40 km/h). Cyclists and pedestrians are provided separate lanes (2,5 m and 3m) and are, in turn, separated from other traffic with flexible spaces, including greenery. This is the least prioritised street but provides good accessibility for public transport.

Fig. 32, 33. Photos from Hjällbo



Added high fences to create privacy.



Unused space between buildings due to lack of control.

MINOURA – CONTROL AND LEDGIBILITY FOR QUALITATIVE PRIVATE SPACE

Minoura (2019) argues for the importance of distinguishing between the public and the private. The appreciation and use of space are said to be determined by the spatial framing and clarity in borders between the two. In short, people want to know where they are welcome/unwelcome and what is theirs to claim/what is not. If this is unclear, it creates confusion and insecurity (Minoura, 2019). As a result, the uncertainty that emerges with unclear borders causes the use of space to diminish. This theory applies to all public, semi-public, semi-private and private spaces that can be seen in a city, hence, all streets, parks, residential courtyards, and private courtyards are included. The quality of these spaces has social consequences for the residents as it affects the feeling of safety, participation in, and responsibility of the urban space (Minoura, 2019). As stated by Minoura (2019), open spaces and residential courtyards, in urban settings have a crucial role in making it possible for more people to spend time outdoors. The time spent outdoors can, in turn, be linked to the activity level, especially for children and youth. As such, access to outdoor space can be related to the physical and mental health of inhabitants in an area. Minoura (2019) further argues that private residential courtyards and public parks are equally important as they for example provide different opportunities for recovery from stress.

According to the studies performed by Minoura (2019), there are two critical factors in defining space: capacity and control. Capacity refers to the size and spaciousness of the place, whereas control refers to the clarity of borders. Depending on the intended function of the space, different degrees of control and capacity are desired (Minoura, 2019).

When there is an unclear distinction between private and public, residents can feel a more substantial need to introduce distinctions of space in the form of fences, signs, etc (Minoura, 2019). In extension, these risks hurting the architectonic form since these barriers are not included in the original design. In modernist city planning, the distinction between private and public tends to be more fragmented as the buildings, streets and the ground itself have a freer relation to each other, in turn making the residential courtyards less defined. A tower in park and slab blocks, the most typical typology in modernist planning; has created spacious and bright neighbourhoods and buildings, but also inhuman spaces with long shadows from the high-rise buildings. Since these buildings often have windows in all directions, they require space around them, resulting in added buildings being forced to follow the same typology (Minoura, 2019).

Active activities, such as children playing and sports, are more likely to occur in public spaces, whereas stationary activities, such as eating and socialisation, are better suited for the more secluded and private

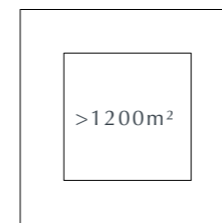


Fig. 34. A minimum size of a courtyard (Minoura, 2019).

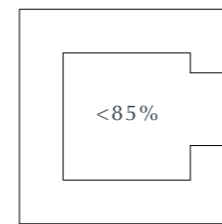


Fig. 35. Degree of openness for a courtyard (Minoura, 2019).

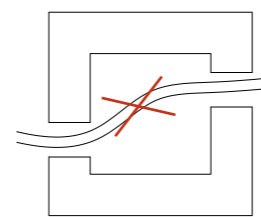


Fig. 36. Avoid paths through residential courtyards (Minoura, 2019).

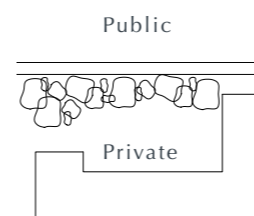


Fig. 37. Interfaces should be well defined (Minoura, 2019).

spaces. The requirement of space is hence dependent on type of activity, as well as, on what other surrounding spaces have to offer (Minoura, 2019). In this thesis the theories of Minoura will serve as a reference to both analyse the existing situation as well as to guide interventions when planning new connections and materialising the new centralities that are created.

SIZE MATTERS

The size of the courtyards decides what activities can be hosted within them and the flexibility of and the possibility for simultaneous activities. A courtyard should be minimum of 1200m² (Minoura, 2019).

CONTROL

A degree of closeness higher than 85% signals non-public functions. The more secluded a courtyard is, the more control the residents feel over their space and who sees them. If a path passes through, the closeness is undermined, and control is lost (Minoura, 2019).

According to Minoura (2019), other residents using the courtyard is positive, but “others” lead to a feeling of lack of control and a diminished feeling of safety. When the feeling of safety increases, it causes the courtyard to be more used and hence can increase the social interaction between neighbours, having a positive social effect. Furthermore, a more closed courtyard is preferred, as it lessens the noise and particle pollution from surrounding roads, and

improves the microclimate, as the wind is reduced, provided the courtyard is large enough to let the sun hit the ground (Minoura, 2019). In a more open or extensive yard, more secluded sections can increase control resulting in more usage.

CARE OF INTERFACE

To provide clarity of the intentions of a space, the interface between the public and more private spaces is crucial so that users know when they are passing from one functional space to another. Minoura (2019) highlights that a clear design of space avoids later additions to the interface, such as private signs and unplanned bushes or fences. Furthermore, expressions of private usage are discouraged in the public space as it makes the publicness of the space less prominent, in turn preventing public use. An exception is the front yard land, where personal expression is encouraged. Minoura (2019) advocates for a front yard strip of one meter and entrances being placed at short intervals, to increase variation along the street (see also Gehl, 2010 and Stähle et al., 2020).

“Space and size provide capacity. Spatial control yields responsibility and belonging. Care in interface provides readability.”

Minoura 2019, p.98
Authors translation

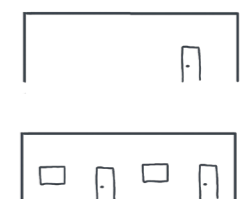


Fig. 38. Avoid far stretches between openings in the façades, windows or doors (Minoura, 2019).

METHODOLOGY

RfD (Research for Design)

I utilise various methods to process and organise large volumes of information. Brainstorming graphical organisers such as Affinity diagramming and Mind mapping (see Jormakka, 2017 and Hanington & Martin, 2012) played a crucial role in both the initial steps and later stages of my research process. These methods are valuable tools for processing large quantities of information from research papers and planning documents, for example.

RoD (Research on Design)

BACKGROUND UNDERSTANDING – RoD

In this section, the methodological approach consists of a literature review aimed at gaining an overview of modernist planning and MHP in Sweden, from the initial core values and ideals to the stigmatisation of today. Important references are Ann Legeby (2010), Hall (1999) and Johansson (2012).

The first part of the study establishes a background, initiated in preparations for the Master's Thesis (MT). This entails a review of relevant literature from diverse sources, including books, journals and research papers addressing both contemporary and historical perspectives.

1. ANALYSIS

THEORY AND METHOD - URBAN FORM AND SEGREGATION – RfD

In this phase, the literature review focuses on building an understanding of the bigger picture, hence the theoretical framework for the study. Consisting of a deep dive into the theme of segregation

and its relation to urban form in general and the MHP in specific, along with studies of spatial analysis as a tool for analysing spatial relations. The theory is heavily based on research by Legeby (2010), along with Hillier and Vaughan (2007), Klasander (2001) and Marcus (2007), among others.

CASE STUDY – ANALYSIS OF CURRENT SITUATION – Rod /Rfd

Parallel to the development of the theoretical understanding, I initiated a case study of Hjällbo in Gothenburg. This step consists of a literature study of policy and planning documents as well as research papers depicting the current situation in Gothenburg in general and Hjällbo in specific. To gain a deeper understanding of the local resident perspective, documentation of citizen dialogue is consulted. The citizen dialogue was conducted in relation to the development of a new comprehensive plan for Hjällbo in 2022 (see Reuter Metelius, 2022). To complement others' impressions, multiple site visits are conducted during the work with this thesis, focusing on distinct aspects of the public space.

Site visits 1 and 2 focus on configuration and accessibility, specifically looking at the structure of space and hierarchies between public and private spaces. The following site visits are directly focusing on understanding space and movement through space as a basis for detailing interventions.

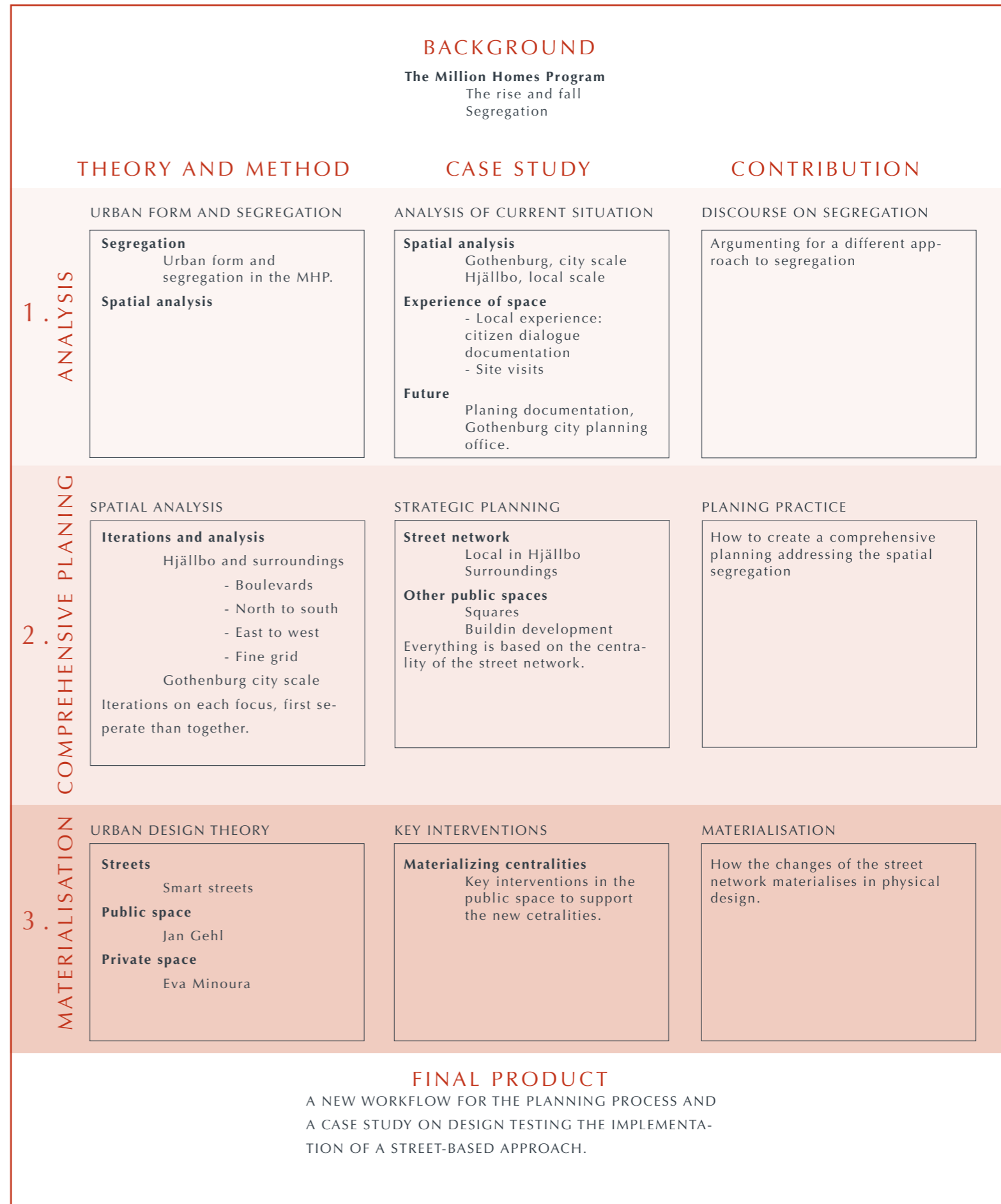


Fig. 39. Thesis work flow.

Furthermore, using PST, Spatial analysis techniques are employed to examine the current situation. This is based on the studies of Legeby (2010) and Delad stad (Legeby et al., 2015a;2015b). Using the following measurements, the existence of segregation is analysed:

- > Angular Integration
- > Angular Betweenness
- > Attraction Distance to schools and preschools, local markets, public transport, and public spaces such as squares and parks or social green.

This analysis helps identify disparities in access to essential services and evaluate spatial segregation. An analysis is conducted on a city scale as well as locally in Hjällbo.

CONTRIBUTION – DISCOURSE ON SEGREGATION

This part of the thesis aligns with the arguments in the space syntax discourse and calls for a different approach to segregation, see e.g. Marcus (2007) and Hillier & Vaughan (2007).

DATA

The morphological data for this thesis comes from the SLU public database (SLU, 2024) and from the SMOG research team at Chalmers (Stavroulaki, I et al., 2020). Emphasis is on the non-motorised movement as it captures more of the everyday movement in the neighbourhood. Motorways are hence excluded. The network was updated after site visits to Hjällbo,

the larger context, however, relies on the available data. The motorised network is also consulted in some analysis, as all modes of transport are interlinked, but has not been updated as thoroughly.

2. COMPREHENSIVE PLANING

CASE STUDY – SPATIAL ANALYSIS – RbD

This phase focuses on the implementation of spatial analysis tools on the local and global network. Through iterations based on set goals and analysis of the current conditions, the street configuration was altered and new centralities emerged.

CASE STUDY – STRATEGIC PLANNING

The iteration finally lands in a proposal for a new street configuration. Based on the new centralities, a new comprehensive plan for Hjällbo is proposed, including streets, other public spaces, such as parks and squares and possibilities for densification.

CONTRIBUTION – PLANNING PRACTICE

Conclusively, the step culminates in a proposal for a new way of conducting comprehensive plans addressing spatial segregation through network planning.

3. MATERIALISATION THEORY AND METHOD – URBAN DESIGN THEORY – RfD/ RbD

This step investigates the materialisation of new connections and resulting centralities. Through a literature study, the principle for qualitative urban design has been consulted. The Design guide for Smart streets (Stähle et al., 2020) has been consulted for street design. For the design of other public spaces, the thesis primarily relies on principles developed by Jan Gehl (2010). The design of private outdoor spaces is based on Eva Minoura's (2019) research on courtyards. From these theories, principles for design, as previously presented, are extracted.

CASE STUDY – KEY INTERVENTIONS

The materialisation of new spaces and connections is investigated based on the preconditions presented by the street configuration and the previously mentioned design principles. This is done by forming a case study on design principles with a focus on street configuration and the preconditions it creates.

CONTRIBUTION – MATERIALISATION

This final step aims to contribute to an exploration of how changes in the street network could materialise in physical design.

FINAL PRODUCT

As a final step, the learnings from working with Hjällbo as a case study are explored in a proposal for a new planning practice. The proposal aims to show the potential of this methodology and hence bridge the gap between research and practitioners in the field. The study culminates in a discussion on the general learnings of how to address MHP areas when redesigning the city. The contribution from this study is, hence, a new way of working with urban development projects. The theoretical basis for such practices has a solid foundation, but the practice has not kept up with research. Through the case study of Hjällbo, I aim to display the potential of a street-based planning process.

Legeby (2010) argues for the importance of not assuming and treating all MHP areas the same since significant spatial differences and nuances should not be overlooked. At the same time, these areas have strong similarities. It could, therefore, be assumed that similar structural interventions could be suggested as long as they are adapted to the local circumstances at the time of implementation.

Each individual part of the study has not been treated as separate steps to reach the end goal. Instead, they have been developed in an iterative manner bouncing back and forth between each section as new questions arose during the development of this thesis. The research has there by both guided and been guided by the analysis and design.

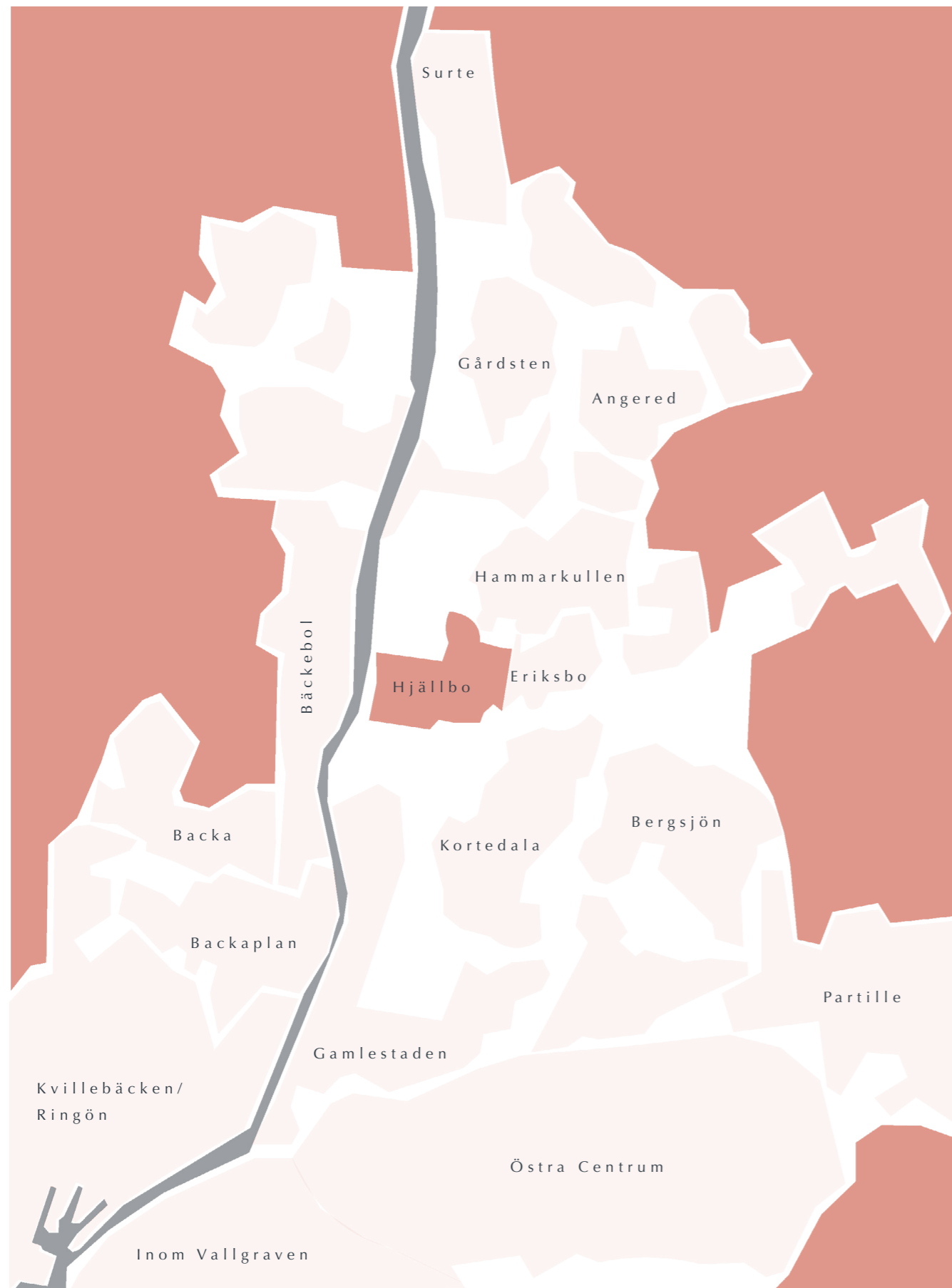
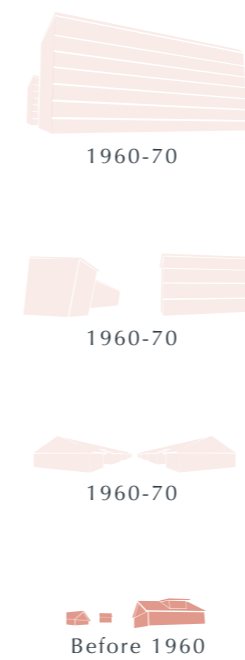


Fig. 40. Map of the northeastern parts of Gothenburg

Fig. 41. Typologies in Hjällbo



CASE STUDY

BECOMMING HJÄLLBO

The MHP area of Hjällbo will serve as a case study for the thesis, providing a concrete case to illustrate general and specific findings. In addition, the study will adopt a broader perspective, examining Hjällbo's relationship with its neighbouring areas and its integration within the larger context of Gothenburg.

Hjällbo holds historical significance, having been constructed during the emergence of the MHP between 1965 and 1969 (Thörnquist, 2001). Initially, it was regarded as a model implementation of the MHP. However, the energy crisis of the early 1970s led to a decline in occupancy rates, with only 40% of the housing stock being occupied, resulting in a stigmatisation of the area (Legeby et al., 2015a). This stigma persists despite numerous interventions over the years (Legeby et al., 2015a). Furthermore, several proposed developments for the area, such as a bridge over Göta Älv connecting Hjällbo to Bäckebol, a tram line to Kortedala, and a stop for regional commuter trains, were never realised. Consequently, Hjällbo never attained the role of a regional node as intended (Legeby et al., 2015a).

Most of the buildings in Hjällbo (96%) date back to the MHP era between 1960-1970, apart from the villa area to the east, which constitutes the original village (Göteborgs stadsledningskontor, 2023). With the construction of a new school and the planned redevelopment of the old school area, Hjällbo faces major changes, as plans have

already been initiated in the city planning office (Göteborg Stad, n.d.). This evolving landscape presents the project with an opportunity to engage with ongoing urban planning efforts to propose alternative directions, thereby enhancing the local relevance of the project.

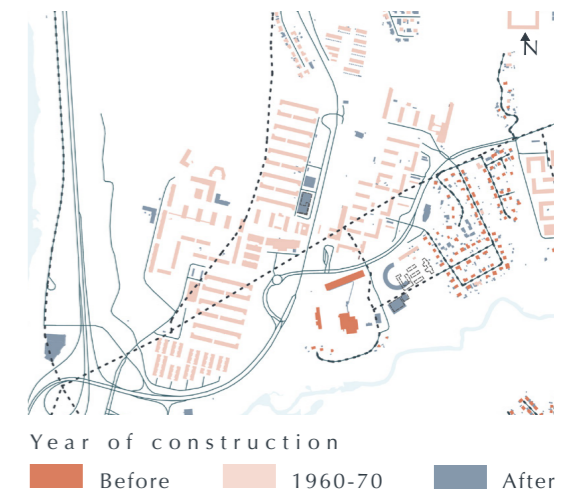


Fig. 42. Development of Hjällbo

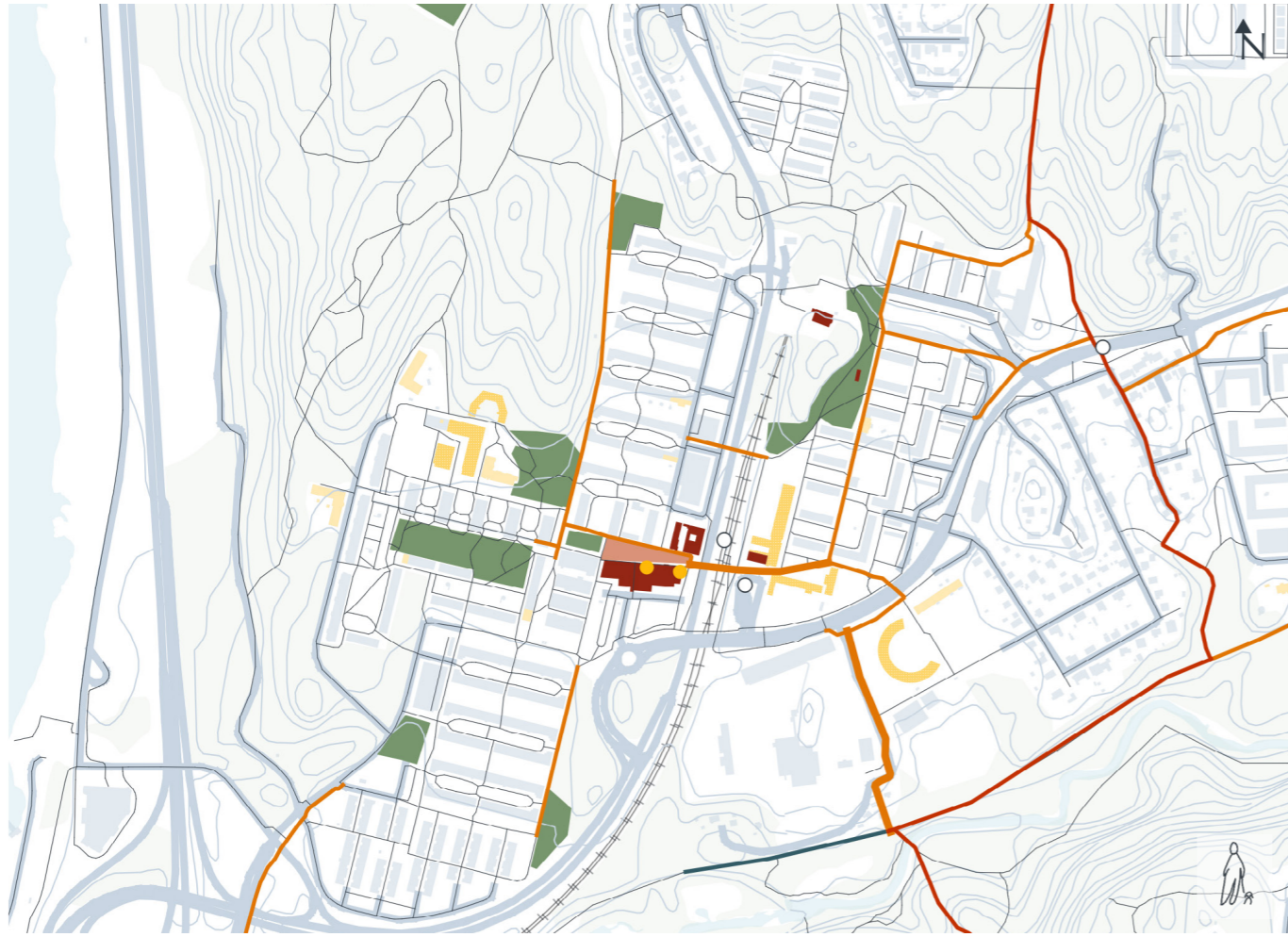


Fig. 43. Map of the current structure of Hjällbo.

- Legend
- Public functions
- Square
- Social green
- Preschool
- School
- Motorised network
- Centralities
- Mid local & global
- High local
- Medium local
- Medium global
- Local market
- Public transport

Hjällbo is home to nearly 7,400 residents in 2474 housing units and exhibits a higher population density per dwelling than the city-wide average, with 20% of its housing units accommodating five or more inhabitants, compared to 5.8% (Göteborgs stadsledningskontor, 2023). This highlights the importance of the public spaces. Hjällbo offers extensive green surroundings and several social green spaces alongside a central square featuring amenities such as grocery stores, fruit stands, a pizzeria, and a healthcare centre. This square, along with the tram stop, serves as a central node within Hjällbo.

With a lower car ownership rate of 192 cars per 1000 inhabitants (the city-wide rate is 278 per 1000) (Göteborgs stadsledningskontor, 2023), the public transporta-

tion network plays a significant role in residents' mobility. Hjällbo is served by a tram stop, as well as several bus stops linking it to surrounding areas.

Presently, 90% of the housing stock consists of rental apartments owned by the public housing company Poseidon (Poseidon, n.d.). These buildings are clustered, with clear distinctions between each area and motorised traffic is primarily confined to two main roads, while residential areas are predominantly pedestrianised. Furthermore, Hjällbo's characteristics are shaped by its challenging topography, which is particularly noticeable around the tram area, which is flanked by slopes and rocky cliffs on each side. This results in an east and west divide connected by pedestrian bridges.

- Legend
- 6-7 floors
- 3-4 floors
- 1-2 floors
- Non-residential buildings



Fig.44. The areas of Hjällbo.

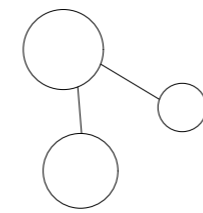


Fig. 13. Enclaves



Fig. 11. Lack of support of the streets



Fig. 12. Traffic separation

- I. Villavallen
- II. Båtsmandalen
- III. Bergsgårdsgärdet
- IV. High-rises in Bergsgårdsgärdet
- V. Skolspåret
- VI. Herregårdsgärdet
- VII. Sandspåret
- VIII. Hjällbo Lillgata
- IX. Bondegärdet
- X. Lärjeskolan (School)
- XI. Concrete Industry



Fig. 45. DETAIL IN ENTRANCE, HJÄLLBO.

CHAPTER III

ANALYSIS

The analysis is based on site visits and spatial analysis combined with analysis of the legal planning document of the future plans for Hjällbo and the citizen dialogue process related to the plan of the city.

ACCESSIBILITY ANALYSIS

GOTHENBURG

Viewing Gothenburg from a city-wide perspective, it becomes clear how resources are unevenly distributed throughout the city. The map below illustrates access to local markets (calculated by attraction distance to address points). The city centre and the southern districts generally exhibit higher accessibility to amenities, whereas access decreases in the northern parts. Here, accessible markets are clustered, re-

flecting a similar pattern for access to other amenities as well.

Analysing the network for angular integration (red = high centrality and green = low centrality) and angular betweenness (dark red = high centrality and light pink = low centrality), a similar pattern emerges. Particularly on a global scale, capturing large-scale movement, the northeast has

notably low centrality. While the central city is well connected, the outskirts rely more on internal service due to limited access to other parts of the city as well as fewer outside visitors.

In conclusion, Gothenburg can be described as a segregated city where living conditions vary based on one's home address. Furthermore, there is generally low centrality, and thereby low expected movement, within the areas in the north and the accessible amenities are limited. Due to low global centrality, there is low expected mobility between different areas in the north, and residents are less likely to encounter residents from other areas in their own neighbourhoods. Consequently, these areas are more isolated from the rest of the city. Coupled with low income and high unemployment rates (Göteborgs stadsledningskontor, 2023), these areas are in a vulnerable position (Legeby, 2010).

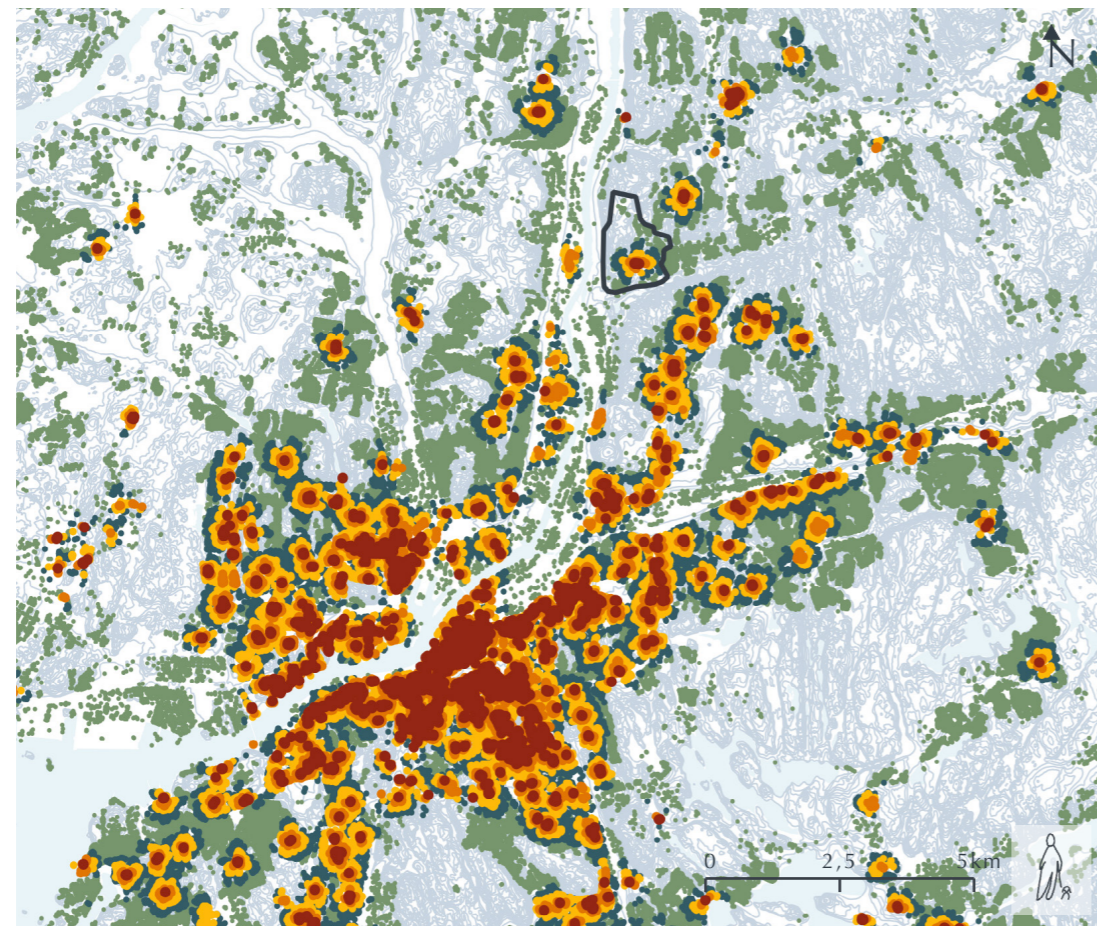


Fig. 46. Access to local markets, Gothenburg in current situation.

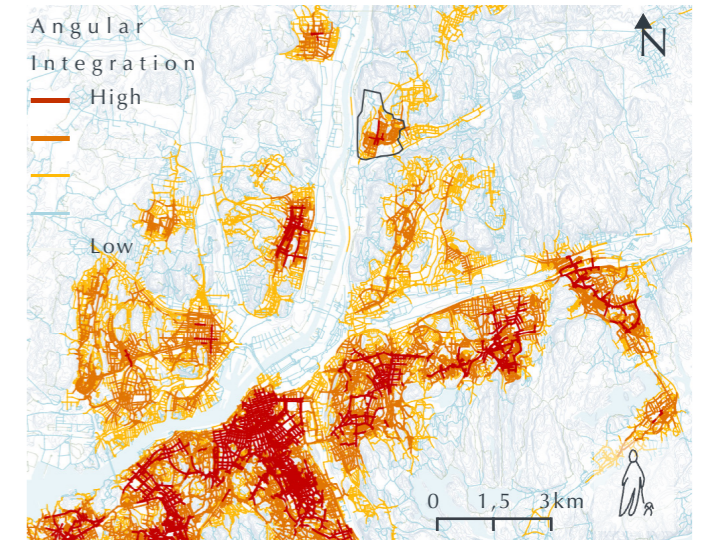


Fig. 47. Angular Integration 1km, Gothenburg in current situation.

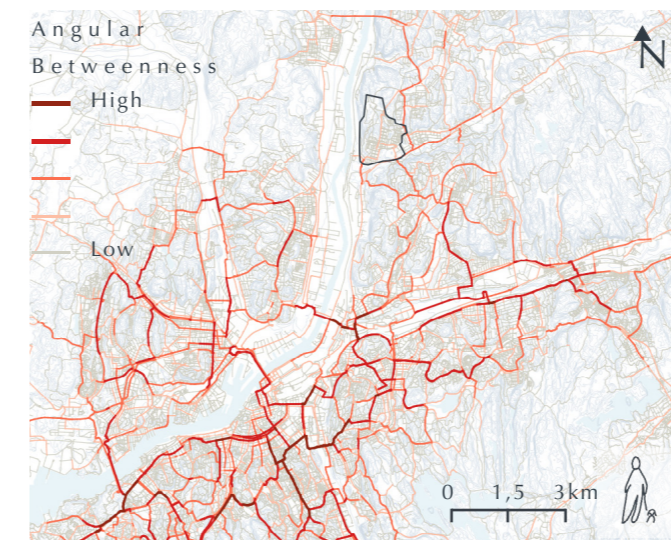


Fig. 48. Angular Betweenness 5km, Gothenburg in current situation.

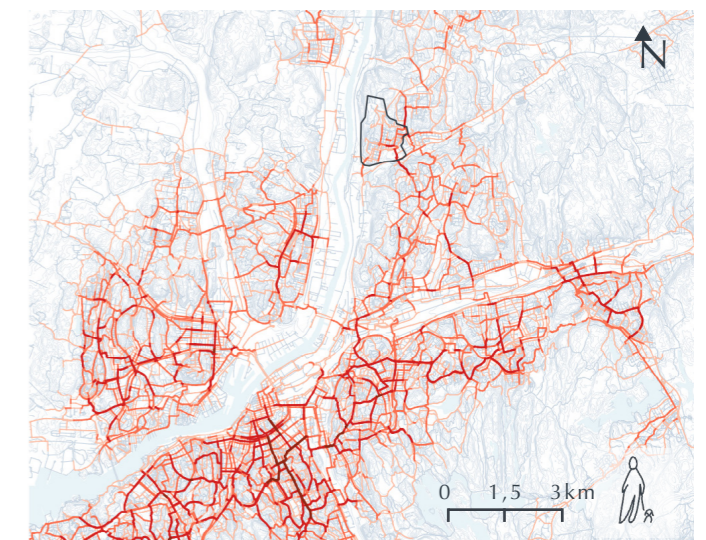


Fig. 49. Angular Betweenness 2km, Gothenburg in current situation.

HJÄLLBO

Hjällbo follow a similar pattern as the rest of northern Gothenburg. The area has limited access to local markets, since all commercial activities are concentrated on the main square. Additionally, access to public transport is sparse, with only one tram stop and a few bus stops. This poses an extra challenge for an area heavily reliant on public transportation as residents cannot easily compensate for the lack of local services

by travelling to other places. However, access to public spaces is relatively high, which is beneficial for Hjällbo given its dense living conditions. Yet, the quality of these spaces remains a question that will be addressed in the coming section. Access to preschools is relatively high but unevenly distributed across Hjällbo. Amenities are clustered around the central area (with preschools being the exception), limiting access for residents further away.

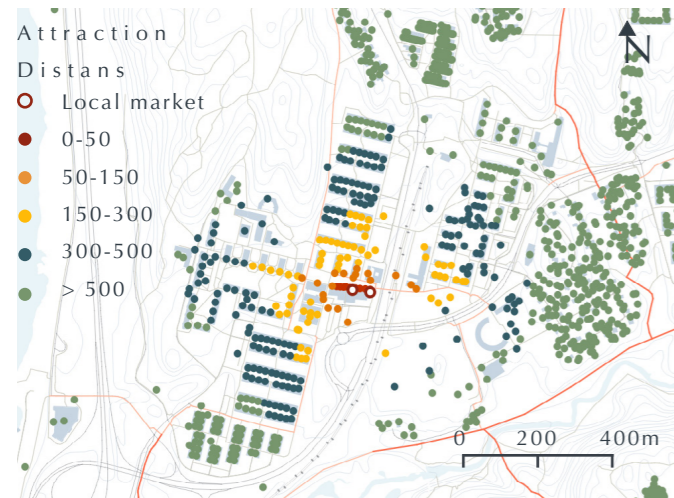


Fig. 49. Access to local markets, Hjällbo in current situation.

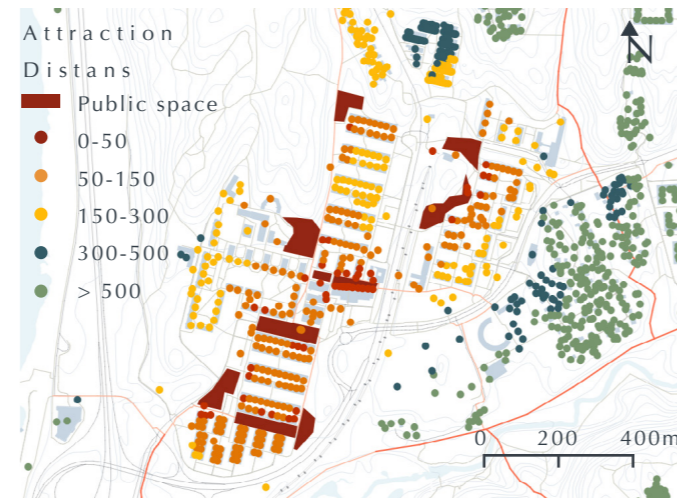


Fig. 50. Access to public space, Hjällbo in current situation.

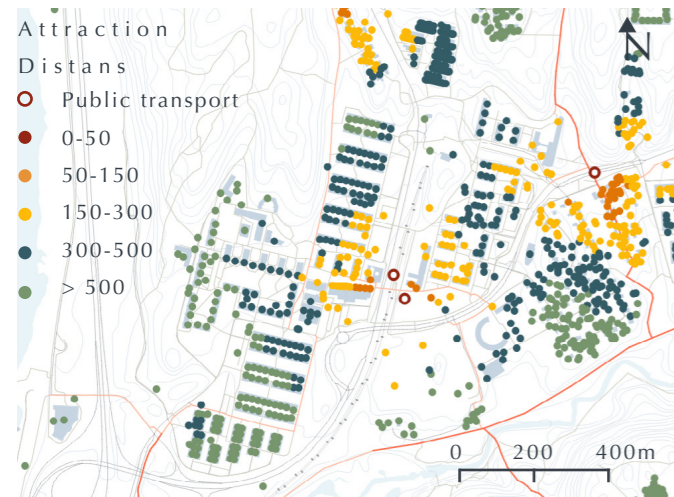


Fig. 51. Access to public transport, Hjällbo in current situation.

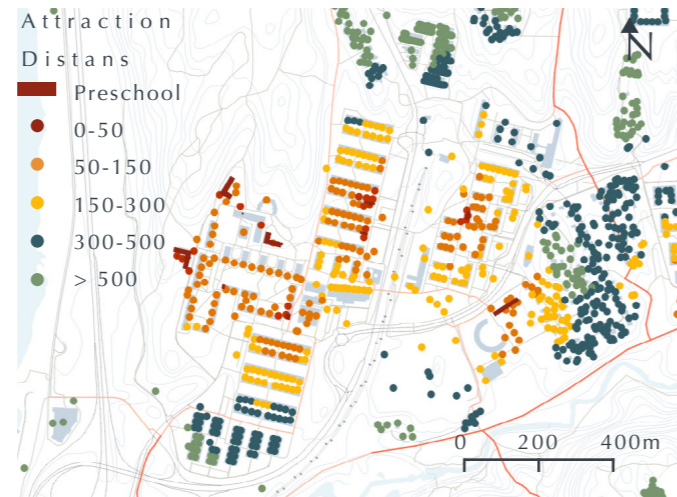


Fig. 52. Access to preschools, Hjällbo in current situation.

This limited access is partly attributed to the absence of attractors, but it also reflects the limited centrality in the street network. Integration is primarily concentrated around the central areas and is low in the outskirts, hindering movement between distinct parts of the area. An enclave design becomes evident as the layout does not facilitate internal movement. Betweenness analysis reveals a clear structure, with minimal global betweenness in Hjällbo, indicating limited movement to and from other areas. Furthermore, local (movement within) and global (movement between areas) betweenness are generally separated, reducing the potential for interaction between non-residents and residents, as their movement predominantly occurs in separate places. The local betweenness forms a disrupted grid centred around the main square and traversing housing courtyards, causing a discrepancy between private and public space as the main pedestrian flows, as per the analysis, cuts through areas meant exclusively for residents.

In conclusion, Hjällbo exhibits similar patterns as described for the MHP areas, where the built environment provides little support for internal and external movement flows, ultimately negatively impacting local residents (see Klasander, 2001 and Minoura, 2019).

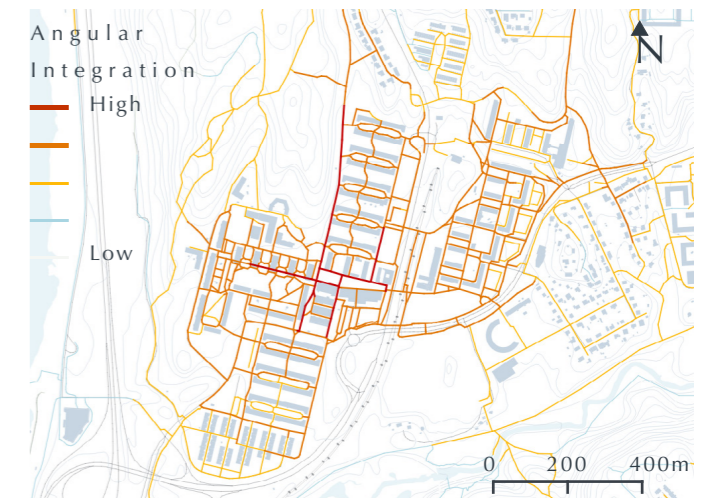


Fig. 53. Angular Integration 1km of Hjällbo in current situation.

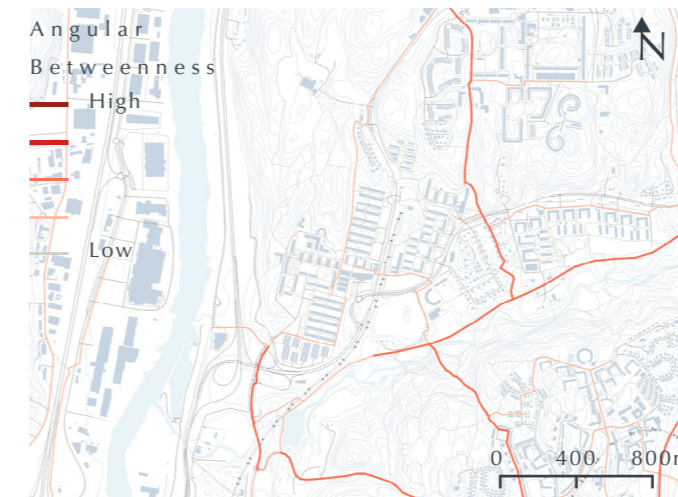


Fig. 54. Angular Betweenness 5km of Hjällbo in current situation.

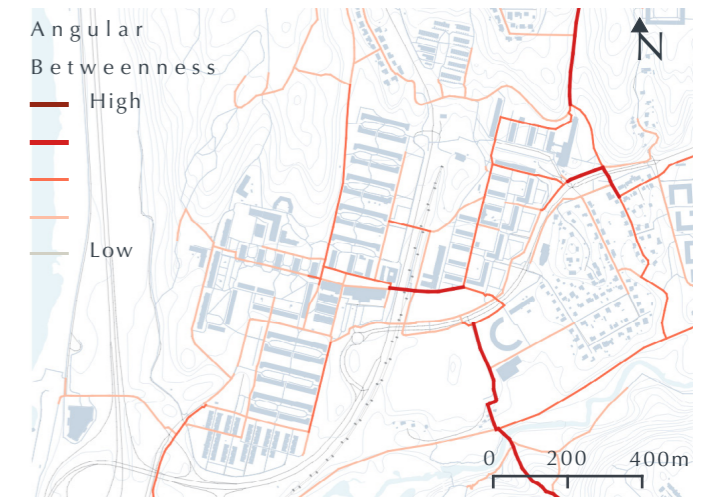


Fig. 55. Angular Betweenness 2km of Hjällbo in current situation.

SITE VISIT

CONNECTIVITY AND PATHS

Hjällbo finds itself surrounded and divided by various barriers, including **roads** and **tramlines** and **topography**. Due to a traffic separation design, large parking lots are situated between the streets and the buildings, resulting in ambiguous spaces and unclear entrances into the area. Different housing blocks are **disconnected**, hindering movement and making navigation challenging.

PUBLIC/PRIVATE SPACE

The distinction between public and private spaces is often unclear due to the open structure. The large courtyards have an open structure (over 85%) indicating a **lack of control** (Minoura, 2019). Additionally, seemingly, **unutilised space** is prevalent between buildings. This lack of care for interfaces, results in limited privacy for inhabitants (Minoura, 2019). This is evident in Hjällbo by closed blinds and added high fences. Moreover, many building ends lack windows, reducing the eyes on the street.

Public spaces lack a human dimension, with limited seating. The **main square** lacks clear functions and seating. Surrounding **private spaces** intrude upon the square and windows are covered or have a reflective film, hindering the squares potential for vibrant urban life (see Gehl 2010). Playgrounds, while public, are scarce and often standardised, with fewer amenities. As a visitor, most spaces appear private, however, lacking the personal touches one would expect if residents felt a sense of ownership.



Fig. 56. Barrier effect from roads and tram-rails.



Fig. 57. The parking lot and the tram area.



Fig. 58. Windowless façade and closed blinds.



Fig. 59. The main square and a building are on the square, with backyards on each side.

This category is not directly addressed within the scope of this thesis.

AMBIANCE

Moving through the area, you are constantly subjected to noise from surrounding road infrastructure as noise blocking structures are absent. Large print signs also contribute to an overall sense of undesirability. Narrow passages between buildings often feature unpleasant lighting fixtures, and underpasses are poorly lit. The area's large-scale design turns inward, with life primarily contained within, reflecting the era's urban planning principles (Klasander, 2001). As a result, surrounding areas are excluded, and Hjällbo appears internally divided. Notably, in Hjällbo Lillgata, a police station with high fences contributes to this division, with police cars frequently moving through the space, encroaching upon surrounding courtyards.

QUALITIES OF SPACE

Each area within Hjällbo possesses a distinct character, reflecting the architecture typical of its construction period. The average building height is 3-4 floors, fostering a connection between windows and the street below. The spacious open structures promote freedom of movement and invite **nature** into the urban fabric. The absence of cars further enhances a sense of **space and freedom**, encouraging movement and play.

The main square's strategic location, in relation to the tram stop, ensures a constant flow of passers-by, with some surrounding businesses contributing to street life activities.



Fig. 60. Signs are from a bin in a backyard and on a post next to a pedestrian housing street.



Fig. 61. The police office from the outside, located next to the private housing.



Fig. 62. Characteristic buildings.



Fig. 63. The greenery spilling into the urban fabric.

DIALOGUE

Along with the development of a new comprehensive plan for Hjällbo, a citizen dialogue was initiated to react to the first public draft from the city of Gothenburg. Due to a feeling of exclusion among the inhabitants, the dialogue process was extended with additional public meetings and design workshops at the elementary school, Hjällboskolan (Reuter Metelius, 2022).

The importance of the public space is underscored as having a special meaning in Hjällbo due to the generally high number of inhabitants per apartment. The inhabitants request meeting places for different age groups and activities, indoors and outdoors. Children, youth, and elderly are highlighted as groups in need of more directed space. Sports fields and playgrounds are pinpointed in the public outdoor space, along with spaces for social interactions and gatherings. The openness of the outdoor space was expressed as highly regarded, giving “space for the mind” when the individual apartments were not enough (Reuter Metelius, 2022).

The design workshop with the students further acknowledged the need for meeting spaces. There is a request for more space for indoor activities, such as the development of the existing library and culture house, new cafe’s, facilities, or space to be used by the association for meetings, events, and other activities. The students also request more meeting places explicitly targeting the youth, such as a youth centre or a gaming hall. Regarding outdoor spaces,

playgrounds are highlighted, specifically on the main square as well as development of existing ones. Other meeting places that are mentioned are football and basketball pitches, grilling areas, and seating for the elderly, along with places in the forest. Nature is, judging from the dialogue, generally highly regarded by the inhabitants (Stadsbyggnadskontoret, 2022).

A reconstruction of the Gråbovägen, the road in front of the school, is requested to provide a safer crossing for the children. With respect to buildings, the students are requesting more buildings and with brighter colours, as existing architecture is perceived as grey. They also express a worry about rent increases and that existing rental units will be converted, and that the new constructions would result in expensive condominiums, inaccessible to the current population (Stadsbyggnadskontoret, 2022).

In conclusion, there is a consensus that Hjällbo requires more meeting places. Space is available today; this request thereby seemingly stems from a need for more programmed space and a clearer distinction between private and public. Furthermore, there is a fear among the inhabitants that major development and renovations will lead to rent increases and that the current inhabitants will be pushed out.



Fig. 64. Welcome different users in the streets. Improve car flows, introducing biking networks while still prioritising pedestrian movement (see Minoura, 2019; Hillier & Vaughan, 2007; Gehl, 2010 and Ståhle et al., 2020).



Fig. 65. Bridge barriers that can't be removed (see Hillier & Vaughan, 2007).

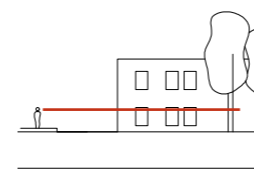


Fig. 66. Densifying to support the streets (see Ståhle et al., 2020) while preserving lines of sight to greenery.

PROBLEM SUMMARY

Hjällbo is segregated on a global scale, resulting in low accessibility to amenities compared to the inner city and the southern part of the city. At a closer look access to amenities and centrality within Hjällbo is unevenly distributed, and the area has low global centrality, thereby limiting the number of visitors from other areas. The internal divide is visible in site visits and can be partly explained by the barrier effect of major infrastructure, such as the tram and roads, resulting from traffic separation of the MHP planning (Klasander, 2001). Furthermore, each area is seemingly planned as a separate enclave rather than a flowing network, leaving extensive, ambiguous space between the built, which is also typical for the MHP (see Klasander, 2001).

Hjällbo is described as spacious as well as lacking meeting places. This could result from the missing hierarchies between private and public space, as a form of no-mans-land is left, not belonging to either the resident or the visitor. Public space is hence not interpreted as public, and private space is designed to cater to the public (see Minoura, 2019). By making the public and private more defined, as requested by Minoura (2019) and Gehl (2010), the quality of space could be improved. By further defining the function of space, more meeting places could be accessible for the inhabitants (see Minoura, 2019). Today, necessary activities are visible in the urban space. However, the current conditions do not offer the adequate preconditions for it optional and social activities, which the inhabitants request (Reuter Metelius, 2022).

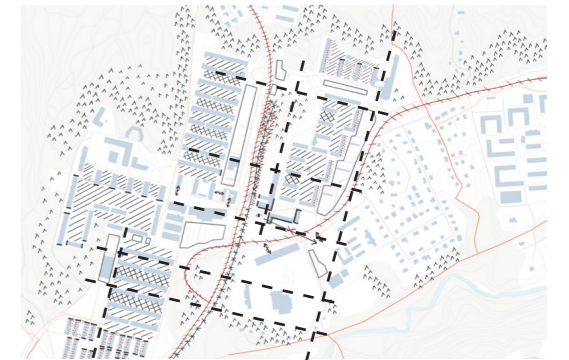


Fig. 67. Potential for improved connections. Global integration is improved by enhancing connections to other areas through Hjällbo and improving internal connectivity (see Hillier and Hansson, 1984).

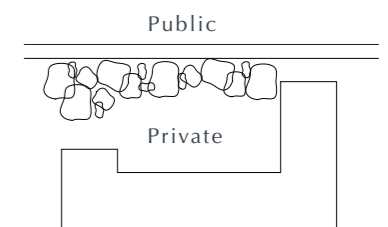


Fig. 37. Define private and public space (see Minoura, 2019)

This thesis seeks to create more social green as well as squares in each intersection of paths with high centrality. As a result, a network of public space is created, maintaining a feeling of openness even as Hjällbo gets more dens. Where new buildings are introduced, the want for openness and greenery are catered to by prioritising long lines of sight and views of greenery. The role of long lines of sight is a central theme in space syntax theory (Stavroulaki et al., 2023), as the more strait a path is, the closer it appears. By making the lines of sight to greenery, nature is more present in the streetscape.



1 Unclear who has access and not. Is this space private for the residents or a public passage for everyone?



2 Undefined in-between space.



3 School is hidden away from the center and surrounded by motorised traffic.



4 Lack of privacy in housing.



5 Backside of building offers no interaction with the passer-by



6 Lack of interaction between building and the public space.



7 Topographic barriers.



11 Buildings separated from the streets with largescale parking.



10 The tram stop is isolated on both sides. Passage is limited to other access points.



9 Large scale tram infrastructure act as a barrier for movement through the area.



8 Large scale car-oriented infrastructure. Car traffic is limited to few places, but here the traffic takes up a lot of space. Acting as a barrier.

Fig. 68. Problem description summary.

FUTURE PLANS



Fig. 69. A comprehensive plan for Hjällbo from Gothenburg planning council (Reuter Metelius et al., 2022).

Legend	
	Hjällbo center development area. Central buildings, offering commerce, community functions and housing.
	Development area. Housing.
	Investigation area. Housing.
	School/preschool , existing and new/developed.
	Transformed street for a calmer traffic rhythm.
	New local or access streets .
	Possible stop locations, (B) bus and (S) tram
	Pedestrian and bicycle paths.
	Neighborhood park, Hjällbo park.
	Green corridors.
	Parks and nature close to residential areas.
	Larger nature and recreational area.

In December 2022, a comprehensive plan was introduced for Hjällbo, positioning it once again as a key node in the area. The plan entails the development of approximately 1,200 dwellings, with 50% dedicated to single-family homes, due to their scarcity in the region (Reuter Metelius et al., 2022). Most of the new construction is located on current parking spaces as well as on industrial land (Reuter Metelius et al., 2022).

The central area of Hjällbo will see the addition of multi-family housing and an expansion of the main square. Notably, main roads such as Hjällbovägen and Gråbovägen are set to be transformed into boulevards. Additionally, the plan emphasises the establishment of more green connections (Reuter Metelius et al., 2022).

At present, detailed plans for the area are lacking.

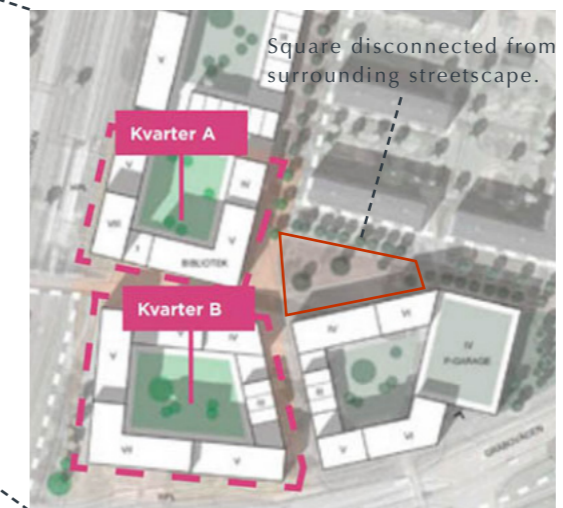


Fig. 70. Land allocation for Hjällbo center from Gothenburg planning council (Göteborg stad, 2023).

SUMMARY OF THE PLAN

DWELLINGS	CA 1200
SINGLE-FAMILY HOMES	43-45%
PRESCHOOL SPOTS	CA 400
SCHOOL SPOTS	300-400

Summary (Reuter Metelius et al., 2022).

The plan indicate large investment in housing and densification. Only a few transformations of the streetscape is indicated in the plan and the transformation of Gråbovägen and Hjällbovägen are seemingly limited to the central area. The it is hence unclear how well the pedestrian flows could support the indicated commercial function and public spaces. Therefore, while significant investments are planned, their impact will only be truly meaningful if complemented by a comprehensive approach that recognises the importance of the street network.

In conclusion the plan from Gothenburg city planning office proposes a comprehensive plan for the development of the area but largely lacks a critical perspective on the space configuration and hence misses to address the structural challenges. The proposed development outlined in this thesis shares many similarities with the plan put forward by the planning council. Primarily in the densification areas, proposed typologies and emphasis on single-family housing. However, the key distinction lies in the process, where the configuration of streets and the resulting new centralities emerge as the focal point of the proposal advocated for by this thesis.



Fig. 71. CHURCH BUILDING, HJÄLLBO

CHAPTER IV

DESIGN

In this final chapter a new comprehensive plan for Hjällbo is proposed and analysed, along with an exploration of the materialisation of the resulting new centralities.

A COMPREHENSIVE PLAN FOR HJÄLLBO

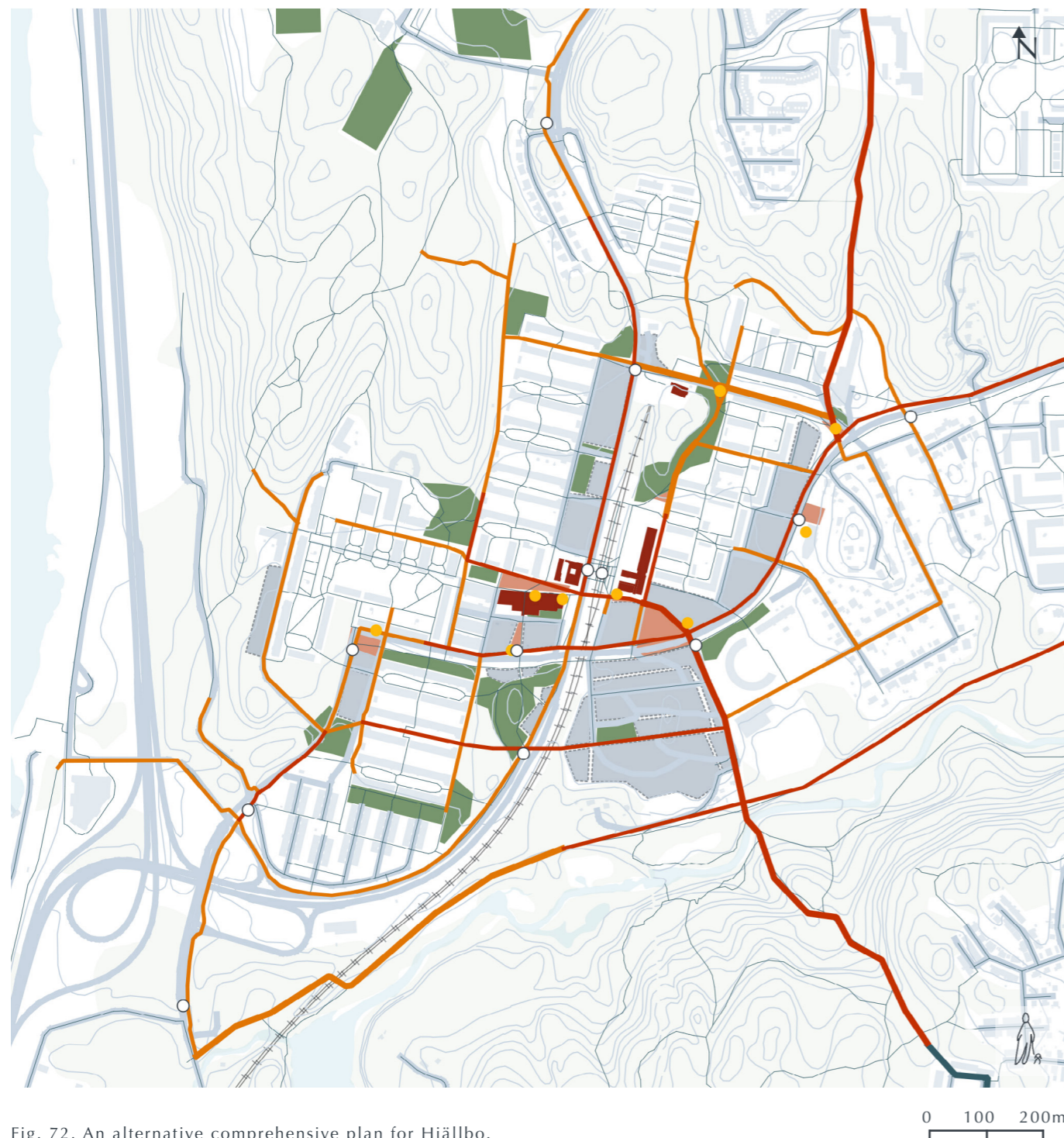


Fig. 72. An alternative comprehensive plan for Hjällbo.

- Legend
- Public functions
 - Square
 - Social green
 - Preschool
 - School
 - Motorised network
 - Centralities
 - High local & global
 - Mid local & global
 - High local
 - Medium local
 - High global
 - Medium global
 - Development area
 - Local market
 - Public transport

The design case -study of Hjällbo, developed in this thesis, focuses on enhancing connectivity and providing the community with public spaces. Based on the street network and spatial analyses, the plan introduces several key features. Parks, local markets, preschools, and squares are strategically added to improve access to amenities, promoting pedestrian flows. New street typologies support these pathways, facilitating pedestrian and cyclist movement throughout the area.

The pedestrian network is a central aspect of the study, aiming to establish clearer structures and hierarchies between spaces. Former traffic barriers are transformed into pedestrian-friendly boulevards. Additionally, new connections enhance the area's cohesion, guiding pedestrian flows while respecting private spaces. The cyclist network also receives attention, with designated lanes, promoting continuous circulation within Hjällbo and connections to surrounding areas.

The motorised network receives attention, primarily via two new central connectors facilitate traffic flow while creating space for development and park areas. By prioritising pedestrians and reducing speed limits, noise and air pollution are minimized, creating a more inviting urban environment.

Public spaces are reimagined to include social green spaces and squares, fostering community engagement and diverse user groups. Collaborative design processes are promoted, ensuring spaces are embraced,

by enhancing the sense of ownership. Development areas are categorised based on street centrality, accommodating a mix of building types and functions to support street life and accessibility.

Analyses of betweenness and integration show the success of the proposal in improving pedestrian mobility and access to amenities. The study extends beyond Hjällbo, contributing to a polycentric city structure and breaking down enclave designs. Overall, the design case study aims to create a more connected, vibrant, and inclusive urban environment for residents.

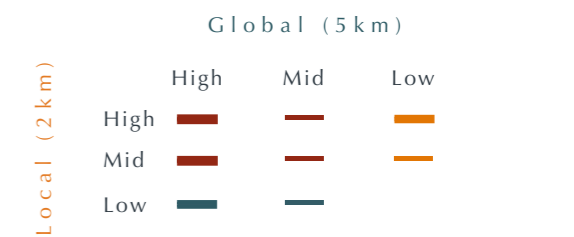


Fig. 73. The streets are coloured in accordance with global and local Betweenness.

To show the centralities in different scales at once the map has been layered with a network that is a combination of the local and global centralities. With the new connections introduced the centralities now intersect on both levels creating a combined network stretching through the area. The integration of scales creates a potential for co-presence of inhabitants of different areas. The combined configuration is complemented by a finer grid with locally high betweenness. Here functions that serve the local community can be placed.

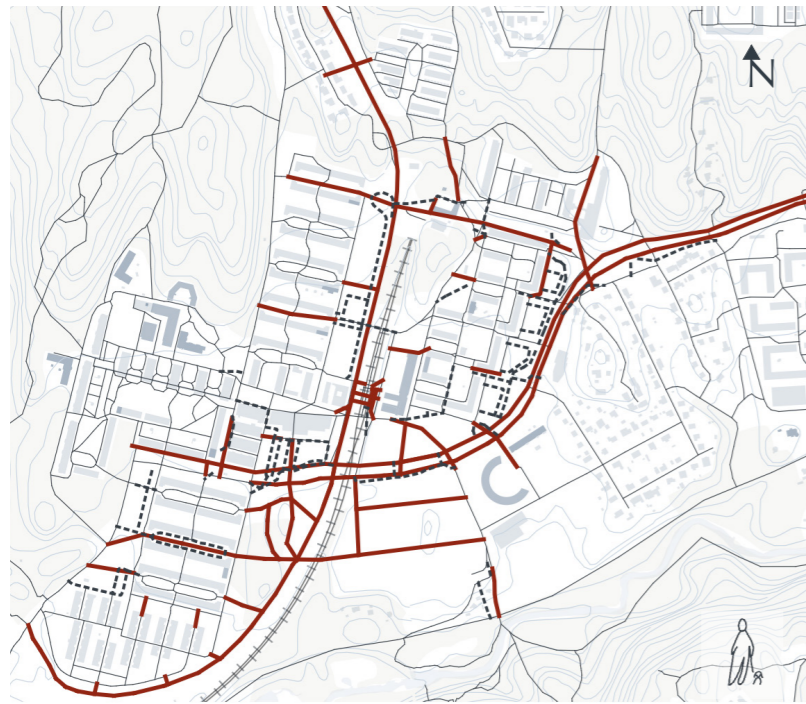


Fig. 74. The pedestrian network showing added and removed paths.

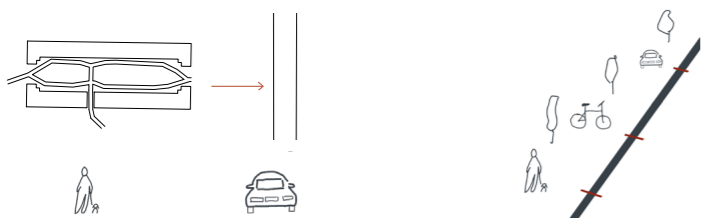


Fig. 75. Traffic separation is countered.

Fig. 64. Different users are welcomed in the street scape.

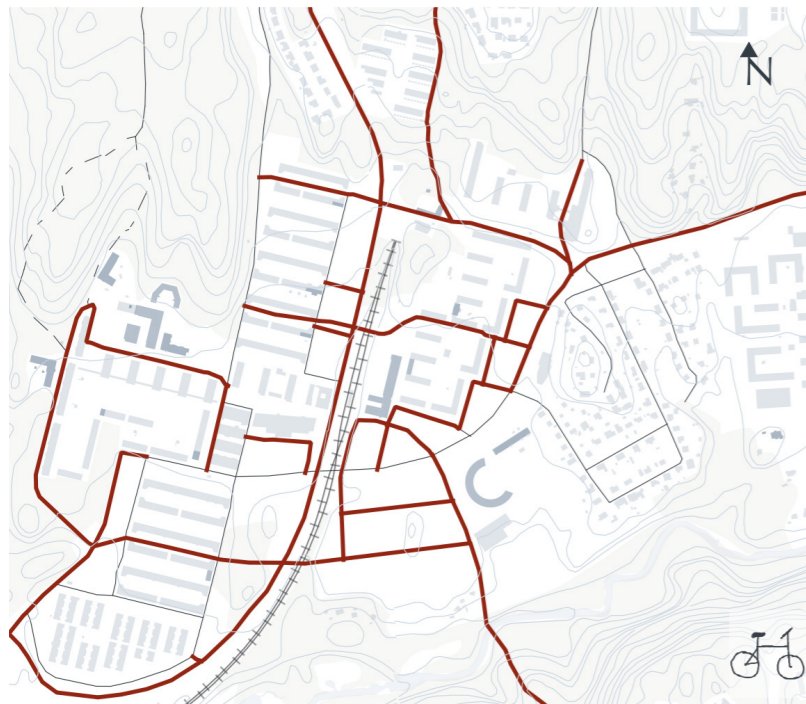


Fig. 76. Cyclist mobility. By introducing new street typologies, a more cyclist friendly area is achieved, facilitating regional mobility.

PEDESTRIAN NETWORK

Pedestrian movement is integral to urban life as it fosters human presence and connectivity. The focus of the case-study is, therefore, on enhancing pedestrian connectivity. The proposal outlined in fig. 74 is a result of an iterative process (see Appendix 1) aimed at improving the local and global connectivity. The proposed new network proves a clearer structure and a hierarchy. Former mayor traffic barriers, Gråbovägen and Hjällbovägen are converted into boulevards, providing ample space for residents and visitors to walk, cycle and relax. By reducing the speed limits and adding pedestrian crossings, these roads cease to be mere obstacles and instead become integral parts of the public space. Moreover, multiple new connections stemming from the boulevards form a cohesive grid, encompassing the entire area. This grid is carefully planned to guide pedestrian flows along desired paths while avoiding crossing through private spaces. Consequently, private spaces remain secluded while major pedestrian routes enhance other public spaces. This hierarchical approach ensures that private areas obtain their privacy, while public spaces gain vitality (Minoura, 2019).

CYCLIST NETWORK

Cyclist accessibility in Hjällbo is currently limited due to insufficient dedicated space for cycling. Enhancing cyclist mobility could therefore significantly improve accessibility to surrounding areas. In accordance with Smart streets (Ståhle et al., 2020), cyclists movement is, in the case-study, emphasised with designated space. Where speed limits are 20km/h or less cyclist share space with motorised traffic. This comprehensive network not only facilitates continuous circulation within Hjällbo but also strengthens connections to the surrounding areas.

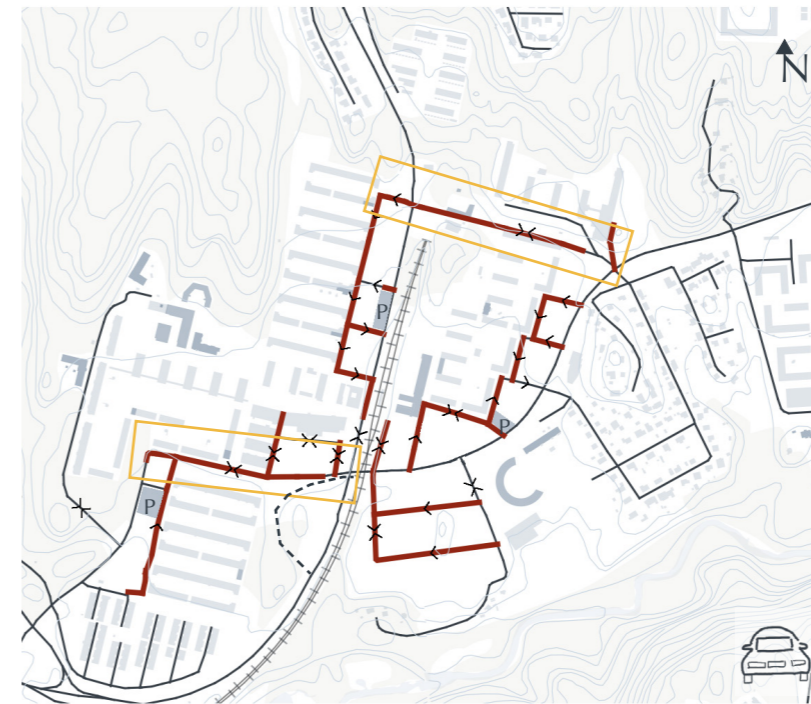


Fig. 77. The motorised network.

- Legend
- Existing path
 - Added path
 - - - Removed path

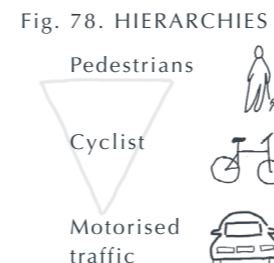


Fig. 78. HIERARCHIES

THE NEW CENTRALITIES

The primary interventions have centred around the implementation of two new connectors, as indicated in yellow in fig. 77. These additions enable the repurposing of land previously occupied by large-scale infrastructure to make room for development and the creation of a new park area. Analysis of betweenness demonstrates reduced congestion, allowing for a smoother traffic flow through the area. With a structure that gives pedestrians priority combined with lower speed limits, noise and air pollution can be lowered. Consequently, the redesigned street configuration provides a more integrated network, prioritising diverse functions.

MOTORISED NETWORK

In Hjällbo the existing streetscape separates different modalities, resulting in significant infrastructural barriers throughout the area. However, the expansive car-free spaces are widely valued by the community, evident in the citizen dialogue (Reuter Metelius, 2022). As a result, the proposed adjustments to the motorised traffic system have been crafted to introduce new connections while preserving the central areas car-free.

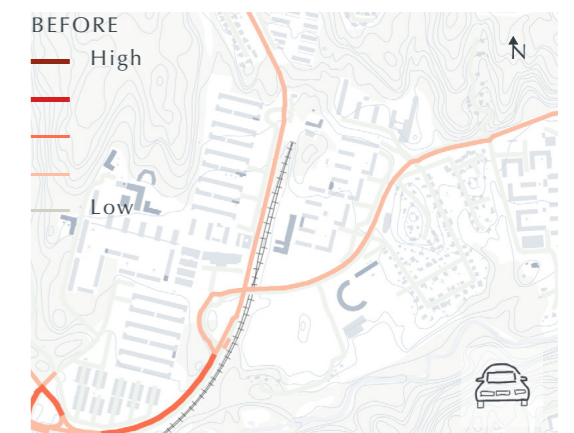


Fig. 79. Angular betweenness, 5km, for motorised network before interventions.

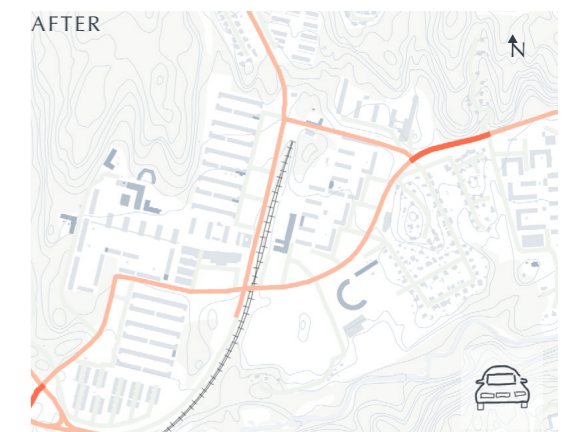


Fig. 80. Angular betweenness, 5km, for motorised network with proposed interventions.

A NEW BETWEENNESS IN HJÄLLBO

The primary focus of refining the pedestrian network has been to establish areas of high betweenness that cater to both local and global movement, thereby overlapping internal and through traffic. An analysis of betweenness at 5 and 2 km scales suggests that these objectives have been met successfully. At a global scale (5 km), betweenness has increased and now passes through the area facilitating movement to

and from neighbouring areas. Another objective has been to direct pedestrian flows along public pathways, diverting them away from private. At a local scale, the new betweenness demonstrates a separation between public and private spaces. This re-direction is anticipated to make public areas more vibrant, as greater foot traffic is expected (Marcus, 2007). Conversely, private spaces become more secluded, affording residents greater control over their environment (Minoura, 2019).

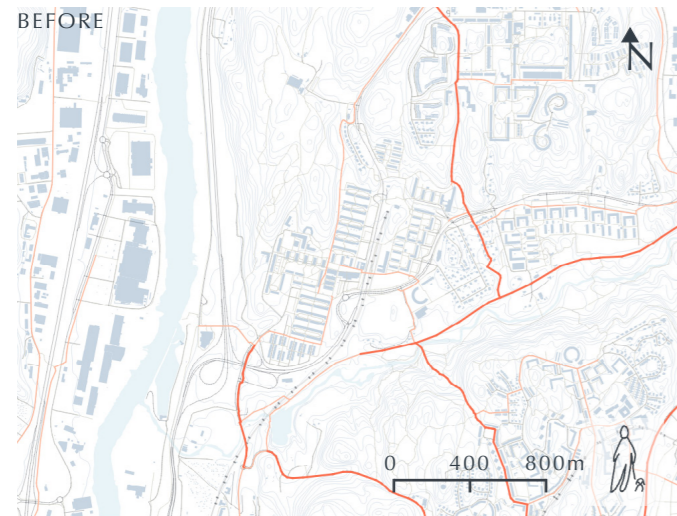


Fig. 81. Angular Betweenness 5km of Hjällbo before interventions.

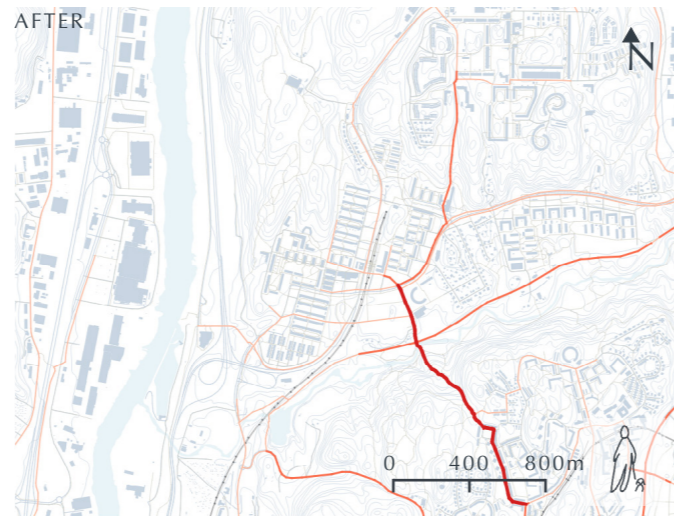


Fig. 82. Angular Betweenness 5km of Hjällbo after interventions.

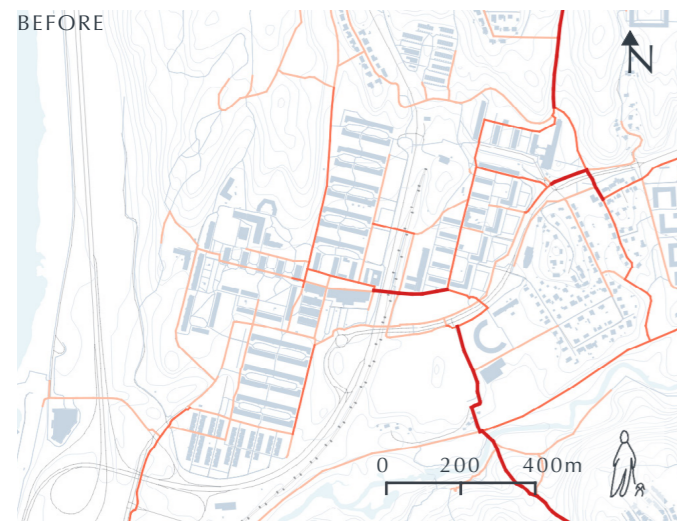


Fig. 83. Angular Betweenness 2km of Hjällbo before interventions.

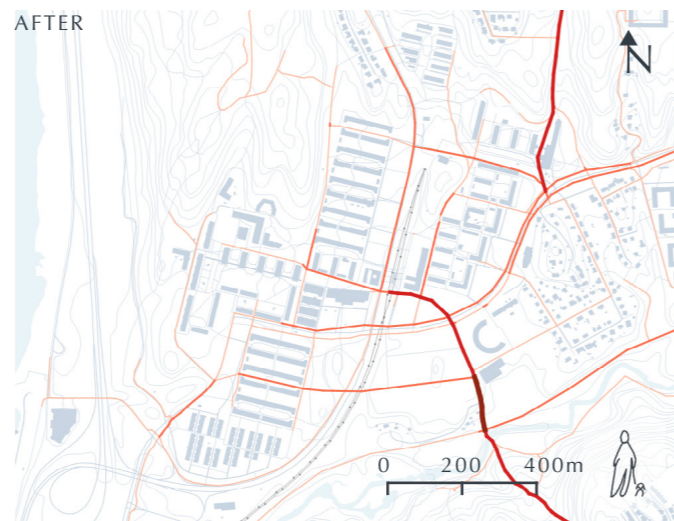


Fig. 84. Angular Betweenness 2km of Hjällbo after interventions.

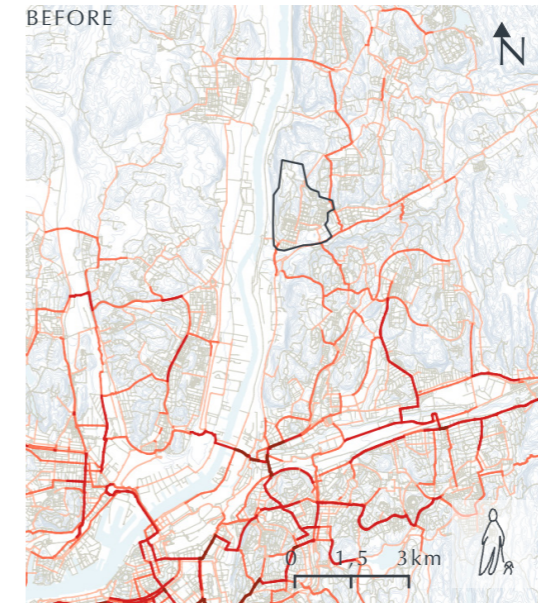
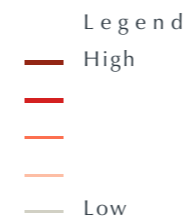


Fig. 85. Angular Betweenness 5km of Gothenburg before interventions.

A NEW BETWEENNESS ON A CITY SCALE

The increased global betweenness is evident also when viewed from a citywide perspective, with effects expanding beyond Hjällbo, particularly in the connection to Kortedala. Within Hjällbo, betweenness increases, from minimal visibility to align with some of the central districts of the city. This trend indicates an enhancement in pedestrian mobility, although it may not attain the levels observed in the inner city. Nonetheless, it hints at the emergence of a polycentric cityscape. By implementing similar interventions in the surrounding areas, with a focus on fostering connections to the broader urban context rather than solely the city center, a less segregating cityscape can be envisioned.

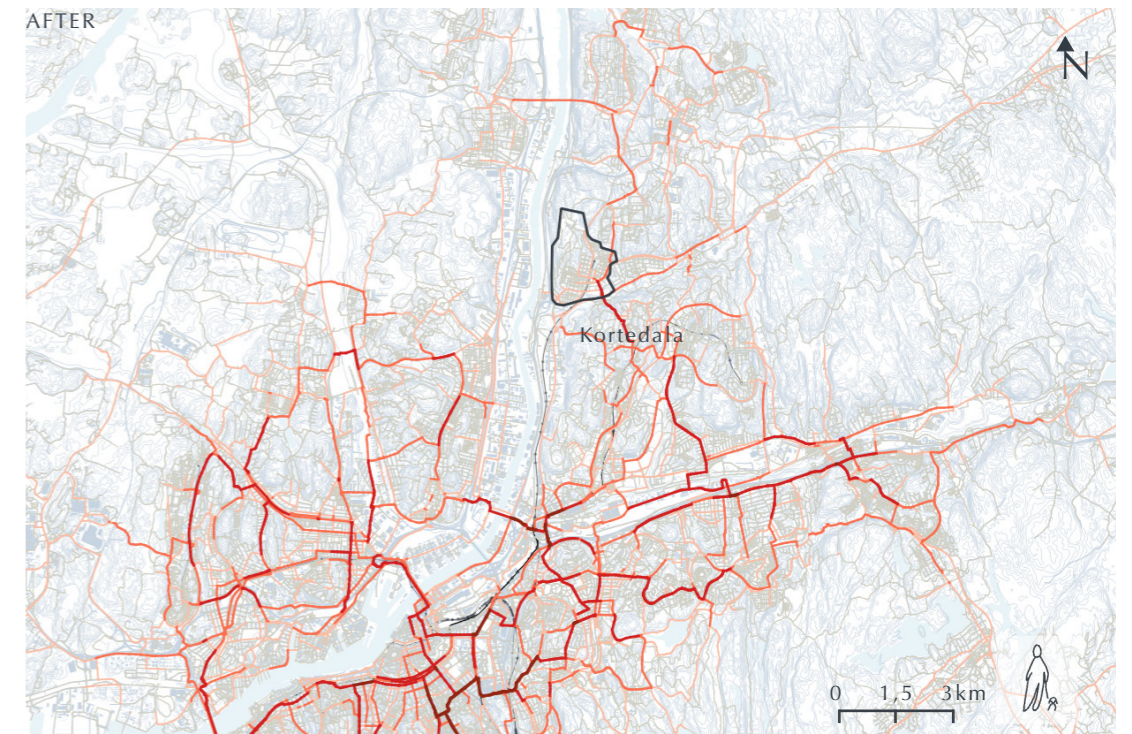


Fig. 86. Angular Betweenness 5km of Gothenburg after interventions.

INTEGRATION ANALYSIS

Local integration in Hjällbo is relatively high compared to the neighbouring areas. However, upon closer examination, the uneven distribution over the network is evident. Integration is an indicator of connectedness, signifying the ease with which different parts are accessed from one another. With the proposed interventions, integration increases significantly throughout the area, visible on both map-scales. However, the southern and northern-most villa and rowhouse

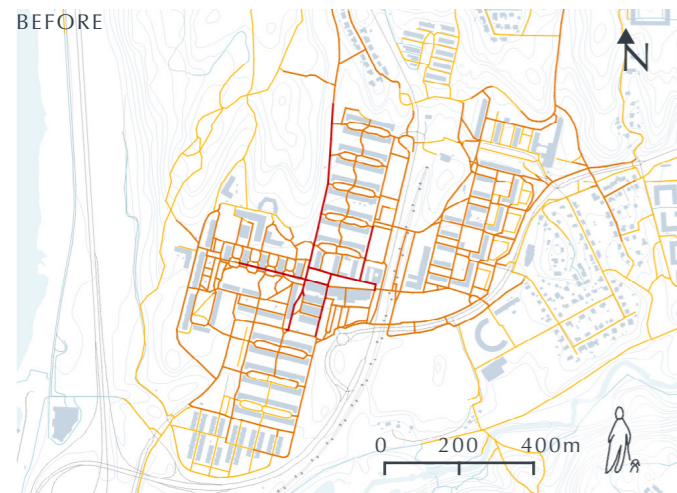


Fig. 87. Angular Integration 1km of Hjällbo before interventions.

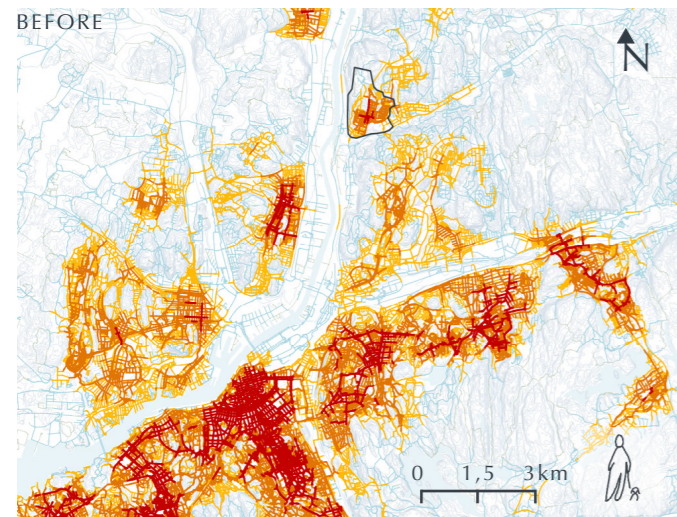


Fig. 89. Angular Integration 1km of Gothenburg before interventions.

areas represents exceptions to this increase. The lower integration in these zones suggests a lower volume of anticipated passersby, which could even be desirable, particularly considering that all areas have access to highly integrated routes near housing streets. This in turn indicates a calm residential environment with convenient access to nearby amenities. With the increased integration the enclave design is counteracted as movement through the area is facilitated.

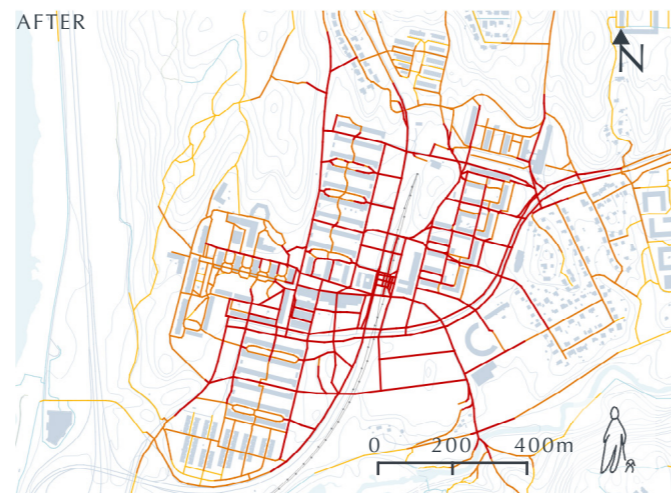


Fig. 88. Angular Integration 1km of Hjällbo after interventions.

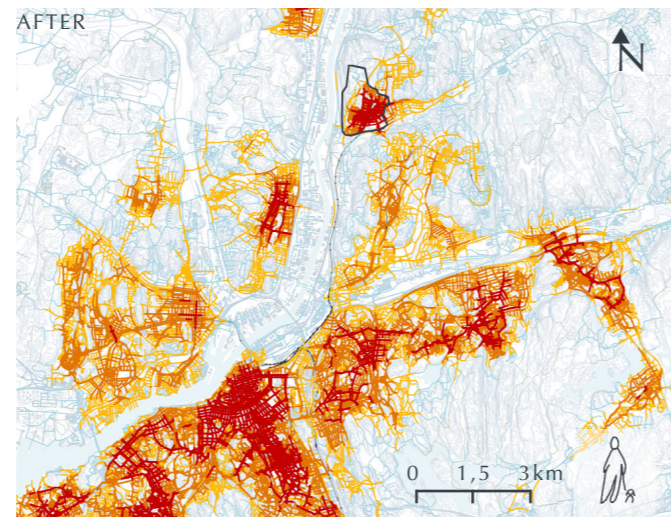


Fig. 90. Angular Integration 1km of Gothenburg after interventions.

BEFORE

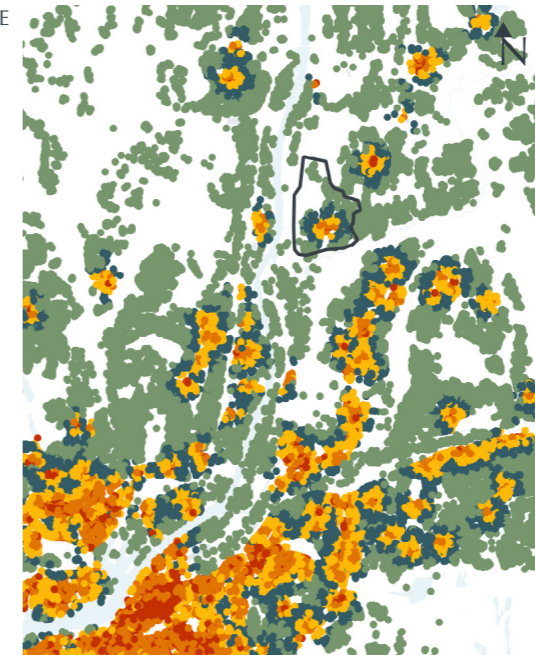


Fig. 91. Attraction distance to local markets before interventions.

AFTER

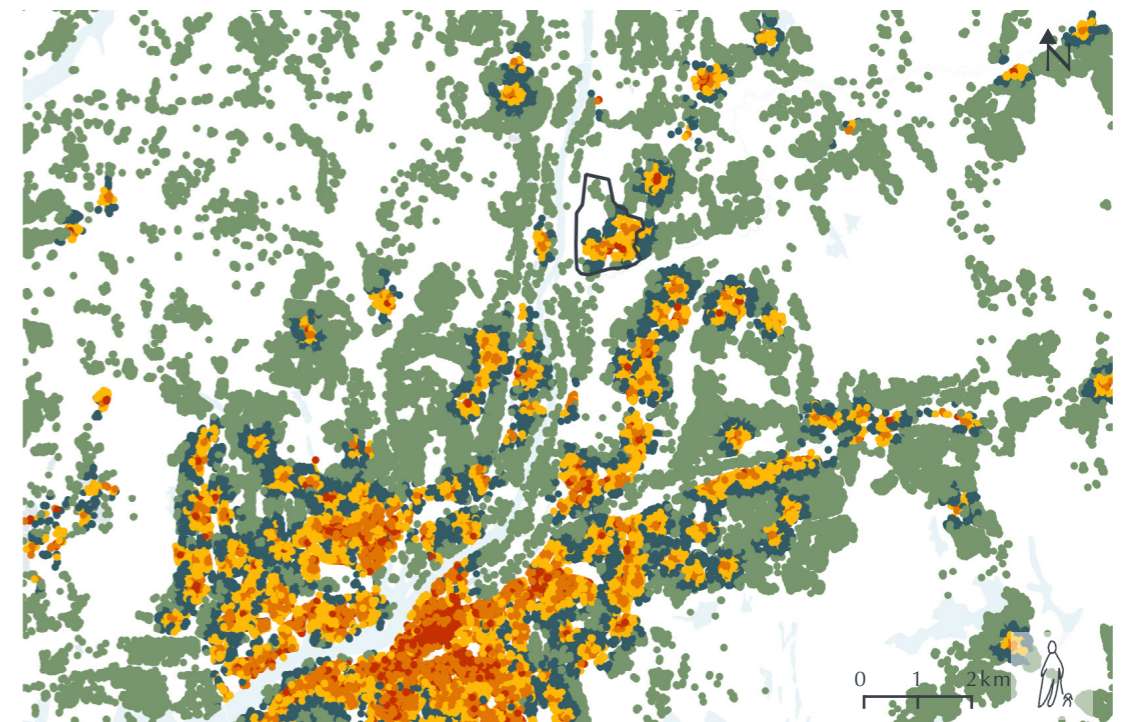


Fig. 92. Attraction distance to local markets after interventions.

ACCESS TO LOCAL MARKETS

Today, access to local markets in Hjällbo is lower than in surrounding areas, especially compared to the city centre. After interventions, access increased noticeably. The network had some impact, but new market points have also been added in locations where the access was low but the centrality high, hence in locations where there is a potential to support local markets due to the higher pedestrian flow.

Integration
 High
 Low

Local market
 0-50
 50-150
 150-300
 300-500
 Above 500
 Hjällbo

ACCESS TO AMENITIES

The maps are all layered with the network between-ness at 5km and showcase a scenario where the network has been upgraded and new attractors have been added. The network alone had some effect, but not to this extent. The main action has been to spread out the functions over the area to reach residents with low access to amenities.

Local markets are distributed along streets with high centralities, which increases access, even though some areas are not fully covered.

Access to Public transport has increased in most parts. Added stops are bus stops as the topography and layout hinder additional stops on the tramline.

Access to public space is evened out. The analysis does not, however, capture the type of space; more programmed space has been added to the proposal, to answer to the requests expressed in the citizen dialogue.

Preschools have been added throughout the area to ensure proximity. This decision is contrary to the plan from Gothenburg city council, which prioritises larger units over accessibility (Reuter Metelius et al., 2022).

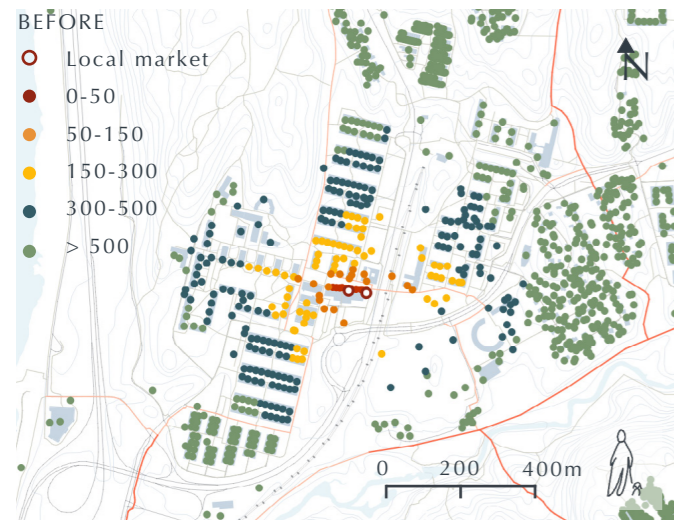


Fig. 93. Access to local markets in Hjällbo before interventions.

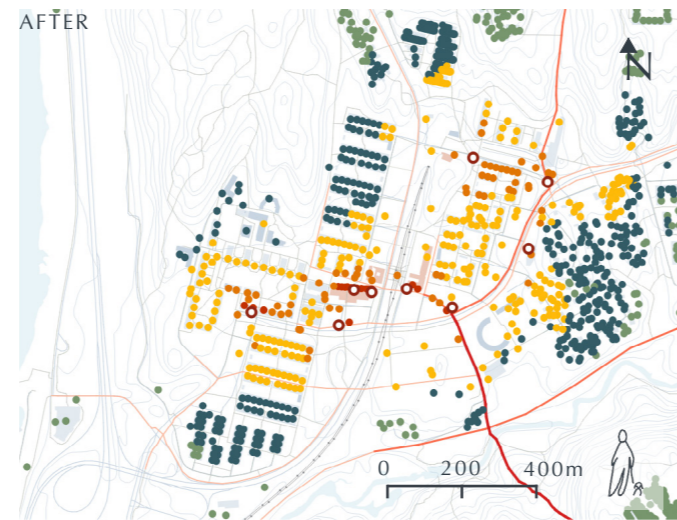


Fig. 94. Access to local markets in Hjällbo after interventions, new network and added attractions.

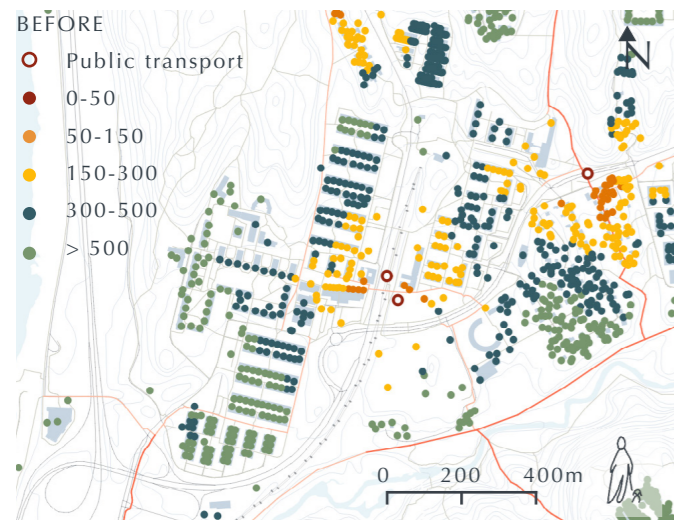


Fig. 95. Access to public transport in Hjällbo before interventions.

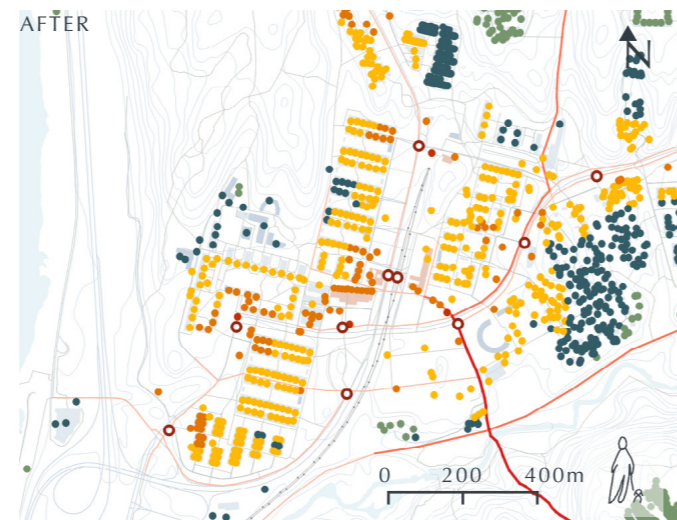


Fig. 96. Access to public transport in Hjällbo after interventions, new network and added attractions.

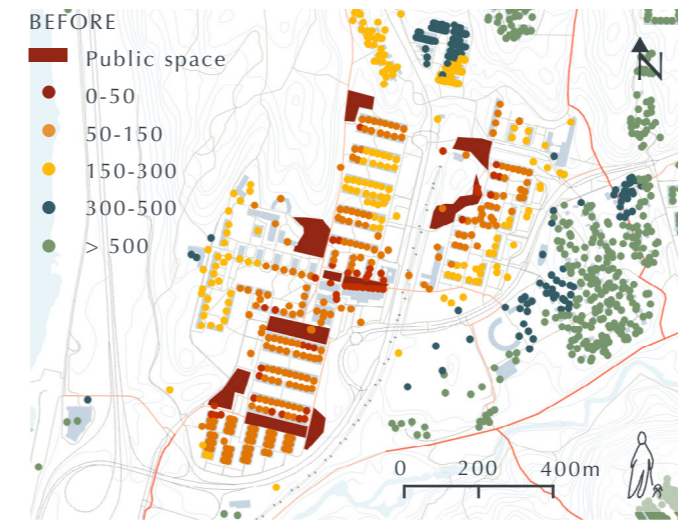


Fig. 97. Access to public space in Hjällbo before interventions.

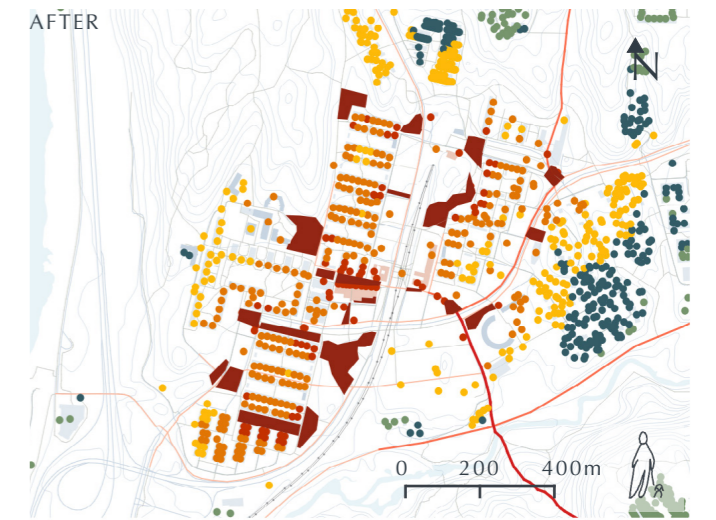


Fig. 98. Access to public space in Hjällbo after interventions, new network and added attractions.

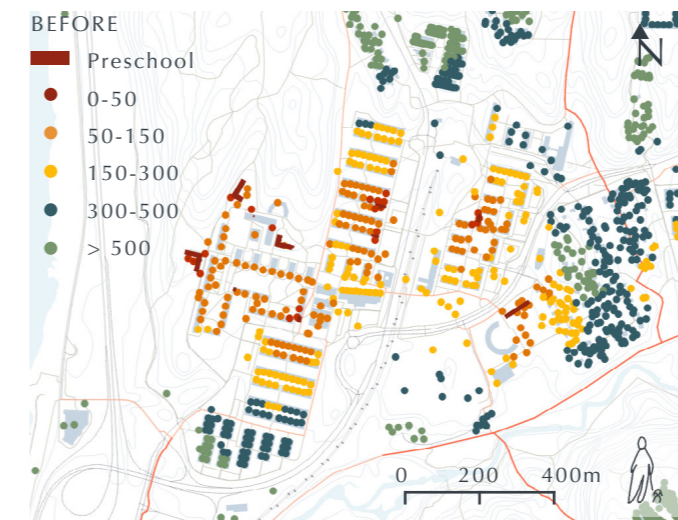


Fig. 99. Access to preschools in Hjällbo before interventions.

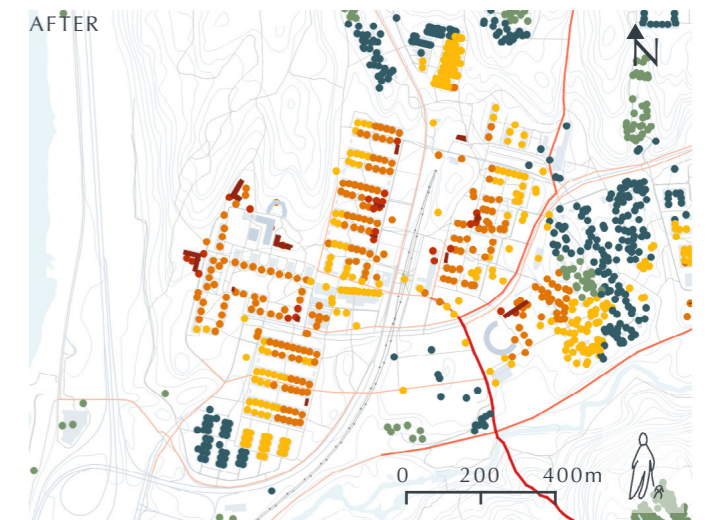


Fig. 100. Access to preschools in Hjällbo after interventions, new network and added attractions.

HJÄLLBO IN A LARGER CONTEXT



Fig. 101. Angular Betweenness 5km of Hjällbo, after local interventions.

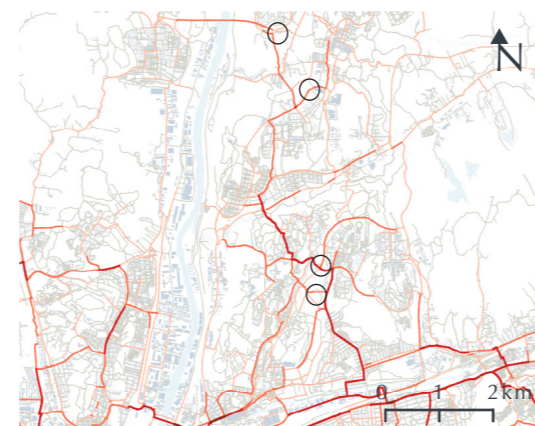


Fig. 102. Angular Betweenness 5km of new connections to and between Kortedala, Bergsjön, Hjällbo, Hammarkullen and Angered.

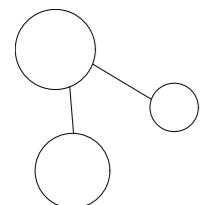


Figure 13. Enclaves

Since the street configuration is interdependent citywide, centralities in Hjällbo are, to some degree, determined by the connections all over the city. To complement and enhance the local centralities the case-study experiment with adding connections to the regional network as well. Four locations were identified where the global betweenness (5km) seemed disrupted. By adding new connections in these locations, a clear impact on the global betweenness was achieved, indicating a potential for a higher flow of though passage between different neighbourhoods.

To work solemnly in this scale would risk being too insensitive to local circumstances, where as a to narrow focus would risk

missing the opportunity of connections in the larger context. Every project therefore needs to address the configuration on multiple scales.

What emerges with interventions in this scale is a polycentric city structure where areas can become more interdependent. Instead of being satellites to a city center they then make up a part of the configuration as more movement is encouraged between areas. Thereby breaking up the enclaves that initiated the drastic increase in segregation.

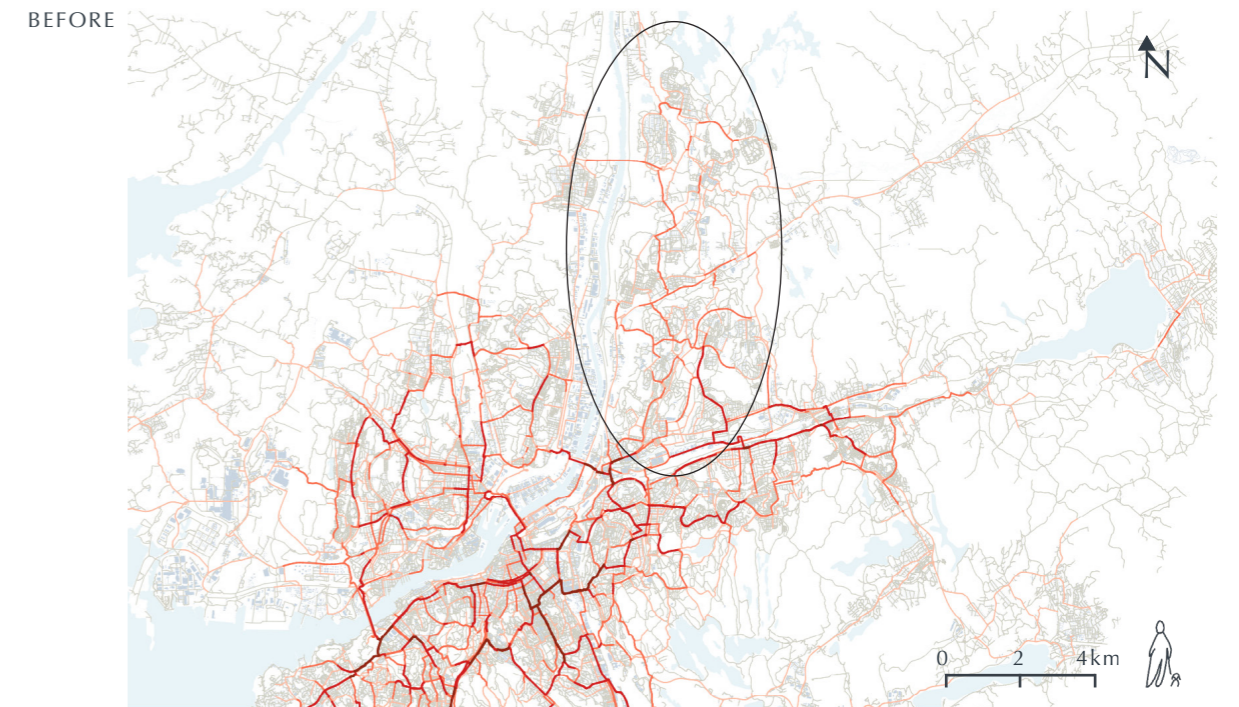


Fig. 103. Angular Betweenness 5km showing Gothenburg after local interventions. Circled is the northeastern part, the focus area for this study.

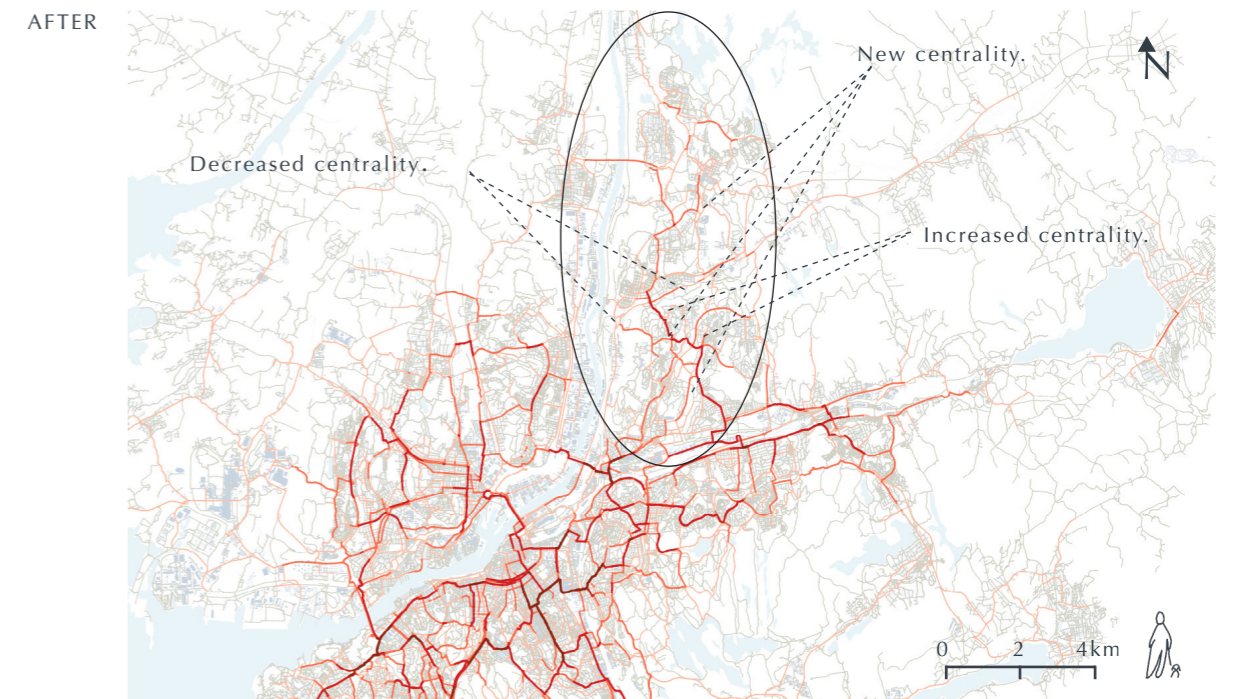


Fig. 104. Angular Betweenness 5km showing Gothenburg with the proposal and the four interventions in the neighbouring areas. In the circled area the result of the interventions are visible.

PUBLIC FUNCTIONS AND DENSITIES

1. THE STREETS

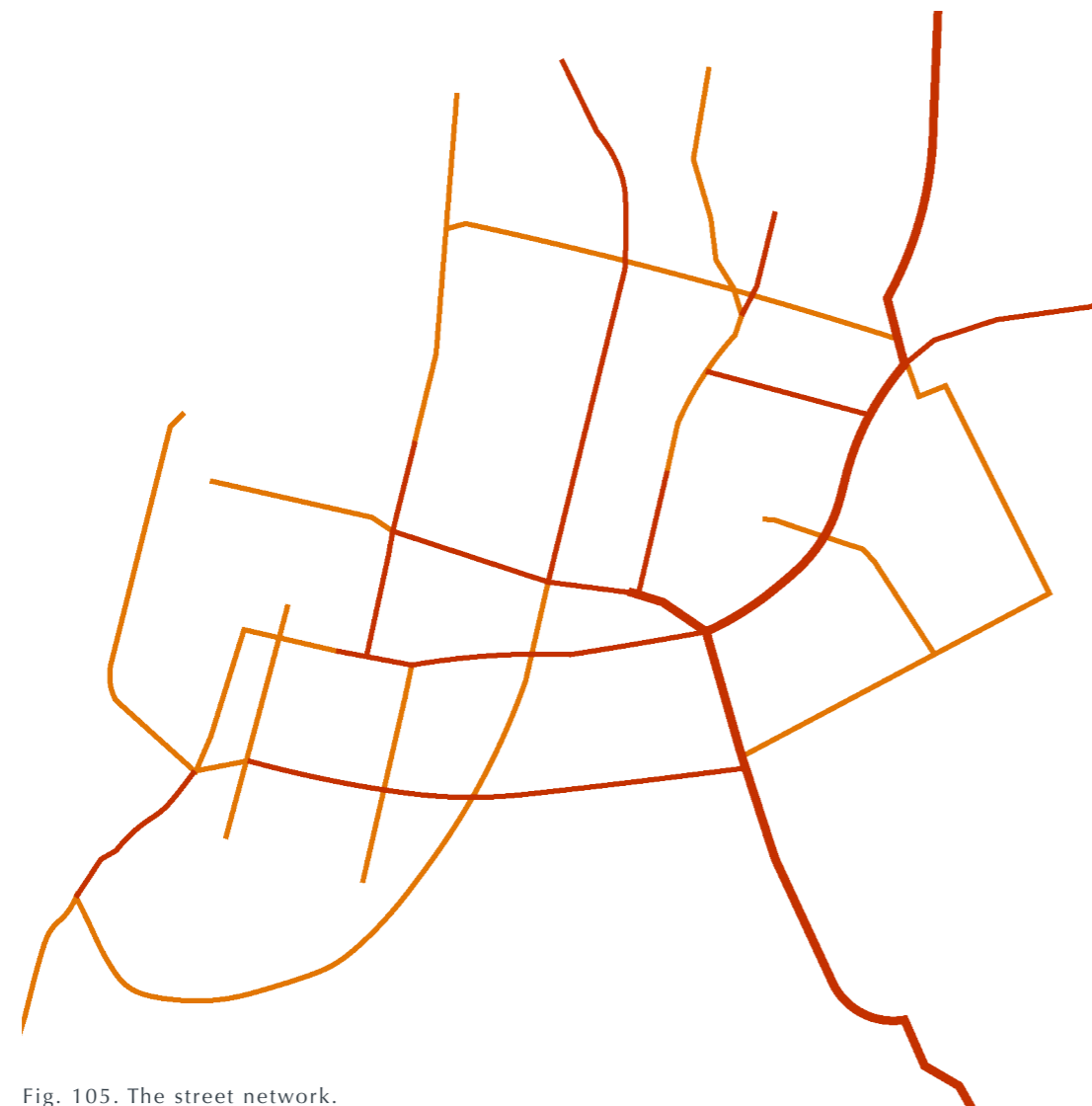


Fig. 105. The street network.

The interventions in the street network create a new configuration of pedestrian movement, integrating local and global flows. The resulting centralities provide a foundation for the area to foster new local and global functions. The centralities of the streets set the preconditions for space and

guide the addition of other functions.

To establish a multimodal street network, four street typologies are introduced based on guidelines outlined in Smart Streets (Ståhle et al., 2020). Pedestrian accessibility in Hjällbo is generally decent, with

- Legend
- Local Centrality
- Local & global Centrality



Fig. 65. Bridging barriers (see Hillier & Vaughan, 2007).

car-free paths across the area, but mobility is disrupted by major roads. Sidewalks and crossings are scarce, creating a feeling of unsafety (Stadsbyggnadskontoret, 2022). As argued by Smart Streets (Ståhle et al., 2020), the study prioritizes enhancing integration among modes of transport to transform streets into linkages rather than barriers. Emphasis is placed on facilitating crossings at street level. In instances where this isn't feasible, such as in the tram area

where topography varies, pedestrian walkways are provided at each level to encourage pedestrian movement.

In the proposal, car access is omitted on pedestrian-oriented streets. This decision is influenced partly by the existing appreciation for the car-free environment and partly by the narrowness of existing paths, making conversion impractical and expensive, with few benefits.

PEDESTRIAN- SPEED STREET

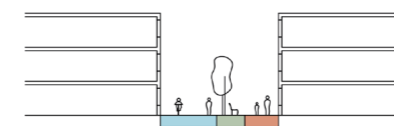


Fig. 106. All modes of transport share the same space, at a max speed of 10km/h (Ståhle et al., 2020). For the proposal this typology is kept car free, since the existing pedestrian paths are too narrow. Focus is instead on making room for cyclists.

MULTI-SPEED STREET

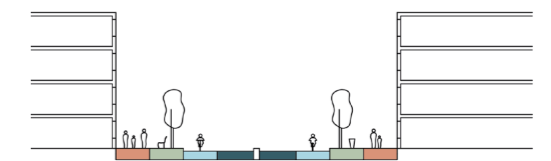


Fig. 108. Flexible space with greenery separates pedestrians and other modes of transport and a separate lane is provided for higher speeds (Ståhle et al., 2020). This is proposed for Gråbovägen as a boulevard with high multi-modal traffic. Speed reducing measures are taken where high pedestrian flows are expected.

LOW-SPEED STREET



Fig. 107. Pedestrian are provided separate sidewalks, 3m in width. All other vehicles share a 5m wide access lane, with a max speed of 20 km/h. Flexible spaces are placed along the pedestrian paths and include green space (Ståhle et al., 2020). This typology makes up all the internal car access streets in the proposal.

HIGH-SPEED STREET



Fig. 109. Central lanes are for higher speeds (3,25 wide and 40 km/h). Cyclists and pedestrians are provided separate lanes (2,5 and 3m) with flexible spaces, including greenery (Ståhle et al., 2020). This is proposed for Hjällbovägen as a boulevard with high, motorised traffic.

- Legend
- Pedestrian
- Flexzone & green
- Cyclist
- Motorised traffic
- Mixed traffic

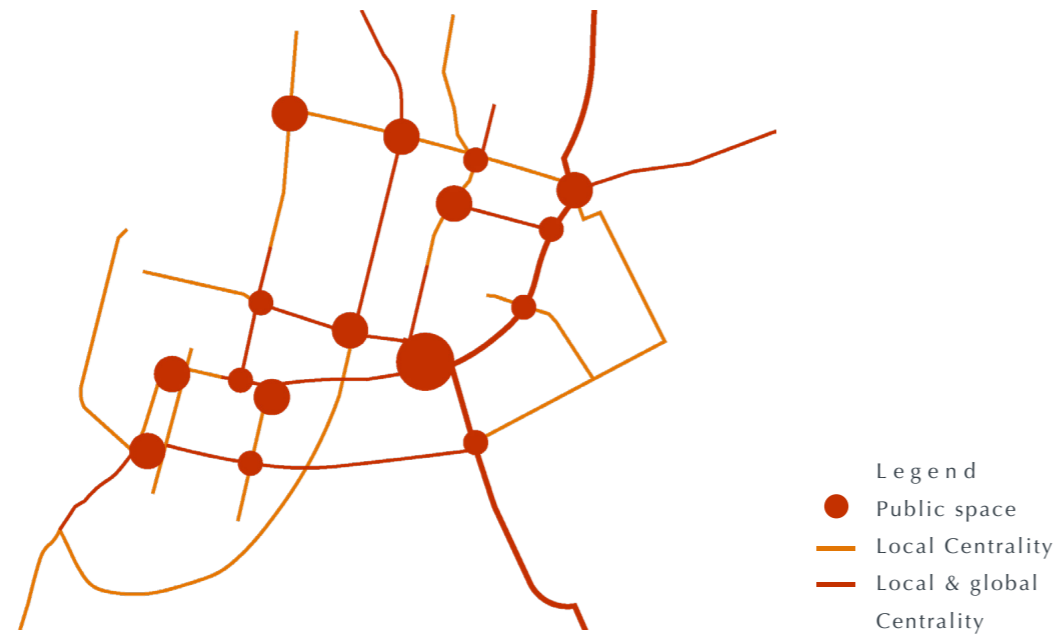


Fig. 110. Intersections with higher centrality is cared for by creating a public space.

2. THE PUBLIC SPACE

The public spaces encompass social green spaces and squares, in addition to the streets. Social green space refers to spaces that serve social and community purposes beyond their ecological benefits, including parks, sports fields, and urban gardening lots. To enhance the newly established centralities, extended public space is positioned at each intersection of higher centrality. The size and function of these spaces correlates with their centrality, with larger areas featuring hard ground surfaces located in areas of high centrality. In instances where existing building structures are detached from the street, public functions are introduced to bridge the gap and maintain continuity in the streetscape. The spaces are programmed to accommodate various user groups as to create co-presence. For instance, hangout spots for youth, urban farming areas, and playgrounds form an ensemble that attracts a diverse range of users.

As a next step, collaborative design processes involving residents could ensure that the spaces are embraced by the community, fostering a sense of ownership and empowerment among inhabitants.

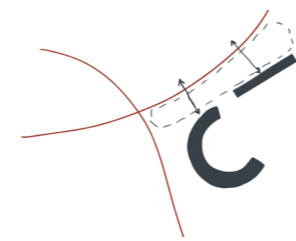


Fig. 111. Existing buildings are buffered to the street with public functions

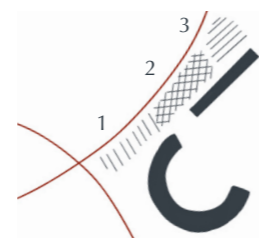


Fig. 112. Co-presence, meeting places for youth (1), urban farming (2) and playgrounds (3).

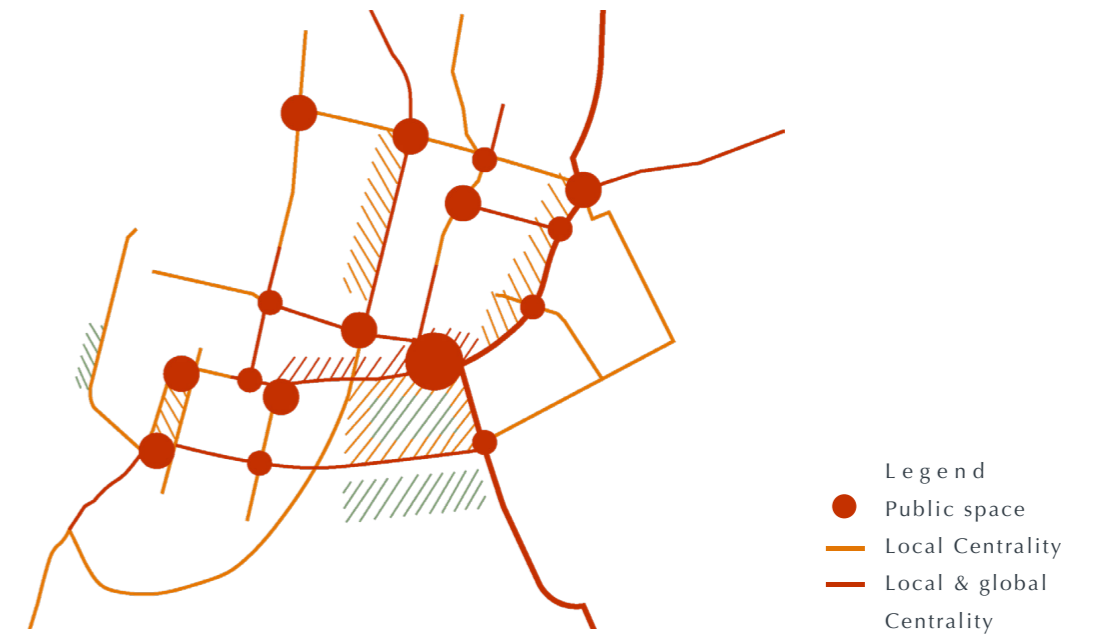


Fig. 113. The density of new construction is determined by the surrounding streets.

3. THE DENSITY

The development has been categorised into three strata based on the centrality of the adjacent streets. The existing central area is expanded, forming a denser central district. Buildings within this area ranges from three to five floors to align with existing building typologies. Ground floors facing streets with a high betweenness should offer possibilities for public functions, such as cafes, shops, community facilities or other public non-commercial amenities. Medium-density buildings are positioned in areas with relatively high betweenness and are designed to offer support to the street. They should also be constructed in order to be able to accommodate public functions, fostering a network of active fronts in places that expect a higher foot traffic. At the same time, more single-family housing is introduced as per Gothenburg city's request (Reuter Metelius et al., 2022). Medium-density developments may include a 1-meter buffer zone, as recommended by Minoura (2019), to maintain street connectivity while still allowing for personalisation. Low-density development is situated on streets with a lower betweenness, where the street allows for a freer building placement creating semi-private fronts.

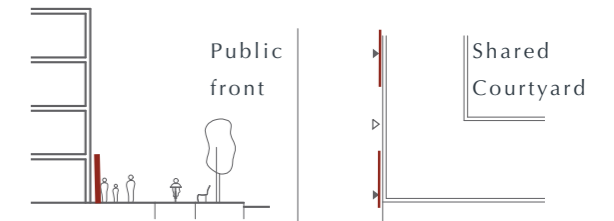


Fig. 114. **High density** meets high centrality. The street is supported by buildings with potentials for public functions.

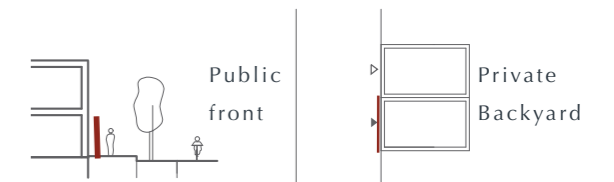


Fig. 115. **Medium density** meets medium to high centrality. The street is still supported by buildings with potentials for public functions.

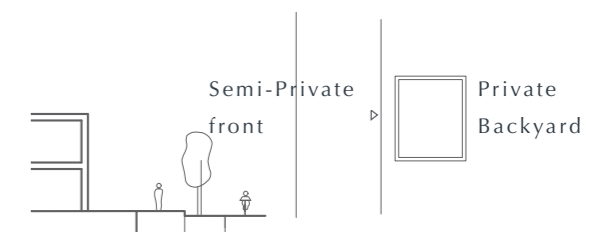


Fig. 116. **Low density** meets low centrality. Here the built can have a freer relation to the street.

THE RESULT

The focus lies on materializing the new connectivity by enhancing urban structures that support the different centralities to foster a vibrant city life. This results in a network of new public spaces and densification that enhances the area's qualities. By following the expected centrality of the streets, functions can be more carefully allocated to ensure successful implementation. A wider variety of spaces is created via the design case study, responding to the demand for more meeting places expressed in the citizen dialogue. As typologies have not been the focus of this thesis, the showcased typologies are gathered from the plan proposal by the city council.

- Legend
- Public functions
 - Social green
 - Buildings with public function
 - Densification
 - High density
 - Medium density
 - Low density
 - xxx
 - Active fronts
 - Centralities
 - High local & global
 - Mid local & global
 - High local
 - Medium local
 - High global
 - Motorised network

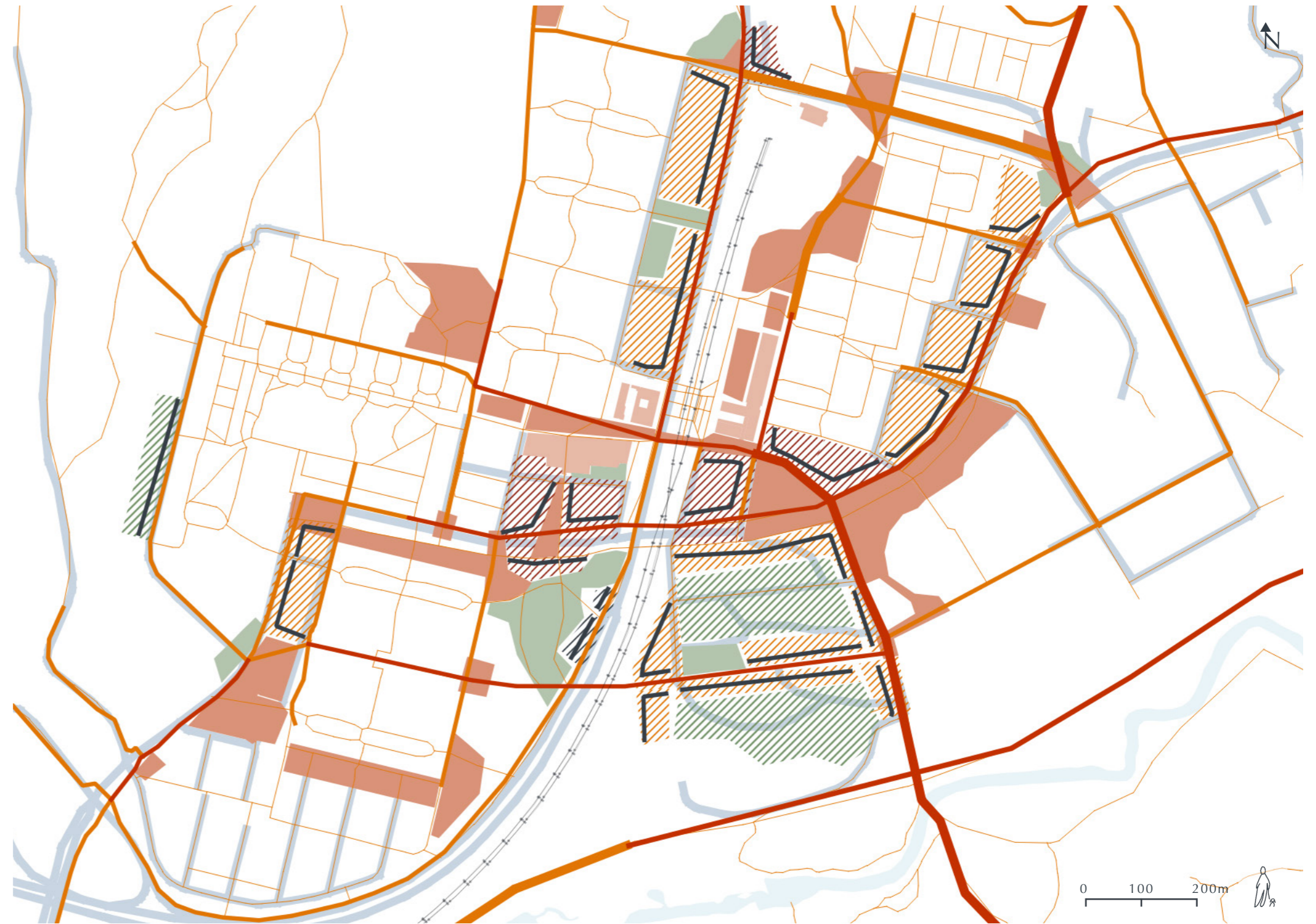


Fig. 117. Public space and density are based on the streets.

HIERARCHIES OF SPACE



The resulting configuration of space has a clearer distinction between private and public functions, thereby providing a better opportunity for a multitude of well-used spaces. Figures 118 and 119 illustrate the envisioned changes in definitions. Here, a clear increase in fully public spaces can be observed, along with the provision of fully private spaces for residents. Some spaces remain ambiguous even after the interventions of the case study and would need to be further observed in case the plans are realized. The following pages contain a breakdown of strategies that can be implemented to achieve a distinction of space.



Fig. 118 and 119. The hierarchies of space before and after interventions.

- Legend
- Public space
 - Private space
 - Ambiguous space
 - Non motorised network
 - Motorised network

PRINCIPLES FOR THE PRIVATE

TODAY:

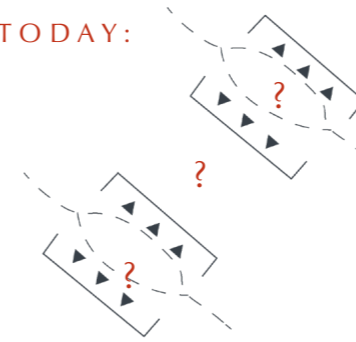


Fig. 120. Ambiguous space.

Unclear hierarchies in spaces around the housing areas.

1. DEFINE WHAT IS PRIVATE AND PUBLIC.

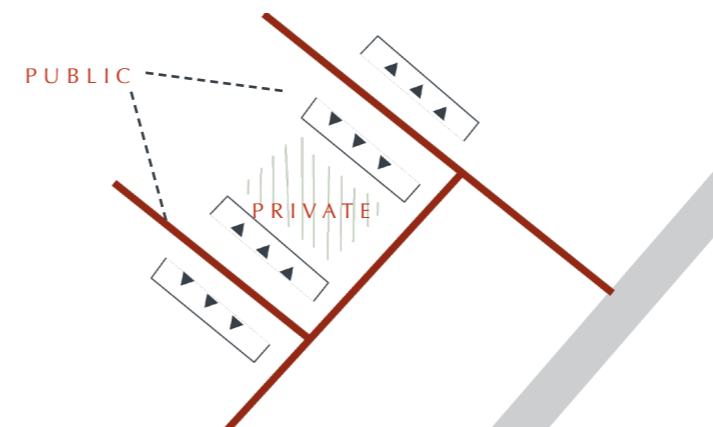


Fig. 121. Private/ public divide.

Define public and private spaces by making through passage clearer and connect movement to a larger grid.

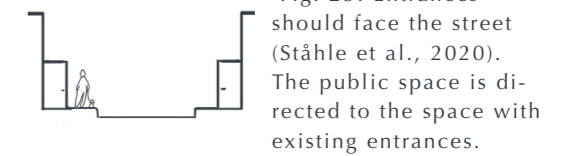


Fig. 25. Entrances should face the street (Stähle et al., 2020). The public space is directed to the space with existing entrances.

2. ENCLOSE PRIVATE SPACE.

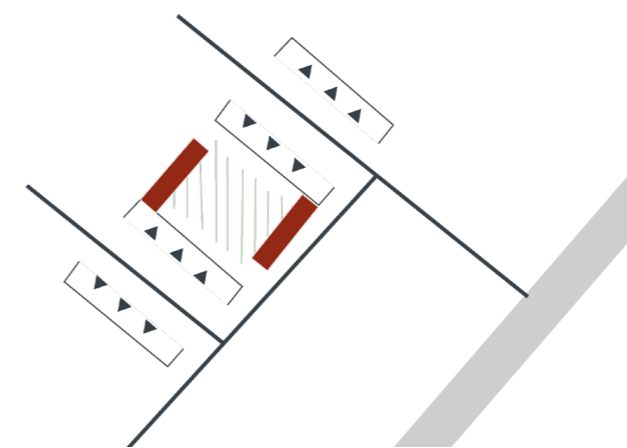


Fig. 122. Additional structures.

Additional structure help define space.

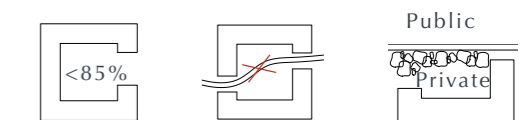


Fig. 35, 36 and 37. Maximum degree of openness, avoid paths through residential courtyards and provide clear interfaces (Minoura, 2019).

PRINCIPLES FOR THE PUBLIC

1. STREET HIERARCHY

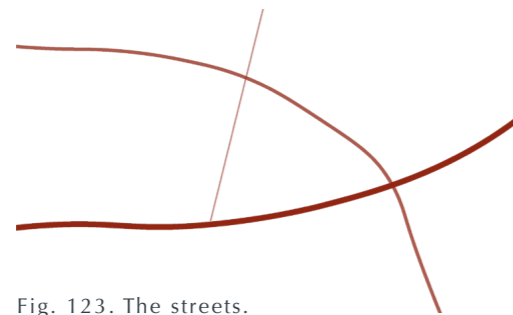


Fig. 123. The streets.

The streets are analysed as the definer of the public space.

2. PUBLIC SPACE IN THE INTERSECTIONS

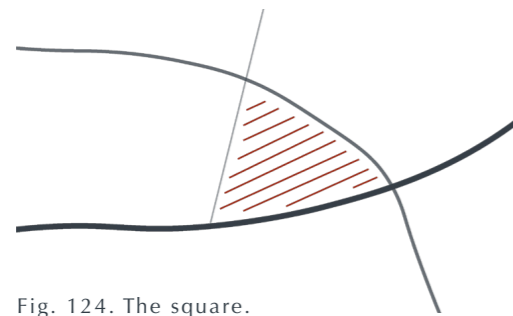


Fig. 124. The square.

Public spaces are placed in the intersection of main paths and the function is determined by the centrality of the adjacent street.

3. SUPPORT THE PUBLIC SPACE WITH BUILT FORM

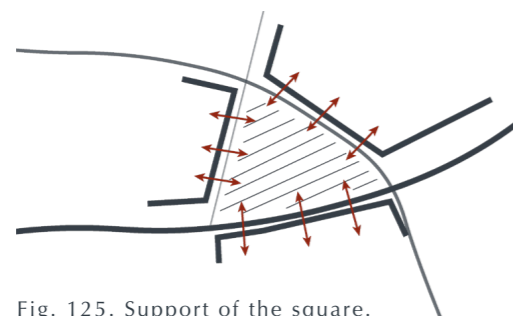


Fig. 125. Support of the square.

The public space is framed by buildings.

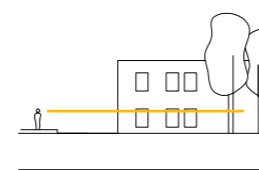


Fig. 66. Densifying to support the streets (see Ståhle et al., 2020) while preserving lines of sight to greenery.

4. ACTIVATE THE BUILDINGS GROUND FLOORS

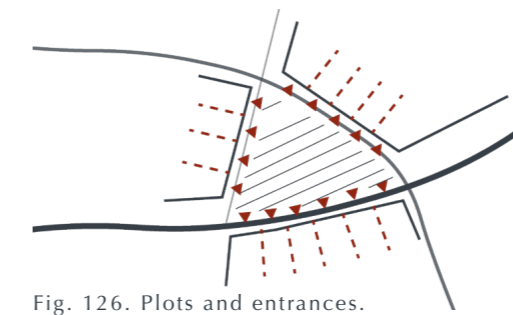


Fig. 126. Plots and entrances.

Providing:
- Active fronts
- Plot structure
- Entrances

Max 10m



Fig. 127 and 25. Entrances are facing the street to contribute to street life (Ståhle et al., 2020). In high centrality entrances are placed every 10 m, in medium centrality every 15m (Ståhle et al., 2020).

5. MAKE THE PUBLIC SPACE A DESTINATION

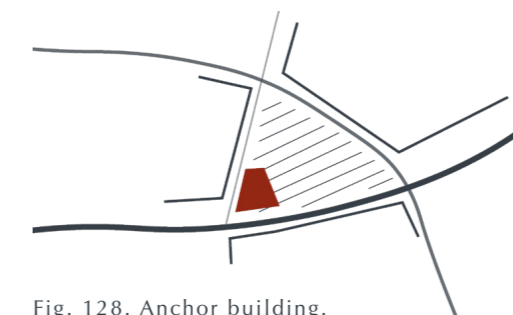


Fig. 128. Anchor building.

Create a space for both through movement and as a destination in itself by adding an anchor building.

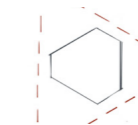


Fig. 129. Corners are cut along important axels as to not bloc the line of sight.

6. GREENERY FRAMES THE MOVEMENT

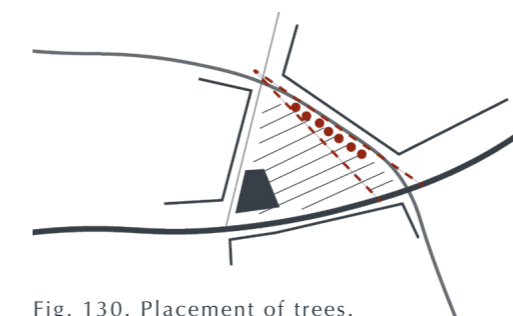


Fig. 130. Placement of trees.

Added trees are placed along the paths to frame the movement and create a visual link.

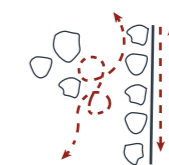


Fig. 131. The existing trees are preserved to contrast and create spaces within.

MATERIALISING CENTRALITIES

- Legend
- Main axels of movement
 - Existing buildings
 - Potential active fronts
 - Arcade
 - Plot division
 - Entrances

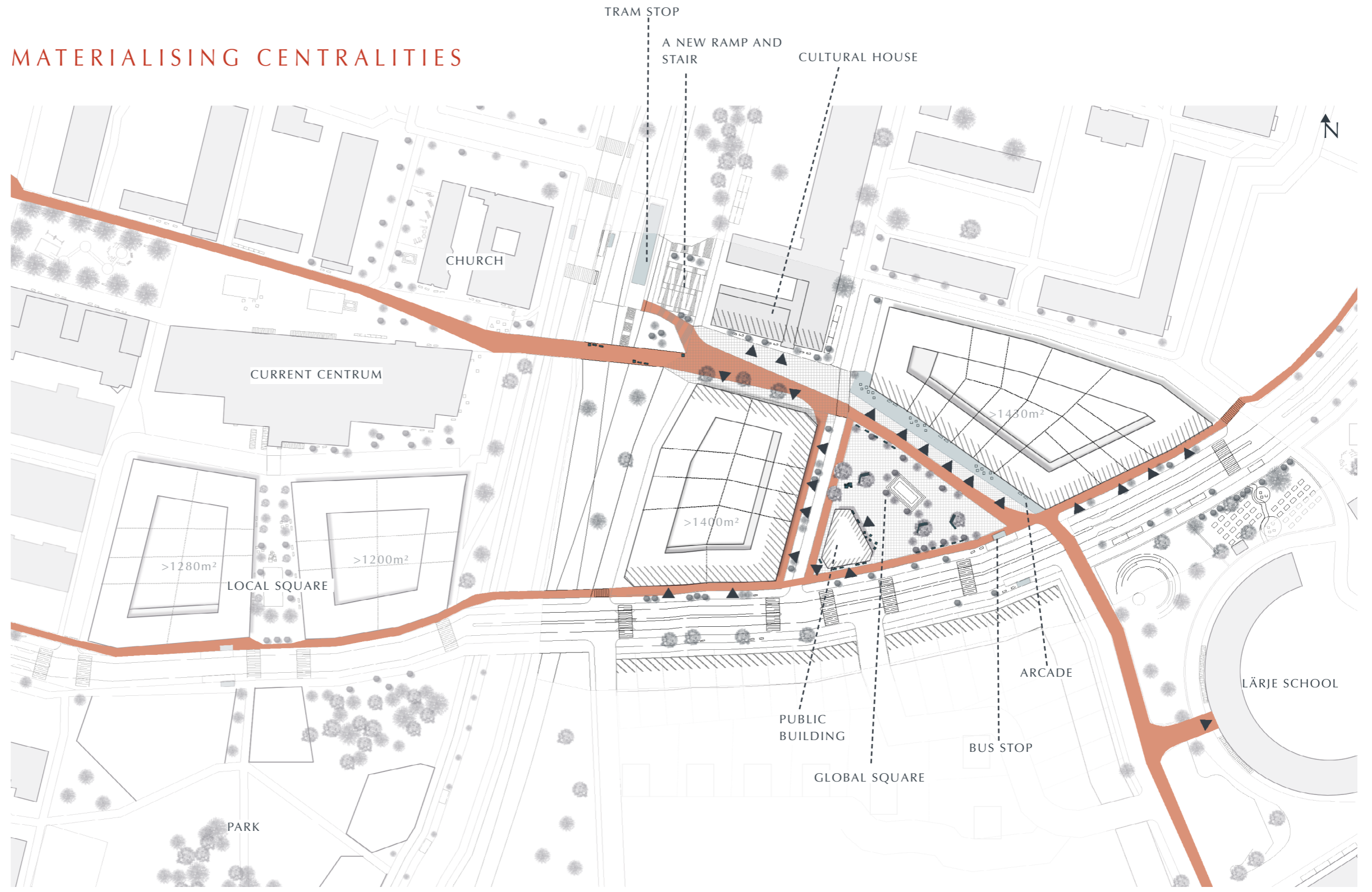


Fig. 133. Materialised centrality in the central part of Hjällbo.



Fig. 132. Centrality around the global square.

CASE STUDY ON DESIGN

In the intersection between paths of high global and local centrality a new square is introduced. Its location is based on the through traffic of pedestrian flows and is envisioned to cater both local and global functions. Its central location is heightened by a cluster of public functions surrounding the space.

Cultural strada: A central stretch is envisioned to lead movement from the existing square, along an axis of high local and global centrality, down to the school area, a cultural strada intersecting with Gråbo Boulevard. This corridor is in the case-study anticipated to become the hub of activity, with preserved sections of the old Hjällbo school repurposed to host cultural functions.

Gråbo boulevard: The new Boulevard intersects with the cultural strada, serving as a

pivotal link between the east and west. This area presents opportunities for vibrant street life, active fronts, and the establishment of small businesses and community spaces, due to its high local and global centrality.

Integrated Connectivity: The plan emphasizes the seamless connectivity between key destinations such as the shopping center, tram station, a new culture house, bus stops, and the school. Visual connections and well-defined paths are incorporated to facilitate navigation within space.

Enhanced Tram Area: The tram area is revamped to be more integrated into the urban fabric. The addition of a large ramp and stairs, along with seating arrangements, aims to create visual connections and make the tram area more inviting. Weather protection features are proposed to enhance comfort.

Legend
 - - Main movement
 — Line of sight

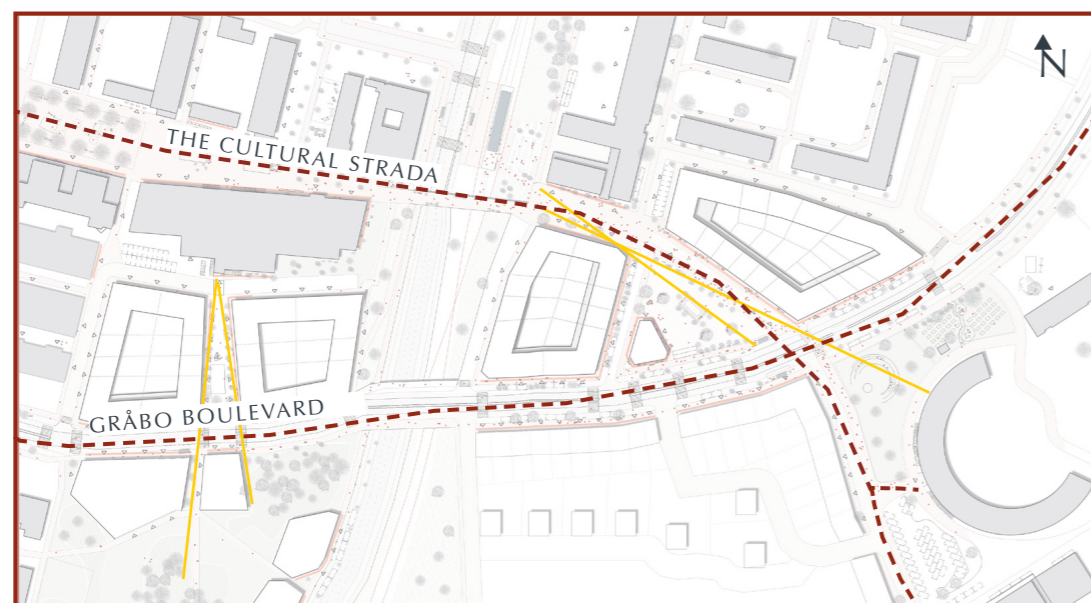


Fig. 134. Key movement axels and visual connections.

Movement axels and lines of sight

To enhance the design of the square, two key elements have been of importance: the lines of sight and the movement axes. The square serves as a thoroughfare, facilitating high volumes of movement. Clear lines of sight not only aid navigation but also contribute to the legibility of space. Significant visual cues include sightlines from the tram stop at one end to the bus stop at the other. Equally crucial are pathways guiding individuals from the existing square to the cultural house, arcade, and school. These pathways, coupled with movement along Gråbo Boulevard, form the primary movement axes within the square.

The global square serves a pivotal role in urban configuration as it supports a high through-movement of people going about with their life. This pedestrian flow provides opportunities for different public activities, whether commercial or non-commercial. Entrances frequency is therefore high and plot structure of varying size to provide opportunities for different scale actors.

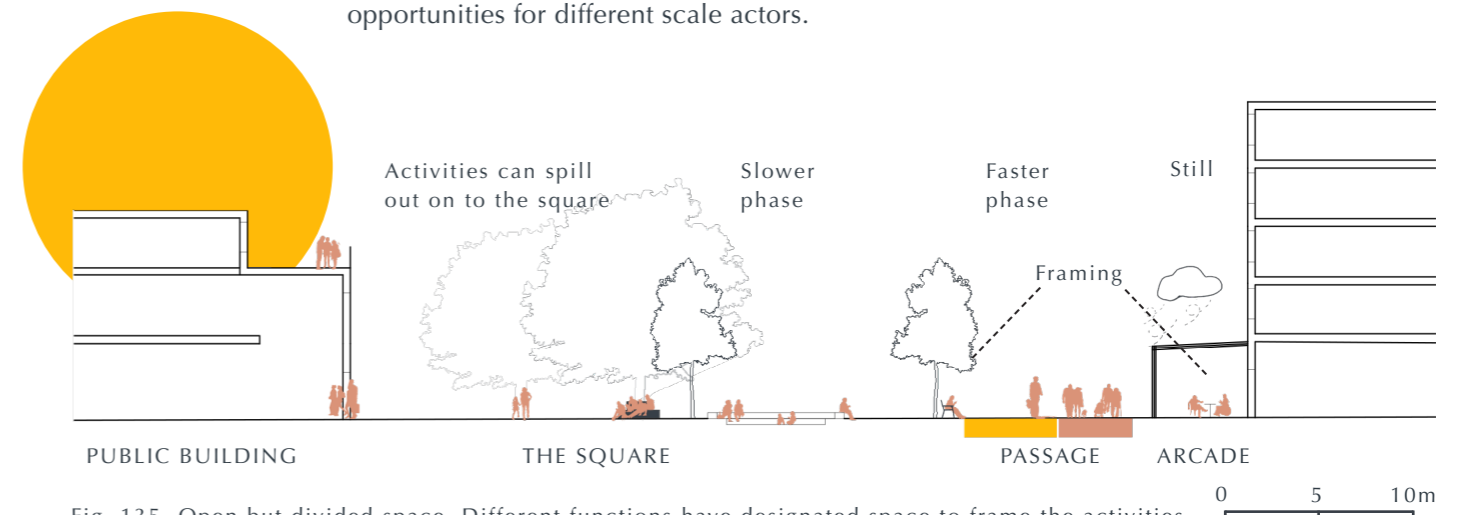


Fig. 135. Open but divided space. Different functions have designated space to frame the activities.

The arcade: Along the south-facing wall an ample space is provided for seating or other functions. The space is framed by an arcade to give shelter from the weather. It also serves as a form of border between the motion on the through path and the stillness of the arcade.

Framing movement: To the main square a line of trees serves the same purpose as it directs the fast through motion along one path and invites for a slower phase in the inner space.

The public building: To the southern end of the square a public building, maybe hosting a library focusing on youth, frames the space. The exact function of the culture house and the public building on the square should be decided in agreement with the residents. The study therefore only provides a central space for these functions to indicate their importance, answering the citizens request for indoor meeting places.

DISCUSSION

SPATIAL CHALLENGES

What are the main spatial challenges of the MHP when adopting it to a contemporary context?

This thesis argues that the Million Homes program contributed to segregation by advocating for the enclave-based urban design ideals, both on a city-wide perspective and within individual neighbourhoods (Klarsander, 2001). This spatial structure leads to unequal access to amenities and reinforces social division among communities.

The case study of Hjällbo exemplifies this segregation, exhibiting internal fragmentations well as a disconnect to the surroundings. As a result, the area appears private to the visitor but lacks control for the resident (Minoura, 2019). In sum, the area is hard to navigate, overview and access and most visible uses of public space seem to be necessary activities (Gehl, 2010). The citizen dialogue shows evidence of other activities, but an explicit request for more support for things to happen is expressed and interpreted as a request for more programmed space.

In conclusion, the main challenges are seen as the spatial structure not offering enough support for public life due to :

- Lack of hierarchy between the public and the private.
- Lack of connection to the surroundings.

Resulting in a desire for places to meet among the public.

SPACE ANALYSIS TOOLS AND DESIGN INTERVENTIONS

How can space analysis tools be employed to design interventions in MHP areas, using Hjällbo as a case study, that addresses the urban network challenges?

The analysis of the current situation and the development plan from the city planning office reveals that Hjällbo lacks through-movement and connections to the surroundings, as well as internal connections, resulting in limited access to amenities. Based on the analysis, a new configuration is proposed to address these spatial issues. The analysis is instrumental in providing an overview of the existing conditions and understanding the potentials and problems regarding spatial connectivity. With this understanding, interventions can be tailored to address underlying problems rather than only treating the symptoms. Space analysis tools can therefore be employed to quantify the problem and understand the factors contributing to urban segregation. By extension, the analysis indicates what changes are needed and what connections are possible. Finally, they serve as evaluative tools to assess different solutions beforehand to determine the most effective approach.

AN ALTERNATIVE PLANNING APPROACH

How would an alternative planning approach tackle spatial segregation in the MHP areas, addressing urban form and spatial configuration?

Based on the case study, it becomes evident that a different design process would more efficiently address the segregation of a whole city. The streets play a vital role in urban life and the distribution of resources, as they foster proximity if correctly designed.

As much as it concerns the streets themselves, it also involves how the built form relates to the streets, as the streets set the preconditions for activities. The built form must provide adequate space for these activities. Minoura (2019) theories on the qualities of the private, Gehl's (2010) insights on the quality of the public realm, and Smart streets (Stähle et al., 2020) perspectives on the street are potent tools for materialising centralities, as they offer a fundamental understanding of how to create space that foster human connection in the local context. Hence, all these elements need to relate to the centralities for the city to function as desired, as the spatial configuration creates the preconditions for a new urban form. In contrast, the current planning approach, as seen in the new plan for Hjällbo from the city planning office, is rather generic, focusing mainly on increasing densities. It misses out on proposing structural interventions aimed at addressing the underlying issues.

Based on the learnings from literature studies, analysis, case study and an iterative design process, the following alternative structure is proposed for a new planning process:

CITIZEN DIALOGUE AND BACKGROUND

Understand the background, the site and the people.

- Identify what works, what is missing, and the lived experience as well as key elements of urban life today?

ANALYSIS OF CURRENT

Understand the patterns of segregation.

- Analyse and evaluate the current problems to address qualities and potentials.
- Do this on multiple scales, from very local to the whole city structure, as this will reveal different aspects.
- Decide on key attractors and analyse access to them – access to local markets is a good indicator of urban life. Other factors could include access to schools, parks, healthcare, etc.

COMPREHENSIVE PLANNING

- Evaluate and form goals – where is their potential for centrality, and where is it desired.
- Improve the street network based on the goals – test things out and iterate.
- Make a comprehensive plan based on the new centralities – where can densification support the centralities, and what kind of densification? If designed correctly, see the street not as a divider but as a provider of flows of people and thereby of potential.

WORK FLOW DIAGRAM

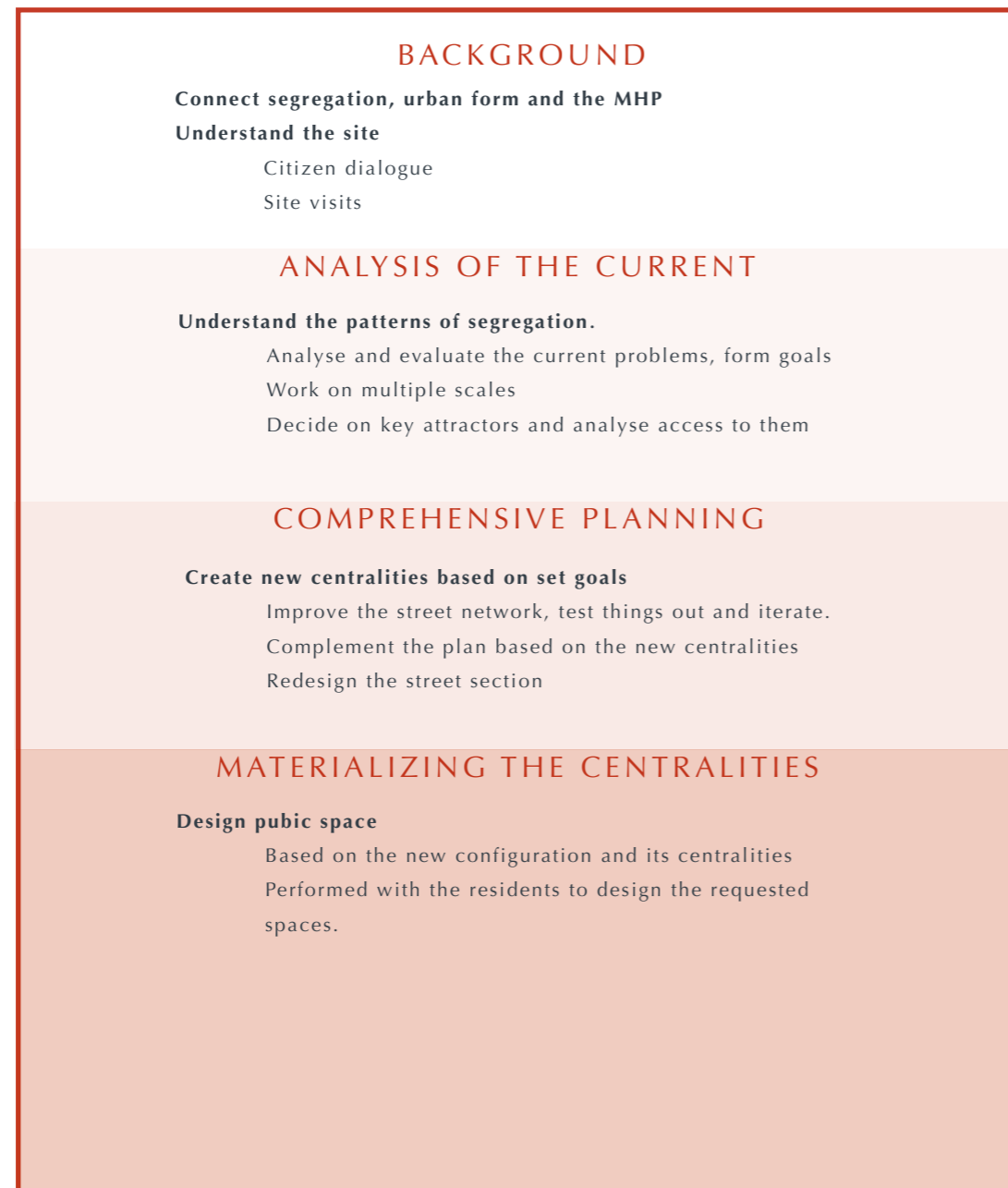


Fig. 136. A new work flow for the planning process.

– Redesign the street section, typology are based on the function of the streets. What are the speeds, is movement integrated or are different modes offered different lanes?

MATERIALIZING THE CENTRALITIES

Design public space – where will people move and how does that effect the space? Detail the space to materialise the centralities. This step is preferably performed with the residents to design the requested spaces. The organisation of space should be influenced by the current inhabitants as it is changing media, football fields can become, planting beds, can become BBQ spots, can become a stage, can become football fields. Therefore, it should be influenced by the users. The city's structure has a more significant responsibility over a longer perspective. It must be based on other factors, like centralities and integration.

CHALLENGES AND LIMITATIONS

This thesis aims to shift the focus of the planning process, specifically when addressing the MHP. In doing so, emphasis on financial investments is reduced. Some readers may perceive the proposal naive if interpreted as advocating for an immediate implementation based on the proposal for a comprehensive plan. This is not the purpose. Rather, the intention is to highlight the shortcomings of the current planning structure and showcase the potential of an alternative approach.

The claim made by this thesis is that to efficiently address segregation, we need to

work on a multiscale, structural approach. At the same time, it remains grounded in a realistic methodology, avoiding major infrastructural interventions deemed unrealistic. For instance, the decision to retain the tram rail in its current position, despite its potential to significantly alter conditions in Hjällbo if placed elsewhere. This thesis is, hence, a balancing act between challenging conventions while still keeping it realistic.

Furthermore, the designation of Hjällbo as a regional node by the city signals an interest in investments. Given that segregation patterns are structural and costly to change, investments in the MHP areas are essential for community well-being. Moreover, a shift in the measurement of returns could reveal the financial benefits of these interventions. As segregation decreases, improvements in health and well-being could result in returns in other areas.

In conclusion, this thesis should be seen as an inspiring alternative focusing on the potential for new spatial qualities in the MHP areas.

THE PEOPLE

While not the primary focus, this thesis acknowledges the impact of gentrification resulting from proposed interventions. Gentrification, characterised by the displacement of long-term residents due to changing neighbourhood conditions leading to increased rents and property prices (Angotti, 2012), poses a risk, particularly in areas like Hjällbo where rental units dominate,

and incomes are below average. Although not the primary focus, gentrification is an unavoidable topic in discussions about development and investment, especially when tackling issues of segregation and public housing.

To mitigate adverse effects, the interventions proposed in the thesis should be coupled with gradual change, protecting existing rentals and involving residents in evolving public spaces. Engaging residents in decision-making processes and respecting their desires for each space is crucial. For an exploration of this topic, see the works by Harvey (2015), Baeten et al. (2017), Thörn & Holgersson (2016), and Harrison and Jacobs (2016).

Ultimately, successful development hinges on understanding the local community's needs and aspirations, respecting their input, and striking a balance between city goals and community desires. This requires ongoing dialogue and a commitment to inclusive, sustainable development practices.

CONTRIBUTION

The aim of this thesis is to contribute to the discussion on segregation and to explore a spatial example of a planning process that prioritises street configuration. By applying spatial analysis techniques to a case study of Hjällbo in the northeastern part of Gothenburg, local circumstances and network-based interventions are discussed and tested. The thesis should not be viewed as a design project but rather as a commentary on the current planning process in the context of a design case study. The main contribution is a new workflow for urban planning and a case study of the implementation of design tools, showcasing how smaller interventions in the urban network can influence segregation patterns in a city.

CONCLUSIONS

The Million Homes program was an ambitious attempt to address the challenges of its time, unfortunately the segregation effects of the planning ideals are today visible on a city-scale, often with visible negative effects on the individual neighbourhoods. As interventions are discussed today, they tend to have an ambitious but generic approach of addressing the segregation, where the solution is often spelled out as densification, many times with minimal structural interventions. This thesis argues for the opposite. The spatial challenges in the MHP are based in incomplete network configurations. Consequently, it is first and foremost structural interventions that are required to address the core problem rather than the symptomatic approach that seems to be common practise today.

In this thesis an alternative approach to city planning is proposed, accentuating the importance of the street configuration as a basis and guide for development. This further requires the ability to work in multiple scales, addressing the internal network as well as its connection to the surrounding centralities. Residents today are rarely expected to live, work and find all their entertainment in one area, the goal should therefore be to aim for better connectedness between areas, a form of polycentrism, where everyone can benefit from what each has to offer. Furthermore, we cannot expect everyone to have access to a car or rely only on public transport. Building cities for pedestrians and non-motorised traffic, also in suburbs is essential today, for the freedom of movement, environment and for the health of inhabitants.

BIBLIOGRAPHY

- Andersson, R. (2007). *Ethnic Residential Segregation and Integration Processes in Sweden*. In *Residential Segregation and the Integration of Immigrants: Britain, the Netherlands and Sweden*, ed. Karen Schönwälder, 61-90. Berlin: Wissenschaftszentrum Berlin für Sozialforschung gGmbH.
- Angotti, T. (2012). The Gentrification Dilemma, Architect. Retrieved 5/5 2024 from https://www.architectmagazine.com/design/the-gentrification-dilemma_o
- Baeten, G., Westin, S., Pull, E. and Molina, I. (2017). Pressure and Violence: Housing renovation and displacement in Sweden, *Environment and Planning A*, 49(3):631-651 doi/abs/10.1177/0308518X16676271
- Cambridge dictionary. (n.d) Segregate. In Cambridge Advanced Learner's Dictionary & Thesaurus. Retrieved March 3, 2024, from <https://dictionary.cambridge.org/dictionary/english/segregate>
- Franzén, M. (2009). Matters of urban segregation. In D. Koch, L. Marcus, & J. Steen (eds.), *Proceedings to the 7th International Space Syntax Symposium*, (I05:1-I05:2.). Stockholm: KTH.
- Gehl, J. (2010) *Life between buildings. Using public space*. Arkitektens Forlag.
- Göteborg Stad. (n.d.). *Hjällbo - Program för stadsutveckling i Hjällbo*. [Hjällbo - Program for Urban Development in Hjällbo.] Retrieved October 27, 2023, from <https://goteborg.se/wps/portal/>
- start/goteborg-vaxer/sa-planeras-staden/plan-och-byggprojekt?uri=gbglnk%3Agbg.page.bb7386fd-1152-47cb-9da4-d06b-d7780a77&projektid=BN0261%2F22
- Göteborgs stadsledningskontor. (2023). *Göteborgsbladet 2023 - områdesfakta* [Gothenburg Leaflet 2023 - Area Facts]. https://goteborg.se/wps/wcm/connect/7c0f1414-b15d-4771-9582-6f6f06af2317/132+S-DN+%C3%96stra+G%C3%B6teborg+2020.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE-7c0f1414-b15d-4771-9582-6f6f06af2317-ncfr1s
- Poseidon. (n.d.). *Hjällbo*. Retrieved April 29, 2024, from <https://poseidon.goteborg.se/sok-ledigt/vara-bostadsomraden/hjallbo/>
- Hall, T. (Ed.). (1999). *Rekordåren : en epok i svenskt bostadsbyggande* [The record years: an era in Swedish housing]. Boverket.
- Hanson, J. (2000). *Urban transformations: a history of design ideas*. *Urban Design International* 5: 97–122.
- Harvey, D (2015) Contradiction 1, Use Value and Exchange Value, In: *Seventeen Contradictions and the End of Capitalism*, London: Profile Books, p. 15-24.
- Harrison, S & Jacobs, A. (2016). Gentrification and the Heterogeneous City: Finding a Role for Design, *The Plan Journal* 1(2):239-259, doi: 10.15274/tpj.2016.01.02.03
- Hill, A. V (ed.). (2020). *Foundries of the Future: a Guide to 21st Century Cities of Making*. TU Delft Open. DOI 10.4121
- Hillier, B. (1996). *Space is the Machine: a configurational theory of architecture*. Cambridge University Press.
- Hillier, B and Hanson, J. (1984). *The social logic of space: The logic of space*. Cambridge University Press.
- Hillier, B. & Iida, S. (2005). *Network effects and psychological effects: a theory of urban movement*. In: Cohn, A.G., Mark, D.M. (eds) *Spatial Information Theory. COSIT 2005*. Lecture Notes in Computer Science, vol 3693. Springer, Berlin, Heidelberg. https://doi.org/10.1007/11556114_30
- Hillier, B. & Vaughan, L. (2007). The city as one thing. In L. Vaughan (Ed.), *The spatial syntax of urban segregation*. (205-230). *Progress in Planning* 67.
- Integrationsverket. (2004). *Rapport integration 2003*. [Integration Report 2003]. Norrköping: Integrationsverket.
- Johansson, B. (Ed.). (2012). *Miljonprogramen - utveckla eller avveckla*. [The million program- develop or dismantle]. Formas.
- Klasander, (2001). *Stads-delar. Förorter som stadsbyggnadsfråga*. [Urban Areas: Suburbs as Urban Planning Issue]. [Licentiate Thesis, Chalmers University of technology].
- Legeby, A. (2010). *Urban segregation and urban form 1. From residential segregation to segregation in public space*. KTH Royal Institute of Technology.
- Legeby, A., Berghauer Pont, M. & Marcus, L. (2015a). *Dela[d] Stad: Stadsbyggande och segregation 1 Perspektiv och utgångspunkter*. [Divided city: City building and segregation: 1 Perspective and premises]. TRITA-ARK Forskningspublikationer.
- Legeby, A., Berghauer Pont, M. & Marcus, L. (2015b). *Dela[d] Stad: Stadsbyggande och segregation 5 Summerande reflektioner*. [Divided city: City building and segregation: 5 Concluding reflections]. TRITA-ARK Forskningspublikationer.
- Legeby, A., Berghauer Pont, M., Marcus, L. (2015c) *Dela[d] stad - Stadsbyggande och segregation. Metoder:sociala stadsbyggnadsanalyser*. [Divided city: City building and segregation: 2 Methods: social city planning analysis] TRITA-ARK Forskningspublikationer.
- Marcus, L. (2007). Social housing and segregation in Sweden – from residential segregation to social integration in public space. In L. Vaughan (Ed.), *The spatial syntax of urban segregation*. (251-263). *Progress in Planning* 67.
- Minoura, E. (2019). *Bostadsgården. Territoriell arkitektur*. [Residential Courtyard. Territorial Architecture.]

Prop. 1967:100. Kungl. Maj:ts proposition till riksdagen angående riktlinjer för bostadspolitiken, m.m [guidelines for the housing politics etc.]. Sveriges riksdag. https://www.riksdagen.se/sv/dokument-och-lagar/dokument/proposition/kungl.-majts-proposition-nr-100-ar-1967_es30100/html/.

Theselius, M. (1993). *Miljonprogrammen*. [The million programs]. Mama (Magasin för modern arkitektur).

Thörn, C and Holgersson, H (2016), Revisiting the urban frontier through the case of New Kvillebäcken, Gothenburg City, 20(5):663-684. doi/10.1080/13604813.2016.1224479

Thörnquist, A. (2001). *Till förortens försvar. Utveckling och organisering i de tre stadsdelarna Hjällbo, Hammarkullen och Eriksbo 1970-1995*. [In the Defense of the Suburbs. Development and Organization in the Three Districts of Hjällbo, Hammarkullen, and Eriksbo 1970-1995]. Göteborg: Kompendiet

United nations. (n.d.). *Communications materials. Sustainable Development Goals*. Retrieved October 22, 2023, from <https://www.un.org/sustainabledevelopment/news/communications-material/>.

Reuter Metelius, A., Adolfsson, J., Lindberg, E., Bronstring, S., Gustafsson, S., Hultgren, V., Larsson, E., Lundahl, E., Bäärnhielm, K., Gustafson, H. & Franklin, H. (2022) *Program för stadsutveckling i Hjällbo*. [Program for Urban Development in Hjällbo].

Stadsbyggnadskontoret. [https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Godk%C3%A4nnandehandling/\\$File/Program%20Angered%20Hjällbo%20Godk%C3%A4nnandehandling%20221208.pdf?OpenElement](https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Godk%C3%A4nnandehandling/$File/Program%20Angered%20Hjällbo%20Godk%C3%A4nnandehandling%20221208.pdf?OpenElement)

Reuter Metelius, A. (2022). *Samrådsredogörelse. Program för Hjällbo inom stadsdelen Angered i Göteborg*. [Consultation Report. Program for Hjällbo within the district of Angered in Gothenburg]. Stadsbyggnadskontoret. [https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Samr%C3%A5dsredog%C3%B6relse%20f%C3%B6r%20program/\\$File/Samr%C3%A5dsredog%C3%B6relse%20Hj%C3%A4llbo%20221205.pdf?OpenElement](https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Samr%C3%A5dsredog%C3%B6relse%20f%C3%B6r%20program/$File/Samr%C3%A5dsredog%C3%B6relse%20Hj%C3%A4llbo%20221205.pdf?OpenElement)

Sennett, R., (1992). *The Conscience of the Eye: The Design and Social Life of Cities*. New York: W. W. Norton

SOU 2020:46. *En gemensam angelägenhet Vol. 1*. [A Common Concern]. Jämlikhetskommissionen. https://www.regeringen.se/contentassets/a60a4b64403e466fb7af8ab30a2399e2/sou-2020_46_vol-1_webb.pdf

Stadsbyggnadskontoret, (2022). *Dialogprocess Bilaga till Program för Hjällbo*.

[Dialogue Process Appendix for the Hjällbo Program] Göteborgs stad. [https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Dialogprocessen/\\$File/Bilaga%20dialogprocess%20hela.pdf?OpenElement](https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planobygg.nsf/vyFiler/Hj%C3%A4llbo%20-%20Program%20f%C3%B6r%20stadsutveckling%20i%20Hj%C3%A4llbo%20-Program%20-%20godk%C3%A4nt-Dialogprocessen/$File/Bilaga%20dialogprocess%20hela.pdf?OpenElement)

Stavroulaki, I., Berghauer Pont, M. and Fitger, M. (2023). PST (Place Syntax Tool) Documentation v3.2.4-3.2.5_20230110. DOI: 10.13140/RG.2.2.23168.51208.

Stähle, A., Dahlhielm, M., Nordström, T., Rydell, M., Karlsson, L., & Pinto, S. (2022). *Designguide för smarta gator*. [Design Guide for Smart Streets] <http://www.diva-portal.org/smash/get/diva2:1670683/FULLTEXT01.pdf>

Svenska Akademiens ordlista. (2015). *Segregera*. [Segregate]. In Svenska Akademiens ordlista. Retrieved March 3, 2024, from <https://svenska.se/saol/?hv=lnr79957>

DATA SET

Stavroulaki, I. et al., 2020. GIS-based Time model. Gothenburg, 1960-2016_2. Available at: <https://doi.org/10.5878/ke11-je22>.

SLU (2024). *Sök digitala kartor och geodata* [Search for digital maps and geodata.]. SLU University Library. <https://www.slu.se/site/bibliotek/soka-och-lana/soka/digitala-kartor/>

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Fig. 70. Göteborgs stad. (2023). *Markanvisning Hjällbo centrum – Inbjudan till uppförande av bostäder i Hjällbo*. [Land Allocation Hjällbo – Center Invitation to the Construction of Housing in Hjällbo]. [https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planbygg.nsf/vyFiler/markanvisningMarkanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20Centrum--Inbjudan%20till%20markanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20Centrum/\\$-File/Inbjudan%20till%20markanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20centrum.pdf?OpenElement](https://www5.goteborg.se/prod/fastighetskontoret/etjanst/planbygg.nsf/vyFiler/markanvisningMarkanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20Centrum--Inbjudan%20till%20markanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20Centrum/$-File/Inbjudan%20till%20markanvisning%20f%C3%B6r%20Hj%C3%A4llbo%20centrum.pdf?OpenElement)

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ITERATIONS

TESTING THE BOULEVARDS



Fig. 136. Boulevard.1. Angular Betweenness 5km where sidewalks are added along Hjällbovägen and Gråbovägen in their current location.

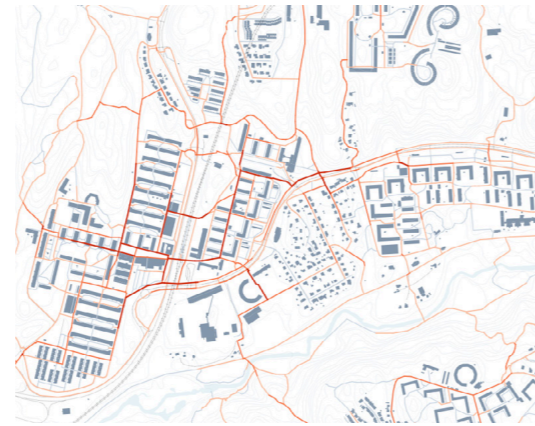


Fig. 137. Boulevard.1. Angular Betweenness 1km.

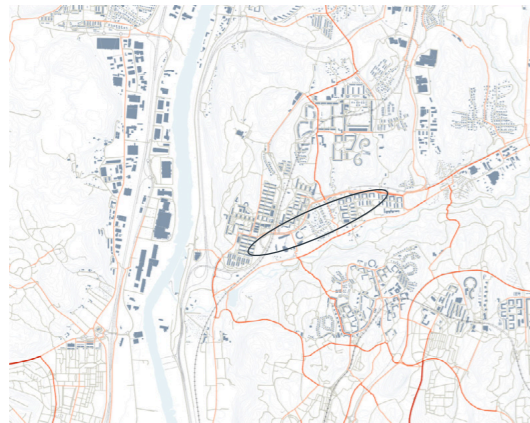


Fig. 138. Boulevard.2. Angular Betweenness 5km Gråbovägen is moved to better support the built.

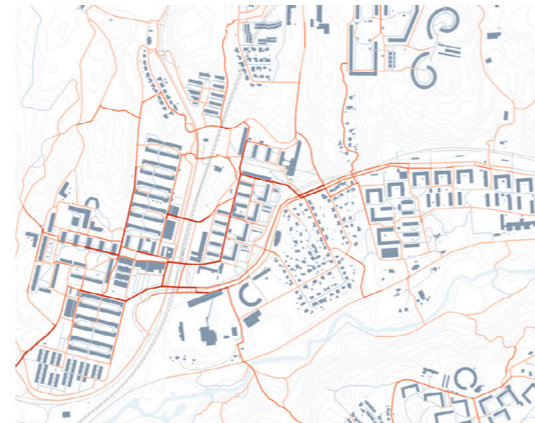


Fig. 139. Boulevard.2. Angular Betweenness 1km

CONNECTING NORTH TO SOUTH

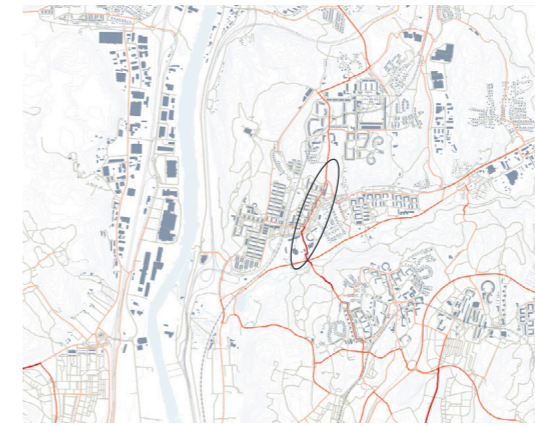


Fig. 140. I.1. Angular Betweenness 5km of strengthening the connection to Hammarkullen and Kortedala.

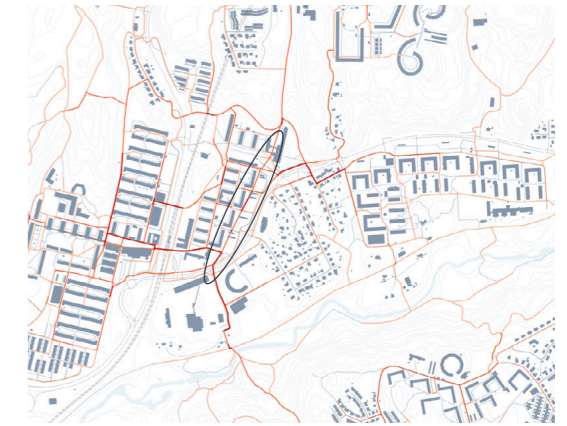


Fig. 141. I.1. Angular Betweenness 1km.

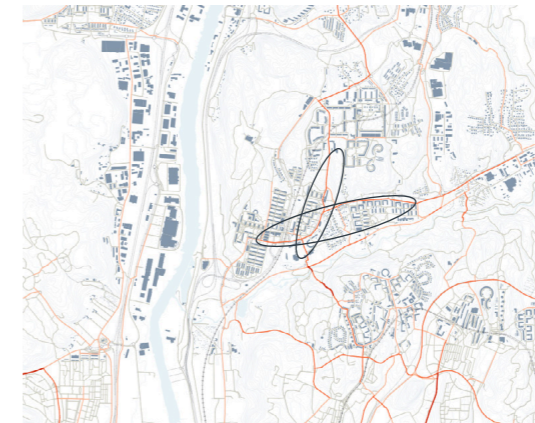


Fig. 142. Figure xx I.1. Angular Betweenness 5km of strengthening the connection to Hammarkullen and Kortedala.

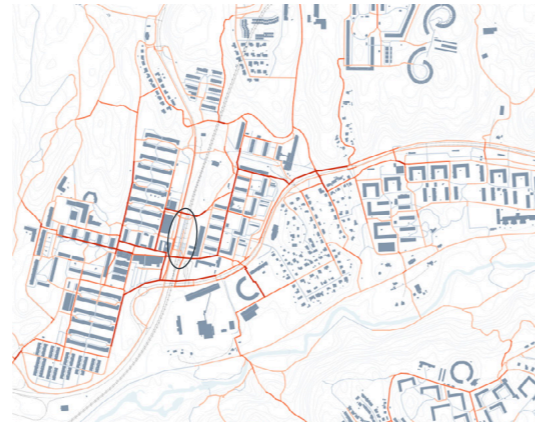


Fig.143. Angular Betweenness 1km

CONNECTING EAST TO WEST
— TRAM RAIL



Fig. 144. Angular Betweenness 5km increasing the connections around the tram station and over the rails.



Fi.145. Angular Betweenness 1km.

CONNECTING EAST TO WEST
— INDUSTRIAL AREA



Fig. 146. Angular Betweenness 5km connecting east to west over the industrial area.



Fig. 147. Angular Betweenness 1km.

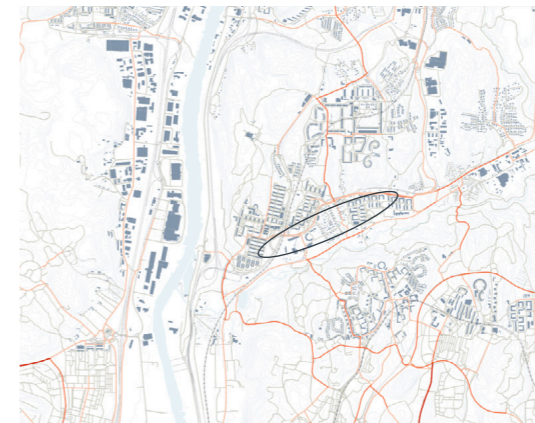


Fig. 148. Angular Betweenness 5km Gråbovågen is moved to better support the built.



Fig. 149. Angular Betweenness 1km



CHALMERS