GRADUATION THESIS   JANNINE DE JONG

2022 / 2023

From Intent to Action

Fostering sustainable behaviours in vulnerable neighbourhoods through public space design.

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In a tribute to the city of Rotterdam, with all its raw authenticity, each section of this report opens with a poem, celebrating talented local poets.

TU Delft Department of Urbanism
BK Bouwkunde

I would like to express my heartfelt gratitude to my mentors, Maurice and Denise. Maurice - our mentor sessions have been truly enjoyable and uplifting. Your extensive knowledge is inspiring, but it's your joyful and pleasant presence that always kept my energy high. Denise - I could always rely on you to provide intriguing reference projects that fueled my passion for design. Once again, you have motivated me to explore the depths of my creativity.

I also want to extend my thanks to those who engaged in interesting and enlightening conversations about my thesis, which led to the emergence of new ideas. In particular, I would like to thank Dirk, Chantal, and Maël. Additionally, I am grateful to the wonderful people of Bloemhof and Tarwewijk, including Robert, Patricia, Sergio, the residents of Samenhuis Ernaast, Carolien, Hans, and all those whose names I didn't have the chance to learn.

Above all, I recognise that this thesis would not have been possible without the unwavering support and patience of those who surrounded me with love. Thomas, the joy of graduating alongside you was undoubtedly one of the standout moments of this year. Once a koepel, always a koepel. Josephine (Joos), the thought of not spending my upcoming years with you at BK feels incredibly foreign. I am immensely grateful to have had you by my side throughout these past six years and will cherish these memories forever. Paula, despite the physical distance, your presence consistently lifted my spirits throughout this journey. Sharing this experience with you brings me genuine happiness. Lies, Simon, Melle, and Meyha, as my roommates, you witnessed me in all my different states. Thank you for the countless cups of coffee, for handling the dishes, and for the amazing pep talks over the past year. You all are truly incredible.

And to Lars, who deeply shares a passion for design with me. During those moments when my Illustrator crashed yet again, your comforting presence with a cookie or a Kardemummabullar meant the world to me. Your genuinity and the solace you provided were invaluable. Thank you for always being a haven of comfort.

Abstract

The world is changing, and the impact of climate change is becoming increasingly apparent. in our daily lives. The need for people to change their unsustainable behaviours is clear, particularly in vulnerable neighbourhoods where the effects of climate change are most pronounced. Not only are environmental vulnerabilities being exposed within this context, but social vulnerabilities as well. That's where this project comes in. The aim is to take an eco-social approach to urban design, creating purposeful and sustainable interactions within these neighbourhoods to help achieve a more inclusive and sustainable future. The influential role that the physical environment plays in shaping our behaviours needs to be recognised. It can either facilitate or dismiss specific actions, particularly in relation to sustainable behaviours. Encouraging

sustainable behaviours in public spaces requires a comprehensive approach that encompasses community awareness, everyday decisions, and recovery and protection behaviours. To effectively promote environmental actions, it's crucial to tailor interventions to the needs and capabilities of the local population, considering factors such as affordability, feelings of safety, and cultural backgrounds. With this in mind, the project proposes design interventions that gathered in a pattern language. By considering local capabilities and sustainability behaviours, design propositions are made for four places within Bloemhof and Tarwewijk - each representing a different approach in terms of scale and functionality. The final designs represent a future in which a strong community practices sharing and repairing within a balanced and natural streetscape.

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"Now, begin with imagining a typical walk in an urban environment—perhaps your home city, or a global metropolis. What does the city invite you to do? What kinds of behaviours does it primarily solicit? What are the functional meanings of its form? What kind of information do you encounter, and what are the action opportunities it specifies?"

Researcher of sustainable cultural evolution, collective behaviour change and decision-making under uncertainty - Roope Okaii Kaaronen (2020)

Conflicting messages in public space

Roope Okaii Kaaronen's quote highlights the strong interconnection between humans and their environments, which is the central idea of environmental psychology. This relationship is influential to both sides: our attitudes, values, and beliefs impact environmental well-being, just as the environment impacts our well-being. The pressing environmental challenges we face today serve as a reminder of this interconnectedness, calling for a reevaluation of our behaviours - our consumption patterns and the emissions we produce are among the major contributors to environmental degradation. Thus, it is essential to consider how our environment can facilitate sustainable behaviours, rather than promoting unsustainable ones. (Barlow, Ochsner, Kosslyn, Reisberg, Altmaier, Hansen, Zelazo, and Friedman, 2012).

For decades, the dominant paradigm has prioritised economic growth over other values, resulting in public spaces that reflect this narrow focus. Examples of this include the dominance of cars in the streetscape and the proliferation of commercial advertising, which prioritise individual interests over sustainability or community well-being. As a result, conflicting messages arise in public space, where the desire for growth and development clash with efforts to promote sustainability.

Designing public spaces that facilitates environmentally-friendly actions is essential for promoting sustainable behaviours. This aligns with the United

Nations' goals (2016) of ensuring sustainable consumption patterns and leaving no one behind.

That is when inclusive design becomes important. The influence of the environment on our well-being becomes more apparent in vulnerable neighbourhoods, such as Bloemhof and Tarwewijk in Rotterdam. Inclusive design becomes crucial in vulnerable neighbourhoods like Bloemhof and Tarwewijk, ensuring marginalized groups are not overshadowed. Inclusive design, as defined by Gehl (2018), creates accessible spaces for all, regardless of gender, age, race, ethnicity, religion, culture, socioeconomic status, or beliefs. It promotes a welcoming environment and overcomes barriers to well-being, protecting vulnerable populations.

This report explores the role of urban design in the daily lives of people in vulnerable neighbourhoods. The main focus is to merge the concepts of environmental psychology and inclusive public space design towards a cohesive story on how urban design influences the daily behaviour choices of people within vulnerable neighbourhoods. The impact of urban design on daily behaviour choices is still often underestimated, leading to conflicting messages in the city space. By focusing on this scope, the study aims to bridge the gap between environmental psychology and urban design and highlight the absence of a one-size-fits-all solution. Ultimately, it aspires to inspire care for our precious planet.

Part I

The city as an expression of societies values

Je bent overal
in de ruimte
die je inneemt

J.A. Deelder

► Theory on sustainable behaviour

The city as an expression of societies values

As a young person in a rapidly changing world, I feel my generation and I are constantly reminded of the importance of being more sustainable in order to ensure that the world as we know it can continue to flourish. In the curriculum of the Architecture bachelor and the Urbanism master, we are being taught how to responsibly use materials, how to design pleasant environments to live in, and - above all - how design for the sustainable future of cities.

Becoming more aware of what I can do as a designer to achieve sustainability, I was met with a conflict in my personal life. In my own daily experience of the built environment I feel like I am being constantly met with temptations to consume and use resources. The growing expectation to behave sustainably and to take sustainable decisions in the private sphere is not reflected and even to some extent contradicted by what is displayed in the public sphere. The city, which is supposed to be a reflection of society, is now reflecting back an image of what we should wish to avoid, making our decision-making needlessly difficult.

This made me wonder why such contradictions should exist and what I as a designer can do to make these contradictions become no more. From that, the idea that public space should be reimagined to be a reflection of sustainable values became one of the leading motives for the research in this report.

However, it is not just materials that makes something sustainable. The way people interact with an environment, the way they behave in it, adds another dimension to sustainability. From personal experience I know it can be challenging to alter one's behaviour, even though we know in our hearts we should. In my opinion, psychology plays a vital role in achieving sustainability by exploring how design can influence behaviours. As someone with a longstanding interest in the field of psychology, I believe it is essential to understand how design can encourage and motivate individuals to adopt sustainable behaviours.

The city could maybe then become more friendly towards its citizens; helping people to behave more sustainably, rather than making it a frustrating process. Especially concerning the more vulnerable groups in our society, who face more complexity and additional barriers in their daily lives to achieve their goals. Maybe the need for a less conflicting public sphere is particularly high for the people that have to overcome greater obstacles.

For me as an urban designer, it is important to keep exploring the limits of design's impact and make an effort to minimise contradictions in our living environments to create a more sustainable future for all.

The climate requires us to change

The story of this project starts with a message that most of us are familiar with by now. The summer of 2022 was a time in which the effects of climate change became unmistakebly clear: the summer was marked by extreme heats, causing Europe to be tormented by forest fires, draught and floods (de Brabander, Hofs, de Jong, Kuiper, Ročak and van Pelt, 2022). Climate change is more and more visibly becoming an existential threat to human and planet and most probably the defining crisis of our time (United Nations, n.d.).

The undeniable link between human behaviour and the natural environment's state highlights the urgent need for change (Klaniecki, Wuropulos and Hager, 2018; Kothe, Ling, North, Klas, Mullan and Novoradovskaya, 2019; Steg and Vlek, 2009). On an institutional and policy-based level the necessity of change is becoming more influential in current discourses. As we move forward, clear goals have been set by the United Nations in the Sustainable Development Goals (2015) and the European Commission in the European Green Deal (2019). While these

policies provide standards for governments and institutions, it becomes less evident how to address individual behaviour within society It is because of this, that these policies remain insufficient without tending simultaneous attention towards individual behaviour in society. The Intergovernmental Panel on Climate Change (IPCC) has expressed high confidence in the impact of demand-side mitigation, which includes socio-cultural and behavioural changes (2022). Choice architecture is identified as a valuable tool by the IPCC to facilitate this transformation. Moreover, engaging individuals in society is crucial for fostering acceptance and understanding of physical and technological innovations that support the climate transition (Steg and Vlek, 2009). By reducing resource demand and enhancing societal support, positive outcomes for the climate can be maximised (Kothe et al., 2019).

Megacities

- ⊡ 10 - 20 million inhabitants
- ☐ 5 - 10 million inhabitants
- ◼ 1 - 5 million inhabitants (selected cities)

Population density

- ▮ Dense
- ▮ Moderate
- ▮ Sparse

- Climate change hotspot
- Risk of desertification
- More precipitation
- Less precipitation
- Negative agricultural changes
- Changes in ecosystems

- Impact on mountain regions
- Sea-level rise concerns and affected
- Depletion of fisheries
- Increasing frequency of bushfires
- Melting of glaciers
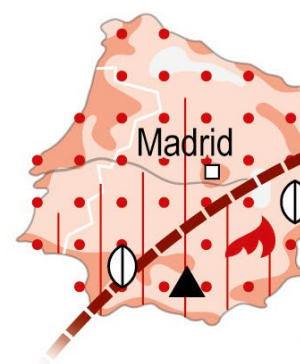
Madrid

St. Petersburg

Moscow

Amsterdam

Rotterdam

Rhine delta

London

Hamburg

Berlin

Kiev

Paris

Alps

Venice

Rome

Istanbul
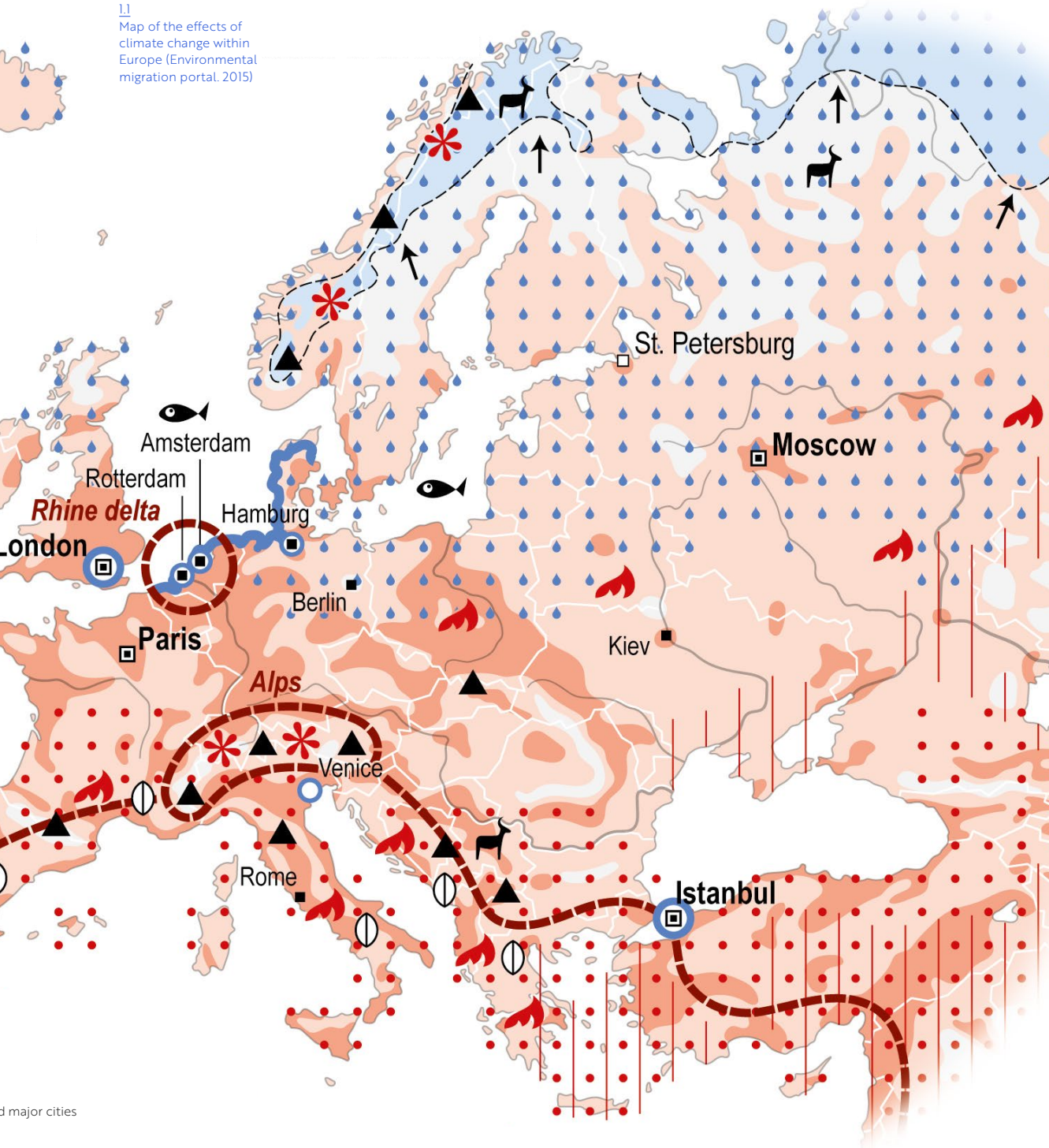
d major cities

The value-action gap

The good news is that overall awareness on climate change is increasing (I&O Research, 2019; Kloosterman, 2021). Dutch people are worried about the future of our planet and recognise that climate change brings the future of the earth in danger. The bad news is, however, that we are not acting according to our own beliefs.

World-wide there is an issue of disregard, as too many stakeholders don't see the environment necessarily as their problem, and consequently underestimate their own role (Carmona, Tiesdell, Heath and Oc, 2010). Among Dutch people, however, six out of ten thinks that their own individual behaviour is affecting the environment and therefore recognises that their actions could make a difference, making them susceptible for the idea of sustainable behaviour (Kloosterman, 2021). But despite this awareness and sense of responsibility, citizens generally take on a passive attitude towards sustainability. Responsiblity for actions on sustainability is projected on governments. It is believed that the national and local government should take on an active role by providing citizens with information and climate policies (I&O Research, 2019; Kloosterman, 2021). Despite individuals' awareness of the importance of their behaviour in mitigating the climate crisis, many shift responsibility onto governments. By doing so people distance their actions from their values, perpetuating the value-action gap.

The role of design

Affordance theory states states that action opportunities are embedded in our living environment (Kaaronen and Strelkovskii, 2020; Linder, Giusti, Samuelsson and Barthel, 2022; Nissen, Prendergast, Aoyagi, Burningham, Hasan, Hayward, Jackson, Jha, Mattar, Schudel, Venn and Yoshida, 2020). This is in line with the notion of choice-architecture as presented by the IPCC (2021). The current design of the urban environment is abundant with affordances that enables unsustainable behaviours. When exploring any city, one is confronted with constant impulses that promote consumption in various forms. Although it is not the sole determinant of unsustainable behaviours, the design of the city is believed to be an important element in the discourse of pro-environmental behaviours (Kaaronen and Strelkvskii, 2020; Linder et al, 2022).

1.2
Environmental concern in the Netherlands (Adapted from McCallum, 2021)

not concerned at all
somewhat concerned
concerned
very concerned
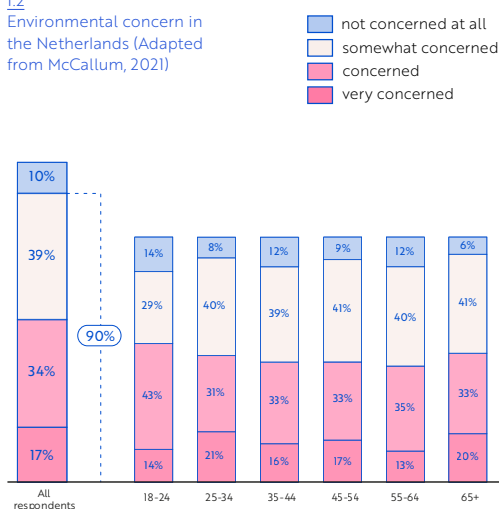
"How can we expect humans to behave sustainably when most, if not all, the new affordances we fit our urban environments with are ones which primarily invite us to behave unsustainably."

Roope Okaii Kaaronen (2020)

Exposure of eco-social vulnerabilities

Climate change is not only impacting the natural environment, but is also increasingly affecting cities. As a side-effect of climate change, social inequalities are becoming magnified. Vulnerable populations with limited social and financial resources are disproportionately affected by the direct and indirect consequences of climate change (Bartels, 2022).

It is the people that don't have a lot to spend that often live in areas with the lowest air quality and little access to greenery. Living in badly insulated homes, they also experience the greatest effects of heat stress in the summer, while considerably profiting less from subsidies for sustainability. On top of the material aspects caused by climate change, inequality also gets exposed in emotions, attitudes and the strengthening of existing power relations (de Brabander et al., 2022).

The connection between social capital and effects of climate change, in spite of this knowledge, has not been an active discourse in the field of social work or urban design. Over the last decades, social work has been dominated by a philosophy in which economic growth and competition are the drivers of a functioning and future-proof society. It is however becoming more and more clear that such an

approach focussed on the spending power of the population is contributing to the further exhaustion of the earth, while individualistic values are highlighted over community.

The 'Nationaal Programma Rotterdam-Zuid' is an example of social work policy which is aimed at improving the socio-economic position of the residents in the less afluent southern region of the city. Albeit there being succes in the program, showing slight progress in the economic capacity of the population, it is also recognised by its policymakers that most likely the people in the South of Rotterdam will remain a vulnerable group in the future (van Schoonhoven, 2022).

The need for strengthening positions in relation to the climate crisis therefore remains. The current social system, which favours individual, economic growth as an indicator for success is not enough to protect vulnerable people from the effects of climate change. There is a need to take a different approach, in which social and environmental issues can be approached simultaneously. A socio-ecological path can defend individuals, groups, and communities in vulnerable positions and work towards restoring and strengthening the natural environment to limit the impacts of climate change (de Brabander et al., 2022).

Vulnerable neighbourhood
score related to climate effects

0.4 - 1.6
1.6 - 3.3
3.3 - 6.1
6.1 - 13.8

Average income
(×1000)

13.1 - 17.7
17.7 - 22.4
22.4 - 27.1
> 27.1

1.3
Map of Rotterdam
Vulnerable neighbourhoods
for climate risks (Adapted
from Atlas Leefomgeving)
and average income in
neighbourhoods.

0   1000m   2000m
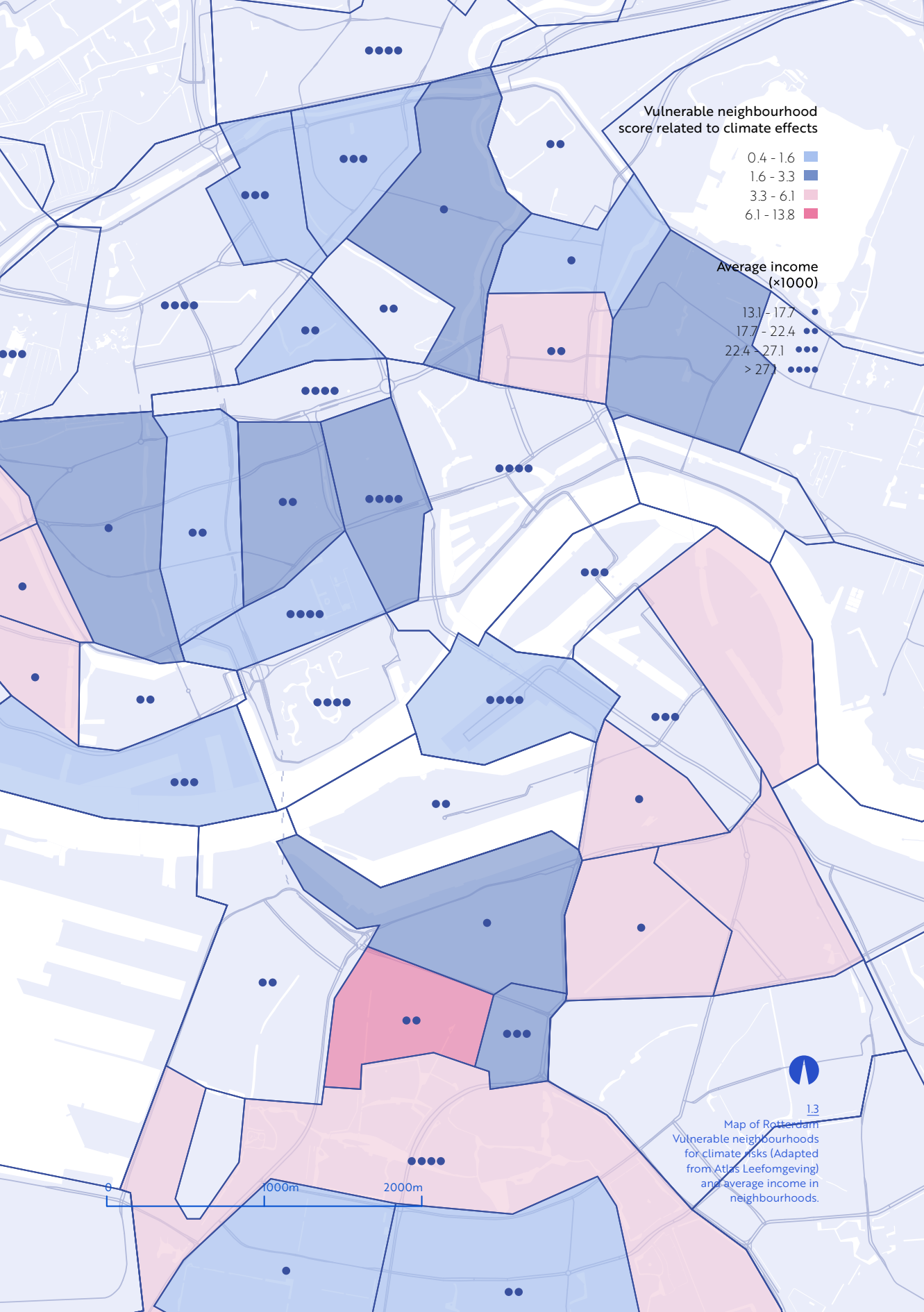
An eco-social approach in Rotterdam South

Bloemhof and Tarwewijk are two neighbourhoods in the south of Rotterdam that are particularly vulnerable to the effects of climate change, both in through their physical environment as through social issues. The National Program Rotterdam South (2023) aims to improve the standard of living in these areas. But how does this social program relate to sustainability?

The three pillars of NPRZ

The National Program Rotterdam South (from now on NPRZ), is a collaborative effort between the municipality of Rotterdam, the national government, the national police, the public ministry, housing coorporations, healthcare practicioners, education institutions and private companies that share the common goal to improve the liveability in Rotterdam South (NPRZ, 2023). This unique collaboration emphasises the importance of a long-term commitment through social work, staying unaffected by political fluctuations.

The program focusses on three main pillars, which they believe will have a significant influence on the quality of life of the people of Rotterdam South., namely: education, employment and the living environment. The upcoming paragraphs will delve into the connection between these pillars, sustainability, and an eco-social-spatial approach.

Education

The National Program Rotterdam South aims to enhance the potential of youth in the area through its education pillar, with a primary focus on improving children's academic performance while taking into account their social circumstances at home. In addition to regular academic programs, the program also offers extracurricular activities, known as "day programming," that focus on skills development, including lessons on nature and technology. These activities provide opportunities for children to learn about sustainability and its importance in their lives and communities. (NPRZ, 2023)

Employment

The employment pillar of the National Program Rotterdam South aims to provide the residents of the area with access to employment opportunities, as it is believed to be a key factor in improving their quality of life by providing both comfort and purpose. The focus of the program is primarily on individual growth and securing job opportunities, rather than collective growth. Recognising that the residents of Rotterdam South have a strong affinity for practical jobs, the program also takes into account the barrier of proximity to employment opportunities in the region. In addressing this barrier, the program indirectly touches upon sustainability by reducing transportation emissions. However, the program's focus on sustainability and collective growth remains somewhat limited. (NPRZ, 2023)

The living environment

The National Program Rotterdam South takes a comprehensive approach to improving the living environment, addressing both housing and public spaces. The program aims to make

the neighbourhoods more attractive through a combination of social mixing and housing upgrades. However, the program's active demolish-and-build approach raises questions regarding issues of justice, as it inevitably results in displacement for some groups. On the other hand, the approach to improving public spaces shows more promise. The program focuses on increasing the resilience of outdoor spaces by incorporating green elements and empowering collective citizen initiatives. Through thoughtful design of public spaces, the program hopes to facilitate encounters, increase social cohesion, and foster a stronger collective identity among residents. (NPRZ, 2023)

Focus on financial wealth

Overall, the program specialises itself in proposing solutions that lead to financial wealth for the neighbourhoods. While there is some evidence of the program integrating environmental and social considerations, this approach remains limited and heavily centered on individual-level change. However, the conditions within the neighbourhoods impact

not only individuals but also the collective as a whole. A stronger eco-social approach could significantly enhance the potential for liveability and social cohesion in neighbourhoods such as Bloemhof and Tarwewijk.

Incentives for a redesign

Within the NPRZ, sustainability is seen as an incentive to undergo change within the physical realm. Through the implementation of a district heating network, the outdoor environment is set to undergo significant transformation. This presents a unique prospect for reimagining the layout of the outdoor space, providing ample room for verdant landscapes, recreational areas, and pedestrian- and cyclist-friendly infrastructure. a whole. If anything became clear during the COVID-19 crisis, it was that people in vulnerable neighbourhoods have a strong desire to escape their small homes and make use of a safe and attractive outdoor space for socialising and physical activity. The sustainability transition can serve as a catalyst for the social development of the city, neighbourhood, and its residents. (Duurzaam010, 2021)

1.4
Focus area of NPRZ. In blue the target/focus neighbourhoods

Afrikaanderwijk
Feijenoord
Tarwewijk
Hillesluis
Oud-Charlois
Carnisse
Bloemhof
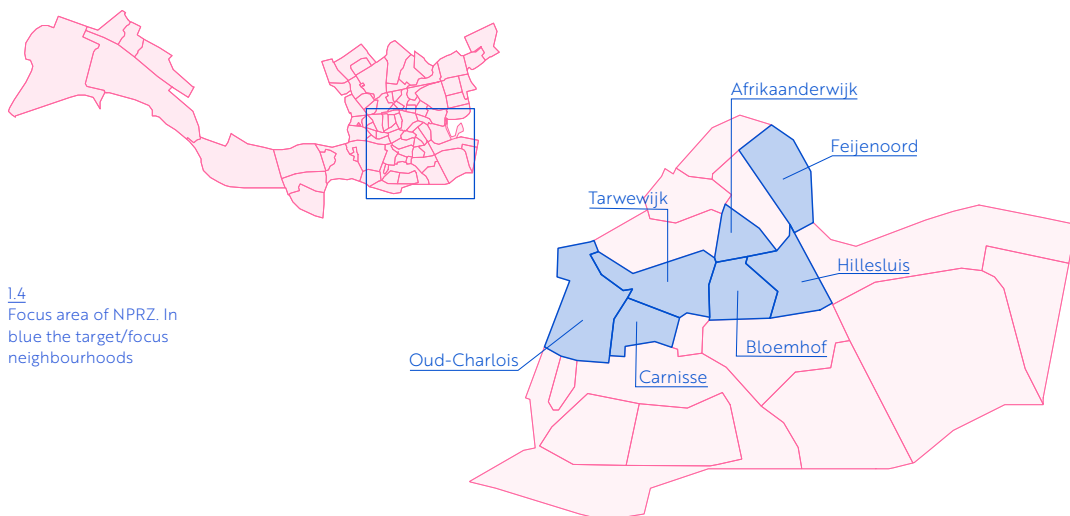
Drivers for change

While the climate crisis is becoming more pressing as an issue that affects us all, it is becoming increasingly clear that people's unsustainable behaviours need to change. Despite growing climate awareness, it has proven challenging to shift away from unsustainable habits. It seems there is a misbalance between our intent to act sustainably and our actual behaviour - a misbalance that is shaped by the environments in which we live. Vulnerable neighbourhoods, such as Bloemhof and Tarwewijk, are places where the pressures of the climate crisis are being amplified.

This exposure not only unveils the fragility of the physical realm but also amplifies the resonance of long-standing social challenges. Current policies have struggled to effectively integrate environmental and social objectives, creating a difficult path toward a more environmentally-friendly society. Through the integration of an eco-social approach in urban design, interactions with and within the neighbourhood can become purposeful and help achieve a more inclusive and sustainable future.

Research
question

In what way can the design of public space contribute to empower citizens of vulnerable neighbourhoods to perform pro-environmental behaviours?

This question emphasises an eco-social approach to urban design on the local scale. An answer is sought to improve upon local environmental quality by relating the experience of the environment to human behaviour.

Research aims

By investigating the main question, my aim is to achieve the following results:
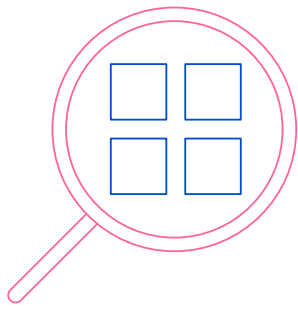
Main aim

To create an overview of eco-socially inclusive urban design interventions that transform the public space, so that people can be empowered to take pro-environmental actions in an exemplary urban condition.
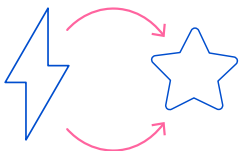
Sub-aims

Turning challenges into opportunities
By considering the role of humans in their daily lives, the goal is to transform the challenges posed by climate change and growing inequalities into opportunities to reshape living environments to inclusive places.

Behaviour-driven design
The objective is to create a comprehensive approach that integrates sustainable behaviours and urban design within an eco-social narrative, with the aim of utilising urban design as a driver for social change.
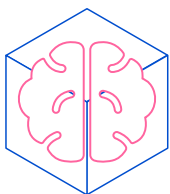
Psychology of place
The aim is to bridge the disciplinary divide between psychology and urban design, with a focus on behaviour theory, in order to enhance human living conditions from an eco-social standpoint.

Secondary research questions

To answer the main research question, it is necessary to break the research down into smaller, more specific research questions. These have been organised into three categories: analysis, integration, and design. These three elements allow for a comprehensive research in which it becomes clear of what already is, what can be (if) and what could work.

What is?
analysis

→

The aim is to provide an overview of the physical-spatial and psychological elements that affect sustainable and unsustainable behaviour, with the ultimate goal of identifying areas of friction and designing interventions to promote sustainable behaviour change.

1. What behaviours take place in public space that can be considered to be sustainable?

Behaviours will be pinpointed through the examination of **literature and fieldwork.**

2. How and by who is the public space in Bloemhof and Tarwewijk used now?

Public space use will be examined through **fieldwork and interviews and dialogues.**

3. What are the present challenges for adopting sustainable behaviours in the context of Bloemhof and Tarwewijk?

Insight into the context of the neighbourhoods will be achieved by **demographic research, a landscape biography, fieldwork, literature review, interviews and dialogues.** Challenges are exposed through l**iterature**, **dialogues** and **interviews** with the local population and the **mapping** of urban structures.

What if?
integration

The objective is to integrate the knowledge obtained from the 'what is' questions into physical and psychological elements that can be used as design principles.

4. What are drivers for adopting sustainable behaviours and how are these drivers related to the spatial environment of Bloemhof and Tarwewijk?

Drivers will be pinpointed through the examination of **literature and interviews with experts.** These will be translated into design criteria.

5. How can the use of public space be made more inclusive to the inhabitants of Bloemhof and Tarwewijk?

Through **literature review, dialogues and interviews,** the elements for an inclusive neighbourhood design will be investigated. These will be translated into design criteria.

6. What are effective interventions to incorporate sustainable and inclusive design principles in public spaces of Bloemhof and Tarwewijk to promote pro-environmental behaviour among residents?

Previous knowledge is linked through the creation of a **pattern language.**

What works?
design

The objective is to design a proposal for Bloemhof and Tarwewijk that promotes sustainable lifestyle choices among residents, while being mindful of the needs of locals in the neighbourhood, resulting in an inclusive public space design.

7. Which areas in Bloemhof and Tarwewijk have the potential to facilitate pro-environmental behaviours?

With the use of the knowledge aquired form previous spatial analysis, the spatial oportunities will be mapped out using the **maximisation method.**

8. How can these areas be transformed over time so pro-environmental behaviours can be inspired, while also fostering to the needs of the current population?

The proposed patterns will be implemented at the neighbourhood scale, and further detailed through **in-depth designs** using binding elements such as a program of requirements and an interpretation of the design by visual representations with maps, sections and 3D designs.

An overview of methods

This project will take form through a mixed method approach. By using both quantitvative and qualitative methods, the subject of pro-environmental behaviours will be explored. The human aspect of this research, through the subjects of behaviour and inclusivity, will benefit from highlighting not only objective, but also subjective studies. By doing so, the generic can be distinguished from the context-specific information for Bloemhof and Tarwewijk.

Literature review

As a starting point for aquiring information, a literature review has been conducted, focussing on themes of urban sustainability, human-environment relationships and sustainable behaviour and it's motivators. Later in the research, the topic of inclusivity has been further explored in relation to sustainable behaviours. The answers that are provided through literature research help in creating a general understanding on the topic, but remain generalised. Therefore it serves as a first step for further research.

Mapping

Mapping will be used to inquire context-specific quantitative data, exploring the present conditions of Bloemhof and Tarwewijk. By analysing the space through maps, it will be possible to discern social and spatial opportunities and challenges that are specific to certain locations. This way areas can be identified that can become worthwhile places for interventions.

Fieldwork and observations

Instead of focussing on quantitative data through mapping, qualitative data can be achieved by visiting the neighbourhood and making observations. The nuances of the neighbourhood were captured by going multiple times throughout the year, on various days of the week and on different times of the day. By doing so, it was possible to achieve a perspective on the neighbourhood that is not bound by data and literature, but rather a feeling for the neighbourhood has been developed that emphasises its qualities.

Interviews and dialogues

Instead of relying solely on my own observations, the perspectives of local residents have also been incorporated through dialogues and interviews. By doing so, a more comprehensive and accurate understanding of the neighbourhood and its inhabitants was created, shedding light on both the challenges and opportunities people face in their daily lives. These conversations were instrumental in identifying areas for potential interventions. However, due to the significant diversity within the community, it was at times difficult to ensure an accurate representation of all residents. To ensure an accurate approach, interviews with experts were conducted to identify the types of interventions most likely to have a positive impact in these complex contexts.

Maximisation method

The environmental maximisation method is utilised to integrate the data gathered through mapping, fieldwork, interviews, and dialogues into an examination of spatial opportunities. Rather than merging this aquired information to form an idealised vision of a sustainable neighbourhood, each theme is analysed and optimised individually in connection to the local environment. The traditional method is focussed on the optimisation of the ecological performance, but for the purpose of this project optimisation is sought for the eco-social performance in relation to sustainble behaviours. This method allows for a more flexible interpretation of how different themes can be combined to create a sustainable neighbourhood.

Pattern language

As a final integration of all the lessons learned throughout the research, a pattern language is formed. This method, as proposed by Cristopher Alexander (1978) allows for an integration of the field of psychology and urban design, in which spatial interventions can be related to social issues. The full version of the pattern language will be collected in an adjacent catalogue. Design will be a crucial component of this research project, as it involves testing the acquired knowledge spatially and through various research and design techniques. The patterns as proposed will therefore be implemented in neighbourhood designs.

1.5
Example of a pattern. From Pattern catalogue that accompanies this report. (Author, 2023)
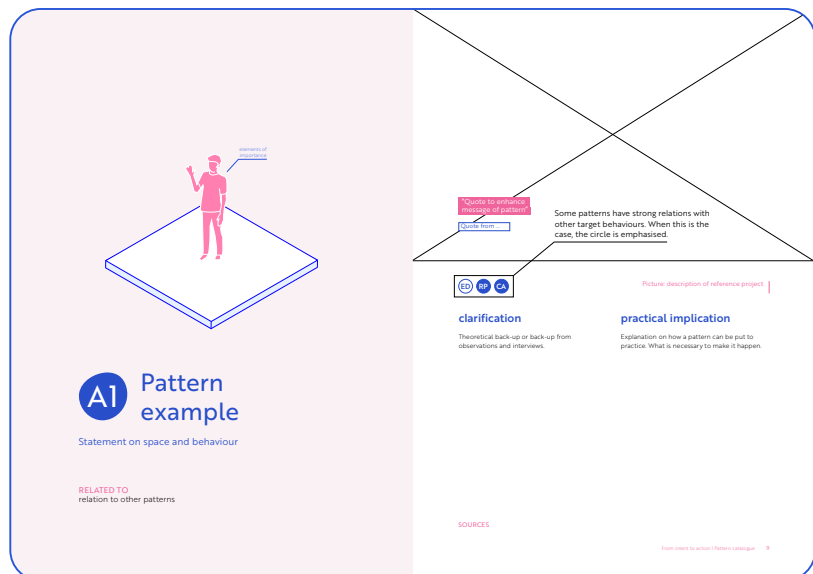
A plea for the
Gritty Neighbourhood

The allure of chaos and spontaneity,
The raw beauty that lies therein,
Is often lost in our pursuit of perfection,
And our definitions of what is good and clean.

In the same way, the neighbourhood is more than what meets the eye,
It's a community, a culture, and a way of life,
The rawness and chaos that may seem unclean,
Are the diversity and spontaneity that make it be.

It's time to embrace the mess and the complexity
To honor the neighbourhood's one-of-a-kind identity,
To keep the culture, history, and grit in place,
And create a lively and unifying space.

So yes, the neighbourhood is gritty.
So yes, the neighbourhood is complex.
But let's work with that

Poem by author on Bloemhof and Tarwewijk and the role of urban designers to
emphasise potential rather than problems.

Design goal and objectives

Design goal

To create specific eco-socially just urban design interventions that transform the public space, and which are illustrative for the empowerment of people to take pro-environmental actions.

Design objectives

To achieve this goal, a complementary set of design objectives are proposed. These objectives are an indicator of the approach that will be taken in this project.

Emphasising potential

In relation to vulnerable neighbourhoods, there is often a tendency to overemphasise the problems. However, this project aims to highlight the existing potential of these neighbourhoods, including a positive outlook on their residents.

Positive change to climate

As a reflection on sustainability, design interventions should not create new negative climate effects. The use of permeable and renewable material is therefore a main intention.

Preserving what is there

The project adopts a reserved attitude towards demolishing existing buildings and focuses on utilising the potential of the existing urban structure to minimize the negative effects of gentrification processes.

A holistic approach

The project aims to promote a comprehensive understanding of pro-environmental behaviours by designing interventions for a variety of sustainable behaviours, rather than focusing on a single type of behaviour.

Research framework

Personal motivation

The city as an expression of societies values

Problem field

The climate requires us to change + The value-action gap + Exposure of eco-social vulnerabilities + An eco-social approach in Rotterdam South

Problem statement

A misbalance between our intent to act sustainably and our actual behaviour ...

Vulnerable neighbourhoods, such as Bloemhof and Tarwewijk, are places where the pressures of the climate crisis are being amplified...

Current policies have struggled to effectively integrate environmental and social objectives,

creating a difficult path toward a more environmentally-friendly society.

Research question

In what way can the d
public space contribu
empower citizens of
neighbourhoods to p
pro-environmental b

Secondary research q

What is?
1. What behaviours take place in pu
can be considered to be sustainab
2. How and by who is the public spa
3. What are the present challenges
sustainable behaviours in the cont
and Tarwewijk?

What if?
4. What are drivers for adopting su
behaviours and how are these drive
spatial environment of Bloemhof a
5. How can the use of public space
inclusive to the inhabitants of Bloe
6. What are effective interventions
sustainable and inclusive design pr
spaces of Bloemhof and Tarwewijk
pro-environmental behaviour amo

What works?
7. Which areas in Bloemhof and Tar
potential to facilitate pro-environn
8. How can these areas be transforr
pro-environmental behaviours can
also fostering to the needs of the c

The research framework presented on this page provides a comprehensive overview of the study's structure and methodology. It outlines the key components and stages of the research process, highlighting the objectives, research questions, data collection methods, and analysis techniques.

Theory | In the mind of the environment

SQ1 SQ3 SQ4

Analysis

Bloemhof and Tarwewijk from the perspective of...

Community awareness
Everyday decisions
Recovery and protection

SQ1 SQ2 SQ3 SQ4 SQ5

Vision

Connecting people and place +

A balanced & connected streetscape +

Utilising resources and skills +

Sharing space with nature

SQ4 SQ5

Spatial opportunities

SQ7

Design criteria

Community awareness
Everyday decisions I+II
Recovery and protection

SQ4 SQ5 SQ6

Design strategy

SQ8

design of
...ute to
...vulnerable
...erform
...ehaviours?

...questions

...ublic space that
...le?
...ace used now?
...for adopting
...ext of Bloemhof

...stainable
...ers related to the
...nd Tarwewijk?
...be made more
...mhof and Tarwewijk?
...to incorporate
...inciples in public
...to promote
...g residents?

...rwewijk have the
...ental behaviours?
...med over time so
...be inspired, while
...urrent population

Design

Heer Danielstraat I
Heer Danielstraat II
Mijnsherenlaan
Putsebocht

SQ8

Pattern language

Community awareness
Everyday decisions
Recovery and protection

SQ6

Design goal and objectives

Conclusion

Translation of the poem
**The city is plural,
incessant, the city
is never alone
the city is always and
everywhere, in the people
around us.**

Part II

In the mind of the environment

De stad is meervoud
onophoudelijk, de stad
is nooit alleen
de stad is altijd en
overal, in de mensen
om ons heen

D. Otte

► Theory on sustainable behaviour

Sustainability in the urban context

To understand sustainable behaviour, one first needs to delve into the multifaceted concept of sustainability within the urban context. Within this academic exploration, attention is drawn to the intricate interplay between human behaviour and urban design, uncovering the vital role it plays in shaping sustainable cities and which sustainability topics are pertinent to human actions.

There is a wide range of definitions for sustainability. In the context of this thesis on urban design for sustainable behaviour, sustainability will be addressed within the urban context.

SUSTAIN-ability

If the word sustainability is rewritten as sustain-ability, the definition seems to become more clear: the manner in which society is equipped with abilities to preserve our environments (Kaaronen, 2020). Urban sustainability encompasses a range of concepts, strategies, and actors working together on different levels to create sustainable urban environments. These concepts can be broadly divided into two main definitions: global and local (Müller-Eie and Bjørnø, 2014).

At the global scale, urban sustainability refers to the city's ability to conform to social, economic, and cultural standards so that its population can thrive without having a negative impact on global environmental, social, and economic conditions. At the local scale, urban sustainability involves the facilitation and coordination between functional and formal strategies, such as land use, sustainable transportation, and resource management

Implementing urban sustainability relies on the provision of sustainable alternatives by institutions and the sustainable behaviour of the urban population (Müller-Eie and Bjørnø, 2014). Therefore, it is crucial to understand the relationship between behaviour and sustainability. For instance, the sustainable use of transportation, waste reduction, and efficient use of resources, are some examples of sustainable behaviours in the urban context.

Urban design, supported by urban policies, are what shapes the place that populations live in. Designers, therefore, design with a subjective set of social, economic, environmental and cultural values. These values exist in the urban design strategies that are translated in spatial urban designs.

This report emphasises two pillars of sustainability: environmental and social. Environmental sustainability focuses on preserving natural resources and reducing negative impacts on the environment, while social sustainability focuses on improving the quality of life and ensuring social equity. Monetary and cultural aspects will also be touched upon briefly, but the main focus is on the relationship between environmental sustainability and social sustainability, including topics such as environmental justice, stewardship over natural resources, and their translation into urban design strategies.

ISSUES

OBJECTIVES

AIMS

IMPLEMENTATION

ACTORS

MEANS

USERS

environmental issues **social inequity**   **cultural numbing**   **economic instability**

secure resources
reduce dependancy
increase efficiency
pollution prevention

equal opportunity
fair acces to resources
participation community

preserving history
expressiveness in space
diversity in the urban

economic stability
green growth long term

environmental balance **social equity**   **cultural flourishing**   **economic feasibility**

GLOBAL

urban sustainability

urban policy   **urban design**

urban sustainability strategies

collective behaviour

individual behaviour

2.1
Urban sustainability
explained by concepts
(Adapted from Müller-
Eie and Bjørnø, 2014)

LOCAL

The figure above provides an overview of urban sustainability concepts and categories. It is a modified version of Müller-Eie and Bjørnø's (2014) figure, with more precise objectives for this research and the inclusion of global cultural standards. While cultural and economic issues are not the main focus of this thesis, they are included to present a comprehensive overview of elements related to urban sustainability, as are urban policy measures.

The thesis primarily focuses on constructing a narrative around global socio-environmental issues and objectives, as well as urban sustainability strategies in local urban design. Bridging these systems poses a significant challenge, as it requires reconciling

rationality with human emotions. While global environmental issues logically call for behavioural changes, individuals may not directly experience their effects, making it difficult to motivate behavioural change based on rationality alone. Visible personal benefits are necessary to drive such changes (Müller-Eie and Bjørnø, 2014).

The scheme highlights the crucial role of urban inhabitants in achieving urban sustainability, as broad public support is essential (Müller-Eie and Bjørnø, 2014). Additionally, urban design is closely tied to behaviours within the urban environment, indicating a relationship between people and their surroundings. This connection prompts further exploration of this relationship.

Exploring human-environment relations

In the pursuit of urban sustainability, the pivotal role of human behaviour in driving meaningful change is being recognised. The following section delves into the significance of the relationship between people and their environment, with a specific focus on behaviour.

As human beings, we bind and relate ourselves to our environment in many ways. Many of these connections are readily observable when we observe our surroundings. For instance, a house offers a shelter with its roof and walls, protecting us from the impacts of weather. Other connections, more intangible in nature, can be discerned through emotions, such as the feeling of having a place to call home, which brings about a sense of tranquility and safety.

Delving into the literature on the relationship between people and their environment, it becomes evident that this connection is characterised by an influential feedback loop (Carmone et al, 2010; Kaaronen, 2020; Kopec, 2018; Larson, Stedman, Cooper and Decker, 2015). This socio-spatial exchange encompasses a mutual interaction in which humans shape their environment, while their surroundings, in turn, shape their behaviour and perceptions. This feedback loop can have both positive and negative effects, as humans can benefit from their environment or be conditioned by it, and can conserve and restore their surroundings or

contribute to environmental degradation. Urban designers bear the responsibility of molding the environments in which people reside, ensuring that the relationship can be viewed as positive. It is crucial to foster an understanding of this relationship so that future designs can create opportunities for people rather than obstacles, and so that our planet can be nurtured rather than polluted.
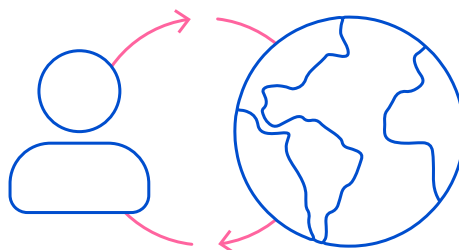
Flexibility and continuity in urban design

Understanding space without considering its social content is a challenging task, just as perceiving society without acknowledging its spatial aspects proves difficult (Carmona et al., 2010). For instance, a school is more than just a physical structure; it serves a social purpose of education. Similarly, a prison is not merely a building but holds a social purpose of administering justice and ensuring safety. Urban theorists have shed light on the socio-spatial exchange by examining the environment through three lenses: the cultural environment, the social environment, and the physical environment (Kopec, 2018). These three dimensions of the environment interact within a socio-spatial context in various ways. Environments do not exist in isolation; they are layered and interact with one another, creating the conditions for life as we know it. Our

cultural
environment

human

personal state

social
environment

the urban environment

+ / -

use

+ / -

spatial
environment

provision
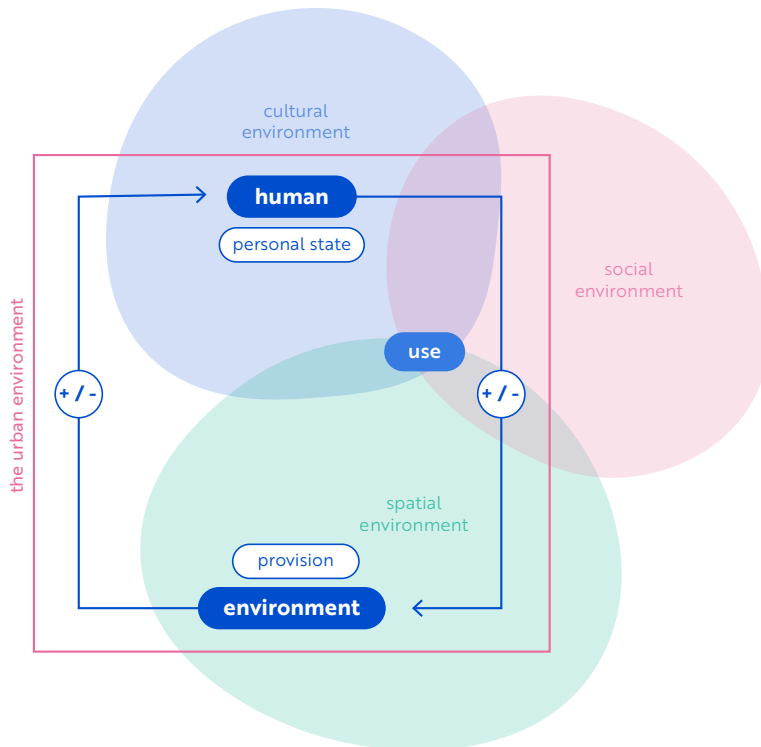
environment

2.2
Schematic
overview
of human-
environment
relations

behaviour, or how we utilise our environment, is influenced by our individual socio-cultural states and the physical provisions available to us. In the context of this report, these interactions and behaviours occur within the urban context—the city (see figure 2.3).

The interplay between the physical, social, and cultural environments is intricate and multifaceted. In urban design, understanding this complexity involves recognising which elements in the feedback loop can be easily altered and are thus flexible, as well as identifying those that are more permanent and less susceptible to immediate change.

At first glance, the physical spatial environment may appear to be the most amenable to quick alterations (Carmona et al., 2010). While changes to the physical environment can indeed be implemented relatively quickly, their long-term

effects should not be underestimated, as they often outlast the pace of social change. For example, constructing a wall may take only a few days, but its impact extends to defining the street, influencing infrastructure, and affecting the movement of people and goods.

Social change, on the other hand, tends to be a gradual process. However, radical new schools of thought can emerge rapidly, demanding swift changes and adaptability from the physical environment. For instance, the sanitation movement of the 19th century introduced new hygiene standards that necessitated the development of new infrastructure and changes to facilities, thus influencing the physical environment.

Cultural environments are shaped by the activities of human communities, encompassing traditions, language, religion, and values. This

environment is particularly resistant to change, as it is closely tied to people's core identities, making proposals for change susceptible to resistance.

It is important to acknowledge that implementing change within a city's social and spatial environment is generally more achievable than changes to its cultural environment. Therefore, when proposing designs for fostering sustainable behaviours, it becomes crucial to focus on the social and spatial dimensions to create change within a manageable timespan, while cultural change might be the ultimate end-goal. The social and physical realms are intricately intertwined, and designing with their relationship in mind can lead to more effective outcomes.

Building upon the theory, it becomes evident that translating this theory into practical application requires a thoughtful approach. By considering the interplay between the social and cultural dynamics within the urban context, one can imagine that certain key practices become significant.

One of these practices is participatory design, which involves actively engaging the community and stakeholders throughout the design process. By incorporating their voices and addressing their needs, a deeper understanding of the social fabric at play is achieved.

Moreover, context-sensitive design logically follows, recognising the significance of social and cultural context. By tailoring designs to specific communities or neighbourhoods and considering local traditions, customs, and values, the resulting physical environment respects and enhances the cultural identity of the place.

Furthermore, the need for flexible and adaptable spaces becomes evident. Urban

environments must be able to evolve and respond to shifting needs and behaviours over time. Creating spaces that can accommodate diverse social activities and changing community needs aligns with this understanding.

In this way, the logical progression from theory to practice leads to the identification of participatory design, context-sensitive design, and the creation of flexible spaces as crucial practices. By embracing these approaches, urban designers can ensure that their spatial designs align with the social and cultural dynamics of the communities they serve, resulting in more meaningful and effective urban environments that foster a sense of ownership and attachment among the residents.

Meaningful bonds

Place attachment, which refers to the meaningful affective bonds individuals form with specific places, holds a crucial position in the discourse of human-environment relations. It is a concept framed within the realm of human experience and affect, encompassing feelings, moods, and emotions (Barlow et al., 2012; Counted et al., 2021; Kopec, 2018). Understanding the various elements of place attachment, such as place identity and place dependence, is essential for comprehending how a physical environment can evoke specific emotions and influence behaviour.

Place attachment encompasses diverse aspects of people's relationship with a physical location and should be viewed as an active phenomenon, where individuals actively seek and engage in their connection with a place (Barlow et al., 2012). Two key elements contribute to place attachment: place identity and place dependence. Place identity describes how an individual's sense of self is intertwined with their

physical environment, encompassing ideas, values, feelings, beliefs, and behavioural patterns (Junot et al., 2018). On the other hand, place dependence refers to individuals' assessment of a place's capacity to support their goals and desired activities. This assessment provides a sense of control, clarity, comfort, and security, fostering attachment to the place (Kopec, 2018).

By comprehending the elements of place attachment, policymakers and urban planners gain valuable insights for creating sustainable environments that evoke positive emotions and behaviours towards the environment. This holistic approach allows for the integration of place attachment principles with the concepts of participatory design, context-sensitive design, and the creation of flexible spaces discussed earlier. By incorporating these principles, urban designers can ensure that their spatial designs not only align with the social and cultural dynamics of the communities they serve but also foster a strong sense of attachment, belonging, and well-being among residents. This interconnected approach contributes to the development of more meaningful, effective, and sustainable urban environments.

Acting sustainably

Having gained clarity on sustainability in urban settings and the intricate relationship between humans and their environments, the subsequent section will delineate specific positive relations. This chapter will propose pro-environmental behaviours that can be fostered within an urban context.

A formal definition of pro-environmental behaviour is the behaviour that either benefits the environment, increases the environments quality, or does as little harm to the environment as is possible (Larson et al, 2015; Steg and Vlek, 2009). Reflecting at the model of human-environment relations, this implies that pro-environmental behaviours involves a relationship between humans and the environment that is positive, wherein humans actively engage to conserve, preserve, and restore their environment.

It should be noted that there is not a universal sustainable lifestyle that will be targeted in this thesis, as lifestyles are highly context dependent. As diverse as we people are, as diverse can lifestyles be that are pro-environmental. The most important notion, however, is that the lifestyle exists within the capacities of nature and the environment (UNEP, 2018).

While there is a consensus on the formal definition of pro-environmental behaviours, the context-dependency leaves a lot to remain unclear on what this would mean in practice. This desires more specificity to the concept, so it can become measurable or observable. As mentioned in the previous chapter, there can be direct and indirect impacts of environmental actions, and the scope of influence can range from the local to the global. So, to be able to design concrete interventions in public space, an array of specific target behaviours will need to be appointed (Steg and Vlek, 2009).

Conservation psychologist and social sciences researcher Lincoln Larson and his colleagues (2015) suggest a foursome of target behaviours, each with a unique focus. They are defined as follows: conservation lifestyle, which focusses on the preservation of resources in daily life; land stewardship, which focusses on ecology; social environmentalism, which focusses on the education and activation of communities; and environmental citizenship, which focusses on advocating for political action. Environmental citizenship falls outside of the scope of this report as it is the least related to the spatial environment.
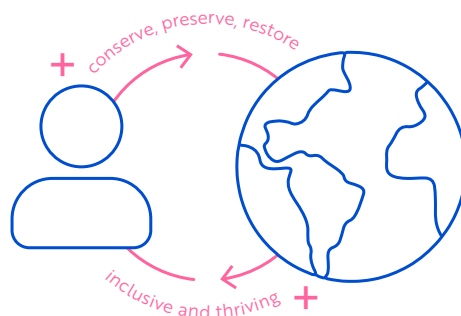
The target behaviours are the acts of individuals, communities or organisations that take care of, protect or responsibly use the local environment, so that there can be social and/or environmental benefits (Bennet, Whitty, Finkbeiner, Pittman, Bassett, Gelcich and Allison, 2018).

The proposed target behaviours by Lincoln Larson and colleagues (2015) have been renamed for the purpose of this thesis, and are briefly described below. These behaviours will be further defined in later sections of the report.
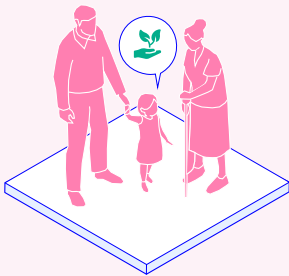
community awareness

The way in which communities, as a form of social relationships, can contribute to conservation and pro-environmental activities and mindsets. Addressing social issues such as equal opportunity, access to resources and participation.

► Discourses about environmental issues
► Participation in local groups
► Education on sustainability

everyday decisions

A reflection of conservational lifestyle choices made by citizens that have an influence on environmental sustainability, addressing resource security, resource dependancy, resource efficiency and pollution prevention on the scale of the neighourhood.

► Recycling behaviours
► Green consumerism
► Environmentally-conscious transportation
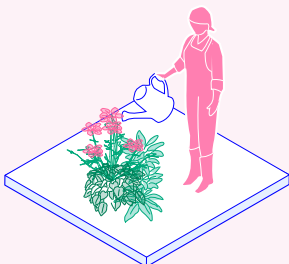
recovery and protection

Citizens consideration and engagement with local ecosystems. Addressing once again environmental issues, but moreso focussed on ecological aspects, such as biodiversity.

► Habitat management on public lands
► Use of environmentally preferable materials
► Participation in ecological activities

From intent
to action

In the pursuit of urban sustainability, examining the intricate psychological dynamics at play offers insights into how actions in urban settings shape the path towards sustainability. In the following section, the reasons behind the value-action discrepancy is explored. This understanding will help identify effective solutions to bridge the gap and foster meaningful change.

The necessity for sustainable behaviours seems to be clear by scientific evidence. So why is so hard for humans to behave pro-environmentally? The continuum that is often described in behaviour theory, where knowledge is followed by a change in attitude and consequently a change in behaviour, is seemingly not that straightforward. In reality, unsustainable behaviour still exists even though attitudes reflect a sustainable mindset, causing a mismatch. As a result, it can be concluded that people experience barriers that obstruct intentions. Unsustainable habits are so strong that they repeatedly override new knowledge and changes in attitudes; meaning that the provision of knowledge alone is not enough for a change in behaviour (Linder, Giusti, Samuelsson and Barthel, 2022).

knowledge   attitude   ~~behaviour~~
                                      habits
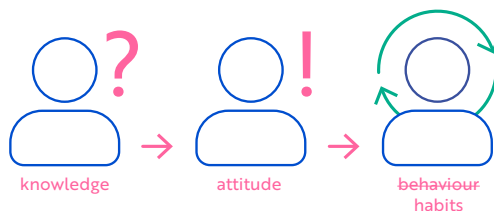
Thinking mistakes

To achieve sustainable outcomes, it is crucial to understand the cognitive biases that influence our decision-making processes. These biases can lead us to make choices that may have unintended negative consequences on the environment. By identifying and addressing these thinking mistakes, urban designers can promote positive change in the built environment and contribute to the creation of more sustainable and livable cities. There are many ways to organise what we will call now 'thinking mistakes'. Behavioural psychologist Chantal van der Leest identified three main categories of the most common cognitive biases that affect our decision-making processes and provided insights into how to overcome them for more sustainable behaviours (see appendix IV).
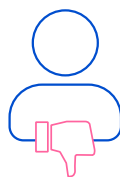
The first cognitive bias is the **aversion to loss**, whereby people perceive losing something as 1.5-2 times more impactful than gaining something. This can be related to a desire to status and a desire for immediate satisfaction, making it difficult for people to imagine past the present (Giphart and van Vught, 2016). As a way of countering

this, it is important for proposed sustainability solutions to put emphasis on benefits and gains, rather than framing in terms of loss. For instance, when advocating for the removal of cars from a neighbourhood, using language that promotes "liveable streets" may be more effective than labelling the area as "car-free."

losing something is

1.5-2×

more impactful than gaining something

The second cognitive bias is related to ease of decision-making, which stems from ther brains' natural tendency to be passive and rely on quick, intuitive judgments based on among others past experiences and observations of others. If the brain would have to make active decisions all the time it would result in overstimulation and extreme tiredness; being passive is therefore necessary. As a result, people may make decisions that do not necessarily make sense rationally or people do not fully consider the potential impact of their actions in the larger scheme. To address this, design should consider ways to make sustainable choices the easiest and most intuitive option. This is in line with affordance theory. For example, designing bike lanes that are more accessible and convenient than car lanes can encourage more sustainable transportation choices as the environment provisions a certain action opportunity and

therefore makes an action more viable. Research has also shown that the incorporation of green spaces and biodiversity in urban environments enhances the feeling of ease and consequently has a positive effect on well-being and attachment to place.

The third cognitive bias is self-preservation, which stems from the tendency to prioritise decisions that protect personal interests and self-image. The well-being of oneself or the people closest to a person is a primary concern, rather than the well-being of strangers (Fiske, 2018; Giphart and van Vught, 2016). This so-called optimism bias can lead to a lack of critical self-reflection, where people are quick to judge others for their behaviour while unintentionally making excuses for their own. In the context of urban design, it is essential to recognise and address this bias by engaging with communities and promoting a sense of collective responsibility for the (built) environment. For example, promoting community-led initiatives to clean up litter and maintain public spaces can foster a sense of ownership and pride in the neighbourhood. Additionally, highlighting the collective benefits of sustainable choices, rather than framing them solely as individual sacrifices, can encourage more widespread adoption of sustainable behaviours. This is also related to the bias of ease.
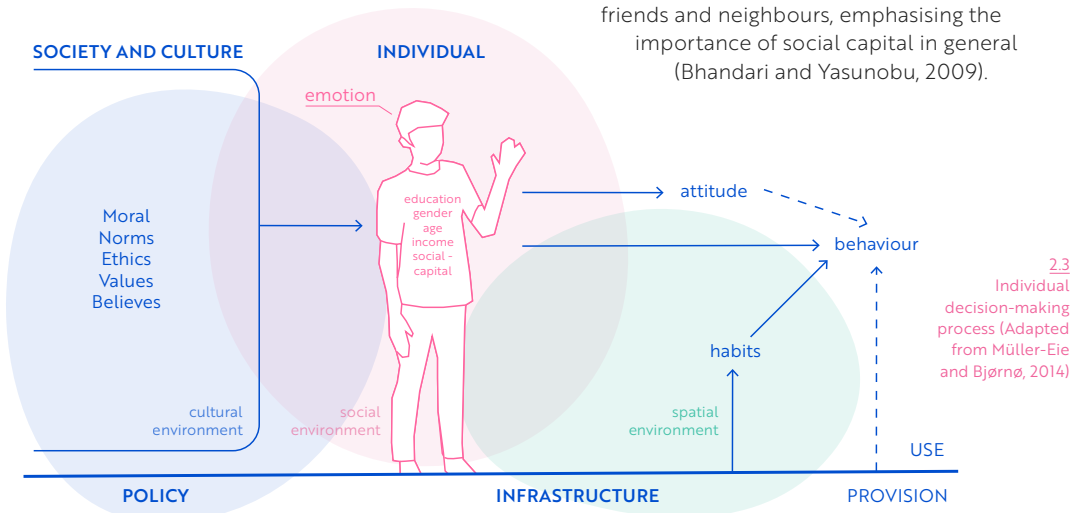
These 'mistakes' in the brain that lead to unsustainable behaviours are important to recognise. They can be used to create the path of least resistance towards sustainable behaviours, providing opportunities and tipping points in which behaviours can be addressed.

Leveraging biases for sustainable behaviours

Within the realm of sustainable behaviour, an intriguing aspect lies in the biases associated with aversion to loss, ease, and self-preservation. These biases, ingrained within human nature, can be transformed into powerful tools for cultivating sustainable behaviours. In this section, the potential of these biases is explored so they can be harnessed as instrumental forces to foster and propel sustainable actions.

The Norwegian architect and academic Müller-Eie and urban design researcher Bjørnø (2014) propose a comprehensive framework for understanding sustainable urban behaviour. In this framework the planned behaviour model is combined with the spatial notion of provision. Recognising the discrepancy between values and actions, this model emphasises two types of motivators: intrinsic and extrinsic.

In the context of this thesis, two adjustments have been made to enhance the proposed framework. Firstly, as discussed in the chapter 'Human-environment relations' (Kopec, 2018), behaviours are influenced by the social, cultural, and spatial environments in which they occur. To delve deeper into the mechanics of behaviour, a proposition is made to integrate these environments into the framework, recognising that actions are shaped by contextual factors. Furthermore, the original framework reflects a traditional perspective that places the family at the core of an individual's life. However, in the modern age, it can be argued that a person's identity is not solely defined by family values, but also by the chosen "family" consisting of close friends and neighbours, emphasising the importance of social capital in general (Bhandari and Yasunobu, 2009).

2.3 Individual decision-making process (Adapted from Müller-Eie and Bjørnø, 2014)

hedonic

good feelings
and low efforts

egoistic

gaining of
resources like
status, money
or time

altruistic

well-being of
others

egoistic

caring for
nature and the
environment

In the following section, the before-mentioned cognitive biases will be related to the decision-making process model. From this, instruments will be proposed that are effective in fostering sustainable behaviours.

Society, culture and the individual

In the behavioural sciences two types of motivations are distinguished: intrinsic motivation and extrinsic motivation. These motivations are related to both individual and collective behaviour, and are therefore essential for creating urban sustainability strategies. Intrinsic motivation can be understood by the way a behaviours makes one feel, driven by personal interest, satisfaction and enjoyment. Within the behavioural model we can recognise this through society, culture and the individual. Intrinsic motivation is hard to change as it is related to the values that people inhibit, which are a result of culture and the circumstances of the life of the individual. However, when it comes to sustainable behaviours, intrinsic motivators should not be overlooked, as achieving change in intrinsic motivations will create the most lasting impact and is crucial to achieve behaviour that is stable over time (Steg, 2016; Steg, Lindenberg, Siegwart and Keizer, 2016).

What makes us feel good can be explained through the use of value motivation models. Value motivation models are frameworks that describe how individuals intrinsically prioritise and make decisions based on what they believe is important. Four main value motivation models can be identified that are important in the discourse of pro-environmental behaviours: the hedonic-, the egoistic-, the altruistic- and the biospheric model (Steg and de Groot, 2012).

Hedonic motivation reveals the desire to have pleasure and is closely related to the biases of aversion of loss and self-preservation. Egoistic values reflect a particular interest towards personal outcomes, such as a gain of resources. Altruistic values, on the other hand, are moreso related to a concern for the well-being of others and their gains. Biospheric values are like altruistic values, but in addition reflect an ability to take on a concern for nature and the environment.

So how do these values translate to environmental actions?

For people who have strong egoistic or hedonistic values, pro-environmental actions will follow based on a personal cost-benefit evalution, in terms of loss and gain. As a lot of sustainable actions have individual disadvantages, e.g. having high prices or being time consuming, people with a strong egoistic value system are less likely to proceed to take these actions on. Opposed to that, people who are strongly motivated by altruistic values might choose

to perform pro-environmental actions based on the perceived costs and benefits for not themselves, but others and are therefore more likely to perform on these actions (Steg and de Groot, 2012; Stern, 2000). People with strong biospheric values choose their actions based on the perceived costs and benefits for not only people, but moreso for nature and the environment, and are therefore most likely to perform pro-environmental actions (Steg and de Groot, 2012). Biospheric and altruistic values will therefore have the highest likeliness to lead to environment-friendly behaviours (Steg, 2016).

To strategically shift values towards sustainable behaviours, information and knowledge has to be provided so that existing biases can be altered. According to self-determination theory (Deci and Ryan, 2015), intrinsic motivations cannot be created out of thin air but can be activated through feelings of autonomy, competence, and relatedness. Based on determination theory, place attachment theory and research done by Dutch environmental pyschologist Linda Steg (2016), five main instruments can be derived:

> ► Spreading knowledge (competence) through information campaigns and education, supported by other forms of persuasion to increase awareness. To avoid, negligence, information campaigns always have to be supported by other forms of persuasion. (Abrahamse, 2019; Steg and Vlek, 2009)

> ► Using explicit commitments (autonomy and competence) that include goals and plans to reach those goals and promote commitment through community-forming (Abrahamse, 2019; Steg and Vlek, 2009).

> ► Strenghtening attachment to place (relatedness) to motivate individuals to protect and improve their environment based on their emotional connection and sense of responsiblity to a place.

> ► Strengthening values through social norms (relatedness) by encouraging sustainable behaviours through social influence strategies (Abrahamse, 2019; Kaaronen and Rietveld, 2021; Kopec, 2018 Steg, 2016), social support, and role models (Steg and Vlek, 2009). This becomes especially effective when there is high social cohesion. Social learning can happen in the spaces in which people pass each other, or interact. Providing community space and designing places to promote social interactions supports social learning by creating a sense of "we" and promoting feelings of belonging (related to place attachment) and social connection (Song et al, 2019).

> ► Providing information through symbolic means (relatedness) by exposing people to value symbols that align with sustainable values. Altruistic values are generally activitated when religious symbols or symbols of justice are visible. Biospheric values are created when natural symbols, such as trees and animals, are visible. Less desirable values for sustainability can, however, also be triggered through symbols in the environment. (Steg, 2016)

These instruments should be effective if the logic of the planned behaviour model is followed. The first three instruments are especially important in relation to the target behaviour of community awareness. Symbolic representation is meaningful in relation to everyday decisions and recovery and protection actions. However, as long as sustainable behaviours are not convenient or economical - either in terms of money, time or social gain - prompt changes in the actions of individuals should not be expected (Steg and Vlek, 2009). It has proven to be hard to break old habits as constraints are constantly testing one's willpower, which continuously varies over time (Linder et al, 2022). When it comes to habits, people tend to ignore information that doesn't allign with their way of doing, but rather put a focus towards the information that validates it (Steg and Vlek, 2009).

2.4
Contextual cues and how it influences our behaviours (Adapted from Linder et al, 2022)

routine

reinforcing loop

cue

reward

physical environment / urban design
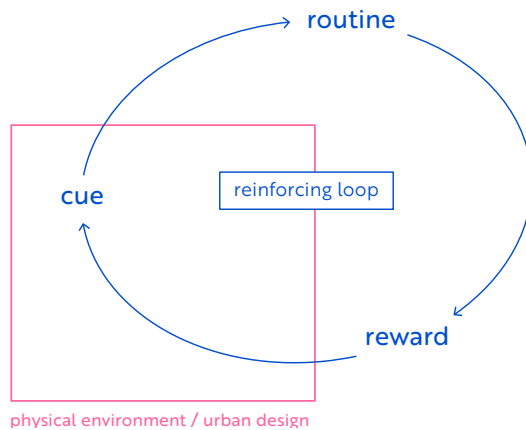
Provision and habit architecture

Because of habitual tendencies and the existence of hedonic and egoistic values, it is important that also extrinsic motivators are addressed when proposing a design that fosters pro-environmental behaviour. Whereas intrinsic motvation explains how a behaviour makes one feel, extrinsic motivation explains how a result of a certain behaviour makes one feel good. In this case, actions are not so much a result of the cultural environment, but moreso of the social and the spatial environment. External determinators as a result of policies and infrastructures, shape the actions of people (Müller-Eie and Bjørnø, 2014). The instruments associated with extrinsic motivation are exploiting the tendencies of preferring easy decision-making and avoiding losses, with the aim of making sustainable actions the most alluring option.

One of the most effective ways to encourage sustainable behaviour is by altering the contextual cues in the physical and social environment (Linder et al, 2022; Steg and Vlek, 2009). This can change the perceived costs and benefits of a certain behaviour, influencing the routine- and reward-systems and motivating people to adopt more sustainable habits (Kaaronen and Rietveld, 2021; Steg, 2016). The transformation of the so-called 'habit architecture' or 'choice architecture' (IPCC, 2021) has especially potential when it comes to our mobility behaviour and consumption habits (IPCC, 2021; Kaaronen and Strelkovskii, 2020; Linder et al, 2022). There are two types of main levers that can be altered to achieve a changed perception (Steg and Vlek, 2009):

> ► the availability of services – facilitating behaviours
> ► the quality of services - making behaviours attractive.

The feasability of unsustainable behaviour patterns can be negatively altered by decreasing or even excluding the availability of unsustainable services. However, caution needs to be exercised when altering availability. The reduction of certain elements, such as the mobility of the car, should not occur without proper replacement. This is because certain restrictions can lead to displacement as people might no longer be able to perform daily jobs (Carmona et al, 2010). On the other hand, by improving the quality and increasing the availability of certain services, sustainable behaviour patterns can become the most convenient option. This links in with affordance theory, where the landscape of affordances is indispensable in creating opportunities for pro-environmental behaviours (Kaaronen and Strelkovskii, 2020). Adjusting quality or quantity of services intent to reward desirable behaviours and dismiss undesirable behaviours.

Place attachment can also play an important role when considering extrinsic motivation for pro-environmental behaviours. The quality of a place can subjectively improve when people feel psychological ownership towards the place as it can be perceived as an improvement on well-being in relation the neighbourhood, responding to the bias of self-preservation.

> ► Psychological ownership of a place can promote stewardship actions such as taking care of, protecting, and responsibly using the natural environment (Kuo, Su, Wang, Kiatsakared and Chen, 2021). To encourage this, opportunities need to be created for people to take ownership and care for a place. This would involve physical places, which can be maintained by local residents and exists in the realm between public and private space, such as community gardens or the front garden in relation to the sidewalk.

Because of the aversion of loss of people, positive messaging and feedback are also effective tools for promoting sustainable behaviour. Positive feedback, focusing on gain rather than loss, can encourage attitudes sustainability (Abrahamse, 2019). In terms of

urban design, positive messaging can be approached through different instruments, such as aesthethics and maintenance.

> ► Urban design can provide positive feedback to people by creating an enjoyable experience through aesthetics. This can be achieved by incorporating interesting forms and attractive materials. For instance, natural materials are often more appealing than cold-looking steel structures. Although the direct impact of aesthetics on sustainable behaviours is not established, it can help to communicate a clear message by making sustainable solutions more noticable (Kaaronen and Rietveld, 2021; Xie, Qin, Gou and Yi, 2020).

> ► Studies have shown that people tend to avoid littering in clean and well-maintained environments (Abrahamse, 2019), indicating the importance of positive messaging through maintenance in promoting sustainable behaviours. Once again this can be related to materials in urban design and the perceived quality of them. Consistency in maintaining clean environments is also crucial in reinforcing these norms (Abrahamse, 2019).

The alteration of contextual cues can happen through different strategies, depending on the sensitivity of the intervention towards the residents. There are three main ways to go about a change in the physical structure of a neighbourhood: prototype interventions, placemaking interventions, and permanent alterations.

> ► Prototype interventions test ideas in real-world contexts through small-scale interventions, such as pop-up bike lanes or temporary parklets, allowing for community feedback and informed decisions for permanent changes. This is especially effective for the implementation of major interventions like removing car parking that can face resistance from the community (see appendix III).

> ► Placemaking interventions are similar to prototype interventions but are designed to last longer, typically several months or even years. These temporary interventions allow communities to experiment with new ideas and test how they work in practice (Platt, 2006). For example, a temporary pedestrian zone could be an effective way to test the impact on foot traffic and communities before making a permanent change. These interventions are particullarly useful to create a sense of place and community ownership in a specific area.

> ► Permanent alterations are the most effective way to alter the physical environment and change the context for sustainable behaviour. For example, redesigning streetscapes to prioritise walking, cycling, and public transport can encourage sustainable mobility habits. Similarly, creating green spaces and parks can encourage people to spend more time outdoors, which has been linked to improved mental and physical health (see appendix IV).

Translation of the poem by Lucebert
Everything of worth is defenseless

Translation of the poem/anagram by Segbars
All sorts of things are worthless.

Part III

Behaviours unraveled

Alles van waarde is weerloos
Lucebert

Van alles is weer waardeloos
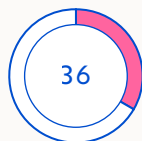**J. Segbars**

► Analysis of the neighbourhoods

Tarwewijk and Bloemhof, understood from numbers

This section provides an quantitative overview of Tarwewijk and Bloemhof, two densely populated neighbourhoods located in the south of Rotterdam. Insights about the quality of life within the neighbourhoods is gathered through numbers.
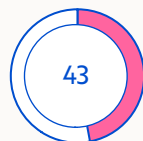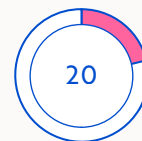
Tarwewijk   Bloemhof

0.79km²
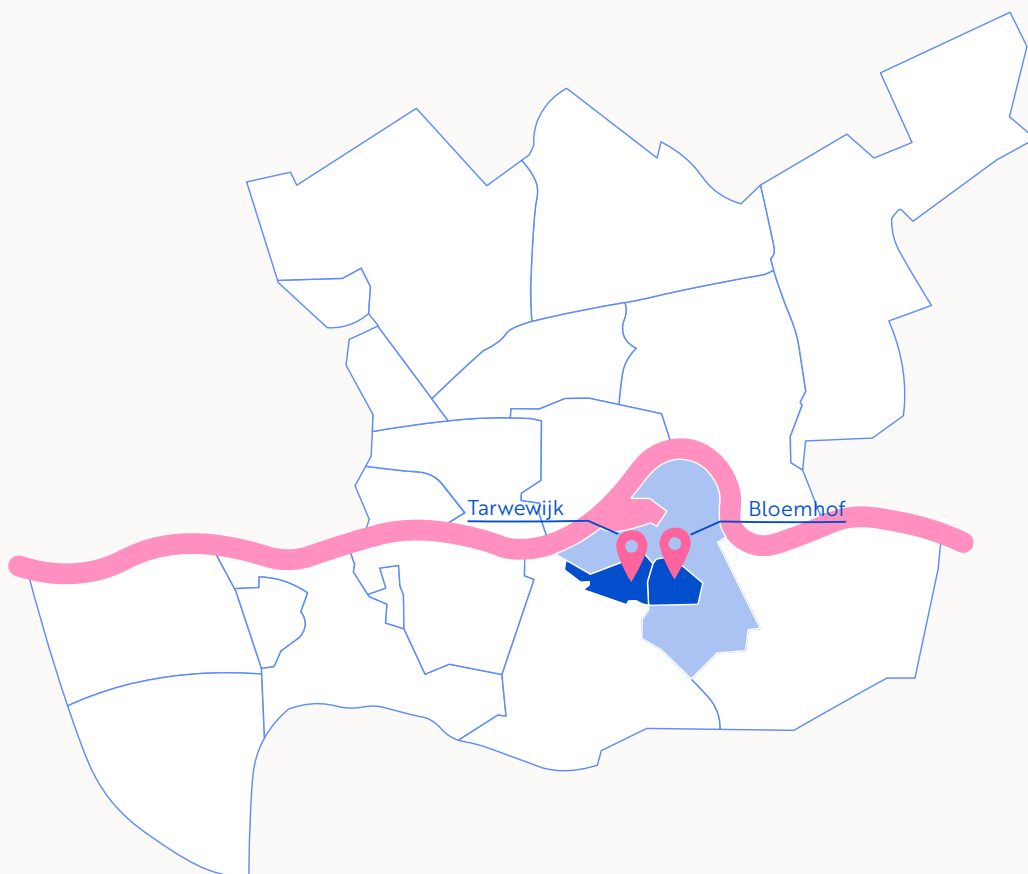
13.175 people
€17.600 average
22.25% native
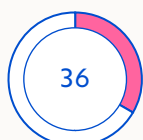
36
physical index
living experience
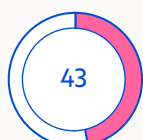
43
safety index
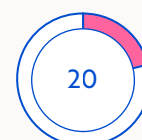safety experience

20
social index
thoughts on
quality of life

0.85km²

12.265 people
€19.800 average
19.76% native

36
physical index
living experience

43
safety index
safety experience

20
social index
thoughts on
quality of life

3.1
Measurements of the Wijkprofiel
(Gemeente Rotterdam, 2020)

In both Bloemhof and Tarwewijk, a large number of people coexist on a relatively small area. These neighbourhoods exhibit significant diversity in terms of residents' backgrounds (Allecijfers.nl, 2022). When compared to the rest of Rotterdam (€27.173), it becomes evident that the average household income in these neighbourhoods is significantly lower. The density of the population, cultural diversity, and socio-economic status of the inhabitants shape the discourse surrounding these neighbourhoods.

The pressure on these neighbourhoods is further highlighted through the Neighbourhood Profile measurements conducted by the municipality of Rotterdam (2020). Figure 3.1 illustrates the overall scores for living experience, safety, and quality of life. These scores are an average of subjective evaluations regarding the physical, safety, and social aspects of the neighbourhoods. From the perspective of the residents, areas for improvement as well as existing qualities become apparent. Both neighbourhoods score low in terms of the physical quality of the neighbourhood, mainly due to inadequate public spaces and housing

conditions. Issues such as litter on the streets and insufficient or unusable green spaces are prevalent. Another noticeable aspect is the poor quality of pedestrian spaces, including sidewalks. Safety is a significant concern for these neighbourhoods, with many residents indicating that they avoid certain places due to feelings of insecurity.

Bloemhof and Tarwewijk differ in their overall perceptions of quality of life. In Bloemhof, low scores are observed in areas such as participation and social cohesion. Interestingly, despite this lack of attachment, residents still express a sense of responsibility towards Bloemhof. On the other hand, Tarwewijk receives a high score in the general quality of life, primarily based on the social experience, attributed in part to the availability of social facilities.

These findings underscore the complex relationship between place dependency, identity, and the various dimensions that shape the experiences and challenges faced by residents in Bloemhof and Tarwewijk.

The upcoming three chapters will centre around the analysis of Bloemhof and Tarwewijk, utilising the target behaviours identified earlier in this report. Specifically, these chapters will delve into the areas of community awareness, everyday decisions (including sub-chapters on mobility and consumption behaviours), as well as recovery and protection. Through this focused examination, supplemented by theory when necessary, we aim to gain a comprehensive understanding of the dynamics and opportunities for promoting sustainable behaviours within these neighbourhoods.

Within each chapter, design criteria will be derived, enabling the formulation of a vision and strategy that encompass the temporal and spatial aspects related to the target behaviours. This process will lay the groundwork for the creation of a pattern language that is considerate towards the unique needs and contexts of vulnerable neighbourhoods such as Bloemhof and Tarwewijk.

▶ What is

Community awareness

"The way in which communities, as a form of social relationships, can contribute to conservation and pro-environmental activities and mindsets. Addressing social issues such as equal opportunity, access to resources and participation."

This chapter delves into the significance of community influence on acquiring pro-environmental behaviours, Social influence and norms shape individual behaviours, increasing the likelihood of engagement in conservation activities when others exhibit similar behaviours (Quimby and Angelique, 2011). Social comparison within communities acts as an accelerator for adopting new behaviours, expanding knowledge and attitudes effectively (Larson et al., 2015). Designing opportunities for citizen engagement, both informal and formal, is crucial for fostering pro-environmental actions.

Community education on sustainable lifestyles plays an increasingly important role in supporting transitions (Quimby and Angelique, 2011). Existing resources like faith-based organisations, schools, and community centers serve as facilitators, while new facilities can enhance educational initiatives. Social influence strategies, when combined with incentives or rewards, effectively promote specific behaviours by providing necessary tools and support (Quimby and Angelique, 2011).

Moreover, community behaviour serves as a foundation for building other behaviours, emphasising the significance of daily lifestyle changes and the impact of conservation activities within engaged groups. Placing the burden of climate actions solely on individuals is impractical; collective action yields greater impact and accelerates systemic change (UNEP, 2016). Collaborative efforts within communities to protect shared values demonstrate resilience (Harteveld and Asadollahi Asl Zarkhah, 2021). The social interactions of individuals within spatial contexts are central to community awareness, highlighting its pivotal role in promoting sustainable behaviours.

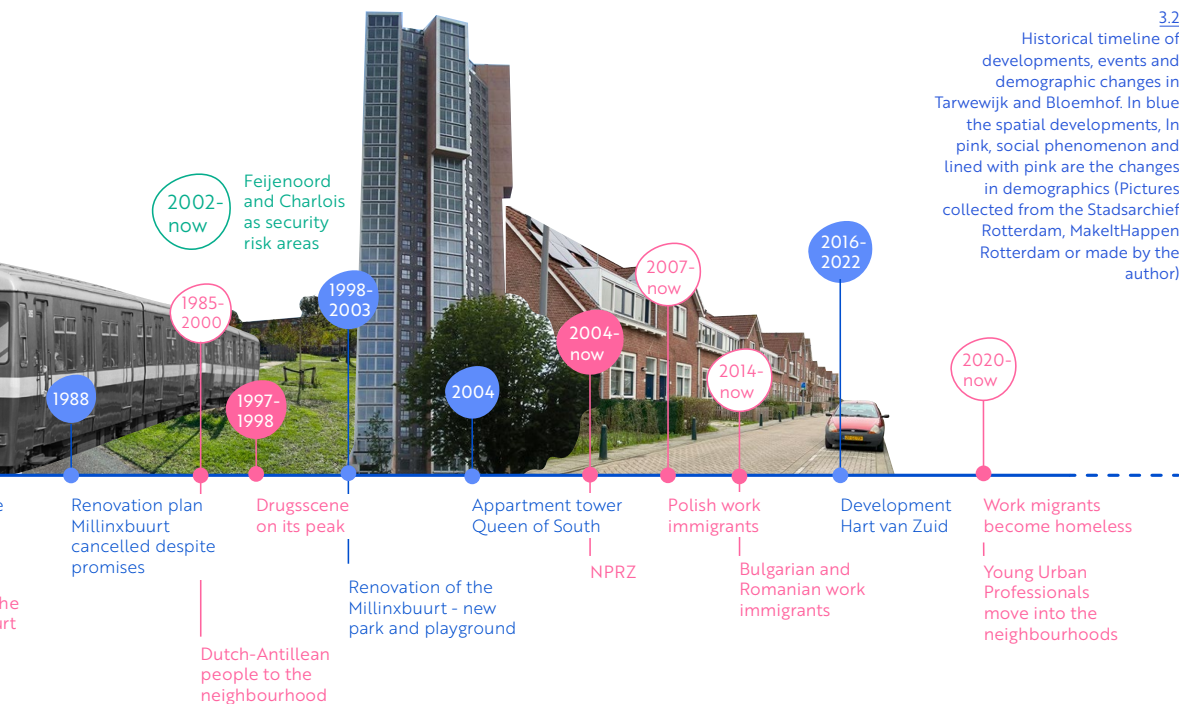# A historical account

Tarwewijk and Bloemhof are relatively young neighbourhoods, but despite this they are already full of history that made the neighbourhoods what they are today and that still lives in the minds of the local population. In the following section The identity that lives within these neighbourhoods will be explored using historical accounts of the neighbourhoods.

At the end of the 19th century Tarwewijk and Bloemhof emerged as a product of a growing economy. The neighbourhoods have historically had a close connection to the industry of the port of Rotterdam, housing its workers, wherever they were from - Dutch or from other parts of the world. It is because of this that the local population has perpetually been the more marginalised groups in the city - people with a low income and high diversity in background. Tarwewijk and Bloemhof were in their early years vibrant neighbourhoods, with high social cohesion. There were 5 educational schoolgardens and an array of community centres in which people could come together. However, these assets to the neighbourhoods dissappeared when the municipality of Rotterdam cutback on the funds available for the neighbourhoods, which turned out to be the start of the decay of the neighbourhoods. When in the 70s the drugscene became dominant in the area, Bloemhof and Tarwewijk turned

1940 bombing city centre Rotterdam

1898-1905

1900

1910s

1910

1945

1948

1949

1952

1959

1960-1963

1964-1973

1968

1970s

construction of the Maashaven

first part of the Maassilo built

playground Millinx founded

playground Tarwewijk built

Art exhibition space buildt - closed in 1981 due to budget cuts

construction of the metro network of Rotterdam South

first homes built for port workers

new wave of working class

playground association Tarwewijk founded

Italian guestworkers to Rotterdam

Decay of t Millinxbu

Zuidpleinflat completed highest appartment buidling in Europe

Morrocan guestworkers to Rotterdam

into an unsafe place in which people became distant from one another. People didn't go outside, closed their curtains towards the street and trust towards each other was lost. In the first decade of the 2000s the municipality of Rotterdam started investing more money in the neighbourhood and the surrounding areas, such as Kop van Zuid and Katendrecht. This caused an inflow of a new population: the more afluent young urban professionals. Over the last decade the neighbourhoods are on a rise again, with a new focus on social projects, such as the National Program of Rotterdam-South (NPRZ). However, concerns are rising on who the neighbourhoods are improving for. The discourse on gentrification and displacement is on a high, which requires a new critical consideration on the future of Bloemhof and Tarwewijk.

Based on anecdotes from the inhabitants of the neighbourhood in 'Portret van de Tarwewijk en haar bewoners,' the historical account depicts the cycle of marginalisation, decline, revitalisation, and the challenges of gentrification and displacement in Bloemhof and Tarwewijk. It emphasises the significance of considering the social and economic implications of urban development and the importance of inclusive approaches that prioritise the well-being of existing communities.

3.2
Historical timeline of developments, events and demographic changes in Tarwewijk and Bloemhof. In blue the spatial developments, In pink, social phenomenon and lined with pink are the changes in demographics (Pictures collected from the Stadsarchief Rotterdam, MakeItHappen Rotterdam or made by the author)

2002-now
Feijenoord and Charlois as security risk areas

1985-2000

1998-2003

2007-now

2016-2022

1988

1997-1998

2004-now

2014-now

2020-now

2004

Renovation plan Millinxbuurt cancelled despite promises

Drugsscene on its peak

Appartment tower Queen of South

Polish work immigrants

Development Hart van Zuid

Work migrants become homeless

Young Urban Professionals move into the neighbourhoods

Renovation of the Millinxbuurt - new park and playground

NPRZ

Bulgarian and Romanian work immigrants

Dutch-Antillean people to the neighbourhood
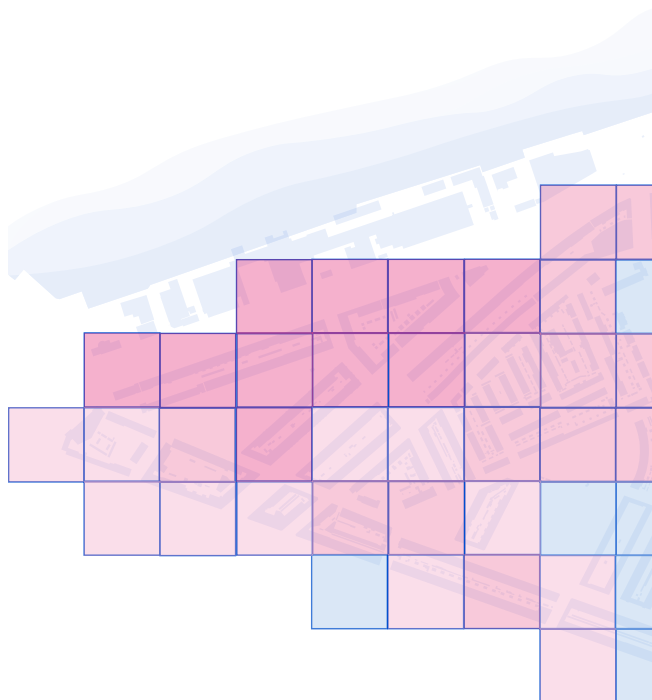
63

Multicultural communities

Located in the south of Rotterdam are Bloemhof and Tarwewijk. Two neighbourhoods that have a strongly diverse population. Tarwewijk has a population of which respectively 24% and 57% have a western and non-western migration background, while in Bloemhof the percentages are 15 and 63% (Allecijfers, 2022). Given the diversity of the population, inclusive design becomes crucial.

Language

Proficiency in the Dutch language is not guaranteed in Bloemhof and Tarwewijk, highlighting one of the main challenges in these neighbourhoods. Due to the presence of language barriers, sustainability campaigns should refrain from relying solely on the Dutch language as the primary communication tool. It is imperative to explore alternative solutions that can effectively engage and communicate with the diverse linguistic backgrounds present in these communities.

Use of space

Insights gained from conversations with local residents (see appendix I) have revealed that diversity plays a significant role in shaping the utilisation of space. It has become evident that diverse population groups hold varying interpretations of social norms within public spaces. This highlights the importance of considering the influence of diversity when examining and understanding the dynamics of space utilisation.

Social cohesion

During dialogues, it was revealed that ethnic groups often tend to form their own distinct communities, posing a challenge to fostering social cohesion. To overcome this hurdle, the design of public spaces should be inclusive and accommodating to all types of groups. By creating environments that encourage interaction and engagement among diverse ethnicities, the potential for fostering social cohesion can be enhanced.
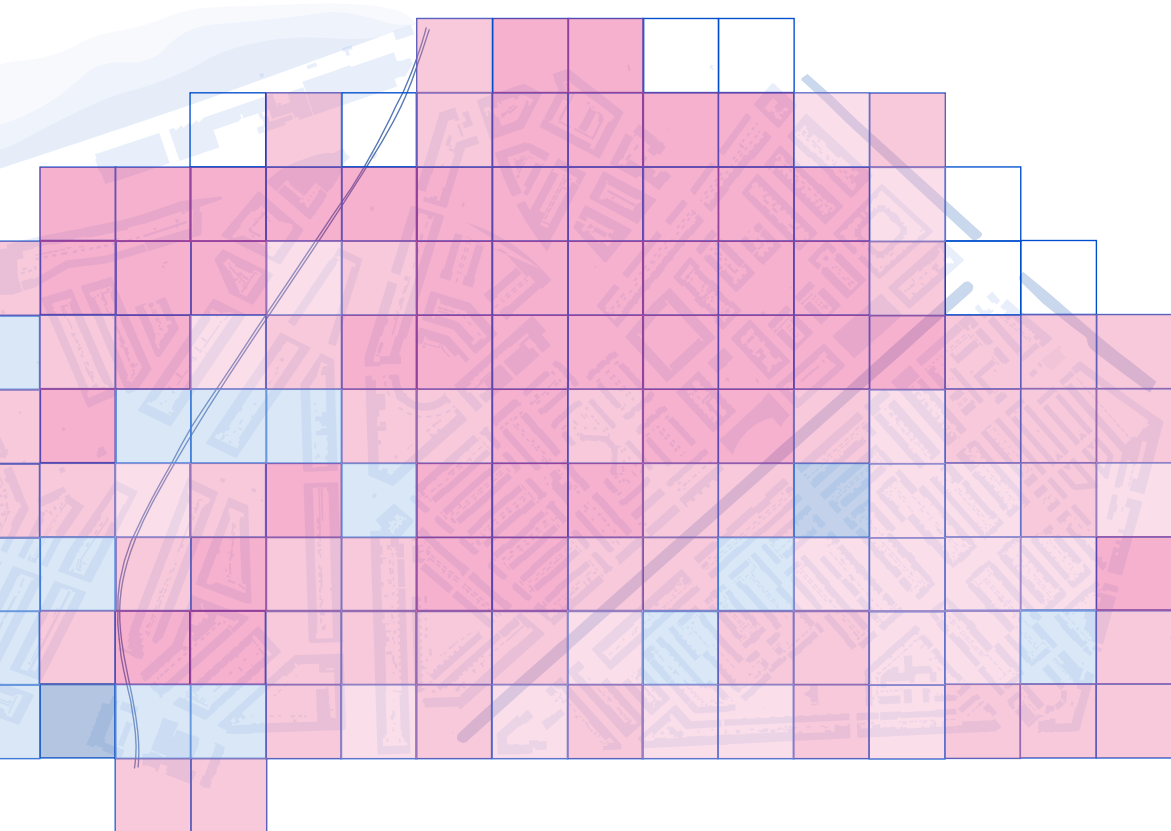
3.3
Percentage of inhabitants with a non-western migration
background

- 70% or more
- 50 - 70%
- 40 - 50%
- 30 - 40%
- 20 - 30%
- 10 - 20%

0   100 m   1000 m
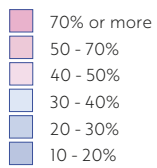
Communities uses of space

Both Bloemhof and Tarwewijk are places of diversity. In this section, an understanding is created on how a design for community can facilitate a variety of needs and foster participation and collaboration towards community awareness.

Public spaces are essential for building a sustainable community, and designing them with diversity in mind is a complex task that requires a deep understanding of the differences in cultural, class, gender and religious factors that shape people's experiences and expectations (Low, Taplin and Scheld, 2005; Peters, 2011). Ethnicity is an important factor that helps to understand the different uses and meanings of public space (Peters, 2011). Different theories exist on why ethnicity is important. For one, the marginality thesis explains that socio-economic characteristics, such as poverty and unequal acces to resources, are the reason for differences in participation in public space. Another theory, the ethnicity theory, focusses on differences due to variaties in values, norms and patterns of socialisation. Reality exists as a combination of these two theories, meaning that both socio-economic factors as normative factors play a role in the way people use public space (Peters, 2011).

Through four primary dimensions of cultural differences, namely individualism; masculinity; uncertainty avoidance and power distance, use of public space can be understood (Peters, 2011). Some cultures have stronger collectivistic values, whereas others stronger individualistic

values. Typically, Western cultures tend to be individualistic, while non-Western cultures tend to be more collectivist in nature. This enhances the importance of public space that facilitates the coming together of groups.

To achieve this, it is necessary to provide safe, spatially adequate territories for everyone within the larger space of the overall site (Low, Taplin and Scheld, 2005). Traditional gender roles also perpetuate in public space (Peters, 2011). Public spaces should therefore provide different degrees of access for different groups, including intimate spaces that bring together members of a specific social group, such as women (Polyak, 2021). For example, community gardens, rooftops, social centers, women's orchards, or recreation areas, which are maintained by the people who use them, can serve as intimate spaces for specific social groups. The provision of closeby spaces is also significant due to the tendency of non-western people to stay at close distance to their homes in their free time (Peters, 2011).

The idea of beauty is also closely connected to the cultural and social background in which it is assessed (Incirlioglu and Tandogan, 2006). For instance, aesthetics are typically judged based on elements like balance, rhythm, and proportion. However, what is considered balanced, rhythmic, or proportional varies depending on the society that an art piece or an everyday item comes from. In light of cultural diversity, there shouldn't be a dominant aesthetic in design since standards of aesthetics seem to impact the power dynamic between non-European immigrants and their "hosts (Incirlioglu and Tandogan, 2006).

It is crucial to exercise caution and avoid perpetuating stereotypes by relying on an essentialist definition of culture. However, these basic understandings of cultural expression can help to create inclusive public spaces.

Social capital for community awareness

By using public space, intended and unintended social interactions take place. Social interaction can be a main goal, for example by meeting someone, or can be a by-product of a goal, such as the playing of sports. Through interactions social capital can be created. Social capital can be understood as the accessibility of resources through social interactions and social networks, forming norms and trust among people (Peters, 2011). Activities in public space can be useful to built and maintain social networks from which skills can be obtained for social capital. Shared interests and activities provide opportunities for getting to know people that would otherwise have been strangers. Public space therefore becomes a social space, where people are confronted with unkown others who happen to be present in the same space.

Most of the time, however, strangers do not interact by themselves. Interaction can be facilitated when an external stimulus provides a connection between people and strangers. This process is called triangulation, in which for example external factors such as children, dogs or balls prompt people to socialise as if they are not strangers (Peters, 2011).

The physical design of the social space, becomes significant in forming community awareness through an understanding of participation and social learning. An inclusive design of public space will through social learning processes have a positive effect on the widespread exposure of day-to-day activities. Day-to-day activities become shared experiences and create a shared sense of belonging and identity (Peters, 2011). If these experiences can become sustainable activities, community awareness on sustainability can be formed.


divide space up using landscaping elements like trees

Pattern C2   Social variety
► Inclusive public space that embraces cultural diversity and invites for active use is characterised by different degrees of openness and enclosure.

The social environment of Bloemhof and Tarwewijk

Communities are formed when people come together and get to interact within a social environment that is most often situated within a physical environment. This segment focuses on the exploration of the social space of Tarwewijk and Bloemhof, so that its strenghts and weaknesses can be assessed.
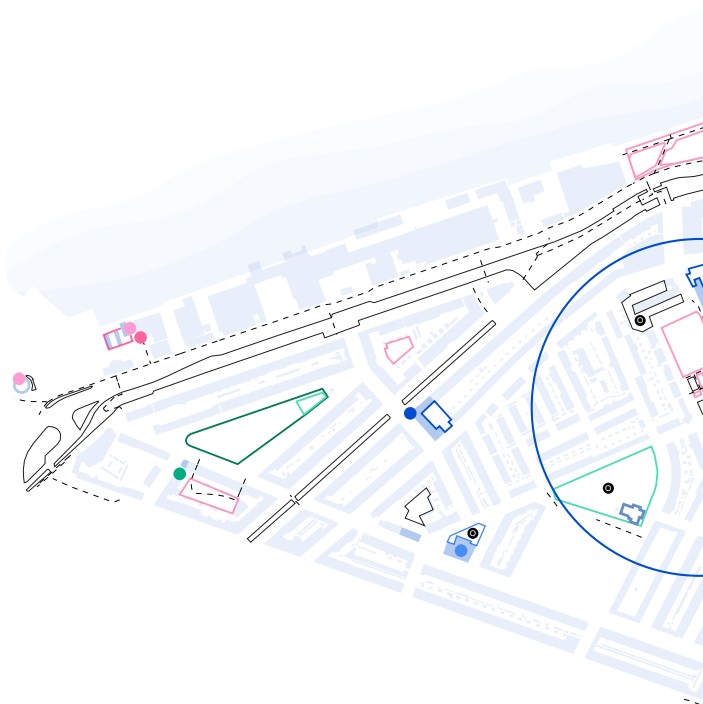
The need for inclusive public spaces

At first glance, Bloemhof and Tarwewijk may seem to offer a rich social environment, with clusters of social functions in certain parts of the neighbourhoods. However, upon closer examination, it becomes evident that the social network in both areas is actually quite fragmented. Residents express a sense of lacking accessible community spaces in close proximity to their homes. The current network of public spaces predominantly caters to specific groups, such as children, parents, or vulnerable individuals, which leaves limited room for a diverse range of people to actively utilize the spaces and engage in interactions.

Nevertheless, there are a few exceptional places, such as Cultuurwerkplaats Tarwewijk and cafe Blend, that serve as welcoming spots for people from different backgrounds and are appreciated by individuals from various walks of life. These places demonstrate the positive impact of inclusive public spaces, where people feel comfortable and connected.

Residents expressed that in the past, living room settings and corners of building blocks held significant social importance, acting as spaces where people would naturally connect and engage. Unfortunately, due to budget cuts, these spaces gradually disappeared, resulting in the loss of numerous social connections, particularly in the case of Tarwewijk.
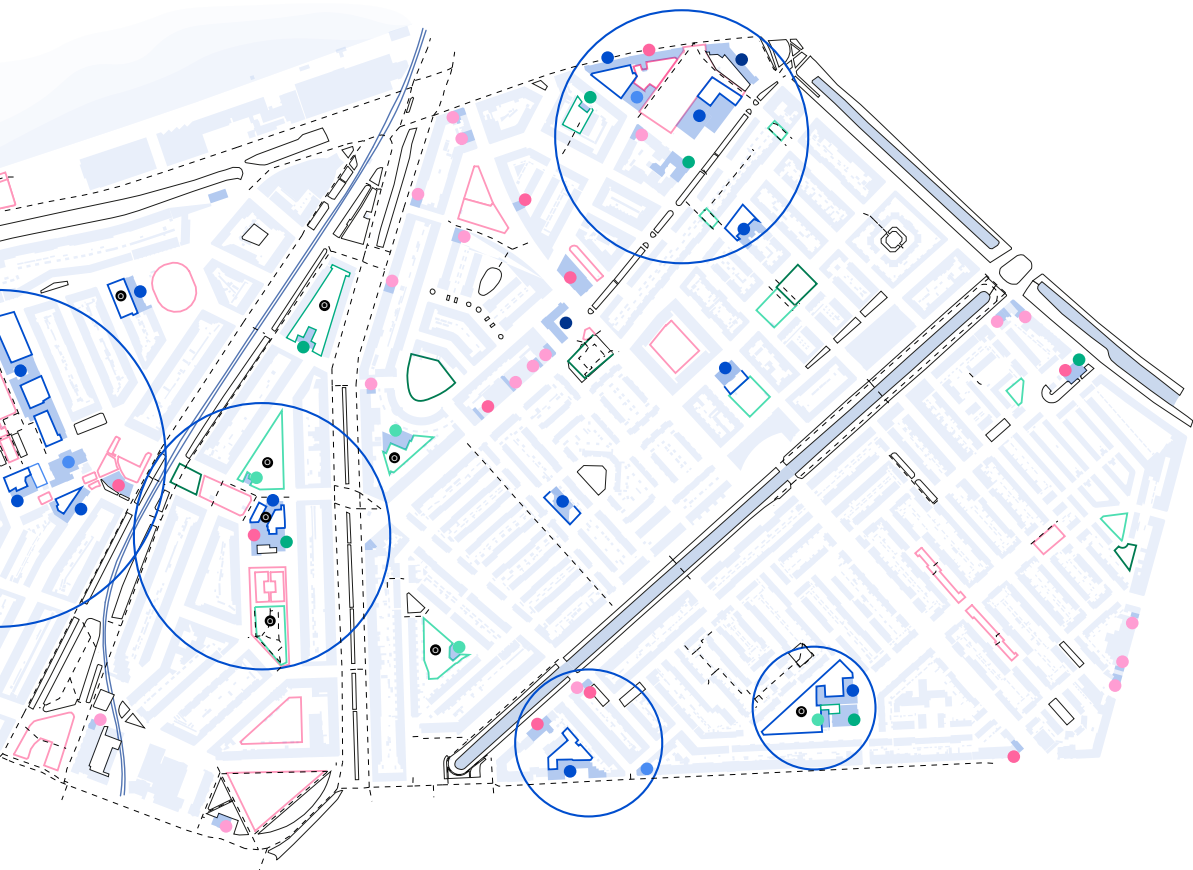
3.4
Typologies of social
environments in Bloemhof and Tarwewijk

Interior public spaces
- primary school
- social work
- community centre
- playground association
- religious institution
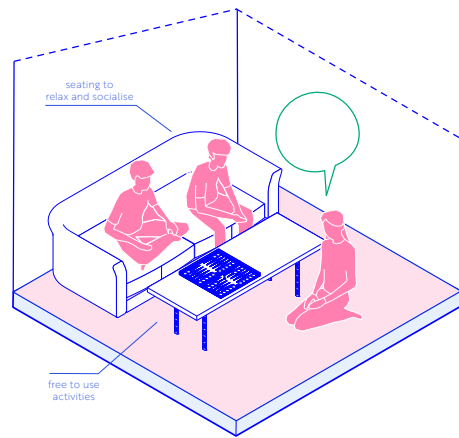- restaurants/cafe's
- social porosity

Exterior public spaces
- primary school
- social work
- community centre
- playground (association)
- sportsfield
- religious institution
- public-usable spaces
- non-usable public space

- fenced public space (>1m)
- -- pedestrian network
- social node

0   100 m   1000 m

▷ **Design for active use**

The decline in communal living room settings and publicly-accessible corners within building blocks has negatively impacted social connections in vulnerable neighbourhoods. To foster inclusive interactions among individuals from diverse backgrounds, it is crucial to establish community spaces that cater to their specific needs, with common urban spaces playing a vital role in promoting community resilience and responsible citizenship (Harteveld and Asadollahi Asl Zarkhah, 2021). These spaces should be conveniently located near residents' homes, ensuring easy access and regular engagement (Peters, 2011).
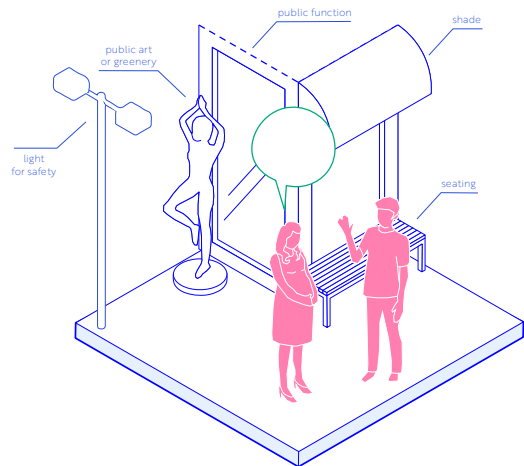
Diversifying the typologies of community spaces is essential to accommodate diverse preferences and financial capacities, moving beyond spaces that serve specific groups (Peters, 2011). This requires attention to both interior and exterior spaces (Harteveld and Asadollahi Asl Zarkhah, 2021). Examples include neighbourhood living rooms, cultural centres, community kitchens, multipurpose community centres, community gardens, and outdoor playgrounds or gyms.

Repurposing old public structures, like street corners, presents an opportunity to create affordable, vibrant, and accessible public spaces. By leveraging the existing urban fabric, these transformed spaces contribute to the overall community fabric.

By prioritising affordability in establishing and repurposing community spaces, vulnerable neighbourhoods ensure accessibility for all residents, regardless of their economic status. This approach fosters a sense of belonging, encourages diverse interactions, and promotes community cohesion, providing opportunities for individuals from different backgrounds to come together and engage in activities that enhance collective well-being.

seating to relax and socialise

free to use activities

Pattern C4   Living together
► Warm and inviting community living rooms foster strong community connections.

public function

public art or greenery

shade

light for safety

seating

Pattern C6   Intersection interaction
► Streetcorners are points of action and interaction within neighbourhoods and therefore enhance community cohesion.

Uitgestelde koffie

Koffie and friends, the best BLEND!

TIP: Reken een uitgestelde koffie af voor iemand die het kan gebruiken €2,50

Blend
BLOEMHOF

MEER DAN
KOFFIE | KLEDING

UITGESTELDE
KOFFIE
BETAAL 2.50 VOOR ...

"THE
UNRULY
BARBER"

"The Unruly Barber"
Lange Hilleweg 220A
3073 BZ Rotterdam
The Netherlands

BLEND
Bloemhof

In the south of Bloemhof, two local residents - Carolien and Hans - have turned a literal dream of theirs into reality. On the corner of the Lange Hilleweg, they have established a social cafe. Their goal: to create a welcoming, secure, and affordable neighbourhood living room where people from diverse backgrounds can come together.

BLEND stands out as an inclusive and accessible indoor community space, fostering meaningful connections among individuals from diverse backgrounds. What sets BLEND apart is its multifaceted approach, offering a wide range of services that combine business-oriented offerings with social and community care initiatives. With a hair salon, coffee bar, and second-hand clothing store, BLEND presents itself as a versatile three-in-one establishment, ensuring both sustainability and viability.

However, BLEND's impact goes beyond its business offerings. It demonstrates a profound commitment to social responsibility , community engagement and sustainable practices. By actively supporting local cleanups and meal projects, BLEND contributes to the betterment of the neighbourhood, emphasizing affordability, shared responsibility, and collective well-being.

The true power of BLEND lies in its multifunctionality, making it a dynamic community space that accommodates diverse goals and serves the needs of different individuals. Carolien and Hans, the founders, have expressed their desire to expand the social enterprise to include an outdoor space. This expansion would enable the establishment of a herb garden and a terrace, further enhancing their impact within the neighbourhood.

Inclusivity through spontaneous interactions

According to Harteveld and Asadollahi Asl Zarkhah (2021), the pedestrian network is a vital aspect of community infrastructures and plays a key role in promoting social interactions. This is supported by research indicating that nearly 80% of spontaneous social interactions occur on sidewalks (Van der Ham and van Ulden, 2021). These findings underscore the importance of sidewalks, not only for accessibility but also as an integral and essential element of a neighbourhood's social fabric.

However, in Bloemhof and Tarwewijk, there is a notable disparity in the social quality of sidewalks. Some areas lack sidewalks altogether, while in other areas, sidewalks are excessively wide. What becomes evident is that both neighbourhoods suffer from a scarcity of places at sidewalks for people to gather and spend time, as sidewalks are rarely furnished with amenities such as benches and shade trees. As a result, opportunities for social interaction are severely limited.

▷ Enhancing the social life of sidewalks

There is significant potential for enhancing community infrastructures in Bloemhof and Tarwewijk. A promising approach is to focus on improving the quality of existing sidewalks through the implementation of zoning principles. According to the Global Designing Cities Initiative (2022), sidewalks can be divided into distinct zones, including a frontage zone, a clear path spanning 1.8-2.4 meters, a street furniture zone, and a buffer zone.
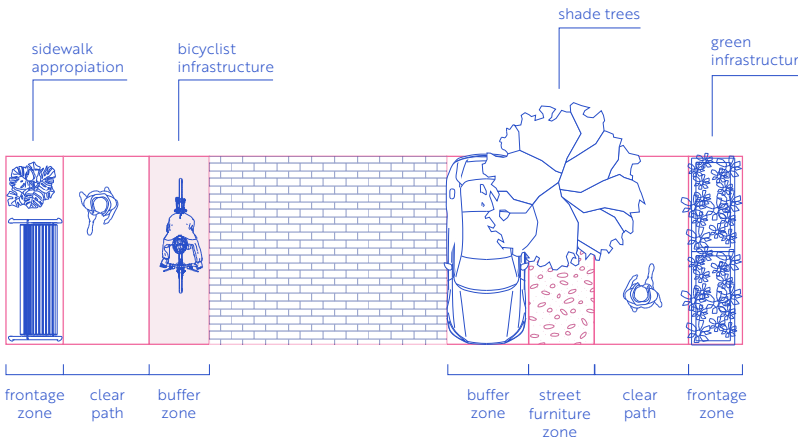
By employing this zoning strategy, the concept of liminal space is emphasised, creating opportunities for spontaneous interactions (Harteveld and Asadollahi Asl Zarkhah, 2021). Within these designated zones, a variety of amenities such as benches, shade trees, and cyclist infrastructure can be incorporated. This design approach encourages people to linger and engage with their surroundings.

In areas where sidewalks are currently nonexistent, efforts should be made to establish new sidewalks, while in areas where sidewalks are excessively wide, they should be redesigned to promote greater interactivity. By investing in the thoughtful design of sidewalks and implementing well-defined zones, the community infrastructures in Bloemhof and Tarwewijk can be transformed into vibrant spaces that facilitate spontaneous interactions among individuals from diverse backgrounds, making interactions for sustainable practices more likely.

frontage zone

free path 1.8 - 2.4m

street furniture zone

buffer zone

greenery

light for safety
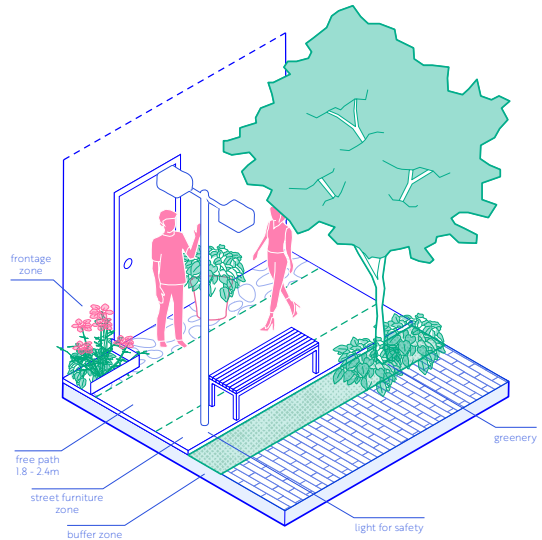
Pattern C5   The social life of sidewalks
► Sidewalks serve a crucial role in fostering community networks by providing a space for people to interact and engage with each other.

sidewalk appropiation

bicyclist infrastructure

shade trees

green infrastructur

frontage zone

clear path

buffer zone

buffer zone

street furniture zone

clear path

frontage zone

3.6
Example of the different zones as proposed by the Global Designing Cities Initiative

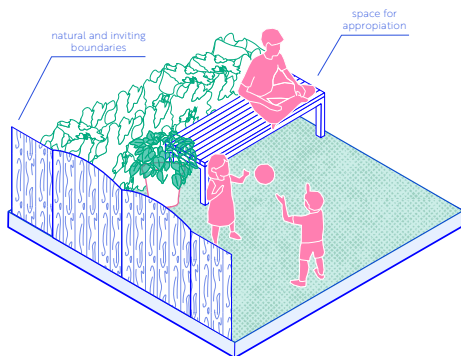### Safety concerns and social interaction

The primary concern voiced by residents in Bloemhof and Tarwewijk consistently revolves around the safety of public spaces, particularly in relation to criminal activity and vandalism. Despite continuous efforts by the municipality and social organisations to address these issues through various programs, visible remnants of criminal activity and vandalism persist within the spatial environment. Consequently, a pervasive sense of mistrust and unease permeates the local community. This apprehension is reflected in the design of public spaces, often characterized by enclosed areas secured with fences and gates that are closed during nighttime. While these enclosures are deemed crucial by residents to safeguard the social environment both physically and psychologically, upon closer analysis it becomes clear that their design can be unwelcoming and inadvertently hinder opportunities for social interaction. The prevailing perception of public space within the community thus leaves limited room for fostering attachment and a sense of belonging among its residents.

"At first I was not happy about the fence, but I got used to it and now I like it"

Resident Tarwewijk
Samenhuis Ernaast

▷ Creating comfortable and secure places

To create comfortable and secure spaces that promote usage and foster a positive social climate, it is essential to address safety considerations in the design of these neighbourhoods. Conversations with residents (see appendix I and II) have emphasised the importance of enclosure, which provides a sense of clear ownership and aligns with existing literature linking urban form and enclosure to perceived levels of safety (Alkresheh, 2007; Stamps, 2005). While this may not directly reduce crime rates, it positively impacts feelings of fear and encourages greater utilisation of the space. Achieving enclosure involves thoughtful integration of elements such as walls and fences, known as edges or boundaries (Stamps, 2005).

Residents frequently cite courtyards as their favourite spaces within the neighbourhood due to their pleasant atmosphere and perceived safety associated with clear ownership. Boundaries, such as fences and gates, also play a significant role in shaping perceptions of safety by reducing negative external influences and preserving cultural values. However, enclosure can limit social contact with the outside, as evidenced by residents' reluctance to approach someone inside an enclosed area when passing by. Thus, while territorial boundaries enhance perceived safety, it is crucial to balance this with permeability and welcoming design that encourages social interaction and respects cultural diversity. This reimagining of enclosure design promotes inclusivity and accessibility.

When individuals feel safe within enclosed spaces, it cultivates a stronger attachment to the community, reducing concerns about destruction. This heightened sense of devotion to the living environment increases the likelihood of pro-environmental behaviours as residents become more motivated to improve and protect their surroundings (Song, Daryanto, & Soopramanien, 2019).

natural and inviting boundaries

space for appropiation

Pattern C3   Vibrant enclosures
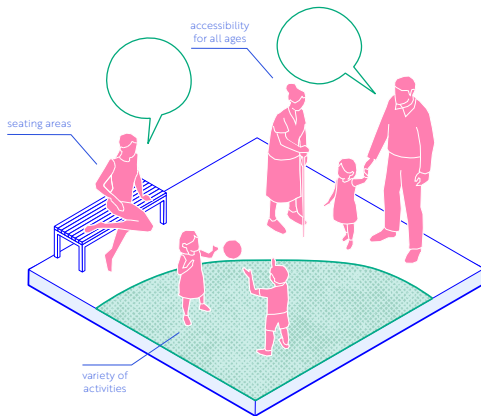► Enclosed spaces serve as valuable social areas, offering a secure and comfortable environment for pro-environmental community activities.

accessibility
for all ages

seating areas

variety of
activities

Pattern C7   A playful gathering space
▶ (School)playgrounds serve as a vital social space that
promotes social learning among generations.

Beyond Play: how playgrounds connect people

Not all public spaces in Tarwewijk and Bloemhof
are created or used equally. One of the
typologies of social gathering places that stands
out as well-functioning on a social level is the
(school-)playground. Before school starts and
after school is done, parents and kids gather
around the premises to socialise. Children,
become a bonding factor between people with
a variety of backgrounds. Because of the clear
function and it's association with children, the
schoolplaygrounds are considered to be a safe
space. The playground has clear boundaries and
because everyone is familiar with the concept
of the schoolplayground, it is clear when and for
whom the boundaries are transparent.

▷ Harnessing the Curiosity of Children

In an interview with urban designer Maël
Vanhelsuwé (see Appendix III), the potential
of the curiousity of children came forward in
relation to sustainability. Children are curious
and eager to learn and are on top of that not
yet shackled by worries such as money or
time. It is therefore relatively easy to talk about
sustainability with children. Therefore, when it
comes to education on sustainability, children
are an important anchor point. By involving
the parents in children's activities, Maël hopes
to also reach out to the older generation and
share some of their sustainability knowledge.
Schoolplaygrounds have the advantage of
already having an educational function being
associated with it, so it seems like not too
far of a stretch to take the next step to use
it for the education process for sustainable
lifestyles, albeit with help of external
organisations like Archiklas. Through the design
of the schoolplayground, but also regular
playgrounds, kids can learn about nature
through play by being exposed and using their
imagination in relation to natural elements.

As mentioned, the social space of the
playground is important to connect parents
from all types of backgrounds. To facilitate this
even further, an enhancement of the design
of the social space could invite people to
linger. Elements, such as benches or shaded
spots allow people to spend more time, more
comfortably at the playground.

"Children are an important anchorpoint. They are enthousiastic, curious and have less worries."
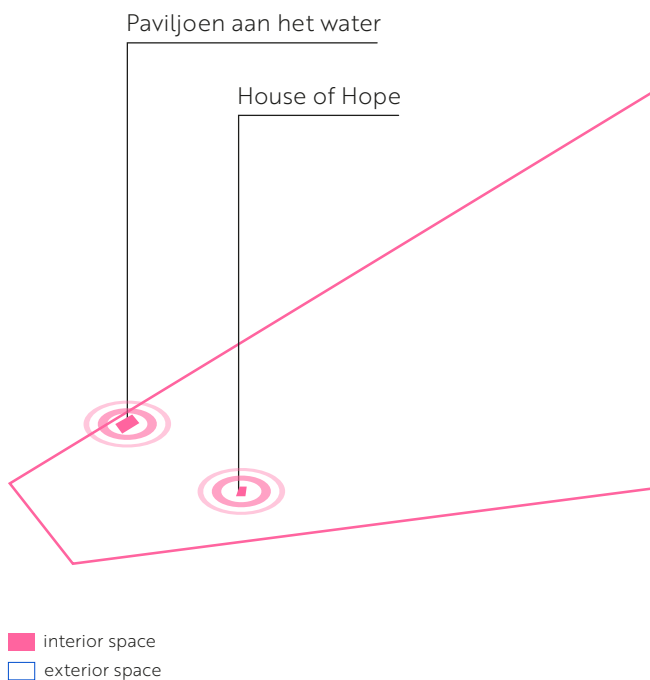
Maël Vanhelsuwé
Archiklas and Buurtklimaatje

Collective action and shared values

This section highlights impactful neighbourhood initiatives in Tarwewijk and Bloemhof, showcasing residents' dedication and trust in their communities. Through these initiatives, trust-building, social capital, and shared values are examined. The collective actions in these neighbourhoods provide valuable insights into future participation and community engagement.
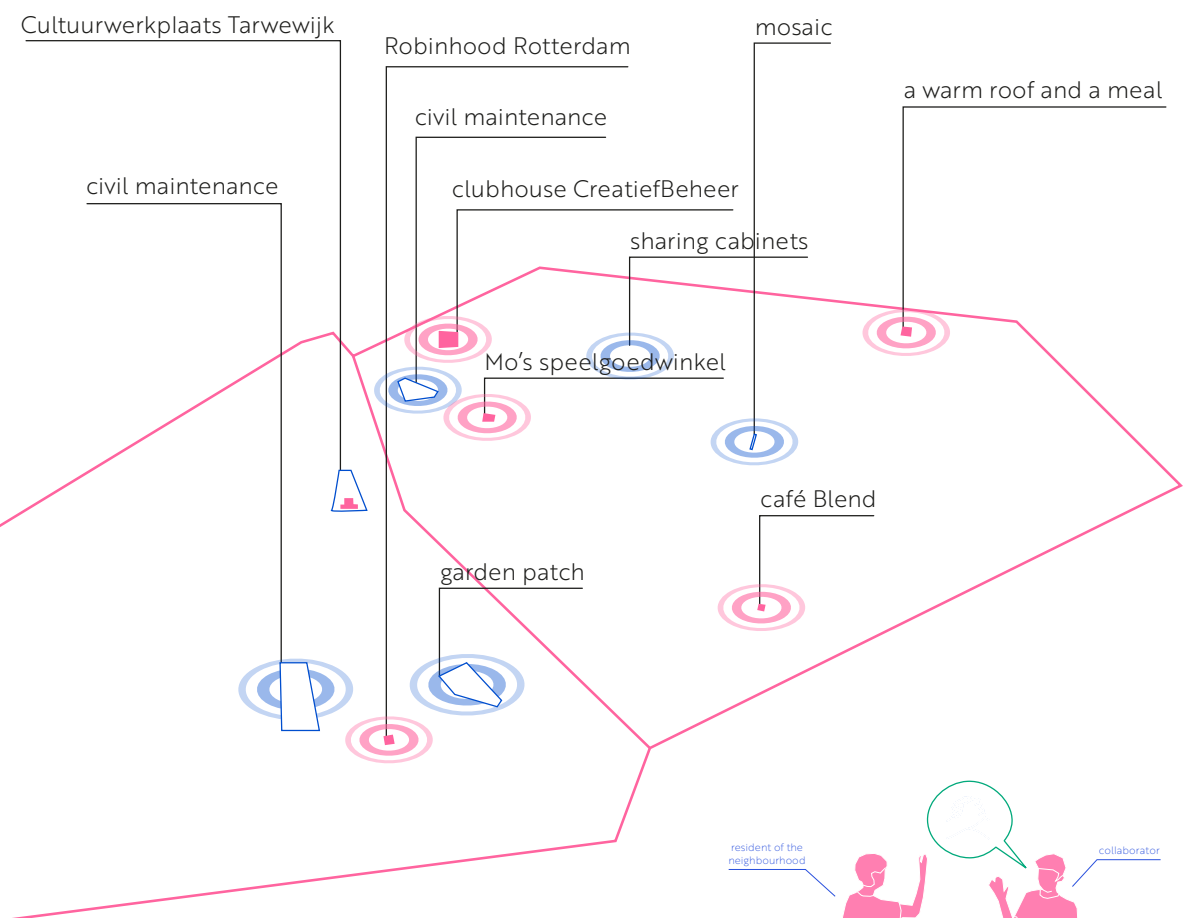
This chapter showcases the creativity, ambitions, and therefore resilience that exist in Bloemhof and Tarwewijk. From interviews with residents it became clear that there is no lack of willingness to do something meaningful in the neighbourhood. Arguably, people are more involved than in many other neighbourhoods in Rotterdam. Maybe because there is so much to gain personally from being involved in local action. However, it is not easy. Getting something of the ground requires a lot of energy and persuasion because of the complex burocracy that has to be dealt with. In terms of future developments, the strengthening of partnerships between local organisations and groups could result in a knowledge network for setting up community initiatives.

Observing these initiatives, it is evident that there is a growing culture of sustainability values. The initiatives reflect a strong sense of

community and a willingness to collaborate and share resources. Through this, materials are reused and spaces become more meaningful, serving multiple purposes. Despite being described as disadvantaged, the communities of Bloemhof and Tarwewijk are actually resourceful and resilient. They possess the social capacity and creativity to overcome challenges and drive change, albeit on a small scale.

Paviljoen aan het water

House of Hope

- interior space
- exterior space

3.8
Local social initiatives in
Bloemhof and Tarwewijk

Cultuurwerkplaats Tarwewijk

Robinhood Rotterdam

mosaic

a warm roof and a meal

civil maintenance

civil maintenance

clubhouse CreatiefBeheer

sharing cabinets

Mo's speelgoedwinkel

café Blend

garden patch

resident of the neighbourhood

collaborator

capital

▷ Keeping momentum

In order to maintain and enhance this positive energy, there is a need to construct the necessary supportive infrastructure. This chapter highlights the importance of recognising and building upon existing social and cultural resources to create sustainable communities.

A list of initiative descriptions is provided on the following page.
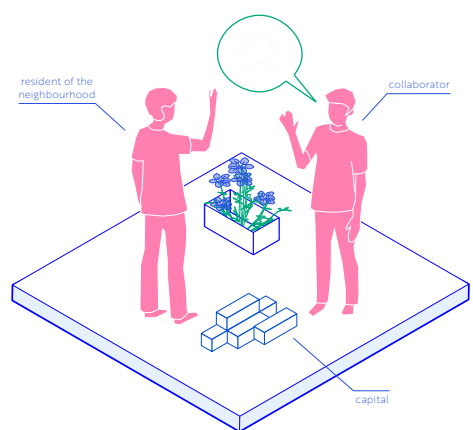
Pattern C1   Connecting key players
► Sustainability values in a neighbourhood can become meaningful for a larger group through collective action.

Mosaic in Bloemhof

To make the neighbourhood prettier, a mosaic was made. In total about 70 residents helped to make this happen.

Mo's speelgoedwinkel

Meetingspot and activities for children (and parents). Here children can play and parents can get help from the volunteers with, among others, reading letters. (temporarily closed due to illness)

'Weggeefkastjes van Marym'

Swap cabinets by local resident. Here people can take stuff and bring stuff they do not need anymore.

Gardens in the Millinxpark

In the Millinxpark a few garden beds have been arranged by local residents where food is grown. The gardens are next to the playground and is bringing different groups together and teaching the children about growing food.

A warm room and a meal

In the Salvation army building, local residents are providing a warm living room for the people that are not able to pay the high heating bills. People of different groups can come together and share a space to study, work or play games.

House of hope

House of hope is a neighbourhood living room. Recently, they opened a clothes bank opened where residents with a low income can get a nice outfit for special occasions for free, or buy regular clothes for a small price.

CreatiefBeheer

CreatiefBeheer is an organisation in which local residents with distance to the jobs market get to do maintenance and gardening work on the public space in their own neighbourhood. For

this work they receive a small compensation. This way the neighbourhood get's greener and more beaufitul, while also providing a sense of purpose

Blend Cafe

Blend is a social cafe, second-hand clothes shop and hairdresser initiated by local residents. The goal is to bring different types of people together to promote social cohesion. On top of that they want to make the neighbourhood a nicer and cleaner space.

Cultuurwerkplaats Tarwewijk

At the Cultuurwerkplaats residents and cultural enterpreneurs work together to improve the social and economic situation in the neighbourhood.

Paviljoen aan het water

Paviljoen aan het water is a unique "Freeplace" that empowers local residents to pursue entrepreneurial activities. With resident-run restaurants and cultural events, this space operates without hierarchy, offering community ownership and freedom of use. It truly belongs to the community.

Robinhood Rotterdam

At Robinhood Rotterdam they are bringing new monetary value to old furniture by upcycling them and bringing social value in the neighbourhood by doing this with people that have been distanced from society.

Civil maintenance Mijnsherenlaan

A local group has proposed a transformative plan for the design and maintenance of Mijnsherenlaan. Through neighbourhood participation, parts of the public space will be taken under community maintenance, fostering trust and community formation. Once trust is established, the municipality will proceed with the transformation of the entire street profile.
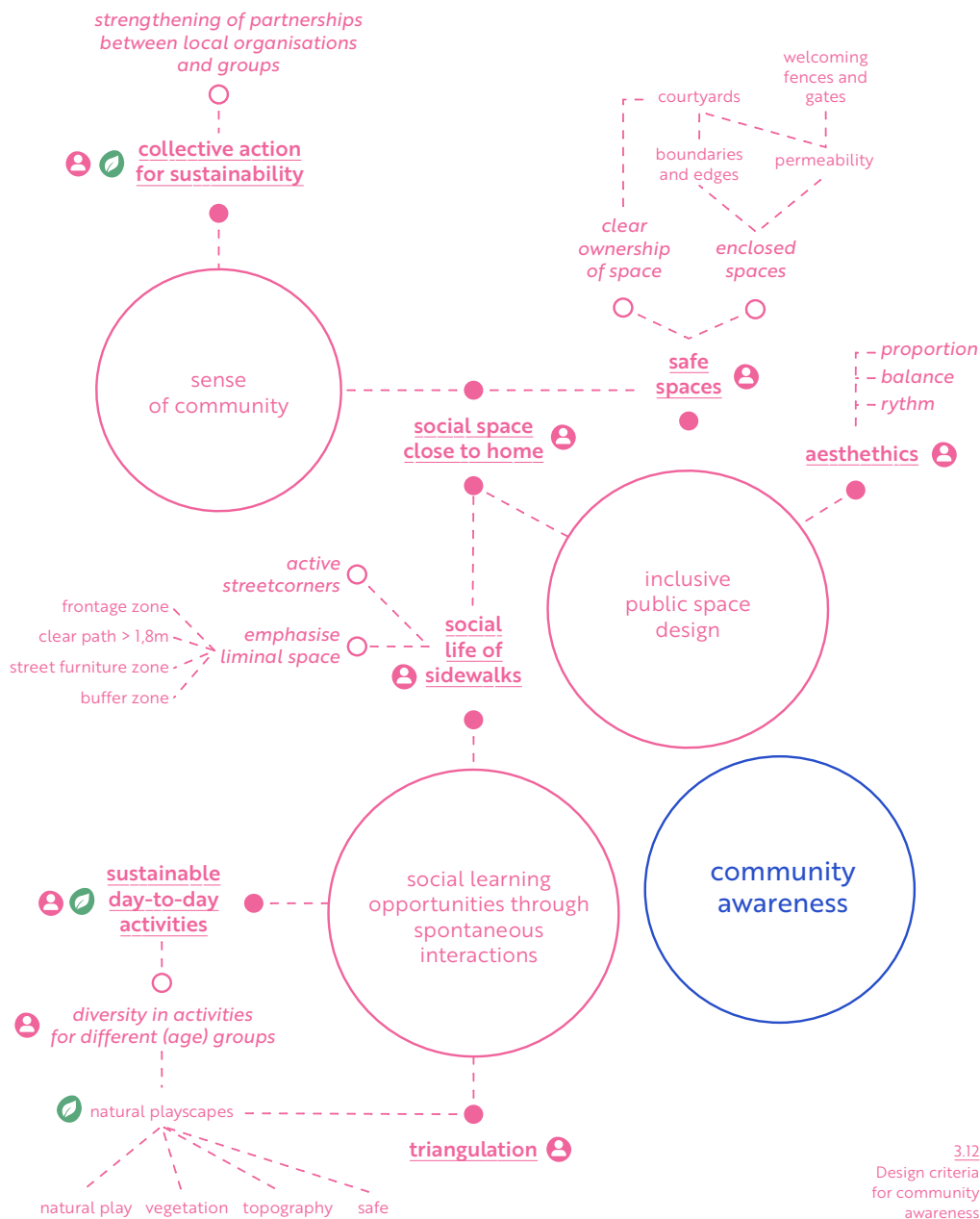
ZORG & WELZIJN TARWEZ_T

Zorgu

► **What if**

Community awareness

A more attractive and interactive design of public spaces, catered towards the needs of local residents, can make public space more inviting and conducive to social action, leading to a dynamic and engaged community that supports each other towards more sustainable lifestyles.

strengthening of partnerships
between local organisations
and groups

○

**collective action
for sustainability**
👤 🌿

courtyards

welcoming
fences and
gates

boundaries
and edges

permeability

*clear
ownership
of space*

*enclosed
spaces*

○   ○

**safe
spaces** 👤

– *proportion*
– *balance*
– *rythm*

sense
of community

**social space
close to home** 👤

aesthethics 👤

*active
streetcorners* ○

frontage zone
clear path > 1,8m
street furniture zone
buffer zone

*emphasise
liminal space* ○

**social
life of
sidewalks** 👤

inclusive
public space
design

social learning
opportunities through
spontaneous
interactions

**community
awareness**

**sustainable
day-to-day
activities** 👤 🌿

○

👤 *diversity in activities
for different (age) groups*

🌿 natural playscapes

triangulation 👤

natural play   vegetation   topography   safe

areas of focus
👤 inclusivity
🌿 sustainable behaviours

Designing for
sustainable interactions

So how can awareness on sustainability in a community be facilitated? The design criteria that enhance an inclusive and engaged community are presented on the right. These criteria are a result of the analysis done on the previous pages and the lessons that have been learned from the theory. From these criteria, actions can be derived that can be turned into a pattern language.

From the analysis done on the previous pages, it has become clear that an engaged community is an inclusive community, where spontaneous interactions are facilitated. Through a sense of community, collective action can be taken in light of sustainable goals. Inclusive public space design is a concept that entails a variety of different themes, of which safety, aesthetics and proximity are emphasised in the scheme. These are not the sole indicators of inclusivity, but are factors that are significant when it comes to culturally diverse communities.

Safety in general is an important theme in vulnerable neighbourhoods, where rates of criminality and vandalism are often high. The design should therefore provide protection, but should not significantly limit social interactions. The sense of community should be promoted through the provision of safe spaces and by the promotion of collective action. For the latter,

existing stakeholders should be empowered by collaboration between active groups.

Through community infrastructures, such as sidewalks, active streetcorners and facilities for day-to-day activities, sponteanous interactions can be promoted, allowing for people from different backgrounds to find similar values and learn from each other. Playgrounds are especially important places to connect culturaly diverse people and teach them about sustainability through intergenerational learning.

Designing for a sustainable community facilitates the formation of shared values, therefore putting emphasis on intrinsic motivation strategies, such as social learning, education and community commitments. Moreso, to emphasise diversity, external motivation such as aesthetics are supplementary tools to foster sustainable communities.

Paving the way for sustainable behaviours

This strategy presents a roadmap for constructing an inclusive and sustainable community on the neighbourhood scale. By following these steps, positive impacts emerge, nurturing a sustainability-focused awareness and mindset. Simultaneously, efforts are made to bridge cultural and socio-economic gaps, acknowledging the nuanced challenges that arise in achieving sustainability.

(2) growth by education

Incorporate inclusive and sustainable school playgrounds. These playgrounds should be designed to prioritise intergenerational learning and foster spontaneous encounters, with a focus on sustainability. Natural playscapes will help to promote biospheric values among children. By creating these spaces, the community can actively engage in sustainability education while promoting social interactions among people of different age groups and from different backgrounds

Relates to pattern C7 and R4

(1) assess the current state

Begin by understanding the existing conditions and dynamics of the community. Evaluate the social environment through demographics, existing infrastructure, public spaces, transportation systems, collective action and other dynamics within the neighbourhood. Identify any barriers to sustainability and community engagement, such as cultural differences, lack of community spaces or limited access to resources.

From here patterns can evolve

(3) spontaneous interactions

Create community infrastructures such as sidewalks, active street corners, and facilities for day-to-day activities to promote spontaneous interactions between people from diverse backgrounds. By providing accessible and inviting spaces for people to gather and engage in daily activities, the community can foster a sense of connection and promote cultural exchange

Relates to pattern C2, C3, C4, C5, C6 and C7

4 enhance safe territories

Promote trust within local communities by prioritising the provision of safe and enclosed spaces that are welcoming and open for appropriation. These spaces should be designed with the intention of fostering a sense of security and comfort, allowing individuals to freely and comfortably engage in various activities. By creating such spaces, the community can establish a foundation of trust, which is crucial for encouraging collective action towards sustainability.

Relates to pattern C2, C3 and R6

5 empower collective action

Foster partnerships that support sustainable practices, such as establishing community gardens, organising clean-up events, or promoting local businesses that prioritise environmental and social responsibility. Empower existing stakeholders within the community by facilitating collaboration between active groups, which will promote collective action. Recognise and highlight the efforts of these stakeholders, putting them in the spotlight as role models for sustainable practices. Provide necessary resources, such as capital and dedicated spaces, where locals can interact and engage with these initiatives. This collaborative approach will not only empower local stakeholders but also inspire and motivate others in the community to actively participate in sustainability efforts.

Relates to pattern C1

1 Urban designer facilitates events and conversations with residents and experts, such as social workers, to create a full image of the neighbourhood.

Deciding on the direction
Phase I

▶ interviews
▶ spatial analysis
▶ citizen input sessions

2 **4** **3** Urban proposals should involve input from residents, stakeholders (such as local NPOs and the municipality), and be evaluated at multiple timepoints with these groups.
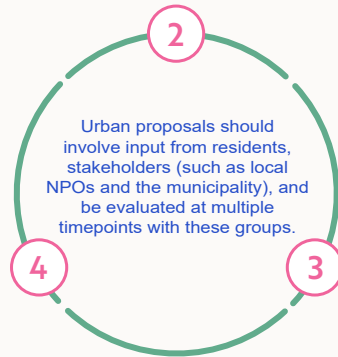
Setting the foundation
Phase II

▶ place-making interventions and redesigns through co-creation
▷ workgroups
▷ citizen input sessions

5 Municipality and local NPOs help to empower community initiatives. Urban designer helps to promote places in which interactions can take place

Empowerment for lasting impact
Phase III

▶ community events
▶ commitments & collaborations
▶ financial support

Connecting people and place

meaningful spaces

In the transformative journey of Bloemhof and Tarwewijk, a call emerges to cultivate an array of vibrant community spaces - or rather places. These places intricately woven into the fabric of a robust social network, stand as beacons of support for the diverse needs of local residents. Embracing connection, they engage individuals to gather, fostering social bonds, cultural exchanges, and educational exploration. In these places, a tapestry of shared experiences unfold, nurturing a sense of community and positive interactions.

educational territories

Moreover, the educational territories in these neighbourhoods, such as community centres and school playgrounds, play a vital role in promoting sustainable mindsets and practices. By incorporating sustainability and nature into the design of school playgrounds in a visible and playful way, children have been introduced to the discourse of sustainability at a young age. This, in turn, has led to intergenerational social learning and the creation of a culture of sustainability that spreads throughout the community.

A more attractive and inclusive design of the public spaces of Bloemhof and Tarwewijk, catered towards the needs of local residents, will strenghten the social capital in the neighbourhoods. Through communal use of public space by people of all backgrounds, we can imagine a dynamic and engaged community that supports each other on the journey towards more sustainable lifestyles.

Envision a future where Bloemhof and Tarwewijk flourish as vibrant and harmonious places, brimming with purpose-driven individuals united by a shared vision. Through intentional community design, sustainable behaviours can be fostered and a shared sense of responsibility and connection can be created. The bedrock of a resilient community fabric, inclusive to all members, sets the stage for transformative neighbourhood initiatives, enriching the lives of its inhabitants.

spaces within reach

The social environment intertwines the essential social needs of its inhabitants with their daily rhythm, remaining within close proximity. Seamlessly blending into the daily fabric, both interior and exterior spaces unfold as sanctuaries accessible to all. Secluded yet accessible areas, such as courtyards, offer places of safety and shared ownership, nurturing bonds among different groups within the neighbourhood. Meanwhile, the revival of forgotten street corners breathes new life into the streetscape, inviting spontaneous connections and creating connections between strangers. Within this inclusive vision, affordability takes center stage, ensuring that these transformative spaces are within reach for all, empowering every member of the community to partake in the collective journey and shared experiences.

3.14
Abstract representation of the community awareness vision

buurThuis

HI!

bla bla
bla bla
bla bla bla
bla bla
bla

Opportunities for interaction

3.15
Spatial
opportunities
in Bloemhof
and Tarwewijk
for community
awareness

The map of spatial opportunities in Bloemhof and Tarwewijk shows how the existing and potential spaces in the neighbourhoods can be used to foster community behaviours and meet the design criteria. The map emphasises safe and comfortable spaces for interaction, such as community courtyards and community living rooms. Education is highlighted through the existing structures of primary schools, community centres and playgrounds. Both interior spaces as well as exterior spaces are highlighted to provide variety of spaces. Spontaneity of interactions is considered through active corners and the pedestrian network.

The map shows how these elements can be integrated into the existing urban fabric of Bloemhof and Tarwewijk, to create more spatial opportunities for building a strong community foundation. The map is based on the previous chapter's of analysis, interviews and theory.

0   100 m   1000 m
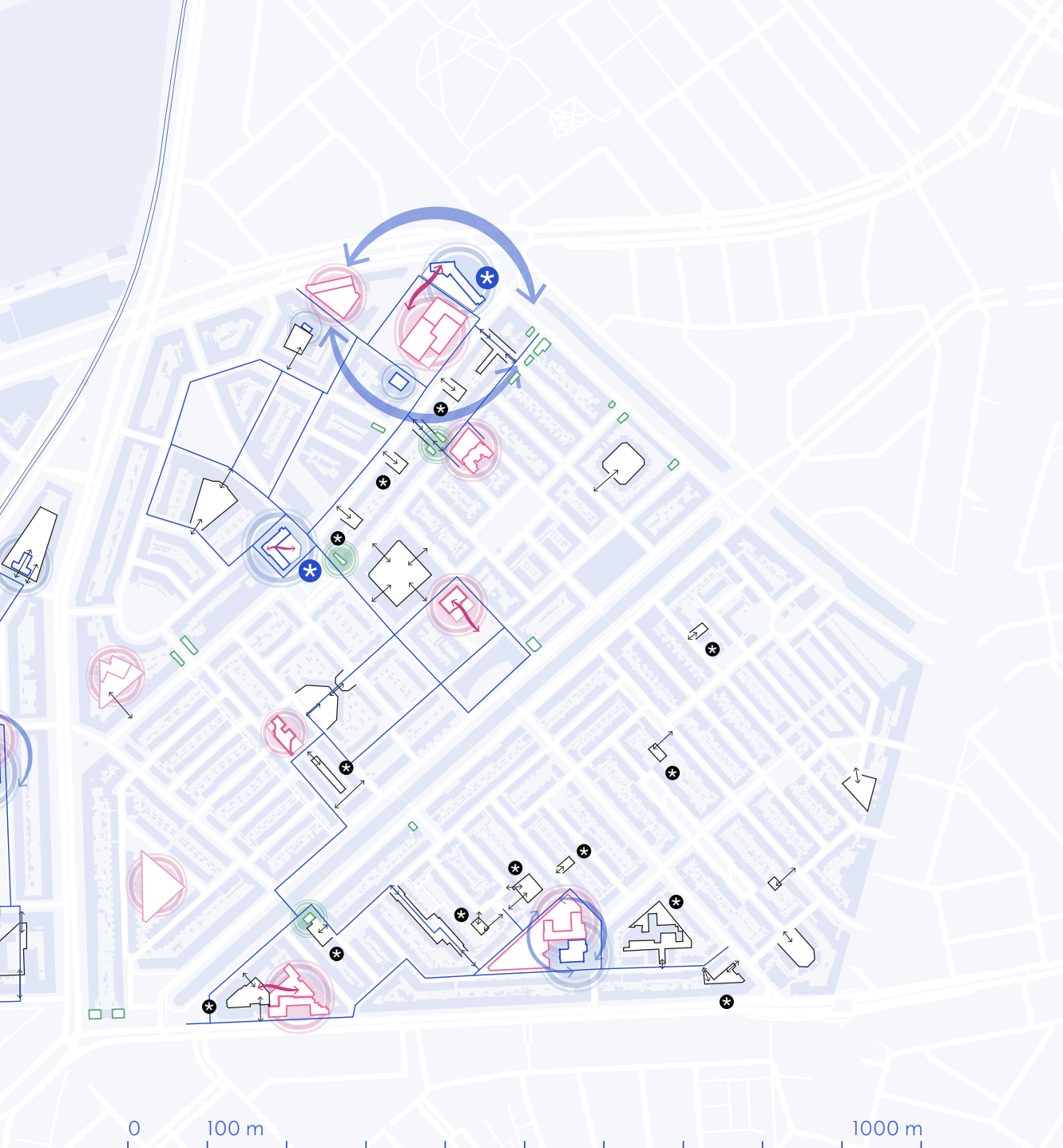
☐ community enclosures
☐ playgrounds
☐ primary schools
☐ community living rooms
☐ corners for interaction   ◡ bring together ammenities- shared zones
↦ entrance courtyard   ⌒ connecting interior and exterior
✸ existing community courtyard   ● social zone - education
✸ existing community centre   ● social zone - community centres
✸ existing active corner   -- improved pedestrian network

▶ What is

Everyday decisions

"A reflection of conservational lifestyle choices made by citizens that have an influence on environmental sustainability, addressing resource security, resource dependancy, resource efficiency and pollution prevention on the scale of the neighourhood."

Everyday decisions can best be described by their typical character. - they are simple conservational behaviours that occur on a daily basis and are applicable to nearly everyone. Everyday behaviours can be expressed through consumer purchasing-, use- and disposal actions. It is implied that if these relatively simple actions are adequately spread in society, benefitial environmental impacts will be generated (Larson et al, 2015). These everyday conservation lifestyle behaviours can happen in both the private and public sphere, and while what happens in the private sphere is important - thinking of topics such as water- or energy-savings - it is hard to say to what extent these behaviours can be influenced from interventions in public space. Therefore, in this thesis research a particular focus will be put on the activities that occur in public space.

The Taskforce on Sustainable Lifestyles, in collaboration with the United Nations Environment programme, (2018) did a research on sustainable lifestyles in which they elaborate on a shift towards sustainable consumption, based on minimising consumption patterns. Consumption as defined by the taskforce is a comprehensive concept, which includes topics such as mobility, the utilisation of consumer goods, housing, food and leisure activities.

From this and from knowledge earlier mentioned on the global issues of urban sustainability, an array of conservation activities that can occur in the public sphere can be established. The subject matter of the following actions have been widely researched in relation to behaviour change and can be considered significant and relevant for sustainability. In this research a particular focus will be put on recycling behaviours (Knussen, Yule, Mackenzie and Wells, 2004; Lange, Brückner, Kröger, Beller and Eggert, 2014; López-Mosquera, Lera-López and Sánchez, 2015; Mannetti, Pierro and Livi, 2004), in relation to green consumerism (Balderjahn, Seegebarth and Lee, 2021; Hanss and Böhm, 2013; López-Mosquera et al, 2015; Richetin, Perugini, Conner, Adjali, Hurling, Sengupta and Greetham, 2012), and environmentally-conscious transportation (Friedrichsmeier, Matthies and Klöckner, 2013; Liu, Du, Southworth and Ma, 2017; Lo, van Breukelen, Peters and Kok, 2016; López-Mosquera et al, 2015; Muñoz, Monzon and Muñoz, 2016) .

The first section, which will now follow, will focus on mobility behaviours

Maashaven

R·NET

Getting around more sustainably

The choice for modes of transportation are a daily choice that is highly visible in the public sphere. In the following section, it will be explored what the requirements are for the shift from unsustainable mobility to sustainable mobility behaviours, to be able to reassure environmental balance (Müller-Eie and Bjørnø, 2014).

Mobility choices have a high impact on the global goal to reduce emissions and pollution. Change in choices of transportation are highly dependent on individuals and their habits, which requires contextual shifts so that people can be enabled to make sustainable behaviour choices that still meets daily needs.

The Taskforce for sustainable lifestyles proposes three main action areas, that based on ecological footprint and carbon footprint data have been proven to be effective to reduce emissions (UNEP, 2018). Within these areas, actions can be emphasised that range from being simpler and quicker, and therefore requiring less effort, to high effort actions. The lower effort actions give momentum and can help set up the high effort actions.

The first action area is the shift towards the amount of trips done by walking, cycling and public transit. This would require an increase in the use of public transport, an understanding of the walkability of a community, actions to improve biking infrastructure and developing high quality alternatives to short distance trips.

The second action area is to find alternatives to personal car ownership. A way to approach this is to promote shared commuting, such as carsharing, carpooling and ride-sharing programmes.

The third action area focusses on the reduction or elimination of the need to travel, in terms of long and short distances. The reduction of number of people commuting is dependent on how far people have to travel for work. As a lot of people in vulnerable neighbourhoods have practical jobs that are not located in the centre of the city, it is less likely that on the short term this action area will be productive. As long as practical jobs are located on the edges of cities, the need for long-distance travel will exist.

reduce emissions

↓

trips by foot, bicycle and public transport

+

alternatives to personal car ownership

+

reduce or eliminate the need for travel

3.16
Action areas for sustainable mobility

Environmentally-conscious transportation

Through affordances that are create through design, the urban environment either enables or hinders certain choices in mobility. To gain a deeper understanding of how the impact of transportation emissions in Bloemhof and Tarwewijk can be minimised, the following section will explore the existing infrastructure for both sustainable and unsustainable modes of transportation.
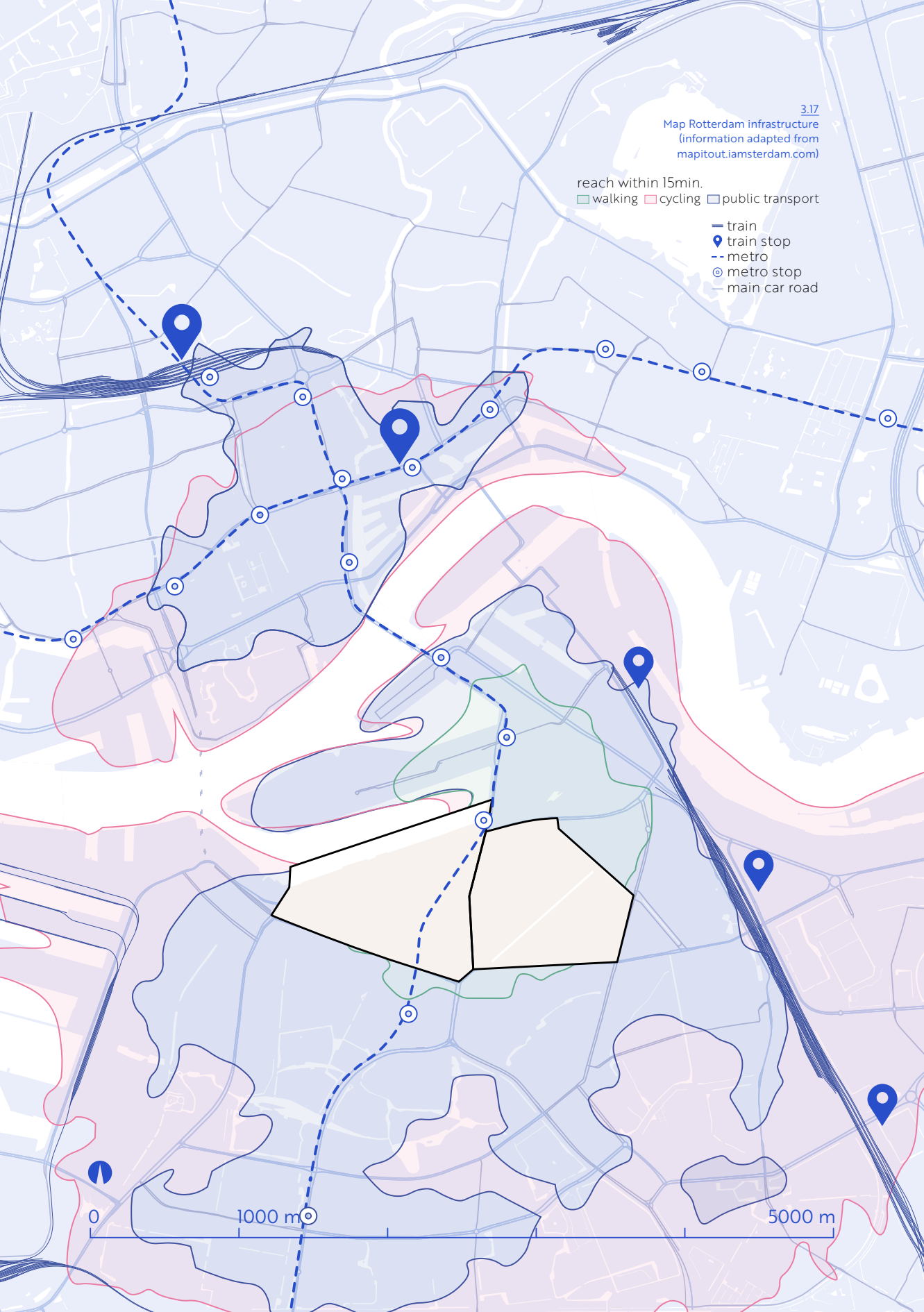
Reaching the neighbourhood

The intersection of Bloemhof and Tarwewijk takes place at Maashaven metro station, which serves as a crucial hub for residents to travel to other parts of Rotterdam, whether it be towards the north or south, and for visitors arriving in the neighbourhoods. The metro line in Rotterdam South transitions from an underground route to an above-ground one, becoming a prominent feature in the area. During the day, the accessibility to different parts of the city is relatively favourable, with frequent metro services making it a convenient mode of transportation. The metro operates with high frequency, ensuring easy access to public transportation. Within a 15-minute journey, one can reach most areas in the southern region as well as the main train stations of the city. However, during the night, accessibility becomes limited due to reduced metro service frequency. As the metro line extends southward, the number of metro stops decreases, necessitating longer walks or bicycle rides to access public transport.

▷ A good foundation

In terms of sustainable modes of transportation, the existing public transport connections provide a solid foundation to build upon. To enhance the current network, the consideration of a new metro station in the southern area would greatly improve accessibility to public transport. An immediate improvement that could be implemented is increasing the frequency of night services, making public transport a viable option around the clock.

reach within 15min.
walking   cycling   public transport

train
train stop
metro
metro stop
main car road

0   1000 m   5000 m

Moving around in the neighbourhood

From the Maashaven station, the tram provides a new east-west connection to public transport. The station itself does not provide a pleasant experience for public transport users. It is an uninviting and outdated space, with numerous broken parts and a lack of cleanliness. Upon leaving the station, pedestrians are faced with a challenging transition due to the presence of cars dominating the area. The exit is situated in the middle of a busy road, which has to be crossed before being able to continue. The dominance of car-roads is a re-occuring theme in the neighbourhoods, with noisy streets acting as boundaries around the edges of the neighbourhood, which are unpleasant as a pedestrian. As a result, Bloemhof and Tarwewijk are separated from each other, and districts within them are disconnected. Even though there are speed limits, car drivers look for speed within the neighbourhoods in places like the Lange Hilleweg or the Mijnsherenlaan, which causes local residents a lot of disturbance.

city centre
waalhaven
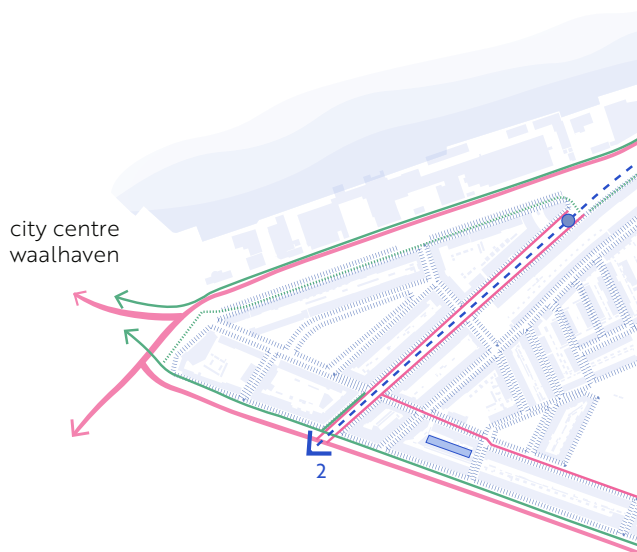
▷ Enhancing accessibility

The overall experience of the accessiblity of the neighbourhood, related to the main infrastructures can be improved upon significantly. A lot of quality can be gained at the Maashaven station by improving the experience for pedestrians and the overall image of the station through a redesign (UNEP, 2018). This could involve upgrading the station's facilities and infrastructure, such as installing new lighting, repairing broken parts, and providing a more welcoming entrance. Aesthetically, the station could be improved through the addition of public art, greenery, and other design features that enhance its visual appeal. To improve upon the pedestrian experience in relation to the main infrastructures, traffic calming measures, such as speed bumps, narrowing of the road or new materials of the street, will be necessary to create a safer environment for pedestrians and cyclists.

shelter

art displays

seating

high quality materials

light for safety

greenery
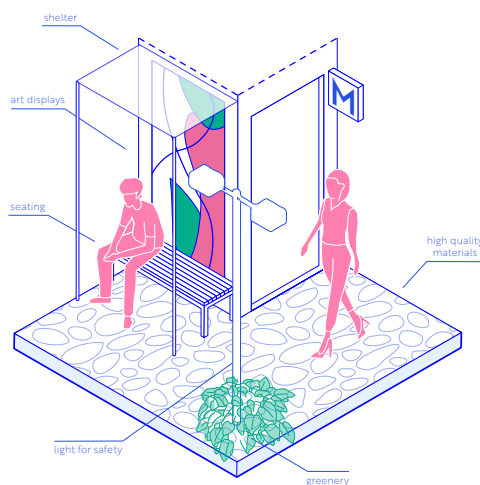
Pattern E3   A joyful journey
► A well-designed and maintained public transport station will have a positive impact on people's perception of public transport usage.
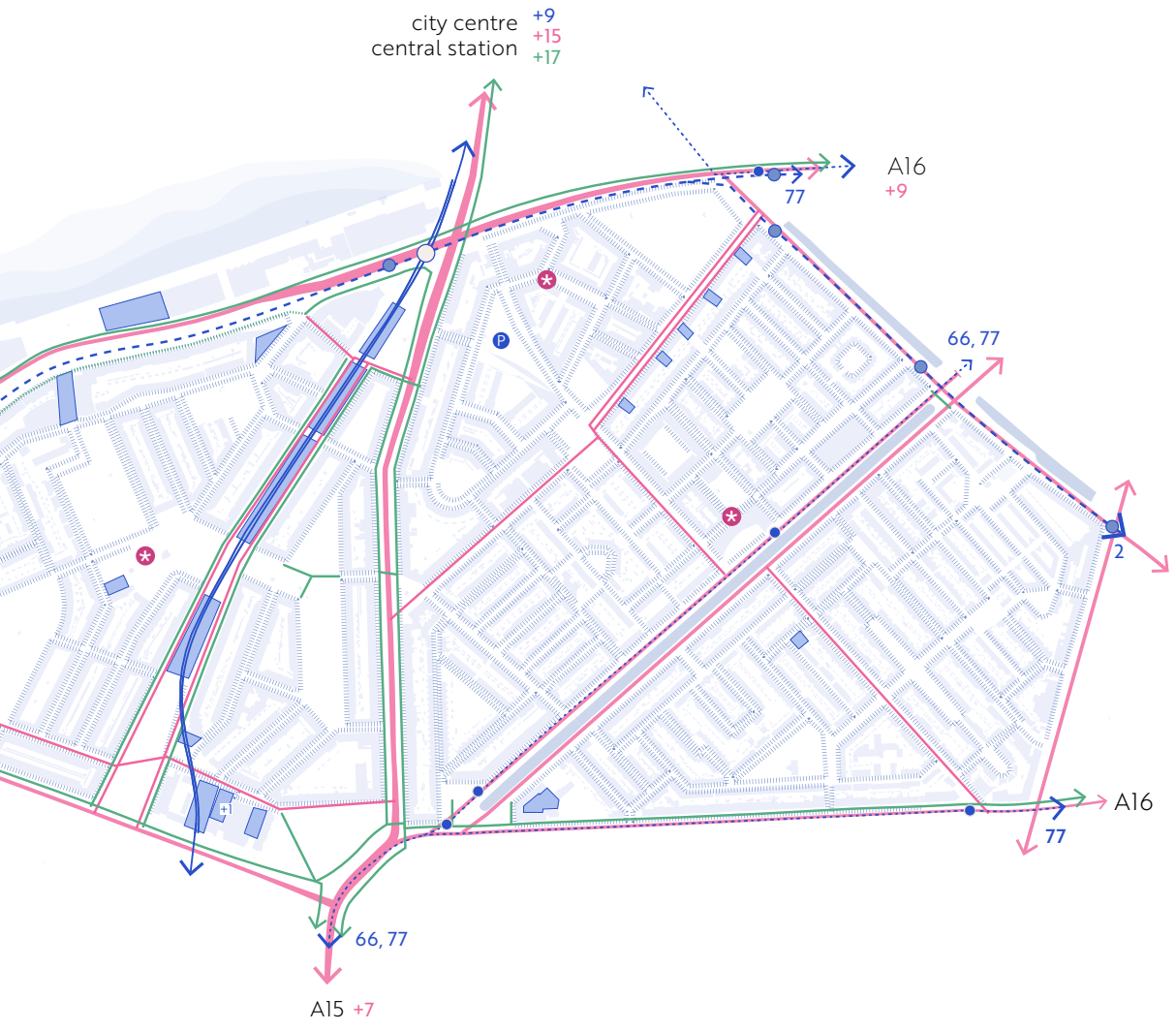
city centre +9
central station +15
+17

A16 +9

77

66, 77

2

A16

77

66, 77

A15 +7

0 100 m   1000 m

— metro
-- tram
··· bus
stops
○ metro ● tram ● bus

■ main car roads (50km/h)
— secondary roads
— bicycle paths
··· bicycle streets

✴ shared car service
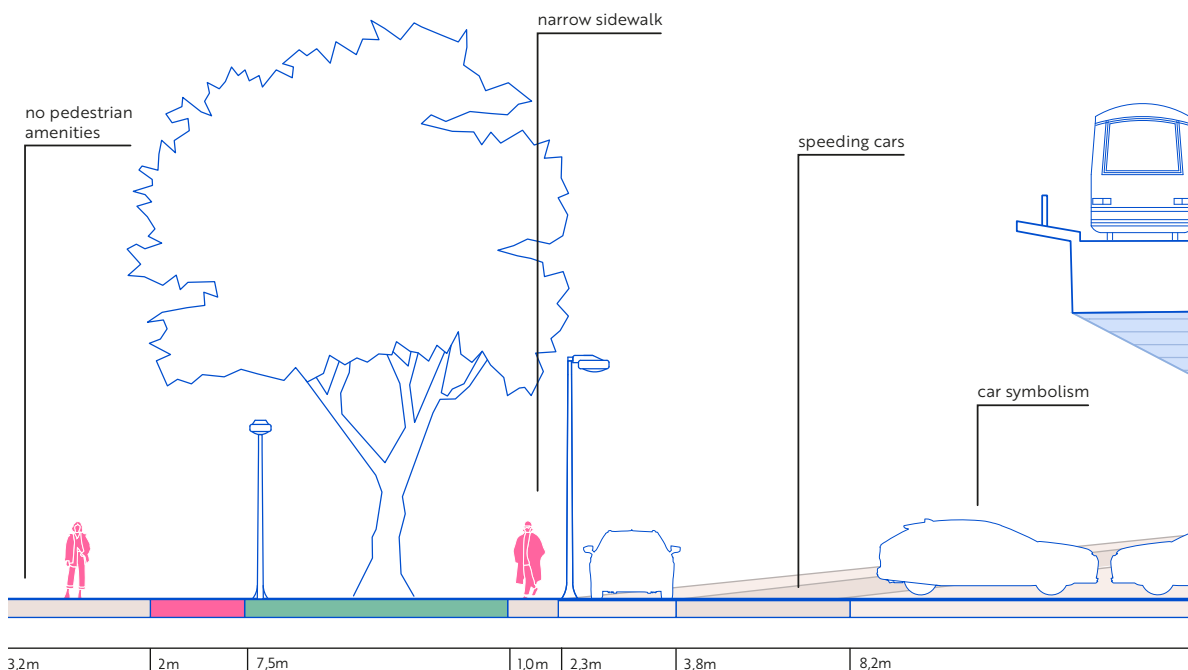··· street parking
▢ parking lots
Ⓟ parking garage

An unbalanced streetscape

The significance of the car in Bloemhof and Tarwewijk becomes even more clear when analysing the neighbourhood streetscape. The streets of Bloemhof and Tarwewijk are heavily dominated by cars, leaving little space for pedestrians, cyclists, and greenery. Despite owning fewer cars per household than the national average (Allecijfers, n.d.; CBS, 2022)., the accumulation of cars in the streetscape is a result of high density and a lack of parking solutions other than street parking. During the day a lot of the cars dissapear from the streets, showing the dependency of people on the car for work purposes.

This dominance of cars creates a second-class status for pedestrians and cyclists, who are forced to share spaces with cars. The car symbolises hedonistic and egoistic values, which do not encourage sustainable behaviours. Currently, there are only a few small pedestrian zones and limited cycling infrastructure, while the need seems to be great - bicycles are parked everywhere.

▷ Finding balance

To promote sustainable behaviours, the significance of the car should be reduced and the pedestrian should be prioritised in public space design. Rather than removing cars or parking altogether, which would have a high impact on the daily lives of local residents, a more nuanced approach should be taken to gradually reduce car usage and prioritise slow traffic. Urban design interventions such as planting trees, installing green spaces, and creating pedestrian-friendly spaces (see figure 3.7 in Chapter 'Social space in Bloemhof and Tarwewijk') could be implemented to create a more welcoming and comfortable environment for pedestrians, while also reducing the impact of traffic on the neighbourhoods.

3.19
Section of Mijnsherenlaan, displaying role cars in streetscape

no pedestrian amenities

narrow sidewalk

speeding cars

car symbolism

| 3,2m | 2m | 7,5m | 1,0m | 2,3m | 3,8m | 8,2m |

shade trees

bicycle infrastructure

broad sidewalks

traffic calming

traffic calming through materials

green spaces

pedestrian amenities

mobile parklets
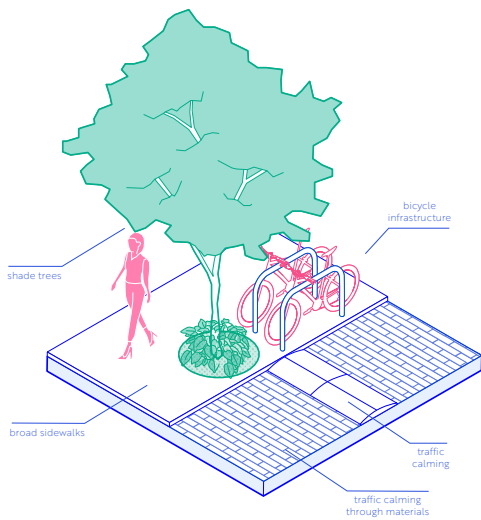
Pattern E1   Walking matters
► Visibly prioritising pedestrians and cyclists in street design is an effective way to increase the likelihood of people choosing sustainable modes of transportation.
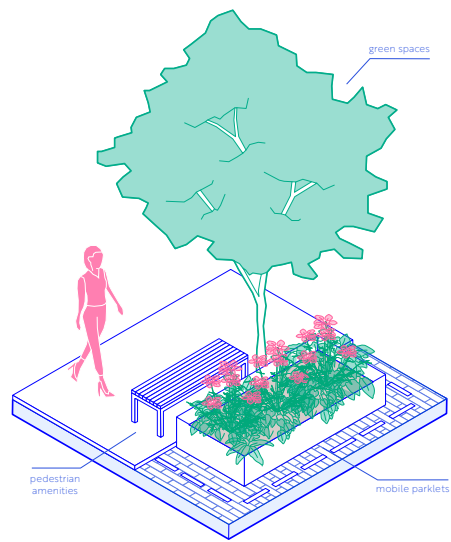
Pattern E4   Removing the car out of carpark
► By decreasing the reliance on cars in a neighbourhood, new opportunities for community spaces emerge.
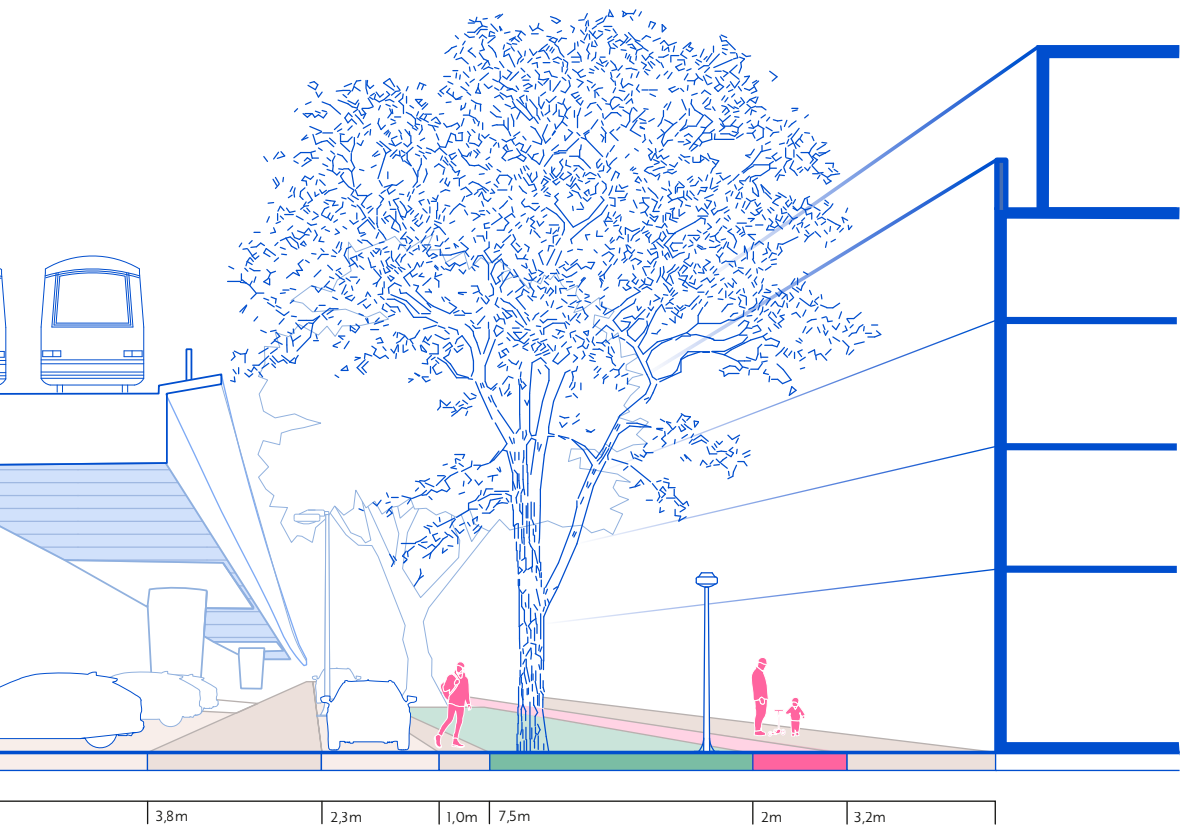
| 3,8m | 2,3m | 1,0m | 7,5m | 2m | 3,2m |

Shared mobility

One way to reduce cars in a neighbourhood is by offering alternatives. Not always is public transport a viable option, for example when larger objects need to be moved from one place to another. So what are other alternatives to move away from car culture? Shared mobility is often considered to be an important tool in decreasing the presence of cars in the urban fabric. At the moment, there is a shared mobility hub at the metrostation, including bicycles, transport bicycles and scooters. Throughout the neighbourhoods three shared cars are distributed (see figure 3.15). Considering the density in population, this quantity does not make a significant impact. The lack of shared car services is repeatedly observable in vulnerable neighbourhoods such as Bloemhof and Tarwewijk. Often, the business model of shared mobility providers does not pinpoint these neighbourhoods as lucrative.

▷ Making sharing attractive

Local governments, however, could create incentives for making car-sharing more attractive in vulnerable neighbourhoods (Kondranksy and Lewenstein, 2014). Car-sharing could become a way for people to save money on fixed charges that belong to car-owning and therefore become attractive for exactly the target group in Bloemhof and Tarwewijk (Kondranksy and Lewenstein, 2014). Spatially, this would require recognisable places in which these cars would become available for local residents. Information campaigns and on-site signage serve the purpose of spreading the concept of sharing cars. Because needs differ greatly in different contexts, it is important to evaluate through testing grounds which type of shared mobility is most attractive for the residents of Bloemhof and Tarwewijk.

clearly visible
information signs

Communal cars

green structures
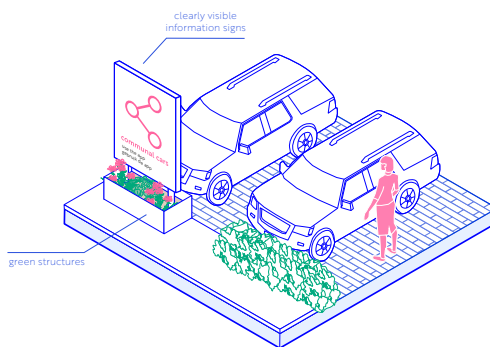
Pattern E4   Collaborative commuting
▶ By turning existing parking lots in vulnerable neighbourhoods into testing grounds for shared mobility, sustainable mobility behaviours can become more widespread.

► **What if**

Everyday decisions

A mobility design to breathe new life in the streets, creating a more balanced and better connected streetscape, in which sharing of space with the car does not mean being overpowered by the car. It is a streetscape where the power dynamic is tipped in favour of the human and in which mobility is mostly communal so emissions can be reduced.

frontage zone

clear path > 1,8m

street furniture zone

buffer zone

speed bumps

narrow road

materials of the street

reduce presence car in streets

improve and broaden sidewalks

traffic calming measures

pedestrian-friendly spaces

increase greenery

redesign parking spaces

increase walkability

bicycle roads

bicycle roads

repair and maintenance

welcoming entrance

greenery

public art

upgrade facilities

improve quality and image public transport

car-free modality

improve bicycle infrastructure

alternative to private car ownership

everyday decisions mobility

promote shared comuting

recognisable parking spots

information campaigns

job opportunities in close proximity

reduce or eliminate need for travel

3.20
Design criteria for everyday mobility decisions

areas of focus

🧍 inclusivity

🍃 sustainable behaviours

Designing for sustainable mobility

So how can sustainable mobility behaviours be achieved through a redesign of the neighbourhood? In this chapter, the design criteria that make emission-low transportation options more attractive are proposed. These criteria are a result of the analysis done on the previous pages and the lessons that have been learned from the theory. From these criteria, actions can be derived that can be turned into a pattern language.

As mentioned at the beginning of this section, there are three main action areas to enhance sustainable transportation choices. For one, car-free modalities can be made the more attractive option than using the car. To be able to achieve this, there must be something to gain. Through a redesign, values can be represented by prioritising pedestrians and cyclist, and deprioritising the car in the streetscape.

However, as mentioned before, there is a high dependency on the car in vulnerable neighbourhoods, such as Bloemhof and Tarwewijk. Just removing the car out of the streetscape would therefore result in social inequity. Therefore, high quality alternatives to private car ownership have to be made

more available. Shared commuting and public transport offer alternatives, with each their own benefits for users. To promote shared commuting, action would be needed from local institutions, providing incentives to both locals as well as mobility providers.

Designing for sustainable mobility would require therefore both external motivation, playing into psychology of ease, but also motivation that emphasises gains rather than loss and promotes symbolism that are in line with sustainability values. Through the creation of affordances and norms, sustainable mobility can be facilitated.

Choosing emission-friendly

This strategy presents a roadmap for transforming neighbourhoods where sustainable transportation is the norm. Recognising the psychological impact of change and people's strong reliance on cars, a careful consideration of time is essential to ensure an equitable transition on the neighbourhood scale. By following these steps, the intricate aspects of creating a well-balanced streetscape can be attained.

① **assess the current state**

Begin by comprehending the community's existing conditions and dynamics. Conduct a thorough assessment of the neighbourhood to understand its current transportation patterns, challenges, and needs. Identify existing infrastructure, such as roads, sidewalks, bike lanes, and public transit options. Also, consider social and economic factors that contribute to transportation vulnerability, such as low-income households, and car dependency.

From here patterns can evolve

② **enhance pedestrian infrastructure**
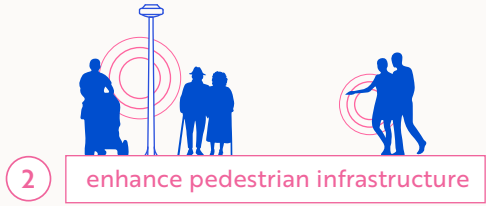
Based on the orientation and the location of important social functions, or future social functions, assign areas where foot traffic can be high and pedestrians and cyclists infrastructure therefore should be improved upon. Enhance pedestrian infrastructure by constructing, broadening or upgrading sidewalks, crosswalks, and pedestrian-friendly paths. Emphasise proper lighting, accessibility, and traffic calming measures to promote walking as a viable transportation choice.

Relates to pattern E1 and C5

③ **high quality public transport**

Work with local transit agencies to enhance public transit options within the neighbourhood. This means that public transport has to be both functional as well as attractive. Give public transport stations a design upgrade when possible. Increase the frequency and coverage of the metro and bus routes. Consider implementing shuttle services to connect the neighbourhood to key work destinations like industrial areas.

Relates to pattern E3

4 introduce shared mobility hubs

Introduce shared mobility programs in selected parking lots, starting with pilot projects to assess the ideal model and expanding based on evaluation and demand. Launch educational campaigns to raise awareness about the benefits of shared mobility. Emphasise cost savings, congestion reduction, environmental benefits, and enhanced mobility options. Conduct workshops, distribute materials, and organise community events to familiarise residents with shared vehicle usage.
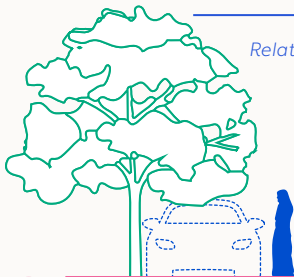
Relates to pattern E2

5 redesigning new porosities

Introducing shared mobility not only provides sustainable transportation options but also presents an opportunity to reconfigure the urban landscape. By reducing the need for private vehicle ownership, shared mobility can help free up space traditionally dedicated to parking. Identify designated areas where street parking can be eliminated. Designate these zones as car-free or pedestrian priority areas. Convert the reclaimed parking spaces into green spaces or seating areas for community engagement. Enhance aesthetics with greenery, trees, and urban gardens for improved air quality. With reduced parking demand, some car repair shops may become obsolete. Consider repurposing these spaces to serve the evolving needs of the community. Transform them into makerspaces, that foster local entrepreneurship and social interaction.

Relates to pattern E4 and E11
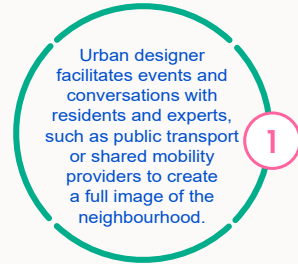
1 Urban designer facilitates events and conversations with residents and experts, such as public transport or shared mobility providers to create a full image of the neighbourhood.

Deciding on the direction
Phase I

▶ interviews
▶ spatial analysis
▶ citizen input sessions

2 **3** Urban proposals should involve input from residents and local businesses. Approval needs to be obtained from municipality and mobility providers. This can also be the time to do pop-up interventions and evaluate.
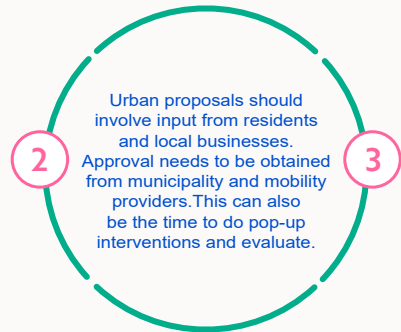
Setting the foundation
Phase II

▶ place-making interventions and redesigns.
▷ citizen input sessions
▶ large-scale investments

4 **5** Collaboration between municipality, shared mobility providers and local residents. Urban designer helps locating porosities and intervention sites. Evaluation at multiple points in time.

Empowerment for lasting impact
Phase III

▶ place-making interventions
▶ commitments & collaborations
▶ large-scale investments

115

A balanced and connected streetscape

Imagine a vibrant future for Bloemhof and Tarwewijk, where the roar of engines fades into the background and where th sounds of nature and people can prevail. In this transformed landscape, the design of public spaces holds the power to turn these neighbourhoods into examples on how to relinguish the dominance of the car and give back space to the people. Through a balanced and connected streetscape, these transformed communities foster not only sustainable travel but also the flourishing of social interactions.

balanced streetscape

In the reimagined version of Bloemhof and Tarwewijk, the car assumes a submissive role instead of being dominant in the streetscape. This will create space for symbolism that encourages human interaction and engagement with nature, rather than symbolism related to personal gain. Through traffic calming measures and the transformation of parking areas, a more balanced streetscape has been achieved.

ensuring mobility

In this future, displacement due to mobility limitations will not be tolerated. While an ideal scenario would involve bringing work closer to people, a more realistic future will still entail travel beyond neighbourhoods. Time becomes crucial in facilitating the transition in which the car becomes less dominant. A smoothened transition is phased and provides high quality alternatives to private car ownership.

collective movement

Instead of private car ownership, communal mobility has become the norm. Throughout the neighbourhoods visible and attractive testing grounds for shared mobility services will have emerged, allowing for a mobility solution that will fit the locals needs and reduces the need for private car ownership. The public transport stations are no longer a place of disrepear, but have become appreciated places within the neighbourhood, improving the image of public transport altogether.

The aim of mobility design is to achieve a harmonious streetscape where the dominance of cars is not overwhelming, but instead encourages coexistence. By prioritising modes of transportation that are communal and sustainable, urban design can make it effortless and appealing to choose environmentally-friendly transportation options.

pedestrian first

At the same time, the visibility of pedestrians and cyclists is being promoted. By redesigning sidewalks and prioritising pedestrian safety, streets with social functions have become vibrant pedestrian-priority areas bustling with activity. Bicycle parking infrastructure has been introduced througout the whole neighbourhood to promote bicycle usage. Car parking, on the other hand, has been reduced by reimagining the space as porosities that can be turned into public spaces for the community. This way mobility will have obtained a social meaning, facilitating community interactions. Pedestrian-priority will also be expressed through the redesign of public transport stations.
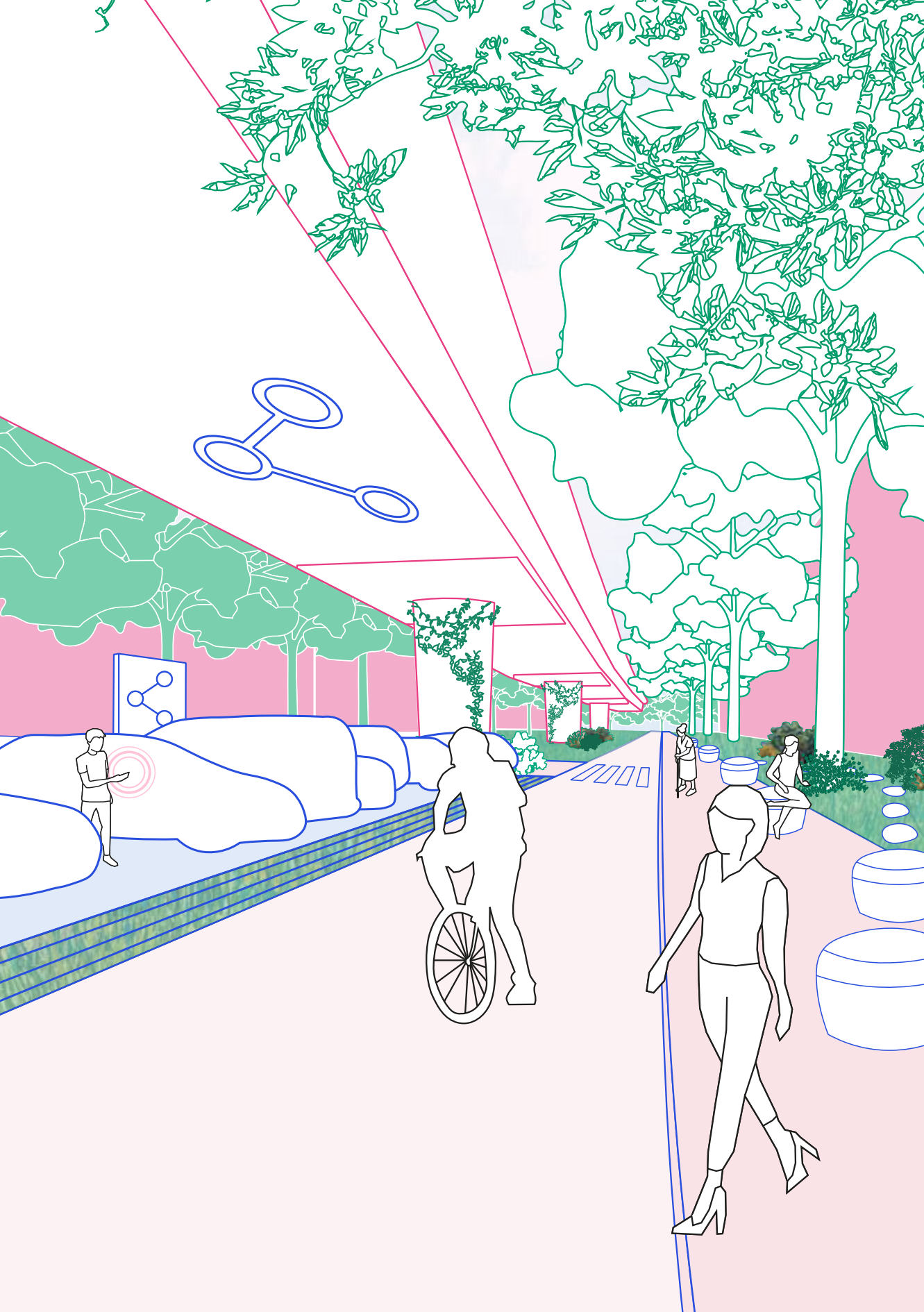
Opportunities for sustainable mobility

3.23
Spatial
opportunities in
Bloemhof and
Tarwewijk for
everyday mobility
decisions

The map of spatial opportunities in Bloemhof and Tarwewijk shows how the existing and potential spaces in the neighbourhoods can be used to foster sustainable mobility choices and meet the before-mentioned design criteria. The map emphasises how the transformation of existing spaces, such as parking lots and streets can result in a more friendly climate for pedestrians. Pedestrian streets or heavy traffic calming make most sense around spaces that carry a social function, such as playgrounds and community centres. The main streets of the neighbourhood require special attention towards traffic calming. The existing public transport stations are highlighted as points of attention in terms of quality of design. This requires special attention towards safety, but also image. Shared mobility hubs are proposed at places where there is a parking lot, using the existing structure. The map is based on the previous chapter's of analysis, interviews and theory.

0   100 m   1000 m
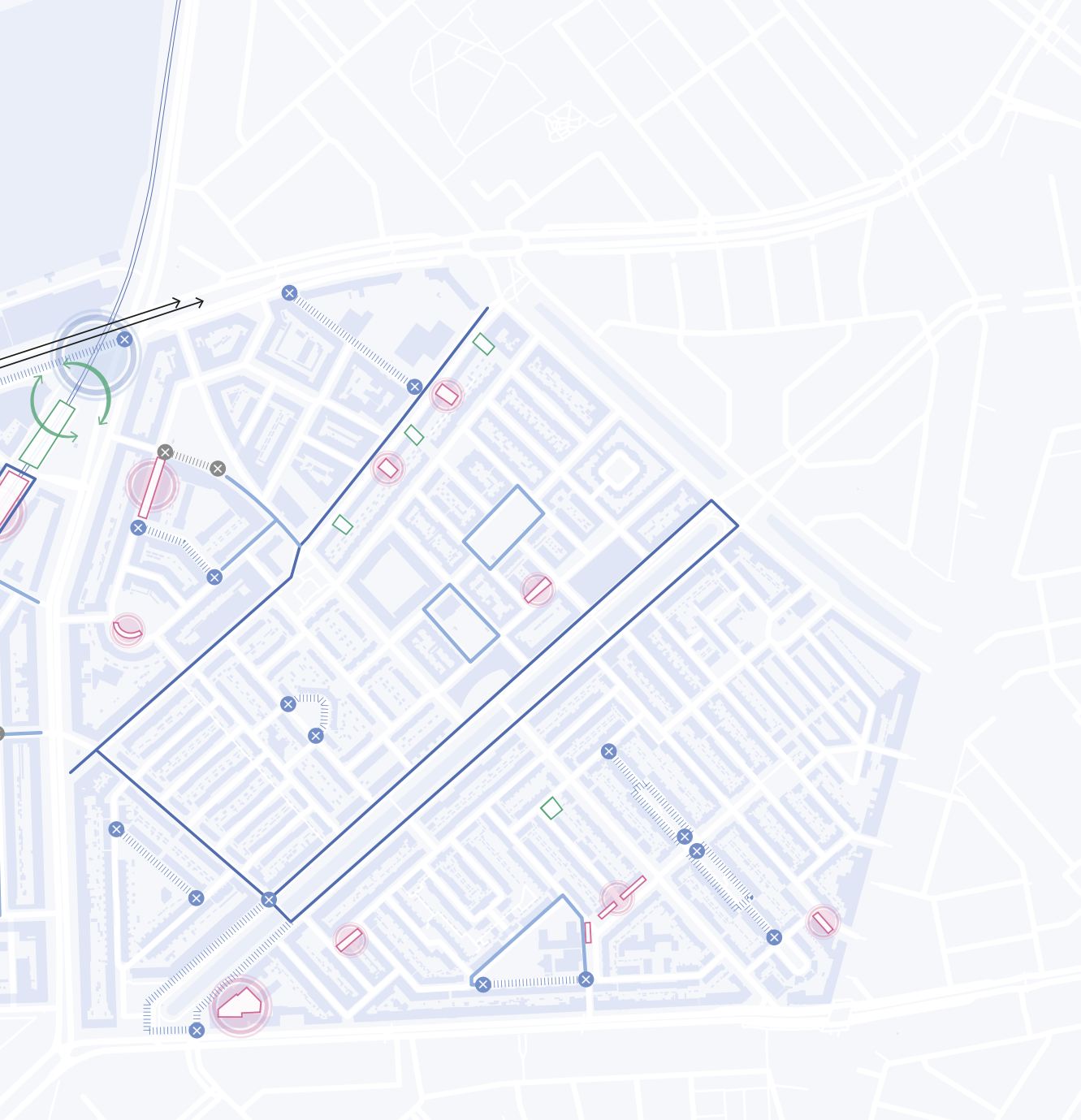
- parking lots to public space
- shared mobility parking
- traffic calming
- traffic calming - more space pedestrians
- pedestrian street
- block entrance car
- existing pedestrian street
- existing block entrance car
- connecting public space
- attractive public transport station
- shared mobility zone
- ↔ redirecting traffic

Design to
reduce littering

Litter on the streets is one of the main eyesores for locals in Bloemhof and Tarwewijk. Design could be a tool to address this issue and improve the overall quality of the public space.

The Dutch Association for waste and cleaningmanagment published a report in which strategies are approached to manage littering in specific in proximity of waste disposals (NVRD, 2021). The first step to reduce littering is dependent on the basic waste facilities in the neighbourhood. The criteria for a well-designed waste facility are based on service, communication, facilities and environment.

The service towards the end-users should be provide as much ease as possible. For example, making an appointment to pick-up waste could be considered as a barrier for a lot of people, especially for those that are not fluent in Dutch. To make disposal of waste effortless, the proximity in terms of accessiblity and density should be sufficient. The lack of closeby appropiate recycling facilities have proven to decrease people's intention to recycle (Lange, Brückner, Kröger, Beller and Eggert, 2014), playing into the bias of ease. When there is littering, the quantity of waste disposals should therefore be reconsidered (Gemeente Schoon, 2011). As socio-economic conditions influence waste generation, the context of a solution is highly important (López-Mosquera, Lera-López and Sánchez, 2015). A fruitful example of a context-specific solution is the distribution of small disposal bins in Carnisse, which could be placed at informal public places. This action reduced litter around semi-private areas. places.

Communication towards residents about expectations on waste managment should be clear (NVRD, 2011). In the communication, barriers such as language should be well-considered and played into. Communication should be clear and far from complex. Communication does not have to be verbal, but can also be done through design.

Waste disposals should be user-friendly, meaning that they should be visible, recognisable and attractive (Gemeente Schoon, 2011). Attractiveness can be considered in terms of functionality, but also through visual aestethics. The appearance of waste disposals can influence the way people use it (NVRD, 2021). Broken, dirty and visually unattractive recycling containers should be cleaned or replaced, ensuring that the facility is clean and inviting for use. To enhance visual attractiveness, colours and form can be used to make recycling containers more unique. A way to approach this is by involving residents in the design of waste disposals. Green and blue are colours that haven proven to be associated with cleanliness (Gemeente Schoon, 2011).

Not only does the design of the waste facility itself influence use, so does the design of the adjacent environment. The point of disposal should be accessible and well-maintained. The broken-window theory explains this concept of 'clean keeps clean' and emphasises the importance of the general quality of an environment. Social norms can be created through the maintenance of the streets, greenery and nuisance from other objects around the disposal.

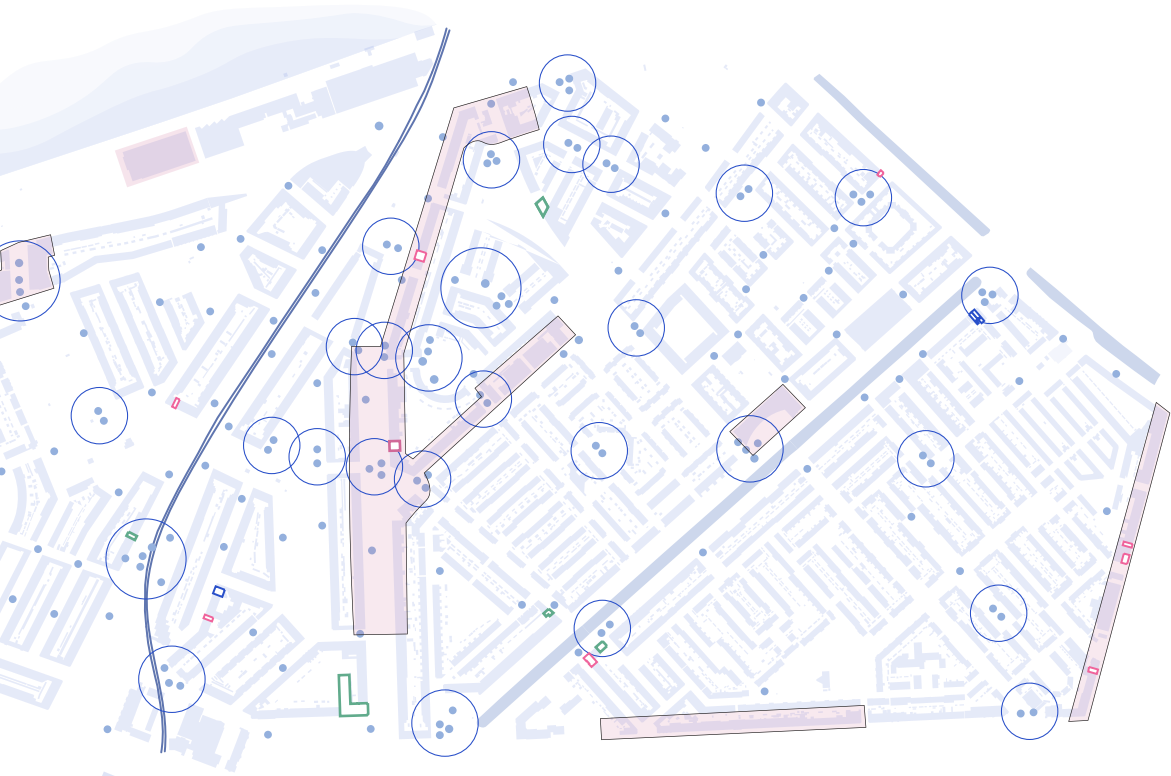# From consumption to disposal

In Bloemhof and Tarwewijk, the amount of waste on the streets stands out in terms of unsustainable behaviours. The upcoming section delves into why this becomes a problem for the neighbourhood and explores the available options for local inhabitants to consume goods, dispose of waste, recycle, reuse, and repair.

3.24
Map consumption, recycle, repair, reuse and disposal opportunities in Bloemhof and Tarwewijk

Disposal convenience

After having used a product to its intended potential, waste is generated. While disposal starts in the private sphere, waste disposal is also observable in the public sphere. As can be seen in the figure on the right, waste disposals are spread throughout the neighbourhood. From the map it becomes clear that the distribution of disposal nodes is not even. In the zones where consumption takes place, such as the Dordtselaan, there is a high concentration of waste disposal nodes - residents do not have to travel far to get rid of their waste. However, when looking at other parts of the neighbourhoods, the distribution becomes more sparse. In the case of the south of Bloemhof, waste is disposed in private house containers, which are visible in the front yards in the streets. Therefore there are presumably less public waste disposals required. For bulky waste people have to either travel to a recycling facility or make an appointment with the municipality.

commercial zones
car services
repair services and shops
secondhand stores

waste disposal
waste disposal node
= > 2 types of waste disposal

0   100 m   1000 m

▷ Increasing convenience

To address the substantial waste in the neighbourhood, more waste disposal facilities are needed, based on feedback from local residents.

Each community faces unique waste challenges influenced by socio-economic factors and language barriers (López-Mosquera, Lera-López, and Sánchez, 2015). Therefore, customised approaches are crucial to meet the specific waste management requirements of each neighbourhood, improving overall quality of life.

In Tarwewijk, the excessive accumulation of bulky waste is a particular concern. To overcome residents' reluctance to schedule waste pick-ups, fixed pick-up points can be established, following successful practices observed in Amsterdam (see Appendix III). Regular collection and visible disposal facilities ensure cleaner streets.

Dog waste management is also a prevalent issue in both Bloemhof and Tarwewijk. Providing dedicated stations with bags and proper disposal facilities, as suggested by a local resident, is an effective measure to reduce dog waste and maintain a cleaner and hygienic environment.
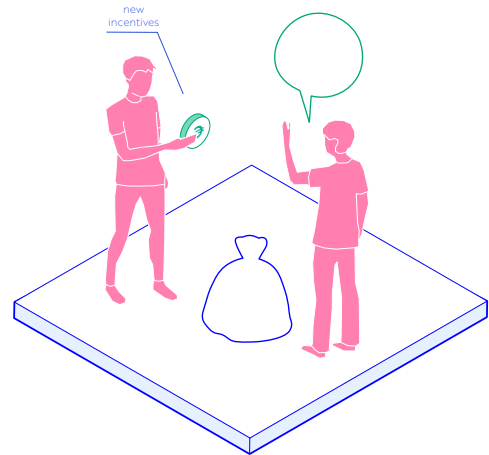
Pattern E6   Socialising waste
► Socio-economic conditions influence waste behaviours.
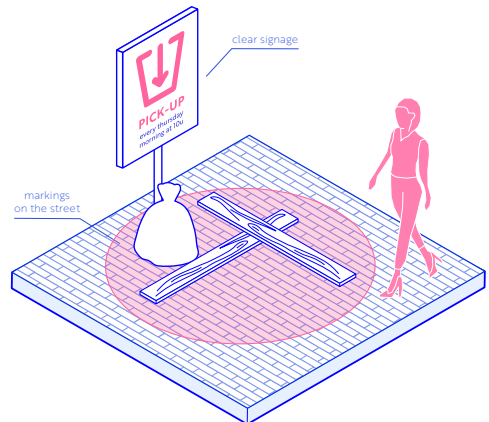
Pattern E9   Trash walk
► Appointing fixed places and fixed pick-up times for bulky waste in a neighbourhood will not only reduce waste in the streets, but also provides opportunities for sharing.

3.25
Throughout the neighbourhoods, pieces of old furniture, broken electronics and scrap materials are found.

Recycling is unappealing

While increasing recycling opportunities will as research suggests have some positive effect on recycling behaviours, it will not solve all problems. Another spatial aspect that can be looked at is the state of recycling containers in terms of quality. Upon visiting the neighbourhood, it becomes apparent that little attention has been given to the design of recycling locations. Underground containers disrupt pedestrian space and lack inspiration, while others have been carelessly placed in public areas, exposing old and dirty steel structures. The lack of care that has been put towards this spaces is mirrored by a lack of concern by residents to take care of the place, as made apparent by the trail of garbage surrounding most recycling containers.

"The trash in the neighbourhood says a lot about how public space is treated."

Resident Tarwewijk
Samenhuis Ernaast

▷ Reinforcing social norms

To promote recycling behaviours, it is crucial to establish social norms and implement thoughtful design strategies that enhance the physical quality of public spaces. Current recycling locations often lack visual appeal, which undermines the perceived importance of recycling. By intentionally designing recycling places that convey the significance of recycling, a mindset can be cultivated that recogniszes its vital role in sustainability.

In terms of maintenance after a redesign, the primary responsibility lies with the municipality and its waste management department. They should prioritise the cleanliness and prompt repairs of public spaces. While residents can contribute by properly utilising trash and recycling bins, the main focus should be on creating an environment that motivates and supports responsible waste management. The municipality should ensure the placement of an adequate number of bins.

Community events, such as the OpzoomerMee event in Rotterdam, can be utilised to actively engage residents in their living environment and raise awareness about the importance of cleanliness and maintenance. By organising such events and promoting community participation, the municipality can foster a sense of collective responsibility and strengthen social norms related to waste management.

recycling opportunities

clean and maintained
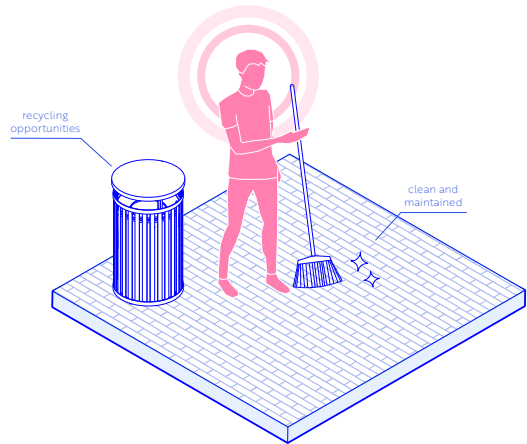
Pattern E5   Clean streets, green mind
► People feel attached to well-maintained environments, leading to both safety and pro-environmental behaviours.

well-maintained

container gardens

place-making
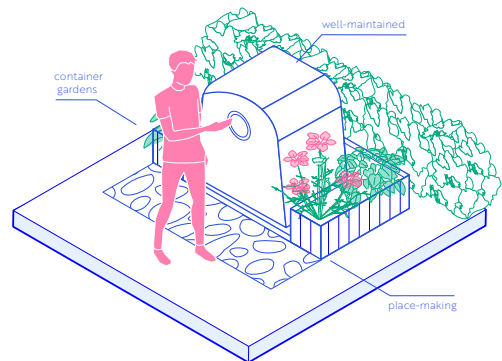
Pattern E7   Happy recycling!
► An attractive design of recycling containers and its surroundings helps to reduce littering.

De kleine chimpansee
Bo Buijs

laat me ooit meer rrassen

KIN EN Z gaan op k

Selma Noort
k je spook lenen?

de Zwaantjes

Sustainable consumption

The Taskforce on Sustainable Lifestyles, in collaboration with the United Nations Environment programme, (2018) did a research on sustainable lifestyles in which they elaborate on a shift towards sustainable consumption. In the following section, the meaning of sustainable consumption will be further explored.

In contemporary neoliberal society, economic growth and the accumulation of material goods are often seen as indicators of societal success. However, as planetary limits are being approached, it becomes necessary to critically evaluate whether current consumption patterns can effectively meet future needs. Sustainable consumption offers an alternative framework that prioritises the improvement of overall well-being within the ecological boundaries (Lerch, 2017).

A toolkit has been developed to promote sustainable consumption practices, encompassing the following principles: an absolute reduction in energy and material consumption, a shift in values from material wealth to human well-being, technological innovation to mitigate environmental impact, recognition of the need to address consumption disparities in marginaliszed communities, and a transformation of the economic system. Unlike circular economy and waste management approaches, sustainable consumption goes beyond managing product cycles and focuses on transforming consumer behaviour (see figure below).

Relevance to vulnerable neighbourhoods

For the adoption of sustainable consumption behaviours, it is essential that they resonate with diverse individuals and households, including those characterised by excessive consumption and those facing financial constraints. By embracing sustainable consumption practices that cater to the daily requirements of residents in vulnerable neighbourhoods, it is possible to reduce the ecological footprint while simultaneously enhancing overall quality of life. In a more vulnerable context, this involves providing viable and sustainable employment opportunities, as well as addressing basic household needs through practices like sharing initiatives.

1 reduction of the amount of materials and energy consumed
more efficiently made products, reduction purchased goods

2 reuse of products and materials
reused material stores, remanufacturing businesses

3 repair and maintenance of products to extend their useful life
repair businesses, repair cafes and fix-it clinics

4 sharing of products, services and land, including borrowing and renting
tool and other lending libraries, clothing swaps, community gardens

5 use of durable, long-lasting and upgradable products and materials
more durably made goods, goods that are more repairable

6 use of lower-impact, equitably sourced products made using materials and resources that are renewable, can be replenished and less toxic than conventional materials.

3.27
Practices of sustainable consumption
(Adapted from Lerch, 2017)

The practice of sharing

In the neighbourhoods of Bloemhof and Tarwewijk, the options for purchasing goods are relatively limited within the local borders. However, the proximity of the Zuidplein shopping mall encourages larger-scale consumption. Most of the places where consumption occurs in these neighbourhoods are located along the streets, with a focus on everyday goods like groceries. To address sustainability and affordability concerns, second-hand stores play a significant role as they offer a form of "green consumerism" and meet the local demand for affordable alternatives. These stores serve both environmental and social functions, although the options for second-hand purchasing are still somewhat limited.

▷ The practice of sharing

To promote a more sustainable and affordable lifestyle, it is important to explore alternatives to traditional purchasing. Sharing culture already thrives in the neighbourhood, with residents engaging in various sharing practices. Sharing cabinets and community spaces, such as de Speelplaats, facilitate borrowing of items like tools for gardening, DIY projects, and sewing.

By shifting the emphasis from individual consumption behaviours to community-based sharing behaviours, the consumption of goods can be reduced and community sharing can be scaled up (Cooper, 2017). This can be translated into practice by emphasising communities with a natural potential for sharing. Sharing becomes a meaningful way to meet the affordability needs of a significant portion of the Bloemhof and Tarwewijk population. It not only promotes environmental sustainability but also fosters social connections within the community.

Community cupboards present a promising avenue for expanding accessible sharing within the neighbourhood. These cupboards can be customised to meet the specific needs of local residents, further enhancing the culture of sharing and reducing the reliance on traditional purchasing. By embracing sharing as an alternative to consumption, the neighbourhoods can foster a more sustainable and interconnected community.

neighbourhood pantry

sharing cupboard

ensure visibility

>1.8m sidewalk

Pattern E9   Sharing = caring
▶ Street libraries at the corners of the street promote sustainable consumption and by visually creating opportunities for the practice of sharing.

scrap
materials

tools

books

food

housegoods
and toys

clothes
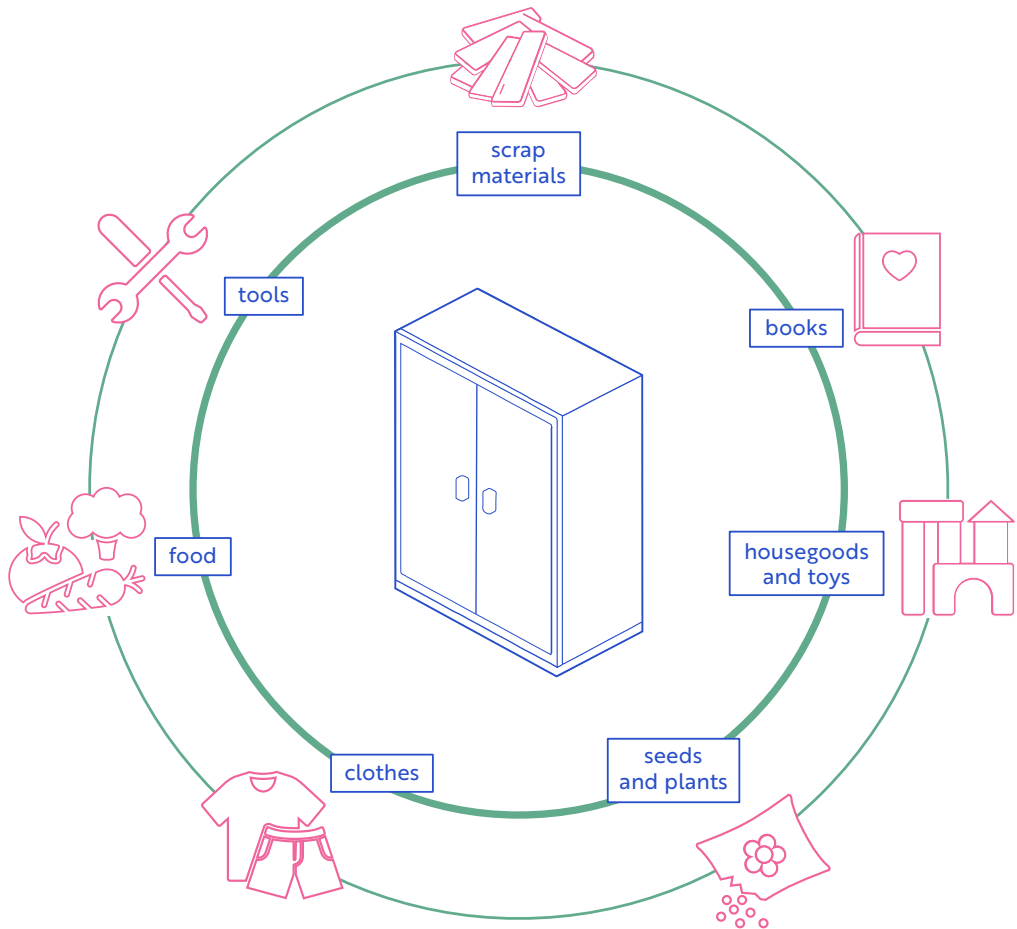
seeds
and plants

Creativity and craftmanship

During a dialogue with a local resident, it was revealed that the neighbourhood possesses a wealth of underutilized skills, particularly in manual craftsmanship. This chapter aims to explore the creative and craft-oriented aspects of the community, focusing on the repair and recycling of products that would otherwise go to waste.
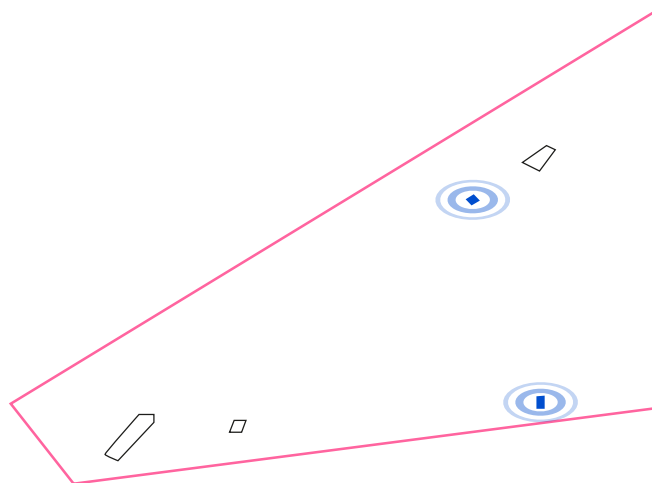
Creative hotspots

Affordability is an important factor to take into account when considering the everyday choices that people make in Bloemhof and Tarwewijk. Affordability becomes especially significant through consumption, as sustainable and durable products often do not come cheap. When one does not have too much money to spend, it seems that there are two options when something is broken: either buy a cheap and wasteful replacement or repair said product. Repairing is a more sustainable approach to consumption, and can help to achieve environmental and social goals.

The repair shops in Bloemhof and Tarwewijk offer a variety of services, such as clothes repairs, electronics repairs or furniture repairs. Striking is the density of car repair services in the neighbourhoods. The repair shops have been indicated in the figure on the right. With this, also the creative hotspots have been

highlighted. The creative hotspots are places where activities take place that focus on skill-building and craftmanship, like woodwork, gardening or sewing. Through these places of creativity, community innovations can be facilitated (Cooper, 2017). The skills that exist in these places can, through organised efforts, become spread throughout the community.

▷ **Providing places for skill-building**

The main barrriers for community innovations are limited funds, time and space (Cooper, 2017). Through design, places can be provided

■ creative hotspots
■ repair shops
□ car repair shops

3.29
Creative hotspots and places of repair in Bloemhof and Tarwewijk

Cultuurwerkplaats Tarwewijk

Robinhood Rotterdam

Creative Factory

clubhouse CreatiefBeheer

community centre Irene

SKAR ateliers
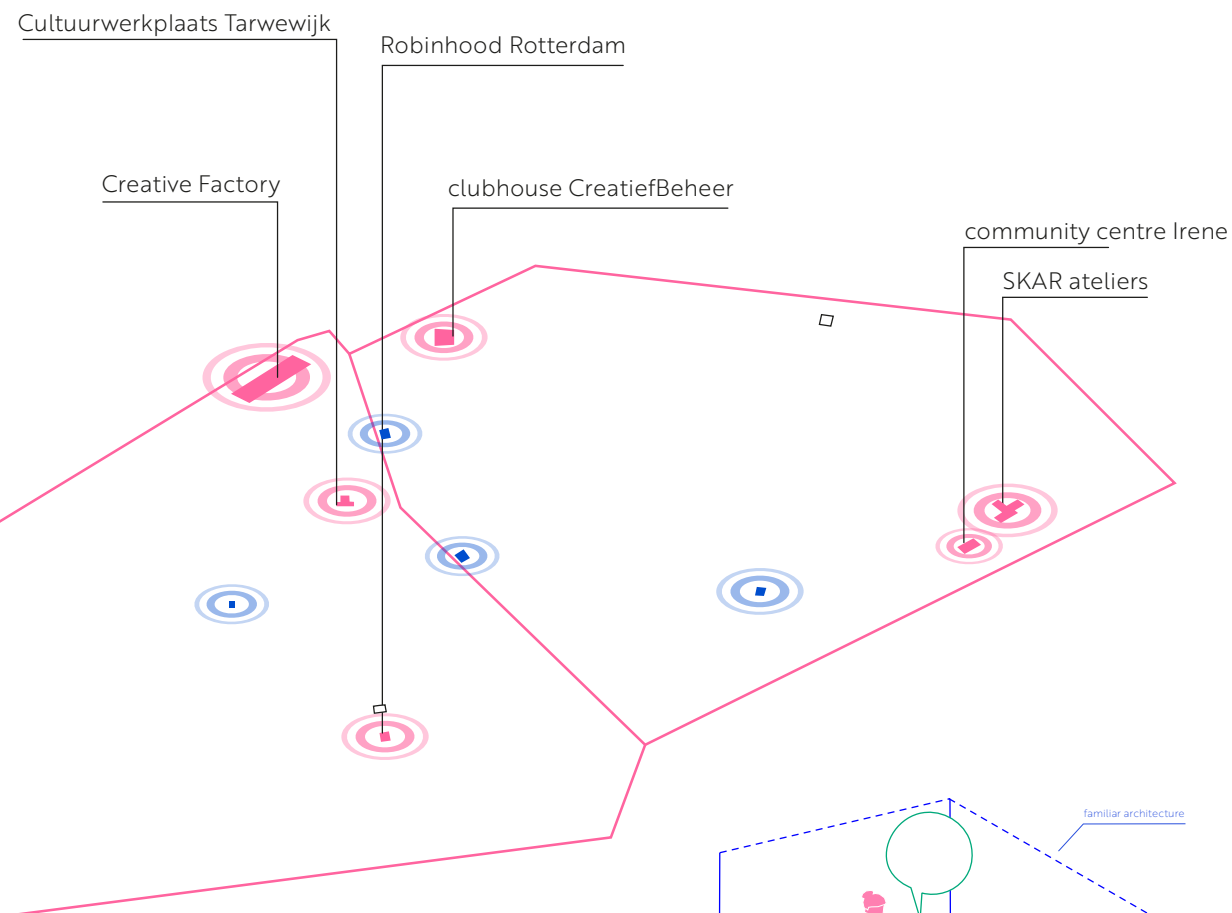
in which creatives and locals can come together to built or utilise skills. These places can take on the form of workshops or repair cafes. Next to a purpose of sustainability, such workplaces could also bring social gain, as through repairing activities a new sense of purpose can be brought to many people in the neighbourhoods that are currently distanced to the labor market (Pluspunt Rotterdam, n.d.). Existing places can be improved or made open to the public by collaboration, but also possible future porosities such as car repair shops can be utilised to create workshops for the community.

familiar architecture

workspaces

tools
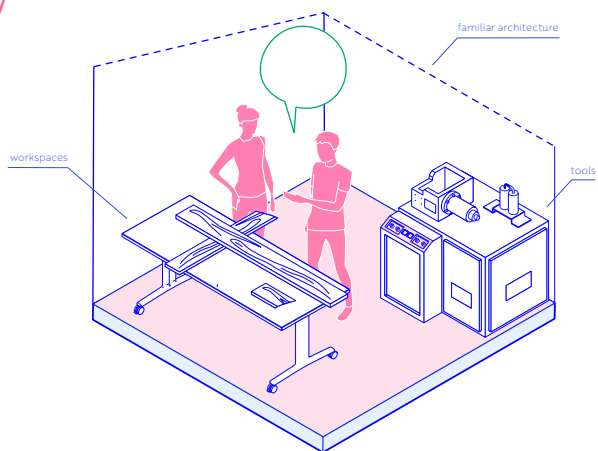
Pattern C10   Revival of the apprentice
► Opening neighbourhood workshops can generate social and environmental value by the promotion of sharing and repairing actions within a community.

Werkcentrum Pluspunt

Pluspunt Rotterdam is a work centre for residents of Rotterdam who need a helping hand, and for those in Rotterdam who want to contribute. In their workshops, they work towards a better life for everyone. There are two locations: Pluspunt Noord and Pluspunt West. Additionally, we offer vocational training programs in collaboration with social entrepreneurs in M4H.

The workshops of Pluspunt in Blijdorp and Delfshaven are inclusive spaces where individuals from diverse backgrounds come together and collaborate to create a better life.

The workshops serve as protected learning and work environments, providing opportunities for individuals in residential, care, or reintegration programs to work as cooks, artists, woodworkers, or bike mechanics. Here, they can focus on their recovery and personal development. Furthermore, these spaces function as activating learning and work hubs for individuals facing significant challenges in the job market. Participants engage in activities aimed at obtaining qualifications that will enhance their position in the workforce. In addition, these workshops offer a valuable platform for experienced ship welders, carpenters, and other skilled volunteers to share their expertise and pass on their knowledge to others. Lastly, they serve as creative havens for artists, architects, and professionals who collaborate with the participants, collectively striving to contribute to a better life for everyone.

It is because of this that the workshops from Pluspunt are inspiring examples of repair - both for objects as well as people. They serve as a model for creating positive change and improving lives in vulnerable neighbourhoods.

natural
light

new types
of repair
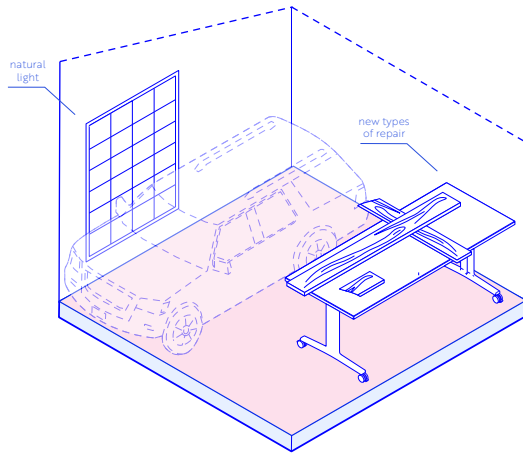
Pattern E11   Upcycling garages
► Car repair shops can be repurposed to become
typologies of repair workshops, promoting
sustainable repair practices.

complement surrounding
environment

place with
foot traffic
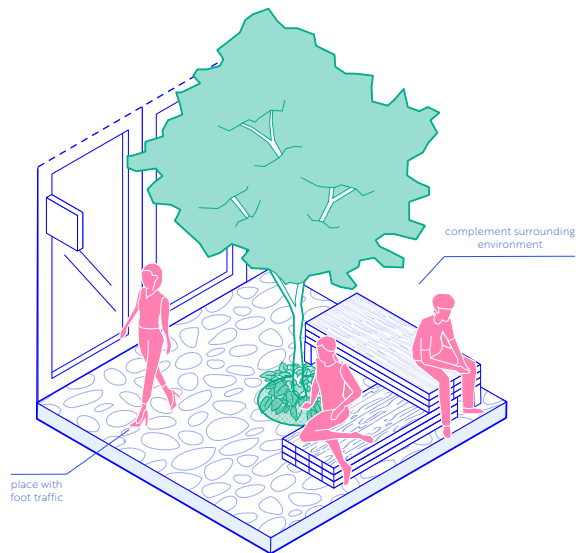
Pattern E12   The new green aesthetic
► Recycled furniture displays in commercial
zones promote pro-environmental behaviour by
showcasing waste materials' potential for stylish
and functional use.

► **What if**

Everyday decisions

A practice of sharing and repairing becomes second nature to communities through a focus on eco-friendly disposal, recycling, and conscious consumer choices in public space. New life can be brought to old objects, repurposing materials and harnessing the skills and resources of local communities. Together, waste can be minimised and resources maximised.

tools

seeds and
plants

food pantries

books

clothes

housegoods
and toys

scrap
materials

community
cupboards/
libraries

workshops for
skill-building

repair
cafes

**reparation
of goods**

**sharing
of goods**

**sustainable
materials**

recycling
station

**reuse products
and materials**

**sustainable
consumption**

**provision of
waste services**

quantity
disposals

facilities
tailored to
context

design to
reduce littering

everyday
decisions
consumption

**environment
of waste facilities**

clean and
well-maintained

materiality
streets

maintenance
greenery

**attractive
waste facilities**

usability

aesthethics

clean and
well-maintained

unique colour
and form

areas of focus

inclusivity

sustainable behaviours

Designing for sustainable consumption

So how can sustainable consumption behaviours be achieved through a redesign of the neighbourhood? In this chapter, the design criteria that enhance green consumerism opportunities and have a positive effect on the treatment are proposed. These criteria are a result of the analysis done on the previous pages and the lessons that have been learned from the theory. From these criteria, actions can be derived that can be turned into a pattern language.

Sustainable consumption in vulnerable neighbourhoods can be approached through two main topics: the use of goods and the disposal of waste.

The latter has been proven to be a main point of attention in Bloemhof and Tarwewijk. Even though waste behaviours are partly a result of social norms, spatial norms can help to navigate the neighbourhood towards being a cleaner place. While the current waste solutions might work in other neighbourhoods, the status quo requires a more hands-on waste managment approach, demaning special attention towards the provision of waste services and the design of the faciltiies and its environment. Hereby a careful evaluation of the specific problems needs to be done and tailormade solutions need to be proposed.

In terms of consumption patterns, affordability is a main component for consideration. People simply do not have enough money to buy new products that have been named sustainable. Rather, they have to do with the means that are available. The community can be an important tool to support more sustainable consumption patterns by means of sharing. Additionally, there is potential in repairing goods by utilising creativity and practical skills, which many locals already possess, because of their work background.

Designing for a community that promotes sustainable consumption patterns has to be done through both external and internal motivation. Education and exposure to the concept of sustainable consumption can help to set up a community for succces. Creating the affordances and the architecture to support this, however, is as important. Through the design of the public space, positive messages on sustainable consumption and littering can be spread.

Embracing green consumerism

This strategy empowers communities to foster sustainable consumption habits by integrating the culture of sharing and repairing through phases. By following these steps, neighbourhoods can embrace an eco-friendly, inclusive, and economical approach towards consumption patterns, especially benefiting those with limited financial resources.

2 improve image daily waste

Improve quality of existing waste disposal (zones) by maintenance and redesigns, prioritising accessibility and usability. Improve the quantity and quality of daily waste disposals by addressing the surrounding environment. Implement site-specific solutions based on neighbourhood needs, such as pick-up points for bulky waste or dog poop stations. Organise events like neighbourhood clean-up days to foster a positive image, while ensuring consistent municipal maintenance.

Relates to pattern E5, E6, E7 and E8

1 assess the current state

Engage residents through meetings, surveys, and workshops to grasp their needs and challenges regarding consumption and resource access. Examine the socio-economic context of the neighbourhood, including income levels, employment opportunities, and access to services. Identify key stakeholders, creatives, and relevant spaces. Assess existing spatial resources, such as the waste managment system, community centers or vacant buildings, for repurposing. Evaluate suitability, accessibility, and potential of these spaces for interventions.

Relates to C1

3 network of sharing

Locate existing street libraries and cupboards, improve their accessibility by design. Identify suitable locations within the neighbourhood to expand the network of sharing libraries. These can be at highly social spaces or at points of intersection, such as streetcorners. The sharing libraries will serve as repositories for sharing various resources such as books, tools, kitchen appliances, and toys. Neighbourhood pantries can become more specific sharing points for produce and other food related items.

Relates to pattern C6 and E9

4 community tool stations

Designate specific areas in the neighbourhood as tool stations where residents can borrow tools for DIY repairs, gardening, or small-scale construction projects. Think of places such as community centres. Equip these tool stations with a variety of tools and ensure they are well-maintained. Offer training workshops to educate residents on tool usage and safety.
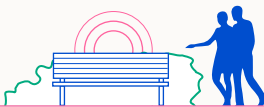
Relates to pattern E9 and E10

5 places of social repair

Identify spaces within the neighbourhood to establish community workshops. These workshops can be utilised for skill-sharing sessions, repair cafes, upcycling workshops, and other activities that promote sustainable consumption. Engage with local artisans, craftsmen, and experts who can lead these workshops and provide training to residents. Ensure that these workshops are besides a place for work, also a place for social interaction. To promote sustainable material use, create recycle hubs at these workshops.

Relates to pattern E10 and E11

6 display of repair culture

Display the repair and recycle culture by placing art and street furniture in public space that has been made by local residents in the neighbourhood workshops.

Relates to pattern E10, E11 and E12

3.31
Strategy everyday decisions consumerism in phases

1 Urban designer facilitates events and conversations with residents and experts, such as local creatives and repairman, to create a full image of the neighbourhood.

Deciding on the direction
Phase I

► interviews
► spatial analysis
► citizen input sessions

2 **3** **4** Urban proposals should involve input from residents, and local businesses. Collaborations should be encouraged with the municipal waste managment, the municipality and community centres. Temporary interventions can provide feedback on site-specific solutions.

Setting the foundation
Phase II

► temporary interventions
▷ workgroups
▷ citizen input sessions

5 **6** Municipality and local creatives collaborate to create eco-social repair centres. Urban designer helps locating porosities and intervention sites. Promotion of places through events.

Empowerment for lasting impact
Phase III

► community events
► commitments & collaborations
► large-scale investments

Utilising resources and skills

Step into the reimagined world of Bloemhof and Tarwewijk, where these neighbourhoods become shining examples of eco-consciousness in disposal, recycling, and consumer choices. Embracing a culture of sharing and repairing, waste management and resource conservation take center stage in a holistic approach. Witness how these neighbourhoods showcase the benefits and beauty of sustainable living, offering inspiration for a greener future.

mindful waste

In the reimagined future of Bloemhof and Tarwewijk, waste disposal becomes an accessible and visually engaging experience. Disposal areas have been transformed into captivating spaces, moving from steel structures to places for greenery and arts, inviting residents to participate in responsible behaviour. Alongside traditional disposal methods, designated spots for bulky items spring up, freeing the streets from clutter throughout the week while inspiring creative repurposing and mindful consumption at all times.

sharing goods

The spirit of sharing thrives through street libraries and cupboards at points of intersection. These humble yet captivating nodes within the neighbourhoods make the act of sharing goods visible and accessible to all. Spread throughout the neighbourhoods, this network of shared resources fosters a sense of community, igniting connections among neighbours and inspiring a culture of generosity and mutual support.

neighbourhood pride

The urban landscape features the display of recycled objects and street furniture from the workshop, showcasing the use of sustainable materials and practice of repair. Through this awareness on recycling and resource conservation is promoted while, above all, instilling a sense of neighbourhood pride through local products.

In the redesign of Bloemhof and Tarwewijk environmentally-friendly disposal, recycling, and consumer choices will be prioritised. By working together and utilising the skills and resources of the local community members, a new practice of sharing and repairing can be cultivated.

from dispear to repair

A practice of repair addresses consumption and waste. This shift extends beyond environmental considerations, acknowledging the local need for affordability and fostering significant social impact. Traditional car repair shops and historical buildings transform into diverse repair and creation spaces. These workshops empower both creatives and everyday citizens, promoting recycling, repairing, and repurposing practices. Through the provision of hands-on learning, these workshops not only offer practical skills but also facilitate a sense of connection and opportunity for those who are marginalised within society. Participants have gained knowledge on how to recycle old items or construct new creations, contributing to a more sustainable lifestyle. Access to necessary tools and resources is available, encouraging community members to collaborate and support one another. Community centres become important support systems through the provision of tools, promoting sustainability and resource conservation.

3.32
Abstract representation of the everyday consumption decisions
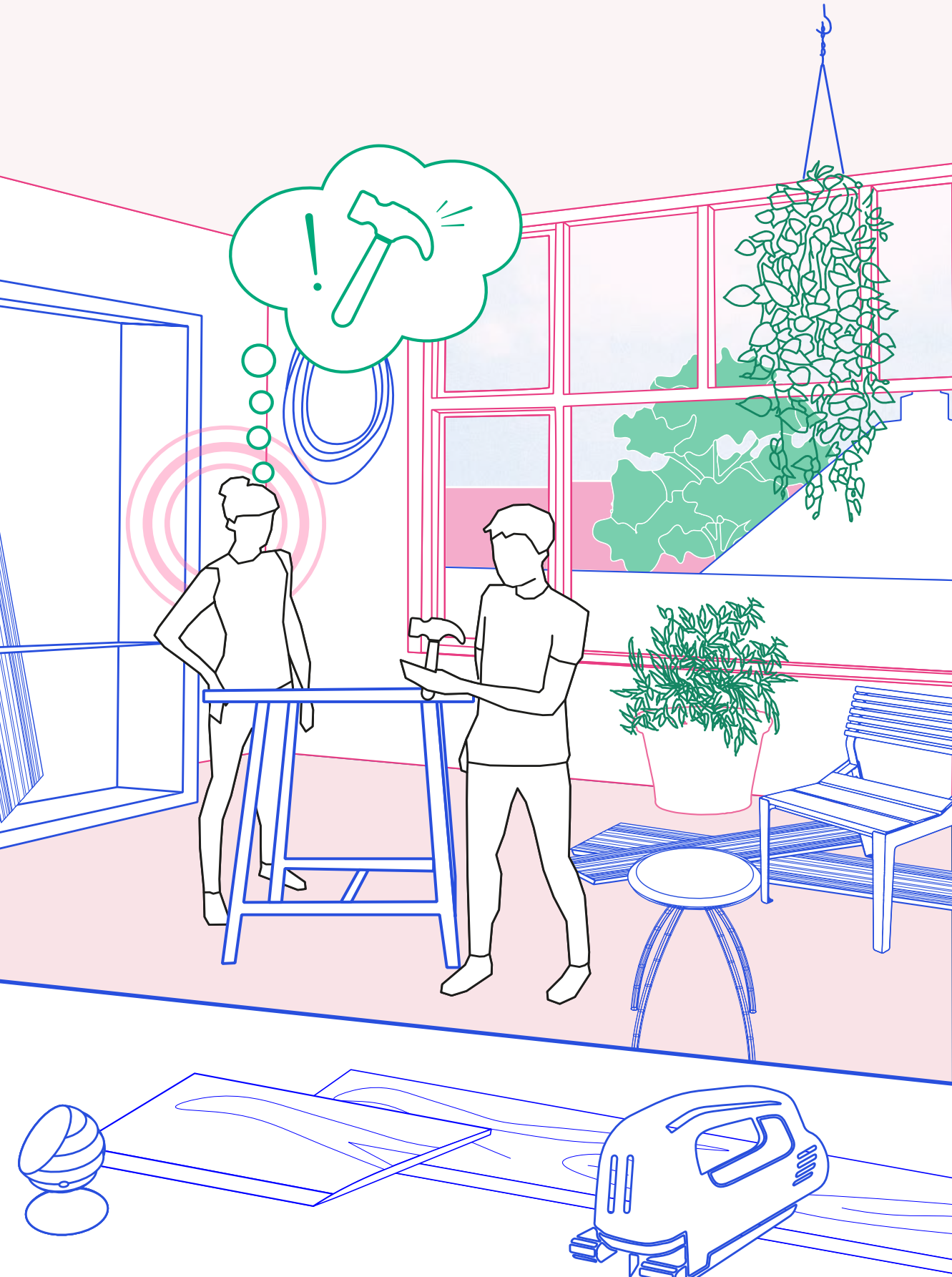
Opportunities
for waste reduction

3.33
Spatial opportunities
in Bloemhof
and Tarwewijk
for everyday
consumption
decisions

The map of spatial opportunities in Bloemhof and Tarwewijk shows how the existing and potential spaces in the neighbourhoods can be used to promote sustainable consumption, therefore reducing waste. The map emphasises waste disposal through existing zones, but also adding new potential places for waste disposal. Places for skill-building are found in the existing structure of the neighbourhoods: community centres, old architecturally interesting buildings and car repair shops. Streetcorners serve a purpose of emphasising a culture of sharing in a visual and accessible manner. Commercial zones are illustrated as places where skills can be showcased, to make people proud of what is made in the neighbourhood. The map shows how these elements can be integrated into the existing urban fabric of Bloemhof and Tarwewijk, to create more spatial opportunities for building a strong community foundation. The map is based on the previous chapter's of analysis, interviews and theory.
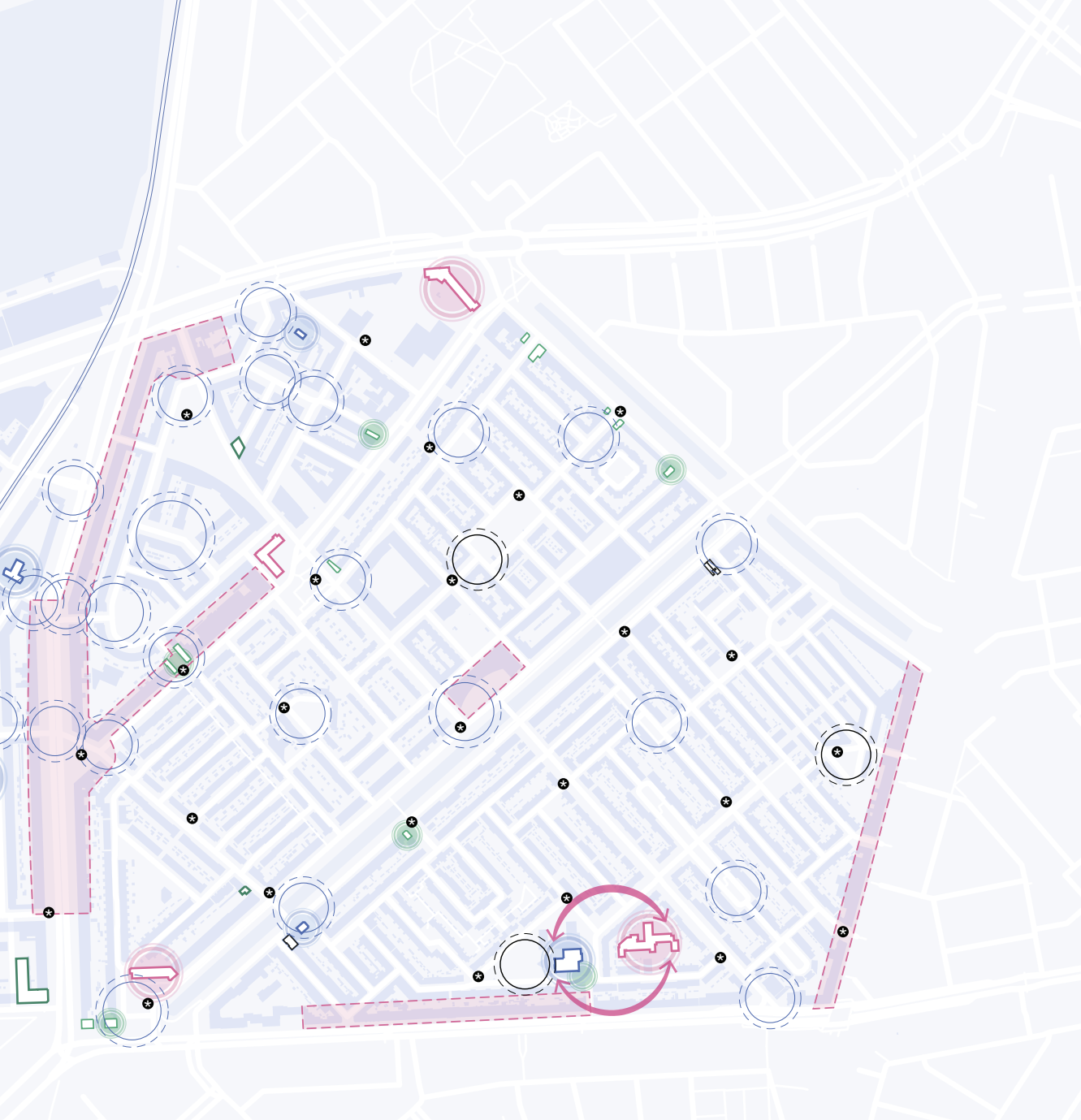
☐ car repair workshops	
☐ upgrade existing second-hand stores	
☐ neighbourhood workshops	◡ sharing and repairing hub
☐ tool distribution and sharing cabinets	◯ multifunctional zone - sharing and repairing
☐ corner street libraries	◯ multifunctional zone - social cohesion and tools
◩ showcase recycled street furniture	◯ sharing visiblity
✸ bulky waste collection site	◯ upgraded existing disposal zones
	◯ new disposal zones

0   100 m   1000 m

► What is

Recovery and protection

"Citizens consideration and engagement with local ecosystems. Addressing once again environmental issues, but moreso focussed on ecological aspects, such as biodiversity."

The quality of the natural environment can be considered through actions of recovery and protection. Recovery and protection actions are, like everyday decisions, based on values of conservation. It differs from everyday decisions by shifting the focus from resource conservation to ecological conservation. So, while everyday decisions typically are related to urban sustainability issues on the global level, recovery and protection decisions are orientated on improving and managing the ecological features of a particular location on the local level (Larson et al, 2015). Therefore, positive impacts on the process of climate-proofing the city can be expected. To achieve this, different approaches can be sought through the identification of particular resource systems, such as the support of ecological land managment- and development practices through activities such as gardening or the use of environmentally preferable materials in the city (EPA, 2005).

On top of the environmental gains of recovery and protection behaviours, social benefits can likewise be accomplished. Recovery and protection activities have a prositive influence on sense of responsiblity and will require a commitment from individuals or groups towards one another. (EPA, 2005). The participation in ecological activities will benefit the forming of stronger local communities and have proven to be strongly related to attachments to place (Larson et al, 2015). Interaction with nature or natural elements can foster people's connection with nature and therefore strenghten human-environment relations. Such place attachment appears as a significant indicator of environmental management, characterised by protective behaviours of the place. The bonds that people foster with their environments help as a source of a state of mind in which commitment, responsibility and management of place become significant (Junot et al, 2018).

Green proximity

In order to comprehend Bloemhof and Tarwewijk's relationship with nature, it is necessary to take on a wider perspective. These neighbourhoods are situated in Rotterdam, which enables a larger natural ecosystem. The way in which these neighbourhoods interact with nature can therefore be linked to a broader context.

Green in the neighbourhoods

In the map on the right, the percentages of green areas in Rotterdam neighbourhoods are illustrated. It becomes clear that Bloemhof and Tarwewijk belong to the section of neighbourhoods that have relatively little greenery, with only 10-20% of the neighbourhood being classified as 'green'. This lack of greenery has an impact on the microclimate of these neighbourhoods, leading to higher risks of the urban heat island effect, air pollution, and decreased biodiversity. As mentioned in the problem field, these neighbourhoods are particullarly vulnerable to local climate effects. Improving upon the amount of greenery in the neighbourhood would therefore not only have an environmental effect, but also social effect.

In the figures on the left the material makeup of the neighbourhoods have been further defined according to three categories: trees, low greenery and stone. What becomes clear is that both neighbourhoods are somewhat well represented with trees in the public sphere, but low greenery is limited. Most of the public sphere, about 70% consists of stoney surfaces.

Tarwewijk

% stone
% trees
% green

Bloemhof
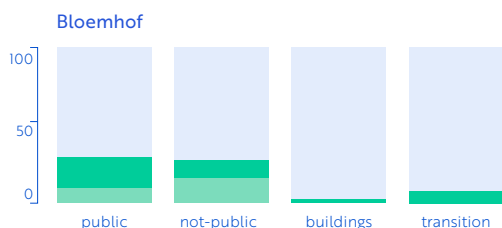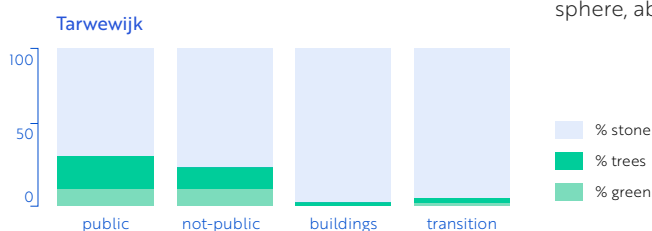
3.34
Indication of green according in the functional zones of the public, private, built and transitional environment (Adapted from Klimaateffectatlas)

3.35
Percentage of green in Rotterdam
neighbourhoods (Adapted from
Klimaateffectatlas)

< 10%
10 - 20%
20 - 30%
30 - 40%
40 - 50%
50 - 75%
> 75%

0   1000 m   5000 m
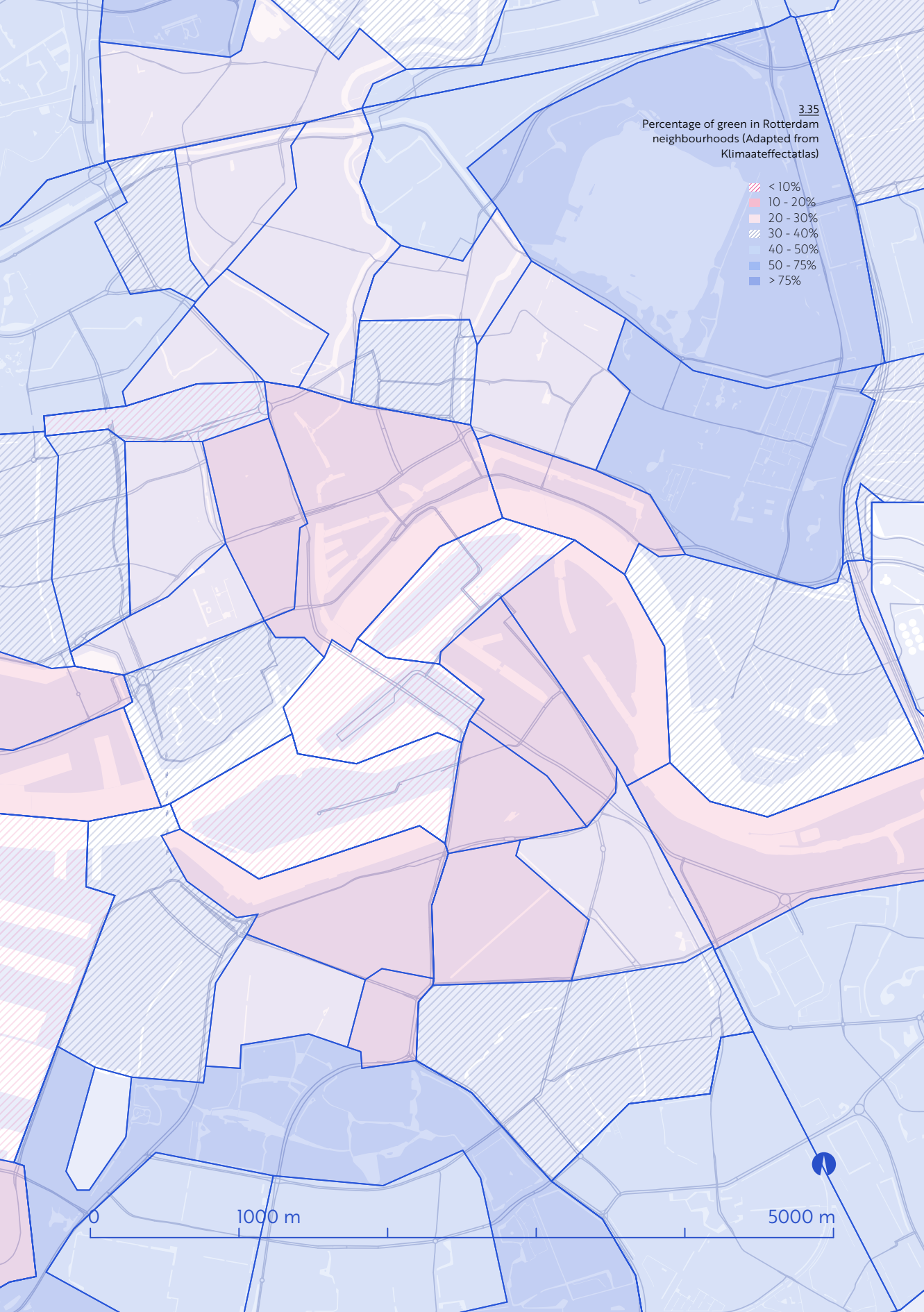
Diversity in the natural environment

An approach towards the enhancement of the value of green facilities is by enhancing biodiversity. Biodiversity from the perspective of locals is, like mentioned previously, a matter of a perception of variety in greenery moreso than about its effects. To better understand biodiversity and what other positive effects it can bring to the lives of locals, this section will dive into the specific criteria for a more nature-friendly environment.

Biodiversity is a broad concept in which all main elements - genes, species and ecosystems - are contemplated in the world of diversity (Vollaard, Vink and de Zwarte, 2018). Biodiversity, in simple terms, can be measured through the variety in the number of organism species in a given area (Puppim de Oliveira, Doll, Moreno-Peñaranda and Balaban, 2014). It is through diversity that the health and resilience of ecosystems can be indicated (Vollaard, Vink and de Zwarte, 2018). Diversity among species and genes is what makes an ecosystem a whole, as without diversity balance is lost. Diversity in the living world of species - the biotopes - ensures that all species have a safe space to be.

The city as a biotope

Urban biodiversity is the variety in natural life within the context of towns and cities (Müller, Werner and Kelcey, 2010). Biodiversity in the city, at first sight, seems hard to achieve. In between the concrete and stone it is hard to imagine a lively ecosystem. However, over the last few years, biodiversity in the urban environment has been growing, and in some cases, cities have become more biodiverse than the Dutch countryside (Vollaard, Vink and de Zwarte, 2018). But this does not happen by itself. Through the design of the city, conditions can be created that make it attractive for a variety of species to settle in the urban context. This relies on the provision of food through plants or other species, the provision of places to reside or conditions for residence, and the provision of safety through shelter, albeit through plants.

▷ Distribution of benefits

The benefits of such a diverse natural environment are not only distributed among animal species. The city benefits from it too (Vollaard, VInk and de Zwarte, 2018). The benefits of biodiversity go beyond the benefits of greenery, which has a strong connection to human physical and mental well-being (Müller, Werner and Kelcey, 2010). A strong ecosystem plays an important part in water- managment and quality; and mitigating the urban heat island effect - issues which are influencing the daily lives of urban dwellers (Vollaard, Vink and de Zwarte, 2018). These human benefits can be an important argument to include biodiversity in urban design.
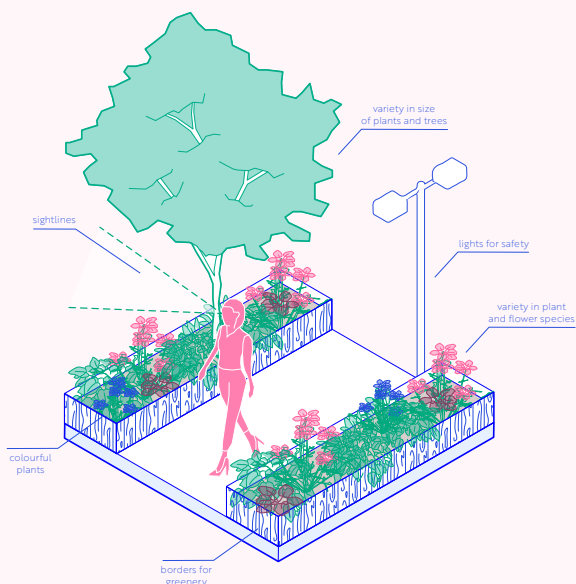
▷ Designing for diversity

The design for a nature inclusive environment happens through notions of diversity. Through a variety of open planes and dense native vegetation; from grass, flowers to tall treefs and everything inbetween, a pleasant and safe

environment can be created for all creature to flourish. On an abstract level, this diversity can be approached through points, surfaces and lines. The points are the smallest elements, such as a cluster of a tree and its bushes, that in larger quantities can be perceived as a surface, such as a park. The lines are the connections in the urban context between points and surfaces. All elements are essential for a well-functioning ecosystem. In the natural design of a city, different elements of green structures need to be emphasised. This does not necessarily mean that an ecosystem only functions when there are big natural infrastructures. Smaller structures, such as a series of facade gardens can play an important role in faclitating natural life. (Vollaard, VInk and de Zwarte, 2018)

The balance between natural life and human life is always a consideration in nature-inclusive design. Especially when it comes to more vulnerable neighbourhoods, as design decisions can have a considerate impact on the daily lives of its inhabitants. The inclusion of a biodiversity

agenda can improve the living environment of exactly these groups. Like mentioned in the problem field, it is often the more vulnerable neighbourhoods that have water issues and heat problems. However, a more careful perspective on biodiversity in vulnerable neighbourhooods includes perceptions of safety. Highly biodiverse areas that can be characterised through wilderness, and an unmanaged and overgrown appearance can have the unintended effect to induce people's fear of crime as sightlines are obstructed (Müller, Werner and Kelcey, 2010). In practice, this would mean that a careful consideration of lines of sight should be maintained in a design that enhances biodiversity. Children have a more positive view towards biodiversity as it creates a sense of mystery and exploration.

variety in size of plants and trees

lights for safety

variety in plant and flower species

sightlines

colourful plants

borders for greenery

Pattern R2   Embracing (bio-)diversity
▶ Nature in diverse neighbourhoods has to be well-maintained to ensure appreciation.

Lessons from biodiversity for human diversity

When talking about the natural world, literature is rapidly expanding that explores the design for a biologically diverse environment. When it comes to designing for (cultural) diversity for humans, literature is not as dense. This is despite the fact that both areas share some fundamental principles, such as the need for variation in shelter and typologies. Unfortunately, the design of public spaces for human diversity often takes a back seat to other priorities, such as aesthetics or economic considerations. However, it is crucial to recognise that designing public spaces for human diversity is just as important as designing for biodiversity. Both are necessary for creating healthy, sustainable, and inclusive communities. It is time to take the lessons from the literature on biodiversity and apply them in the design of public spaces that cater to the diverse needs of all people, just as we prioritise the principles of biodiversity for the natural environment.

Chart (top - by income):

	neighbourhood park	local amenities	citypark	recreational natural areas	beach and dunes	landscapes
social minimum	41	52	61	32	34	15
minimim to modal	40	45	63	43	44	27
uptil 2× modal	45	46	69	55	54	38
> 2× modal	46	44	74	59	57	43

Chart (bottom - by education level):

	neighbourhood park	local amenities	citypark	recreational natural areas	beach and dunes	landscapes
LO or less	39	51	54	34	31	15
LBO - MAVO	35	45	57	43	44	26
MBO - VWO	42	47	68	49	49	30
HBO -WO	51	44	82	56	57	44

Legend:
- social minimum
- minimim to modal
- uptil 2× modal
- > 2× modal
- LO or less
- LBO - MAVO
- MBO - VWO
- HBO -WO

3.36
Percentages of Rotterdam inhabitants that visit different varieties of green typologies, according to income (top) and education level (bottom) (Adapted from Dujardin and de Vries (2008))

Finding nature

In relation to other neighbourhoods in Rotterdam, Bloemhof and Tarwewijk are relatively stoney. A relation with nature is therefore not very straightforward in these neighbourhoods. So can they seek this relation elsewhere? In the map on the right the main urban green areas of Rotterdam have been illustrated, as well as community gardens. In close proximity, residents can travel to the Zuiderpark, which is reachable within 10 minutes of cycling from most places in Bloemhof and Tarwewijk. However, from conversations with residents it became clear that they do not particularly feel attached to the Zuiderpark. In a research done for the municipality of Rotterdam it has come forward that people with a lower income or a practical education are indeed less likely to visit city parks or recreational natural areas. This becomes especially significant for residents of the southern region of Rotterdam. Rather they are more likely to interact with neighbourhood facilities (Dujardin and de Vries, 2008). It therefore seems that the park does not foster a close relationship with nature for a large part of the residents of vulnerable neighbourhoods.

The density of community gardens in the southern region of Rotterdam is relatively low when compared to the northern region. Community gardens have a positive effect on well-being (Egli, Oliver and Tautolo, 2016), which in turn enhances people's connection to place. Considering that people with a lower income are more likely to engage with community facilities, such as community gardens, the focus for fostering natural connections should be on the facilitation of local green interventions.

3.37
Map Rotterdam urban green
(information adapted from
mapitout.Iamsterdam.com and
Stadsnatuurkaart (2016))

urban green

reach within 15min.
▢ walking ▢ cycling ▢ public transport

✚ high biodiversity value
◯ community gardens

±30min.
±25min.

±31min.
±24min.

1000 m

5000 m

0
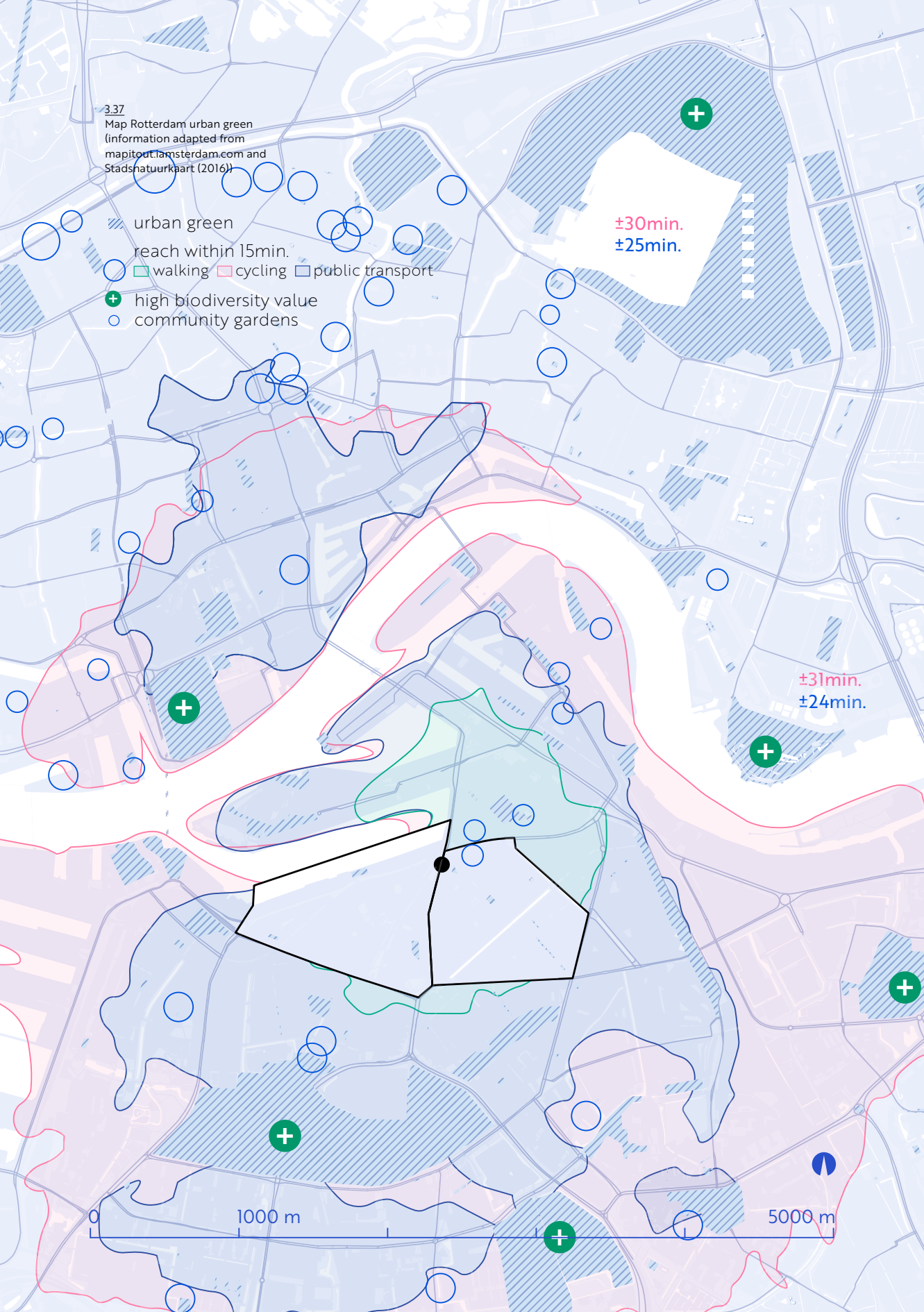
Urban nature and nature-relatedness

The 'Mind of the environment' highlighted the positive impact of biospheric symbolism on people's biopsheric value systems, indicating that increased exposure to nature promotes more sustainable mindsets. In this section, nature-relatedness will be further explored.

Urban nature's positive effects, such as improved air quality, increased physical activity, enhanced social cohesion, and stress reduction, are being increasingly acknowledged (Hoyle, 2020). Contact with nature, particularly in small-scale urban spaces like gardens, school playgrounds, and vegetated streetscapes, is crucial for understanding the importance of urban nature in the human dimension (Church, 2018).

Urban nature can be described in three main categories: remnant nature, cultivated nature and nature on display (Hoyle, 2020). Remnant nature is the space within the urban that are defined by topography and geomorphology. Cultivated nature is what is known as the living walls, the green roofs, roof gardens and allotments, being directly related to buildings. Lastly, nature on display, which are designed spaces such as formal parks and gardens, which provide an interactive relationship between people and nature. This last category will be most relevant for this work, as interactions can be described through its presence.
Displays of nature can be categorised into three main types of spaces: nature spaces prioritising biodiversity, living spaces focused on human recreation, and high-profile flowered spaces intended to impress with colourful planting. The appreciation of these types of nature spaces can be linked to individuals' value systems. Those with a strong biospheric value system tend to value nature for its biodiversity, while those with an egocentric value system appreciate the recreational opportunities it provides. People with strong altruistic values value the social impact of nature.

Therefore, different individuals may value different types of nature spaces. Cultural groups can have varying perceptions of nature, with individuals from migrant backgrounds often associating it with food production and valuing functional aspects, while those with a Western

native trees

native plants and flowers showing different seasons

wadi's

natural materials
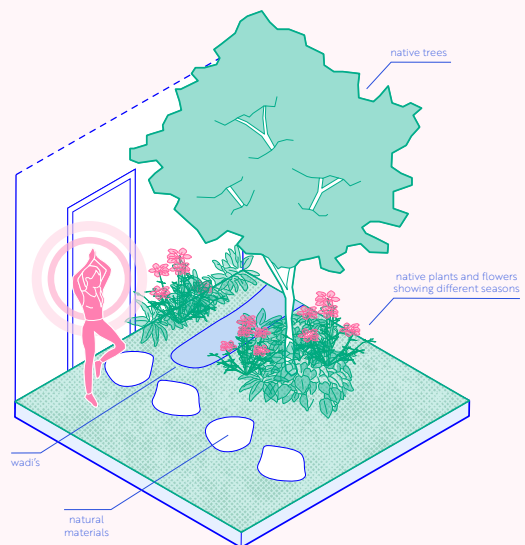
Pattern R1   Green exposure to devotion
► Through natural design, social norms can be created and deeper connections between human and nature can be fostered.
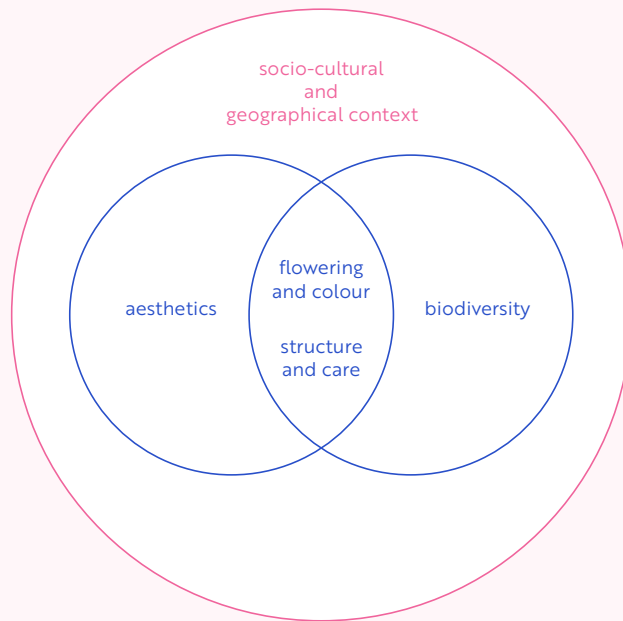
The diagram shows a large pink circle labeled "socio-cultural and geographical context" containing two overlapping blue circles. The left circle is labeled "aesthetics" and the right is labeled "biodiversity". The overlapping center contains "flowering and colour" and "structure and care".

background may hold a wilderness view. Vegetation patterns and perceptions of tidiness also influence how nature is perceived (Church, 2018). Ethnicity is also linked to perceptions of tidiness and care, with individuals from migrant backgrounds often preferring well-maintained spaces (Hoyle, 2020).

Research has shown that people generally have a positive response to colourful, flowering plants in urban areas, finding them aesthetically pleasing and stimulating. On the other hand, green spaces are also valued for their soothing and restorative qualities. Biodiversity in its truest sense does not make a significant to the perception people have of nature, as knowledge on biodiversity is limited to what can be seen on a general level. However, this does not prevent people from forming a connection with nature through and enjoying its benefits (Hoyle, 2020).

Various forms of engagement with urban nature offer benefits to humans, ranging from passive experiences like observing or sitting in natural surroundings to active involvement such as walking, running, or gardening (Church, 2018). In addition to these nature-based activities, actively participating in environmental stewardship has the potential to foster a stronger connection between humans and nature. It can facilitate a deeper understanding of natural systems and have a positive impact on individual environmental values and behaviour. By actively engaging with the environment, individuals can develop a sense of responsibility towards nature and contribute to its preservation. So while projects that focus on restoring natural systems by habitat restoration or stormwater managment have many positive effects for the natural habitat, designing and programming urban nature projects to encompass a broader range of human activities (providing stewardship opportunities), while considering diverse human needs, can lead to wider ecological and social impacts.

Impact on
natural perception

Bloemhof and Tarwewijk are both characterised by a lack of greenery. In the previous chapter this was expressed by numbers, but how does this manifest in the spatial environment? In the following section the current natural state of the neighbourhoods is revealed so an understanding can be formed on the human-environment relationship of the local community.

3.39
Paved and 'green' public spaces in Bloemhof and Tarwewijk (Adapted from Boomregister, 2018)

Low perception of nature

The natural state of Bloemhof and Tarwewijk can best be described by the lacking thereof. While the figure on the right shows that there is 'green' in the neighbourhood, there seems to be a common understanding among local residents that the neighbourhoods are not green or natural enough. The term "green" is used loosely and encompasses all types of natural spaces.

However, just having green spaces does not satisfy the desires of the local community. Conversations with residents revealed that the presence of paved spaces has a greater impact on how the neighbourhoods are perceived, and this has a negative effect on their urban beauty. In Bloemhof, the issue is even more pronounced, with a lack of mature trees and public green spaces.

Pattern R3   Green spaces to green places
► Designing community-related green spaces fosters an environmentally conscious and engaged community in diverse neighbourhoods.

- — paved public space
- — 'green' public space
- — partly 'green' public space

trees

>20m   1m

0   100 m   1000 m

▷ A natural design approach

In vulnerable neighbourhoods, adding green public spaces is a challenging task due to the potential for real estate value enhancement and eventual gentrification processes. To avoid such processes, there are two main objectives of designing natural spaces. On the one hand green spaces should be designed based on the concerns, needs, and desires of the community. As the neighbourhoods both are diverse, this would result in a diverse selection of natural spaces, relating to more functional needs such as food production, as well as to restorative needs through biodiversity (Hoyle, 2020). To support this, large-scaled interventions should be avoided, as they have a greater effect on real estate prices. Rather, small-scaled solutions should become the norm, once again safeguarding and prioritising the needs of local communities (Wolch, Byrne and Newell, 2014).

KLIMROOS

10

Examples of sustainable material
use in public space design

3.40
Eco-quartier Ginko
Bouygues Immobilier
| Bourdeaux, France

3.41
Natural playground at
Childrens centre 'De
Vlinder' | Rotterdam

3.42
Kokerstraat square
| Rotterdam

Neglect and disinvestment

The neglect of public spaces in Tarwewijk and Bloemhof is evident in the material design of the area, indicating years of disinvestment. The quality of materials in the streets and street furniture is an example of this. The pictures of unsustainable materials in the figure on the left are taken in both Bloemhof and Tarwewijk. Even when disregarding the lack of maintenance, the materials used for sidewalks and street furniture show a lack of consideration for liveability in these neighbourhoods. As a result of wanting to create a vandal-proof environment, the municipality has resorted to the use of cheap-looking pavement and cold-looking, metal street furniture. This makes the materials are uninspiring towards sustainability values as they convey a message and aesthethic that is not relatable to sustainable lifestyles. Instead, they symbolise unsustainable lifestyles through exposure of unsustainable materials, such as plastics and rubbers.

If it is considered that people take better care of environments that are well-maintained, and as mentioned in the historical account, years of disinvestment in public spaces have led to the current broken state of these areas. It's unreasonable to expect residents to take on stewardship actions when the public space is in such an undermaintained state.

▷ Creating social norms through design

To make people care more for their local environment, making it more likely for them to undertake stewardship actions, the social norms that the public space communicates should be addressed. This will require investments in maintenance, but also in the materiality of the public sphere. Sustainable materials are materials that are not only durable and replacable, they can also be understood to have a low-impact in the use of resources, emphasising renewable and non-toxic materials (Lerch, 2017).

Investments in sustainable materials in the streetscape will further enhance biospheric symbolism and can lead to greater attachments to place. Sustainable materials (see examples on the left) need to be durable, non-toxic, improve permeability and reduce heat exposure and be renewable or biodegradable. Above all, the implementation of sustainable materials should contribute to a welcoming and pleasant atmosphere in the neighbourhood. The reuse of materials as proposed through everyday decision behaviours can be further promoted by showcasing recycled street furniture and art in public space, giving locals opportunity to feel pride for their neighbourhood.

Taking matters into own hands

To design for recovery and protection actions, it is crucial to explore the principles underlying stewardship. Understanding how these principles intersect with the daily lives of individuals is key to comprehending the benefits they bring, particularly in vulnerable neighbourhoods like Tarwewijk and Bloemhof.

Motivation for stewardship

A combination of intrinsic and extrinsic motivations work together to promote stewardship actions. Some types of motivations may have a stronger influence than others. Intrinsic personal and social motivations are stronger predictors of participation in volunteer urban stewardship activities than environmental mindsets. However, intrinsic motivation can be enhanced through external benefits for locals, such as payments for stewardship. A good example of this are the activites done by the NPO CreatiefBeheer, which transfer maintenance duties from the municipality to locals that have a distance to society. These locals are motivated by the opportunity to do some work for a small compensation, giving them not only a sense of purpose, but also a small income. (Bennett, Whitty, Finkbeiner, Pittman, Bassett, Gelcich and Allison, 2018)

Capacity for stewardship

Stewardship is not necessarily self-evident. The complexity and speed of socio-ecological changes are high influential for stewardship. Essentially, if changes happen quickly and on a large scale, or if they are very severe or complex, it may be more difficult for people to effectively take care of their local environment. Additionally, if changes are unpredictable, it may be harder for people to plan and take action to protect the environment. In simple terms this means that the capacity of stewardship is highly dependent on stability. The second point to consider is that the social-ecological context plays a crucial role in determining the social, cultural, and political feasibility, appropriateness, and effectiveness of different stewardship actions. Social, financial, human, physical, cultural and institutional capital are assets towards stewardship. These assets can either enable or disable people from taking stewardship actions. In practice, this means that in order to enable people for stewardship actions, the current state of their capabilities need to be examined and geared towards. (Bennett et al, 2018)

Outcomes of stewardship

Stewardship actions can be made attractive through both environmental and social outcomes. Environmentally, stewardship can lead to an improved habitat for both human and animal as well as an increased productivity in ecosystems. As much important, however, are the social effects of stewardship. It can bring an added purpose for livelihoods, increase employment, have a positive effect on food security and increase overall well-being through contact with nature. Stewardship can be a significant factor in vulnerable neighbourhoods not only because of its environmental impact but especially because of its social outcomes,

addressing eco-social issues. (Bennett et al, 2018)

Interventions and leverage points for stewardship

Policy makers, organisations and designers can intervene to promote stewardship actions. Leverage points such as introducing new actors, like Buurtklimaatje or CreatiefBeheer; providing incentives, such as compensations; growing capacity or governance; promoting actions through campaigns; or monitoring outcomes to adapt stewardship actions to the context (Bennett et al, 2018). In terms of spatial interventions, stewardship can be enhanced through designing and implementing spaces that can be appropiated or maintained by locals, such as green infrastructure projects, community gardens, educational gardens or facade gardens. These spatial interventions can provide tangible opportunities for local communities to engage in stewardship activities and enhance their connections with the natural environment.

financial capital

policy makers for instituational capital

physical capital

collaborations

material capital
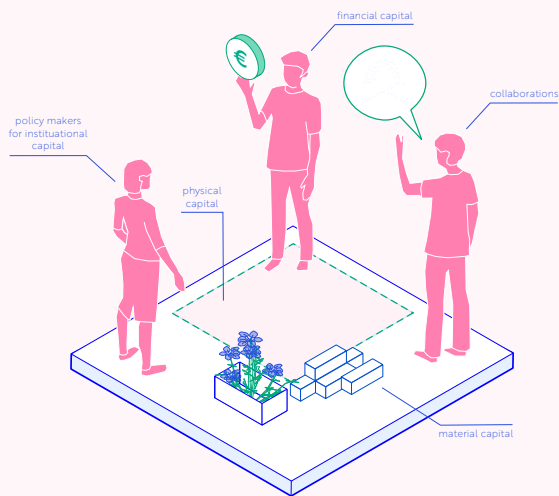
Pattern R5   Capital for change
► Empowering stewardship actions in vulnerable neighbourhoods requires capital investment across financial, institutional, and physical domains.

highlighting zones for appropiaton

transparant boundaries to indicate ownership
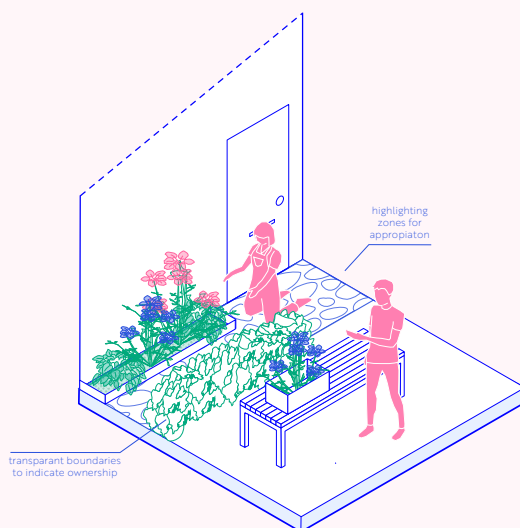
Pattern R6   Inhabiting the inbetween
► People will take better care of their environment when they are allowed to take ownership of the zones inbetween the public and the private.

Creatief Beheer

At the Oleanderplein in Bloemhof, every tuesday and thursday a group of locals works to clean up the square and do maintenance on the greenery. After working in the morning, they assemble for a lunch at their clubhouse at Speelplaats de Regenboog, where there are tools

Creatief Beheer, led by Rini Biemans and Karin Keijzer, is at the forefront of proposing a holistic approach to revitalising public spaces. Their mission is to transform daily maintenance activities into catalysts for community investment and neighbourhood livability. This is done by recruiting people that are distanced from society to take on green maintenance duties in their own neighbourhood. For this they get a small compensation, empowering them while getting them in contact with nature. This approach, aptly named "city medicine" (stadsgeneeskunde), has been successfully implemented in numerous projects across working-class districts of Rotterdam since 2002.

These projects are made possible through the empowering Right to Challenge process in Rotterdam, enabling them to assume municipal responsibilities within the same budgetary constraints. By collaborating closely with the municipality as budget managers, procurers, and implementers, Creatief Beheer has forged an essential partnership in bringing these transformative initiatives to life.

Creatief Beheer also provides valuable guidance to municipalities and businesses, offering expert advice on how to infuse outdoor spaces with more greenery for health.

Perspectives on local engagement with public space

To get a better grip on the relation between people and their local environments, and the opportunities for ownership that are linked to this, this section will focus on how outdoor spaces in Bloemhof and Tarwewijk take shape. Through the mapping of the exterior public space, and through insights achieved from local inhabitants, the current level of engagement with the natural environment can be uncovered.

3.43
Typologies of public land in Bloemhof and Tarwewijk

- ■ playground
- ■ school / privatised playground
- ■ public park / square
- ■ 'looking' green
- □ community courtyard
- □ grass
- ⊗ badly maintained
- ⊕ high biodiversity
- ⊕ high community value
- ⊗ fenced (higher than 1m)
- ◯ communal gardening activities

0   100 m

Greenery and community

The current role of greenery in these neighborhoods falls short of fostering a meaningful connection between people and nature. Instead, it creates a sense of detachment. This issue can be attributed to the limited functional value of green spaces in Bloemhof and Tarwewijk.

Interactive elements, such as playgrounds, predominantly feature non-green materials like stone. During conversations and interviews, the most highly regarded places in the neighbourhood emerged, such as the garden of the Cultuurwerkplaats or Millinxpark. Residents have expressed a preference for spaces that exhibit a strong green identity. For instance,

the courtyard at the Cultuurwerkplaats is a delightful spot during summer, offering a serene environment for reading a book while being surrounded by lush greenery. These spaces also have the possiblity to be closed off, making them protected from unwanted intruders.

▷ Enhancing the local value of green facilities

A study investigating the appreciation of green facilities in Rotterdam highlighted the significance of providing engaging activities in public spaces for individuals with non-Western backgrounds. To effectively represent nature and infuse it with deeper meaning for the diverse ethnic population within the local community,

green spaces should be designed with specific functions that address their concerns, needs, and desires. These functions could encompass aspects such as human health, food security, or job creation, ensuring a more inclusive approach (Wolch, Byrne, and Newell, 2014).

Another strategy to enhance the value of green facilities involves promoting biodiversity, which has a positive impact on microclimates. For this project, biodiversity will be evaluated visually, reflecting the presence or absence of diverse plant and animal species. Currently, both Bloemhof and Tarwewijk lack significant spaces with diverse biodiversity. This limited representation of biospheric symbolism in the design is also reflected in the residents' perception of nature.

availability of water and sunlight

lights for safety

plants according to locals needs

fences for accessibility and safety
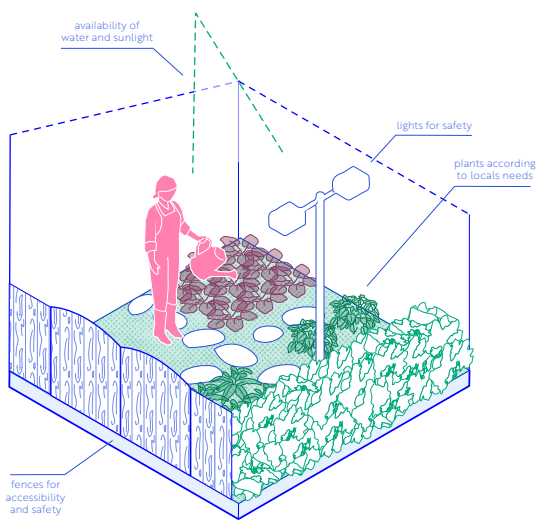
Pattern R7   Engage, connect, protect
► Courtyard community gardens promote participation in ecological activities and reduces crime through a stronger relationship between people and nature.
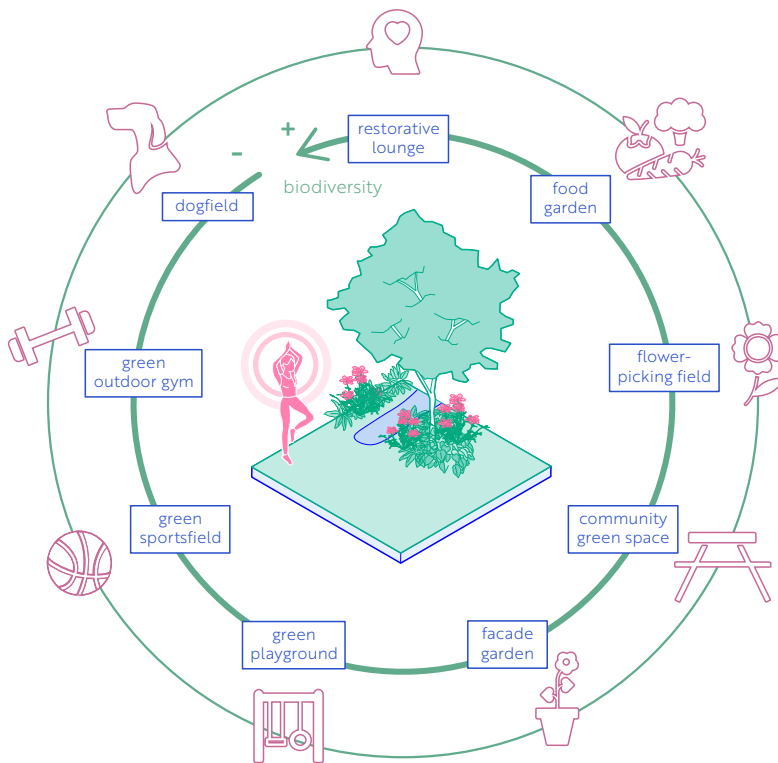
3.44
Typologies
of interactive
green spaces

restorative
lounge

biodiversity
− +

dogfield

food
garden

green
outdoor gym

flower-
picking field

green
sportsfield

community
green space

green
playground

facade
garden

▷ **Exploring interactive values**

The desire for functionality of public space

requires a specification of potential input. In the figure above, an exploration is made of public space typologies that could interact with the natural environment, therefore bringing pleasure to inhabitants and fostering interactions with natural elements. Biospheric symbolism can be incorporated by simple elements like the presence of trees and grass. Not all functions, however, can foster equal amounts of biodiversity, some typologies lend themselves better for the inclusion of a great variety of plant species and sizes, while others do not. The impact on the relation of human to nature will therefore differ per typology. However, as mentioned in the community awareness chapter, bringing variety in terms of functionality is important to enhance social connections between different groups.

seating for
enjoying gardens
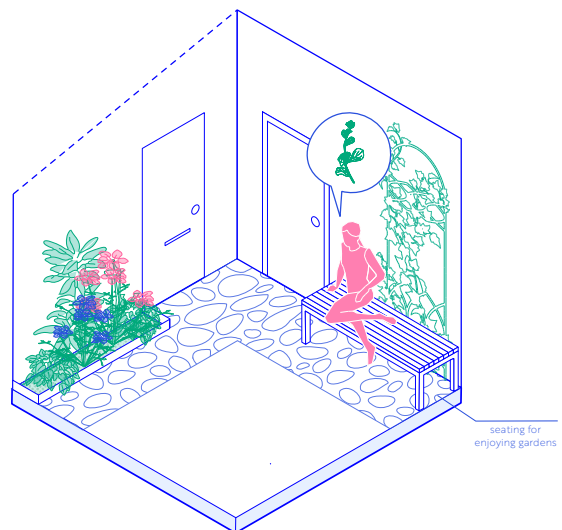
Pattern R5   Nature on your doorstep
▶ Facade gardens are a simple way to strenghten the relationship between people and nature.

The natural playscape

Playgrounds, become through the phenomenon of triangulation a significant spaces for social interaction. While the primary purpose of playgrounds is to provide a platform for play, it begs the question: How can play initiate conversations about sustainability? Natural playgrounds serve as powerful tools for intergenerational learning. By integrating ecological responsibility and environmental preservation into playground designs, these spaces enable children and adults to engage in meaningful activities that promote sustainable values.

Children can play a pivotal role in promoting education on sustainability, serving as anchor points for spreading knowledge about sustainable practices. Studies have shown that children's relationships with their parents and extended family can have a positive influence on how information on sustainability is passed on, resulting in greater awareness of sustainable practices. Environmental behaviours that are obtained in school are transferred to not only the home context, but also through social learning to the wider community. Children, are therefore an important resource for engagement in environmental learning in a community. (Spliteri, 2020)

Playgrounds play an important role in the sustainability education for children (Dyment and Christie, 2005). Studies have shown that environmental awareness and stewardship motivation has increased through regular play on green schoolgrounds. The playground offers children a hands-on access to the natural world. Natural playgrounds offer schools the opportunity to do classes outside and therefore provide education on nature in active and inactive manners.

Green playgrounds have also proven to have a positive effect on vandalism that happens on school playgrounds. While the reasons for this are speculative, it is possible that student ownership and involvement have something to do with crime reduction (Dyment and Christie, 2005). The playgrounds, however, are not a holy grail towards vandalism reduction and careful design of the boundaries of the premises still remains important.

Pattern R4   Learning by playing
► Natural playscapes increase environmental awareness among children.

varying topography

safe waterscapes

natural play elements

clear boundaries for safety

vegetation that varies over seasons
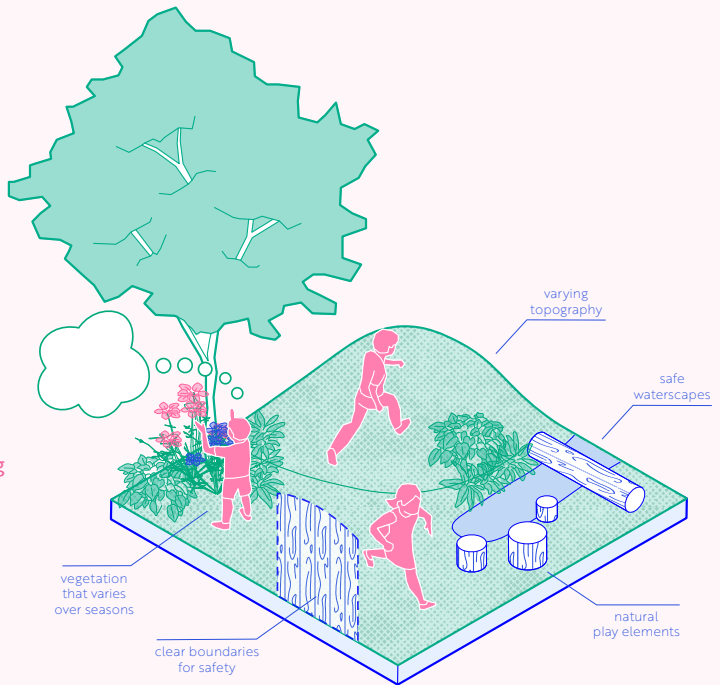
Elements of design

So what elements of design are important in a playground that promotes sustainable behaviours? Children explore and learn through active and passive play. Active play involves motor skills, like running, climbing and balancing. Whereas with passive play, children explore places, use their imagination and strengthen their creative thinking (Loomis, 2008). Playground elements should facilitate both types of play.Natural play elements, safe waterscapes, vegetation and topography are the base elements that create natural playscapes (Bulut and Yilmaz, 2008).

Above all, variation is an important element of a playground that promotes both imaginative and active play. Variation in vegetation allow for enclosure, movement, stimulation of the senses, opportunities for climbing and education on climate modification and seasonal change

The variation of elevation and the use of slopes help to increase diversity of play. So do natural elements such as rocks or logs. The organic variety of these natural elements can through the eyes of children be perceived as forms of equipment for play and opportunities for discovery. The variety of textures of plains, including water, stimulate the senses of chilren. Water in particular has a positive effect on imaginative and creative play and encourages children to interact.

The mere presence of natural elements allow kids to use their imagination and manipulate their environment in more diverse ways that stone and rubber playgrounds could (Dyment and Christie, 2005).

natural playscape
↓
vegetation
+
safe waterscapes
+
topography
+
natural play elements
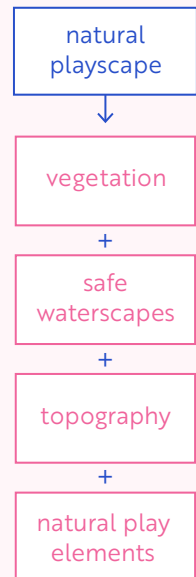
3.45
Elements of the natural playscape (Adapted from Bulut and Yilmaz, 2008)

collective action

individual action

neighbourly action

neighbourly action

neighbourly action

municipal action

small-scale

appropiation with small objects

appropiation with larger structures

communal use of larger structures

Taking ownership

Some hope for a greener and socially responsible neighbourhood perseveres when closer attention is paid to the actions of the residents of Bloemhof and Tarwewijk. In between these vast grey areas little glimmers of greenery arise by the initiative of local residents and NPO's. These initiatives become places of pride for local residents.

The desire for a more green and liveable neighbourhood came forward not only through conversations, but also the actions of locals. Instead of waiting for change from the top, residents start taking matters into their own hands by creating facade gardens, placing planters, creating seating areas in the streets

or even initiating pocket parks. Local NPO's have made the neighbourhood more liveable by creating spaces for people to appropiate or where they can see displays of neighbourhood work.

The existence of these examples, however, does not necessarily mean that locals find it easy to take on stewardship actions. In terms of social stewardship, the ground work is already there. However, when it comes to financial capital, struggles arise. Most people do not have enough financial means to spent money on plants or furniture for the streets. The allocation of funding and permits through institutions is experienced as a struggle and keeps people

local NPO
action

local NPO
action

local NPO
action

local NPO
action

large-scale

collective ownership and
design of desginated spaces

public displays of
collective work

3.46
Signs of ownership categorised by scale
and action in Bloemhof and Tarwewijk

from parttaking in stewardship actions. On top
of that a big fear exists among residents that
once something is set up, it will be destroyed
through vandalism.

▷ Maintaining momentum
In order to maintain and even enhance these
actions of stewardship, residents should be
aided through a variety of means. The provision
of resources, either financial or material, to be
able to parttake in stewardship actions should
be considered.

Through the provision of physical capital, like
physical places and infrastructures, people can
be empowered to take on stewardship actions.

To address issues of fear of vandalism, ownership
can be enhanced through clear boundaries, such
as gates or courtyards.

In Carnisse in Rotterdam, residents have been
given opportunities to take ownership of space
with the help of initiatives like Buurtklimaatje.
Buurtklimaatje engages people in stewardship
action by organising stewardship events and
provides materials, such as plants, for residents
to use. As a result, pride in the neighbourhood
has gone up and people take better care of their
environment.

175

▶ **What if**

Recovery and protection

The seamless integration of nature into community infrastructures will foster a deeper connection between people and the natural world. This integration goes beyond aesthetics; it cultivates a sense of pride and deep connection to close surroundings. A (bio-)diverse environment that can thrive through a community that cherishes and protects it.

enclosure
and boundaries

plants and tools

safe spaces
for appropiation

provision materials
for stewardsip

institutional *physical* *human* *social* *cultural* *financial*

**capital
assets**

diversity
green typologies

interactive
greenery

*community
facilities*

**local value
green facilities**

stewardship
actions

**place
attachment**

**nature
experience**

*sustainable
materials
in surfaces
and furniture*

**nature
perception**

nature-relatedness

recovery &
protection

aesthethics

biodiversity

*variety green
spaces for cultural
diversity*

depaving

flowering
and colour

structure
and care

Design criteria
for recovery
and protection
actions

areas of focus
inclusivity
sustainable behaviours

Designing for nature-relatedness

So how can recovery and protection actions be fostered through a redesign of the neighbourhood? In this chapter, the design criteria for an environment where humans and nature can co-exist in a harmonious way are presented. These criteria are a result of the analysis done on the previous pages and the lessons that have been learned from the theory. From these criteria, actions can be derived that can be turned into a pattern language.

In the previous chapters it became clear that nature-relatedness and stewardship actions are main indicators for the recovery and protection actions towards the environment. Nature-relatedness in diverse neighbourhoods has to be considered differently than in neighbourhoods where there is a western majority. It are often the more vulnerable neighbourhoods that are revealed to be lacking in green and are overrepresented with unsustainable materials. Actions of depaving and increasing biodiversity have both an ecological and social value related to natural perceptions. Nature becomes valuable when it has specific functions and is orderly and maintained. When a design caters towards these needs, this can lead to an increase in attachment to place.

Place attachment is also important for stewardship actions. On the one side attachment to place can be a motivation for stewardship actions. On the other hand, can feelings of ownership lead to a higher appreciation of the environment. To facilitate stewardship behaviours, appropiate capital assets have to be present. In the more vulnerable neighbourhoods, physical and financial capital are mostly points of attention. Matters of safety and security are important themes in vulnerable neighbourhoods and the provision of places that have clear ownership and the opportunity to be closed off therefore becomes important.

Designing for a community that is engaged with the natural world requires an understanding of internal motivation, related to value creation through social norms and place attachment. However, without the proper tools, stewardship actions will not be able to get of the ground. External motivators, such as the provision of materials, but also gains in terms of psychological ownership and an improved quality of public space can move people to take on stewardship actions.

Harmonising human and nature

This strategy empowers communities to have a strong relationship with the natural world and engage with it.
By following these steps, neighbourhoods can embrace an ecological, yet inclusive approach towards stewardship behaviours, taking into consideration the energy and resources at hand.

① assess the current state

Conduct a spatial analysis to identify the ecological context of the neighbourhood, including natural features, permeability and opportunities for enhancement Assess the current state of natural engagement and stewardship through interviews, surveys, and workshops to grasp the needs and challenges regarding nature engagement within the neighbourhood. Challenges can be related to issues such as availability or security of space or resources for stewardship.

From here patterns can evolve

② hands-on community

Organise community events to enthuse people and create an initial feeling of owernship in greening the neighbourhood. Plan enjoyable and social activities like "flipping tiles for facade gardens" or "community food planting" to make greening tangible and approachable. In these events, organise that materials are available for those who want to join. Collaborate with local groups and schools for maximum participation. Offer educational sessions and workshops on sustainable gardening and urban greening during these events. Involve residents of all ages, backgrounds, and abilities to ensure inclusivity and document and celebrate community efforts through media coverage to inspire others and create pride.

Relates to pattern R1, R3, R5 and R8

③ learning about nature

Foster community-focused educational opportunities on nature, ecology, and stewardship by creating nature-inclusive spaces like community centres and playgrounds. Collaborate with community members, schools, and centers to develop information signs, workshops, and programs showcasing neighbourhood biodiversity and promoting sustainable practices to cultivate community pride, ownership, and stewardship and a stronger connection with the natural environment.

Relates to pattern R4 and R5

4 encourage public ownership
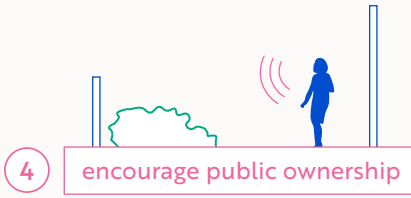
Identify underutilised, vacant spaces and zones inbetween the public and the private within the neighbourhood that can be transformed into green areas and taken ownership of by local residents, such as community gardens or pocket parks. Develop planting strategies to enhance native plant species and create a natural environment that attracts people from diverse backgrounds. Involve community members, schools, and local organisations in the planting and maintenance of these green areas, fostering a sense of ownership and responsibility towards biodiversity.

Relates to pattern R1, R2, R3, R5, R6, R7 and R8

5 enhance biodiversity
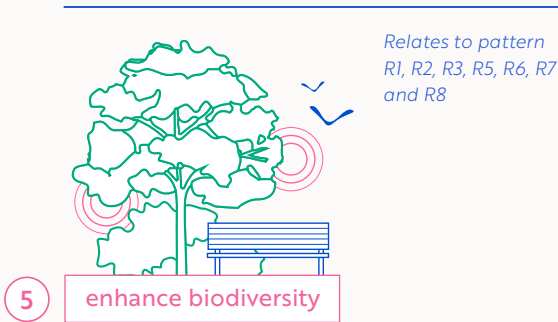
Identify key sites or nodes within the neighbourhood where nature-related interventions can have the most significant impact. Consider locations near community centres, highly paved areas like parking spaces, or high-foot-traffic areas to ensure accessibility and visibility. Implement accupunctural interventions like pocket parks, green alleys, and urban gardens to enhance the urban fabric and create small-scale changes. Develop a plan that focusses on preserving native plant species, creating habitats, and improving the local climate. Within this plan maintenance can be negotiated with local residents and organisation. Prioritise natural, sustainable, and local materials for visual appeal and sustainability. Use timber, stone, and recycled materials for seating, pathways, and play equipment to foster a stronger resident connection to the environment.

Relates to pattern E12, R1, R2, R3

3.48
Strategy recovery and protection in phases

1 Urban designer facilitates events and conversations with residents and experts, such as ecologists to create a full image of the neighbourhood.

Deciding on the direction
Phase I

▶ interviews
▶ spatial analysis
▶ citizen input sessions

2 **3** Community events and educational empowerment can happen through local collaborations between the municipality, residents, schools, community centres and NPO's, such as Buurtklimaatje and ArchiKlas.

Setting the foundation
Phase II

▶ community events
▷ citizen input sessions
▶ financial and material support

4 **5** Collaboration between municipality, housing coorporations, ecologists, local resident groups and the urban designer Urban designer helps works as the communicator and designer.

Empowerment for lasting impact
Phase III

▶ place-making interventions
▶ commitments & collaborations
▶ investments in public space

Sharing space with nature

In the future, the communities of Bloemhof and Tarwewijk will showcase biospheric values through an intentional ecological design as a catalyst for sustainable behaviours. Ecological activities will be present throughout the neighbourhood, emphasising an stewardship mentality. The neighbourhood designs will prioritise the integration of nature into the built environment to establish a strong sense of place attachment and deeper connection between people and the natural world.

relating to nature

The natural design within Bloemhof and Tarwewijk embraces the importance of locality by implementing interventions on a scale that resonates with the community. Instead of relying solely on large-scale measures driven by biodiversity concerns, acupuncture-like practices will create a series of green enclaves. These intimate spaces form a captivating landscape of their own, inviting residents to engage with nature right at their doorstep and making green spaces an integral part of everyday life. This close proximity allows residents to feel a sense of pride and ownership, fostering a deep connection with their surroundings.

taking ownership

Throughout the neighbourhoods, facade gardens will start to emerge and be a place in which nature can break through the stone. These places not only green the streets, but will also allow for meaningful social interactions. As opposed to being in the path of much foot traffic, the courtyard becomes an intimate enclave for green activities. Courtyards become versatile gathering spots for social interactions, community events, and green activities - all within a green environment - reinforcing residents' connection with their surroundings. The zones in-between the public and the private become free spaces, where individual expressions within public space can be made.

enhancing diversity

In the green future of Bloemhof and Tarwewijk, everyone has the posibility to be actively engaged with nature. The neighbourhoods embrace and celebrate their diverse populations, ensuring that everyone feels engaged within a natural setting. By offering a wide range of green activities, such as gardening, playgrounds, and sports in natural surroundings, people are enabled to develop an interest in utilising green public spaces. Nature itself reflects this diversity through vibrant biodiversity, characterised by an array of colors and textures that create a welcoming and well-maintained atmosphere.

By enhancing these features in Bloemhof and Tarwewijk, engaged communities will be created that fosters a deeper connection between people and nature. This way Bloemhof and Tarwewijk can become models for promoting sustainable behaviours.

neighbourhood makers

Residents of Bloemhof and Tarwewijk are not alone in their efforts. Empowered by the municipality, local residents with a deep connection to their neighbours and a genuine passion for their neighbourhood become "neighbourhood makers." Through organised events and the provision of resources, residents are mobilised to take ownership of their community, initiating a greening movement. By actively engaging and collaborating, they collectively transform their neighbourhood into a vibrant and cherished space, where a sense of pride and belonging flourishes.

3.49
Abstract representation of the recovery and protection vision

Tjirp Tjirp
Tjirp

Opportunities for
nature interactions

3.50
Spatial
opportunities in
Bloemhof and
Tarwewijk for
recovery and
protection actions

The map of spatial opportunities in Bloemhof and Tarwewijk shows how the existing and potential spaces in the neighbourhoods can be used to promote stewardship actions by facilitating a closer relation to nature. The map emphasises spaces like courtyards as places in which activities can take place that are nature-related. These spaces, as well as school playgrounds, allow for clear ownership and are protected from external influences. Throughout the neighbourhood, greening interventions can also take place by series of smaller interventions, avoiding flagship projects. Overall, the quality of green spaces in the neighbourhood can be improved by a redesign focussing on biodiversity and interactive values. The map shows how these elements can be integrated into the existing urban fabric of Bloemhof and Tarwewijk, to create more spatial opportunities for enhancing nature relatedness. The map is based on the previous chapter's of analysis, interviews and theory.

☐ courtyard - secluded space	⊙ accupuncture greening - for community
☐ taking ownership of courtyard	⚫ make more green + give interactive value
☐ playground	⚫ give interactive value
⋯ existing front gardens	◉ opportunity for ownership by local community
↤ invest in general quality	

0   100 m   1000 m

Translation of the poem
Multiple ways lead to dreams

Part IV

Beyond intentions

**Meerdere wegen
leiden naar dromen**

D. Otte

▶ Design

Relating strategies over time

In the timeline presented, the before proposed four urban design strategies are highlighted and correlated with each other.

These strategies revolve around community awareness, everyday decision-making, and recovery and protection actions as target behaviours. While each strategy can be considered independently, their interconnectedness strengthens the role of sustainable behaviours within a community. By combining these strategies, a comprehensive approach to sustainable urban design can be established.

Community awareness serves as the foundational strategy, playing a pivotal role in the success of the others. By fostering awareness of sustainable living practices and fostering community cohesion, communities become better equipped to support and engage in other sustainability initiatives. This strategy focuses on educating residents about the significance of sustainable living, cultivating a sense of environmental responsibility within the community, and motivating residents to take action. Community awareness thus serves as the bedrock upon which the

Paving the way for sustainable behaviours
Community awareness

2. growth by education

1. asses current

3. spontaneous interactions

4. enhance safe

Choosing emission-friendly
Everyday decisions

1. asses current

2. enhance pedestrian infrastru

3. hig

2. improve image daily waste

Embracing green consumerism
Everyday decisions

1. asses current

3. network of sharing

4. community tool stations

2. hands-on community

Harmonising human and nature
Recovery & protection

1. asses current

4. en

3. learning about nature

Deciding on the direction
Phase I
approx. 1 year

Setting the foundation
Phase II
approx. 2–3 years

remaining strategies are built, providing the essential support and participation of local residents.

The strategies of everyday decision-making and recovery & protection work in tandem to create sustainable urban environments that prioritise the well-being of both people and the planet. By encouraging sustainable choices in day-to-day activities and implementing measures for ecological restoration and protection, communities can actively

5.   empower collective action

territories

5.   redesigning new porosities

cture

4.   introduce shared mobility hubs

h quality public transport

5.   places of social repair

6.   display of repair culture

5.   enhance biodiversity

courage public ownership
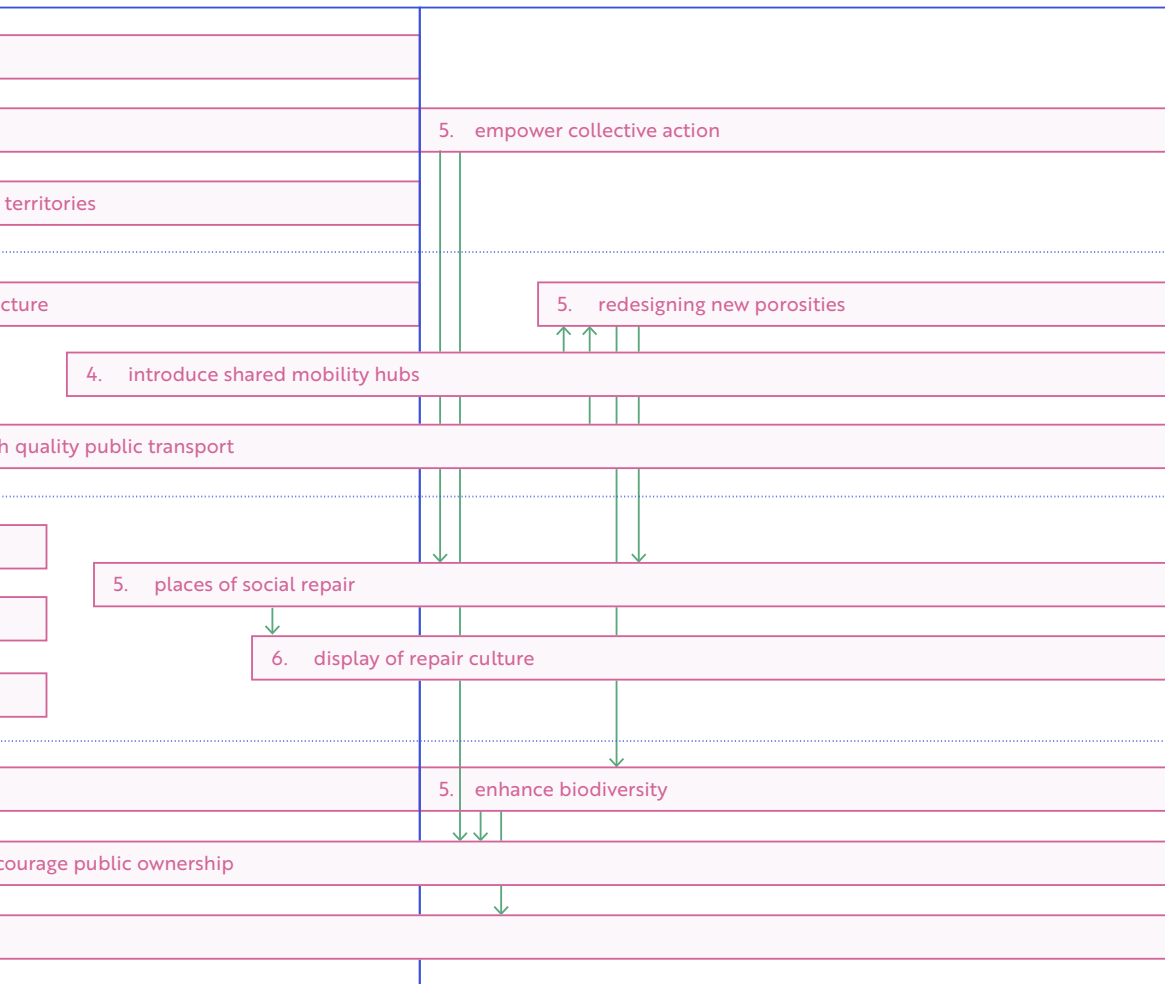
Empowerment for lasting impact
Phase III

approx. 2-3 years

contribute to long-term sustainability goals. These strategies encompass a wide range of actions, including promoting emission-friendly practices, reducing waste generation, conserving natural resources, and implementing measures to safeguard ecosystems and biodiversity.

Ultimately, these four strategies—community awareness, everyday decision-making, recovery, and protection—are crucial for promoting sustainable behaviours and establishing resilient and sustainable communities for the future. Their combined implementation enables communities to actively participate in creating a sustainable future while fostering a sense of collective responsibility and well-being.

Focal points
for sustainability

Mijnsherenplei

The provided map highlights four specific locations that serve as the focal points for a design exercise. The objective of this exercise is to implement interventions aimed at promoting sustainable behaviours within the Bloemhof and Tarwewijk areas. - so that we can find out what might work.

4.2
Design location choices

When selecting locations to motivate sustainable behaviours within a vulnerable neighbourhood, several logical determinants come into play. In vulnerable neighbourhoods, a medium to small-scale approach is often necessary to address the specific challenges faced by the community. The chosen locations reflect this approach, allowing for focused interventions that cater to the unique needs of each area. By adopting a place-based strategy, these locations become focal points where positive change can be nurtured and sustained.

One crucial factor is the publicness of the sites, as it directly affects the scale of influence within the neighbourhood. By choosing locations that are accessible and frequented by the community, the interventions have the potential to reach

Putsebocht
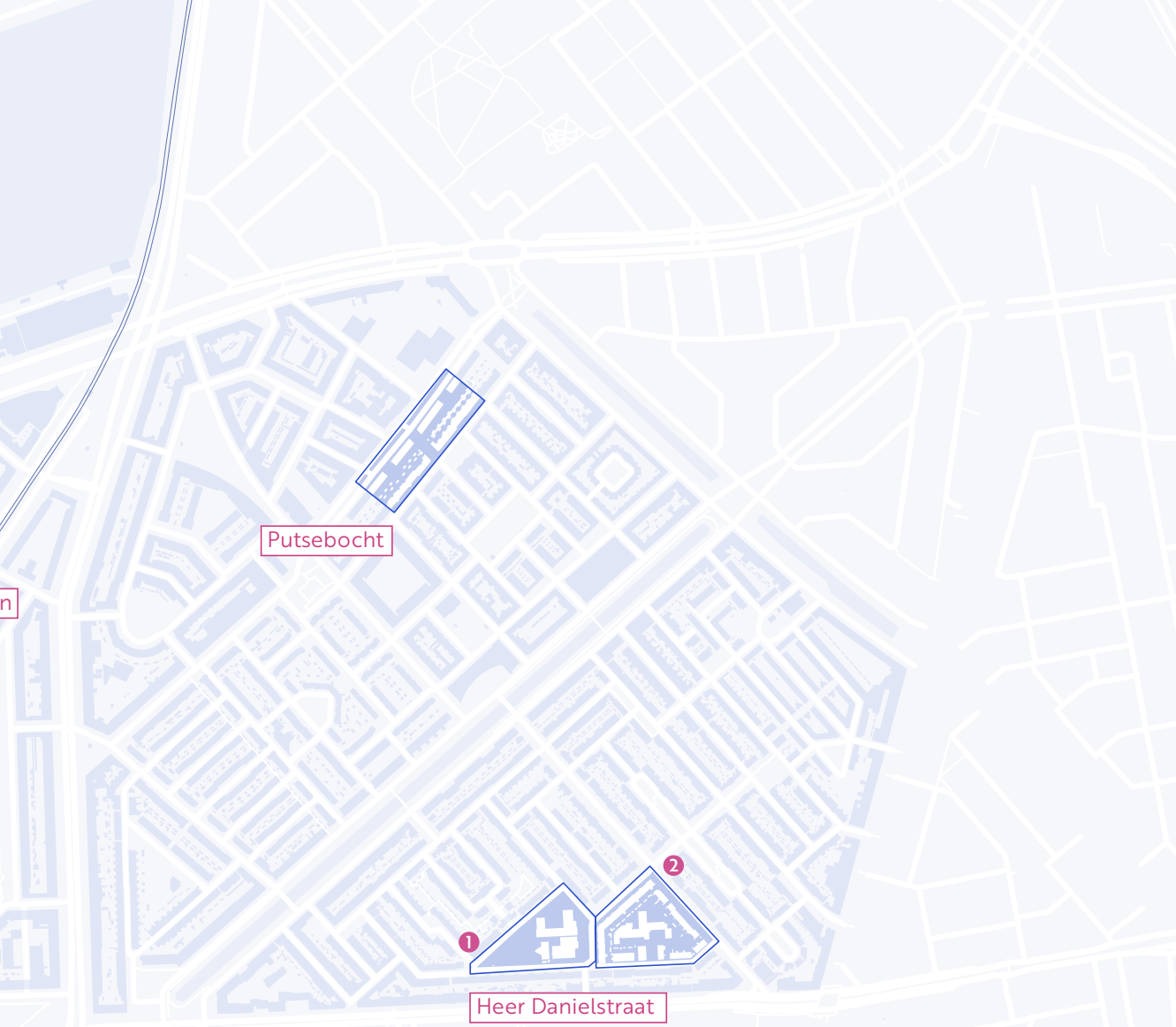
Heer Danielstraat

a wider audience and have a greater impact. This is where the eastern part of the Heer Danielstraat (1) and the Mijnsherenplein come into play. The western part of the Heer Danielstraat currently does not attract many people, but has the potential to, especially being located close to very public functions at the eastern part.

The Mijnsherenplein and the eastern part of the Heer Danielstraat, characterised by their public nature, offer immense potential for community engagement and interaction. However, it is in the less public areas where stewardship behaviours often thrive. The Putsebocht, with its more intimate setting, presents an opportunity for community stewardship to flourish. In these spaces, individuals

feel a greater sense of safety and ownership, leading - most likely - to a stronger commitment to taking care of the environment.

While at the Putsebocht intimate relations and stewardship behaviours are important (CA and RP). The Mijnsherenplein focuses on recreation and spontaneous interactions, while the eastern part of the Heer Danielstraat emphasises education (CA and RP) through its school and community centre. The western part of the Heer Danielstraat taps into creative energy and serves as a space for repair (ED). By selecting diverse locations it is ensured that different aspects of sustainable behaviours can be addressed.

Heer WEST Danielstraat

Nestled in the western part of Heer Danielstraat, lies a thriving hub that weaves itself into the social fabric of Bloemhof's urban landscape. This vibrant area houses essential community resources, such as the beloved Irene Community Centre, the Pantarijn Primary School, and the joyful De Driehoek Playground Association. Serving as a central location for education and community engagement, Heer Danielstraat breathes life into the neighbourhood. As one makes way through the primarily paved streets, cars line the way, but amidst all the stone, old trees stand tall and proud, adding a touch of natural beauty to the surroundings.

4.3
Map of the current situation of the Heer Danielstraat
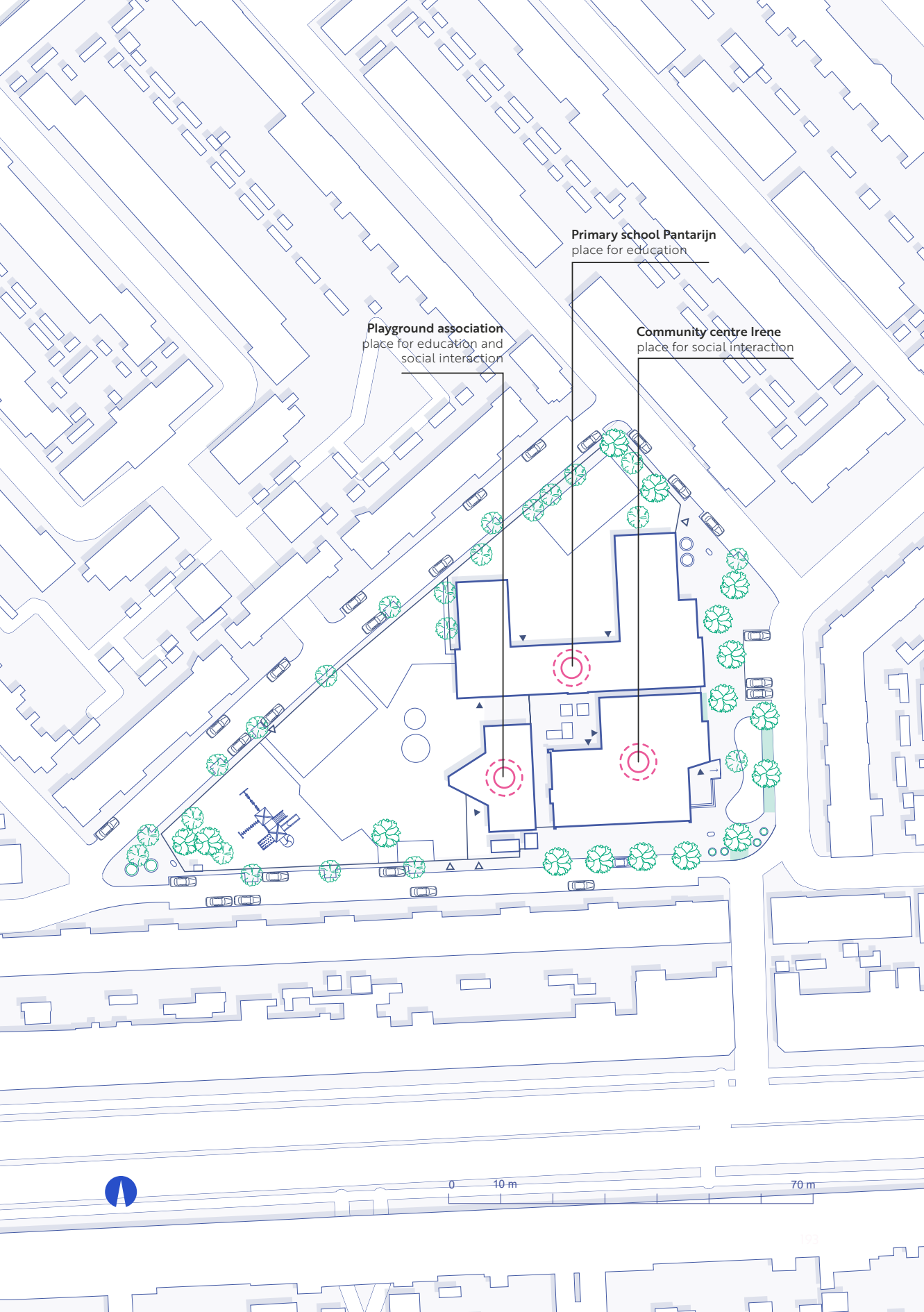
Playground association
place for education and
social interaction

Primary school Pantarijn
place for education

Community centre Irene
place for social interaction

0   10 m   70 m

Inside the community centre, a group of turkish woman are having their weekly meeting. At the same time a group of elderly women are having tea. After their meeting, some of the elderly women wait in the foyer to be picked up. Outside two 13-14 year old boys are sitting on the edge of a low wall. They do not seem to be doing much other than looking on their phone.

inside
elderly women
group of turkish women
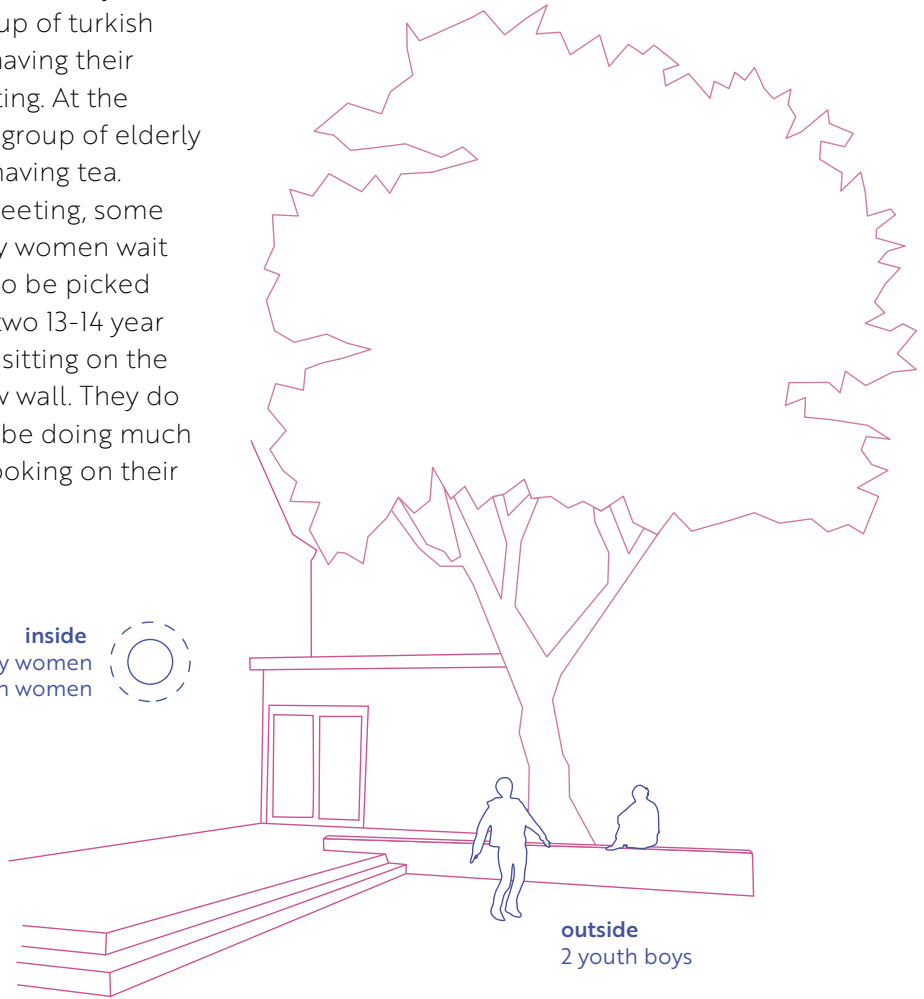
outside
2 youth boys

On the other corner, a mother and her children are walking towards the entrance of the playground. The mother is manipulating her stroller over the narrow sidewalk and her children run in front of her. On the playground, already a few children are playing with a parent watching over them.

inside playground
a parent
three children
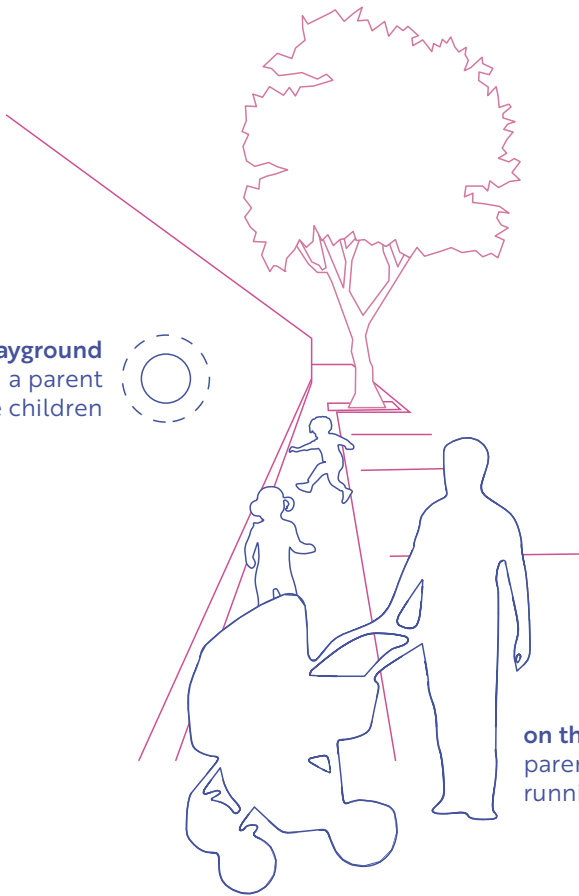
on the street
parent with stroller
running children

The need
for green

The amenities provided in the Heer Danielstraat play a crucial role in fostering community cohesion and promoting sustainability education. Based on the existing conditions, which prescribes future opportunities and current challenges, an approach for a redesign is formed.

Stakeholders

ACTIVATORS | Community centre Irene (SOL), Primary school Pantarijn, Playground association De Driehoek
INVESTORS | Municipality Rotterdam, SOL
PARTICIPANTS | Parents, Children, Visitors community centre

Opportunities

The Heer Danielstraat area presents both opportunities as challenges, which can be addressed through a redesign. On the positive side, the area already attracts a lot of people, which is positive for the sense of community and makes the area a good place to educate on sustainable solutions. There is already some variety in typologies of public spaces, with 2 playgrounds, a courtyard and a small central square in front of the community centre. The playgrounds provide a safe space for children to play and learn. The existing small community garden in the courtyard is also a source of pride for the people that are involved in it. Furthermore, the many full-grown old trees provide natural beauty and shade. The volunteers and employees at the community centre, with the volunteers of the playground association are important key players in the surroundings - they are already organising community events. Efforts can be merged to enhance intergenerational events and a new focus on sustainability.

4.4
Section of the current situation at the Heer Danielstraat

areas of focus
- inclusivity
- sustainable behaviours

Pantarijn primary s

materials top view

materials sustainability

Challenges

However, there are also several elements in the area that can be improved upon. The lack of greenery, other than the trees, is withholding the users of the space to build a meaningful relationship with nature. The area is heavily paved, leaving little room for nature, which is only represented in a few small planters added by the municipality. Another main challenge is the balance of the streetscape, where the car is lining every street at both sides. This leaves very little room for pedestrians, making the area less accessible. As the amenities are attracting people from all generations, safety should be a first priority.

Approach for a redesign

To address these issues and make the area more succesful in motivating sustainable behaviours, a redesign should focus on the following site-specific goals:

Goal 1 | Depave and provide green experience

This way biospheric values can be addressed and opportunities can be created for building a relationship with nature and to take on stewardship actions.
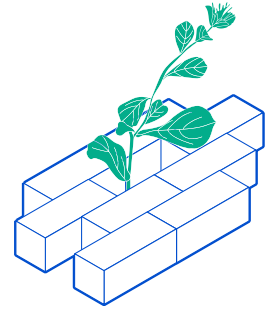
Goal 2 | Create a pedestrian-friendly environment

A positive step forward in rebalancing the streetscape and making social functions more accessible. This also requires providing sustainable mobility alternatives.

Goal 3 | Bringing people together

Creating more opportunities for social interactions within an environment that promotes sustainability, with a specific emphasis on merging different generations to foster social learning opportunities.

CA behaviours
workshops and living room

RP and CA behaviours
community garden

school

Community centre Irene
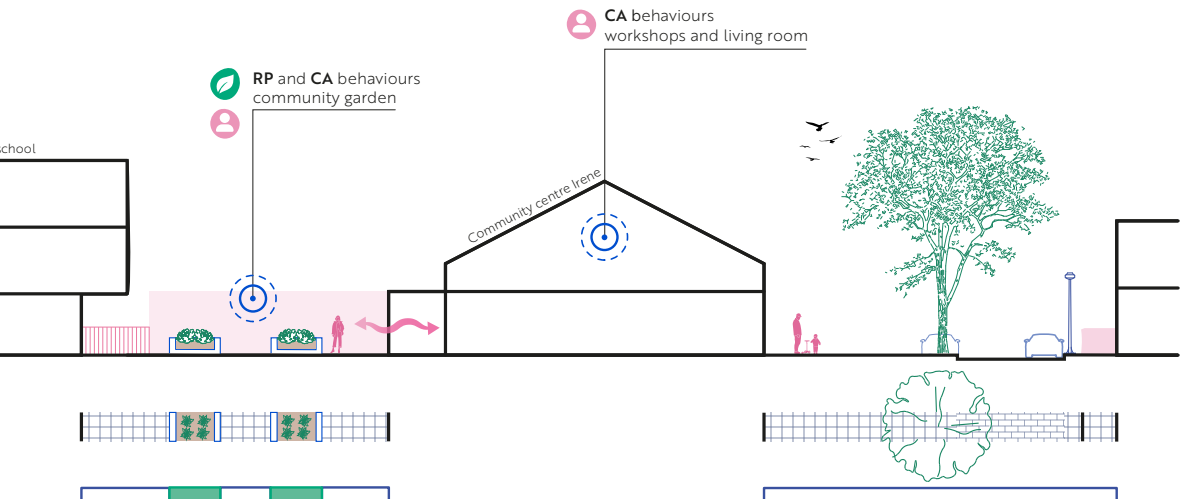
Activating green values

Through a redesign, the Heer Danielstraat and its ammenities can become places in which people of all generations can actively get involved with nature. To ensure a design that engages people in sustainable practices, some conditions need to be put in place.

Below, a list of requirements has been made up in which interventions are highlighted that can enhance sustainable behaviours in this specific context.

On the right page, the spatial conditions that inform the final design are listed through diagrams. This way, the final design becomes readable as a process.

4.6 (right)
Spatial conditions for the design at the Heer Danielstraat

4.5
Program of requirements for the Heer Danielstraat, location 1.

TB = target behaviour

focus	program	TB
	mobility and accessibility	
🌿	integrated bicycle parking	ED
🌿	pedestrian street Heer Danielstraat	ED/CA
🌿	shared car hub + information signing	ED
	social and natural experience	
🌿	sustainable materials of surfaces and equipment	RP
🧑🌿	variety of native greenery: maintained and colourful	RP
🧑	variety seating options to suit different needs	CA
🌿	variations in topography for natural playing	CA
	activities	
🌿	greenhouse for nature education	RP
🌿	planters for community gardening	RP
🌿	outdoor lecture benches	CA
🌿	natural playing equipment	CA
	– sensory pit	
	– waterstream with elements to climb on	
	– rocks and logs to climb on	
🌿🌿	pathways between greenery to run and explore	CA
🧑🌿	at least 2 varieties of sharing cabinets	ED
	zoning and safety	
🧑	fencing of natural materials, allowing for visibility	CA
🧑	gates between designated zones	CA
	waste managment	
🌿	waste disposal at every streetcorner	ED

areas of focus
🧑 inclusivity
🌿 sustainable behaviours

legend:
- buildings
- shaping elements
- trees
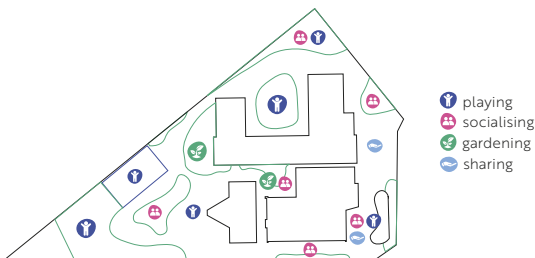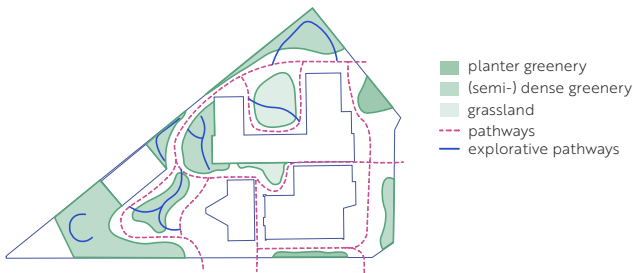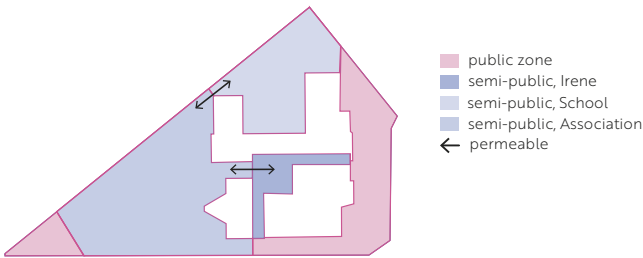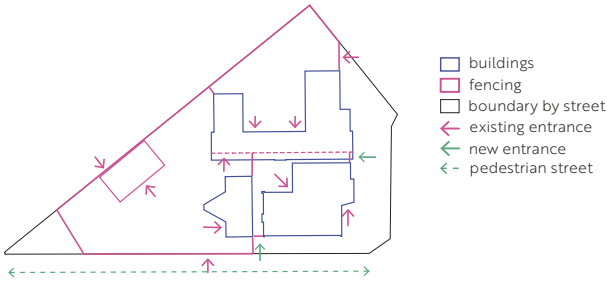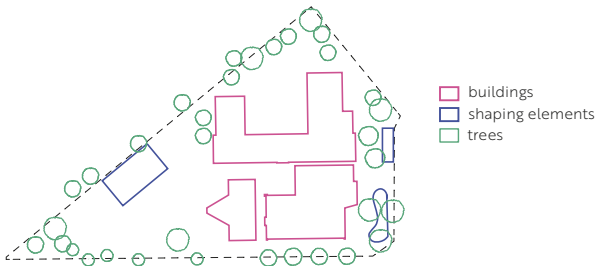
Structural elements

Irene, Pantarijn and De Driehoek will be maintained. The socer field, the car park in the Oudelandstraat and the bicycle landscape will be kept. The presence of existing trees can serve as a focal point for increasing biodiversity in the area.

legend:
- buildings
- fencing
- boundary by street
- existing entrance
- new entrance
- pedestrian street

Entrances and boundaries

Boundaries in the form of fences and gates help to provide safety for kids, but also from unwanted intrusions. Existing entrances are kept, but made more inviting. To enhance accessibility, a pedestrian street will be constructed on the south side.

legend:
- public zone
- semi-public, Irene
- semi-public, School
- semi-public, Association
- permeable

Alternating publicness

There are 4 main public zones. In pink the most public and accessible area. In blue, there are 3 zones that can be closed off, but also connected to one another through the use of fences and gates.

legend:
- planter greenery
- (semi-) dense greenery
- grassland
- pathways
- explorative pathways

Experience

The design will incorporate pathways that meander through green areas, creating a natural and immersive experience, where small pathways are introduced to enhance childrens exploration. In addition to shaping the pathways, the greenery will also provide open spaces where activities can take place.

legend:
- playing
- socialising
- gardening
- sharing

Accentuating functions

Play equipment and landscaping will cater towards the children and consequently their parents. Places will also be dedicated to sit, relax and casually socialise for youth, adults and elderly. Gardening can act as a unifying factor across different age groups.

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The Heer Danielstraat:
a biospheric landscape

The Heer Danielstraat can be transformed to a point of intersection between people from diverse backgrounds, fostering a connection with nature. To achieve this, the redesign must prioritise inclusivity, ensuring equal opportunities for everyone to engage in the public space. By doing so, the promotion of sustainable behaviours can become more impactful.

Inclusive design
To ensure that everyone feels welcome in the new design, certain elements become main points of attention.

► Cultural diversity
To appeal to diverse cultures, maintain well-conditioned greenery in public areas. Allow for a wilder look in playgrounds to encourage children's imagination. Spread sustainability information through school and community centre activities, as well as through universal symbolism to overcome cultural and language barriers.

► Affordability
Sharing practices contribute to affordability. It should also be acknowledged that not all cars should be removed to ensure that job opportunities are not lost.

► Safety
Safe boundaries are crucial. Fences protect playgrounds and the community center shapes a courtyard. Clear ownership by the center, school, and association promotes a welcoming and secure environment.

4.7
Section of the new situation at the Heer Danielstraat
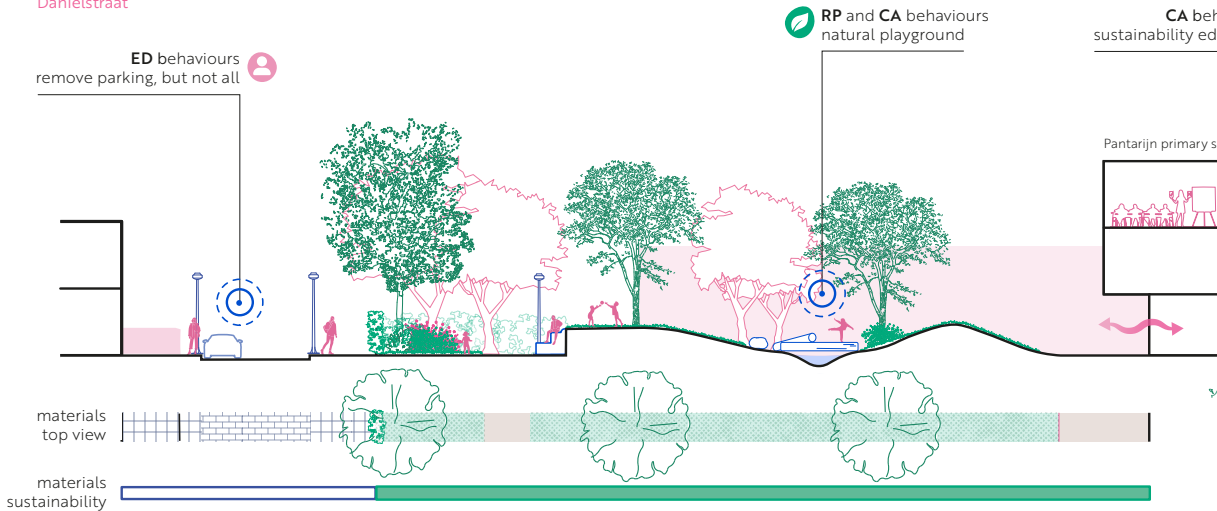
RP and **CA** behaviours
natural playground

CA beh
sustainability ed

ED behaviours
remove parking, but not all

Pantarijn primary s

materials
top view

materials
sustainability

Desired effects of the design

Through the proposed interventions some effects can be expected. These relate to the goals mentioned in the previous paragraph.

► Closer connection between people and nature through a comprehensive natural design for adults and children (IM). **Goal 1 & 3**

► Opportunities for stewardship actions through the provision of interactive green functions, such as a food garden and a natural playscape (EM). **Goal 1 & 3**

► A cohesive community through the provision of new opportunities for communal activities and opportunities for lingering in public space (EM). **Goal 1, 2 & 3**

IM = intrinsic motivation   **Goal** = site-specific goal
EM = extrinsic motivation

► Intergenerational learning through the connection of different functions by permeable boundaries (IM). **Goal 3**

► More sustainable mobility behaviours through the creation of affordances for pedestrians and communal transport (EM). **Goal 1 & 2**

► Stimulation of the practice of sharing through the provision of affordances that allow sharing, such as cupboards and shared mobility (EM). **Goal 2 & 3**

► A clean public space through an intentional design of waste facilities, both in terms of quantity and quality (EM). **Goal 2**

AA

ED and **CA** behaviours
workshops, living room and swapping

RP and **CA** behaviours
community garden

RP behaviours
well-maintained greenery

ED and **CA** behaviours
pedestrian street

...haviours
...ucation

...chool

Community centre Irene

Broadened sidewalk
prioritise sustainable mobility
and increase accessibility
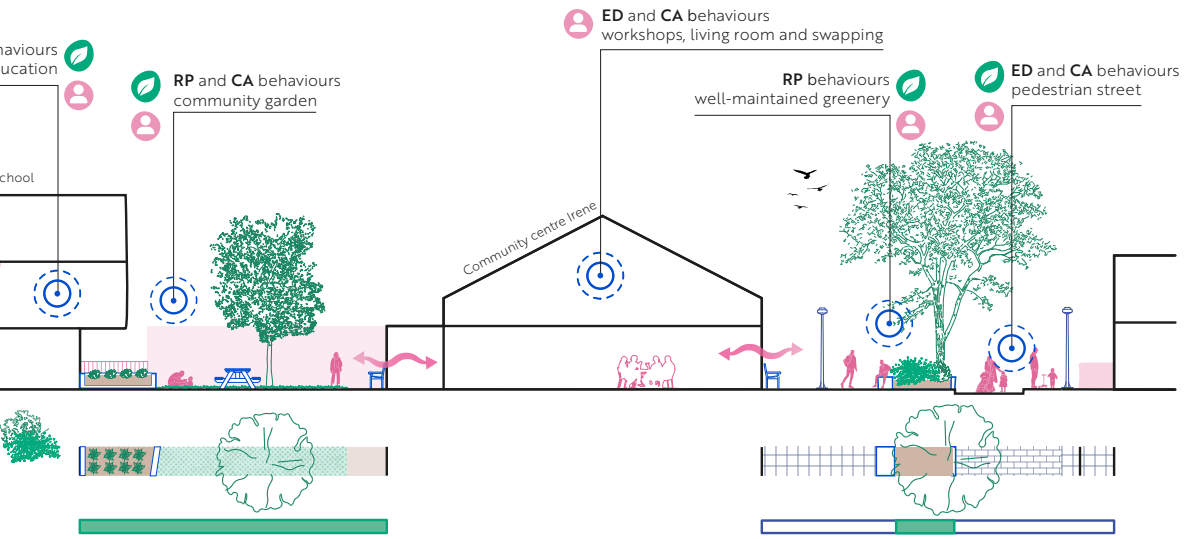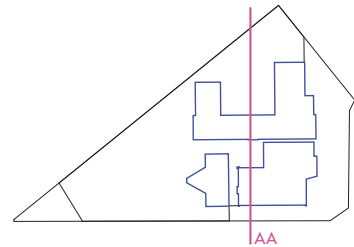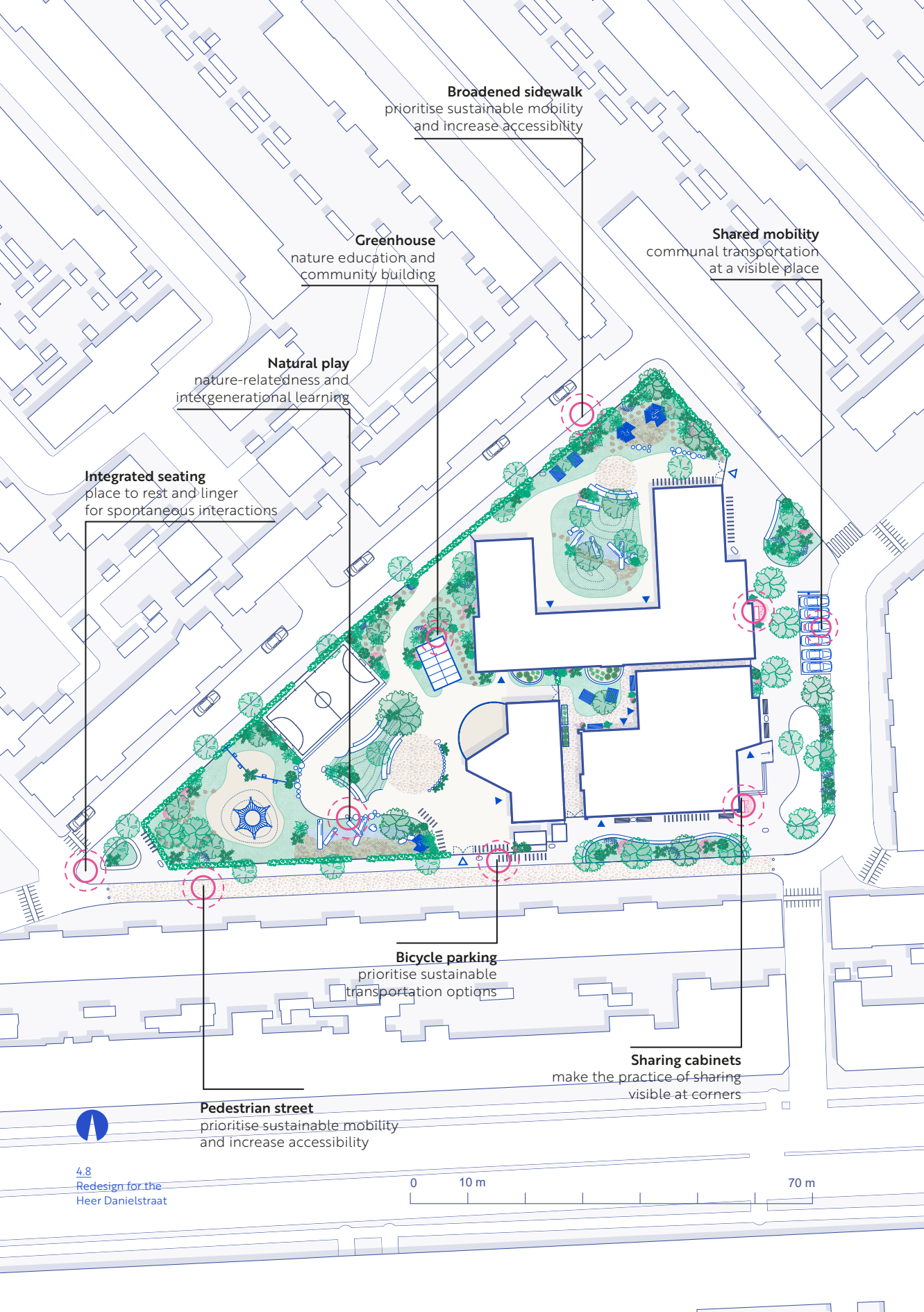
Shared mobility
communal transportation
at a visible place

Greenhouse
nature education and
community building

Natural play
nature-relatedness and
intergenerational learning

Integrated seating
place to rest and linger
for spontaneous interactions

Bicycle parking
prioritise sustainable
transportation options

Sharing cabinets
make the practice of sharing
visible at corners

Pedestrian street
prioritise sustainable mobility
and increase accessibility

4.8
Redesign for the
Heer Danielstraat

0   10 m   70 m

The impact of the design can be observed from different scale levels, addressing both behaviour as well as the general quality of the environment.

Individual interactions

Moving beyond symbolism, the impact of interventions become more tangible, leading up to actions of individuals. When it comes to individual behaviour, the concept of ease takes center stage. Through thoughtful design, we can aim to facilitate easy access by foot, provide convenient bicycle parking, streamline waste disposal processes, and promote sharing opportunities, ranging from small objects to cars. The design also incorporates opportunities for gardening and engaging with nature, establishing a space where active behaviours can thrive. Children are encouraged to active play by incorporating loops and pathways throughout the playground, guiding them through bushes, wadis, and trees. Tipi's, the variety of plants and wadis additionally tickle the senses of kids towards explorative play. The tranquility of the natural environment can be enjoyed in seating areas, where individuals can come, sit, rest and observe their environment.

Beyond the site

The interventions at the Heer Danielstraat can be linked to a larger scale of interventions within the neighbourhood. To effectively enhance sustainable mobility, these interventions should be integrated with larger-scale efforts, such as the improvement of public transport systems. The natural playground predominantly caters to younger children, and it would be beneficial to complement it with surrounding playgrounds that offer a diverse range of experiences and focuses, thus adding variety to the neighbourhood.

Materials and vegetation

The importance of design materiality can be understood from two angles: symbolism and environmental impact, of which the latter can be understood on a global and local scale. By choosing non-toxic, renewable, and plant-based materials, both aspects can be effectively addressed. This means that when it is safe to do so, playing equipment and seating facilities will be constructed using materials like wood and stone. The playground surfaces will consist of grassy planes and semi-paved areas, such as dolomite or wood chips. Create small valleys to enhance drainage and accommodate wadis. Paved surfaces will still be present for accessibility purposes and activities like children's chalk drawing, but a better balance is achieved by making permeable surfaces the norm. Prioritise native plant species, ensuring a diverse selection in terms of species, sizes, and colours. Opt for easily maintainable plants that thrive through different seasons to sustain long-lasting appeal of green spaces and enhance learning opportunities.

Collective interactions

However, above all this design seeks to promote interactions between people and lift up the community as a whole. The existing facilities, which already attract people, are further enhanced by the thoughtful design of the public space. The educational function of the school is enhanced by outdoor lecture areas, by incorporating outdoor lecture areas, offering opportunities for nature-based lessons. The playground now serves as a platform for intergenerational interactions through a shared activity: gardening. Gardening not only provides individual engagement but also fosters a sense of communal participation. This can be facilitated through the involvement of the community centre. Inside the community centre, an affordable and welcoming space exists, which can be further utilised to expand the current program of lessons and workshops centered around sustainable practices such as gardening, clothes repair, or clothing exchanges. Throughout the premises, spaces for lingering are designed not only to encourage peaceful solitude but also to facilitate spontaneous interactions. At the school entrance, parents can linger and interact while dropping off or picking up their children.

Temporality and cycles of use

In urban design, considering the usability of interventions throughout the year is essential for creating dynamic and sustainable spaces that cater to the diverse needs of communities. Categorising interventions based on their year-round usability allows us to understand how these spaces remain engaging and continuously express sustainable values towards their users.

Daily cycles
Sharing cupboard, Shared mobility/ cars

Event-based
Use of courtyard, Garden beds and educational events greenhouse

Seasonal
Food garden, Use of courtyard, Greenery of the natural playscape, Wadi's

Continuous
Use of waste disposals, Bicycle parking, Playground, Greenhouse, Community centre living room

The community centre hosts a sharing cupboard, providing a platform for collaboration and resource-sharing among residents on a daily basis. Additionally, a shared mobility testing ground allows residents to explore and utilise sustainable transportation options on a daily basis, promoting eco-friendly commuting regardless of the season. These interventions provide a different experience allround, as what is offered can vary greatly.

Seasonal cycle interventions acknowledge the influence of weather and environmental conditions. The community centre's courtyard serves as a versatile space, adapting its usability based on changing seasons. A garden consisting of planters is integrated, offering accessibility and the opportunity for gardening for all age groups. Because the planters alleviate plants from the soil, it can lengthen the lifespan of some crops. The natural playscape within the community incorporates greenery that

emphasises the seasons, as well as wadi's that respond to the weather, providing an immersive and educational experience for children.

Event-based cycle interventions add vibrancy and foster a sense of community identity. The courtyard becomes a gathering place for celebrations, events, and cultural expressions, fostering a strong sense of belonging. Planting a garden and education at the greenhouse can become events in themselves, bringing residents together to promote sustainable practices and beautify their surroundings. These initiatives contribute to collective experiences and a shared sense of pride.

Continuous cycle interventions ensure year-round availability and functionality. Conveniently located bicycle parking facilities promote sustainable mobility options and reduce car reliance. Strategically placed waste disposals contribute to proper waste management, ensuring a clean and healthy urban environment. The educational role of gardening can also become meaningful year-round through the greenhouse.

The progress over time is reflected in the incorporation of green infrastructure and the growth of plants and trees within the urban space. As vegetation matures, it enhances aesthetics, improves air quality, reduces the urban heat island effect, and increases biodiversity. This progression fosters a deeper connection with nature and demonstrates a long-term commitment to sustainability.

continuous

event
based

seasonal

seasonal

continuous
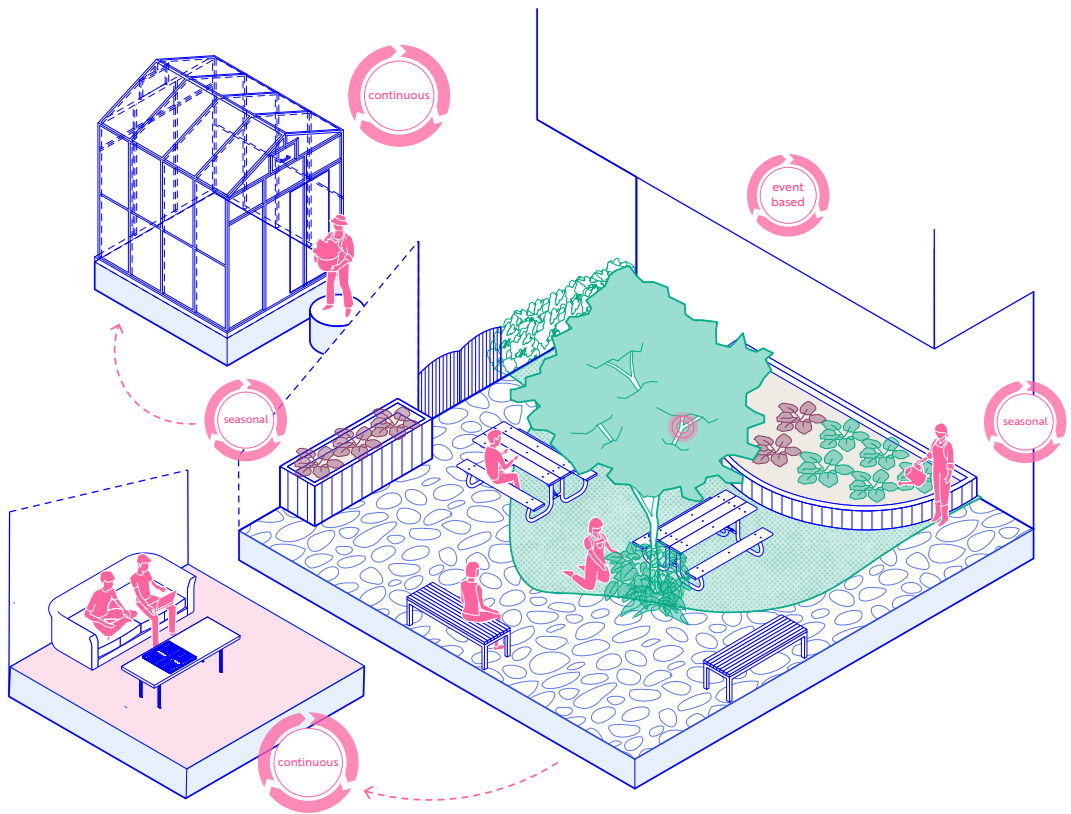
Examples of temporality
of interventions at the
Heer Danielstraat

growth over
the years
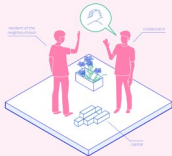
Below, the patterns are showcased that are
related to the interventions described above.
Full description of the patterns can be found
in the pattern catalogue

C4 Living
together

Warm and inviting community living rooms foster strong
community connections.

RELATED TO
C2, C3

C1 Connecting
key players

Sustainability values in a neighbourhood can become
meaningful for a larger group through collective action.

RELATED TO
E5, E9, E10, R3, R5, R7, R8

R4 Learning
by playing

Natural playscapes increase environmental awareness
among children.

RELATED TO
C7, R1, R2, R3

► Warm and inviting community
living rooms foster strong
community connections

► Sustainability values in a
neighbourhood can become
meaningful for a larger group
through collective action.

► Natural playscapes increase
environmental awareness among
children.

Moving towards action

The phasing of an urban design plan ensures an inclusive transition, allowing the population to acclimate and adjust behaviours. By involving communities from the beginning and fostering a sense of ownership, the design can inspire and empower individuals to embrace new sustainable behaviours

Phase II | Setting the foundation

After assessing the current state, a few interventions can be implemented relatively quickly. These include waste disposals, bicycle infrastructure, sharing cupboards and seating areas with integrated greenery in the most public area that don't require the removal of parking. At this stage, active participation of the community centre, the school and the playground association is required in the form of workshops, events and input sessions. The shared mobility testing ground can now be implemented, but does require further development from this stage. Trees need to be planted so they can mature.

Phase II-III | Temporary interventions

Before parking spaces can be removed from the streets, the mobility hubs have to be evaluated on succes. When succesful, the process of broadening the sidewalks can be started. At the Heer Danielstraat, the conversation of a pedestrian street can be started at the same time. The design of the courtyard can be implemented at this stage. The playgrounds can be transformed by involving the kids intensively, allowing them to start planting new vegetation and making it an educational experience.

Phase III | Empowerment for lasting impact

Before finally establishing the pedestrian street, a temporary pedestrian street can be established. When this is succesful, the street can be transformed. The mobility hub should at this stage be fully implemented.

—— Finalised intervention
—— Temporary intervention
-- -- Participation process

4.11
Phases of
interventions

C1 C4

E5
R1

C5   R2

E9

E2

E7

C6
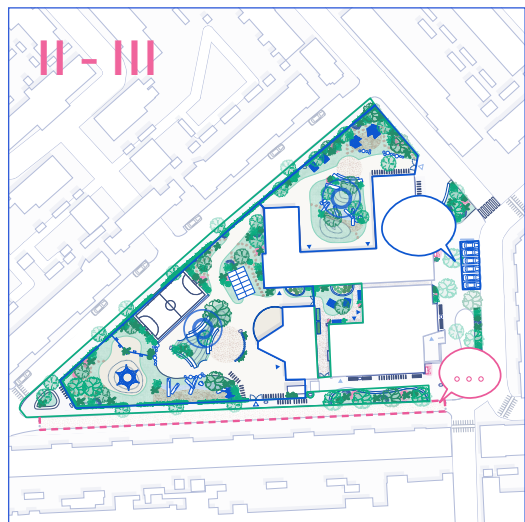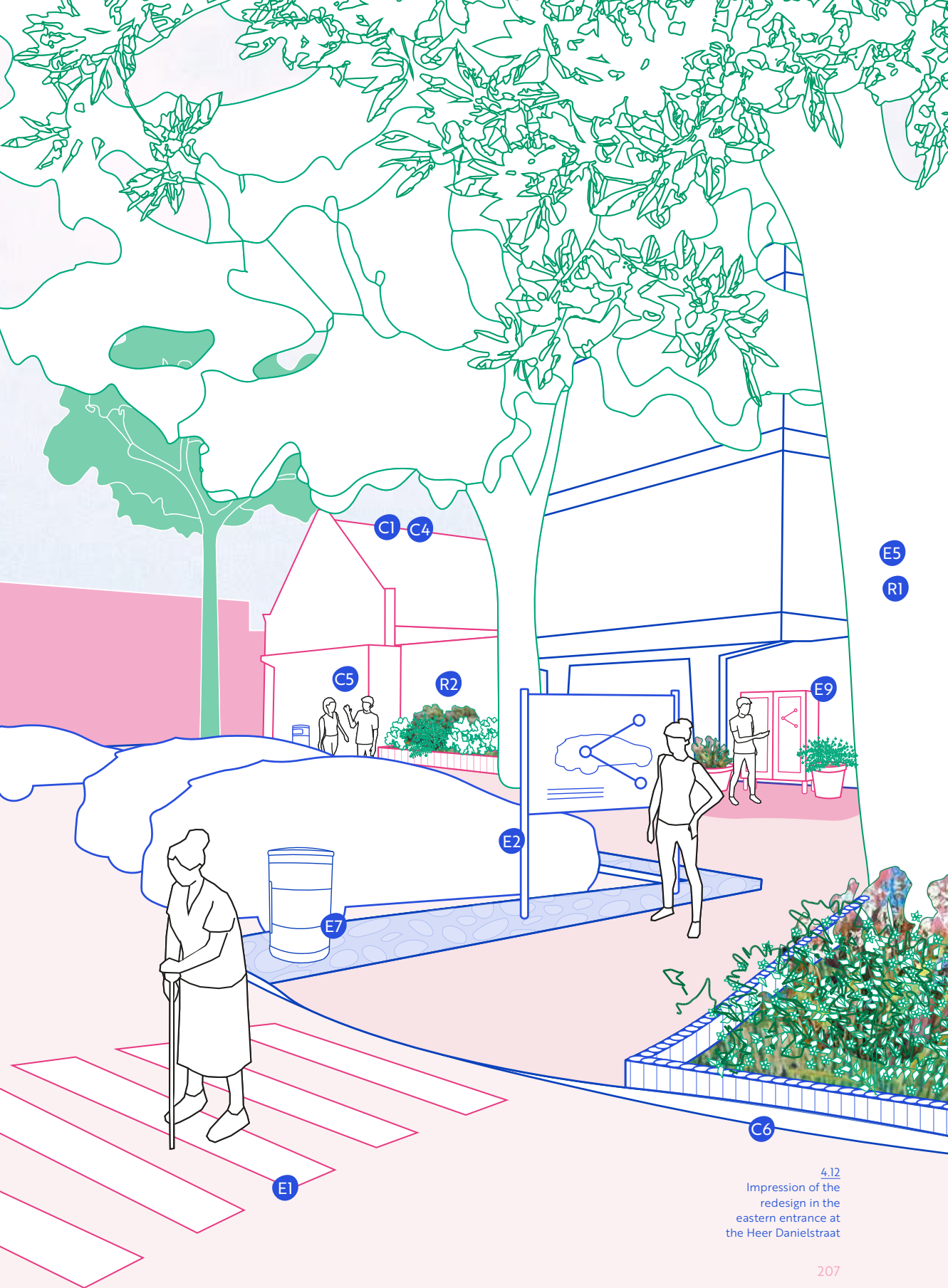
Impression of the
redesign in the
eastern entrance at
the Heer Danielstraat

E1

R3

R3 R7

R1

R4
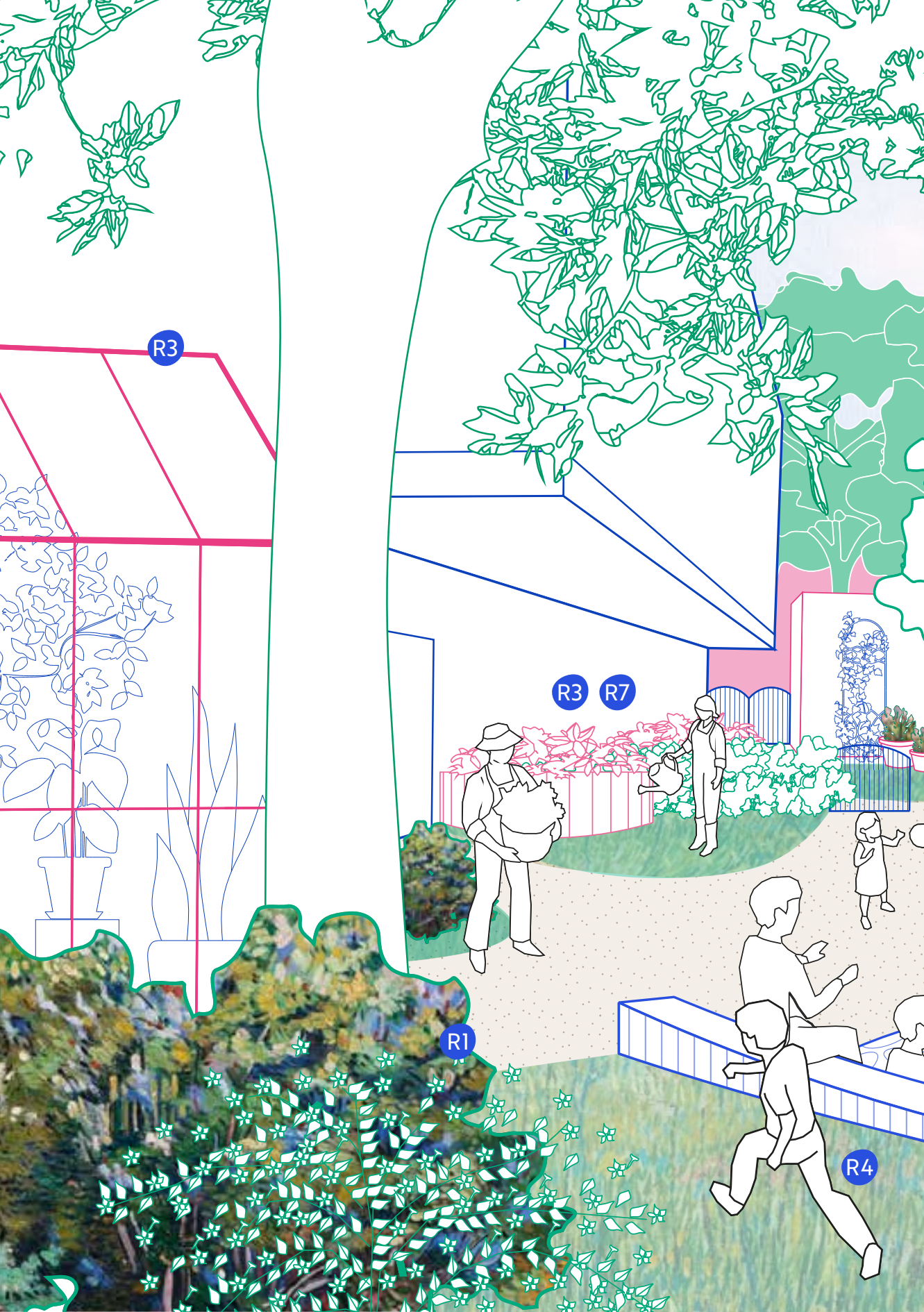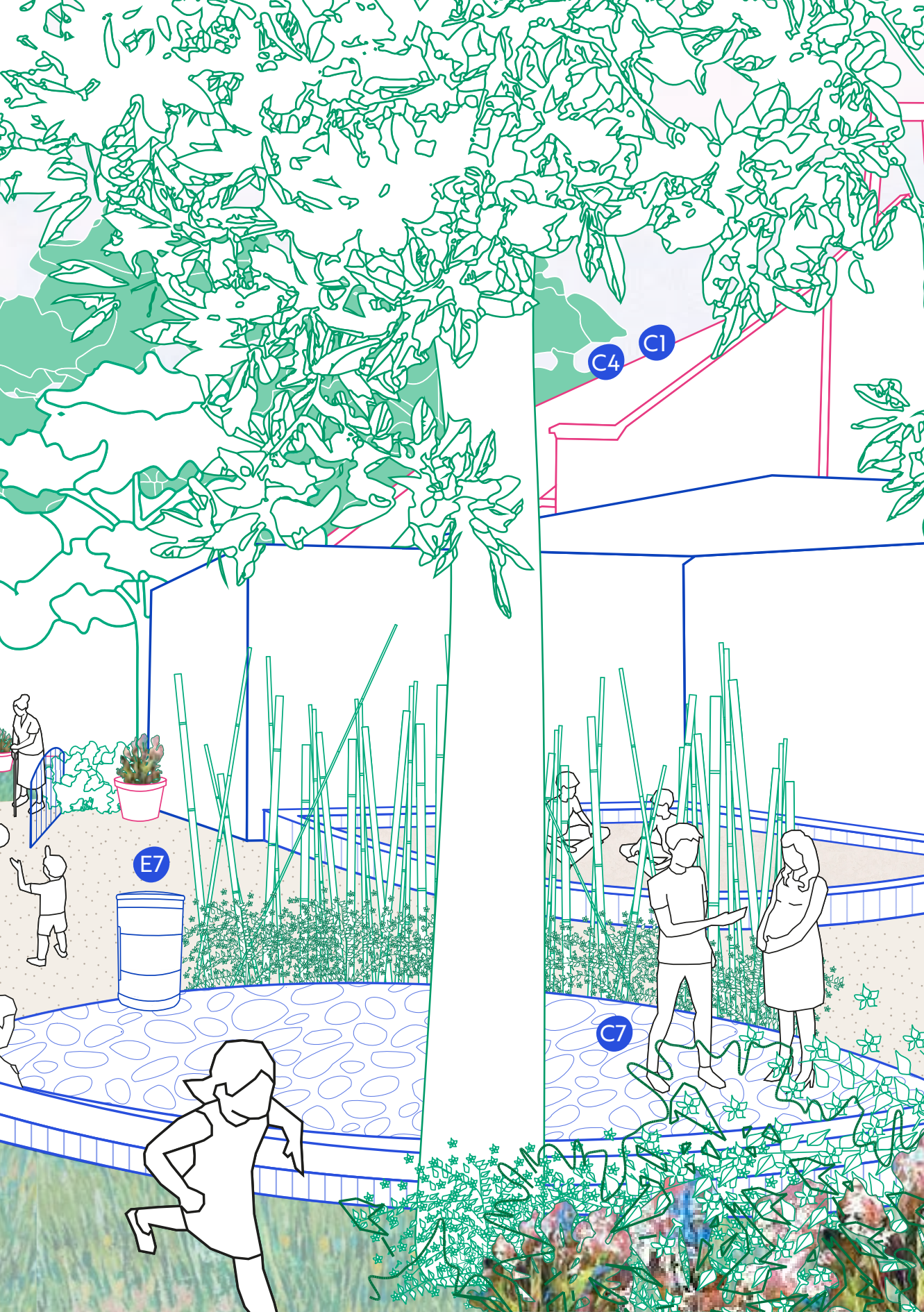
Heer EAST Danielstraat

In the southern area of Bloemhof, a majestic tower stands tall, captivating the gaze as it gracefully presides over the rooftops. Nestled within the eastern part of Heer Danielstraat lies a vibrant hub of creativity. Amongst the residential areas, a historic building lies, waiting to be awakened as a potential focal point for the community. Through the small streets and by passing front gardens, the entrance of a stoney courtyard is met with high iron gates. Beyond those gates, a world of inspiration and possibilities awaits.

4.14
_Map of the current situation of the Heer Danielstraat

SKAR ateliers
place for creative work

0   10 m   70 m
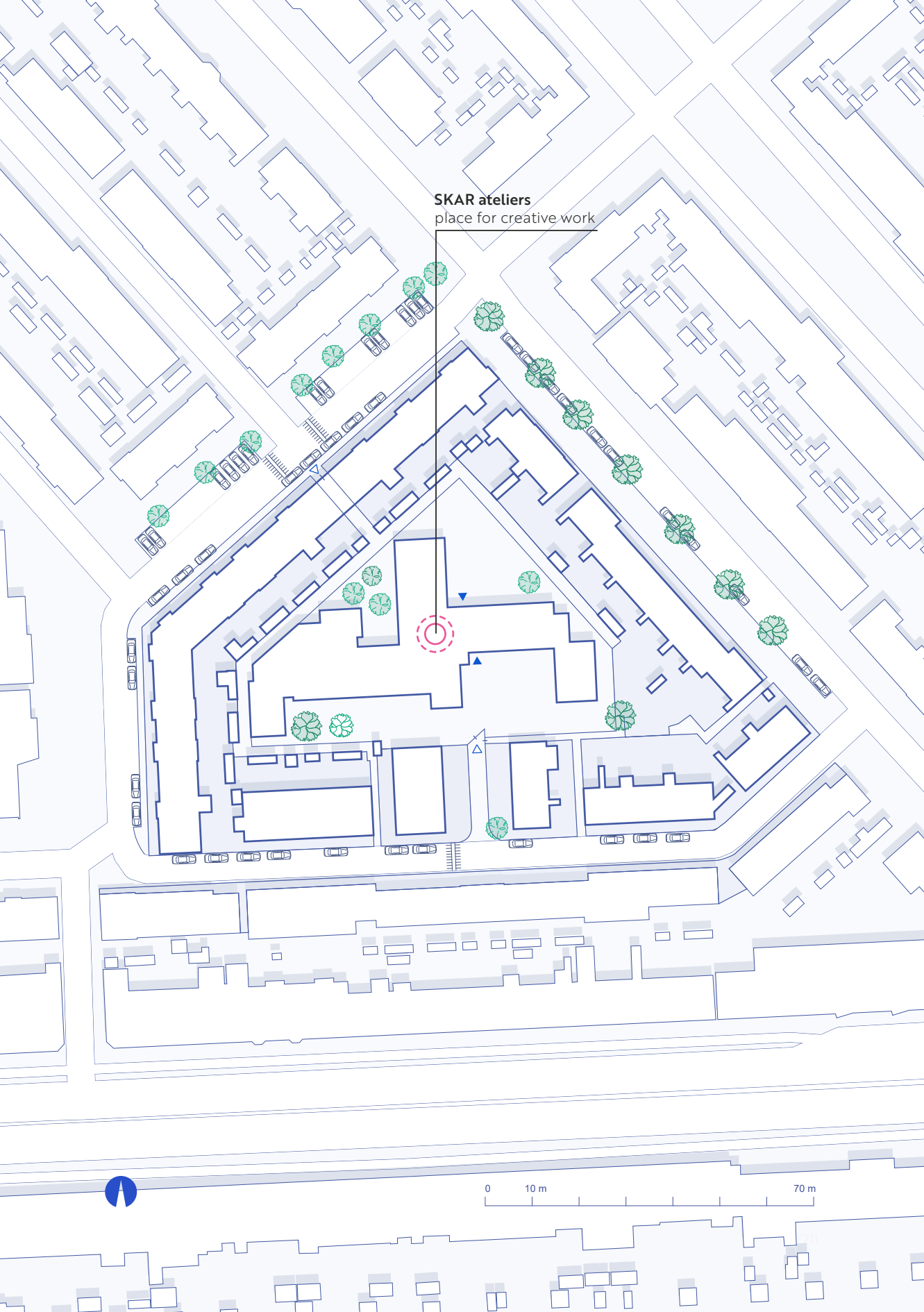
Untouched creativity

The ateliers are an important facilitator of creative thinking within Bloemhof and can play a crucial role in fostering a practice of sharing and repairing. Based on the existing conditions, which prescribes future opportunities and current challenges, an approach for a redesign is formed.

Stakeholders

ACTIVATORS | SKAR ateliers, Adjacent residents
INVESTORS | Municipality Rotterdam
PARTICIPANTS | Adjacent residents, Wider community Bloemhof, SKAR ateliers artists and craftsman

Opportunities

The eastern part of the Heer Danielstraat area presents a unique canvas of opportunities that can be brought to life through a redesign. Among the positives is a central building nestled among local housing, currently housing a variety of creative ateliers. The ateliers are a hub of skills and knowledge that can unlock numerous opportunities for the local community to engage in creative activities centered around sustainable material use and repair work.
The building itself, designed by the renowned Rotterdam architect Ad van der Steur, boasts a striking tower and a fascinating architectural style that adds character to the area. Despite its secluded location, the tower can be seen from afar, making it a unique landmark. Furthermore, the site is covered with mature trees that provide natural beauty and shade, creating a peaceful environment.
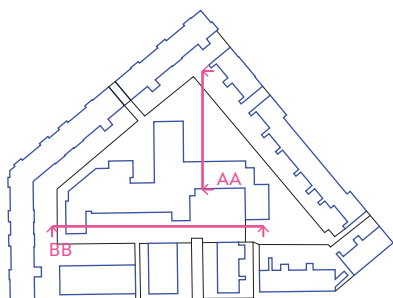
4.15
Sections of the current situation at the Heer Danielstraat (part II). Left is AA. Right is BB.

ED behaviours
ateliers and workshops

materials
top view

materials
sustainability

materials
top view

materials
sustainability
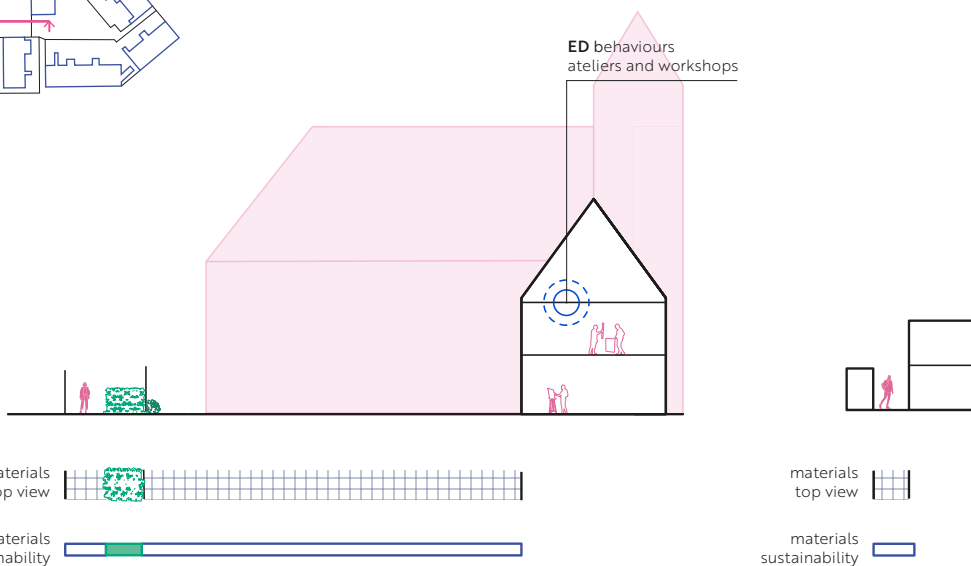
Challenges

However, the current state of the courtyard that surrounds the ateliers can best be described as badly maintained and underused. Most of the area is paved, allowing limited space for natural elements. Moreover, the courtyard is disconnected from the adjacent residences by steel fencing and a narrow alleyway, hindering social interaction between residents and the ateliers. The narrow alleyways also prohibit opportunities for spontaneous interactions between local residents themselves. In terms of accessiblity, the entrance towards the courtyard provides an obstacle. The eastern part of the Heer Danielstraat is very narrow, which is further enhanced through street parking, and does with a lack of sidewalks not invite for wandering in.

Approach for a redesign

To address these issues and make the area more succesful in motivating sustainable behaviours, a redesign should focus on the following site-specific goals:

Goal 1 | Promote the reuse and recycling of materials

Sustainable consumption can be promoted by providing places in which the practice of sharing and repairing becomes accessible to all people within the neighbourhood.
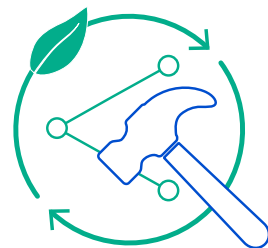
Goal 2 | Create an engaging and natural courtyard

Create an engaging and natural courtyard that fosters interactive activities with the environment and between people, strengthening relationships by opening it up to the public.
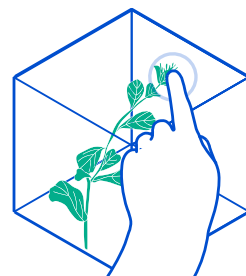
Goal 3 | Ensure the privacy and safety of surrounding residents

Designing public spaces with consideration for adjacent residents' privacy and feelings of safety. This can be ensured by allowing for gradients of publicness.
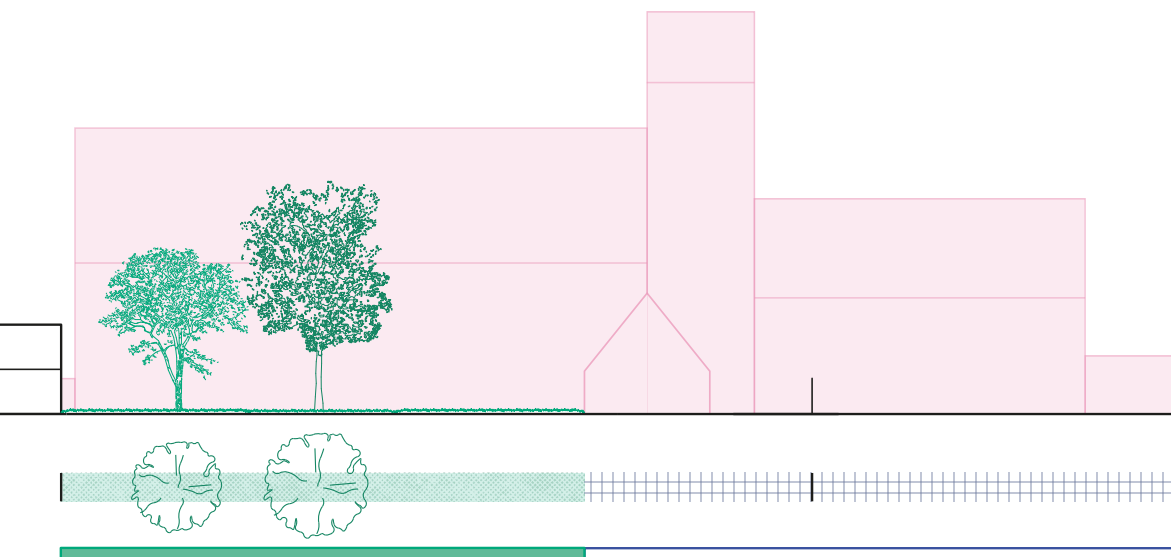
Reconstructing waste to wonder

The unused potential of the atelier courtyards present an opportunity for a redesign that enhances the practice of sharing and repairing in the neighbourhood. By leveraging these features, new opportunities can be created that support and enrich the lives of those in the area. To ensure a design that engages people in these practices, conditions need to be put in place.

Below, a list of requirements has been made up in which interventions are highlighted that can enhance sustainable behaviours in this specific context.

On the right page, the spatial conditions that inform the final design are listed through diagrams. This way, the final design becomes readable as a process.

4.17 (right)
Spatial conditions for the design at the Heer Danielstraat (part II)

4.16
Program of requirements for the Heer Danielstraat (part II)

TB = target behaviour - related to the patterns

focus	program	TB
	mobility and accessibility	
🌿	integrated bicycle parking	E1
🌿	broaden sidewalk Heer Danielstraat	E1/C5
👤	privacy of the path towards backgardens	R6
	social and natural experience	
🌿	sustainable materials of surfaces and equipment	R1
👤🌿	variety of native greenery: maintained and orderly	R2
👤	variety seating options to suit different needs	C2
	activities	
🌿	patch for gardening	R3
🌿	outdoor workshop	E10
👤	small playground	C7
👤	neighbourhood oven	C3
👤	neighbourhood pantry	E9
👤🌿	sharing cabinet	E9
	zoning and safety	
🌿	fencing of natural materials, allowing for visibility	C2/R1
👤🌿	gates between designated zones	C2/C3
	waste managment	
🌿	waste disposal at every seating opportunity	E5/E6
🌿	outdoor recycling station	E6/E9/E10

areas of focus
👤 inclusivity
🌿 sustainable behaviours
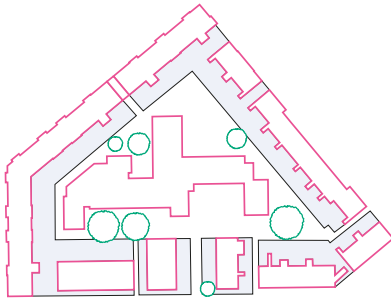
buildings
**shaping elements**
trees

Structural elements

Keep existing public buildings: housing and SKAR ateliers. Other structural elements are the backgardens of the housing and the presence of existing trees can serve as a focal point for increasing biodiversity in the area.
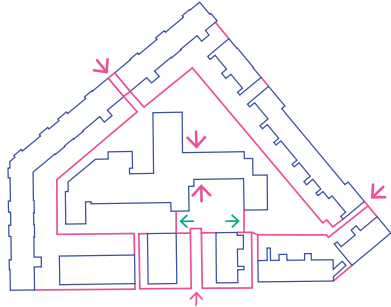
buildings
fencing
← existing entrance
← new entrance

Entrances and boundaries

Boundaries in the form of fences and gates help to maintain privacy of residents and from keeping the garden from being tainted by vandalism. Existing entrances are kept, but made more inviting.
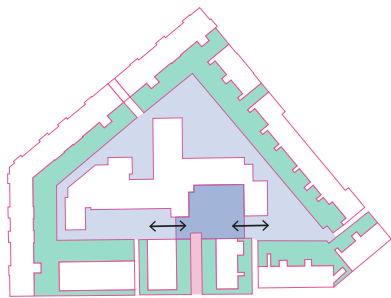
public zone
semi-public, ateliers
semi-public, residents
private zone, backgardens
**← permeable**

Alternating publicness

The area is surrounded by private backgardens. The main entrance is the most public place. The zone before the entrance of the workspace can be closed off at night. The zone that is connected to the backyards of the residents can be closed off seperately to provide more privacy when necessary.

planter greenery
(semi-) dense greenery
grassland
- - - pathways

Experience

The design will incorporate pathways that meander through green areas, creating a natural and immersive experience. Greenery will also act as dividers that create a more secluded zone in front of the private gardens, but still allow interacting between the shared space and private space.
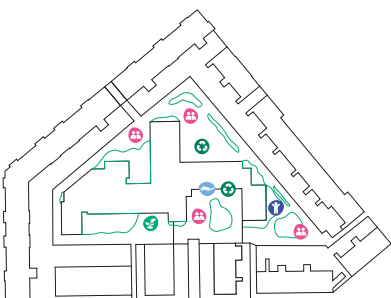
playing
socialising
gardening
sharing
recycle or repair

Accentuating functions

Different zones of socialisation will be created, enhancing different types of interactions. Recycling and repair facilities will be visible in the outdoor space. A community garden will be available for residents and visitors. Children can play in a designated area.

The Heer Danielstraat: a place of repair

The Heer Danielstraat can be transformed to the centre of a practice of repairing and sharing within Bloemhof. To achieve this, the redesign must prioritise inclusivity, ensuring equal opportunities for everyone to engage in the public space. By doing so, the promotion of sustainable behaviours can become more impactful.

Inclusive design
To ensure that everyone feels welcome in the new design, certain elements become main points of attention.
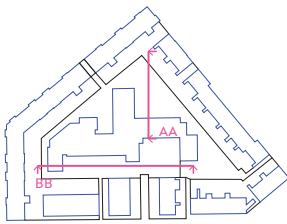
▶ Cultural diversity
To cater to diverse cultures, greenery should serve multiple purposes, including aesthetics, ecology, and functional significance. For instance, a food garden can be established to grow culturally familiar foods. Promote sustainability through community workshops and universal symbolism to bridge cultural and language barriers.
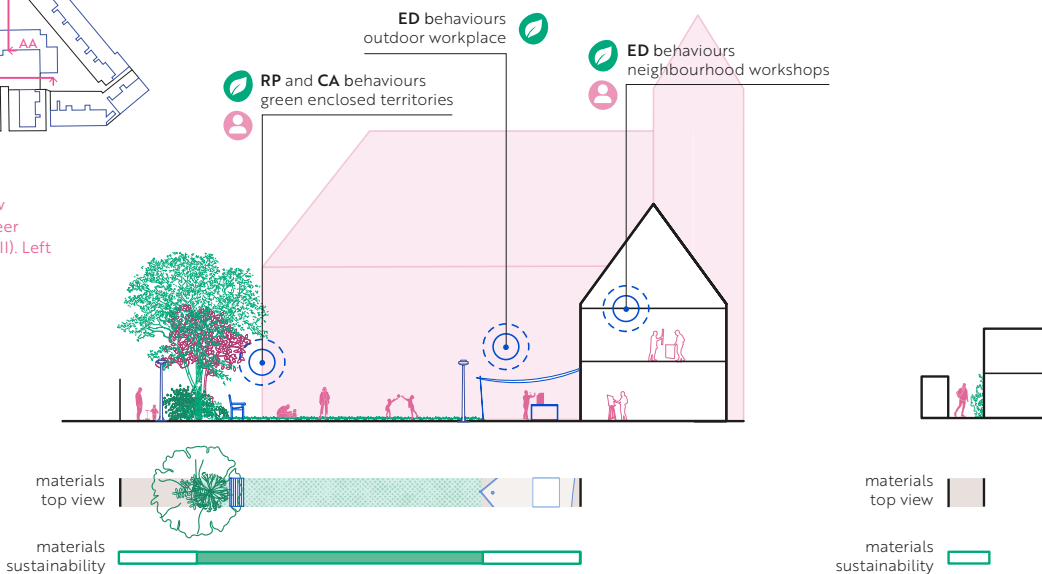
▶ Affordability
Promote affordability by encouraging sharing and repairing practices. Repurposing objects instead of discarding them preserves their functionality. Participating in workshops allows individuals to learn new skills and potentially earn a small income. This is especially advantageous for those who are distanced from the job market.

▶ Safety
Safety requires clear boundaries. The courtyard is divided into zones that can be closed off to outsiders while remaining accessible to adjacent residents. The entrance serves as the most public area, which can be isolated from the rest of the courtyard if disturbances arise.

4.18
Section of the new situation at the Heer Danielstraat (part II). Left is AA. Right is BB.

ED behaviours
outdoor workplace

RP and CA behaviours
green enclosed territories

ED behaviours
neighbourhood workshops

materials top view

materials sustainability

materials top view

materials sustainability

Desired effects of the design

Through the proposed interventions some effects can be expected. These relate to the site-specific goals mentioned in the previous paragraph.

► Aquiring a new public space that is valuable for both the community in close proximity, as well as a wider public - therefore enhancing social interactions within a sustainable context (EM). Goal 2 & 3

► Closer connection between people and nature through a comprehensive natural design for adults and children (IM). Goal 2 & 3

► Opportunities for stewardship actions through the provision of interactive green functions, such as a food garden (EM). Goal 2

► A cohesive community through the provision of new opportunities for communal activities and opportunities for lingering in public space (EM). Goal 1, 2 & 3

► Opportunities for residents to aquire new skills through an eco-social program focussed on purposeful activities of repairing (IM and EM). Goal 1

► Less waste of materials in the neighbourhood by providing a place in which broken goods can be brought and repaired (EM). Goal 1

► Stimulation of the practice of sharing through the provision of affordances that allow sharing, such as public cupboards and pantries (EM). Goal 1
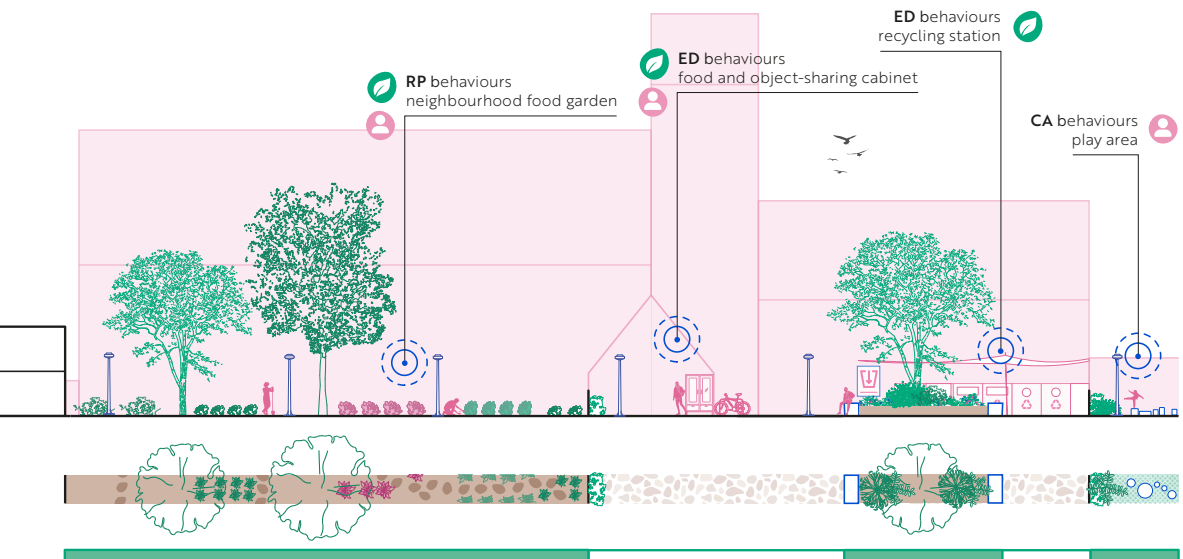
► An addition to food security. While not being able to supply for all residents, the communal food garden aims to not only engage people with nature, but also has a social effect by providing affordable/free food (EM). Goal 2

IM = intrinsic motivation Goal = site-specific goal
EM = extrinsic motivation

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4.19
Redesign for the
Heer Danielstraat

Neighbourhood workshop
place in which repairing and
recycling skills/labor gets trained

Recycling station
giving new value to waste
at a visible place

Natural playground
include all generations
in the design

Community interactions
place for interactions and
appropiation by local residents

Pedestrian facilities
places to rest and linger
for spontaneous interactions

New sidewalk
prioritise sustainable
transportation options

Community food garden
promote interactive green
spaces and food sharing

Phasing out parking
prioritise sustainable
transportation options

0   10m   50m
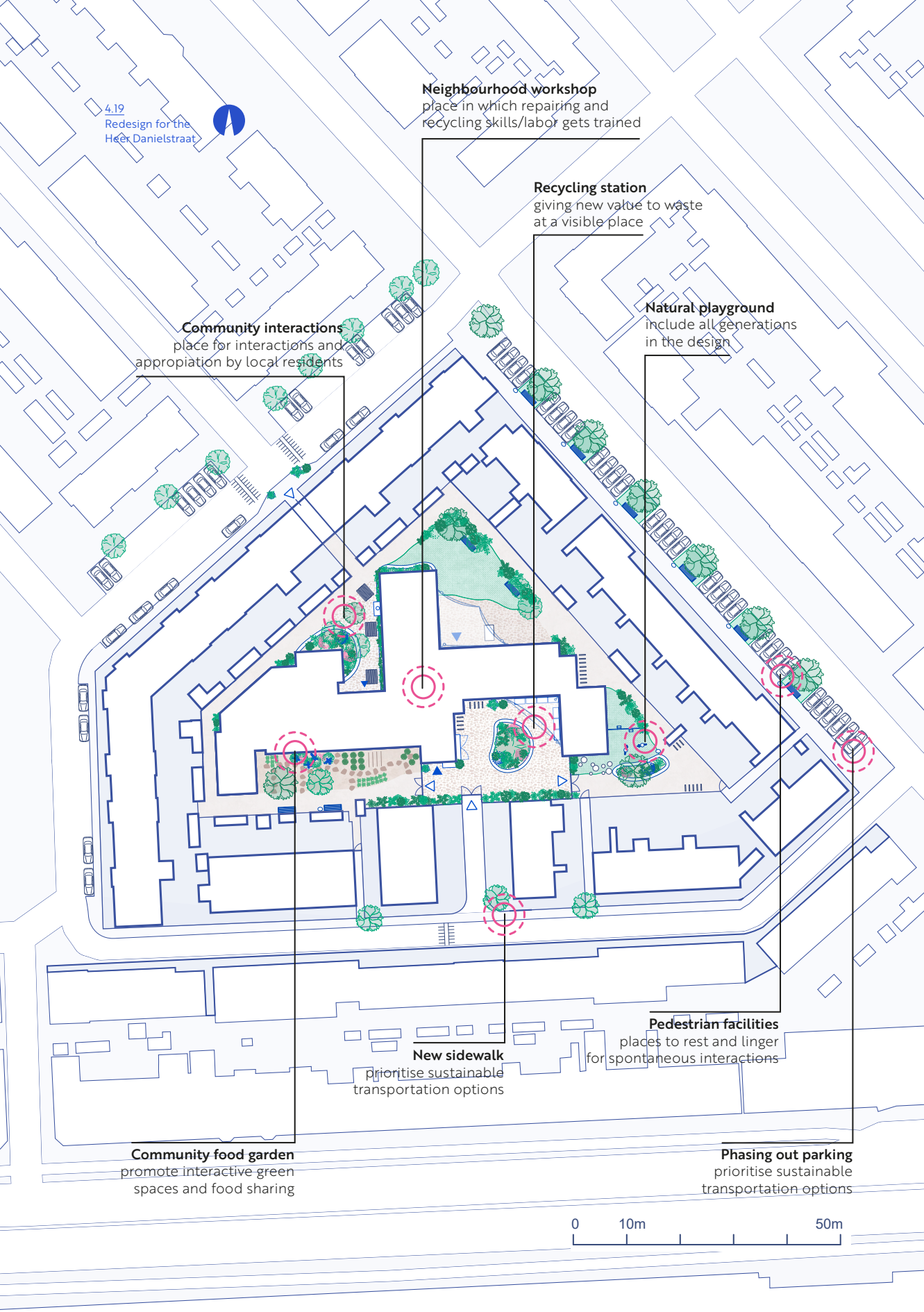
The impact of the design can be observed from different scale levels, addressing both behaviour as well as the general quality of the environment.

● Individual interactions

Moving beyond symbolism, individual actions and tangible impacts take center stage in the courtyard design. Recycling and repairing is made more accessible and convenient at the neighbourhood workshop. It offers opportunities to learn valuable repair skills like carpentry, electric work, sewing, and bicycle repairs, empowering individuals in new fields. The recycling station enables proper disposal of broken items, knowing they will be repurposed on-site. The sharing cabinet provides a space for functional items deserving of a new home. The design incorporates gardening opportunities to encourage active stewardship. The community pantry offers direct access to the food grown. Seating areas allow individuals to enjoy the tranquility of the natural environment, providing a place to rest, observe, and appreciate their surroundings. By relocating parking spaces in the Heer Danielstraat towards the Sandelingstraat, walking behaviour is promoted, with the potential for future transformation of parking spaces at Sandelingstraat into green spaces.

○ Beyond the site

The interventions at the Heer Danielstraat can be linked to a larger scale of interventions within the neighbourhood. The sharing cabinet on-site is part of a larger network of cabinets found at social functions and street corners. The neighbourhood workshop collaborates with existing repair initiatives, creating a communal and recognisable space. Promoting the workshop as a valuable and prideful neighbourhood asset means a representation of recycled furniture and street art in Bloemhof and Tarwewijk.

● Materials and vegetation

Design materiality plays a significant role in symbolism and environmental impact, both globally and locally. To address these aspects effectively, prioritise non-toxic, renewable, and plant-based materials. Use wood, natural stones, and locally recycled street furniture to emphasise sustainability. Surfaces will alternate between fully permeable (soil and grass) and semi-permeable (dolomite and natural stones), while soft materials will be used for leisure areas and semi-hard materials for walking routes. Semi-paved surfaces will still be present for accessibility, but a better balance is achieved by favouring permeable surfaces. Prioritise native plant species, ensuring a diverse selection in terms of species, sizes, and colours. Choose easily maintainable plants that thrive throughout different seasons, sustaining a lasting appeal of green spaces. Greenery also serves the purpose of providing privacy to backyard entrances. To achieve this, the green borders should be denser and taller compared to other green areas. Greenery and the use of inviting materials are essential at the main gate to create an attractive entrance. The food garden should include culturally familiar and useful plants.

● Collective interactions

Besides individual growth, this design seeks to promote growth within the community, connecting people from all sorts of backgrounds. The neighbourhood workshop encourages collaborative projects in which community members can work together to make something valuable for the neighbourhood, such as street furniture or art. The small playground offers a place in which children can enjoy themselves when parents visit the site. By providing a seating place, it invites people to linger and have spontaneous interactions. The food garden can also be viewed through a communal lens, allowing not only individuals to engage with the garden, but moreso allowing groups to set shared goals regarding produce outcomes. On the north side of the main building, two spaces exist - an intimate space with a community oven on the western side, and a more open space on the eastern side. Both spaces promote community engagement and allow adjacent residents to organise activities like neighbourhood barbecues or picnics.

Temporality and cycles of use

In urban design, considering the usability of interventions throughout the year is essential for creating dynamic and sustainable spaces that cater to the diverse needs of communities. Categorising interventions based on their year-round usability allows us to understand how these spaces remain engaging and continuously express sustainable values towards their users.

Daily cycles
Sharing cupboard, Neighbourhood pantry

Event-based
Neighbourhood events

Seasonal
Food garden, Use of courtyard, Outdoor workshop, Neighbourhood pantry

Continuous
Waste disposals, Recycling station, Neighbourhood workshop, Playground

Daily cycle interventions, like the sharing cupboard and the neighbourhood pantry, are designed for year-round accessibility despite their varying day-to-day experiences. Sharing cupboards and neighbourhood pantries serve as communal resources accessible throughout the year, but their contents continuously change depending on the harvest and the goods that people bring in.

Seasonal cycle interventions adapt to changing weather and environmental conditions. The food garden flourishes during growing seasons, fostering a connection with nature and allowing for fresh produce cultivation. The outdoor workshop, protected by a canopy, offers a space for repairs and activities that can be enjoyed even during milder winter days. However, the courtyard, being an open outdoor space, may become less usable in winter due to colder temperatures and adverse weather conditions.

Continuous cycle interventions ensure year-round functionality and convenience. Waste disposals, the recycling station, and the neighbourhood workshop contribute to proper waste management and resource utilisation. The playground provides a continuous space for children's play and socialization, although it may be used less frequently during harsh winter conditions.

Event-based interventions bring vibrancy to the community. The community courtyard serves as a space for neighbourhood events, fostering social interactions and a strong sense of belonging. These interventions provide opportunities for cultural expression and community identity.

Lastly, the progress over time is reflected in the integration of greenery and the growth of plants and trees within the public space. This commitment to green infrastructure enhances aesthetics, improves air quality, and strengthens the community's connection with nature, regardless of the seasonal variations in the usability of certain spaces.

continuous

daily
cycle

seasonal

seasonal
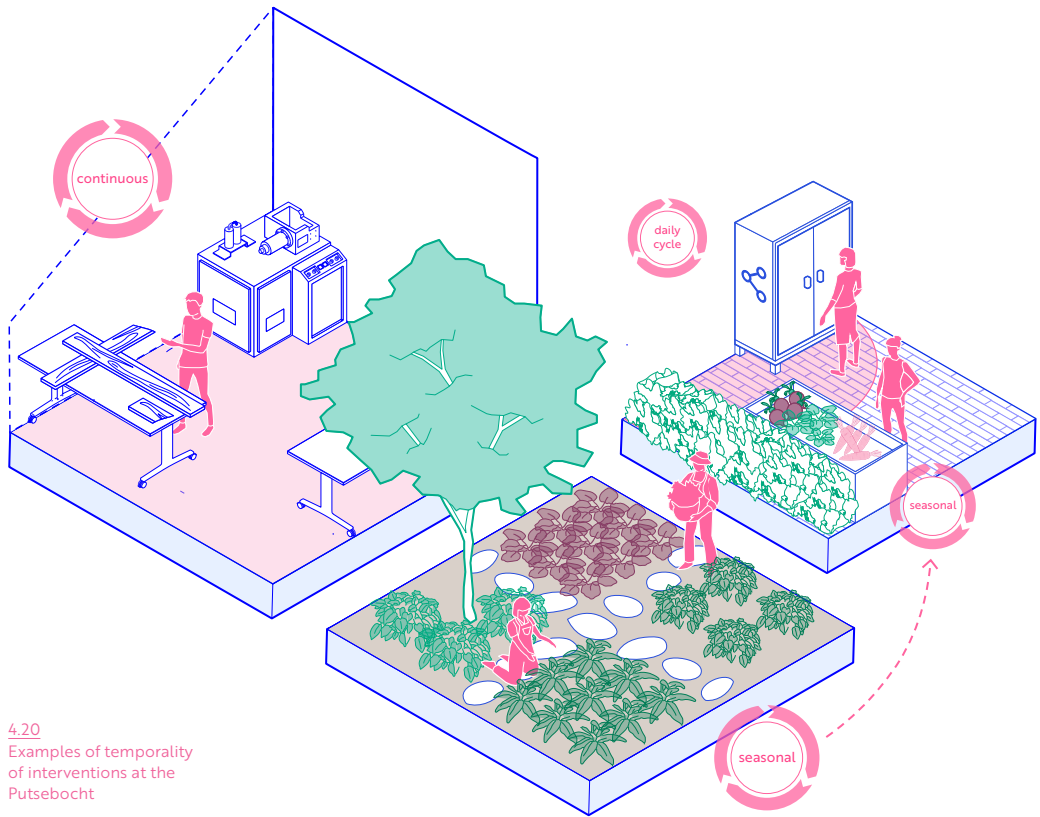
4.20
Examples of temporality
of interventions at the
Putsebocht

4.21
Below, the patterns are showcased that are
related to the interventions described above.
Full description of the patterns can be found
in the pattern catalogue

E10 Revival of the
apprentice

Opening neighbourhood workshops can generate social
and environmental value by the promotion of sharing and
repairing actions within a community.

RELATED TO
C1, E11, E12, R5

R7 Engage, connect,
protect

Courtyard community gardens promote participation in
ecological activities and reduces crime through a stronger
relationship between people and nature.

RELATED TO
C1, C2, C3, R1, R2, R3, R5, R6

E8 Sharing =
caring

Street libraries at the corners of the street promote
sustainable consumption and by visually creating
opportunities for the practice of sharing.

RELATED TO
C1, C5, C6, E8, R6

► Opening neighbourhood
workshops can generate social
and environmental value by the
promotion of sharing and repairing
actions within a community.

► Courtyard community gardens
promote participation in ecological
activities and reduces crime
through a stronger relationship
between people and nature.

► Street libraries at the corners
of the street promote sustainable
consumption and by visually
creating opportunities for the
practice of sharing.

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Moving towards action

The phasing of an urban design plan ensures an inclusive transition, allowing the population to acclimate and adjust behaviours. By involving communities from the beginning and fostering a sense of ownership, the design can inspire and empower individuals to embrace new sustainable behaviours

Phase II | Setting the foundation

To enable further interventions, remove fences around the ateliers, opening the courtyard to adjacent residents. Construct the entrance courtyard to ensure privacy and accommodate interventions like sharing cabinet, bicycle parking, and waste disposals. Initiate active participation of adjacent residents and creative stakeholders through workshops, events, and input sessions to shape the courtyard and community workshop according to local needs. Invest money and time to make the neighbourhood workshop a local success. Plant trees for future growth. Relocate parking spaces from Heer Danielstraat to Sanderlingestraat for early accessibility to the area.

Phase II-III | Temporary interventions

At this stage, the courtyard can be formed with the help of the local residents - planting trees and plants. The food garden and northwest community nook can serve as experimental spaces for residents to determine their preferred form. Organise events at the neighbourhood workshop to discover creative activities that interest Bloemhof's population. Conduct trials on Sanderlingestraat to temporarily replace parking spaces with green structures.

Phase III | Empowerment for lasting impact

At this stage, the community has been given the tools to maintain the courtyard with the help of the neighbourhood workshop. The workshop's creations can be used to enhance the courtyard's furnishings.

— Finalised intervention
— Temporary intervention
--- Participation process

4.22
Phases of
interventions
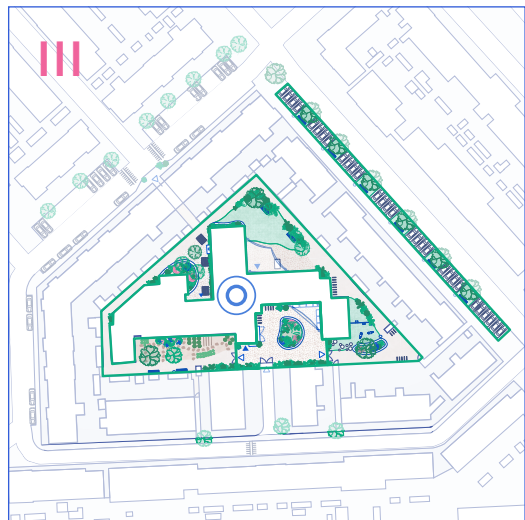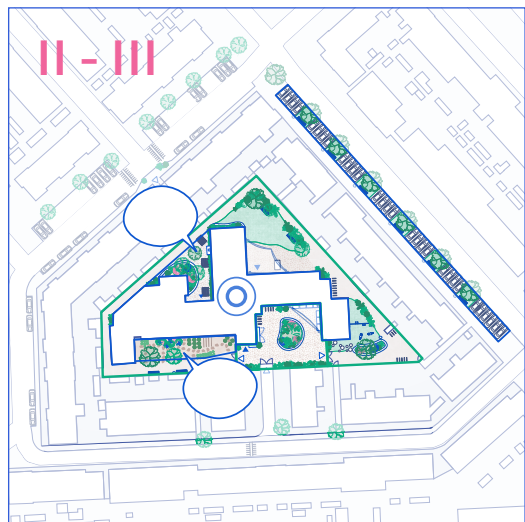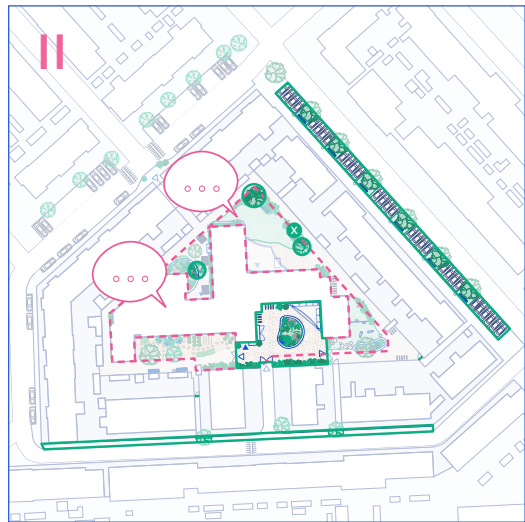
4.23
Impression of the redesign at the Heer Danielstraat part II

wijk werk plaats

Mijnsheren plein

Nestled next to the metro flyover on the Mijnsherenlaan, you'll find the vibrant Mijnsherenplein. This square serves as a vital link between the eastern Millinxbuurt and the western Gaesbeek- and Mijnkintbuurt neighbourhoods. Despite the constant buzz of speeding cars, the square remains a bustling social hub in Tarwewijk. The air is filled with the sounds of balls being kicked and the murmur of people seated on benches, captivated in their phone conversations. Amidst the interplay of green and concrete, grassy plains harmoniously alternate with paved pathways. Before the social node of Victory Outreach, old trees stand stall, covering the stone area before it with shade.

Victory Outreach Church
social institute neighbourhood

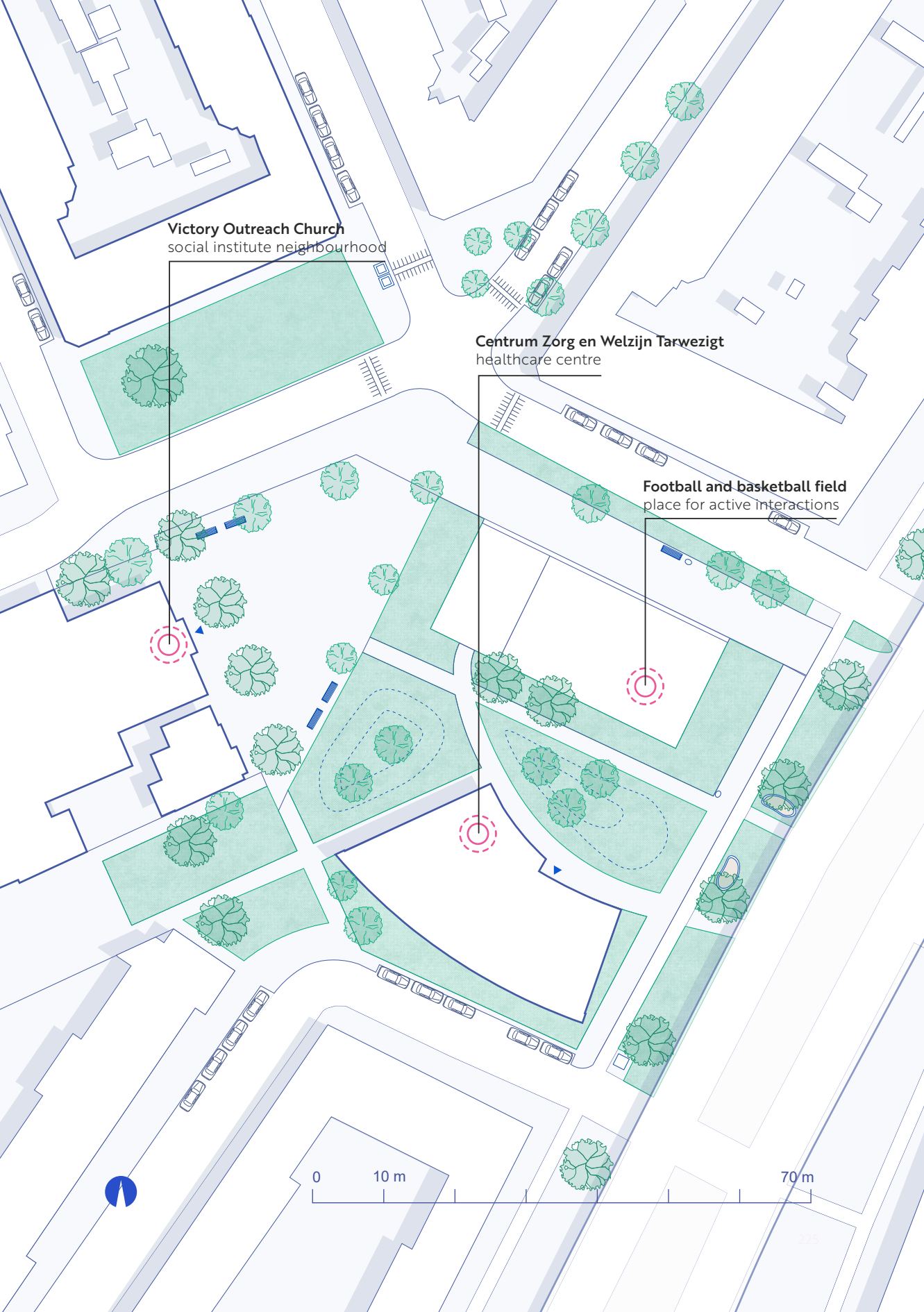**Centrum Zorg en Welzijn Tarwezigt**
healthcare centre

Football and basketball field
place for active interactions

0   10 m   70 m

The desire for diversity

The public character of the Mijnsherenplein attracts a wide variety of people, making it an effective place for promoting social learning on sustainability. Based on the existing conditions, which prescribes future opportunities and current challenges, an approach for a redesign is formed.

Opportunities

The soccer field on the east side of the square is a popular gathering spot for youth and children, with parents often nearby. While the current design of Mijnsherenplein lacks sustainability focus, its central location in Tarwewijk presents an opportunity to promote sustainability knowledge and practices. The Victory Outreach church, functioning as a social work center, actively engages with the neighbourhood and utilises the space for community events. By collaborating with local residents and taking ownership of the square, they can enhance social activities and promote sustainability. The existing planter gardens are an interesting


4.4
Section of the current situation at the Mijnsherenplein - patch of grass northside of the square
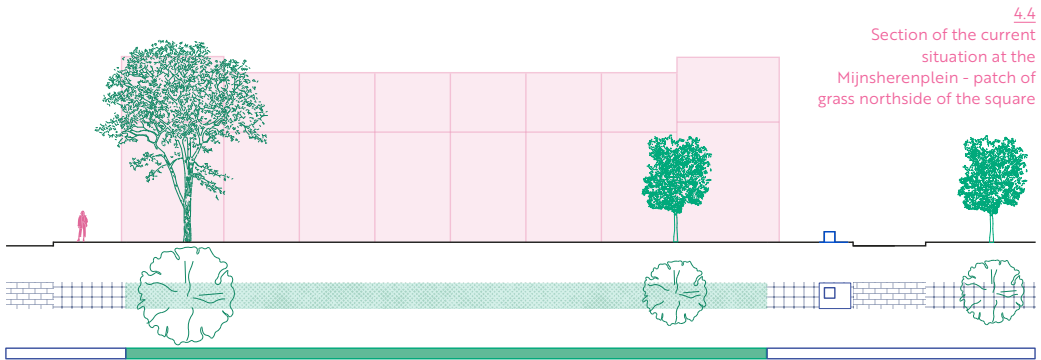
Stakeholders

ACTIVATORS | Victory Outreach, Zorg & Welzijn Tarwezigt, adjacent community members
INVESTORS | Municipality Rotterdam, Victory Outreach
PARTICIPANTS | Adjacent residents, Visitors Victory Outreach, Visitors Tarwezigt, Wider community of Tarwewijk

4.25
Section of the current situation at the Mijnsherenplein

CA behaviours
neighbourhood events

materials top view

materials sustainability
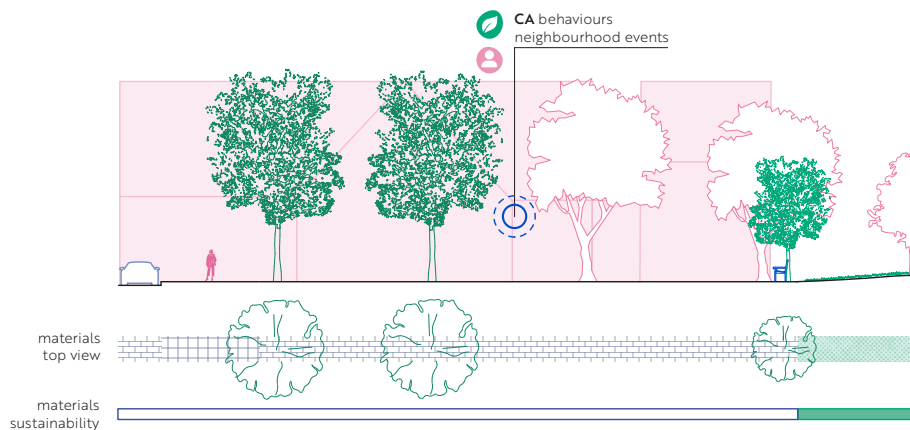
feature, but they seem to be underutilise and badly maintained. Adjacent to the north side of Mijnsherenplein, there is an empty and poorly maintained patch of land with a tall old tree, providing an opportunity for adjacent residents to take ownership.

Challenges

At the moment, the square is an open space that provides little shelter. This allows for certain groups, such as (young) men, to thrive, but also for other groups to not feel fully comfortable to use the space, such as women or elderly. The absence of a cosy, welcoming environment reduces the ability for diverse groups to comfortably make use of the space. In addition, the vast paved area lacks seating options, leaving visitors standing or perched on the edge of the pavement. Even the grass fields, intended for recreation, are covered with dog waste, rendering them less than desirable for leisure activities. Furthermore, the fast-paced traffic surrounding the square creates a feeling of unease, making it difficult to fully engage with the space.

Approach for a redesign

To address these issues and make the area more succesful in motivating sustainable behaviours, a redesign should focus on the following site-specific goals:

Goal 1 | Create a welcoming landscape for diverse groups

Create an inclusive and inviting space that caters to a diverse range of individuals, offering variety in shelter and function. Increase accessibility and enjoyability of the space by addressing car nuisance.

Goal 2 | Enhancing nature's worth

Enhance the value of natural elements to foster a stronger connection with people. This means addressing functionality of and within green spaces, promoting biodiversity and considering interpretations of aesthetics.

Goal 3 | Make responsible waste disposal the obvious choice

Establish a cleaner environment by implementing a context-specific approach to waste management that enhances visibility and attractiveness. This approach will foster a greater sense of attachment to the place.

RP behaviours communal planter
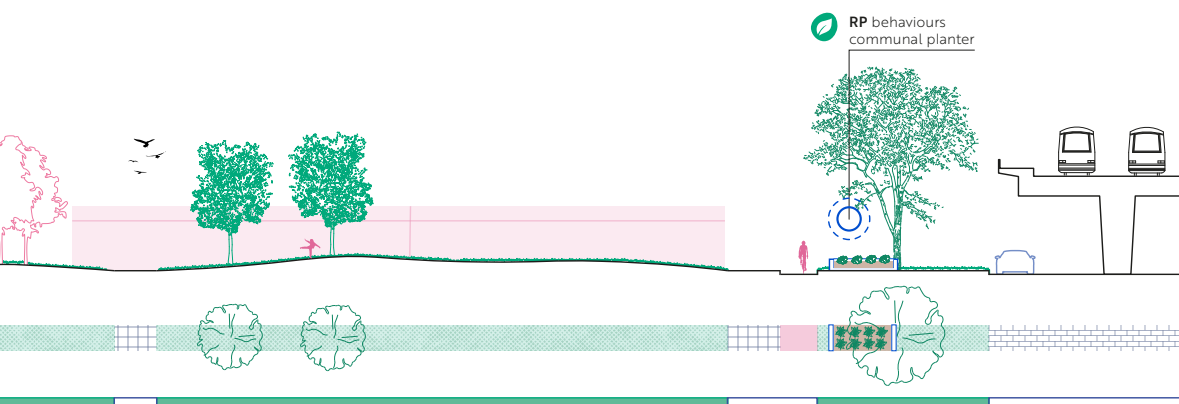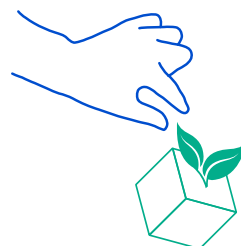
Providing a natural place for all

The Mijnsherenplein open features present an opportunity for a redesign that can benefit the wider community of Tarwewijk. By leveraging these features, new opportunities can be created that support and enrich the lives of those in the area. To ensure a design that engages people in sustainable practices, some conditions need to be put in place.

Below, a list of requirements has been made up in which interventions are highlighted that can enhance sustainable behaviours in this specific context.

On the right page, the spatial conditions that inform the final design are listed through diagrams. This way, the final design becomes readable as a process.

4.27 (right)
Spatial conditions for the design at the Mijnsherenplein

4.26
Program of requirements for the Mijnsherenplein

TB = target behaviour - related to the patterns

focus	program	TB
🌿	**mobility and accessibility** integrated bicycle parking	E1
	social and natural experience	
🌿	sustainable materials of surfaces and equipment	R1
🧑🌿	variety of native greenery: maintained and orderly	R2
🧑	variety seating options to suit different needs	C2
🧑🌿	facade gardens	R8
	activities	
🧑	small playground	C7/R4
🧑	soccer / basketball field	C2
🧑	theatre seating around sportsfield	C7
🧑🌿	flower and herb picking field	R3
🧑🌿	community garden	R3
	zoning and safety	
🌿	fencing of natural materials, allowing for visibility	C2/R1
🌿	traffic calming around square	E1
	waste managment	
🌿	waste disposal at every seating option	E5/E7
🧑	dedicated dog poop stations	E6
🧑🌿	bulky waste pick-up point	E8

areas of focus
🧑 inclusivity
🌿 sustainable behaviours
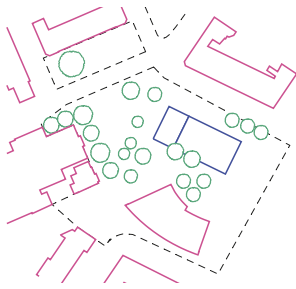
Structural elements

Keep existing public buildings: Victory Outreach and Tarwezigt. Other structural elements are the sports field and part of the car park at the Mijnsherenlaan. The presence of existing trees can serve as a focal point for increasing biodiversity in the area.
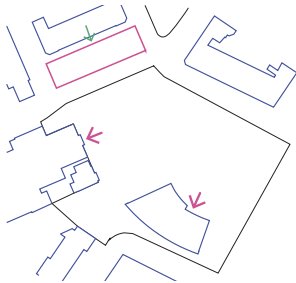
buildings
shaping elements
trees

Entrances and boundaries

As the Mijnsherenplein is supposed to attract a wider public, accessibility is key. Therefore boundaries have to be permeable. and not harsh. As an exception the field in the north can be made more secluded for local residents with hedges.

buildings
fencing
boundary by street
← existing entrance
← new entrance

Alternating publicness

The main part of the square has a public character. The field in the north will become a semi-public area, with a more tailored design for adjacent residents.
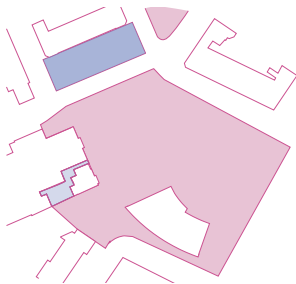
public zone
semi-public, housing
semi-public, Victory outreach

Experience

The design will incorporate public pathways that meander through green areas, creating a natural and immersive experience. In addition to shaping the pathways, the variety in greenery will also provide open spaces where activities can take place.

planter greenery
(semi-) dense greenery
grassland
flowerfield
— facade gardens
--- pathways
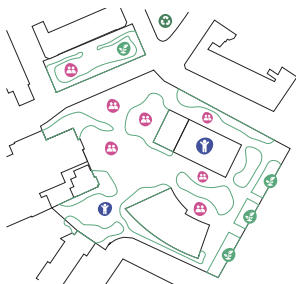
Accentuating functions

The main purpose of the Mijnsherenplein is to facilitate social interaction, with distinct areas designated for various groups. Specifically, there will be separate zones for youths and children to play and engage in sports. Additionally, community members will have access to gardening and picking areas a waste disposal zone.

🏐 playing
😃 socialising
🌱 gardening
♻ sharing
♻ recycle or repair

The Mijnsherenplein: actively green

The Mijnsherenplein as an open place for interaction, can be transformed to a natural space in which everyone can feel welcome, regardless of age, ethnicity or socioeconomic status. To achieve this, the redesign must prioritise diversity in all forms, while also being mindful about enabling positive behaviours for the environment.

Inclusive design
To ensure that everyone feels welcome in the new design, certain elements become main points of attention.

► Cultural diversity
To appeal to diverse cultures, make sure greenery is well-maintained and also appeals with features like colours. The inclusion of edible greenery, such as herbs, can attract people with a non-western background. The Victory Outreach church also ensures that neighbourhood events are accessible to a diverse group of people.

► Affordability
While this not being a solution to rising food costs, the picking of herbs and flowers and the grown food in the community garden is free and becomes an affordable activity. There are no paid activities at the square making it accessible for use.

► Safety
The community garden in the north has clear boundaries, which can be closed of at night. The square provides a variety of spaces in which different groups can feel welcome and secure. To make sure that spaces that have a more enclosed character are also safe at night, lighting becomes an important element to integrate.
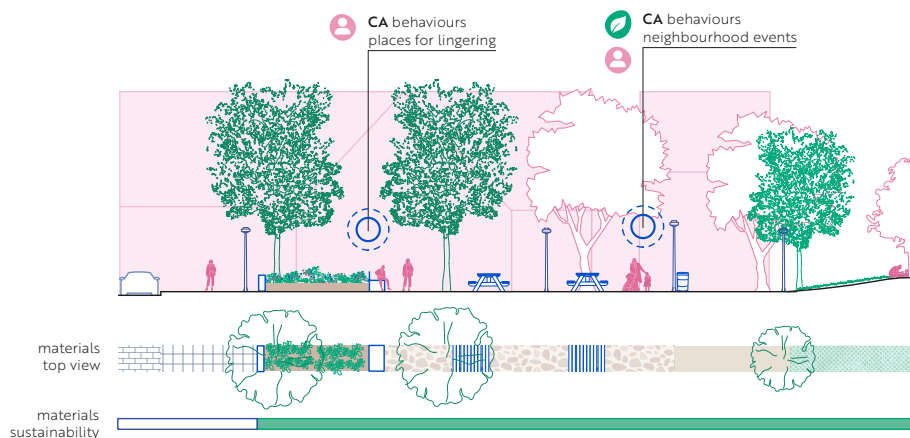
CA behaviours
places for lingering

CA behaviours
neighbourhood events

materials top view

materials sustainability

4.28
Section of the new situation at the Heer Danielstraat

Desired effects of the design

Through the proposed interventions some effects can be expected. These relate to the goals mentioned in the previous paragraph.

► Closer connection between people and nature through a comprehensive natural design for adults and children (IM). **Goal 1 & 2**

► Opportunties for stewardship actions through the provision of interactive green functions, such as a herb-picking field, a food garden, and a natural playscape (EM). **Goal 1 & 2**

IM = intrinsic motivation   Goal = site-specific goal
EM = extrinsic motivation

► A cohesive community by providing a patchwork of open and secluded, safe spaces for activities, social interaction and lingering for diverse groups of people (IM & EM). **Goal 1**

► Opportunities for community events for community building and raising sustainability awareness by the provision of cozy squares (IM). **Goal 1**

► A clean public space through an intentional design of waste facilities. This includes an increase in the quantity of regular waste disposals, the provision of dog poop bags, enhancing recycling containers with greenery, and establishing a centralized collection point for bulky waste so disposal becomes easier. (EM). **Goal 3**

CA behaviours
playing in a green environment

CA and RP behaviours
community food garden

ED and RP behaviours
container gardens

ED behaviours
bulky waste pick-up point

RP behaviours
colourful and maintained greenery

RP behaviours
flower and herb picking
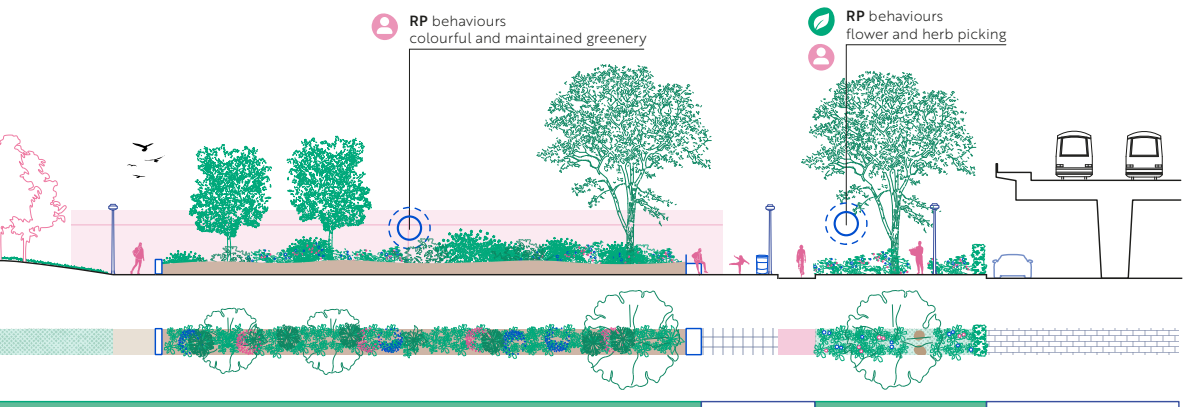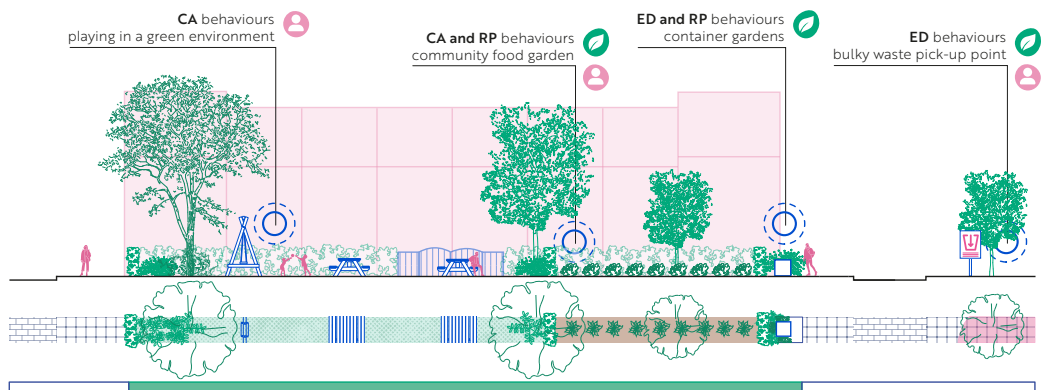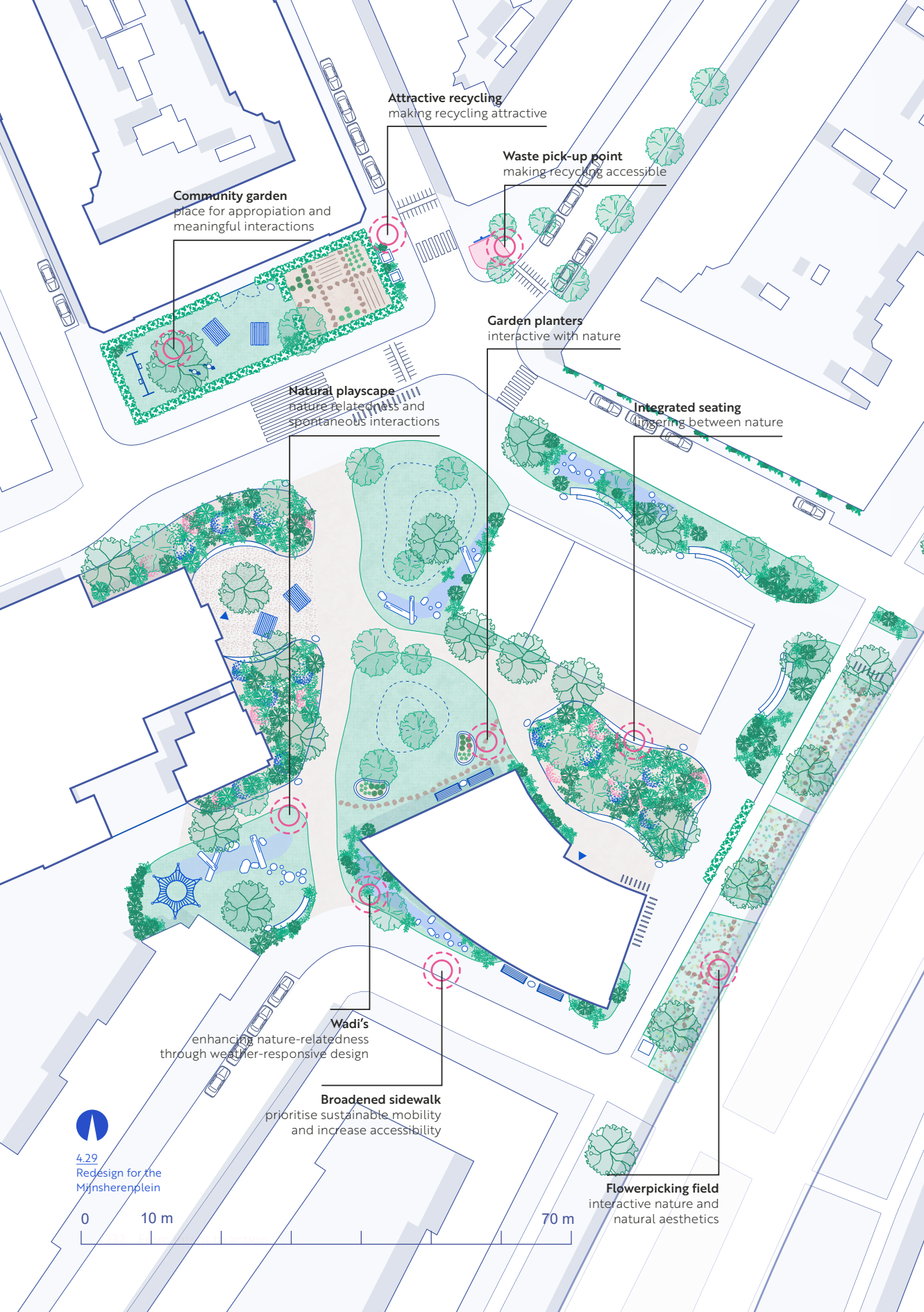
Attractive recycling
making recycling attractive

Waste pick-up point
making recycling accessible

Community garden
place for appropiation and
meaningful interactions

Garden planters
interactive with nature

Integrated seating
lingering between nature

Natural playscape
nature relatedness and
spontaneous interactions

Wadi's
enhancing nature-relatedness
through weather-responsive design

Broadened sidewalk
prioritise sustainable mobility
and increase accessibility

Flowerpicking field
interactive nature and
natural aesthetics

4.29
Redesign for the
Mijnsherenplein
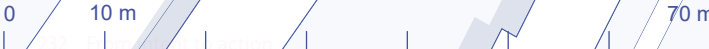
0   10 m   70 m

The impact of the design can be observed from different scale levels, addressing both behaviour as well as the general quality of the environment.

● Individual interactions

Moving beyond symbolism, tangible impacts and individual actions take center stage. Thoughtful design can promote easy pedestrian access, offer convenient bicycle parking, and enhance the attractiveness and convenience of waste disposal. For the latter, context-specific considerations need to be made, such as the barrier of language proficiency and the nuisance from dog waste in public space. Site-specific interventions therefore include a waste-pick up point so that no appointments need to be made with the municipality and dog waste stations, where sachets for the waste are easily available, making the disposal of it easier. The design also incorporates opportunities for gardening, flower and herb-picking, and facade gardens, establishing a space where active stewardship behaviours can thrive. The tranquility of the natural environment can also passively be enjoyed in seating areas, where individuals can come, sit, rest and observe their environment. With the changing weather, interactions also change with the wadi's.

○ Beyond the site

The interventions at the Mijnsherenplein can be linked to a larger scale of interventions within the neighbourhood. The facade gardens as suggested can be part of a larger scale project or event in which locals get enabled by the provision of materials and enthousiasm to depave the space in front of their house. The waste facilities as suggested on this square, such as the pick-up point, need to exist within a larger network, so that the issues on waste that exist within the neighourhood can be addressed effectively.

● Materials and vegetation

Design materiality holds significance in terms of symbolism and environmental impact, both globally and locally. To address these aspects effectively, prioritise non-toxic, renewable, and plant-based materials. Utilise wood and natural stones whenever possible, while incorporating recycled street furniture created by locals to emphasise sustainability. Surfaces will alternate between fully permeable (soil and grass), semi-permable (dolomite and natural stones), and hard materials (street tiles), indicating different zones within the square to enhance safe and secluded spaces. Paved surfaces will still be present for accessibility purposes, but a better balance is achieved by favouring permeable surfaces. By the implementation of wadi's the absorbability of the park will be further improved upon.Prioritise native plant species, ensuring a diverse selection in terms of species, sizes, and colours. Opt for easily maintainable plants that thrive through different seasons to sustain long-lasting appeal of green spaces. The picking field can, based on the preferences of the locals, feature a variety of flowers and herbs, so greenery can become useful.

● Collective interactions

However, above all this design seeks to promote interactions between people from all sorts of backgrounds. The sports field provides a space within a natural environment for young people to engage with one another, while the surrounding seating areas create an inclusive environment for people of different generations. The small square in front of Victory Outreach serves as a venue for community events, such as neighbourhood barbecues or small performances. The playground welcomes another demographic, acting as a unifying force between parents of different backgrounds. Given the proximity of other playgrounds, this one is designed to be modest. On the whole square - or moreso a park at this point - spaces for lingering are designed not only to encourage peaceful solitude and enhance restorative qualities, but also to facilitate spontaneous interactions. On the other side of the street, the community garden offers a shared yet private space that facilitates more intimate connections rather than spontenous interactions. Gardening not only engages individuals but also nurtures a sense of communal participation.

Temporality and cycles of use

In urban design, considering the usability of interventions throughout the year is essential for creating dynamic and sustainable spaces that cater to the diverse needs of communities. Categorising interventions based on their year-round usability allows us to understand how these spaces remain engaging and continuously express sustainable values towards their users.

Weekly cycles
Waste pick-up point

Event-based
Planting facade gardens,
Use of public space Victory Outreach

Seasonal
Food garden,
Picking field,
Container gardens,
Use of community garden,
Wadi's

Continuous
Use of waste disposals,
Bicycle parking,
Playground,
Sportsfield

Mijnsherenplein exhibits a range of cycles that shape its functionality and user experience. The waste pickup point reflects the weekly cycle, ensuring regular waste management and highlighting the importance of responsible waste disposal practices. Through this residents are provided with a consistent and convenient means of waste removal.

Seasonal cycles play a significant role at Mijnsherenplein, with interventions that vary in importance and usability throughout the year. The food garden, picking field, and container gardens reflect a connection with nature and urban stewardship. These spaces flourish during the growing seasons, enabling residents to cultivate fresh produce and fostering a sense of self-sufficiency and sustainability. While colder seasons may limit their usability, these interventions continue to express sustainable values and enhance the area's aesthetics. The wadi's will change according to the weather,

creating an educational moment on water managment over time.

Continuous interventions, such as waste disposals, bicycle parking, playgrounds, and sports fields, are designed for year-round usability. Waste disposals contribute to urban cleanliness, while bicycle parking encourages active transportation and reduces car reliance. Playgrounds and sports fields can be enjoyed in any season, although colder weather might limit their use to some extent.

Event-based cycles add vibrancy and a sense of occasion to Mijnsherenplein. The planting of facade gardens serves as an event itself, bringing the community together to enhance the surroundings and express a shared commitment to sustainability. Additionally, the public space before Victory Outreach hosts various events, cultural celebrations, performances, and community gatherings. These interventions foster social interaction, cultural expression, and a vibrant atmosphere.

Lastly, the concept of evolution is reflected in the growth of plants and trees within urban spaces. Incorporating green infrastructure and allowing vegetation to mature enhances aesthetics and demonstrates long-term commitment to sustainability. Evolving plants and trees contribute to improved air quality, reduced urban heat island effect, increased biodiversity, and a deeper connection with nature.

continuous

seasonal

weekly
cycle

PICK-UP
every thursday
morning at 10u

seasonal
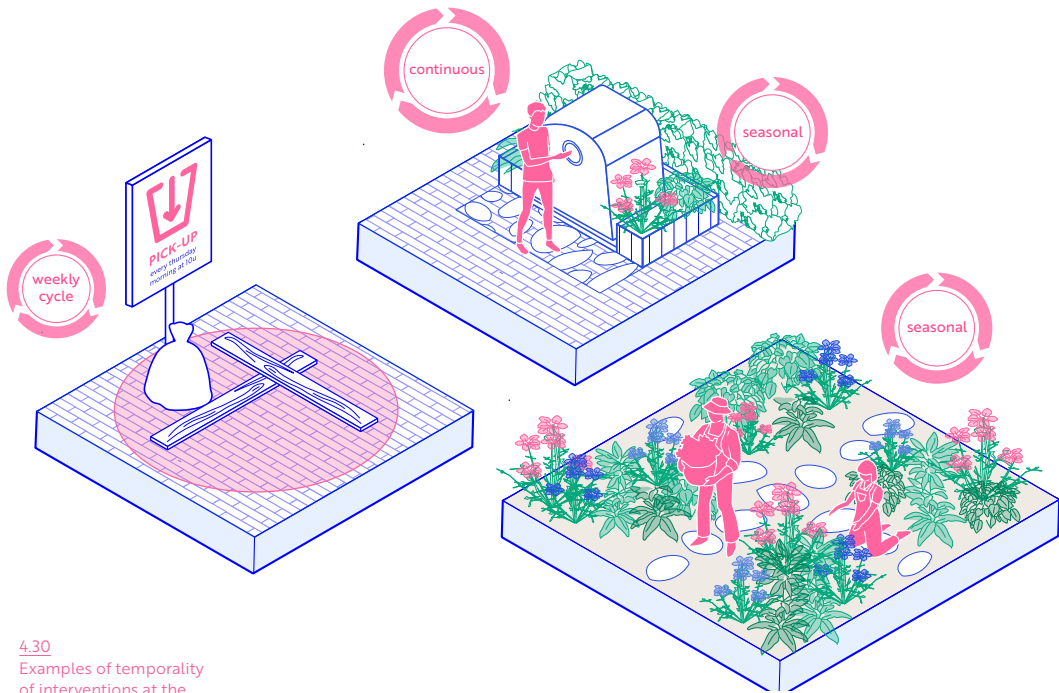
4.30
Examples of temporality
of interventions at the
Mijnsherenplein.

4.31
Below, the patterns are showcased that are
related to the interventions described above.
Full description of the patterns can be found
in the pattern catalogue

E9 Trash
    walk

Appointing fixed places and fixed pick-up times for bulky
waste in a neighbourhood will not only reduce waste in
the streets, but also provides opportunities for sharing.

RELATED TO
C5, C6, E5, E6, E9

E7 Happy
    recycling!

An attractive design of recycling containers and its
surroundings helps to reduce littering.

RELATED TO
E5, E6, R1, R3

R3 Green spaces to
    green places

Interactive community-related green spaces fosters an
environmentally conscious and engaged community in
diverse neighbourhoods.

RELATED TO
C1, C2, C3, C5, C6, E4, E7, R1, R2, R4, R5, R6, R7, R8

► Appointing fixed places and
fixed pick-up times for bulky waste
in a neighbourhood will not only
reduce waste in the streets, but also
provides opportunities for sharing.

► An attractive design of recycling
containers and its surroundings
helps to reduce littering.

► Interactive community-
related green spaces fosters an
environmentally conscious and
engaged community in diverse
neighbourhoods.

235

Moving towards action

The phasing of an urban design plan ensures an inclusive transition, allowing the population to acclimate and adjust behaviours. By involving communities from the beginning and fostering a sense of ownership, the design can inspire and empower individuals to embrace new sustainable behaviours

Phase II | Setting the foundation

There are a few interventions that can be implemented relatively quickly, wihtout needing many structural changes, such as the planting of facade gardens with inhabitants, the placement of a waste pick-up point and container gardens and the sowing of herbs and flowers where there is currently grassfields. To motivate proper waste disposal, also more waste bins can be placed within the park that can also be moved at a later stage. Initiate active participation of adjacent residents and stakeholders, such as Victory Outreach and the health centre through workshops, events, and input sessions to shape the park and the community space according to local needs. The community's involvement is particularly crucial in shaping the design, purpose, and functionality of the community garden, fostering a sense of ownership and empowerment among residents. Plant trees for future growth.

Phase II-III | Temporary interventions

The design of the community space in the north can be facilitated through events and temporary interventions, so that residents can get a feeling for what they like to see in public space. The park can be largely constructed, leaving space for possible appropiation by Victory Outreach.

Phase III | Empowerment for lasting impact

Lastly, when plants have matured more the park comes into bloom. The community space can now be finalised, making sure that commitments are made with residents and that capital is provided for upkeep.

— Finalised intervention
— Temporary intervention
-- Participation process

4.32
Phases of interventions

4.33
Impression of the redesign at the Mijnsherenplein

Putsebocht

In the heart of Bloemhof lies the Putsebocht, a vital artery connecting the east and west. Its two main car lanes house the energy of fast-moving vehicles, with a green strip separating them. Along this vibrant street, a diverse community thrives, weaving their stories and cultures into its fabric. Between the Putsebocht and the Asterstraat, a series of public spaces exists, currently serving as parking areas with occasional bursts of colorful playgrounds. These spaces blur the lines between public and semi-public, inviting locals to find solace and connection. It is here, amidst the hustle and bustle, that a hidden world of shared moments and community can unfold.

4.34
Map of the current situation at the Putsebocht
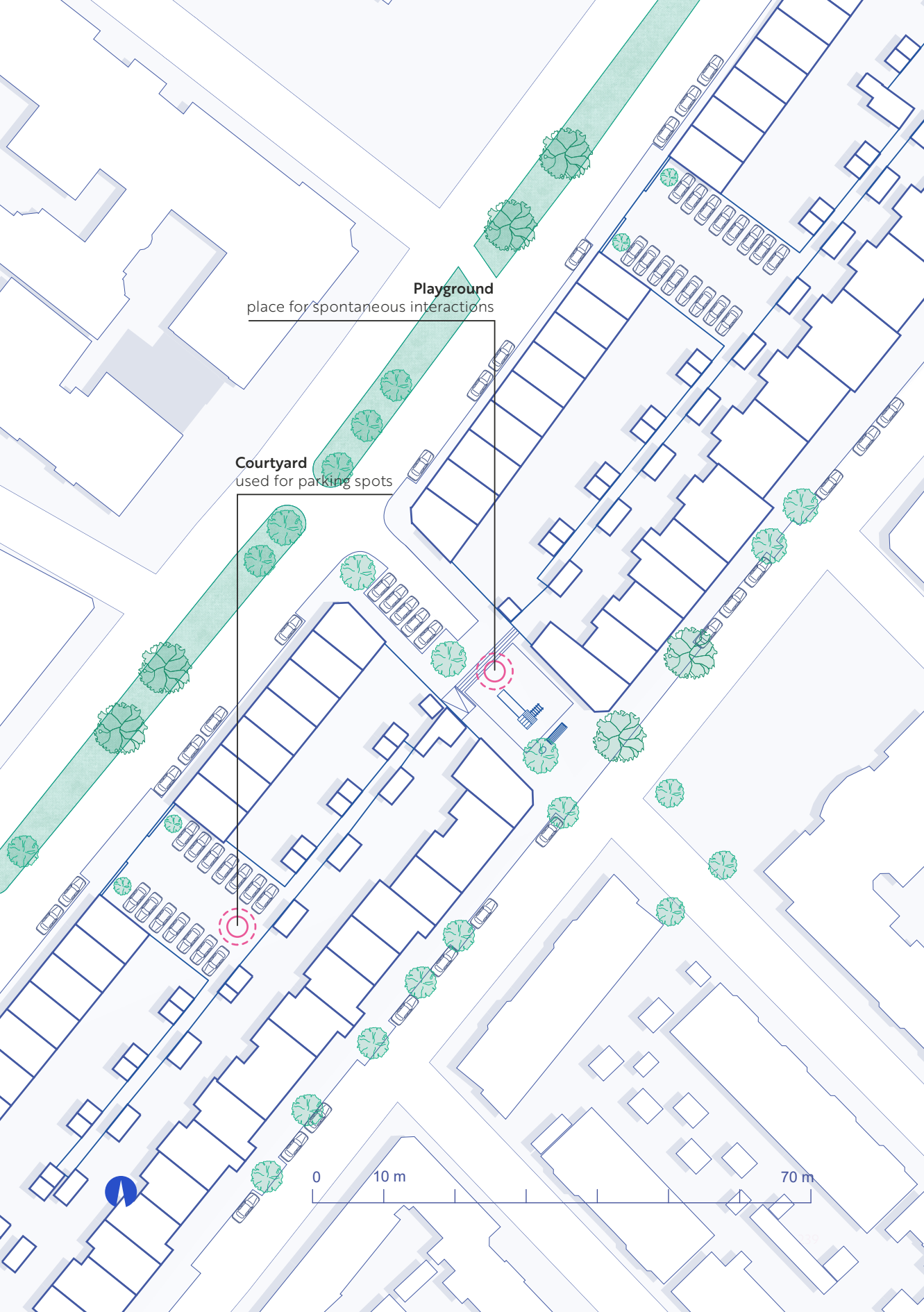
Playground
place for spontaneous interactions

Courtyard
used for parking spots

0   10 m   70 m

An overpowered landscape

The public spaces at the Putsebocht offer an intriguing variety in scale and degrees of publicness, making them interesting points for social interactions. Based on the existing conditions, which prescribes future opportunities and current challenges, an approach for a redesign is formed.

Opportunities

The current condition of the courtyards at the Putsebocht give reason for a redesign. In a future where the car becomes less prominent, the space that is now used for the car can become social and usable space for the local community. The current design of the two courtyards allow for a transformation to a more secluded space, in which residents can be inspired to appropiate the space. The middle square provides an important connection between the Putsebocht and the Asterstraat, leading towards the primary school. In this square, a small playground allows for children to play and for parents to meet and interact.

Stakeholders

ACTIVATORS | Adjacent residents
INVESTORS | Municipality Rotterdam
PARTICIPANTS | Parents, children, adjacent residents, locals in close proximity
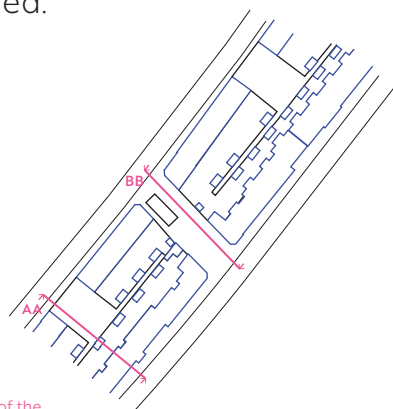
4.35
Sections of the current situation at the Putsebocht. Left is AA. Right is BB.

materials
top view

materials
sustainability
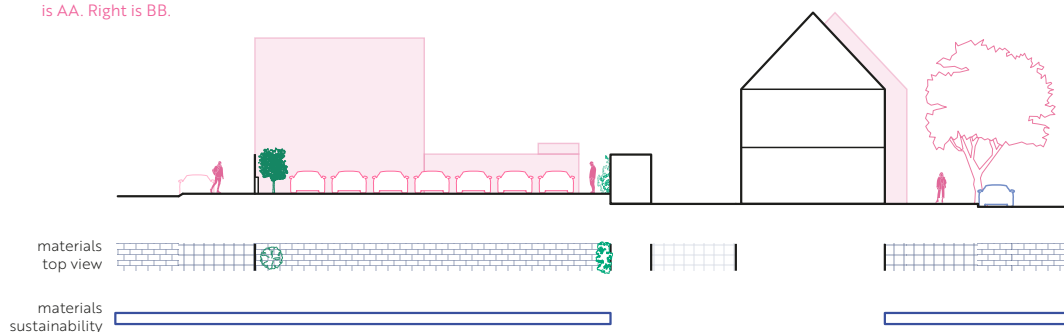
Challenges

The current design of the area heavily favours the presence of the car, which limits possibilities for social interactions and increases the amount of paved areas, leaving little space for natural elements. The small playground that lies inbetween the houses has been constructed using unsustainable materials, such as rubbers and colourful metals, which fail to inspire any real inspiration or commitment towards sustainability.

Approach for a redesign

To address these issues and make the area more succesful in motivating sustainable behaviours, a redesign should focus on the following site-specific goals:

Goal 1 | Reduce car dependence and promote sustainable mobility

By providing alternative transportation options and promoting shared mobility services, the aim is to encourage residents to rely less on private cars and choose more sustainable modes of transportation.
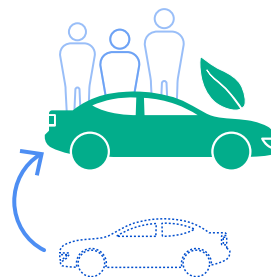
Goal 2 | Transform parking spaces into community spaces

By reclaiming parking areas and converting them into shared community spaces, the goal is to enhance social interaction, create green areas, and reduce the dominance of cars in the urban. environment.
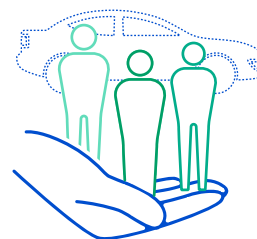
Goal 3 | Enhance community and appreciation of place

Strenghten emotional connection and sense of belonging to the space, so stewardship behaviours can follow. Create sustainable, appealing streetscapes and activate liveliness to foster appreciation and responsible behaviours.

CA behaviours
play area
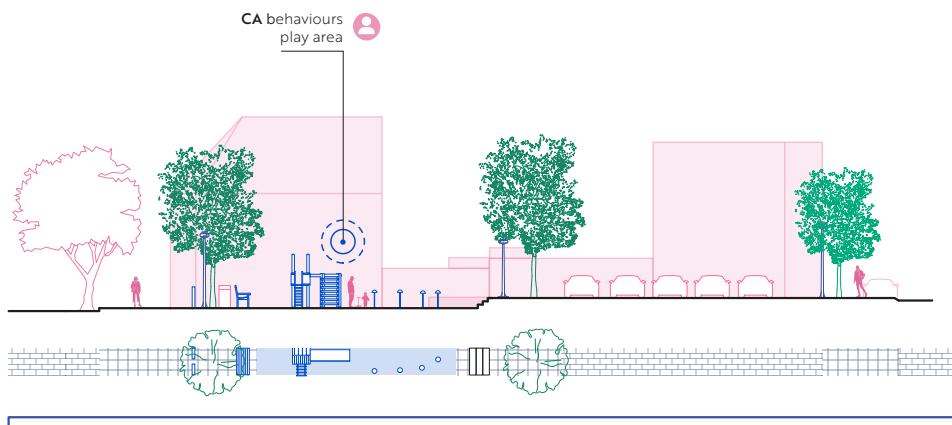
Creating safe spaces for community-bonding

The Putsebochts' unique features present an opportunity for a redesign that can benefit the community in numerous ways. By leveraging these features, new opportunities can be created that support and enrich the lives of those in the area. To ensure a design that engages people in sustainable practices, some conditions need to be put in place.

Below, a list of requirements has been made up in which interventions are highlighted that can enhance sustainable behaviours in this specific context.

On the right page, the spatial conditions that inform the final design are listed through diagrams. This way, the final design becomes readable as a process.

4.37 (right)
Spatial conditions for the design at the Putsebocht

4.36
Program of requirements for the Putsebocht

TB = target behaviour - related to the patterns

focus	program	TB
	mobility and accessibility	
	integrated bicycle parking	E1
	shared car hub + information signing	E4
	social and natural experience	
	sustainable materials of surfaces and equipment	R1
	variety of native greenery: maintained and orderly	R2
	variety seating options to suit different needs	C2
	facade gardens and sidewalk appropiation	C5/R8
	activities	
	small playground in public zone	C7/R4
	neighbourhood ovens in courtyards	C2
	food gardens in courtyards	C3/R3/R7
	sharing cabinet in public zone	E9
	zoning and safety	
	fencing of natural materials, allowing for visibility	C2/R1
	gates between designated zones	C2/C3
	waste managment	
	waste disposal at every streetcorner	E5/E6

areas of focus
🧑 inclusivity
🌿 sustainable behaviours
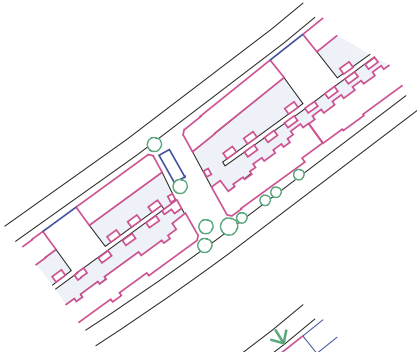
	buildings
	shaping elements
	trees
	backgardens

Structural elements

Keep existing gates at semi-public parking spaces and the access routes to the back gardens. The existing trees should be maintained, as well as the parking lot in the middle square.
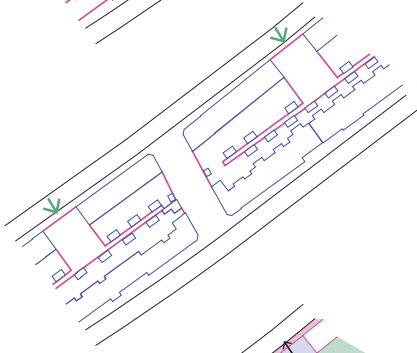
	buildings
	fencing
	boundary by street
←	new entrance

Entrances and boundaries

The existing gates at the northern and southern courtyard will be equiped with doors, so that residents can close of the courtyards from intruders when necessary.
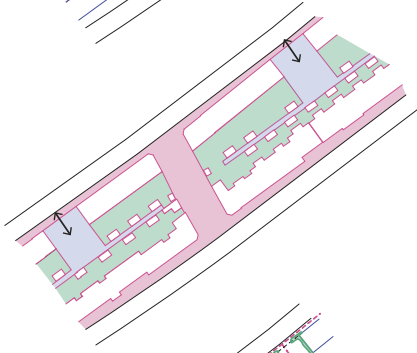
	public zone
	semi-public, bound to housing
	private zone, backgardens
←	permeable

Alternating publicness

The main public zone in pink connects the Putsebocht and the Asterstraat. The two blue courtyards provide a semi-public space that residents can appropiate and use to get to their private back gardens.
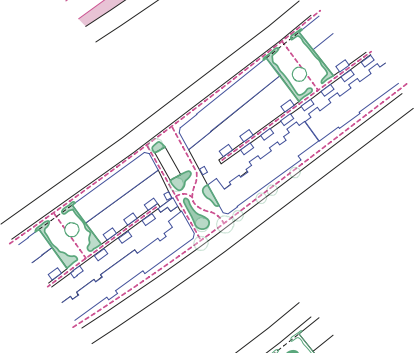
	planter greenery
	(semi-) dense greenery
	grassland
—	facade gardens
---	pathways

Experience

Pathways are mostly functional in the design, leading people to a specific destination. However, greenery acts to enhance feelings of seclusion, so that people can feel safe and get a sense of nature.

🎯	playing
😊	socialising
🌱	gardening
☁	sharing

Accentuating functions

To bring reason to visit to the most public zone, play elements will be placed, as well as sharing facilities, such as shared mobility and sharing cupboards. The more private courtyards bring opportunities for gardening and socialising with neighbours.

The Putsebocht:
an active community

The courtyards at the Putsebocht can become meaningful places for social interaction and stewardship behaviour. To achieve this, the redesign must prioritise a transition in which people can get engaged. By doing so, the promotion of sustainable behaviours can become more impactful.

Inclusive design
To ensure that everyone feels welcome in the new design, certain elements become main points of attention.

▶ Cultural diversity
Greenery should serve diverse cultures through aesthetics, ecology, and function. For instance, a small playground can be transformed into a secure area for women and children to gather and play, while a food garden can be cultivated to grow crops that hold cultural significance. Use multilingual signs and visual cues to promote sustainable mobility and bridge cultural and linguistic barriers.

▶ Affordability
Promote affordability by the financial benefits of shared mobility, tailored to the communities needs. The construction of facade gardens or courtyard gardens should be supported by external organisations, ensuring that materials such as plants can be obtained. Lastly, a sharing cabinet provides the opportunity for people to obtain free objects.

▶ Safety
To ensure safety, small community courtyards should have both a wall and a gate, allowing residents to secure their community space and prevent unwanted intruders.
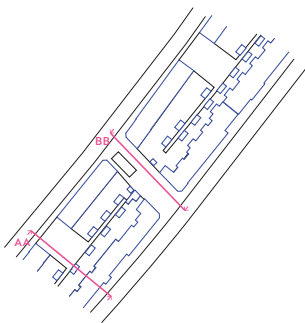
4.38
Section of the new situation at the Heer Danielstraat (part II). Left is AA. Right is BB.
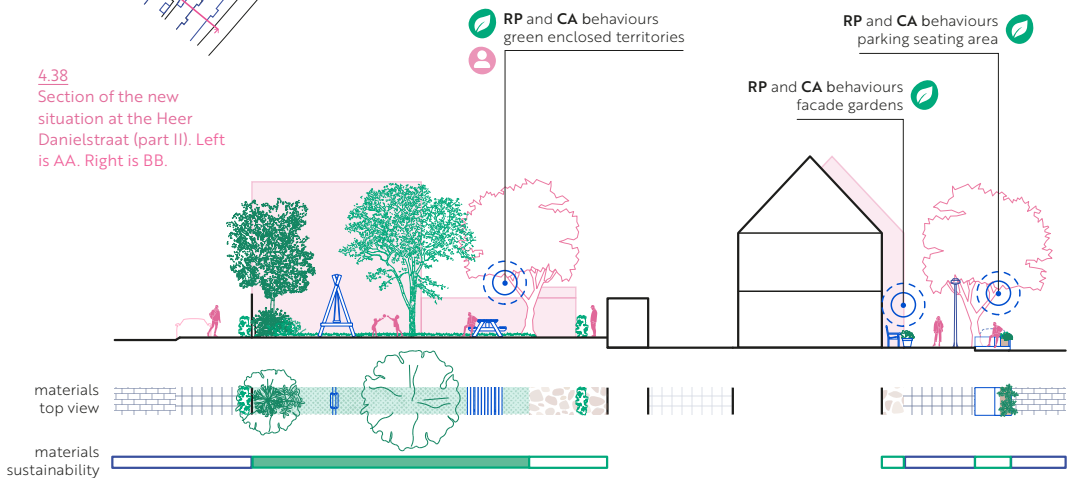
RP and CA behaviours
green enclosed territories

RP and CA behaviours
parking seating area

RP and CA behaviours
facade gardens

materials top view

materials sustainability

Desired effects of the design

Through the proposed interventions some effects can be expected. These relate to the site-specific goals mentioned in the previous paragraph.

► Aquiring new community spaces that enhance more intimate social interactions within a sustainable context (IM). Goal 2 & 3

► Closer connection between people and nature through a comprehensive natural design for adults and children (IM). Goal 3

► Opportunties for stewardship actions through the provision of interactive green functions, such as a food garden (EM). Goal 3

► A cohesive community through the provision of new opportunities for communal activities and opportunities for lingering in public space (IM and EM). Goal 2 & 3

► Discourage private car ownership by the provision of alternatives, such as shared cars (EM). Goal 1

► Enhance values related to nature, rather than personal gain by reducing the presence of cars within the streetscape and increasing natural spaces (EM). Goal 1 & 2

► Stimulation of the practice of sharing through the provision of affordances that allow sharing, such as sharing cupboards or community ovens (EM). Goal 3

► An addition to food security. While not being able to supply for all residents, the communal food garden aims to not only engage people with nature, but also has a social effect by providing affordable/free food (EM). Goal 3

IM = intrinsic motivation   Goal = site-specific goal
EM = extrinsic motivation

ED behaviours
bicycle parking

CA behaviours
play area

RP behaviours
colourful and
maintained greenery

ED behaviours
shared mobility
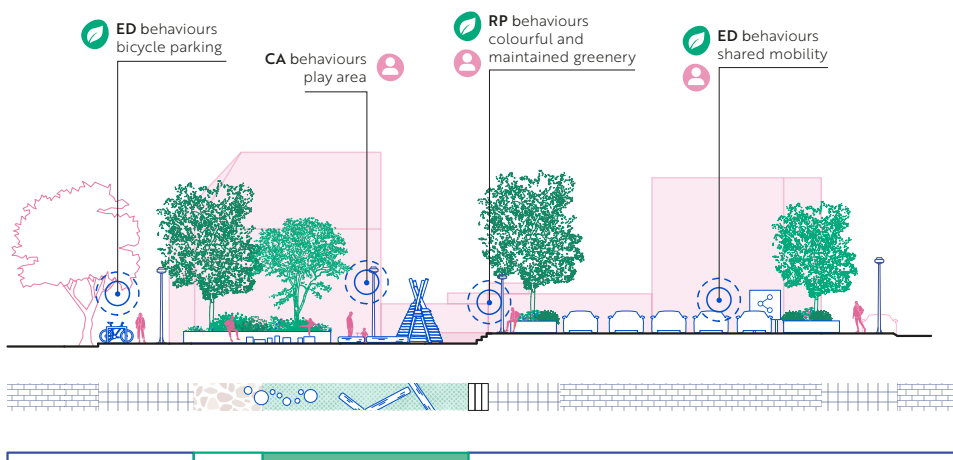
Shared mobility
communal transportation
at a visible place

Sharing cabinets
make the practice of sharing
visible at corners

Courtyard
secluded space for community
open for appropiation

Depaved playground
place for spontaneous interactions

Sidewalk appropiation
semi-public zones for
spontaneous interactions
and stewardship

Appropiating parking space
from car space into social
and green space
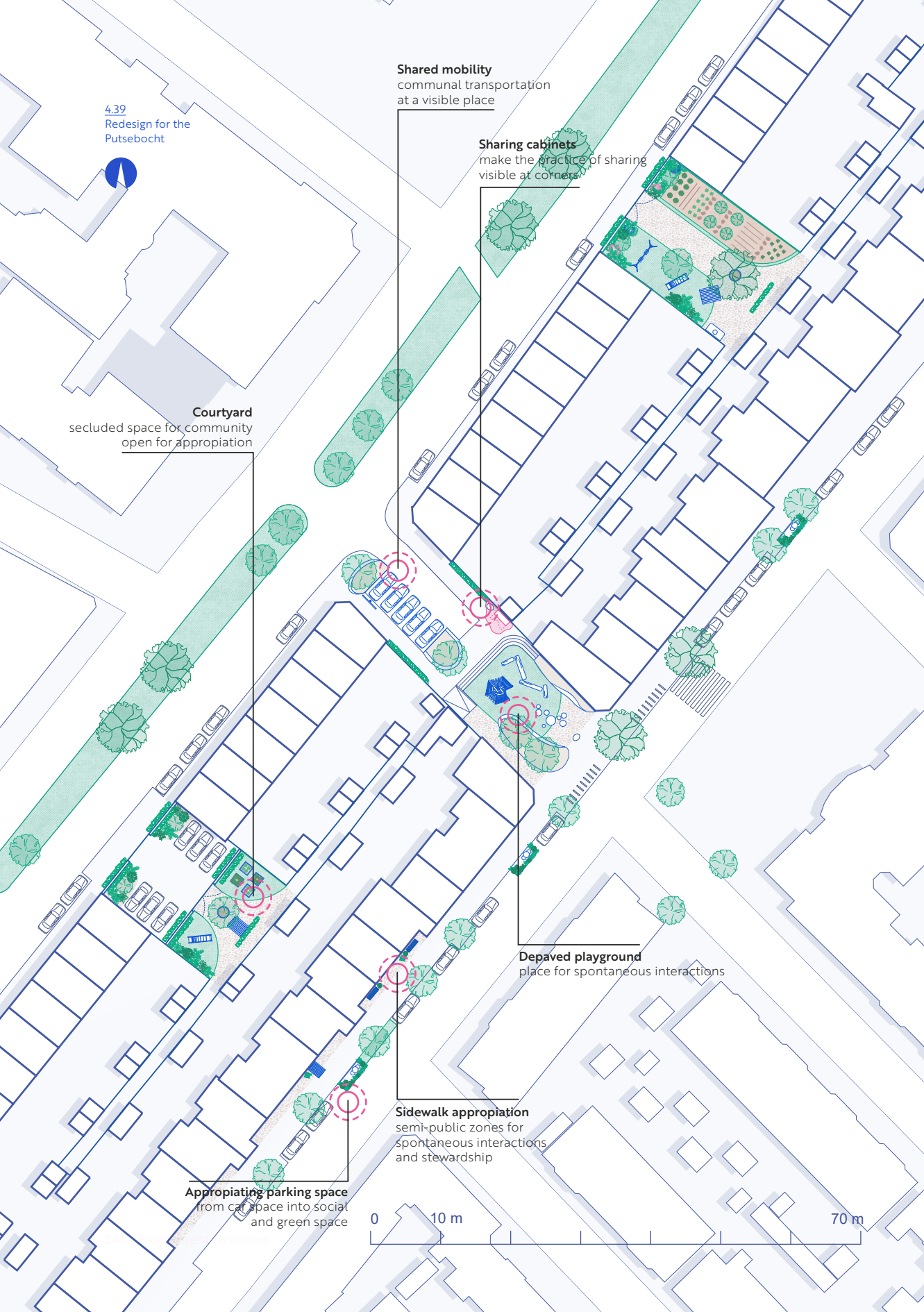
0   10 m   70 m

The impact of the design can be observed from different scale levels, addressing both behaviour as well as the general quality of the environment.

● Individual interactions

When designing public spaces, it is crucial to consider new actions and interactions that individuals can engage in. Individuals can choose to use shared cars, as there is a designated area for shared car parking, along with clear signage and user-friendly interfaces for seamless access. Additionally, the inclusion of sharing cupboards within the public spaces allows people to contribute items or take what they need, fostering a sense of community and resource sharing. Waste disposal remains an important consideration in urban design. Strategically placed and well-maintained waste bins should be provided to facilitate proper waste management in public spaces. To encourage active participation and a sense of ownership, the design should incorporate areas for gardening where individuals can grow plants, herbs, and vegetables, as well as provide opportunities for facade gardens. Lastly, creating well-designed seating areas throughout public spaces offers individuals a chance to rest, relax, and enjoy the ambiance of the surroundings.

○ Beyond the site

The interventions at the Putsebocht are connected to larger neighbourhood initiatives, where facade gardens are part of a project enabling locals through depaving and planting events, the sharing cupboard relates to a network with various typologies, and the shared mobility solution requires a comprehensive plan with high-quality alternatives dispersed throughout the neighbourhood.

● Materials and vegetation

The choice of design materials holds great significance in terms of symbolism and environmental impact, both globally and locally. To address these aspects effectively, it is important to prioritise the use of non-toxic, renewable, and plant-based materials. Whenever feasible, incorporate wood and natural stones, while also integrating recycled street furniture crafted by local artisans to emphasise sustainability. The surfaces should be a combination of fully permeable (soil and grass), semi-permeable (natural stones), and hard materials (street tiles), indicating different zones and enhancing safe and secluded spaces. While paved surfaces will still be present for accessibility, a better balance can be achieved by favouring permeable options where possible. Additionally, give priority to native plant species, ensuring a diverse selection in terms of species, sizes, and colours. Opt for easily maintainable plants that thrive throughout different seasons, ensuring the long-lasting appeal of the green spaces.

● Collective interactions

Through the design interactions among people from diverse backgrounds can be encouraged within the public space. A designated gardening area provides a safe and shared space where community members can garden together, fostering a sense of collaboration and connection. The courtyards are designed with picnic tables and a neighbourhood oven, facilitating neighbourhood events like barbecues, creating opportunities for residents to come together and socialise. The playground serves as a hub for interactions among local residents, providing a space for children to play and allowing parents from different backgrounds to engage with one another. Within the courtyard area, more intimate interactions are nurtured. Equipped with play equipment for children, the courtyard provides a space where families can gather

Temporality and cycles of use

In urban design, considering the usability of interventions throughout the year is essential for creating dynamic and sustainable spaces that cater to the diverse needs of communities. Categorising interventions based on their year-round usability allows us to understand how these spaces remain engaging and continuously express sustainable values towards their users.

Daily cycle interventions, like shared cars and sharing cupboards, are designed for year-round accessibility despite their varying day-to-day experiences. Shared mobility options offer flexible transportation choices, promoting sustainable commuting regardless of the season, although car availability may fluctuate daily. Sharing cupboards serve as communal resources accessible throughout the year, but their contents continuously change.

Facade gardens, food gardens, and parklets exemplify this. Facade gardens and parklets can showcase sustainability through evergreen plants or visually appealing features that enhance building facades year-round. However, the social function of facade gardens shifts with the seasons, as people are less likely to spend time outside in cold weather. Food gardens thrive during growing seasons, enabling fresh produce cultivation and a connection with nature.

Daily cycles
Shared cars/ mobility, Sharing cupboard

Event- based
Planting facade gardens, Use of courtyards

Seasonal
Food garden, Facade garden, Parklet, Use of courtyard

Continuous
Use of waste disposals, Bicycle parking, Playground

Continuous cycle interventions, such as waste disposals, bicycle parking, and playgrounds, remain available and functional at all times. Waste disposals contribute to urban cleanliness. Bicycle parking encourages year-round active transportation, reducing car reliance and promoting sustainable mobility. Playgrounds, designed for children's play and socialization, can be enjoyed in any season.

Event-based cycle interventions, like planting facade gardens or utilising courtyards for gatherings, infuse vibrancy into the urban environment. Courtyards serve as spaces for community events, performances, and seasonal celebrations, fostering collective experiences and a sense of belonging. Planting facade gardens can be an event in itself, uniting people to beautify surroundings and promote sustainability. These interventions provide opportunities for cultural expression and community identity.

Lastly, the concept of evolution is reflected in the growth of plants and trees within urban spaces. Incorporating green infrastructure and allowing vegetation to mature enhances aesthetics and demonstrates long-term commitment to sustainability. Evolving plants and trees contribute to improved air quality, reduced urban heat island effect, increased biodiversity, and a deeper connection with nature.
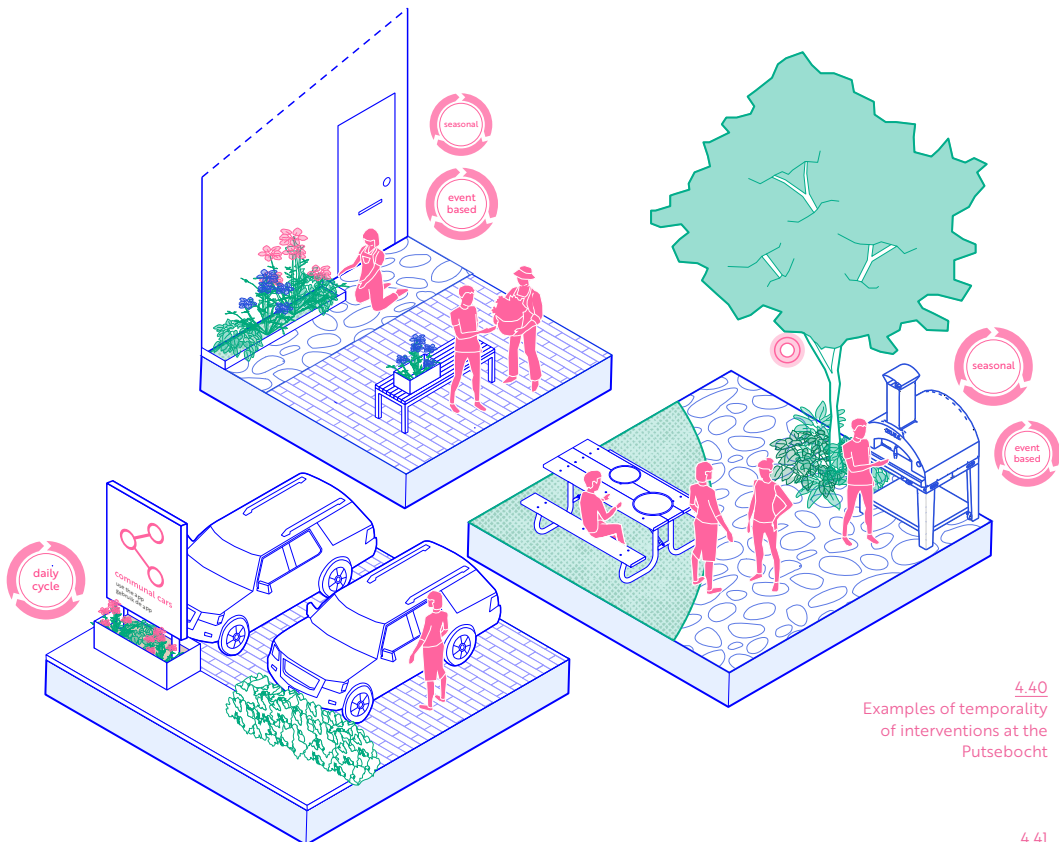
4.41
Below, the patterns are showcased that are
related to the interventions described above.
Full description of the patterns can be found
in the pattern catalogue

C3 Vibrant enclosures

Enclosed spaces serve as valuable social areas, offering a secure and comfortable environment for pro-environmental community activities.

RELATED TO
C2, C4, C6, R3, R5, R7

E2 Collaborative commuting

By turning existing parking lots in vulnerable neighbourhoods into testing grounds for shared mobility, sustainable mobility behaviours can become more widespread.

RELATED TO
E5, E11

R8 Nature on your doorstep

Facade gardens are a simple way to strengthen the relationship between people and nature.

RELATED TO
C1, C5, C6, E1, R1, R2, R3, R5, R6

► Enclosed spaces serve as valuable social areas, offering a secure and comfortable environment for pro-environmental community activties.

► By turning existing parking lots in vulnerable neighbourhoods into testing grounds for shared mobility, sustainable mobility behaviours can become more widespread.

► Facade gardens are a simple way to strengthen the relationship between people and nature.

Moving towards action

The phasing of an urban design plan ensures an inclusive transition, allowing the population to acclimate and adjust behaviours. By involving communities from the beginning and fostering a sense of ownership, the design can inspire and empower individuals to embrace new sustainable behaviours

Phase II | Setting the foundation

After assessing the current state, a few interventions can be implemented relatively quickly. These include waste disposals, bicycle infrastructure, a sharing cupboard, and greening facades through events with local residents. A shared mobility testing ground can be established and evaluated in stages with residents. While the construction of the playground will take longer than the other interventions, introducing it early enhances the quality of the environment. The process of co-creating the courtyards needs to begin in this stage.

Phase II-III | Temporary interventions

Before being able to move towards the final state of the design, people need to be motivated and feel involved in the changes within their living environment. Before all cars can be removed from the courtyards, the mobility hubs have to be evaluated on succes. The transition to lesser parking places can be phased, in which first half of the courtyard becomes community space. At the streetlevel, experiments with removing parking can be done by (voluntarily) placing temporary parklets at parking spaces.

Phase III | Empowerment for lasting impact

When proper alternatives to private car ownership is established and residents feel comfortable with the idea, the courtyards can transition towards being car-free and community-rich.

——— Finalised intervention
——— Temporary intervention
- - - Participation process

4.42
Phases of
interventions

Impression of
the redesign at
the Putsebocht -
letters and number
correlate with
pattern catalogue

C3 E4 R7

1

R6

R1

R3

C2

R8

E5
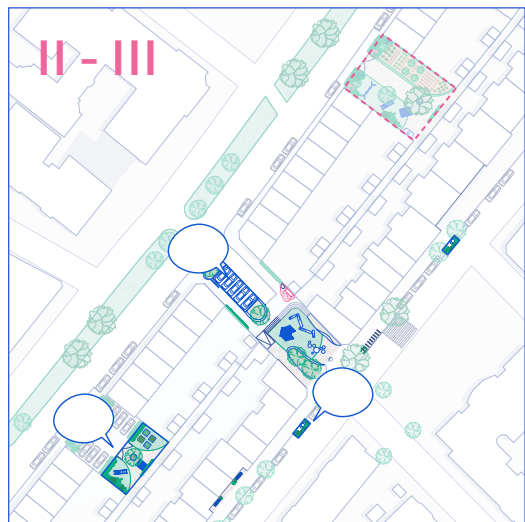
Part V

Designing
for change

Geluk is slechts
een woord maar jij
maakt het een
daad

J. Gomes

▶ Conclusion and reflection

Conclusion

Throughout this project, I worked to answer the main research question, 'In what way can the design of public space contribute to empower citizens of vulnerable neighbourhoods to perform pro-environmental behaviours?'. To provide a comprehensive answer, I will begin by addressing the secondary research questions that were explored during the project. This will help to summarise the key findings. Following this, I will present general and context-specific conclusions.

Main research question
In what way can the design of public space contribute to empower citizens of vulnerable neighbourhoods to perform pro-environmental behaviours?

Aims
▶ To create an overview of eco-socially inclusive urban design interventions that transform the public space, so that people can be empowered to take pro-environmental actions in an exemplary urban condition.

▶ *Behaviour-driven design*
The objective is to create a comprehensive approach that integrates sustainable behaviours and urban design within an eco-social narrative, with the aim of utilising urban design as a driver for social change.

▶ *Turning challenges into opportunities*
By considering the role of humans in their daily lives, the goal is to transform the challenges posed by climate change and growing inequalities into opportunities to reshape living environments to inclusive places.

▶ *Psychology of place*
The aim is to bridge the disciplinary divide between psychology and urban design, with a focus on behaviour theory, in order to enhance human living conditions from an eco-social standpoint.

1) What behaviours take place in public space that can be considered to be sustainable?

Sustainable behaviours in public spaces encompass a wide range of activities that promote environmental balance, social equity, cultural balance, and economic feasibility. In the scope of this project, the environmental and social actions have been highlighted. Behaviours can within this scope be grouped into three action categories: Community awareness, Everyday Decisions, and Recovery and Protection. Examples of sustainable behaviours in public spaces include mobility choices, recycling and waste disposal, community gardening, using public spaces for community events and gatherings, and education on sustainable practices. These social behaviours, consumption behaviours, and stewardship behaviours collectively form a broad spectrum of sustainable actions that are crucial for creating a more sustainable public space.

2) <u>How and by who is the public space in Bloemhof and Tarwewijk used now?</u>

The public space in Bloemhof and Tarwewijk is currently used by a diverse range of users, with varying ethnic backgrounds and ages represented. The use of space is influenced by factors such as age, cultural background, perceptions of safety, and affordability of the space. Understanding these factors is crucial in designing for the future, as they play a significant role in defining how the public space is utilised by its users. It is important to consider these elements when designing public spaces to ensure that they are inclusive, accessible, and meet the needs of all users.

3) <u>What are the present challenges for adopting sustainable behaviours in the context of Bloemhof and Tarwewijk?</u>

The human brain's biases towards the aversion of loss, ease, and self-preservation often result in unsustainable life choices, despite being aware of the climate crisis.

In Bloemhof and Tarwewijk, adopting sustainable behaviours faces several challenges. The residents' daily struggles to preserve their livelihoods leave little mental space for broader environmental concerns. Concerns for affordability limits their ability to take sustainable actions, as financial resources are often scarce and sustainable options are not always the most affordable ones. Moreover, safety concerns also restrict the use of public spaces, making it harder for people to adopt stewardship behaviours.

The spatial environment in Bloemhof and Tarwewijk presents further challenges for sustainable behaviours, with a dominant car infrastructure, a high percentage of paved public space, and an unclean environment that discourages care for surroundings. To address these challenges, interventions within the capabilities of the locals are needed to make sustainable behaviours more appealing and easier to adopt.

4) <u>What are drivers for adopting sustainable behaviours and how are these drivers related to the spatial environment of Bloemhof and Tarwewijk?</u>

The drivers for adopting sustainable behaviours are influenced by both intrinsic and extrinsic motivation. To encourage intrinsic motivation, information, education, and social learning and norms can be provided. Promoting biospheric and altruistic value systems has been found to be successful in predicting sustainable behaviours, which can be fostered by promoting place attachment to enhance social cohesion and nature-relatedness to enhance the relationship people have with nature. However, opportunities for social and nature interactions in Bloemhof and Tarwewijk are currently limited.

Extrinsic motivation can be created by carefully considering the context and the benefits or losses it can allow. This can be achieved through habit architecture and affordances that make sustainable behaviour the most beneficial and

easiest option, and unsustainable behaviours less attractive. Unfortunately, the spatial environment in Bloemhof and Tarwewijk currently favours unsustainable behaviours of consumption and mobility, and provides little space for stewardship actions.

5) How can the use of public space be made more inclusive to the inhabitants of Bloemhof and Tarwewijk?

To enhance inclusivity in the use of public space for the residents of Bloemhof and Tarwewijk, it is crucial to take into account cultural diversity, affordability, and safety. Inclusive design can be achieved by providing a wide variety of functions, through a careful consideration of permeability of spaces, and aesthetics that cater to the diverse needs and preferences of the culturally diverse community. The practice of sharing and the provision of financial capital, such as materials for stewardship actions like plants, can make public space more affordable and accessible to all. Safety can be improved by designing clear but welcoming boundaries and allowing for clear ownership, which can also enhance the sense of community ownership and belonging.

Additionally, it is important to consider the element of time to ensure inclusivity and prevent gentrification processes. Strategies should be implemented gradually over time and with the involvement of the community through community-driven design. External organisations may need to invest financial, institutional, and physical resources, and provide manpower to support the development of public space in Bloemhof and Tarwewijk. An excellent example of an inclusive approach on sustainable neighbourhood design is Buurtklimaatje, an organisation that invests time and resources through close collaboration with locals.

6) What are effective interventions to incorporate sustainable and inclusive design principles in public spaces of Bloemhof and Tarwewijk to promote pro-environmental behaviour among residents?

Effective interventions to incorporate sustainable and inclusive design principles in public spaces of Bloemhof and Tarwewijk to promote pro-environmental behaviour among residents are community-driven and focused on small interventions that take an acupuncture approach. The pattern language offers an overview of interventions that promote sustainable behaviours, while considering the capabilities of the local community. These interventions can be categorised into community awareness, everyday decisions, and recovery and protection.

7) Which areas in Bloemhof and Tarwewijk have the potential to facilitate pro-environmental behaviours?

In the densely populated neighbourhoods of Bloemhof and Tarwewijk, there are various areas that have the potential to facilitate pro-environmental behaviours, as highlighted in the spatial opportunities map. The map shows different scales

of interventions that can be made, ranging from small-scale and easy replicable waste disposals to larger-scale community courtyards or pedestrian networks. Interventions can range from small-scale waste disposals to larger community courtyards, and should be tailored to the specific needs and characteristics of the community.

The specific locations that have been explored are Mijnsherenplein, Heer Danielstraat (through two locations), and the Putsebocht. Each of these locations has a different degree of publicness, which affects the types of behaviours that can be promoted and the approaches to inclusivity that should be taken.

It is important to note that the potential for pro-environmental behaviours is not limited to these specific locations, but can be found in other spaces around the current social environment where there is already a high energy or some energy that can be harnessed to facilitate change. By connecting interventions to social spaces, feelings of security can also be further enhanced as it allows for clearer ownership.

8) How can these areas be transformed over time so pro-environmental behaviours can be inspired, while also fostering to the needs of the current population?

To transform the design areas a comprehensive approach to sustainable urban design can be implemented. This approach prioritises the current population and work through the scales and through time. The interventions mentioned in the pattern language, which are related to the vision statements of connecting people and place, creating a balanced and connected streetscape, utilising resources and skills, and sharing space with nature, can be implemented to achieve this goal.

For each location, specific interventions can be applied based on their unique characteristics. For example, for the Heer Danielstraat I location, green values can be activated through natural playscapes and social interaction in nature, and the streetscape can be rebalanced. For Heer Danielstraat II, a neighbourhood workshop and a recycling center can be created, which becomes an affordable place for consumption for the wider community and a social place for adjacent residents. For the Mijnsherenplein, an open natural design can be provided, which promotes interactions with the natural environment. The open character of the area can be used to emphasise new social norms for waste collection. Finally, at the Putsebocht, safe spaces for community bonding can be created by practicing sharing of mobility and goods and by providing small courtyards that adjacent residents can take ownership of.

General conclusions and recommendations

The conclusions that are presented on this page are more generic and can therefore be applicable to the wider field. These conclusions were formed mostly by the use of theoretical knowledge, but also highlights information gained from analysis and interviews.

► **The connection between humans and their environment is still often overlooked in urban design solutions.**

The project highlights the significant impact of design decisions on behaviour and on the daily life quality. The concept of an "asshole-proof environment" for vulnerable neighbourhoods illustrates the influence of design choices in shaping community norms and enhancing the neighbourhood's sense of worth. It is crucial to recognise the connection between humans and their environments in sustainable design practices to create positive and meaningful outcomes that promote sustainable living. Therefore, incorporating such considerations into sustainable design practices is essential to achieve long-lasting impacts.

► **Sustainable design goes beyond reducing emissions and must also address the intersection of social and environmental issues.**

Sustainable design must address the intersection of social and environmental issues because they are deeply interconnected. Environmental problems disproportionately affect marginalised communities and exacerbate social inequality. Human capability is a crucial aspect of sustainable design because sustainable solutions must be designed with the understanding of how people behave, interact with their environment, and use resources. The success of sustainable design depends on the engagement and participation of the people who will live and work in the designed spaces. Thus, human capability is an essential consideration in sustainable design as it relates to how people can be empowered and equipped to make more sustainable choices in their behaviours. Additionally, sustainable design can also be seen as an opportunity to enhance human capability by creating healthy and productive environments that support people's physical, emotional, and social well-being. Therefore, sustainable design must take into account both environmental and social factors in order to create solutions that are effective, equitable, and inclusive.

► **Sustainable behaviour is not a single type of behaviour, nor is there a single motivation that drives it.**

Rather, these behaviours and motivations are closely interconnected. Both intrinsic and extrinsic motivations play a role in shaping sustainable behaviour. Achieving long-lasting change in behaviour requires a shift in intrinsic values, and support from the social and spatial context. Community awareness behaviour is the foundation on which other sustainable practices are built, as it provides the necessary support and participation from local residents. The everyday decisions and recovery & protection strategies then work together to create sustainable urban environments that prioritise the well-being of both people and the planet. By recognising and incorporating these different types of sustainable behaviours into design, we can create more comprehensive and effective solutions for promoting sustainable living practices.

► **A truly sustainable society can only be achieved through a fundamental shift in the way we approach social issues.**

Rather than prioritising individual economic growth, we should emphasise collective growth and collaboration between people, institutions, and governments. This requires a rethinking of our social approach to governance, as we work towards building stronger, more equitable communities that prioritise the needs of all individuals. Building of capital should be a complete story, in which all aspects of capital - albeit financial, social, institutional or physical - are emphasised through the lens of empowering communities. By focusing on collaboration and collective growth, we can create a more sustainable future for ourselves and for generations to come.
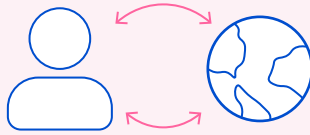
The connection between humans and their environment is still often overlooked in urban design solutions.

Sustainable design goes beyond reducing emissions and must also address the intersection of social and environmental issues.

Sustainable behaviour is not a single type of behaviour, nor is there a single motivation that drives it.

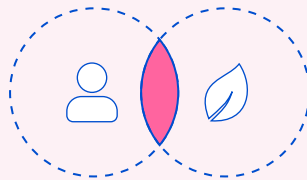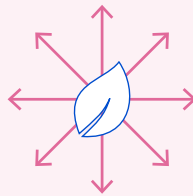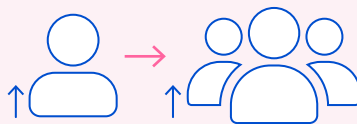A truly sustainable society can only be achieved through a fundamental shift in the way we approach social issues.

Context-specific conclusions and recommendations

The topic was further studied through fieldwork and design in the Bloemhof and Tarwewijk neighbourhoods, leading to location-specific conclusions and recommendations. These have been partially addressed while answering the research question.

► In order to achieve sustainable behaviours within a community, it is essential to take a long-term approach.

This involves providing assistance to individuals and organisations in setting up sustainable practices, as well as providing financial, institutional, and physical resources to support these efforts. It is crucial to identify key players, whether individuals or organisations, who can effectively communicate across diverse cultural backgrounds. This is particularly important in order to overcome cultural barriers and promote understanding within communities. It is important to recognise that significant changes can have a significant impact on daily life, so it is crucial to take small steps that are both comprehensible and within the capabilities of the local community, which are heavily limited by financial resources and by low feelings of safety. By taking this long-term approach, it is possible to gradually build a culture of sustainability that can have a lasting impact on the community and the environment.

► Sustainability efforts in Bloemhof and Tarwewijk should prioritise the existing qualities of the neighbourhood.

This includes the people and their energy and efforts, as well as the architectural qualities of historical places. Despite the presence of numerous existing initiatives, lack of resources can be a challenge to their success. By focusing on and highlighting the existing strengths of the community, and providing the necessary resources and support, these initiatives can be better equipped to thrive and contribute to the overal well-being and sustainable character of the neighbourhood. In addition, preserving and making historical places places of pride can help to promote a sense of identity and belonging among residents, while also contributing to the overall sustainability of the area. By recognising and capitalising on the strengths of the community, sustainable efforts can be more effective and meaningful.

► Small interventions have the potential to significantly improve everyday comfort and enjoyment.

The limitations and annoyances that people experience in their daily lives through their environments are mostly related to cleanliness, lack of enjoyable outdoor spaces and safety. Small interventions, such as façade gardens, waste disposals, and clear boundaries, not only have the potential to significantly improve everyday comfort and enjoyment, but also prioritise the local community by creating a sense of ownership and pride in their living environment. Moreso, by focussing on small interventions that are meaningful for the local community the integrity and the identity of the community can be maintained so that gentrification processes are not being promoted. It is important to consider these small changes as part of a larger sustainable design approach that prioritises the well-being of local people and their living environments.

In order to achieve sustainable behaviours within a community, it is essential to take a long-term approach.

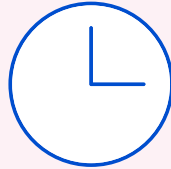Small interventions have the potential to significantly improve everyday comfort and enjoyment.

Sustainability efforts in Bloemhof and Tarwewijk should prioritise the existing qualities of the neighbourhood.

Reflection report
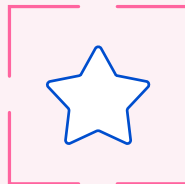
After undergoing a proces, it is time to reflect. In this reflective process, I aim to share my experiences related to two key aspects: 1) the process and resulting products, and 2) the relevance of the project. Throughout this reflection, I will take a critical stance towards both the process I engaged in and the project's significance within the broader discourse.

Part I Process and Products
Understanding behaviours

The most challenging aspect of my thesis by far was understanding how people behave in their natural environment. Initially, I was eager to immerse myself in the literature of environmental psychology to find answers and a strong purpose for my research. I felt it was necessary to pinpoint which behaviours needed to be targeted in my research. However, when I finally knew what to observe, winter arrived, and the streets were empty, making it difficult to gather data. I hoped to encounter busy streets and make direct observations of either sustainable or unsustainable behaviour, but that was hard to do as streets were mostly empty. Therefore, I began to look for indirect signs of behaviour, such as the number of cars on the streets, the condition of front gardens, and the amount of waste on the streets. Additionally, I talked to people whenever possible, and these conversations provided insights into their motivations that I could not have gained through observation or literature. During my conversations, I sometimes made a conscious decision not to emphasise sustainability because I noticed that the locals were preoccupied with more pressing concerns such as affording basic necessities or dealing with the impacts of criminal behaviour. Although I avoided discussing sustainability, I attempted to steer conversations towards the topic of the spatial environment. However, this proved challenging at times, especially with locals who were either unaware of their spatial needs or facing significant social issues that overshadowed the conversation. The difficulty to talk about space may have been caused by the apparent lack of attachment that the residents of Bloemhof and Tarwewijk have to their living environments. Conversations made clear that most locals have no clear feelings of ownership or pride for their neighbourhood in terms of the spatial environment. Ultimately, I found that a combination of observation and conversation was the most effective way to understand behaviour. In future projects, I would prioritise spending more time in public space, observing and talking with locals, instead of immersing myself in theory.

The 'what' questions

Throughout my research, I found that asking "what" questions was a useful way to expose the design process. By asking questions such as "what is," "what if," and "what works," I was able to digest the different products of my work and distinguish what was context-specific and what could be transferable. Every 'What' question is characterised by exposing the 'How' and the 'Why'. By asking "what is," I was able to understand the existing conditions and limitations of the space. Asking "what if" allowed me to explore different design possibilities and expose strategies that are are transferable.

The "what works" question helped me to identify how interventions could be successfully implemented in a specific context, which in this case was Bloemhof and Tarwewijk.

To maximise the possibilities for my design, I used the maximisation method to explore all of the spatial possibilities in the neighbourhood based on the design criteria and information collected from conversations. This helped me to choose interesting locations to focus on and to zoom into specific areas that showed potential for sustainable design. The pattern language catalogue that I created is a representation of the transferability of what I learned in the analysed context. The pattern language includes both tangible, spatial elements and intangible components, making it possible for intangible input to be incorporated into the design process. The pattern language catalogue is not a finished piece of work but rather open for new actions. This point is emphasised by adding an open-ended pattern in the catalogue

It is important to note that the transferability of my findings may be somewhat limited by whether the needs of other neighbourhoods overlap with those of the analysed neighbourhood. Additionally, my research was conducted in the context of the western world, specifically the Netherlands, and as such, its transferability may be limited in other cultural and geographic contexts, as behaviour is greatly dependent of personal factors such as culture.

The target behaviours

Throughout this research, I made a conscious decision not to focus on one particular type of behaviour, but rather to consider a range of actions and habits that contribute to sustainable living. I stubbornly adopted this approach - despite early feedback to narrow down - in order to create a holistic and comprehensive understanding of how design can influence behaviour.

At times, it was difficult to know when to narrow down my focus and make specific choices and when to keep a more general approach, especially given the time I had to finish my work. However, I believe that the benefits of maintaining a broad perspective outweigh my personal struggles. By taking a more general approach, I was able to identify commonalities across different types of behaviours, as well as gain a more comprehensive understanding of the ways in which design can influence behaviour.

One of the most interesting aspects of this research has been learning about different types of topics and behaviours, from waste reduction and recycling to sustainable transportation and community interactions. While these behaviours may seem disparate at first glance, they are all interconnected, and I have been able to identify key design strategies that can motivate sustainable behaviours across a range of domains.

Moving forward, I believe that this research has significant potential for future development. On one hand, this development will involve a deeper investigation of the connections between design and environmental psychology. Although I believe that proposing groups of target behaviours allowed me to discover several relationships, there is still room for further exploration regarding the specific forms and nuances that affect design. Additionally, the research can be strengthened by conducting additional case studies to assess the degree to which contextual factors shape the relevance of different behaviours. By maintaining a broad focus and exploring a range of behaviours, I have laid the groundwork for future research that can build on this foundation and dive deeper into specific topics. Ultimately, I hope that this research will contribute to a more friendly, sustainable and environmentally conscious society, and that it will inspire designers to think creatively about how they can motivate positive behaviour change.

Part II Relevance
Urbanism as multi-disciplinary design

"To us everything is urbanism."
- MVRDV

If Urbanism is anything, it is a discipline in which almost all disciplines come together. The enthousiasm of Maurice about the wide scope of urban planning made me even more convinced of the above quote by MVRDV. So how does my graduation topic relate to my master? I believe my master is about everything. Everything that has a spatial output or that is influenced by spatial output. The theme of the studio 'Design of the Urban Fabric', which was 'Embracing plurality, growing porosity' emphasises the multifaceted role of urban design by questioning our current form of living and working, and questioning the way the built environment interacts with both people and nature, paving the way for the integration of nature and culture. Since COVID-19 the relevance of the discipline of pyschology for urban design has become more clear, especially when we consider natur and culture. The realisation of space has a profound influence on how we feel and how we act. By the design of our public space we create affordances for certain actions.

By intentional public space design, certain behaviours can either be stimulated or prohibited. This thesis was a context in which I could combine my long existing interest for psychology with my fondness for design and place, emphasising the multi-disciplinarity of Urbanism.

practitioner and theorist, even though a better future for urban design could be achieved by integrating the two. There is a problem within the field to transfer knowledge. This problem is partially due to the different ways in which practitioners and academics communicate. Practitioners communication is through visualisation, presentation and report-writing, while academics have a formal and lengthy way of communicating, sometimes leaving out the practical implications of theory. (Araabi, 2018)

This gap is specifically widening in the field of environmental psychology. The scientific evidence that is extracted from people-environment theories is often spread in ways that are not necessarily easily used to inform design. The information provided does often not address the complexity of a project, which includes a great variety of users. On top of that, in the field of environmental psychology, there tends to be a lack of concern for the materiality of the built environment. (Després and Piché, 2016)

In specific, the work on pro-environmental behaviour has an extensive theoretical knowledge range, linking in different elements of environmental psychology. It however remains unclear how this knowledge can be successfully transferred to practice and to material interventions. One of the aims of the study is to bridge this gap and to bring research and design closer together. On top of that, there is an overrepresentation of samples in which white people with a high income are the target group. Therefore, this research aims to represent a different target group in the general research field.

Connecting research and design

In urban design, theory and practice are two processes that sometimes tend to distance themselves from each other, even though they have proven to have similar aims. There are few professionals in the field that are both

Nurturing human-environment relations

With all that is going on in the world right now, the issues that society has to deal with are of great complexity. This project tries to create holistic approach towards the tasks that society is facing.

As a society, we all share the burden of climate change: it is affecting us all one way or another. The discourse on climate change in urban design is primarily focussed on climate adaptation and creating environments that are good for the climate. This thesis aims to bring awareness towards the need for participation of everyone in society to work towards the goal of mitigating the effects of the climate crisis, addressing the human dimension of design. In order to relieve our earth from the exhaustion of resources, demands on our side need to be lowered. For this, we need to reconsider our lifestyles.

As society is in need of a paradigm shift, this project approaches not growth as a main goal of society, but rather preservation. Preservation of not only nature, but also of the more marginalised groups in society. The focus is shifted from the need of the individual, to what is good for all, human and nature. In order to actually create places that are not only good for the climate, but also good for the human, a narrative on eco-social justice is necessary. The improvement of the relation between human behaviour and public space can in the end contribute to inclusiveness, well-being and most importantly, support for the cause of mitigating climate change.

Ethical behavioural design

Even though the intentions of behaviour change are positive, as negative impacts of behaviour are meant to be decreased, some serious ethical considerations need to be deliberated upon. The ethical dimension of behaviour change is still explored to a limited extent, as there is no clear criteria by which interventions can be ranked and ethical repercussions can be assessed (Lilley and Wilson, 2013). It is therefore critical when designing for behaviour change, to take a critical stance as a designer on what you are proposing. Effects on user, society and the environment need to be identified, analysed and evaluated (Lilley and Wilson, 2013), so that

benefits for individuals and society can be maximised and risk and harm can be limited (UKRI, 2022). For example, the effects on the quality of life of a target group in a specific context need to be considered (Steg and Vlek, 2009). One of the difficulties of the ethical evaluation of interventions, however, is that user behaviour is inherintely unpredictable, making that drawing an accurate conclusion beforehand is challenging (Lilley and Wilson, 2013).

Another important consideration is linked to the autonomy of users. In the discourse of design for behaviour change, the choice-control dichtonomy, which is linked to the relation between acceptability versus effectiveness, represents an ethical dilemma (Lilley and Wilson, 2013). As a main principle of ethical research is to preserve not only the rights of individuals and groups, but also a respect towards their dignity (UKRI, 2022), the level of persuasion in design is of importance. Persuasive strategies might be effective in changing behaviour, but can become socially problematic when choice is restricted. For example, when transforming a neighbourhood to be car-free, inhabitants lose control over their ability to own a car. Removing choice, can create negative effects and result in a reduced acceptance for a desired behaviour (Lilley and Wilson, 2013). In some instances, removing choice might become justifiable if done for a greater cause. Proposing new benefits to users can in these cases lead to more positive reactions and hopefully support. However, this is highly context-dependent. It is therefore important to be transparent about the impact of the new design in a specific context (UKRI, 2022). If there is a lack of transparency about the intention, a design can be conceived as intrusive and manipulative. To preserve values such as autonomy, dignity and liberty, people need to be informed about a design.

These considerations had a substantial influence on how I approached this project. As the context in which I work is what we call throughout this report 'vulnerable', it was important to be careful about design decisions and base these decisions not solely on theory, but also on what

can be observed. By emphasising small-scale interventions and avoiding big flagship projects, the context was taken into consideration. Issues of autonomy and the insecurity of working with behaviours were conceptualised by working with strategies, emphasising the sensitivity of time when implementing designs. Despite this, however, there is still a lot of insecurity on whether people feel justified by the suggested design. In practice, implementation of a design should therefore never be pushed without consistent periodic evaluations.

Personal growth

At a certain point, a master thesis project becomes almost like an extension of oneself. So besides having academic and societal relevance, I argue that of at least the same importance is the relevance the research has for my personal growth. While it is sometimes hard to keep track of how much you're learning when you are working for such a long time of a project, it was in my conversation with Chantal van der Leest that I realised that I had aquired a lot of new knowledge over the year. Furthermore, being able to approach strangers with ease, whether they are experts in the field or people on the street, feels like a significant accomplishment on my part.I had always known that this was essential for urban designers, as our decisions on spatial environments can greatly impact people's daily lives. However, as I had no prior experience in approaching people for a project, it felt like a major mental hurdle. As it turns out, people are often happy to spare some of their time to have a conversation. Not only did the interviews and dialogues had for this project therefore have a substantial influence on design choices, it also had a positive influence on my social skills and fueled my ambition to practice this in my future career.

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Samenhuis Ernaast

Date: 23/2/2023

Who: Samenhuis Ernaast is a collective housing group of religious people. The residents are of a variety of ages: from children to 40-year olds. I had a dialogue with Dennis, Sophie, Dennis and Pieter. Dennis is employed in the field of social work.

On the 23th of february I went to the Millinxbuurt and had a dialogue with the residents of Samenhuis Ernaast, a housing collective in the Millinxbuurt in Tarwewijk, on the topics of public space and social behaviour in the Tarwewijk and sustainable practices among citizens.

I started the conversation by explaining my project and telling what I was curious about: their experiences in the neighbourhood. The residents explained that the Tarwewijk is a neighbourhood with a lot of different people. However, there is not a lot of public spaces ('places') in the neighbourhood that can bring them together. When asked about what places they enjoy, they felt like it was really hard to think of some. The lack of places is a relatively recent occurance. Before budget costs, before 2015, there were more places in the neighbourhood that were for the community, like public living rooms. In the past, also the corners of building blocks had clear social functions. This is still visible today by the storewindows that remain. When these places dissappeared, also the people that runned them dissappeared. Finding new driving forces, the people that can put endless amounts of energy in projects, especially non-commercial projects, is hard. However, it is incremental in pulling off initiatives, as the municipal bureaucracy is hard to understand and work with.

Despite bureaucracy being demotivating, Dennis explained, there is still some initiatives happening. For example, last year a sociologist that lives in the neighbourhood initiated the development of facade gardens in the Millinxbuurt. This was an effort to make the otherwise boring and somewhat ugly neighbourhood a little bit prettier. The Cultuurwerkplaats is another of these initiatives and a place where a lot comes together. There are activities for a lot of people and there is courtyard garden, which is mentioned multiple times as one of the most pleasant places in the neighbourhood. However, as a critique, Dennis mentions that a lot of what is there, such as the Cultuurwerkplaats, is very much focussed or branded towards specific target groups. Which makes it less accesible to all. A desire is put forward for places where you don't need to go because

of a certain goal, but where you can just be. Dennis beliefs that it is places without a specific function that can act as a connector of different groups. As an example on how not to do it, he mentions the outdoor sport devices at the Mijnsherenlaan. The Mijnsherenlaan is very much experienced as physical, but also social barrier. As he sees it, the sports function has a limited connecting factor. It only attracts a certain group of people, and not the majority. He therefore would wish to see more functions that can actually act as a bonding agent, such as a nice coffee place. The sport devices, however, are also seen as one of the nice places by some of the other residents.

The Millinxparkhuis and the adjacent Millinxpark are also experienced as one of the more pleasant places in the neighbourhood. They feel like safe spaces, where kids can roam around freely. There is a small garden, which is connected to the playground. There is the hope to create a new playgroundculture with this, where not only children and their family feel welcome, but also other people. As of right now, there is a lot of spaces catered towards family and children in the neighbourhood.

I asked the residents about the fences around the Millinxpark and whether they experienced it as a negative or a positive. They mentioned that at first, they were not necessarily happy with it, but that as time passed on, they changed their opinion. Even though the fence does act as a social barrier, they got used to the idea of the fence and actually felt like it provided a safe space. The park had less opportunity to get trashed and therefore had better chances to stay beautiful. When I asked whether it is hard to keep things nice in the neighbourhood, they answered by saying that without protection from the outside world, beautiful things always got damaged or trashed. They felt like clear boundaries and ownership are necessary in the neighbourhood. Without them, liveability goes down. The trash in the neighbourhood is a good indicator of how public space is treated. Even though a lot of residents put up a lot of effort in keeping their neighbourhood clean, a group of other people continuously keep polluting the neighbourhood with waste. Partly, there are not so many places to put your trash away. However, a lot of the trash problems come from either groups of youth that hang around or from residents that move out of the neighbourhood after a short amount of time. It is the latter group that dumps larger waste, such as old furniture, on corners of the street. The other neighbours then have to call the municipality to clean it up, this seems a big point of irritation. The residents of Samenhuis notice that the youth that hangs around in the neighbourhood seems to be mostly bored. There is not a lot of activities for youth. In the past, there was a workshop, where young people could learn new skills and have social gatherings.

[part III](#)

When it comes to creating a sustainable mindset in the neighbourhood, the residents feel like it is not a hot topic right now. Rather they feel like most people are thinking from their own needs or are not feeling responsible for their neighbourhood, as shown by the trash example. When it comes to transportation, there is a high dependency on car parking spots in the neighbourhood. So much so, that sometimes there are fights over the spots. Transforming parking spots into new public spaces, therefore will for sure cause a lot of friction. Also, dog owners are a group that has a strong opinion on how to treat green spaces. The grass fields are an important element for them in the neighbourhood. Turning them into a different type of green space would cause a possible conflict and could make that the streets become dirtier.

In conclusion, there is a lack of places. In specific 'neighbourhood' and 'activity'-places. There is a need for a variety of different functions that all serve the community, thinking about different age groups. Corners, but also more secluded spaces provide opportunities for creating new neighbourhood social spots. Boundaries and ownership are important urban design elements that ensure that people can enjoy spaces, without the fear of it being ruined.

Robert
CreatiefBeheer

Date: 27/2/2023

Who: Robert is a resident of Bloemhof and works for CreatiefBeheer. He works as a handyman, gardener and looks out for the other residents that do volunteerwork for CreatiefBeheer.

On monday morning the 27th of february, I joined the team of CreatiefBeheer at the Oleanderplein in Bloemhof. Robert, a local resident, showed me the work that they are doing in the neighbourhood and introduced me to other residents. After getting a tour, we went to the Speelplaats de Regenboog and talked about Bloemhof and it's public space and the social behaviour that exists in it.

We first started the conversation, with also other residents/workers, about the living situation in Bloemhof. Socially, there is a need to escape from and/or process the daily problems that people experience at home. Problems that arise in the conversation are related to alcohol/drugs, loneliness or unsafe experiences from criminality. It is because of these issues, that people want to come to a place that has a happy atmosphere. There are many residents in Bloemhof that sit at home, but have a lot of potentials, Robert says. It is at places like the Speelplaats that they can come together, socialize, but also develop themselves. Either socially, or by skills. The need for places is therefore high.

Around the Speelplaats there is a proximity in which CreatiefBeheer operates and does maintenance, cleaning and greening of the public space. They have their own courtyard, which is closed off with a gate that surrounding residents have a key to. Robert thinks it is important that ownership is taken and is communicated. For the courtyard to stay of high quality, it needs to be protected from criminality and loitering youth. The latter is one of the key challenges when it comes to keeping the neighbourhood clean. It might be a good idea to think about what sense of purpose can be given to youth in Bloemhof, Robert agrees. Two other residents are also worried about the youth and their sense of purpose and link it to digitalisation and not having safe spaces at home.

I asked Robert what other important places are in the neighbourhood. He mentions 'de Put' and 'Irene', both some type of community centre. Robert mentions that Irene and de Speelplaats collaborate and are in no way competing, rather they support each other with supplies. Ideally, we fantasise, there would be a network of these community spaces, each

supporting each other and providing a safe space for the surrounding residents. As of right now, there is still a lack of these spaces and also a lack of funding to support them.

Sharing culture already is important in the neighbourhood as it is. Spaces like de Speelplaats are the base of starting such a culture. Here people can borrow things such as tools for gardening, DIY-ing, sewing and more. Robert mentions that they are also thinking about how they can expand by installing charging points for mobility scooters, so the elderly can also come. At the Kamperfoelie, there are also some sharing cabinets he mentions. The idea of being sustainable by sharing, therefore is not a far stretch from the current lives of the residents of Bloemhof. When talking about greenery, Robert also mentions that green in the neighbourhood works as a binding agent. The greenery is visible and accessible for everyone and can therefore be shared by everyone, whether this is in activities or having a beautiful view to share. It makes the neighbourhood prettier. However, Robert quickly adds to this that "everything that is beautiful in the neighbourhood, is gone in 2-3 days". Like mentioned before, clear ownership and putting up boundaries are a way of dealing with this. When walking around the neighbourhood, we talk a little bit about the current state of the public space and we walk past broken street furniture and flower beds. Robert says a lot of the current public space needs special attention by maintenance or replacement.

While visiting de Speelplaats one thing that was very clear, which was not necessarily part of the conversation, is that the quality of the interior space was very much lacking. The building was old, not insulated and therefore very very cold. There was no good heating system. The interior space was therefore not an inviting place in the winter. In a neighbourhood where a lot of people can not pay for the high heating prices, it is important to provide spaces in which they can get warm. This can also be a reason for people to go there.

One of the main conclusions was that when intervening in Bloemhof, things need to be done in the interest of the people. So when it comes to sustainability, we need to put focus on what sustainable behaviours can add to the daily lives of the local residents, what value it can bring. Providing clear ownership, like CreatiefBeheer is taking, brings Bloemhof closer to having a liveable neighbourhood. On top of that, a network of places is needed in which a strong culture of sharing, both emotionally and materialistically, can be supported.

Urban designer
Maël

Date: 28/2/2023

Who: Maël Vanhelsuwé, an urban designer that has been working in the region of Rotterdam South on educating children on sustainability (Archiklas) and helping residents start making their neighbourhood socially and environmentally more futureproof (Buurtklimaatje)

I met Maël at a coffee place on the 28th of February to talk about her experience of working with the topic of sustainability in vulnerable neighbourhoods.

We started the conversation by me explaining my thesis focus and her explaining her work experience. Mostly, she gave me a few tips on organisations to look for, such as Steensoep (about greenery) and Openkaart (a design form that is involved in the Tarwewijk).

Buurtklimaatje as a collective organisation consists of designers and 'city-psychologists'. The way in which they operate is, that they look for people in the neighbourhood that are active and are happy to make their neighbourhood/street greener. Their goal is not so much to school people on microclimates or sustainability, but rather they want to mobilise people; and are therefore focussed on action. They want people to experience themselves what added value is there in green structures, so that they become intrinsically motivated to upkeep it and create support for further expansion in the future. When intervening in vulnerable neighbourhoods, it is super important to start with the people. Putting up facade gardens is much more about creating a strong social network than climate. The social network can be the starting point for further development. Maël recognises that the small interventions are not necessarily about influencing the microclimate, as the effects of interventions of facade gardens are relatively small. But rather, by starting with small interventions, Maël describes, a better understanding can be created for future bigger interventions and therefore conflicts can be decreased or averted.

When it comes to education on sustainability, children are an important anchor point. Children are curious and eager to learn and are on top of that not yet shackled by worries such as money or time. It is therefore relatively easy to talk about sustainability with children. Connected to children are their parents. By involving the parents in children's activities, Maël and the other people from Archiklas hope to also reach out to the older generation and share some of their sustainability knowledge. They do

this by, for example, organising activities to which parents can also come. The limitations of this, however, are that parents don't have to join and there are always high chances parents don't show up.

Another point of attention in vulnerable neighbourhood is the use of traditions. Maël knows that a lot of her collegues work with theory that describes that creating traditions helps to get people involved in the neighbourhood. Examples are a spring market or a flowerplanting day, all repeated on a regular basis over time. People don't often question traditions, rather they just do and think it is an important part of their lives. Traditions and in turn place-making could therefore be an important tool for creating sustainable behaviours. From these traditions new, more sustainable, cultures can emerge. For this, regularity is important. The places that can be targeted for this, could be the less nice places, because than new positive associations can be formed. Regularity could also become a solution for other issues, such as big waste in the neighbourhood. Maël gives an example of an Amsterdam neighbourhood, where bulky waste is always picked up from specific points on a specific day of the week. Because of this, only one evening in the week, the streets are full of waste. While also keeping the streets clean on other days, this also becomes some sort of event, where the streets are turned in somewhat of a fleemarket and people see if they can safe something like furniture.

At the end Maël gives some examples of interventions which could maybe work well to motivate sustainable behaviours; from bigger interventions such as a repair cafe, to smaller interventions such as the 'Biesieklette', where you can borrow tools to repair your bicycle, or containergardens, which in the municipality of Den Haag are free to 'adopt'. People can request a container garden for free under the condition that they take care of it.

Behavioural psychologist Chantal

Date: 28/2/2023

Who: Maël Vanhelsuwé, an urban designer that has been working in the region of Rotterdam South on educating children on sustainability (Archiklas) and helping residents start making their neighbourhood socially and environmentally more futureproof (Buurtklimaatje)

On tuesdaymorning the 7th of march, I met Chantal online via Teams. We started our conversation by talking about the importance of including our living environments when we talk about behaviour change. Chantal stated that she found out over the years, that it does not make sense to push people towards certain behaviours via campaigns or other incentives, when the physical environment is made in such a way that does not support this change in behaviour. She said that this is too much to ask of people and only very strongminded people could succeed with this - not the average person.

Chantal continued to explain some of the mechanisms of our brains, which explain why we make decisions and therefore also thinking mistakes. By understanding these mechanisms, you can start to tempt people to adopt new behaviours. According to Chantal, there are many ways to approach these mechanisms, but she uses three main pillars to comprehend this complexity.

The first pillar is our **aversion to loss**. Research has shown that we think it is 1,5-2 times as impactful to lose something than to gain something. From this perspective, it is important to emphasise not loss, but rather gain. For example, when proposing removing cars from a neighbourhood, using the right wording is super important. People are likely to react badly on terms such as car-free. Rather, promoting livable streets could get a more positive response.

The second pillar is **ease.** Our brains are naturally quite lazy. They have to be, to deal with complexity. Because of this, we sometimes make decisions that do not particularly make sense. We make a lot of our decisions with what is called system 1. System 1 is our fast and almost automatic system, which is based on our own past experiences and our observations of others. It is what some people describe as our gut feelings. Our system 2, on the other hand, is slow and analytical. However, we have relatively very little capacity to use system 2, because it uses a lot of energy. An example of how we use system 2 is by making a pro's and con's list. The

way we use our physical environment is greatly based on our system 1 thinking. Physical manifestations are for example why we don't sit in open fields, when there are spots that are more covered. The ways at which we feel ease are of great variety. It has been proven that spontaneous, short social interactions have a positive effect on our feelings of safety. Also the role of biodiversity is high when it comes to feelings of ease. Biodiversity heightens our feelings of happiness.

The third pillar is **self-preservation**. A lot of our decisions we make to protect ourselves. Overall, people have a generally positive image of theirselves, which is called the optimism-bias. This is in order to feel okay with yourself. Because of that, it becomes easy to judge people. For example, when someone does not clean the poop of their dogs of the streets we think that person is a douchebag. However, when we do not do it, we find all sorts of reasons in our mind why we could not do it. We look with coloured glasses to our environment. We are therefore very bad at being critical towards ourselves and our own behaviours. This is as a form of self-preservation to upkeep image towards ourselves, which is called do-gooder derogation. For example, when someone says they are vegetarian, we are often quick to point out what they are doing unsustainable, because we do not want to feel bad about our own behaviours. Because we are so positive towards the future, we always look for excuses to do something the way we prefer now.

Chantal believes that it is important to create social norms, also in our physical environment. If we are expected to take care of our environment, also the municipality should do so. Often in more vulnerable neighbourhoods it becomes visible that the physical quality of public space is low and people do not feel attached to it. She recognises this also in her own neighbourhood in Amersfoort. Often, there have been little investments in green space. For example, in Carnisse a lot of the green space had been removed and replaced by paving, so the neighbourhood would become more 'asshole-proof'. As a result, people do not feel proud of their own neighbourhod anymore. A mentality then exists that everything will get ruined either way, so it does not make sense to take car of it. In the case of Carnisse, people feel so detached that a research had shown that almost everyone had considered moving. Chantal thinks that is partly because the design of the street does not show any joy. There is no pride or ownership, but rather fear. Either because they feel their living environments will get ruined by others or because the municipality will do their own thing either way. Over the last few years, things have been improving in Carnisse, because new attention have been put towards improving the public space by social actions. For example a flowerbulb-

planting day or depaving for facade gardens. Linking an event to improving the neighbourhood also shows that people are willing to make change. It also creates a feeling of togetherness, which is good for social cohesion.

When neighbourhood networks are broken, which is often the case in vulnerable neighbourhoods, people become less aware of sustainable behaviours. Chantal explains that a lot of sustainable behaviours are not visible, but unsustainable behaviours are - or are more obvious. This leads to a certain nonchalant attitude. It is therefore important to make sustainable behaviours visible, so people feel more involved.