

FROM INDUSTRY TO COMMUNITY



*"In every walk with nature one receives far more than one seeks."
- John Muir. 19 July 1877*

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As a child, I spent as much time outdoors as possible, running and playing with the other neighborhood kids. Those carefree moments in the fresh air have always stuck with me. Even now, I seek peace and clarity by going outside, it gives me space to think and break away from the hustle and bustle. For me, real life unfolds outdoors, among people and in nature, not behind a screen. Yet, in today's densely populated urban environments, finding that same sense of peace can feel like a tension. The noise, pace, and crowded spaces of the city often make it difficult to connect with nature or experience serenity. But I believe the outdoors doesn't have to mean escaping far from the city, it can exist within it. A quiet park bench, a leafy path, or a rooftop garden can offer moments of calm without the need to travel far. In my research, I want to focus on the connection between outdoor living, work, and housing. I believe that an environment where we can experience the freedom and energy of the outdoors not too far away from home also enhances our quality of life. How valuable would it be to create a living and working space that encourages outdoor engagement and social interaction, where living, working, and community life naturally blend? Through this research, I aim to explore how we can integrate these elements into an innovative neighborhood, one that offers tranquility and connection, inviting interaction.

ABSTRACT

The growing need for housing in urban areas requires an innovative approach of land use. This research explores the transformation of industrial zones into mixed-use neighborhoods that seamlessly integrate living, working, public, and retail spaces. Focusing on the Minervahaven in Amsterdam, the study investigates how timber can play a central role in creating sustainable and human-centered environments.

Through a combination of literature review, case studies, and design analysis, this research highlights timber's biophilic and tactile qualities, which enhance social interaction, well-being, and a sense of place. The findings demonstrate how timber, as a lightweight and sustainable material, supports urban densification through techniques like optoppen while maintaining the area's industrial heritage. The study also examines how combining shared spaces and inclusive design principles fosters community cohesion and addresses the broader challenges of urban livability.

The outcomes provide a framework for transforming industrial sites into vibrant, multifunctional neighborhoods that respect the past, address present needs, and anticipate future challenges. This research not only contributes to the redevelopment of the Minervahaven but also offers insights applicable to similar urban contexts.

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01 - INTRODUCTION

PROBLEMSTATEMENT

Cities around the world are facing a growing housing shortage, increasing the demand for available space. Traditionally, this challenge is addressed by adding more homes within existing urban areas. However, as populations grow and space becomes limited, simply building more densely may not be enough. Another approach gaining attention is to repurpose industrial areas, empty buildings, and other unused spaces, like waterfront areas, for housing. This transformation offers a way to expand housing options sustainably without sacrificing city green spaces. However, there are some challenges with this idea. Industrial areas are usually designed for purposes like production, storage, and logistics, which don't always match the needs of residential neighborhoods.

At the same time, the role of industry in the city cannot be overlooked. Industry contributes to economic diversity, local employment, and the character of urban areas. Therefore, it is important to explore a hybrid approach that embraces industry while also creating more livable areas with housing options. A key question in this study is: *"How can the transformation of an industrial area into a functional neighborhood integrate living, working, public, and retail spaces to enhance social coherence and foster a thriving community?"*

There are also forward-looking issues. The shift toward a more sustainable economy, digitalization, and changing market demand all influence the development of industrial areas. Many industries are looking for ways to use space more efficiently, allowing industrial areas to be partially freed up for other uses. This research aims to provide insights into the opportunities that arise when we transform industrial sites into hybrid areas that combine living and working. A key focus is the social aspect, industrial locations are often isolated from residential neighbourhoods, raising the question of how these areas can be developed to promote social cohesion. By integrating communal spaces,, and recreational facilities, an attractive living environment can be created that not only meets housing needs but also positively impacts community well-being.

The purpose of this graduation project is to explore the potential of transforming industrial areas into functional neighbourhoods that seamlessly combine housing, workspaces, public areas and retail. While urban centers struggle with issues like housing shortages and social disconnection, this project aims to contribute to the creation of sustainable, livable environments that promote social cohesion within communities. At the core of this goal is the design of a neighborhood that not only meets residents' practical needs but also fosters a sense of connection and social interaction. By researching how industrial sites can be repurposed, the project seeks to uncover innovative design strategies that prioritize shared spaces, accessibility, and multifunctionality.

METHODOLOGY

The main methodology of this research will primarily involve an extensive literature analysis. By examining existing articles, academic papers, and relevant publications related to the main research question and subcategories, such as densification, mixed-use development, working neighborhoods and the integration of natural materials in urban environments. I will use academic databases such as Google Scholar and JSTOR, to gather relevant sources, focusing on studies published within the last 10 years to ensure up-to-date information. By critically examining and comparing these various sources, a solid foundation will be established for critical argumentation on the thesis topic. This will lead to a deeper understanding of the current research question and inform the development of design strategies.

In addition to the literature review, this research will include a comparative case study analysis. This analysis will focus on case studies of successful mixed-use urban transformations, especially those that incorporate natural materials such as wood in outdoor public spaces. The criteria for selecting case studies will include their relevance to industrial site repurposing, the integration of sustainability principles, and the social cohesion fostered by these developments. These case studies will serve as sources of inspiration for how to balance industrial activity with residential and public spaces in a way that supports vibrant, sustainable communities.

Currently, there is no case study that fully combines these elements, mixed-use development, the tactility of wood in public spaces, and the transformation of industrial sites into thriving neighborhoods. This gap underscores the need for innovative development models that go beyond providing just housing or workspaces. By combining literature research with a search for suitable case studies, this research aims to explore new approaches that can contribute to vibrant, multifunctional living and working areas.

RESEARCH QUESTION

Main question:

“How can the transformation of an industrial area into a functional neighborhood integrate living, working, public and retail spaces to enhance social coherence and foster a thriving community?”

Sub categories:

Hoofdstuk 1

History and site context, Understanding the historical and industrial character of the Minervahaven is essential for creating design solutions that respect its heritage while addressing current urban needs. This context provides the foundation for a sensitive and thoughtful approach to redevelopment.

Primary literature source: Bakker & Van de Poll, (1992)

Densification, With increasing urban populations and limited space, densification is a critical strategy for sustainable development. It allows for efficient land use by integrating housing, workspaces, and public areas within the existing urban fabric, reducing the need for expansion into natural areas.

primary literature sources: Amer et al. (2017), City of Amsterdam (2021), Clerque & Hagendoorn (1983), Gren et al. (2018), Haaland & Van Den Bosch, (2015), Jenks et al. (2003), Mouratidis (2017), Reiter (2010), Towers (2013), Wicki & Kaufmann (2022).

Optoppen, As a specific method of densification, optoppen (adding floors to existing structures) demonstrates how urban density can be achieved without demolishing historical buildings. The use of timber as a lightweight material makes this approach not only structurally feasible but also sustainable, aligning with the goals of modern urban design.

primary Literature sources: City of Amsterdam (2021), MVRDV (2021)

Hoofdstuk 2

Neighborhood, The concept of a neighborhood is central to fostering a sense of belonging and social cohesion. This section explores how design can support the integration of residential, work, and public spaces, creating a thriving environment where people can live, connect, and engage in their community.

Primary literature source: Quality of life foundation (2024)

Hoofdstuk 3

Mixed-Use/Livability, Mixed-use design is crucial for creating multifunctional spaces that address diverse needs. By balancing residential, commercial, and public functions, this approach enhances livability, promotes social interaction, and ensures economic sustainability. Livability is further supported by integrating accessible public spaces that encourage inclusivity and improve the quality of urban life.

Primary literature sources: Kellert (2018), Leby and Hashim (2010), Satu and Chiu (2017), Vergunst (2003)

Hoofdstuk 4

Timber - A Tactile Perspective, Timber is explored as a material that not only supports sustainability but also enhances the sensory experience of urban spaces. Its tactile and biophilic qualities contribute to human well-being, encouraging interaction with the environment and fostering a sense of comfort and connection. This perspective highlights timber's ability to transform industrial spaces into human-centered environments.

Primary literature source: Quality Of Life Foundation (z.d.)

EXPECTED RESULTS

The expected outcome of this research is the development of a design strategy for a neighborhood on industrial land that integrates living, working, and social interaction within a natural environment, enhanced by the tactility of wood. This strategy aims to balance these functions in a way that does not disrupt ongoing industrial activities. The goal is to create a vision in which these different functions complement one another, forming an attractive and livable environment that people genuinely want to live in. While this project focuses on a specific area, the Houthavens, the insights and recommendations derived from the research are intended to be broadly applicable. The model developed should serve as both inspiration and a framework for transforming other industrial sites into vibrant, multifunctional neighborhoods. By adopting this approach to industrial reuse, the research aims to provide a sustainable solution to the housing shortage, while also helping to prevent the further urbanization of natural areas. Thus, the outcomes of this research will not only address the specific challenges of the Houthavens but also contribute to broader urban planning concerns: how to transform industrial areas into mixed-use, vital communities through innovative thinking and design. Ultimately, this research aspires to strategically tackle the housing shortage while enhancing the quality and diversity of urban living environments.

RESEARCH DIAGRAM

Problem statement

The housing shortage is forcing cities to seek creative solutions beyond traditional urban densification. One possible approach is to transform industrial areas and add residential spaces there. However, the challenge remains: how do you turn an industrial district into an appealing living environment that fosters social cohesion?

Thematic research

"What design elements and infrastructures are essential for promoting social interaction and cohesion in repurposed industrial areas, and how can these contribute to creating an attractive and functional neighborhood?"

RESEARCH QUESTION

"How can the transformation of an industrial area into a functional neighborhood integrate living, working, public and retail spaces to enhance social coherence and foster a thriving community?"

Literature analysis

Literature analysis
Case study

Literature analysis
Case studies

Densification

Context and Urgency: The transformation of industrial areas is crucial given the increasing pressure on the housing market and limited space in urban environments. The goal of densification is not only to create more housing but also to optimize the existing landscape. This means that the design must focus on creating attractive and livable residential spaces within a higher density, while preserving quality of life.

Neighborhood

Social cohesion is the thematic focus, as it is essential for creating a vibrant, connected community. This part of the research examines how design choices can encourage social interaction and a sense of belonging, leading to a thriving, cohesive neighbourhood.

Mixed use

The core of the program lies in integrating living, working, public, and retail spaces, emphasizing the multifunctional nature of the neighborhood. This focuses on making diverse amenities and spaces accessible within a compact area, enabling residents to live, work, and shop within close proximity.

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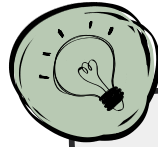
Tactility of wood



=

Outcome

"How can the transformation of an industrial area into a functional neighborhood integrate living, working, public and retail spaces to enhance social coherence and foster a thriving community?"



Outcome

“How can the transformation of an industrial area into a functional neighborhood integrate living, working, public and retail spaces to enhance social coherence and foster a thriving community?”



Research by design



Results



Design

The expected outcome of this research is a design strategy for a neighborhood on industrial land that integrates living, working, and social interaction in a balanced way without disrupting industrial activities. The aim is to develop a new vision in which these different functions enhance one another, creating an attractive, livable environment where people truly wish to live.

02 - HISTORY AND SITE CONTEXT

Source text, (Bakker & Van de Poll, 1992)

The Evolution of Amsterdam and the Minervahaven

Over the past seven centuries, Amsterdam has developed from a small village by the Amstel into a global city. This growth is reflected in the iconic crescent-shaped city center, planned urban expansions since 1870, and the ongoing development of port areas, including the Minervahaven. The historical and spatial evolution of Amsterdam offers valuable insights into understanding the role industrial areas can play in contemporary urban transformation.

From Medieval Port to Trading Metropolis

In the 13th century, Amsterdam began as a fishing and trading town at the mouth of the Amstel River into the IJ. With the exemption from tolls (1275) and the granting of city rights (around 1300), the city grew quickly. During the Golden Age, Amsterdam became an international trading hub, leading to the construction of the famous canal belt. Urban expansion provided space for a growing population and economic activity. After periods of decline in the 18th and early 19th centuries, industrialization in the late 19th century led to new urban expansions and port developments.

Development of the Port Areas

The transformation of the IJ began in the 19th century, with artificial islands and infrastructure projects like the North Sea Canal (1876). This shifted port activity westward, with the construction of the Houthaven and later the Minervahaven. These areas provided space for essential trade flows, such as timber and bulk goods. The Minervahaven, established in the 20th century, served as a logistics hub due to its proximity to rail and waterways. Large infrastructure projects, such as the Coenhaven (1925-1933), strengthened the role of the port as a crucial part of Amsterdam's economy and international trade.

Transformation of the Minervahaven

With the rise of container transport and scale expansion in the late 20th century, the Minervahaven lost its traditional function. However, this created opportunities for urban redevelopment. The preservation of industrial heritage, combined with new functions such as creative workshops and innovative companies, has transformed the Minervahaven into a versatile area. Today, it serves as an example of urban transformation, where sustainability, multifunctionality, and the preservation of historical character are central. This location offers a unique opportunity for further development, with mixed-use as a key component. By combining living, working, and recreational spaces, the area can contribute to a vibrant community and promote social cohesion.

Densification and Reuse

Urban densification has been a central concept in city development since the 1990s. The concept aims to make the most efficient use of existing urban spaces to meet the growing demand for housing without expanding beyond city limits. The Minervahaven offers an excellent opportunity to apply this concept. By utilizing techniques such as "optoppen", adding lightweight, wooden structures to existing buildings, new housing can be created without compromising the area's historical character.

Relevance

The transformation of the Minervahaven illustrates how historical context and industrial infrastructure can be used to promote social cohesion and a thriving community. The preservation of industrial structures, combined with the integration of mixed uses, creates the physical and social conditions for interaction and community-building. This history not only provides inspiration for design but also practical insights for developing a functional neighborhood that meets residents' needs while respecting the cultural identity of the area.

02 - DENSIFICATION

Since the 1990s, urban densification has been a key theme in urban planning, especially in relation to the concept of the compact city. This approach, developed in response to increasing pressure from global urbanization, focuses on making optimal use of existing urban space. Densification is achieved through higher densities, mixed-use, and limiting new developments to urban boundaries (Haaland & Van Den Bosch, 2015; Clerque & Hagendoorn, 1983). For the Minervahaven, densification presents a unique opportunity to combine historical and spatial contexts with contemporary urban challenges.

Benefits and Goals of Densification

According to Jenks et al. (2003), densification provides an effective way to make cities more compact and efficient. By carefully analyzing the existing urban structure, functions can be integrated, and unused spaces can be utilized. Wicki & Kaufmann (2022) emphasize that densification can contribute to protecting undeveloped areas, reducing CO₂ emissions, and addressing the growing housing shortage. These goals align with the "Amsterdam Environmental Vision 2050," which states that urban expansion should take place within the city's boundaries (City of Amsterdam, 2021).

Contradictions and Challenges

Densification offers many benefits. Towers (2013) points out that higher densities lead to attractive amenities like shops and efficient public transport, increasing the livability of an area. Additionally, dense neighborhoods offer environmental advantages, particularly through lower energy consumption due to shared insulation in terraced houses and apartments. Mouratidis (2017) adds that densification can reduce social segregation and improve residents' health by reducing dependence on cars and encouraging more physical activity.

However, Reiter (2010) highlights that densification also carries risks, such as increased air pollution, traffic congestion, and heat islands. It can also lead to changes in urban morphology, loss of architectural heritage, and reduced daylight for residents (Gren et al., 2018). The pros and cons of densification are both important to consider, so it is crucial to balance the benefits and minimize the drawbacks when adding extra floors to existing buildings.

Several strategies have been developed to make urban densification sustainable and effective. For example, Amer et al. (2017) describe a methodology for evaluating opportopen opportunities based on social, technical, and urban criteria.

Application to the Minervahaven

The Minervahaven provides an ideal location for densification through optopen. By using wood as a lightweight and sustainable material, additional floors can be added without damaging the existing structure. At the same time, mixed-use can be integrated by combining residential, retail, and workspace. This creates a lively neighborhood where social cohesion is promoted through shared spaces and community activities.

02 - OPTOPPEN

With the current housing shortage, innovative solutions are being sought to meet the growing demand for housing without expanding beyond urban boundaries. The “Amsterdam Environmental Vision 2050” states that urban growth should occur within the existing city limits, while protecting surrounding nature reserves (City of Amsterdam, 2021). A promising strategy is urban densification through optoppen, where extra floors are added to existing buildings.

According to MVRDV (2021), the Netherlands has about 600 square kilometers of flat roofs, spread across cities like Amsterdam, Rotterdam, and Utrecht. MVRDV (2021) argues that thinking about the layered city with stacked ground levels is important for improving quality of life. For example, rooftops can make neighborhoods more inclusive by offering more meeting places, make hard surfaced areas greener, and give districts more functions and a more diverse appearance. A rooftop can also serve as a peaceful retreat above the bustle of the city center.

Application to the Houtveemloods

This research specifically examines optoppen as a strategy for the transformation of the Houtveemloods in the Minervahaven. This former timber storage building, which once served as a transfer point for large timber logs from larger to smaller waterways, offers a unique opportunity for redevelopment. The robust steel structure of the warehouse allows for lightweight wooden floors to be added without compromising the building’s integrity.

Through optoppen, the warehouse can not only provide additional housing but also house social functions, such as communal markets or cultural events. This strengthens the Houtveemloods’ role as a central point in the Minervahaven and promotes connections with surrounding neighborhoods still in development.

Benefits of optoppen

- **Heritage Preservation:** The industrial aesthetic of the Houtveemloods is preserved while giving the building a new function.
- **Sustainability:** The use of wood as a building material reduces the project’s ecological footprint.
- **Social Cohesion:** By integrating social functions, such as markets and communal spaces, a meeting point for residents and visitors is created.
- **Efficient Space Use:** optoppen optimizes existing space without taking up new land.

“make it nice where you are and put the density on top”
Gehl. J. 2006

CONCLUSION

The history of Amsterdam is closely linked to its ports, which have not only served as economic engines but also as catalysts for urban transformation. The Minervahaven reflects this development: from a functional harbor area to a versatile hub where industrial heritage, innovation, and creativity come together. This historical context provides a unique foundation for further transformation.

The harbor not only provides the opportunity to launch new projects, such as optoppen, but it can also continue to function in its original role as a harbor. This makes the Minervahaven an inclusive area that connects various functions. Additionally, the harbor offers significant opportunities for transporting lightweight timber building elements, which facilitates the integration of sustainable construction materials in urban densification. A potential scenario could involve the establishment of a workshop in the Minervahaven (beneficial for economic opportunities) for the production of wooden elements for optoppen, which could be used on-site for housing but also easily transported via the harbor to other locations. Furthermore, the historical value of the Minervahaven contributes to the cultural identity of the area. The preservation of industrial structures combined with sustainable construction techniques, such as optoppen with wood, makes it possible to create new housing solutions that respect the past while addressing future needs.

The Minervahaven is not just a location, but an opportunity to set a new standard for urban densification and mixed-use. By integrating living, working, and recreational spaces in a historical setting, this place can contribute to a vibrant community and stimulate social cohesion.

03 - NEIGHBORHOOD

What is a neighborhood? A neighborhood can be simply defined as a part of a city or town (Encyclo, 2025). However, the distinction between a “working” and a “non-working” neighborhood is less straightforward. Why does one neighborhood function well, while another does not? What are the characteristics of a healthy and well-functioning neighborhood? This chapter explores these questions through literature and frameworks, with special attention given to the “Quality of Life Framework,” which provides valuable insights for designing livable and socially cohesive neighborhoods.

What is a healthy/well-functioning neighbourhood?

The “National Planning Practice Guidance (NPPG)” defines a healthy place as an environment that “supports and promotes healthy behaviors and environments, and reduces health inequalities for people of all ages. It provides the community with opportunities to improve their physical and mental health, and fosters engagement and well-being within the community.”

Key features such as walkable streets, green spaces, and well-maintained public areas play a central role. Additionally, healthy homes with adequate living space and access to affordable, nutritious food contribute to overall well-being. These elements show that a neighborhood is not only a collection of houses, but a dynamic system that promotes well-being both indoors and outdoors.

The Quality of Life Framework ([appendix, 3.1](#)) offers an integrated approach to designing neighborhoods, focusing on both the physical and social aspects of well-being. Important elements of the framework include (Quality of life foundation,2024):

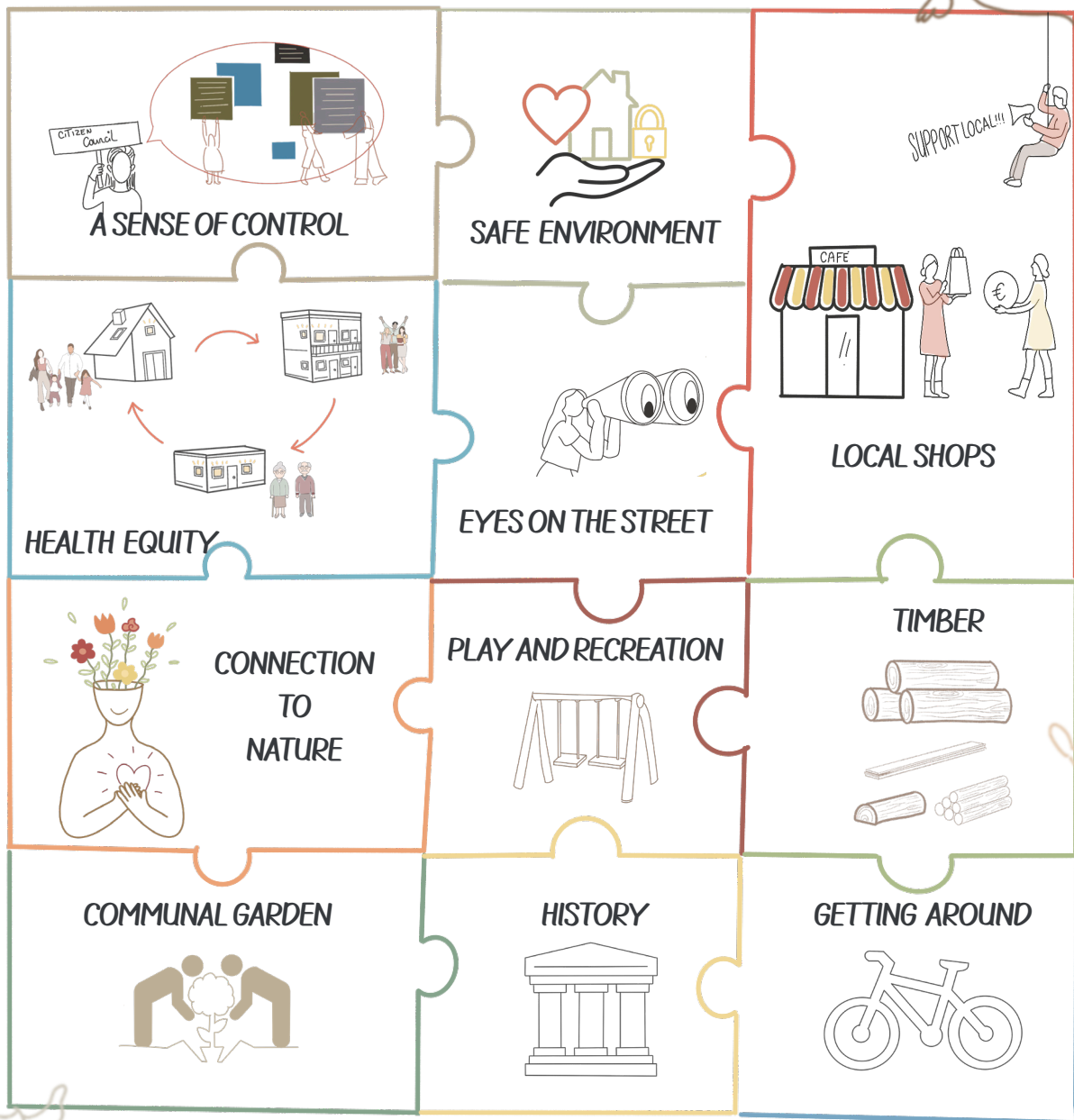
- Physical Health: Access to green spaces, clean air, and safe infrastructure.
- Social Cohesion: Common spaces that encourage interaction and foster a sense of community.
- Inclusivity: Facilities and spaces that are accessible to people of all ages and backgrounds.

[Figure 3.1](#), illustrates how a well-functioning neighborhood operates like a puzzle, where the integration of various elements, taken from the Quality of Life Foundation framework, Wcreates a cohesive whole. Mixed-use promotes not only efficient use of space but also social interaction by bringing together people from different backgrounds and interests in shared spaces.

FIGURE 3.1

A FUNCTIONAL NEIGHBORHOOD LIKE A PUZZLE

(BY AUTHOR)



04 - MIXED-USE AND LIVABILITY

The transformation of an industrial area into a functional neighborhood that integrates living, working, public and retail is a strategic approach for fostering social cohesion and creating a thriving community. Designing neighborhoods requires a understanding of the principles that explain livability and a detailed approach to how different functions can be woven together to create common benefits for residents and users. This chapter explores the role of mixed-use design as a tool and how this approach can contribute to creating an integrated and dynamic neighborhood that promotes both physical and social well-being.

Defining Livability

Leby and Hashim (2010) define livability as the extent to which an environment is experienced as pleasant by individuals. As discussed in Chapter 2, livability encompasses both objective and subjective aspects of the environment that contribute to the well-being of residents. Vergunst (2003) highlights the complex interaction between five key variables: local residents, the service level of amenities, the physical environment, community life, and the local economy, which collectively determine the livability of a neighborhood (see Figure 4.1). This model underscores the importance of an integrated approach, balancing various dimensions of a neighborhood.

Mixed Use as a Key Strategy

The concept of mixed-use, which involves the integration of living, working, public and retail functions within a single environment, plays a critical role in optimizing these variables by utilizing space more efficiently while at the same time fostering social interaction and connection among different groups. The combination of diverse functions creates a setting where people from various social, economic, and demographic backgrounds interact. This strengthens social networks, promotes mutual understanding, and reduces social isolation. Satu and Chiu (2017), in their study of densely populated neighborhoods in Dhaka, emphasize that the relationship between people and their physical environment is fundamental to the experience of livability. By integrating different functions, residents can live, work, and recreate within their immediate environment, minimizing the time and energy invested in traveling to external locations. This promotes overall satisfaction and a sense of connection (see Figure 4.2).

15 minute city

Partially inspired by the work of Jane Jacobs, who viewed neighbourhoods as social connectors, the idea behind 15-minute cities was developed by Carlos Moreno, a Sorbonne professor who aimed to improve the urban quality of life (archdaily,2021). Het idee erachter is om een stad beter te designer naar de basis benodigdheden van de residents. The idea centers around designing cities to better meet the basic needs of residents. By ensuring that essential services and amenities are located within a small radius of people's homes, stronger communities can be created. This proximity encourages residents to feel more connected to, and invested in, the businesses and services in their local area, thereby supporting the local economy. The goal of a 15-minute city aligns closely with the objectives of this research: to transform industrial zones into functional, mixed-use neighborhoods that foster social and economic diversity.

By concentrating more essential services and job opportunities within neighborhoods, the reliance on cars is significantly reduced. This shift encourages walking and cycling as primary modes of transportation, which not only benefits the environment but also enhances the sense of community by making streets more people-oriented. (See Figure 4.3)

In an era where many people spend 1-2 hours a day commuting to work using private cars, there is growing attention on reclaiming streets for the community. Efforts are being made to reduce the dependence on cars and restore the sense of neighborhood that has faded due to urban growth.

The Framework for Mixed-Use Design

An important part of designing mixed-use neighborhoods is how well the different functions work together. The goal is not only to use physical space efficiently but to create a dynamic system where the functions support one another. (See figure 4.4) The design of neighborhoods should ensure that the functional, economic, and social significance of the different activities complement each other. Therefore, housing, work, public and retail should not only coexist but interact to create mutual benefit.

Mixed-use design structures the physical environment in a way that generates both practical and socio-cultural benefits. Living close to work makes it easier for people to connect with their surroundings and build stronger social bonds. Adding shops and businesses makes the neighborhood more economically stable. This improves quality of life by creating jobs, providing access to products and services, and boosting economic activity.

However, a truly thriving neighborhood must go beyond commercial functions. Public spaces that are free to access play a vital role in fostering a sense of community. Features like walking paths, communal gardens, or open plazas encourage social interaction, leisure, and connection with nature. Spaces dedicated to care and inclusivity, such as community homes, childcare facilities, or shared kitchens, strengthen the sense of belonging and cater to the diverse needs of residents.

To achieve this vision, it is essential to blend both commercial and social spaces, creating the above called 15 minutes city, a balanced environment where people can work, live, chill and thrive together.

Social Cohesion and the Role of Common Spaces

Building on the importance of integrating commercial and social spaces in mixed-use neighborhoods, common spaces emerge as essential for fostering social cohesion. Spaces that encourage interaction, such as parks, squares, and shared workspaces, play a key role in creating a sense of togetherness and community spirit. This is especially important in mixed-use areas, where interaction between different social groups helps create an inclusive and lively neighborhood. These common areas serve as venues for encounters and informal networks, which enhance the social capital of the neighborhood.

The accessibility of such spaces is another important aspect of livability. Designs that cater to the needs of various age groups, backgrounds, and physical abilities can promote the integration of diverse populations. In this regard, Satu and Chiu (2017) argue that a livable neighborhood not only provides physical proximity but also inclusivity, ensuring that all residents feel welcome and supported.

Design Tools

While frameworks like those by Vergunst (2003) and Satu and Chiu (2017) offer valuable insights, they also highlight the limits of design interventions. Not all aspects of livability can be fully controlled, a subjective element always remains. However, this also leaves room for unexpected surprises and spontaneous social interactions.

Designers can create the physical and functional conditions for social cohesion, but the success of a mixed-use neighborhood ultimately depends on the residents themselves, who bring the physical space and social structures to life. Creating a mixed-use neighborhood thus requires a holistic approach that goes beyond spatial layout and considers how the neighborhood as a whole fosters social interaction, community spirit, and economic activity.

In addition to ensuring the presence of diverse functions, the choice of materials plays a crucial role in creating a thriving community. Research (QoLF, 2024) suggests that timber, for instance, has a significant impact on human well-being. This aligns with principles from biophilic design, which emphasizes the integration of natural elements to improve human health and social interaction. As Kellert (2018) notes, “Biophilic design can reduce stress, enhance creativity and clarity of thought, improve our well-being and expedite healing; as the world population continues to urbanize, these qualities are ever more important.”

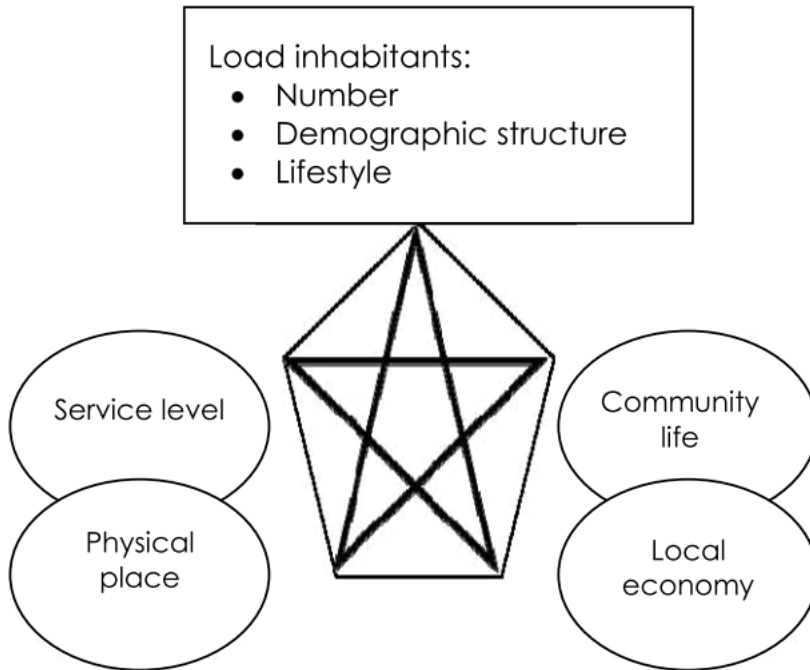
By incorporating the sensory qualities of materials like wood into public spaces, such as communal gardens, walking paths, or seating areas, neighborhoods can foster a sense of calm and well-being. This not only attracts residents to spend more time outside but also encourages spontaneous encounters, which strengthen community bonds. Moreover, environments designed with biophilic elements have been shown to correlate with lower stress levels and reduced crime rates, contributing to a safer, more inclusive neighborhood (Keller, 2018).

To illustrate the integration of various elements of livability and mixed-use design, **Figure 4.5** is presented. This figure combines the concepts from Chapter 2 (Quality of Life Framework) with the principles of mixed-use and visually shows how different functions, residential, work, and retail, can come together in a space that promotes both social cohesion and functional efficiency. The sketches in the figure are intended to clarify the practical implementation of this approach by bringing together the interrelationships and dynamics between the physical and social aspects of the neighborhood in a single visual representation.

"Objects alone do not make a place. It is how people feel about and respond to the elements in their environment. As well as other people who share their space. that helps determine what a place is."

(Leonardo Vazquez (2012))

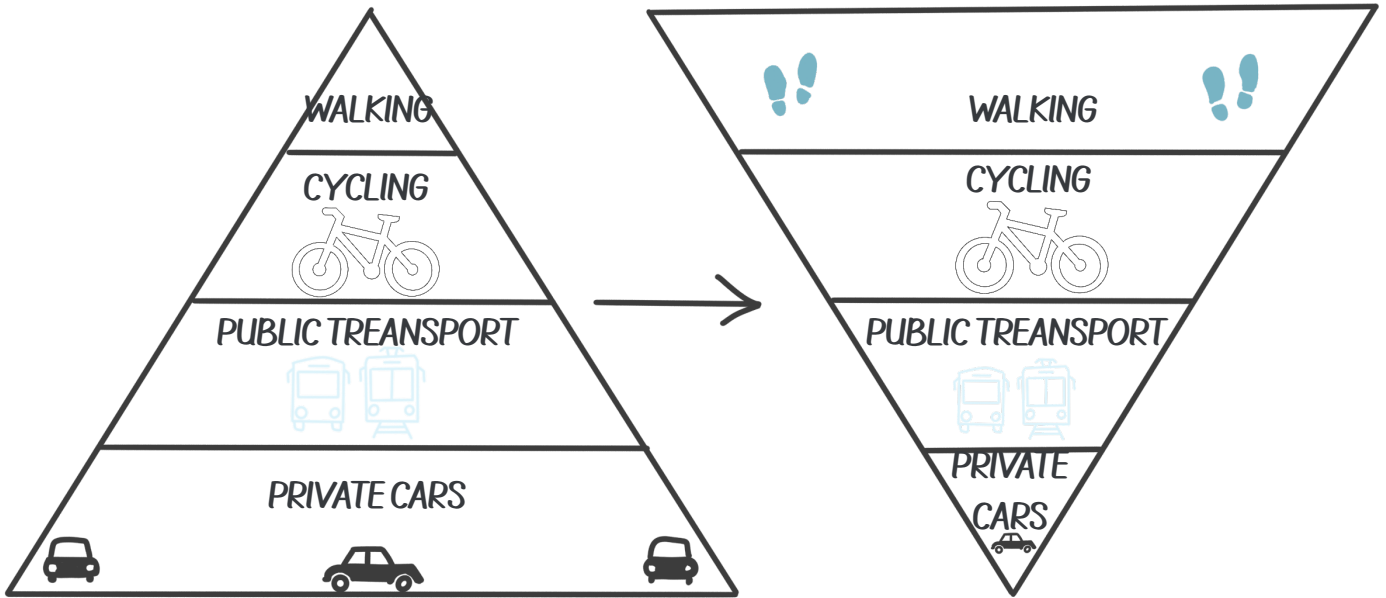
FIGURES 04



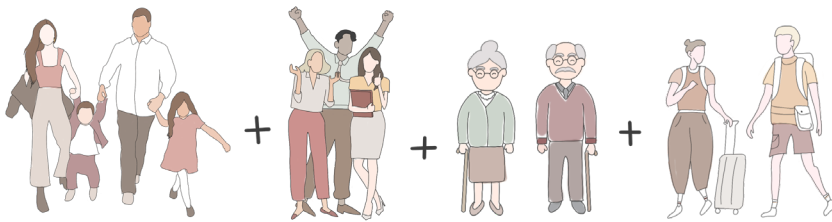
4.1 - (VERGUNST. 2003)

Key issues	Indicators	Assessment criteria
Public transport	<ul style="list-style-type: none"> • Modes used • Duration of waiting time • Average distance to the public transport station • Residents' satisfaction 	<ul style="list-style-type: none"> • Variety of choices • Short waiting time • Within walking distance (5–10 min) • High satisfaction level
Community facilities	<ul style="list-style-type: none"> • Provision nearby • Average distance to the nearest facilities • Transport used • Residents' satisfaction 	<ul style="list-style-type: none"> • Adequacy and good variety • Within walking distance (5–10 min) • On foot • High satisfaction level
Open space and public space at the street corners	<ul style="list-style-type: none"> • Average distance to the nearest open space and street corners • Transport used • Residents' satisfaction 	<ul style="list-style-type: none"> • Within walking distance (5–10 min) • On foot • High satisfaction level
Sense of community	<ul style="list-style-type: none"> • Frequency of using community facilities, open spaces and public spaces per week • Number of social contacts on street and other public spaces in the last month • Number of communications (chatting), while meeting each other in last month • Self-reported involvement in various community activities at in last 12 months • Residents' satisfaction 	<ul style="list-style-type: none"> • Once every one or two weeks • Higher frequency connotes stronger community sense • High satisfaction level
Sense of safety	<ul style="list-style-type: none"> • Perceived safety during day-time and night-time • Residents' satisfaction 	<ul style="list-style-type: none"> • Good sense of safety and security • High satisfaction level
Dwelling space	<ul style="list-style-type: none"> • Size of dwelling unit • Residents' satisfaction with the dwelling space 	<ul style="list-style-type: none"> • Sufficient usable space • High satisfaction level

4.2 - (SATU AND CHIU. 2017)



4.3 - (ARCHDAILY. 2021)



RESIDENTS AND VISITORS

FRESH PRODUCTS



COMMUNAL GARDEN



WORK



SHOP

4.4 - (BY AUTHOR)

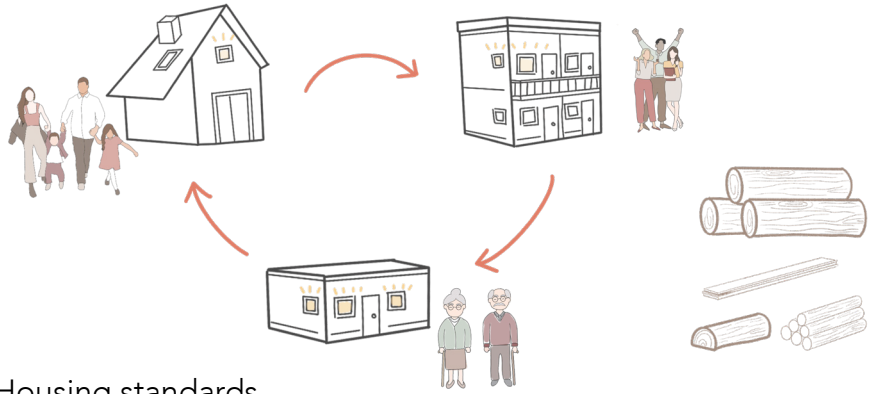
4.5- (BY AUTHOR)

CONNECTION TO NATURE



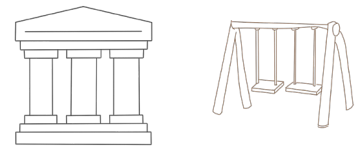
- Communal greenhouse
- Walking paths
- Green environment
- Biophilic design

HEALTH EQUITY



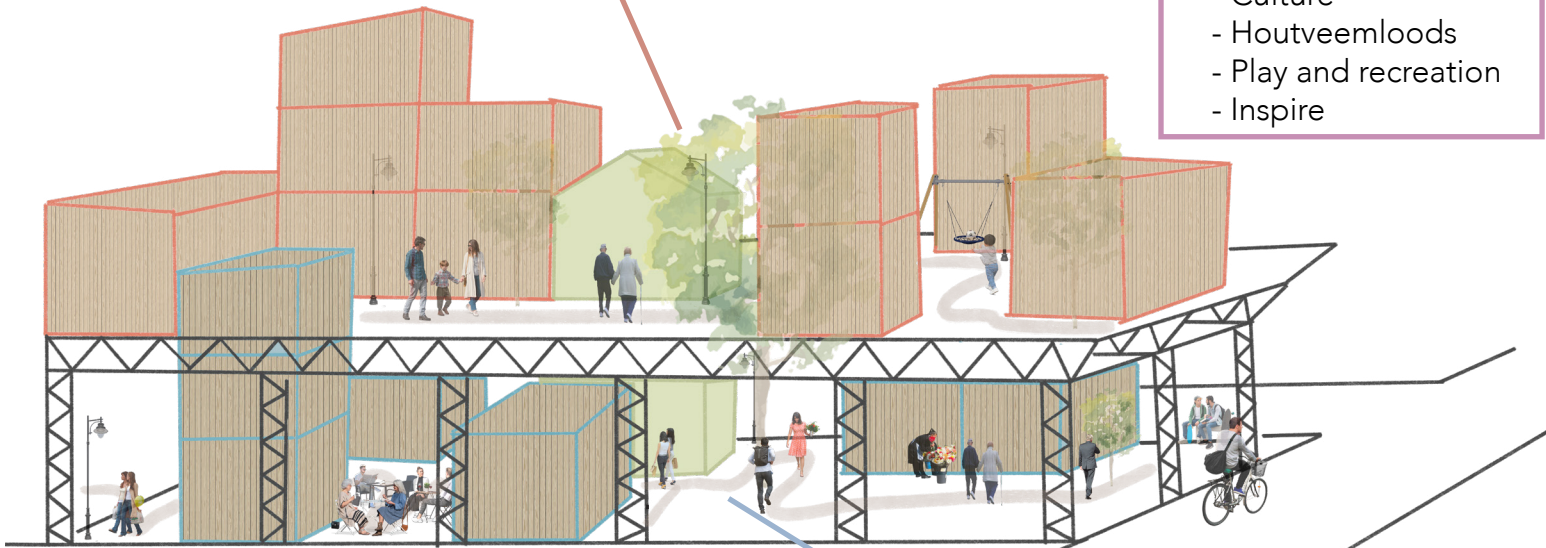
- Housing standards,
- Material = timber
 - Automatic growth by designing houses for different age groups

A SENSE OF WONDER



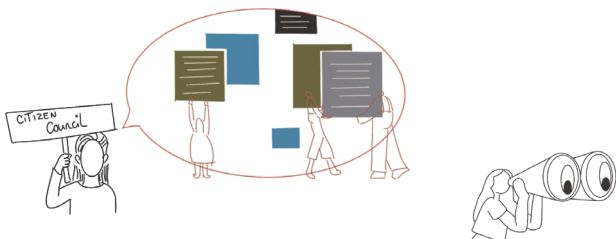
- Culture
- Houtveemloods
- Play and recreation
- Inspire

HOUSING - PLAY - WALK - REST - COMMUNITY SPACE



WORK - RETAIL - PUBLIC

A SENSE OF CONTROL



- Influence,
- Community council
 - Community gathering space
- Safety,
- Enough lights on the street
 - Enough eyes on the street

CONNECTED COMMUNITIES

- Belonging
- Local businesses
- Local services



GETTING AROUND



- Walking paths
- Cycling routes
- Public transport

05 - TIMBER

A TACTILE PERSPECTIVE

In the context of architectural wood, there are multiple ways to approach the material. Timber can be utilized as a structural component, as a cladding material, or in other creative applications, offering endless possibilities. However, this research, which focuses on the development of a functional and social neighborhood, considers timber from a more sensory perspective, specifically as a tactile material.

Timber is not merely a building material but also a material that possesses a distinctive aesthetic and sensory quality. Research has shown that mass timber can significantly enhance the quality of life within built environments. (Quality Of Life Foundation, z.d.) It has been observed that buildings constructed with mass timber lead to a more relaxed and comfortable atmosphere for users compared to those built with other materials. Furthermore, mass timber fosters a greater connection to nature, particularly due to its biophilic qualities. This inherent connection to nature is one of the most valuable attributes of timber and underscores its potential to positively influence the built environment.

As previously mentioned, timber's connection to nature extends beyond its structural role; it can also be integrated into green spaces, such as trees, which provide fresh air, benches made from timber, and the creation of play environments. These elements contribute to biodiversity and promote an environment conducive to social interaction and well-being. Timber is not only a resource for construction but also a conduit for creating spaces that feel more in tune with the natural world.

Referring to [Figure 5.1](#) (model of tactility, by the author), we can see how timber can be used in a different light.

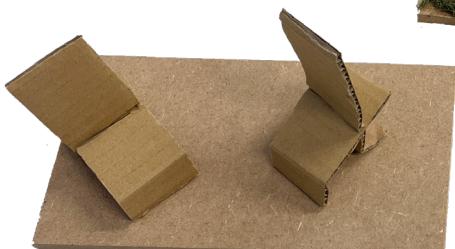
[Figure 5.1](#) illustrates the tactile experience of wood in a community garden or neighborhood setting. This model highlights the sensory qualities of the material—how it feels, how it can be experienced, and how its use in shared spaces contributes to a sense of comfort and connection. The combination of raw wood, moss, and other natural elements evokes a handcrafted aesthetic, creating a peaceful balance within the space. The visible grain and natural irregularities of the wood enhance the tactile experience, making it more engaging for the senses. This not only connects people to the material itself but also fosters a connection with nature.

Wood, in this sense, is not simply a construction material but also a medium that conveys emotion, atmosphere, and a sense of calm. The design and arrangement of these tactile elements in the model aim to evoke a positive emotional response, creating spaces where people feel more at ease and grounded.

The atmosphere created by this tactile experience will be a guiding principle in the continuation of this project. By integrating wood in ways that emphasize its sensory qualities, the design will help cultivate an environment that is both physically and emotionally enriching, encouraging social interaction and a greater connection to the natural world.

FIGURE 5.1

TACTILITY OF WOOD MODEL (BY AUTHOR)



06 - CONCLUSION

The transformation of an industrial zone into a functional neighborhood offers a unique opportunity to integrate living, working, public, and retail spaces in a way that fosters social cohesion and stimulates a thriving community. By combining these different functions, a dynamic and multifunctional area is created where residents, workers, and visitors can meet in shared spaces. This not only leads to more efficient use of space but also strengthens the social interactions essential for a vibrant and inclusive neighborhood.

This thesis answers the main question: *“How can the transformation of an industrial area into a functional neighborhood integrate living, working, public, and retail spaces to enhance social coherence and foster a thriving community?”* The solution lies in a holistic approach where design principles, materiality, and social needs are harmonized.

Timber plays a central role in this transformation. By utilizing the tactile and biophilic qualities of timber, public and shared spaces become not only more functional but also more inviting and human centered. Timber creates warm and welcoming environments that encourage residents to spend time outdoors, fostering spontaneous encounters and building a stronger sense of community. Additionally, as a lightweight and sustainable building material, timber facilitates urban densification through techniques like optopen, without compromising the integrity of existing industrial structures.

The use of timber contributes to aesthetics, sustainability, and well-being. Integrating timber into public spaces, such as walking paths, communal gardens, and seating areas, offers a sensory experience that reduces stress and promotes social interaction. These biophilic properties not only contribute to a safer and more inclusive living environment but also strengthen the connection between residents and their surroundings.

The transformation of industrial areas like the Minervahaven requires a vision where functions not only coexist but actively enhance one another. By using timber as a central material and social cohesion as a guiding principle, it is possible to create urban environments that meet the needs of today while being resilient for the future. This research demonstrates that industrial areas can be transformed into multifunctional neighborhoods that combine heritage preservation, sustainability, and community building into a model for modern urban development.

DISCUSSION

In the conclusion, it is suggested that wood, according to this research, should be capable of connecting various elements, from densification with "optoppen" as a building material, to combining mixed uses, and implementing the tactile experience of wood in outdoor and communal spaces. This, together with the Quality of Life Framework, could contribute to creating a functional and vibrant neighborhood. However, there has yet to be a study that combines all of these elements into one large-scale building, like the "Houtveemloos" in this graduation project.

This is a positive aspect because it highlights the untapped potential in exploring existing knowledge in new ways. On the other hand, there is no concrete evidence yet that this approach will work as expected.

This uncertainty is a critical aspect that needs to be addressed in the design process. Through various sketches and models, the aim is to further develop the right form for this project, balancing the constructive side (optoppen) with the social-psychological side (tactility of wood). The challenge lies in figuring out how these elements can complement each other, and how they should ideally work together.

Nevertheless, based on the study of the Minervahaven area, it has good prospects, as it fits well both historically and functionally within the context of the city. The location is well-connected to other parts of Amsterdam, and the transformation of an industrial zone into a multifunctional neighborhood can enrich the space both physically and socially. The emphasis on sustainability, mixed functions, and inclusive spaces could contribute to strengthening social cohesion and creating a vibrant neighborhood. The location is intrinsically suited for such a transformation, which increases the potential for success compared to other areas where the context is less supportive.

LIMITATIONS

At the beginning of my project, I envisioned guiding different age groups through my design. However, I would now like to explore this through research through design, yet my current research lacks sufficient attention to key details such as who will live in this area, which age groups are involved, etc. This needs to be further developed and addressed in the next design phase, as it directly impacts the types of housing and other design elements.

Furthermore, while some case studies have been reviewed, they miss some design principle sketches and they do not yet provide enough concrete examples to fully address the research gap. None of the reviewed projects comprehensively integrate all aspects of my research question. Therefore, additional analysis of relevant case studies is essential to build a clearer picture of existing solutions and identify opportunities for innovation.

The case studies examined so far have demonstrated that it is possible to create spaces where diverse groups can work, grow, and engage with one another. There is increasing attention to public spaces, such as “playgrounds” designed to teach sustainability, often incorporating the reuse of materials (e.g., repurposed boats). However, these elements have not yet been successfully combined into one. By building on these case studies and continuing to analyze new examples, I have established a solid foundation for my project.

The individual elements have proven effective, the challenge now lies in unifying them to create a comprehensive, innovative design strategy.

RECOMMENDATIONS FOR FUTURE RESEARCH

For future research, I would like to delve deeper into biophilic design, as this could become a comprehensive study on its own. While I have tried to touch upon it in the current project, biophilic design warrants a more focused and independent research plan. Specifically, I am interested in exploring the various ways wood can be used in architectural spaces and how this affects human experience and well-being.

In future studies, I would also like to create an experimental test that allows people to experience and compare a space made of wood versus one made of stone. This would provide valuable insights into how these materials influence people’s perceptions and emotions. Instead of relying solely on literature and case studies, the goal would be to incorporate direct human testing to better understand the psychological impacts of materials. Such research could offer more concrete, experiential data, helping to bridge the gap between theory and lived experience.

07 - CASE STUDYS

BLOQS LONDON - (BLOQS. (2025))

MAKE

The space, machinery and services you need to grow your business - all on a flexible PAYG basis. So you can do your thing and leave the rest to us.

GROW

Expand your skill set and level up. With affordable one-on-one training and courses for all levels.

UNITE

Inspire and be inspired, find a collaborator, a client, a friend, a lunch buddy. Thrive through community.



Bloqs in London is a unique location where various types of workspaces come together, including spaces for materializing work such as woodworking, metalworking, engineering, manufacturing, sewing, and laser cutting & engraving. Additionally, Bloqs also offers storage spaces, study and presentation rooms, a sales area for the products made, a festival venue, and a dining area. In short, a multifunctional space with diverse functions, all within the same building.

This project is relevant because it focuses on combining multiple functions within a single building. It demonstrates how people with a common goal can work, create, and communicate in one space. This concept of interactive workspaces would work well in an industrial area, where products can be directly produced or delivered, reducing transport through the city and minimizing the ecological footprint. This type of work and creativity would be right at home in the Minervahaven. It's about embracing industry, but with a renewed approach by transforming it into a shared workspace.

WHITE ARKITEKTER – GASCOIGNE EAST, LONDON – PHASE 2

(White Arkitekter | Inspiring sustainable ways of life. . z.d.)



The project was an opportunity to regenerate the neighbourhood, deliver new apartments, townhouses, community facilities, and a new park in a place where people will want to live.

This project demonstrates how heritage can be preserved while introducing new elements that enhance both the environment and the building. For example, there is now a stronger focus on public green spaces, with significantly more greenery added. One of the project's strengths is the variety of public gardens located between different blocks, each uniquely designed. This diversity creates curiosity and an inviting atmosphere, encouraging a sense of wander, which positively impacts the neighborhood.

Key takeaway: Design inner courtyards with different functions to encourage people to explore multiple areas rather than staying in the same courtyard.

NIEUWSTAD 128 - WEESP (PICTURES BY FRANK SCHAEFFERS)

TACTILITY OF WOOD

This space (living room) serves as an example of how wood's tactility can be utilized in an interior environment.

The flooring is made of reclaimed wooden panels, and the beams retain their rustic, aged appearance. This combination creates a cozy, inviting atmosphere. The ambiance is directly influenced by the tactile qualities of the wood. If the floor were brand new and the beams perfectly finished, the space would feel neater but less rustic, evoking a different emotional response.

Key takeaway for the project: Explore how the tactile qualities of wood can convey warmth and comfort. This can be tested through small-scale models of interior gardens or communal spaces, experimenting with textures and finishes to assess how they influence the perception of the environment.



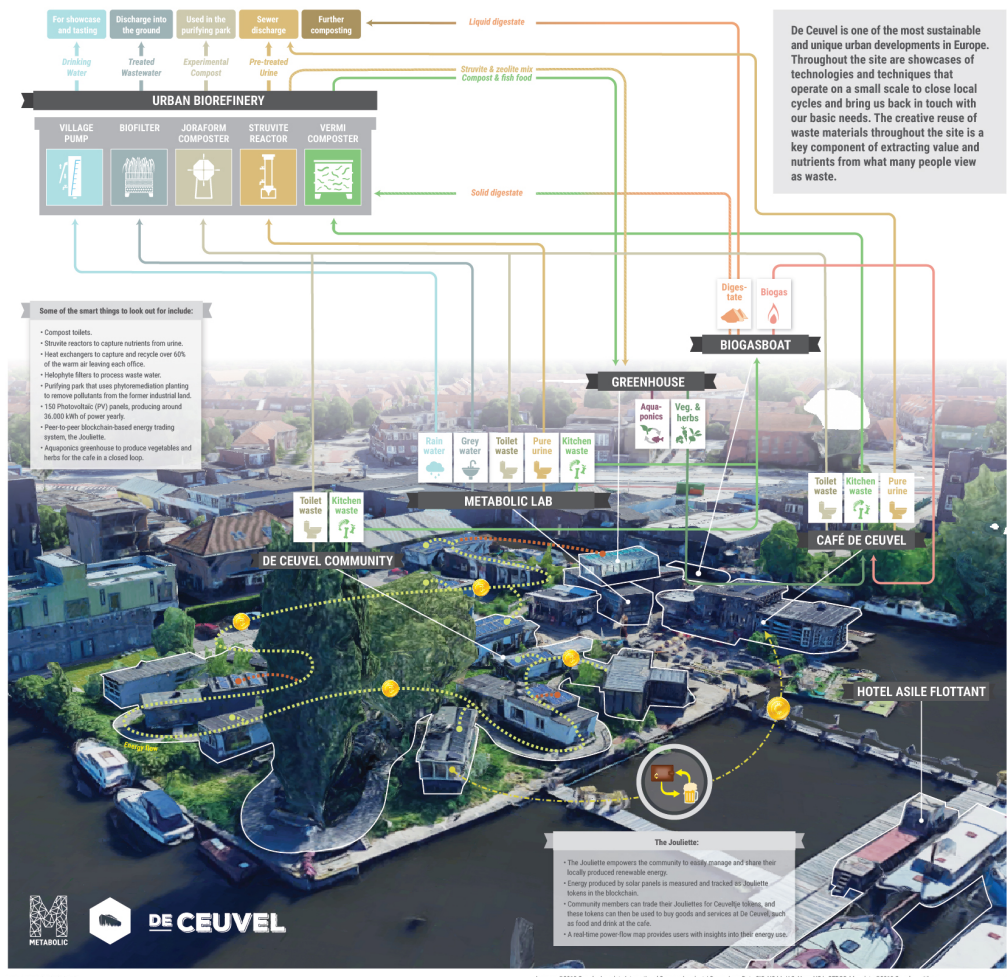
DE CEUVEL (DE CEUVEL Z.D.)

De Ceuvel is a playground for innovation and creativity, an experiment aimed at making sustainability accessible, understandable, and enjoyable.

By carefully placing discarded houseboats on land, a small “harbor” with diverse sightlines and surprises has been created. Space&matter used the variety of boats as a design tool, creating distinctive spaces with unique character. The winding boardwalk adds dynamism to the experience of De Ceuvel, widening at the most scenic spots, such as the west side with its sunsets and the central courtyard.

This space not only reuses materials but also integrates various functions and workspaces, fostering biodiversity that is constantly evolving. It exemplifies the broadest interpretation of reuse and biodiversity.

The deliberate consideration of how visitors experience this environment demonstrates the goal of making it inviting, socially engaging visitors to learn, experience, and exchange ideas. These principles are valuable takeaways for the research and subsequent project, emphasizing how to make spaces inviting and interesting to foster interaction and engagement.



BERLIN'S TEGEL AIRPORT (ELTON. 2022)

The design theme of this project is: Imagine a place where the city of tomorrow takes shape. Where ideas flourish and jobs are created. Where life is vibrant and affordable. Where mobility and climate neutrality are rediscovered as standards. Where we think in cycles rather than pure consumption. Where nature is not "far away" but integrated into the neighborhood. Where collaboration matters, and humans are at the heart of it all.

This project serves as an intriguing case study. Here, various functions and elements are also being brought together to create a new functional neighborhood with a thriving community. By incorporating green facades and wood, the project integrates the biophilic concept into its design.



The new Tegel Airport community will have large pedestrianised spaces and vertical green space - Tegel Projekt GmbH

This is a project I plan to monitor over time, as it aligns closely with my own design objectives. However, the challenge is that this project is still in its design or construction phase, so it cannot yet provide completed insights for direct comparison.



The new Tegel airport redevelopment will house 10,000 people - Tegel Projekt GmbH

WICK LANE (DRMM, Z.D.)

Wick Lane is a truly mixed use project which takes the distinct character of Hackney Wick as its starting point. Light industrial units, retail and workspace are co-located with 175 homes, set in a pedestrian-friendly landscape of yards and lanes. The six distinct buildings work together to form a new community that is an authentic piece of Hackney Wick.

A variety of employment spaces activate and enliven the main street whilst freestanding double-height industrial units are combined with a variety of one, two or three-storey commercial units. Residential accommodation maximises daylight with a high proportion of dual aspect apartments and views to the Greenway. Landscaped public spaces, 'Wick Walk' and 'The Yard', and residents' gardens knit the new buildings into their surroundings providing a strong identity and fostering neighbourliness.

This project showcases the integration of industry, retail, greenery, and housing, offering a truly mixed-use development. By optimizing the quality of life for each of these functions, the project has become a vibrant and self-sustaining community. The housing is designed to be taller, allowing for better natural light, and is situated within a green oasis. Meanwhile, the industrial functions are primarily located on the ground floor, creating an active streetscape where people can see work happening during the day, contributing to a lively and dynamic street-level experience.

Key Takeaways:

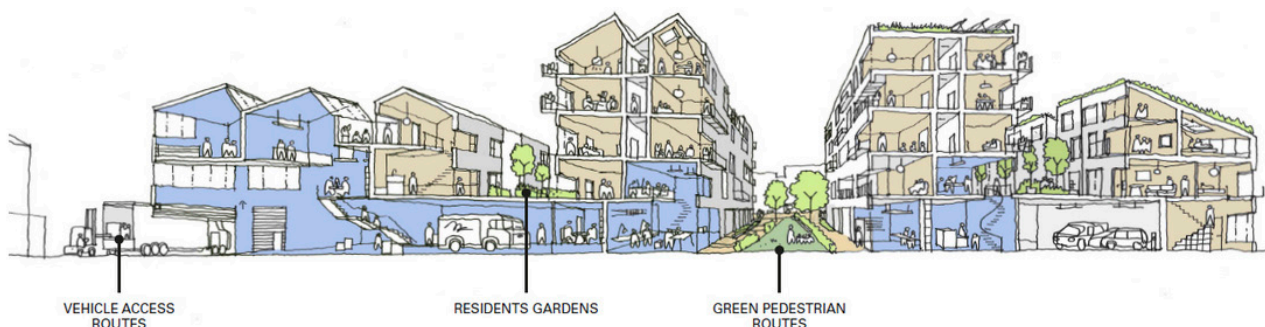
The importance of natural light and its influence on the quality of housing. Ensuring that homes are always surrounded by greenery enhances the feeling of being close to nature.

Situating industrial or active ground-floor uses along the street minimizes their need for light while creating a lively and engaging street frontage.

Connecting residential blocks with green pathways, as seen in this project and others like Gascoigne East in London, fosters a sense of connection and walkability within the community.



Sketch of Wick Lane showing the blue light industrial section and the yellow residential section.



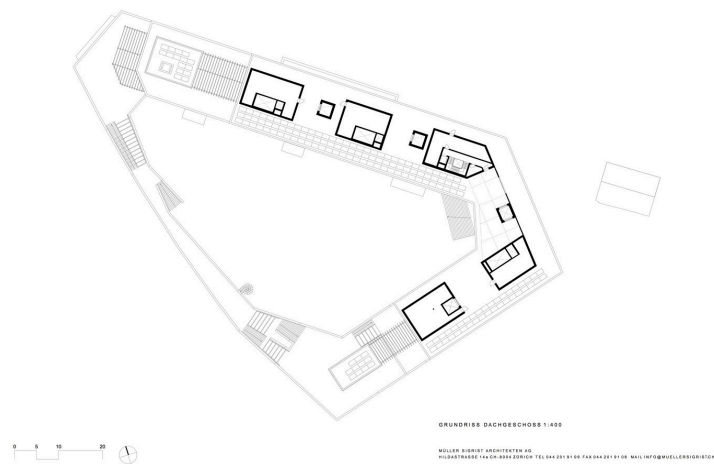
KALKBREITE COMPLEX (GONZALEZ. 2019)

Kalkbreite Complex / Müller Sigrist Architekten

This project features an inner courtyard constructed atop a metro tunnel, providing a shared garden space for the entire building. One of the standout design aspects is that all floors connect to this courtyard, as seen in the floor plan. This layout encourages social interaction by directing connections to one central space, thereby fostering a stronger sense of community.

Observations,

From Photo 1, while there are play areas and seating spaces, the lack of natural materials diminishes the vibrancy and the feeling of nature in the middle of the city. This highlights the need to potentially overemphasize natural elements to ensure that the space truly feels like a slice of nature amidst the urban environment. This is an important point to incorporate when designing inner gardens.



The interior of the building includes various communal areas, which are designed to encourage social interaction. Despite the building being predominantly a concrete block, the designers have extensively used wood finishes in these shared spaces. This choice introduces warmth and enhances the tactile quality of the environment, creating a cozier and more homely vibe.

Key takeaways,

Inner Gardens: Amplify the use of natural materials and greenery to create a strong connection to nature, even in highly urbanized settings.

Tactility: Use wood strategically in communal areas to introduce warmth and improve the sensory experience of the space.

Social Connection: Design communal areas and gardens to be central, accessible, and visually inviting to encourage interaction and create a vibrant community atmosphere.



08 - APPENDIX

QUALITY OF LIFE FOUNDATION - 3.1

• A sense of control

- **Influence**, how much of say people and communities have over their home and neighborhood
- **Safety**, how safe residents and communities feel in their homes and neighborhoods.
- **Affordability**, the cost of living in a neighborhood and how permanent a person's home is.

• Health equity

- **Housing standards**, the material and environmental quality of the spaces inside and around the home.
- **Air, noise and light**, the environmental quality of our neighborhoods.
- **Healthy food choices**, access to affordable healthy food options locally.

• Connection to nature

- **Green and blue spaces**, the natural and semi-natural areas that exist within and around our neighborhoods.
- **Biodiversity**, how diverse the green and blue spaces around our homes and neighborhoods are.
- **Climate resilience and adaptability**, how the places where we live are designed and delivered to be climate resilient and to minimise their impact on the natural environment in the long term,

• A sense of wonder

- **Distinctive design**, how our neighborhood have been designed to be both useful and long-lasting and to inspire and delight.
- **Culture**, Cultural institutions, music, street art and the shared values, beliefs, practices, traditions and social behaviours that characterise the community.
- **Play and recreation**, places for people to unwind and play, and to connect with their friends and neighbors.

• Getting around

- **Walking, wheeling and cycling**, how easy it is for residents and communities to safely navigate their neighborhoods by walking, wheeling or cycling.
- **Public transport**, the availability, quality and quantity of public transport options in a neighborhood.
- **Cars**, recognising that for many they have become an integral part of everyday life but that relying on them less is critical in reducing carbon emissions and air pollution.

• Connected communities

- **Belonging**, how connected people are to their local communities.
- **Local businesses and jobs**, a means for living and working and creating economic opportunities.
- **Local services**, spaces, facilities and infrastructure like community centres, town halls and care services.

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