

GARDENS OF RESPONSIBILITY

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GARDENS OF RESPONSIBILITY

Gardens of Responsibility

The Dutch have complicated relationship with nature, since the land is in a constant battle against flooding. Being successful at conquering nature also showed in the increased urbanisation and management of remaining landscape. Due to globalisation, the impact of daily activities on nature remain distant. The world now has entered a so-called 'digital era' where daily activities take place online rather than outside in nature. A 'shifting baseline' leads to people caring less for nature protection (Miller, 2005; Pauly, 1995; Karouzou, 2018). In the light of a glooming climate crisis, it is urgent to improve peoples sense of responsibility to not only protect, but to restore the natural balance.

In collaboration with Staatsbosbeheer, this research aims to increase nature experiences in urban territory. A case study is done at three scale levels: Tanthof; a neighbourhood in Delft Zuid, the Abtswoudse Bos; Staatsbosbeheer property, and Midden-Delfland; the cultivated green buffer between Rotterdam and The Hague. Although Tanthof was designed as an eco-neighbourhood with a strong green infrastructure and car-free streets called 'woonerven', over the years these streets have become parked car territory. An overall private atmosphere is the result of houses oriented to the backyard and closed off to the streets, making Tanthof a barrier between the citizens of Delft and the adjacent nature areas Abtswoudse Bos and Midden-Delfland. The Abtswoudse Bos fails to function as an urban park, due to a lack of urban program, attractive entrances and the barrier effect of infrastructure. In Midden-Delfland, human interventions serving agricultural practices are causing subsidence of the peatland and lead to fragmentation of the ecological network.

The design attempts to answer the question: 'How can urban design of the woonerf type in Tanthof contribute to reconnecting people to the natural landscape system of Midden-Delfland, by facilitating meaningful gardens of responsibility?'. Literature research, physical analysis in the form of mapping and site visits, and inspiration found in philosophy, art and poetry, are used to reshape our understanding of the human-nature relationship. Following the theory of Oneness- implicating a mutual relationship between humans and their environment- forms the concept of the Gardens of responsibility. A different mobility strategy is proposed to create community gardens as residential public space. A green route is created from home to Midden-Delfland. Meaning is found in reshaping natural layers of the past in Midden-Delfland and in building a intergenerational community that takes responsibility for caring of their environment.

Keywords

Urban Ecology, Ecocities, Reconnect with nature, Rewilding, Responsibility

“If the planet is a garden, we are all gardeners – perhaps not aware of it, yet the choices and lifestyles of each of us have an impact on the biosphere and on our collective, vital space. The gardener discovers something new in their garden every day. They are in constant dialogue with all of diversity.”

– Gilles Clément, 2021

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O
Beloved Mother of All Things
Dear Mother Earth,

I bow my head before you as I look deeply and recognize that you are present in me and that I'm a part of you. I was born from you and you are always present, offering me everything I need for my nourishment and growth. My mother, my father, and all my ancestors are also your children. We breathe your fresh air. We drink your clear water. We eat your nourishing food. Your herbs heal us when we're sick.

You are the mother of all beings. I call you by the human name Mother and yet I know your mothering nature is more vast and ancient than humankind. We are just one young species of your many children. All the millions of other species who live—or have lived—on Earth are also your children. You aren't a person, but I know you are not less than a person either. You are a living breathing being in the form of a planet.

Each species has its own language, yet as our Mother you can understand us all. That is why you can hear me today as I open my heart to you and offer you my prayer.

Dear Mother, wherever there is soil, water, rock or air, you are there, nourishing me and giving me life. You are present in every cell of my body. My physical body is your physical body, and just as the sun and stars are present in you, they are also present in me. You are not outside of me and I am not outside of you. You are more than just my environment. You are nothing less than myself.

I promise to keep the awareness alive that you are always in me, and I am always in you. I promise to be aware that your health and well-being is my own health and well-being. I know I need to keep this awareness alive in me for us both to be peaceful, happy, healthy, and strong.

Sometimes I forget. Lost in the confusions and worries of daily life, I forget that my body is your body, and sometimes even forget that I have a body at all. Unaware of the presence of my body and the beautiful planet around me and within me, I'm unable to cherish and celebrate the precious gift of life you have given me. Dear Mother, my deep wish is to wake up to the miracle of life. I promise to train myself to be present for myself, my life, and for you in every moment. I know that my true presence is the best gift I can offer to you, the one I love.

A loveletter to Mother Earth, by Thich Nhat Hanh, via Emergence magazine
Image via www.visibleearth.nasa.gov

Glossary

Anthropocene

The term Anthropocene marks an era in which it has become evident that mankind has a destructive impact on the earth's metabolism. The impact of anthropocentric processes go way beyond climate change; it is about taking down complete habitats, simplifying ecosystems, exhausting the earth's resources, toxic chemistry, desertification etc. (Harraway, 2015).

Biodiversity

Biodiversity can be divided into three categories: genetic diversity, population diversity and ecosystem diversity. Each component is attributed in a different way: composition, structure and function. (Redford & Richter, 1999).

Earth system

Instead of describing separate processes, the earth system is a single, self-regulating system existing of biological, physical and chemical components (Pronk, 2002).

Ecology

"The entire science of the relations of the organism to the surrounding exterior world, to which relations we can count in the broader sense all the conditions of existence. These are partly of organic, partly of inorganic nature." Ernst Haeckel, 1869 (via Friedrichs, 1958).

Habitat

An area that is inhabited by a specific organism (all of the five kingdom taxonomic classification). The habitat provides in food supply and is a place for reproduction, shelter, nesting, rest, hibernation and migration. The habitat size is dependent on the reach of the species and/or the size of the population. (Snep et. al., 2012).

Intergenerational

If something is intergenerational, it relates, involves or affects several generations (Oxford Languages, 2022). In this thesis the term 'intergenerational growth' is mentioned. The thesis mentions a vision in which a shift of worldview takes place; the sense of responsibility to care for nature grows over multiple generations, together with the necessary skillset to act on the sense of responsibility.

Rewilding

Rewilding is a biodiversity conservation strategy, like ecosystem resoration. Whereas restoration aims to return the ecosystem to a historical state, rewilding is a strategy to create and maintain he natural processes that are crucial to a healthy and self-sustaining ecosystem. (Keulartz, 2018; Jepson and Blythe, 2020). In trophic rewilding, this means that sometimes key species are re-introduced in the ecosystem to achieve a natural balance (Svenning, 2016; Keulartz, 2018). In abiotic rewilding, the abiotic conditions are altered, like water levels or the amount of nutrients in the soil/water.



01 Introduction

This thesis explores the human perspective on nature and how this affects the way humans treat nature. This topic is explored from an anthropological and philosophical perspective as well as on a spatial level. The graduation studio Urban Ecology & Ecocities lab collaborates with Staatsbosbeheer. The project explores new ways of urban life with respect to nature. The research location is defined by different territories and different scale levels.

Human-Nature Dualism in the Netherlands

Fascination

Growing polarisation is the topic of today's newspapers, in 2022. This polarisation, the us versus them, me versus you, them versus that, seems to be born from a lack of interest in the other. The membrane of the bubble has become a thick wall. We seem to not be able to look through, beyond our beliefs- our worldview. A multitude of crises, such as the climate crisis, seems to push people further into the very ends of the spectrum. It made me wonder a certain worldview arises within a culture. And what the impact is of this worldview on our daily lives. In this thesis I try to unravel the philosophy behind the dichotomy of men versus nature. I will do this by using theory, art and personal observations. I believe art is a useful instrument in understanding a certain zeitgeist, but also a way to understand the personal, the more intimate relation between the individual and the subject of the art. To narrow down my research, I observe this dichotomy within the Netherlands, where I was born and raised, and where my design site is situated.

Human-Nature Dualism

In the 17th century the great philosopher Descartes influenced the Western culture. With his rational thought, dividing the world into matter and mind, creating the idea that humans and their environment act as separate entities (Taliaferro, 2001). A product from the Newtonian revolution is the rationalisation of the worldview; externalising nature as the object of knowledge and externalising nature as resource. The Human-Nature dualism describes the worldview in which humans are the organisms and nature is a passive object (Paterson, 2006). By describing the world as lifeless matter the exploitation of earth's resources was justified (Merchant, 1980). In the coming paragraphs, the Human-Nature dualism is described through different phases of perceiving the Dutch landscape.

Protection from nature

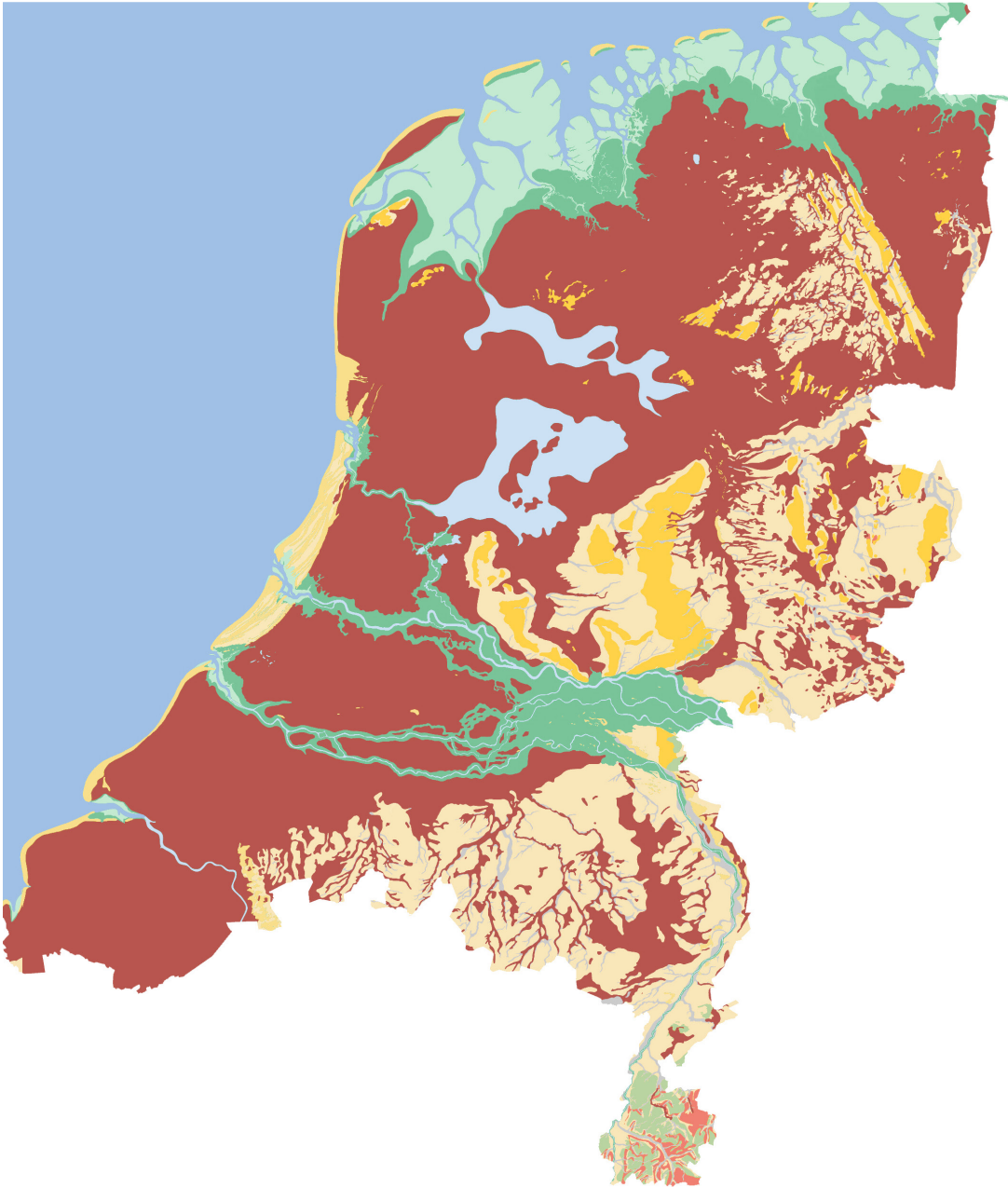
The Netherlands has a complicated relationship with nature. As a country below sea level, the Netherlands is known for its ingenious inventions to protect the land from flooding. About 26% (Correctie formuleringsrisico Nederland in, 2013) of the land lies under sea level and nearly 60% of the land is vulnerable to flooding. Nevertheless, Nederland's largest cities - Amsterdam, Rotterdam and The Hague- are located in this 26% of the land.

More than 2000 years ago, people already built their homes on artificial hills - mounds – to protect themselves from flooding. It was only in 700 AD that people started to build dikes as protection from the sea (Pleijster et. al., 2015). The sea couldn't influence land behind the dikes anymore, and the higher peatlands subsided with the lower water levels. This resulted in the creation of creeks and sandhills (Abrahamse, 2016).

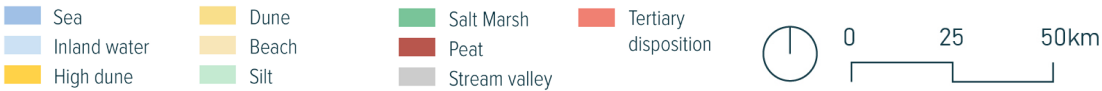
Profit from nature

The reclaimed peatlands were too soggy to use for agriculture. By digging ditches, the water level went down and the area became useful for agriculture (Abrahamse, 2016). The wetlands were fragmented by the artificial rhythm of straight ditches and became the characterization of a typical 'Dutch landscape'. The Dutch landscape is thus an artificial landscape. The term agriculture comprises the manipulation of the land by humans, who use the land to grow their own food; agriculture therefore always affects the environment (Bieleman, 1999). In 1932 the construction of the Afsluitdijk was finished, disconnecting the Zuiderzee from the Noord zee, which provided opportunities for "making new land". Flevoland became a new province and the former Zuiderzee became the IJsselmeer. The transformation of habitat happened not only on the land, but also in the water and from water to land.

Right: Paleogeographic map NL 500 vC. Image altered by author (Vos et. al. (2018))



LEGEND





Fighting nature



Profit from nature

Erasing nature

Around 1850 the Netherlands made the transition from craftsmanship from home to machinal work in the factories. Coal mining grew exponentially as coal was used to fuel the steam engines used in machines in the factories and trains. Industry became centralised in and around cities. Workers homes were built close to the factories, and cities were connected by trains. In 1886, the car was invented, which later in the 20th century changed the layout of the street (Mercedes-Benz Group, z.d.).

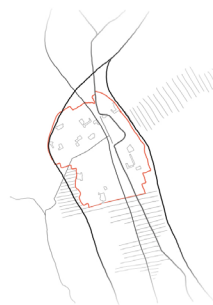
After WWII the welfare in the Western world increased; there was a rise of the car, and modernist neighbourhoods were built. These modernist neighbourhoods often consisted of midrise family houses with shared grass fields in between. The Dutch population grew from 5,1 million in 1900 to 16,6 million in 2010 (Ekamper, 2010). In 2015, 75% of the Dutch population lived in cities (Nabielek & Hamers, 2015). A new province was made to accomodate the food shortages.

Restricting nature

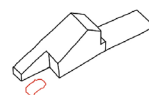
Cities are human dominated territory, and often just designed for one species: humans. Urbanisation is therefore leads to the homogenization of the physical environment (McKinney, 2006). The urban landscape contains all the parks, green strips, trees and bushes within the urban fabric; they are the inverse of the built environment. In the Netherlands, this urban landscape is designed per neighbourhood, per park or even per building plot and form therefore a collection artificial landscapes. Parks can hold a great biodiversity, but it can become an island of green in the petrified landscape (Nielsen et al., 2013). The green strips follow the infrastructure, but are on a lower priority, which results in a bunch of disconnected green areas. Maintenance costs and the durability of the end product is often more important than the ecological value of the place (Strijker et al., 2000). The urban green has to look “neat” whilst being cheap to maintain, resulting in a somewhat uninspiring use of the same shrub and grass combination.



Erasing nature



Restricting nature



Ignoring nature

Today

Ignoring nature

Earlier it was mentioned that the majority of people in the Netherlands live in cities. Larger nature areas often only appear outside the city borders. Urbanisation decreases the availability of nature to humans. In the urban lifestyle it became normal to spend most of day indoors (Kloek, 2016). In my own lifetime, about 25 years, computers and cell phones became the most dominant objects in our society. The new generation grows up playing with tablets, streaming services and mobile phones, instead of playing outside. Only 10% of the children play more outside than inside, compared to the 69% of their grandparents generation (Jantje Beton, 2018). As a grownup one would only experience nature commuting to work, which is often by car or public transport (Centraal Bureau voor de Statistiek, 2021). The daily experience of nature is therefore limited to nature in the street, one's own garden or maybe even the to the indoor plants.

Fragmentation

Throughout history, people have manipulated the landscape, until smaller and smaller pieces of land remained to be experienced. Wild nature is gone and human made nature is often managed in such a way that it is mainly beneficial to humans. In the life of citizens, nature is not a necessary element to their lives, as their food is bought in a supermarket and business is done online. This is of course a false paradigm as plants are still our source of oxygen, fuel and food. There is however a change in experiencing nature, especially wild nature or native species. The fragmentation, designing and management of nature proves how people perceive nature as an object for profit, instead of as the home to all life on earth.

Above: Interpretation of the historical development of South-Holland.

The extinction of flora and fauna

Anthropocene

The term Anthropocene marks an era in which it has become evident that mankind has a destructive impact on the earth's metabolism. The impact of anthropocentric processes go way beyond climate change; it is about taking down complete habitats, simplifying ecosystems, exhausting the earth's resources, toxic chemistry, desertification etc. (Harraway, 2015). Mankind is not able to continue draining, burning, depleting, poisoning of exterminating the earth's resources as they are finite (Moore, 2015 cited by Harraway, 2015). The economical model of cheap nature is thus not a sustainable model and yet most international environmental policy making originates from an anthropocentric ways to value nature (Harraway, 2015 and Paterson, 2006). The World Commission on Environment and Development stated in 1987 that sustainable development is:

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The way nature is valued in the so-called sustainable development policy still originates from the anthropocentric perspective that nature has to serve humans. This serving could be in the shape of economic value, like the mass production of fruit and meat, or an aesthetic value which has a positive impact on tourism. This implies that nature in itself is worthless if people can't see the direct positive impact on humans. Nevertheless there are a lot of species that might not have a direct visible impact on human life, but serve important roles in the ecosystem (Paterson, 2006).

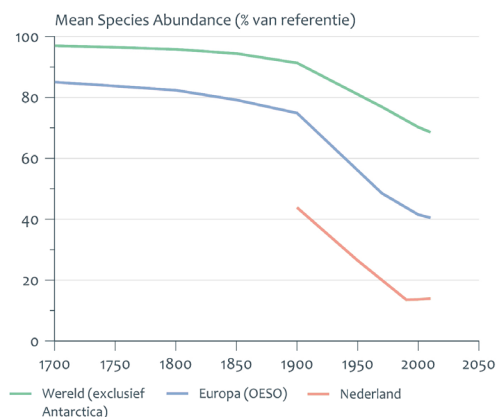
The realisation that human activity has a negative impact on the world's condition, resulted into humans starting to protect nature from people. One could say that people are not allowed to experience real nature because they have the tendency to destroy it. If you turn this around, this could also mean that people don't learn to respect nature as they are not allowed to experience nature. This dilemma is occupying current environmental political scientists, like Bram Bücher and Robert Fletcher (2020).

Biodiversity

Biodiversity refers to the variety of species within one habitat (Oxford Advanced Learner's Dictionary, z.d.). Since all species are interconnected to each other in the ecosystem, the biodiversity changes are a way to predict how resilient the ecosystem is.

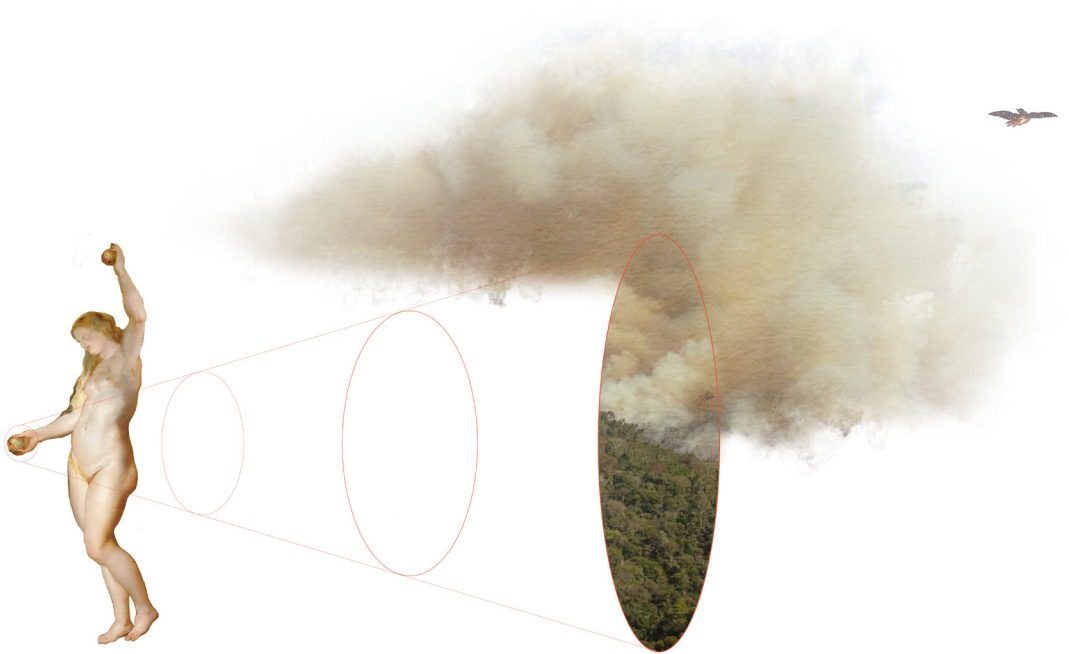
Over the past 100 years, biodiversity in the Netherlands has decreased from 43% to 17% (Planbureau voor de Leefomgeving, 2013). A concerning number given the fact that the earth's system, thus human life, is dependent on a healthy ecosystem. Cities could play a big role in improving the biodiversity through the planning, design and management of urban green spaces (Ives et al., 2015).

Despite the numerous journals and scientific conferences about biodiversity loss, conservationists still fail to convey the societal relevance of biodiversity because scientists don't reach the general public, Miller states (2005). This way the important message only stays within the relatively small academic world, whereas the magnitude of the extinction crisis concerns us all. While there are many researches proposing strategies to reverse the trend of biodiversity loss, there is a certain knowledge gap to be found in how to reverse the degradation of natural heritage in a meaningful way (Miller, 2005).



Above: Biodiversity loss the Netherlands (PBL, 2013).

Right: Diagram on the environmental effects of global consumerism.



The extinction of experience

Alienation from nature

In the past paragraphs the impoverishment of the landscape is explained in several episodes. I'd like to elaborate on last two phases: the human-dominated urban landscape and the indoor life-style.

Native landscapes are reduced by urbanization or partly replaced by the urban landscape, which experiences a homogenizing effect on biodiversity as non-native species often dominate these areas (Miller, 2005 and Schuttler et al., 2018). This way, citizens experiences an impoverished natural environment on a day-to-day base. Children growing up in such a living environment, are likely to see this type of nature as the norm to which the environmental degradation is compared later in life. This phenomenon is known as the 'shifting baseline' syndrome, which results in a downwards spiral of expectations concerning the quality of the natural environment (Miller, 2005 and Pauly, 1995).

We know that children, who will be the next generation, spend more and more time indoors and thus are refraining themselves from experiencing any type of nature at all. Research shows how children who spend more time in nature, will show a greater sense of respect to that type of environment later in life (Brixler, 2002). In my lifetime, which is about 25 years, virtual entertainment has become a huge part of the lifestyles of people of all ages, taking up the hours we otherwise could spend outdoors. People spending less time in nature results in a reduced emotional connectedness to nature (Mayer and Frantz, 2004).

So, since more and more people are living in the human-dominated, biotic impoverished urban areas, the accessibility is decreasing, which leads to the shifting baseline syndrome for future generations. On top of that, the urban lifestyle is happening mainly indoors, reducing peoples experience of any type of nature at all on a day to day basis. These two factors describe what is called the 'extinction of experience', the cycle of homogenization and reduction of local flora and fauna, followed by alienation and indifference (Pyle, 1978). I believe peoples indifference to nature is probably biodiversity's biggest threat.



Paul and Margaret, 2009 by David Hockney.
www.hockney.com

The Green Metropolis

Staatsbosbeheer

Staatsbosbeheer is a Dutch organisation that protects and develops some parts of the green heritage of the Netherlands. Staatsbosbeheer was founded in 1899 by the state, to plant forests that would prevent drifting sand in the coastal area. In the first 30 years, Staatsbosbeheer focussed on restoring the forest areas. A large part of these forests were planted for wood production, which was used in mining activities.

In 1915, Staatsbosbeheer worked together with Rijkswaterstaat in landscape development. Later, in 1928, the protection of nature and nature monuments became part of Staatsbosbeheer's program. After the WW2, recreational use of green areas became more prominent, as welfare increased. Staatsbosbeheer became a multidisciplinary organisation to accommodate a growing number of recreational users. By law of September 11, 1997, Staatsbosbeheer became independent. The tasks of Staatsbosbeheer are laid down in this law: "Managing and making sustainable use for society with the areas entrusted to them." (Staatsblad 1997, 514). Today Staatsbosbeheer focusses on bringing nature closer to people, by facilitating recreational zones at city edges (Staatsbosbeheer, z.d.).

Ambition

Due to increasing urbanisation in the Netherlands, the risk of decline in quality and quantity of the green space in is present. As a counteract to the stony living environment, Staatsbosbeheer set up an ambition to create 'The Green Metropolis'. The Green Metropolis is a plan that inspires urban planners to think of smart green infrastructures with functions in green to reinforce the connection between the city and the areas of Staatsbosbeheer. With this ambition, Staatsbosbeheer works together with municipalities to develop qualitative green spaces in urban development.

"In the green metropolis you can walk, cycle, do sports. Again and again you are tempted to go further, to discover, made possible by easy wayfinding. Along the way you will come across places where it is pleasant to stay. The tea garden or the pancake house, combined with childcare, a play-forest, small-scale activities, social workshops, arts & culture, nature education. There are places where you can drink water from the tap, where you can sit, watch, picnic, fish and bird watch. At farms you can see how our food is produced and buy fresh local products. Through various ways you can participate in the design and management process. You feel connected, compassionate and included. And that feels good."

Staatsbosbeheer (2021) Visie en beleid Groene Metropool. p3












Urban Ecology & Ecocities LAB

The TU Delft graduation studio 'Urban Ecology & Ecocities' is a crossdomain studio of Urbanism and Landscape Architecture. The studio collaborates with Staatsbosbeheer by analysing 16 priority cities in the Netherlands. The goal of the research is to find how the Green Metropolis ambition can be integrated into urban development. The studio worked for six months on an elaborate analysis on national scale and cityscale. Each student worked out two cities and picked one for their thesis. The research involved policy research, spatial research, interviews with different stakeholders and in some cases site visits to existing Staatsbosbeheer property. The assignment was to create a green vision for each city. Students who operated within the same province worked together on the research. Although the focus of the research has a different approach to this thesis, it was a first incentive to the design question and site.

*Right: Map the province of Zuid-Holland
image by author (pdok (2021), z.d., Staatsbosbeheer).*

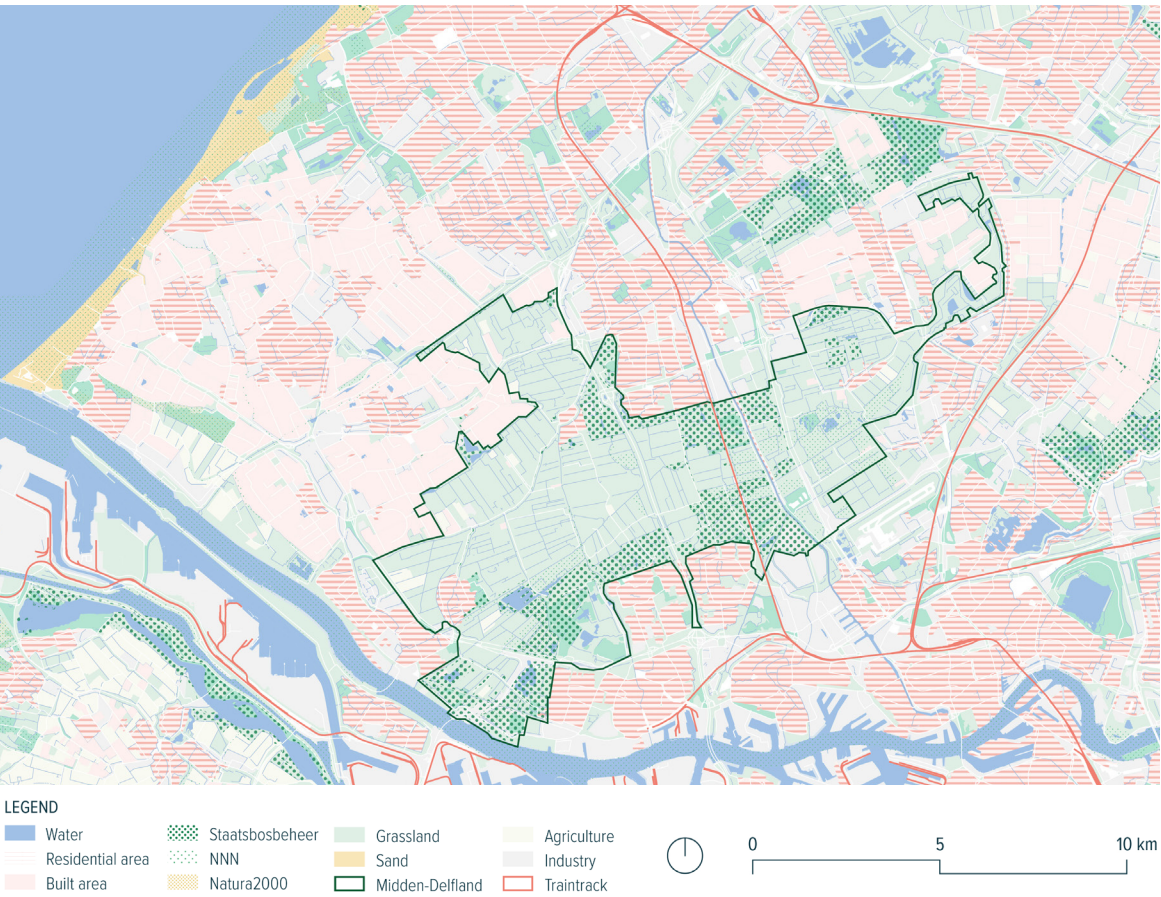


LEGEND

 Water	 Staatsbosbeheer	 Agriculture	 Industry
 Residential area	 NNN	 Sand	 Train track
 Horticulture	 Natura2000	 Forest	



Midden-Delfland



Midden-Delfland is a green zone that is part of the Rotterdam-The Hague Metropol. The landscape is enclosed by urbanized area and greenhouses. There is a constant pressure on the green area, as the Rotterdam-The Hague continues to densify. The province of South Holland included Midden-Delfland as national buffer zone in their vision for space and mobility in 2014 (Gemeente Midden-Delfland, 2017b).

Spatially, the area is cut up by several vertical elements, such as the Schie, the traintrack and the two highways; A4 and A13. Although they don't block the view when you are visiting Midden-Delfland, they become borders in the East-West connectivity. The dominance of the North-South connection in combination with the land use lead to a monotonous landscape.



*Left: Map the metropolis of Rotterdam-The Hague, image by author (Nationaal georegister, z.d., Staatsbosbeheer).
Right: Photograph of Midden-Delfland with the Rotterdam skyline in the background.*

The peat and clay soil is cultivated since the 10th century (Abrahamse, 2016). The landscape is always in movement, influenced by the water levels in the ground. Some historical farmers roads (boeren linten) are still intact, like Abtswoude, which goes from the city of Delft into Midden-Delfland, splitting the neighbourhood Tanthof in East and West. The landscape is characterised

by its polders, bird habitat and wide views. Nevertheless, is Midden-Delfland still not valued as an attractive landscape. In the vision for Midden-Delfland (2021) it is mentioned that the unfamiliarity with the place could be a reason for people to give the area a lower score. I believe there lies an unused potential in Midden-Delfland.



The Schie always served as a vein of transportation, granting Delft an important trading position. Today the Schie still got it's industrial character, giving the visitor a feeling of being unwelcome.



Even in the extreme industrial conditions along the Schie, there is a certain potential to be found in the industrial buildings that start a dialogue with the waterfront.





Visitors are not invited into the area due to a lack of public functions, unclear entrances and unwelcome crossings.

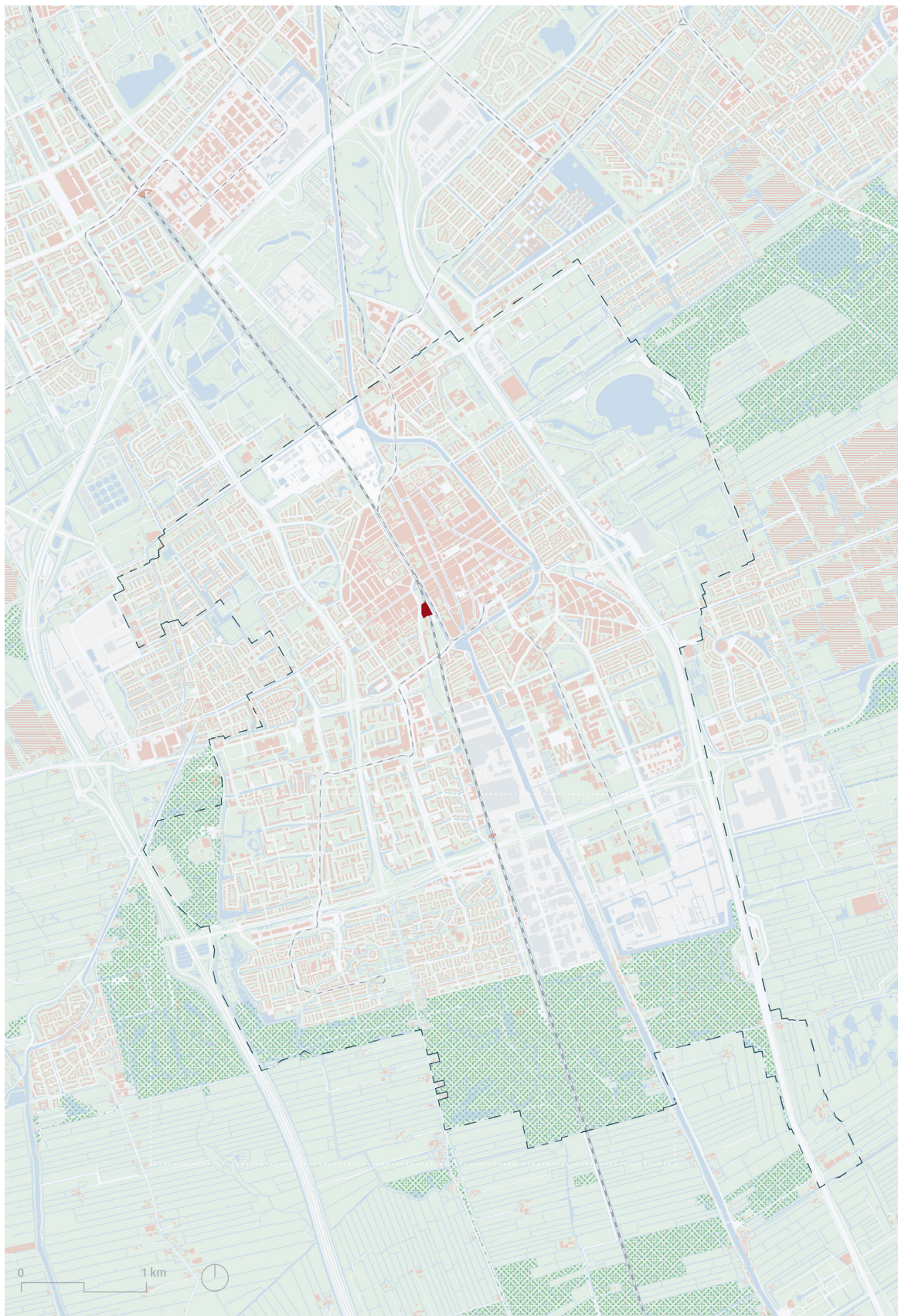


Delft

Delft is a middle-size city, located in Zuid-Holland. Delft is named after the canals that embrace the old city centre; the act of digging was called 'delven'. In 1300 the Schiecanal was constructed from existing streams, and due to the direct link with the sea Delft became an important trading city (Geschiedenis van Delft, z.d.). Today, the city is known for its historical city centre, blue porcelain, artists like Vermeer and Schoonhoven and is home to the TU Delft. Delft is part of the Metropolitan area of Rotterdam and The Hague. Delft envisions to build 15000 new homes in 2040 (Gemeente Delft, 2021).

The city is close to two areas of state forestry: one is known as the Delftse Hout, the other as the Abtswoudse Bos. In summer, the Delftse Hout is full of people walking, cycling, swimming and playing all sorts of games. The Abtswoudse Bos is not as popular as the Delftse Hout.

*Left: Context of Delft.
Right: Map of Delft (pdok, 2021).*



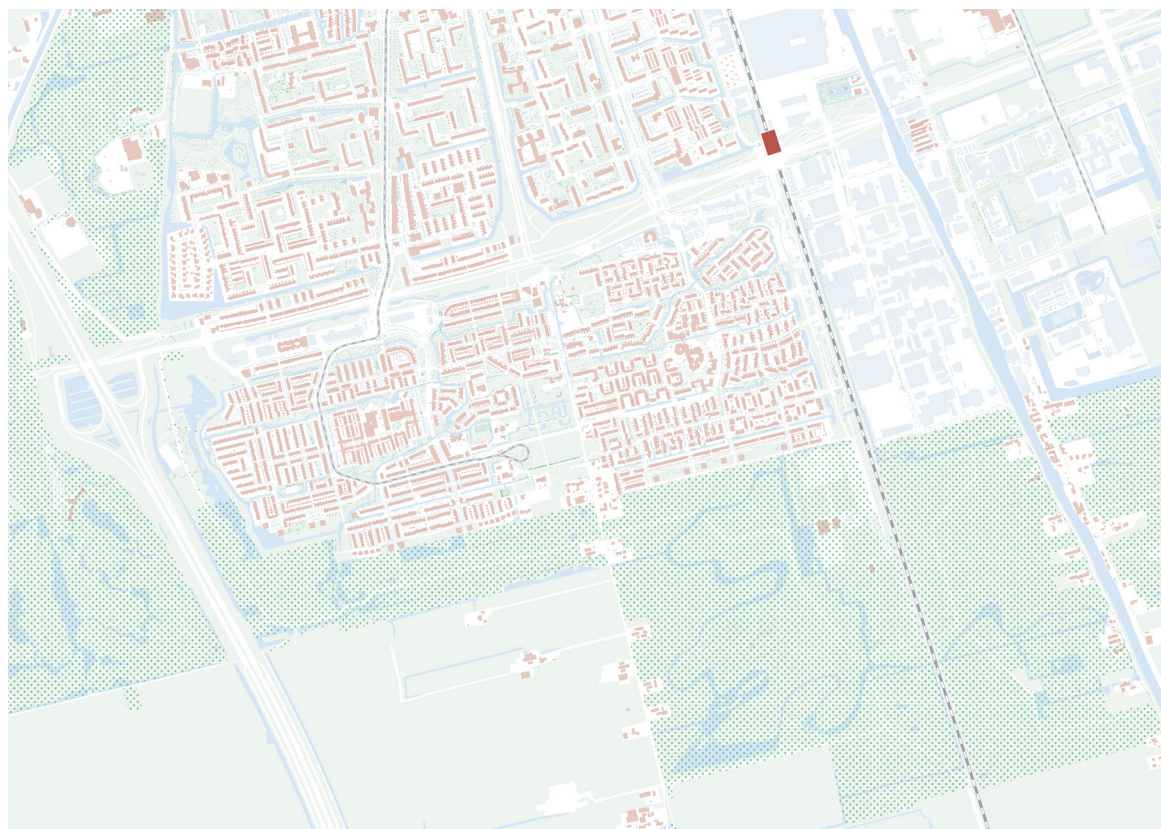


Tanthof

Tanthof a neighbourhood in the south of Delft. Thanks to the compactness of the city, the center is reached within a 20 minutes biking. Surrounded by the A4, the Kruithuisweg, and the traintrack, Tanthof is both the most and least accessible neighbourhood as these large infrastructures also prevent easy access by bike and foot. The renovation of the NS station gives a new impulse to the accessibility for slow traffic, as it provides a tunnel under the traintrack to the east of Delft, where the TU Campus is located, together with a diverse industrial zone and several sports facilities.

The neighbourhood is divided into two areas by the Abtswoude road; a historical farmers road. The road leads through Midden-Delfland all the way to Schiedam and Rotterdam. Adjacent to Tanthof lies the Abtswoudse Bos, a relatively new forest that functions as an urban park.

*Left: Context of Tanthof.
Right: Map of Tanthof (pdok, 2021).*



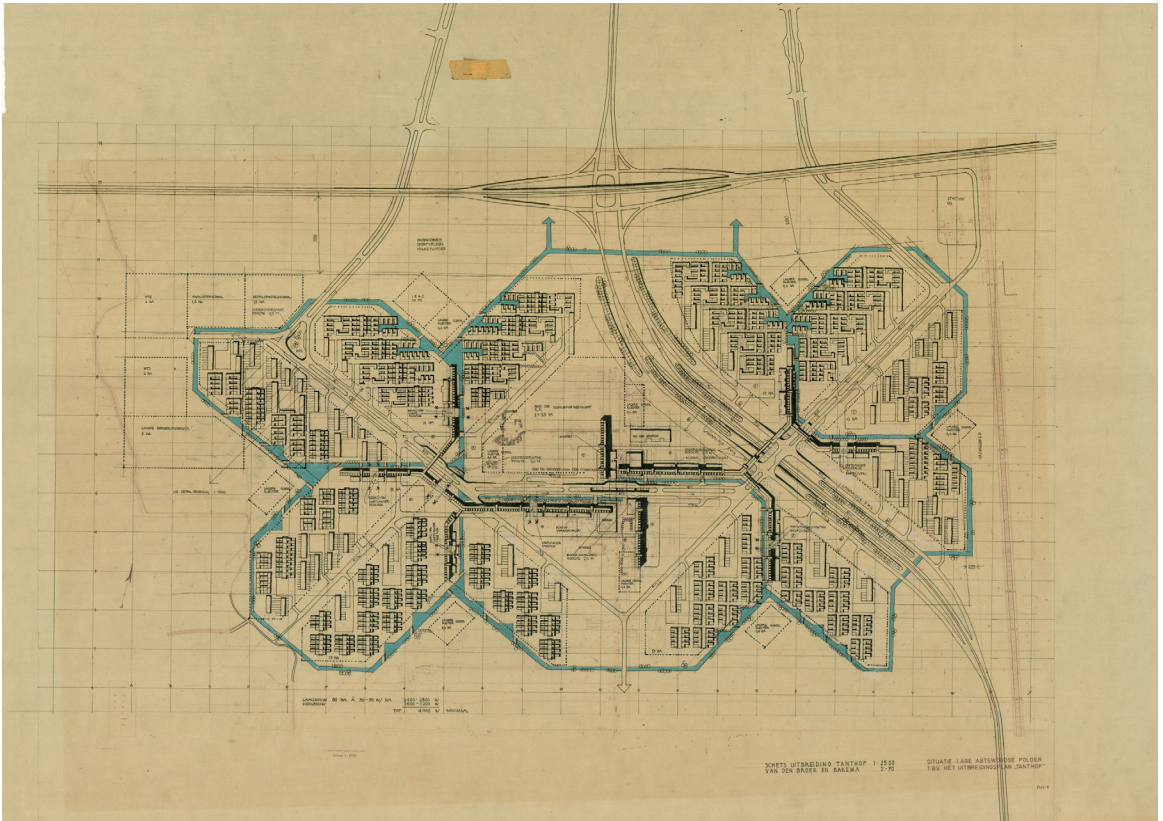
LEGEND

- Municipality
- Residential area
- Industry

- Staatsbosbeheer
- Grassland
- Water

- Horticulture
- NS station
- Rails





Van den Broek en Bakema, Stedenbouwkundig ontwerp van de Tanthof Delft, 1970 (Collectie Het Nieuwe Instituut, BROX,2019).

Masterplan top-down

In 1969, the Rotterdam based architecture firm of Broek en Bakema made an urban design for the neighbourhood Tanthof, as Delft was expanding to the South. The first plan - which could also be mistaken for a microcontroller - is based on diagonal roads, drawn with a mathematical precision. A dense collection of high-rise buildings in

orthogonal directions. The only curving element is the provincial road to Rotterdam, cutting of one third of the plan. There was a lot of critique on the original plan, so a team of people from the municipality and resident representatives worked together with the architects on a new plan (Habitat: de Tanthof, 2019).



Van den Broek en Bakema, Plan Tanthof Delft, 1969 (Collectie Het Nieuwe Instituut, BROX,2019).

Participatory Masterplan

The new plan is based on the former cultural landscape; the neighbourhood was divided into Tanthof-West and Tanthof-Oost by the historical farmers road 'Abtswoude' and the linear shapes of the polder remained present in the new layout, forming a strong green-blue network. Contrasting to the original masterplan, the effect of car traffic was minimized. Since the neighbourhood was placed between large infrastructural interventions, a

buffer zone was created around the neighbourhood. The road system was designed to give priority to slow traffic. Multiple architecture firms were asked to work out different parts of the neighbourhood. Broek en Bakema designed one of the southern areas inspired by the layout of the boerenhof (farmyard), which today is known as the woonerf type (Habitat: de Tanthof, 2019).



The barrier effect of the large infrastructure combined with the useless green bufferzone and the monofunctional industrial terrain make Tanthof into an enclave. Long waiting times and short at complex crossings The dominance of the car is also present in the residential street.



Through the orientation of the houses towards the green areas, green often feels fenced by the backyards and blind facades. Through the orientation of the houses towards the green areas, green often feels fenced by the backyards and blind facades.





Visiting the neighbourhood, one could find these hidden treasures. This green zone provides a nice walk with interesting patterns and changing compositions of dark and light as the sun finds its way through the unique organisation of leaves on every tree. Through its scale the place does not invite to play soccer or throw a frisbee, but it is definitely a treat to walk your dog here. This place represents how the green zones were designed in the first place.

Collective space, like this dead end of a street is dominated by parked cars. A coldness comes from the stone and metal. In the back you can notice a bit of grass with some selfbought playground elements, shoved away as if that's the thing to hide. The whole area is shut off by fences and closed curtains. One little path leads to the green strip behind these houses, making this all feel like a very private space, as if I just entered the stairs to someone's cellar and I am not allowed to look around.





Street, sidewalk and frontyard have become one in this street, and why wouldn't it? What am I doing here anyways, I am the outsider. This covered path marks the transition from public to private, it almost forces me to just walk on the street, as if the house has marked it's territory. Contradictory I walk across closed windows, closed doors, sometimes even covered with newspapers, as if everybody has a terrible hangover today. Why do all these people prefer to live in the shadows? Why don't they open their curtains, or sit in front of their houses, talking to their lonely elderly neighbour? Is it the architecture? Is it the people? Is it me?





02 Methods

By now we have an overview of the research topic and the design site. From the introduction, a problem field is defined. The methods chapter elaborates on the layout of the research, including the problem statement, the aim of the project, the research questions, and the methods used to answer the research questions.

Problem field

Problem statement

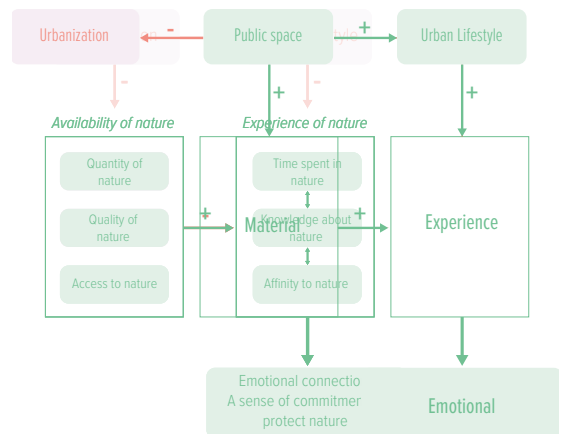
The Netherlands has fought a long battle with nature. As a country below sea level, we conquered our nature, controlled it and made profit out of it. Due to urbanisation, parts of the landscape is replaced by a human dominated built environment, which continues to limit the availability of nature. Next to that we developed a society where most people work and live indoors, enhancing the feeling of us (human, internal) and that (nature, external) as separate entities, called a Human-Nature dualism. In our day-to-day lives, it becomes almost invisible why we need nature. The Human-Nature dualism results in people lacking a feeling of responsibility for the natural environment.

As urbanisation is drastically increasing in the Netherlands, there is a serious pressure on the quantity and the quality of green. The impoverished nature in cities becomes the norm for our future generation, and the emotional connection, the sense of commitment to protect nature, is decreasing. It is therefore important to minimize the negative effects of urbanisation and maximize the experience of nature to enhance biodiversity conservation.

The metropolitan region of Rotterdam-The Hague is the most urbanised area in the Netherlands. Between Delft and Rotterdam lies Midden-Delfland, enclosed by greenhouses and urban area, this green buffer has the potential to become a Metropolitan Garden. However, the reachability for slow traffic is poor, the industrial character of the Schie-route is unattractive, there is a lack of program for the metropolitan citizens and the transition between city and landscape is quite harsh.

Delft is a middle-sized city in between Rotterdam and The Hague. It contains two large green areas owned by Staatsbos-beheer: Delftse Hout and Abtswoudse Bos. Whereas Delftse Hout is full of swimming, walking and picnicking people, the Abtswoudse Bos is not that popular. As an transition area between city and Midden-Delfland, there is a lack of attractive infrastructure for slow traffic to the area and no functions to attract visitors.

Tanthof is a neighbourhood with woonerven, originating from the 70's, located on the edge of the Abtswoudse Bos and surrounded by the heavy infrastructure of highway, the Kruithuisweg and the train. The neighbourhood has a strong green infrastructure, although the green has a private, backside character. I challenge the effectiveness of the design elements of the woonerf for the case of Tanthof. The absence of attractive public space, the enclosed character of the building type and the excess of paved area leads to a lack of interaction between residents and between residents and nature.



Model of how nature-based science can reduce the extinction of experience. (Karouzos, 2018, p406) image altered by author.



Paula Rego (1998), A woman with her hands tied-looking away; in the comfort of a luxury seat, paralyzed by sorrow, ignoring the festering pain of the future (authors interpretation).

Oneness

The looming crisis of a destructive decrease in biodiversity asks for a more radical approach. How is it that we have still not made any radical change? In this thesis, I argue that the Dutch society, influenced by Western philosophy, has developed a false dichotomy between human and nature. The idea of the 'us' and 'them' or even 'that', as if nature is an object, a product we can sell. Current biodiversity conservation act from an Anthropocentric worldview, by focussing only on the value species have for humans (Paterson, 2006). All species are part of a larger live supporting system and earth is seen as the biological habitat for this system, so one could say that every species is part of earth's biodiversity and has an impact on the planets ecosystem (Ehrlich and Ehrlich, 1982). If our society wants to conserve biodiversity for and with people, it is necessary to overcome the Human-Nature dualism and start thinking of the earth as one system.

Western society could borrow some ideas from the Eastern philosophy. The most relevant difference between Western and Eastern philosophy, is that Eastern philosophy is not based on Descartes mind-matter dichotomy (Allwright, 2002). By now, you've read how the Western violent approach to nature focusses on a human dominated world/habitat. The Eastern approach however, is based on the idea of harmonious and nonviolent coexistence which translates in respecting the processes of the natural world (Xian lin et al. 2001).

This thesis is gaining inspiration from the 'non-dualities' of the Buddhist ideology, translated in Ikeda's philosophy as "the oneness of body and mind; the oneness of the internal and the external; the oneness of cause and effect; and the oneness of life and its environment" (Ikeda 1994, as cited by Paterson, 2006, p148). The more pragmatic explanation of Ikeda's theory is the concept of dependent origination (Paterson, 2006). In the view of dependent origination, everything acts in response to internal and external conditions, meaning nothing can exist independent or arise on it's own (Xian lin et al. 2001). This concept reminds you perhaps to the biological concept

called symbiosis: a relationship between two types of organism in which each type provides the conditions necessary for the other to continue existing (Cambridge Dictionary, 2022). Ikeda's philosophy builds upon the mutual relationship of interdependence:

"And if we wish to describe the mutual relations that exist between human beings and the environment in these terms, we would say that the living self depends upon the environment for its existence. That is, human beings depend on the workings of the environment or natural ecological conditions for their growth and development. And conversely, as indicated by the statement above that "without life there is no environment," the environment must wait for the activities of human beings in order to take on a particular shape or undergo changes. Human beings thus play a key role in the creation of a particular environment, and must bear the responsibility for such creation." (Xianlin et al. 2001, p. 19 as cited by Paterson, 2006)

I agree on the statement that the act of humans do not go without consequence for the environment, and thus human beings should carry the responsibility of our environment.



Research

Aim

The first chapter explored the history of the human-nature dichotomy, how this changed our worldview and how the human-nature dichotomy is fueled by the way we design our living environment today. The theory of oneness diminishes the human-nature dichotomy and explains how humans have a mutual relationship with their environment. The hypothesis of this thesis is that our environment plays a big role in our upbringing and thus the creation of our worldview. Simultaneously, people have a direct impact on this living environment, as also mentioned in the theory of Oneness. Since we have the knowledge about the human impact on the earth system, as described in the paragraph on the Anthropocene, it is our responsibility to create an environment that is kind to all forms of life. To enhance this dialogue between human and nature, we have to transform our direct living environment to restore the natural system whilst creating opportunities for meaningful interactions between human and nature. If we link this statement to the site, we could divide the living environment into three territories: Midden-Delfland, Delft and Tanthof. Referring to the quote of Clément Gilles (2021) we are all gardeners of the planet, the aim of the design should be to create 'Gardens of Responsibility'. If we land this idea onto the site, the research question is as follows:

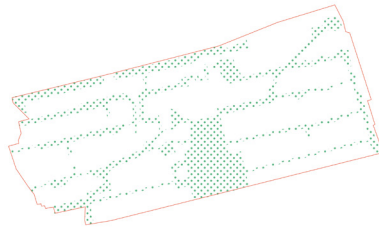
How can urban design of the woonerf type in Tanthof contribute to reconnecting people to the natural landscape system of Midden-Delfland, by facilitating meaningful gardens of responsibility?

Subquestions

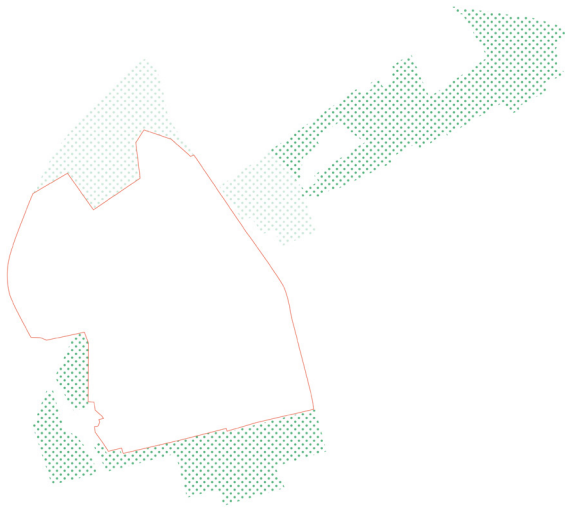
The research question is divided into subquestions, which are categorised into three types: **Theory+Design**, **Analysis+Design**, **Experiment+Design**. The method scheme on the next page shows how the three categories interact and how they contribute to the research.

- What happened to the relation between human and nature?
- What are the characteristics of the woonerf?
- What does it mean to reconnect people with nature?
- How to facilitate change in citizens sense of commitment to protect nature?
- How could nature-based design provoke a sense of responsibility for ecosystem protection in citizens?
- How and where can the original landscape of Midden-Delfland be restored?
- How to make the transition between the natural system of Midden-Delfland and Tanthof?
- How could the biodiversity be improved?
- How to improve the experience of nature in Tanthof?
- How to reconnect Tanthof to the natural system of Midden-Delfland?
- How to create meaningful interactions between human and nature?
- What interventions in the Abtswoudse Bos could improve the connection between the natural territory with the neighbourhood territory?
- What elements of the woonerf could be used to reconnect people to the natural system of Midden-Delfland?

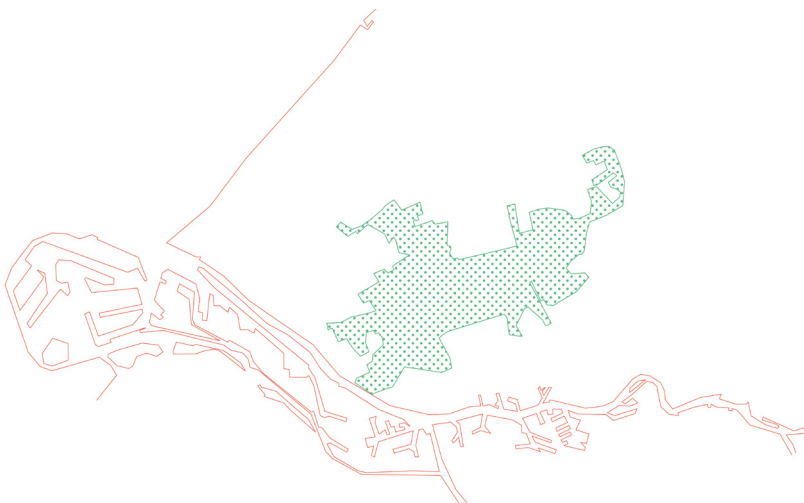
Right:
Gardens of Responsibility



Neighbourhood Garden

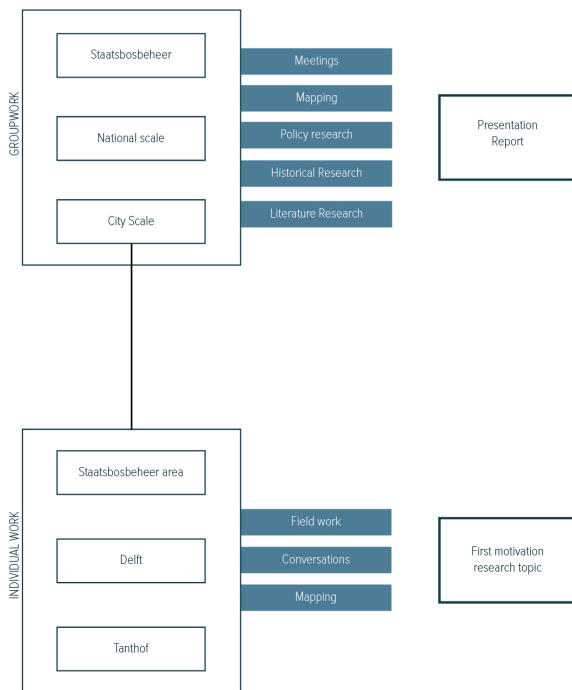


City Garden

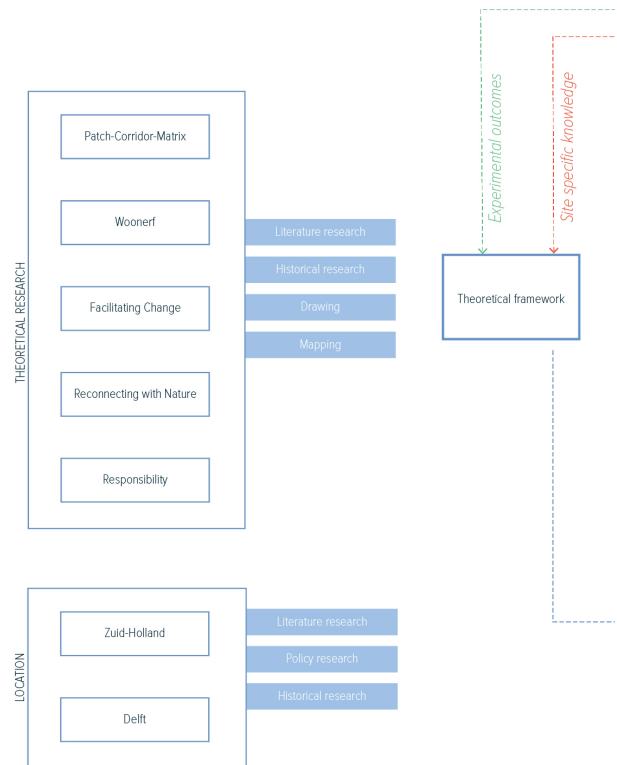


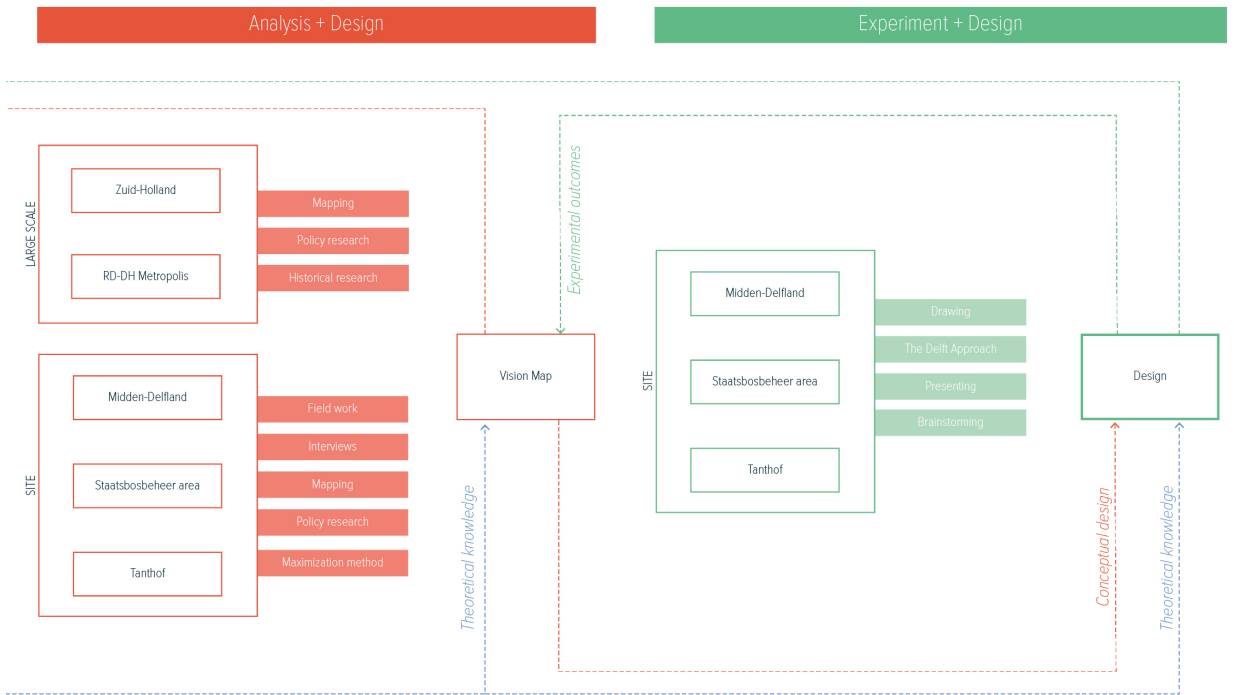
Metropolitan Garden

Problem field definition



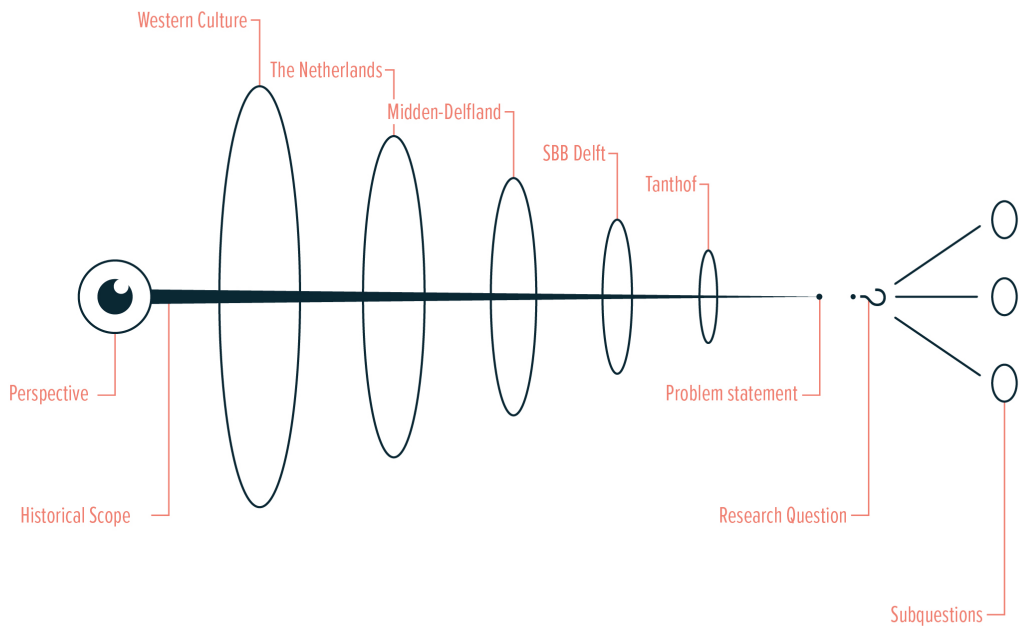
Theory + Design





Method scheme.

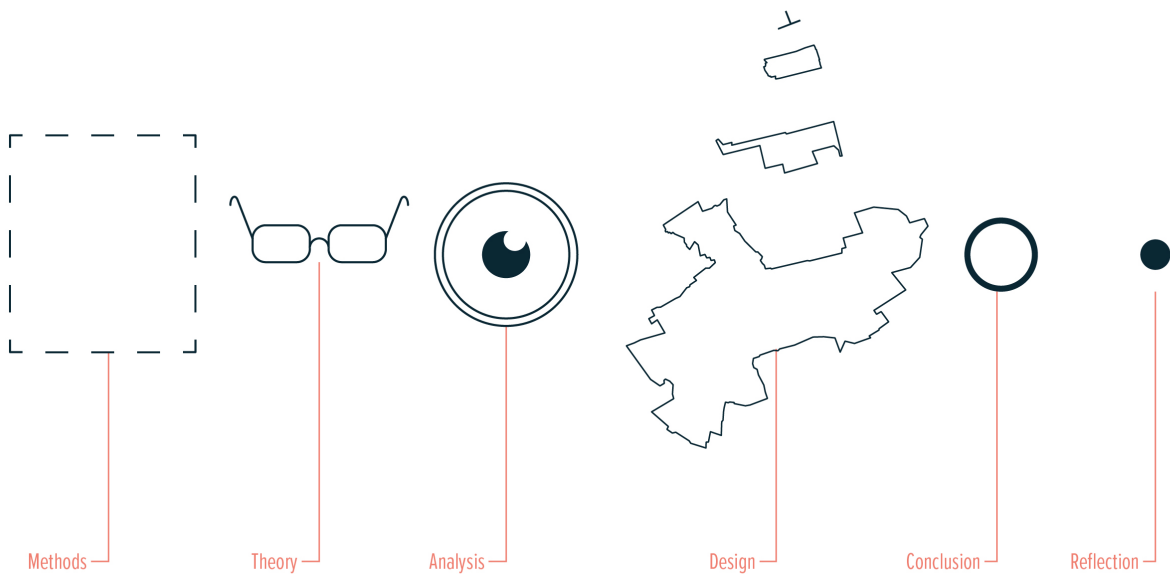
Research approach



This thesis is investigating the relationship between our cultural beliefs and our impact on the natural system. The research begins by gaining an understanding of the perspective that describes the human-nature dichotomy present in the Western culture, using historical, anthropological and philosophical sources. With an historical scope, we analyse how this perspective interacts with the physical context of the Netherlands, and more specifically the area of Midden-Delfland in relation to the neighbourhood Tanhof in Delft. The analysis is describing what is intended with the design of the site and how it is experienced today. Next to that, a relationship is found between how the physical

context adds to the human-nature dichotomy, and more specifically into a lack of responsibility to protect nature. These findings are summarised in the problem statement, consisting of the philosophical problem statement, and the physical problem statement

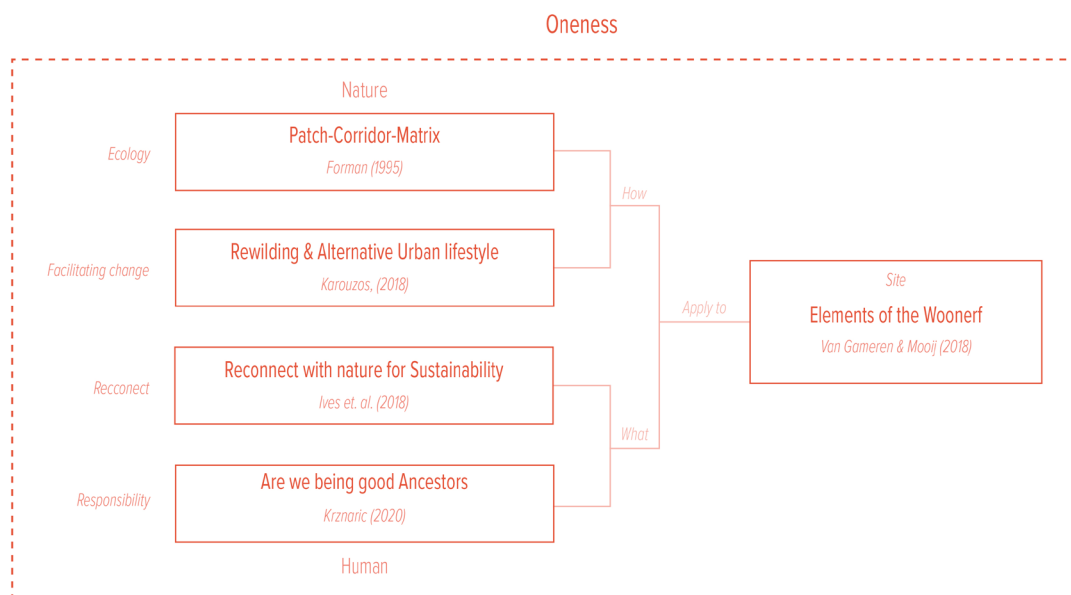
Before the research question is formulated, first the aim of the thesis has to become clear. The hypothesis is that a certain worldview impact the way humanity deals with nature. The aim is thus to explore how to design a different environment from a perspective that opposes the Human-Nature dualism.



Approach scheme.

From the research question follow the subquestions, which are divided into three method categories. The categories are divided into theory, analysis and experiment. The methods all influence the design in different ways. Important to note is how every category is linked to 'experiment'. As a student, I felt that there was often little room for failure, whilst I strongly believe that experiment and thus failure is the basis for scientific research and should also be the basis for design. Having a year in which I am able to manage my own time, I choose to fail and sacrifice this time for the sake of a good design.

The design site is divided into three territories: Midden-Delfland, Abtwoudse Bos and Tanthof. In terms of scales the design goes one step further by adding the scale of the street. The design thus includes both the human scale as well as the scale of the ecosystem. Through scales the relationship between human and nature is reinforced.



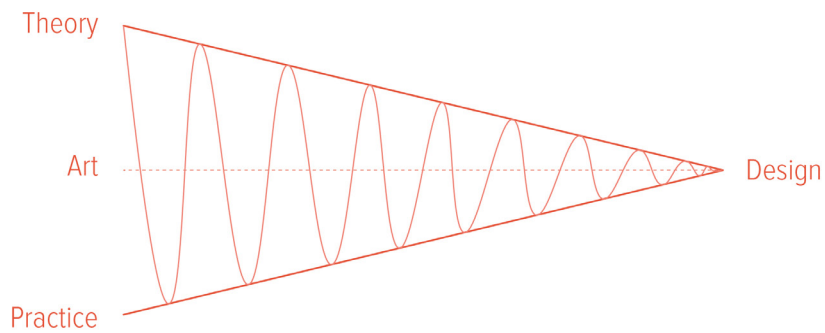
Theoretical framework

The theoretical framework consists of five main themes to gain understanding on how to reconnect people to nature in a way that improves biodiversity. These topics are placed under the umbrella theory of Oneness, explained earlier in this chapter. Oneness implies that humans have a mutual relationship with their environment, we only are not realising this because we lost our connection to nature. The theory is used to gain information on what it means to reconnect and what is necessary to facilitate change towards a human-nature connectedness.

The framework is set up in a way that shows the human motivation on the one side and the pragmatic design strategy for ecology on the other side. From bottom to top the literature goes from philosophy to practice, as human motivation is the foundation of connecting humans to nature. The framework shows thus the way this knowledge builds upon each other. Theory on reconnection elaborates on the different definitions of reconnecting with nature and provides with a

framework to explain the effectiveness of the different interpretations to improve sustainability. Based on this framework, the theory on responsibility, a change of worldview is placed at the foundation. Theory on Rewilding and Alternative urban lifestyles provide with a new form of nature conservation and gives examples from practice on how to engage people in caring for the environment. Lastly, the Patch-Corridor-Matrix is key literature to anyone who wants to improve ecosystems.

These four topics give a basic understanding of the what and the how, which can be projected onto the design of the site. Since the woonerf is a specific street type, it is important to understand the concept of the woonerf and derive some key elements from the literature. The theory thus provides with information on what it means to reconnect with nature, how to design for reconnection and how to improve ecosystems. This knowledge can be implemented in the redesign of the woonerf.



Design process

In the design process I will move a lot between a more conceptual, theoretical, abstract way of thinking to a more practise and analysis based design, which can be recognized in the theoretical framework. Literature is chosen on philosophy as well as evidence based research to gain a broad perspective on the relationship between human and nature. To this research I like to add another source of information. In the scheme this is defined as Art. Art is the umbrella term of different type of artist, moving from music to poetry, paintings to performances. Art is used as a source of personal inspiration, but also as a means to convey a message since reconnection is not about science nor about lines on a map. It is about the human experience. Art helps in conveying a message because it helps freeing the mind from restrains and helps showing things in a different

light.

This project needs a lot of experiment, to start a way of radical thinking that originates from the alternative worldview of Oneness. Designing is a very personal activity, so my hypothesis is that my own cultural beliefs are reflected in my work. To come loose from the pragmatic, anthropocentric way of thinking I tried to let myself be influenced by art, philosophy and artistic writing.



03 Theory + Design

The studio of Urban Ecology & Ecocities aims to strengthen ecosystems within the urban territory to improve the biodiversity in and around cities and mitigate climate change. The project Gardens of Responsibility aims to understand and influence the motivation of people towards a sustainable environment. To gain an understanding of the theory behind Gardens of Responsibility, we split the research questions into smaller theory blocks, which each will be explained in their own paragraph. Besides theory, the literature also provides some examples of experiments done with design interventions. The theory chapter includes sources from different disciplines; landscape architecture, philosophy, anthropology, environmental science and more. The theory combined form the theoretical framework, which is translated into the design.

Patch-Corridor-Matrix

By Forman (1995)

& Dramstad et. al. (1996)

Introduction

In order to create a strong ecosystem, every species in the food chain should be provided with a place to eat, shelter and breed. Darwin's theory already explained how genetic diversity is important for species to adapt and survive (). The smaller the living area of species, the smaller the genetic diversity, thus limited chance the species will survive. To understand how to create strong ecological networks, we use the theory provided by Forman (1995) and Dramstad et. al. (1996).

Habitat

To understand how to design habitats that improve the biodiversity, we first have to define what nature is. The Cambridge dictionary states that nature contains all biological processes of interaction between flora and fauna, and the earth's physical environment (rocks, water, air, soil). Nature is about rhythms, scales and sizes that goes beyond humanity – it takes ages to make peat, it takes milliseconds for a bird to flap its wings, humans can't go through hibernation and we are not capable to understand how a rabbit lives underground. Humans are only a small part of processes, rhythms and phenomena that nature is capable of.

Policy and planning seems to think in short term solutions for small areas and fails to gain a holistic view over the current climate change trends. In times of drastic urbanisation urban planners and landscape architects should cooperate in tackling this issue. Unfortunately designers will always be best at designing small, manageable projects like parks or housing clusters, only stimulating the fragmentation of the landscape.

Patch

Fragmentation of the land breaks up habitats into patches; the most common landscape unit. The habitat conditions in a patch varies from its surroundings, as if it is an island. Patches can vary in size, number and location. Patches resulting from fragmentation express a certain level of isolation and is often associated with biodiversity loss (Dramstad et. al., 1996). Maximum ecological quality is reached in a patch with a large

centre, rounded boundaries and slim lobes and is dependent on the orientation to its context (Forman, 1995). Dramstad et. al. (1996) show examples of different types of patches and the effect of alterations to a patch on the quality of the habitat, like the collection of smaller patches called 'stepping stones', which act as a connector between two or more larger patches.

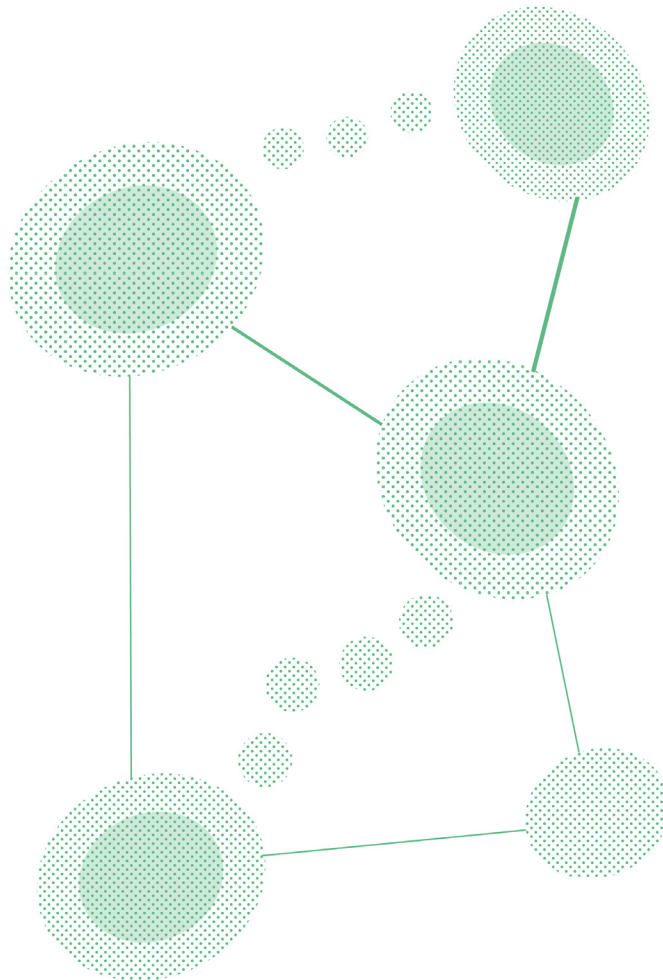
On the edge of a patch are different habitat conditions (Dramstad et al., 1996). For biodiversity conservation, the interior habitat is the most crucial. The structure, shape and width of an edge have both impact on the interior habitat as well as on the exterior of the patch. Most human-dominated landscapes contain straight edges of simple vegetation, harshly contrasting to the curvilinear, gradual borders including a bigger variety in vegetation (Dramstad et al., 1996).

Corridor

Corridors in landscape ecology are elements in the landscape that connect two or more patches by providing a linear habitat through which species can move. Through corridors, the overall reach of a population grows, and interactions between two or more groups of population become possible, increasing the chances of survival for that species. Other kind of corridors or barriers, could be infrastructural elements like railroads, highways or canals, preventing the migration of species (Dramstad et. al., 1996).

Mosaics

A land mosaic is the composition of different ecosystems in distinctive spatial elements, present in one heterogeneous area (Forman, 1995). Corridors and stepping stones can influence level of connectivity between the different ecosystems within the mosaic, described by Dramstad et. al. (1996). Ecological conservationists always look at the matrix, the area that surround the patches and the abiotic conditions of the place, to determine how the ecosystem can be improved.



LEGEND

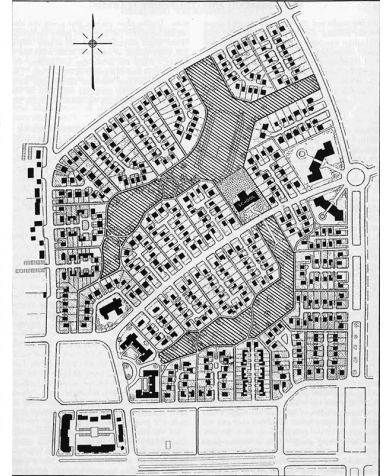
- | | | | |
|---|--------------|---|-----------------|
|  | Edge habitat |  | Stepping stones |
|  | Core habitat |  | Corridor |

Schematic image of an ecological structure, according to the theory on Patch-Corridor-Matrix, authors image.

Woonerf



Boerenerf, Jan Siberechts (1627 - 1703).



Radburn, New Jersey plan Garden Town by Stein and Wright (1929).

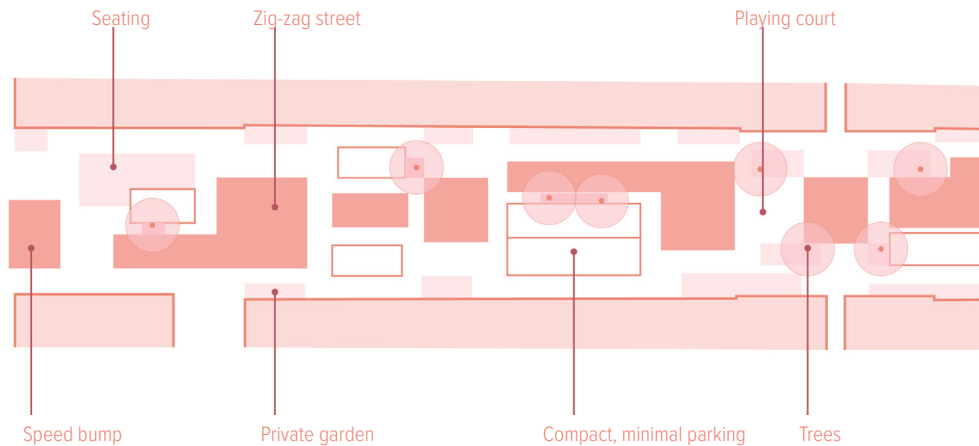
A multifunctional space of interaction

In residential areas, the street is the most used public space. The rise of the car became a threat to this public space, as parking spaces and car traffic started to dominate the residential street. The street has of course a traffic function, but 'The death and Life of Great American Cities' of Jane Jacobs in 1962 inspired designers to make the street a multifunctional and lively space of interaction (Bach, 1983; Nio et al., 2009). The woonerf became the contemporary example of the street as collective space (Nio, 2009).

The woonerf became a popular neighbourhood type in the 1970s in the Netherlands. It borrows some of its characteristics from the boerenerf; the farmyard. The boerenerf can be characterized by a composition of buildings with shared pieces of land between and around them, which together formed a unity. The different microclimates that occurred due to the orientation to the sun and exposure to wind lead to a variety in landscapes on the property (Van Gameren & Mooij, 2018). The built and unbuilt area could mutually benefit from each other. The characteristics of the boerenerf were translated from this agricultural functionality into the first urban designs of the 'woonerf'.

The layout of the woonerf

The first attempt at developing the woonerf type happened in Emmen (NL), drawing its inspiration for the layout from the 1930's Radburn, a neighbourhood in New Jersey. The layout of Radburn consisted of a cluster of detached houses around a cul-de-sac network, which became like a back alley, and a separate infrastructure for the slow traffic (Van Gameren & Mooij, 2018). In Emmen, the domain of the car was separated from the slow traffic and the use of materials, vegetation and street furniture resembled the different landscape characteristics from the boerenerf (Nio et al., 2009). Remarkable about the first woonerf in Emmen was that the representative façade, the living façade, was not orientated to the erf, making the backside of the home the real entrance (Folkerts & De Vroome, 1993).



Design of dutch 'woonerf', image by author, source (Bach, 1983).

A universal street

After the woonerf in Emmen, designers started to experiment with the concept. Delft's neighbourhood 'Tanhof' was the first neighbourhood with the new woonerf type. Joost Vahl and Niek de Boer, experimented with a new design of the street, where instead of separating car from slow traffic, the street became a shared space for car, bike and pedestrian (Nio et al., 2009). The ideal woonerf was a collective domain of the residents, safe enough for children to play outside. The living environment was designed with safety measures against cars, like curved streets or speed bumps, to stimulate social interaction.

Whereas in the 1930's in the generous neighbourhood of Radburn the cars could be parked on the property, the density of Tanhof didn't allow for this luxury and a new solution for car parking must be found. This could be done in two ways: removing the car from the collective space or combining the car within the design of the street. However, most households own not just one but two or three cars, turning front gardens into parking spots. The woonerf got its own traffic sign now, demanding cars to stay under the 15 km/h.

Privacy

Contradictory to the aim for social interaction are the storage spaces in extensions of the house at the front of the house that hide the front door and are especially designed for privacy of the residents. The kitchen is placed at the side of the street too, for a more efficient use of space, so most of the time would be spend at the back of the house, resulting in an empty façade that somewhat enclosed by the shed and the parked car (Van Gameren & Mooij, 2018).

The backyards in Tanhof are either connected to a small fenced backside path or to the larger green structures that wiggle through the area. These green structures often have a very private, low-maintenance appearance. Instead of experiencing this generous green route, as a visitor you rather feel enclosed by the fences of all the backyards. So both the street as the green strips gain a high level of privacy due to the layout of the house.

In Tanhof, green is also used as a buffer between the neighbourhood and larger infrastructure, which in combination with the lack of equivalent crossroads makes Tanhof into an enclave within the city structure.

Reconnecting with nature

By Ives et. al., 2018

Introduction

In the introduction different interpretations of the disconnection between human and nature are described from a historical perspective, a philosophical lens and through anthropological observation. Variables contributing to the growing disconnection to nature found in various research are urbanisation (Cumming et al. 2014), limited accessibility to nature (Lin et al. 2014), changing perceptions (Valentine and McKendrick 1997) and the increasing time spend online (Pergams and Zaradic 2006). The historical separation of people from nature, the lack of people's understanding of the impact of human life on the biosphere (Ives et. al., 2018). Society's disconnection from nature is perceived as the foundation of unsustainability (Pyle 1993; Folke et al. 2011; Dorninger et al. 2017). 'Connection to nature' is still a vague and multi-interpretable term. To be able to contribute in reconnecting people with nature, a deeper understanding of the different interpretations of this concept is necessary.

Conceptualisation

The phrase reconnecting to nature, can be found in literature from philosophy, psychology, biology, environmental science and even in medicine reports (Ives et. al., 2018) and can be understood differently every time. Different understandings of the concept 'connection between human and nature' were divided into five categories (Ives et al., 2017):

- 1 Material connections, like resource extraction and use
- 2 Experiential connections, like recreational activities in natural environments
- 3 Cognitive connections, like comprehension, beliefs and perspectives
- 4 Emotional bonding and affective responses
- 5 Philosophical perspectives on how humans relate to the natural world

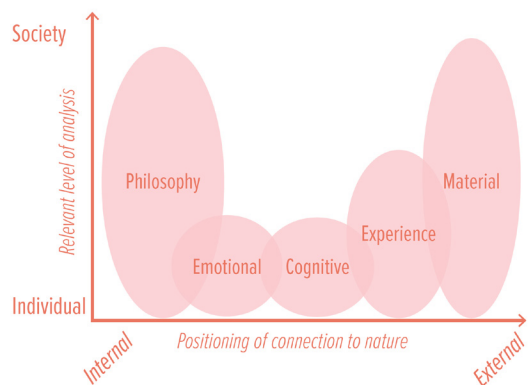
It is important to take into account that these different connections also occur on different scale levels, some apply to the individual, whereas others can be analysed on societal level (Ives et. al., 2018).

To get an overview of the dimensions and understandings of the different concepts, Ives et. al. (2018) developed a scheme which visualises how the different concepts are positioned within the spectrum of individual vs. societal and internal vs external.

The table gives us some insight on the dimensions of the concept 'connection', but different concepts can't be seen as individually operating variables. In fact, these different dimensions are influenced by each other. Collado et. al. (2013) shows how physical interactions with nature (2) has a positive effect on one's environmental attitude and the environmental knowledge (3). It could also work the other way around; as people with positive attitudes towards (3,4) nature seem to be more likely to visit nature areas (2) (Lin et al. 2014).

Impact on sustainability

More relevant than individual experience, is the connection between society and nature, as a step towards societal sustainability (Abson et. al., 2017). To be able to use the reconnection of humans with nature as a means to tackle sustainability challenges, it is important to acknowledge that we are dealing with complex socio-ecological systems. These systems contain of multiple interactions and between people and nature (Fischer et. al., 2015).

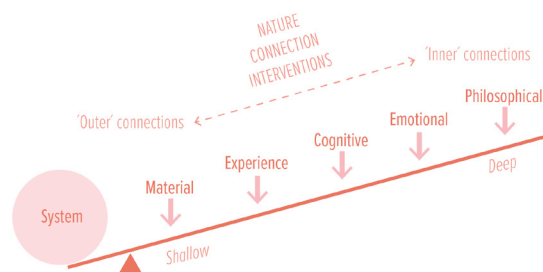


Conceptualisation of different types of human–nature connections. (Ives et. al., 2018).

To illustrate the impact of each of the five types of connections on this socio-ecological system, the framework of Meadows (1999) is used. In this framework, shallow leverage are given types of reconnection are less effective in fostering sustainability, whereas deep leverage points mean this type of reconnection has a great impact on changing the system. Looking at the diagram, it is proposed that outer connections such as material and experiential connections are more related to the systems parameters (like resource stocks), and inner connections, such as philosophical perspectives and emotional connections are more likely to have a strong effect on the sustainability outcomes as it has an impact on the underlying aims and values embodied in a system (Ives et. al., 2018). Although marked as a shallow leverage point, it is crucial to invest in material connections, like increasing the amount of protected land, since they are supporting the system change. To make an impact on the root of societal change towards sustainability, one would rather focus on changing the philosophical perspective.

From theory to philosophy to practice

Although many material connections are related to sustainability outcomes like reducing biodiversity loss, these parameters might be dependent on fundamental systemic change. In the introduction the difference between the human-nature Dualism and Oneness was



Types of connection, ranked by impact on changing the system (Ives et. al., 2018).

mentioned. The hypothesis of the thesis is that sustainable reconnection comes from the philosophical perspective of oneness, rather than the anthropocentric perspective of human-nature dualism. Interventions that provoke emotional and philosophical connection have the greatest potential, according to Ives et. al., 2018. Giving the example of Thomsen (2015), proposing that art has the ability to trigger cognitive change and can convey meaning through a touching experience. Alternative practices to change worldviews and emotional connection can be found in religion and spirituality.

I think it is not a coincidence that religious norms and values still exist in our society. It is the internal deep values that influence the way we act. The Sagrada Familia is one of a handful of projects that transcend a human lifetime. In a time where 15 second videos are watched by eight-year olds, examples of long term planning still exist (appendix.). It is this long term planning, based on an almost altruistic behaviour, that is necessary to achieve sustainability.

Conclusion

The concept of 'connecting with nature' is interpreted in many ways, depending on the type of research. Ives et. al. (2017) were able to categorise and visualise the dimensions of 'connection'. An understanding of the complexity of this concept is necessary for bringing theory into practice and to contribute to sustainability. Examples show how the different categories of connection show interdependency, based on different experiments. Experiences in nature can positively influence the cognitive and emotional connections between humans and nature, and people who have a stronger emotional and cognitive relation with nature spend more time in nature. Theory says that shallow, (external) and deep (internal) connection differ from each other on the level of impact they have on the socio-ecological system. However, in practice some actions provoke multiple connections and moreover these connection types do interact. It is likely that shallow connections lead to parameter changes and deep connections have the potential to change the system.

Facilitating change

How to start?

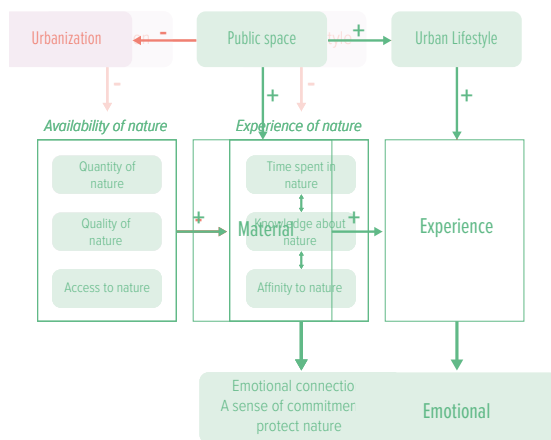
By now, we know what variables affected the disconnection between human and nature, which categories of ‘connection to nature’ there are and we know how effective each of the types of connection to nature is to improve sustainability. It is important to understand the complexity of the socio-ecological system, and to acknowledge that it can’t be changed overnight. However, literature suggest some changes that are within the reach of the urban planner that have to potential to change peoples attitude towards the environment.

Regaining an emotional connection

Today citizens experience little nature on a day-to-day basis, as a result of decreasing quantity and quality of nature in and nearby cities. On top of this, the urban lifestyle is dominated by electronic devices, which correlates to the decrease in nature visits (Pergrams & Zaradic, 2006). Earlier we described the shifting baseline; the tendency to develop an ignorance towards nature protection due to exposure a poor natural environment in childhood. From the literature on ‘reconnecting to nature’ (Ives et al., 2018) it can be concluded that material changes, such as the green area in cities, have an impact on the cognitive and emotional connectedness with nature.

To prevent the phenomenon of the shifting baseline, both accessibility of nature as the experience of nature in cities need to be improved. Whereas urbanisation and the indoor lifestyle have a negative impact on citizens emotional connection to nature, increasing and the stimulation of an outdoor lifestyle could have a positive impact on citizens sense of commitment to protect nature.

If we place the model provided by Karouzos (2018, p406) within the review by Ives et. al (2018) increasing material connection with nature (quantity and quality of nature) on the one side, and experiential, cognitive and emotional connections with nature on the other could lead to a sense of commitment to protect nature.

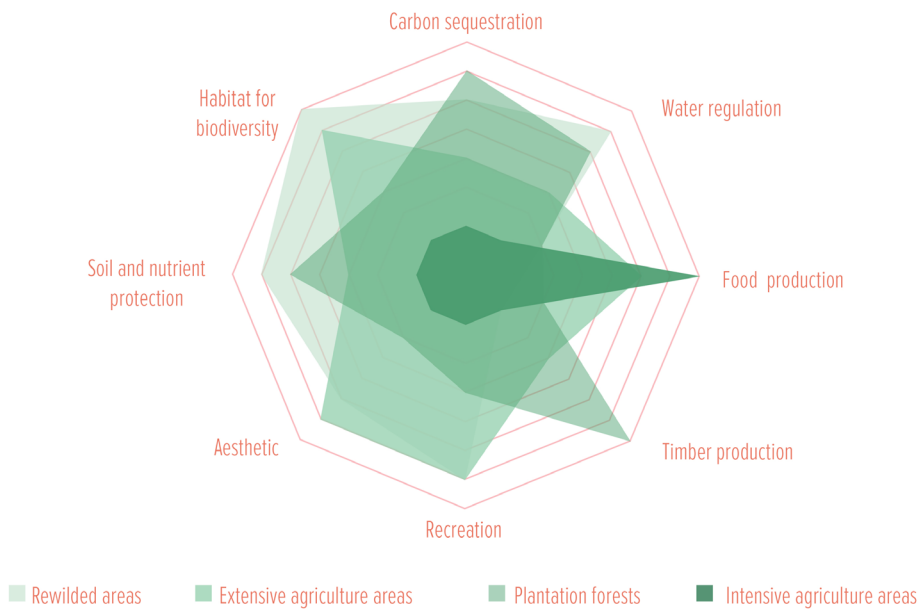


Model of how nature-based science can reduce the extinction of experience. (Karouzos, 2018, p406).

Rewilding in the Netherlands

The Dutch nature policy has always been based on the idea that humans have to take control over the management of nature. Taking it a step further, one could say that nature conservation in itself implies that nature is dependent on human protection; thus human control. According to Liesbeth Bakker, special professor of Rewilding Ecology at WUR, is the current Dutch nature management “too focussed on maintaining the status quo: moorland on the left, woods on the right, and it must never change. But nature is dynamic.” (Nijland, 2020).

Rewilding is a restoration strategy to enhance biodiversity conservation, whilst creating more opportunities for



Ecosystem services provided by rewilding (Laetitia & Pereira, 2012).

human-nature interaction (Torres et al., 2018). Arts et. al (2022) defines rewilding as the restoration or recreation of biophysical qualities. Rewilding can also be described as passive management, where the limited human control allows for ecological succession to happen and eventually lead to restoring the ecosystem (Gillson et. al., 2011). Both interpretations of rewilding aim for a more self-sustaining ecosystem and less human intervention. Instead of planning and planting certain species, you allow the natural processes to slowly develop different stages of succession. This way you end up with a great variety in biotopes, which has a positive impact on biodiversity. On top of that, you minimise the chances of pests and illness. Human management is often only effective at damage control, whereas rewilding is allowing the underlying ecosystem to develop itself. Because rewilding is based on ‘doing

less’ it is a cost-effective strategy which also leads to increased ecosystem services. Rewilding is therefore a suitable strategy for increasing biodiversity whilst having positive impact on human life.

This thesis operates on different scale levels and different types of territory: The neighbourhood, the urban park and the regional green buffer. For each of these scale levels and nature types we can apply the concept of Rewilding. First it is important to create large nature areas, with great connectivity, secondly the restoration of the ecosystem is dependent on certain key species. In this thesis we use the theory of Forman (1995) to improve the ecological network. Then we find a suiting management strategy to decrease human intervention and improve the self-sustaining quality of the landscape.

Nature in neighbourhoods

Cities are in itself human dominated territory. If the goal is to reconnect people with nature, the nature quantity and quality in neighbourhoods need to improve. This thesis only focusses on the public space, so nature inclusive architecture will not be discussed.

In the previous paragraph about the woonerf, it became clear that cars have taken over the public space. With the introduction of shared mobility, electric bikes and improved public transport and the promotion of p+r use, tell us how there is a paradigm shift towards sustainable mobility. If the car moves out of the street, we are left with a lot of space to create more nature.

Some cities are constructed on soils that are not able to support buildings, like peat or wetland areas. In these areas, the building site is prepared by replacing layers of the original soil with sand (Snep et. al., 2012). Urbanisation also increases the paved area, not only in the public space, but also in domestic gardens. Domestic gardens have a great potential to improve biodiversity, especially in suburbs where most of the urban green space is privately owned (Gaston et al., 2005). Improving the biodiversity in domestic gardens could be done by introducing native vegetation and garden ponds, and minimize fences between clustered gardens (Snep et. al., 2012).

Urban green spaces are dominated by exotic plants and trees. The invasion of exotic species is perceived as one of the least reversible human interventions in conservation biology (White, 1998). As exotic species do not have a natural predator, they can easily dominate the native species and form a threat to the ecological system, although this doesn't count for all exotic species. One way to improve the quality of the urban green, is to create a mutual cohesion (same ecosystem type) and improve the connectivity between the urban green space and the hinterland (Snep et. al., 2012).

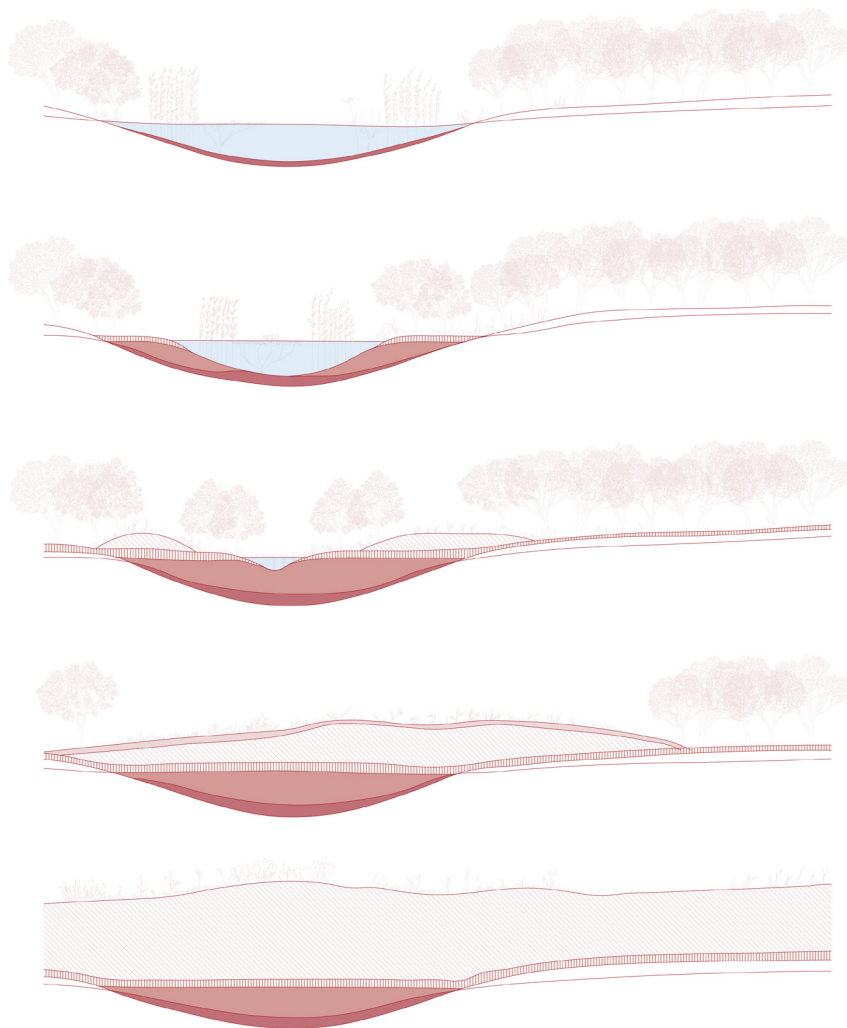
Restoring peatland

Midden-Delfland is a green buffer-zone in the metropolitan region of Rotterdam-The Hague. A large part of the soil in Midden-Delfland consists of peat. Due to strict water management, the original wetland has been made suitable for agricultural use, with some serious consequences for the environment. First, turning a dynamic wetland into grassland for cattle, makes a lot of natural habitats disappear. Secondly, the low groundwater levels lead to subsidence of the land, causing the stored carbon to react with oxygen into CO₂ emissions.

Abiotic rewilding could be a means to restore the nature in Midden-Delfland. Abiotic rewilding refers to the restoration of biophysical conditions, such as the water levels. Groundwater levels are regulated by the Dutch polder system, to prevent the land from flooding and to facilitate agricultural practices. However, from a biodiversity perspective lots of species could benefit from higher groundwater levels or dynamic water levels. Minimizing human control on these landscapes are a part of aquatic rewilding (Arts et al., 2022).

Peatlands are a type of wetland, created through a complex process of interactions between water, nutrients and vegetation (Farrell et al., 2021). Peatlands are a great at demonstrating the dynamic processes that naturally occur in wilderness. Vegetation turns into turf, under the influence of rain water. Water levels are varying, creating a wetland which is the habitat for many amphibians, aquatic animals and birds (Bijl, 2022).

From an anthropocentric perspective, peatlands have great benefits for climate regulation, as they are a cost-effective nature-based solution for carbon storage and regulate excess water (Maes et. al., 2020). Contrasting to using peatlands for carbon storage, peatland degradation turns the land into a carbon source (Urák et al., 2017). Current water management in the Dutch polders, lead to subsidence of the peatsoils and a rise of at least 0,5 m is necessary to restore these peatlands (Jansen, private lecture at TU Delft, april 2022).



LEGEND

 Water	 Low peat
 Forest peat	 Semi-composted biomass
 High peat	 B-Horizon or leaching layer
 Top layer (mulch)	

Stages of peat formation according to Wageningen University. (Stroeken et al., 2009).

Management dilemmas

Dutch forestry is often still closely managed by humans, as trees are planted, cut down and taken away. Instead, rewilding proposes a way of passive management which allows natural succession to happen. However, different rewilding practices can clash with each other. For example, the Abtswoudse Bos in Delft, could only grow because of the strict water management. The area would be completely flooded if we applied the principle of the abiotic rewilding on this area and even worse, the neighbourhood adjacent to the forest would be flooded as well. Rewilding in human territory will thus never be the original wild nature, but always a symbiosis between the human boundaries.

Alternatives for indoor lifestyle

Following the leverage point system, more effective than strengthening ecological networks and re-wilding, as described earlier in this chapter, is the cognitive and emotional connection with nature. When bringing the theory into practice, we have to keep in mind that actions often not only serve one type of connection. The diagram fails to show the impact of the interactions between the different connections, as explained before. Here follow some examples of how physical interactions in natural environments create cognitive and emotional connections with nature.

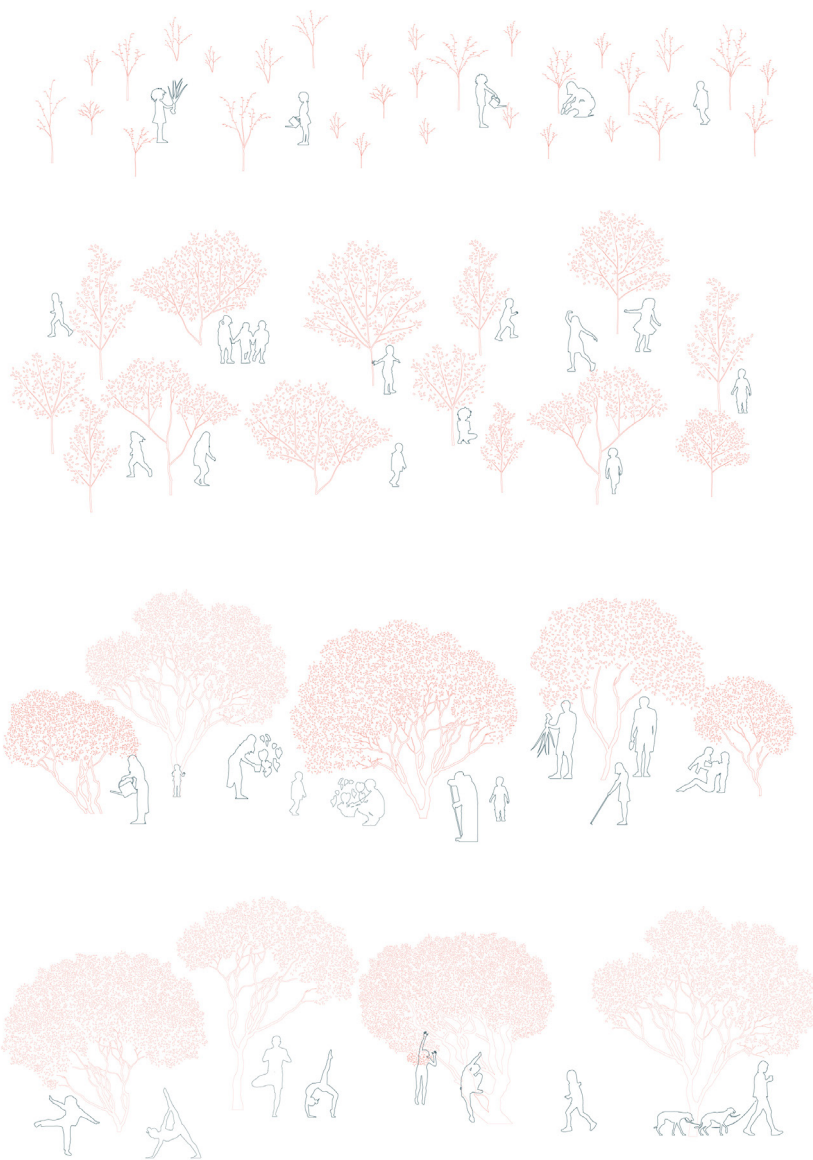
Ives et. al. (2018) proposes to strengthen connections with the local ecosystem through improving self-sufficiency, through eating locally produced food, community gar-dens or building with local timber. Besides the material connection with nature, growing your own food contributes to increasing experiences in nature, cognitive connection leading to knowledge gain about ecosystem functions and the processes of nature, whilst increasing the emotional connection with a place (Hawkes and Acott, 2013).

People's estrangement from nature relates to exposure to nature in childhood, says Peter Kahn (2002). Designing diverse natural environments for children would therefore be a good start in reversing the shifting baseline. Transforming school yards or the areas close to schools to accommodate habitat for native flora and fauna will stimulate children to explore nature (Sneep et. al., 2012). In countries like Germany, Sweden and Denmark, forest kindergartens are a popular urban intervention that promotes children's connections with nature whilst improving their development skills (Whitburn et. al., 2018 & Louv, 2005).

Another way of exposing children to biodiversity conservation is the project of "Tiny Forests". A tiny forest is an artificial dense forest that takes up the area of one tennis court (Over Tiny Forest®, 2019). Advantages of such a forest are the positive effect of the biodiversity and soil condition (Wageningen University et al., 2018), whilst the size of the forest makes it possible to fit into the existing urban fabric. By 2020, over 10.000 children were involved in the Tiny Forest projects (What are the effects of a Tiny Forest?, z.d.).

Research done on high-schools by Bradley et. al. (1999) showed how environmental education had a great impact on the positive attitude towards sustainability. It might be an idea to make high-school programs that engage with nature, just like the forest kindergartens.

It might be clear how interactions in nature, addressing groups of people from different age categories, can trigger a positive attitude towards the environment and might help in creating a sense of commitment to protect nature.



The alternative lifestyle is about caring for nature, playing in nature, learning about nature and extending the feeling of home.

Responsibility

Are we being good ancestors?

We carry devices in our hands, watch more advertisements than we watch our children, let marketing strategies make us believe we become better persons if we consume the next best thing. Instant gratification, emoticons and childlike melodies trigger our dopamine system. Value in life is still searched in success, and success is expressed in luxury, fancy Instagram pages and bonuses and airplane holidays. Globalisation and the capitalist system give the false belief that endless growth is possible. How important we as humans might think we are, the world is not dependent on us, but human beings are dependent on the earth. It is these earthly boundaries in which we have to be able to live.

Current sustainability interventions are still assessed in an anthropocentric way, for example; ecosystem services are seen as a way to assess the economical value of sustainable actions. One could say that this confirms how current sustainability interventions only change the variables instead of the underlying system. I strongly believe that we can not change our future if we operate within the boundaries of the current economical system, based on instant gratification and short term policy. Roman Krznaric (2020) provides with an alternative philosophy to the quick-fix-instant-gain-second-society we are living in, by proposing the question: Are we being good ancestors?

Due to globalisation, the world is so connected that it might seem impossible for everybody to think outside the capitalistic model. Nevertheless, this capitalistic model is also 'just' a model, designed by humans. This model has influenced our world view; perceiving nature as an object of resource or an object of knowledge. It is this way of thinking that needs to change radically in order to secure the safety of future generations. If we want to secure the lives of future generations, we to be open to different worldviews today.

Take a moment to realize that the society we live in right now, is what we inherited from multiple generations in the past. Every generation is building upon what is given. Krnaric (2020) proves how long-term thinking separates human beings from non-human life, like the Sagrada Familia, we are able to achieve a lot over multiple generations. We are the first generation to be able to analyse, measure and prove what impact humanity has on the earths system. These times might call for a new religion, a new worldview, one that calls upon our responsibility to make sure we take care of this world for future generations.

Gardens of responsibility stands for a movement that takes responsibility for change, one that cares for their direct living environment, that cares for non-human life, one that interacts with nature, learns from nature, becomes nature. It is a philosophy that plants the seeds, so that this garden of responsibility grows over generations and builds a responsible generation.



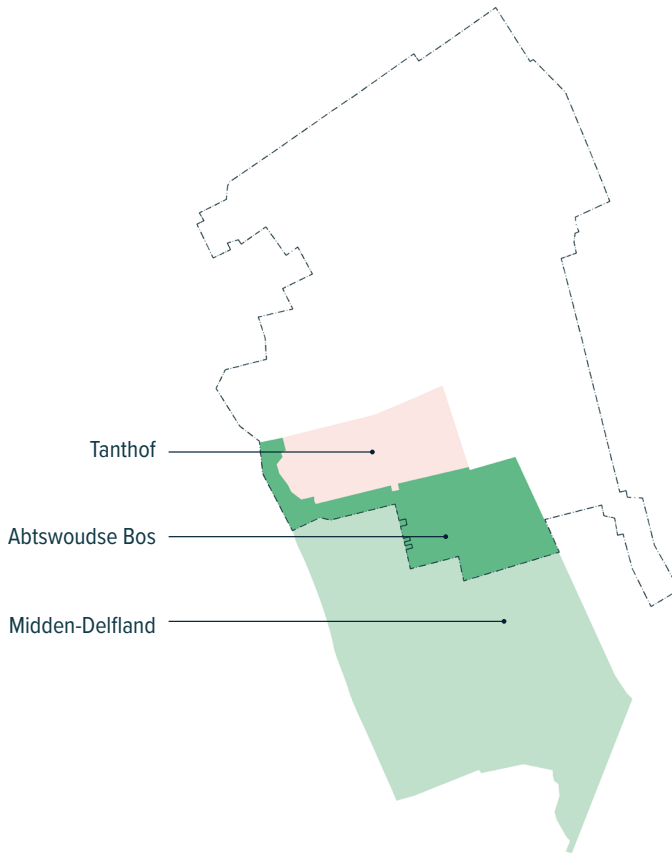
Holding onto something, soft pastel on paper, Mary Herbert 2020.



04 Analysis + Design

This chapter focuses on the spatial context of the design location. The analysis is done through different scales. The site is analysed using data, policy documents, site visits, and personal observations and builds upon the foundation of the theory. In this chapter, some work from the group effort in assignment for Staatsbosbeheer is included. The findings result into a first design proposal.

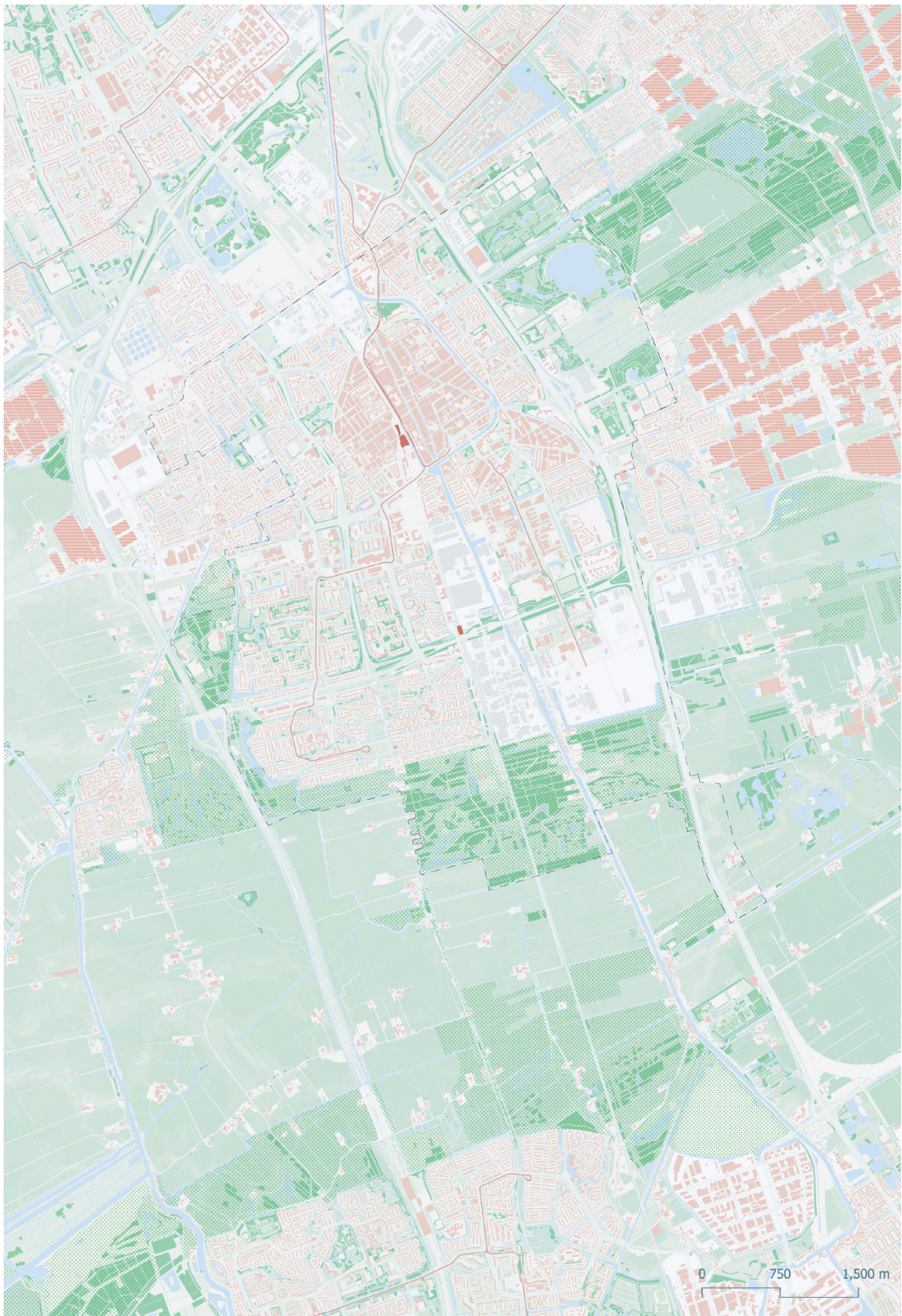
Design site



In the image, we see three defined territories: Tanthof as neighbourhood, the Abtswoudse Bos as urban park and Midden-Delfland as regional landscape. The neighbourhood is a human-dominated area, the urban park is a natural area which serves recreational need of humans. Midden-Delfland is now cultivated land; the land is manipulated to produce food for people.

To fit the time available for completing the thesis, I focus on a specific part of the Staatsbosbeheer property and Midden-Delfland. These areas are defined by the Schie

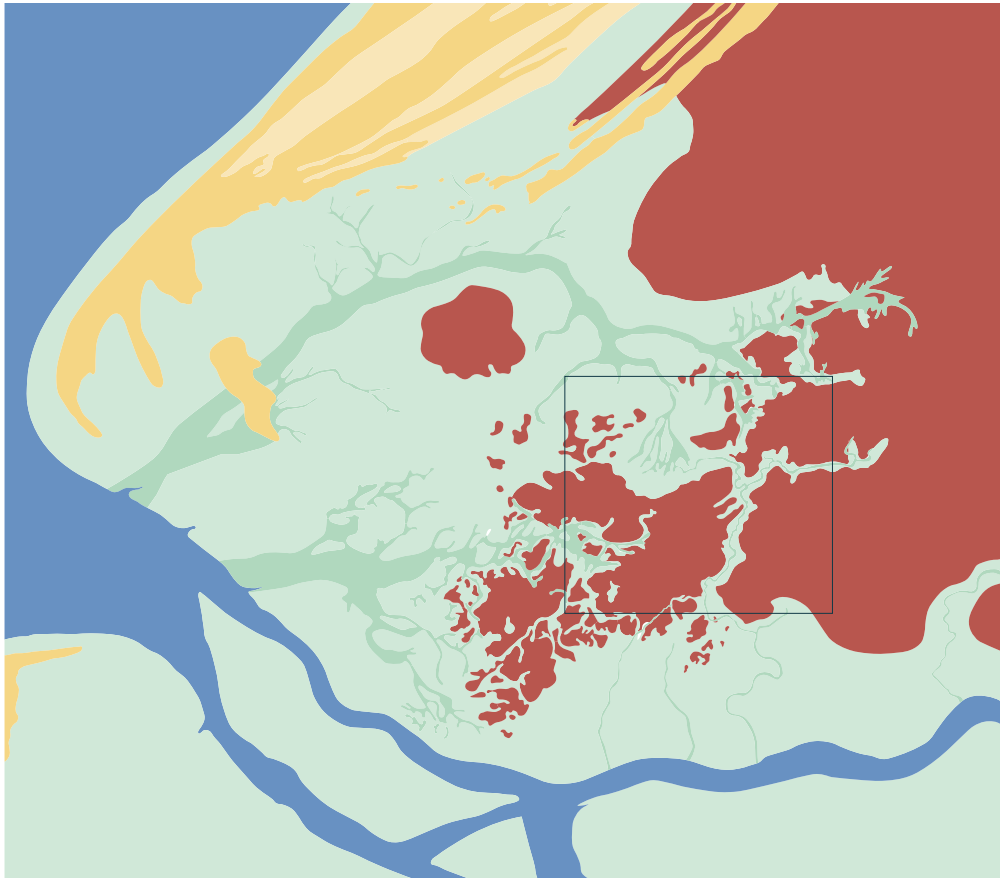
on the east-side and the highway on the west-side. The southern edge of the design area is defined by the built territorium of Rotterdam. The northern border of the design-site is defined by the Kruithuisweg. I have contemplated whether to include the Kruithuisweg into the design, but I decided not to, since the research question focusses on the connection between Tanthof and Midden-Delfland. A second argument to not include the Kruithuisweg is that it would deny the complexity of the road being an infrastructural node for the Rotterdam-Delft-The Hague traffic.



LEGEND

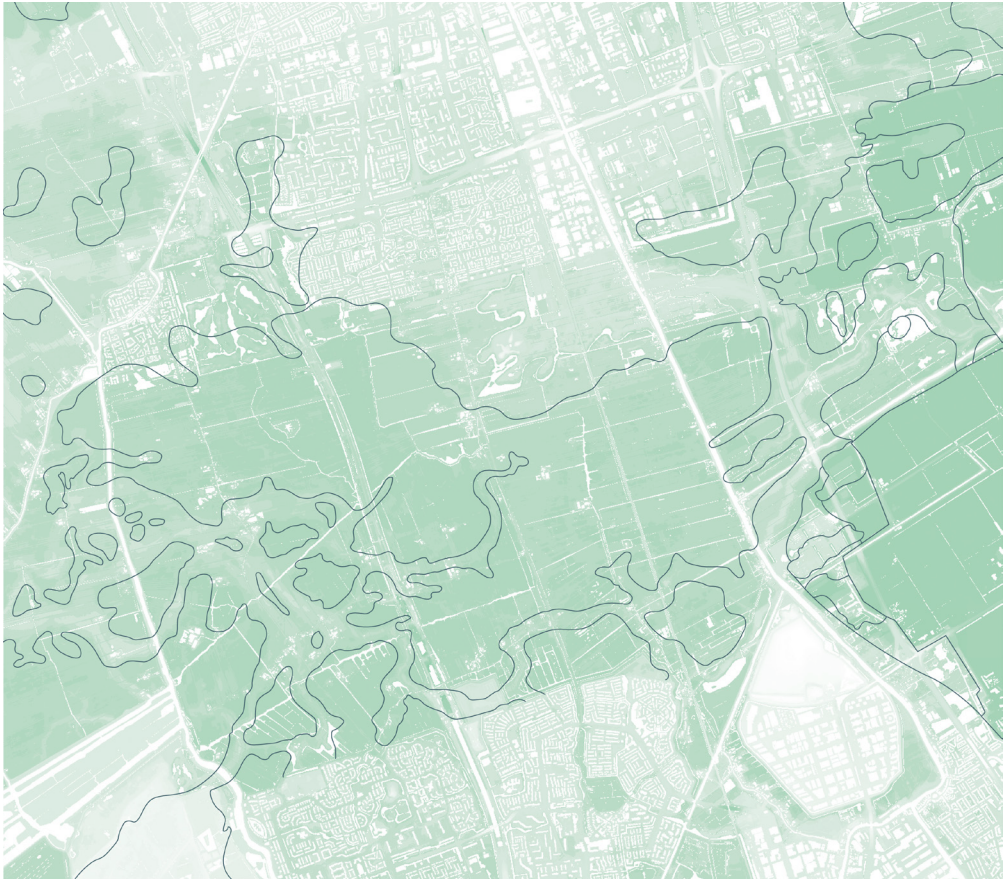
- | | | | | | |
|---|------------------|---|-----------------|---|--------------|
|  | Municipality |  | Staatsbosbeheer |  | Horticulture |
|  | Residential area |  | Grassland |  | NS station |
|  | Industry |  | Water |  | Rails |

Geomorphology



Soil map of the 'Maasmond area', 500 BC , (Abrahamse, Van der Zee, 2016).

About 5000 years ago, this area was a swampy lagoon with small peat rivers, influenced by the sea which deposited clay onto the peatland. A structure of creeks arose in the clay and peat landscape, and layers of sand were carried by the tides creating sand ridges along these creeks. In the 10th century, canals were dug to make the land suitable for agriculture. The dewatering of the land led to subsidence. The peatland sunk harder than the sand which created a height difference in the land. On one of these sandy soils, a small trading village arose, which today is known as the city of Delft.



Elevation of the land, image by author (AHN4, 2022).

The two creeks showing on the soil map of 500 BC used to be present in the design site. The remains of the southern creek are still visible in the heightmap of Midden-Delfland as the composition of the soil differs from the surrounding peatland. As the cultivation of the land are causing the peatlands to subside, the remains of the creek remain slightly elevated. What once were the carved out gutters in the land, are now the podium, telling the story about the origin of the land and the transformation caused by humans.



Geomorphology, 250 BC. Source Vos et. al. (2018).



Geomorphology, 1250 AC. Source Vos et. al. (2018).



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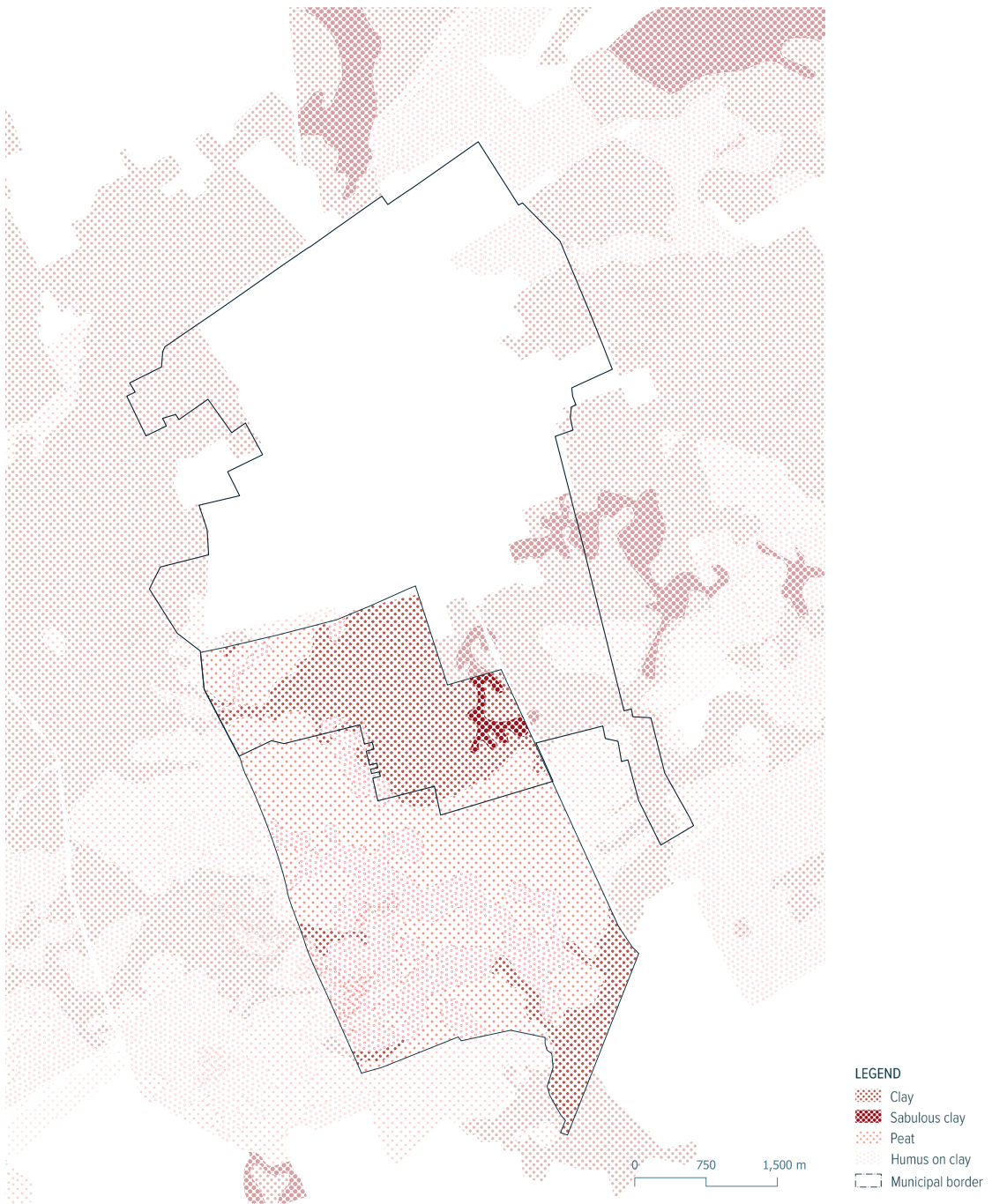
Geomorphology, 1850 AC. Source Vos et. al. (2018).



Geomorphology site. Image by author.
 Used sources: Van de Giessen (2017) and Vos et. al. (2018).

The image above shows the former creeks as an overlay onto the heightmap of the current situation. In Midden-Delfland, the former creeks are still visible as slight differences in height, due to the differences in soil type caused by the creeks. In the area of Delft, these height differences are erased by the layers of sand that are

necessary to build on. The placement of the sand literally erases the readability of the layers of the landscape.



Soil map. Image by author.
Source Bro bodemkaart (pdok, 2013).

The image above shows the soil types of the site. The current Abtswoudse Bos consists of clay and sabulous clay, whereas Midden-Delfland contains way more peatsoil and only a bit of sabulous clay where the creeks uses to flow.

Information on the soil types are useful to understand what kind of ecosystem the place could become; what kind of vegetation thrives on this soil and what animals live in the corresponding nature type. The image also tells us how landscapes transform slow compared to urban development, and act as a kind of time machine.

Natural layer



LEGEND

- Private property
- Green Zone
- Forest
- Cultivated land

Unbuilt territory, image by author.

Different uses of unbuilt land give an impression on the human-nature relationships. The biggest piece of land is cultivated land. The main function is to serve people instead of being a habitat to many species; Land for profit. The farmer decides over a large piece of land and does this to survive, a selfish but inevitable act caused by the capitalist system in which nature is perceived as an object of resource. The second largest green area is used for recreation and nature protection. The Abtswoudse Bos is a manmade forest. Like many

places in the Netherlands, the strict regulation of the groundwater makes it possible to have a forest on polderland. The green zones are the result of ambitious urbanism; they offer a green experience for all residents within 300 m reach. The smallest areas belong to the private property. Here, the owner is free to use this space for their own needs. Although the private garden has the potential to improve the local biodiversity, these areas can not be changed or controlled without participation of the citizens.



LEGEND

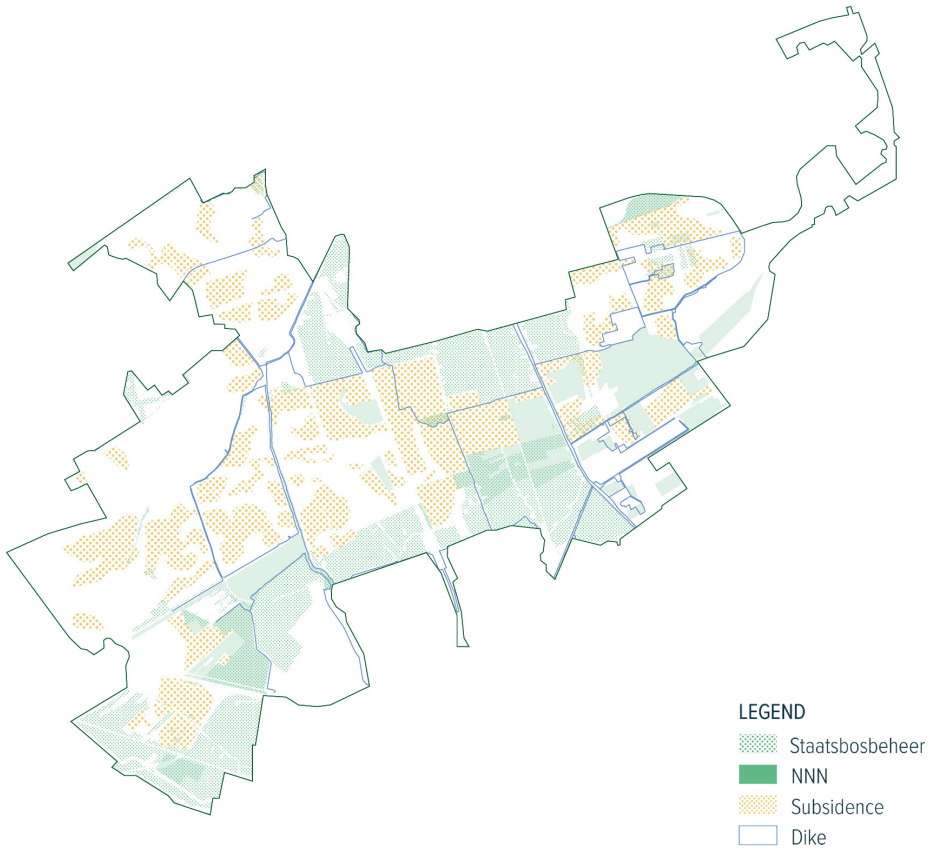
- Open water
- Ditch
- Regional dike
- Polder dike

Water structure (pdok, 2022).

The site is divided into several water-management zones. Regional dikes separate boezem water from polder and polderdikes are created to manage the type of nature within that polder. In the map, the Schie is the boezemwater. Boezemwater is part of a larger waternetwerk meaning that it is often more nutrient rich and could be contaminated water. The groundwater levels in the polder are dependent on management and weather conditions.

We see how Tanthofs water structure is following the east-west linearity of the polderstructure. The Abtswoudse Bos combines larger areas of open water with the small ditches, which strongly shapes the forest, giving it an artificial expression. The ditches are necessary to maintain certain groundwater levels aquired for the cultivated land.

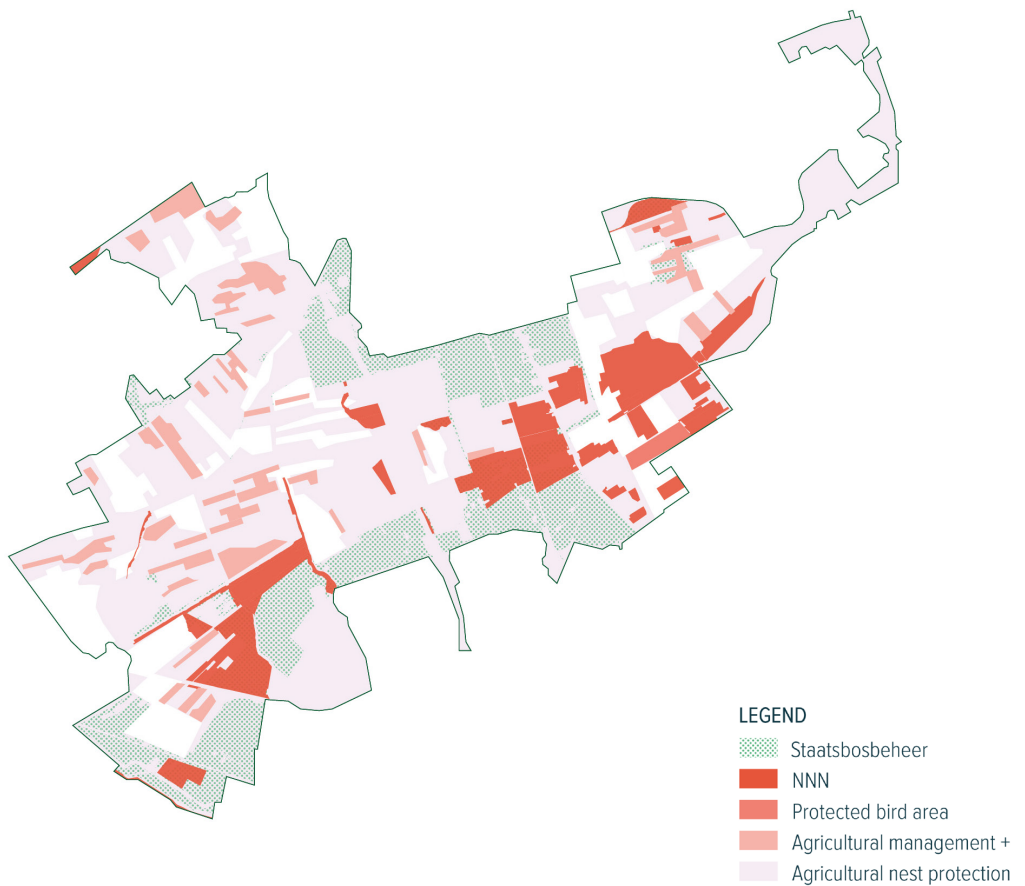
Midden-Delfland



Authors interpretation of 'City edges, recreation and greenstructure'; Kenmerken en kwaliteiten (Gemeente Delft, 2021).

The map is an inventory of the climate issues concerning Midden-Delfland. An analysis of the soil showed how the soil in Midden-Delfland consists of peatland, or clay on peat. Due to the cattle breeding in the area, a low groundwater level is preferred. However, the low groundwater level leads to subsidence of the soil. If the peatsoil dries out, the organic matter starts to react with oxygen to form CO² emissions. Subsidence

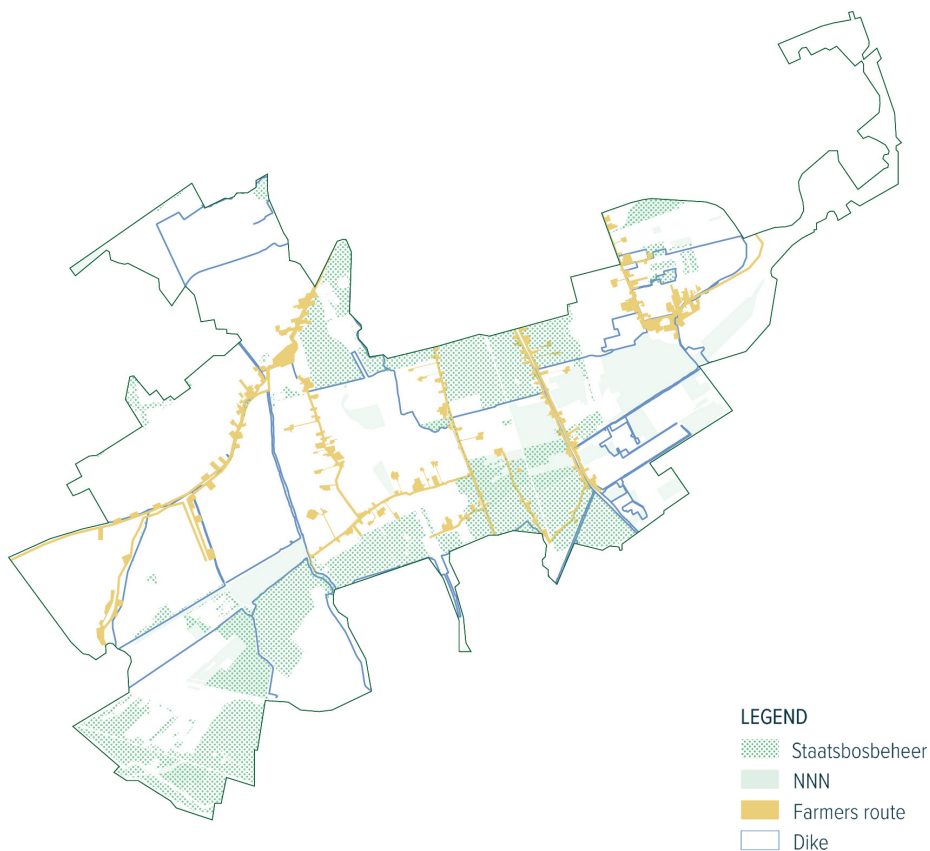
of the soil also means that the groundwater levels have to be lowered again to prevent the soil to become wet again. So maintaining the agricultural function of the landscape causes a continuous cycle of lowering groundwater levels and subsidence of the soil, thus continuous CO² emissions.



Authors interpretation of biodiversity, Kenmerken en kwaliteiten, (Gemeente Delft, 2021).

Agricultural practices still dominate the policy of Midden-Delfland. The land can not be used for vegetable production and is only used for cattle breeding and dairy production. Cattle breeding and dairy production both lead to methane and nitrogen emissions. Animal based diets are not sustainable, so one can predict that the produce of meat and dairy needs to go down. It is not a case of what we want as a society, but rather what will be necessary to survive.

The analysis of Midden-Delfland shows us how agriculture continuously deteriorates the quality of the land, as the strict watermanagement results in subsidence of the land and the corresponding CO₂-, CH₄-, N-emissions. In short, the current use of Midden-Delfland is not a sustainable one. Midden-Delfland is the last green area within the Metropolis, and should act as a compensating factor instead of a contributing factor in global warming.



Authors interpretation of cultural qualities- Kenmerken en kwaliteiten, (Gemeente Delft, 2021).

The municipality envisions a stronger connection between Midden-Delfland through the use of the existing farmroutes. The farms themselves could be transformed into businesses that work in the circular economy.

The current farmroutes are often not adapted to the pressure of daily traffic. The roads are too small to ensure a safe and pleasant route for all types of vehicles. During a site visit I cycled along the Abtswoude road. I noticed how I had to get off my bike to wait for big trucks to pass.

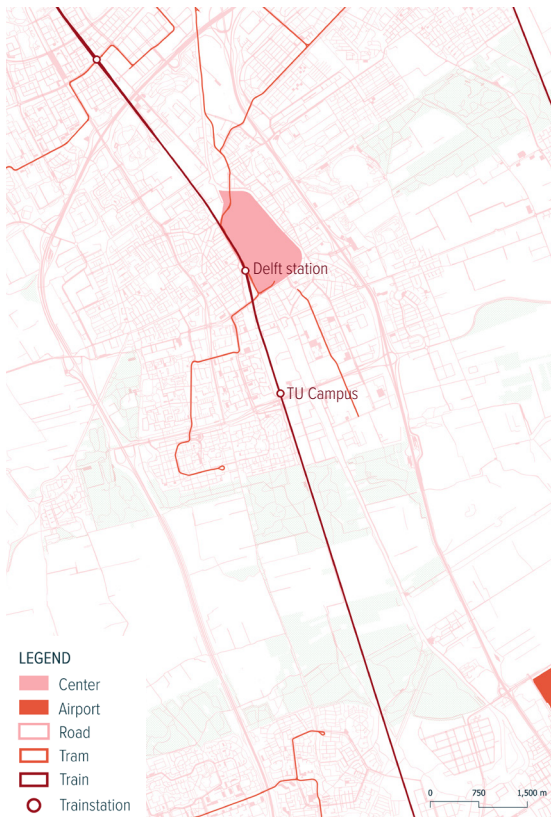


Authors interpretation of 'mobility in Midden-Delfland', Kenmerken en kwaliteiten, (Gemeente Delft, 2021).

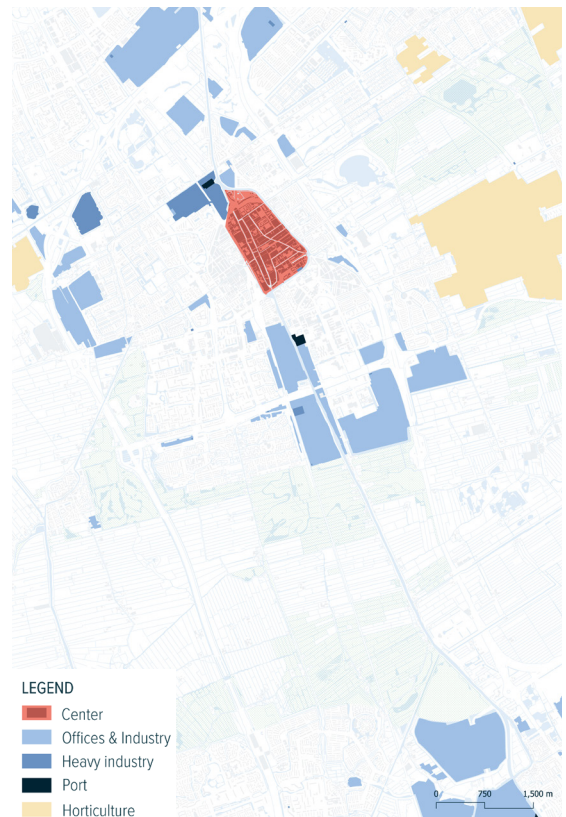
Linear shapes of the highways and traintrack connecting Rotterdam to The Hague are cutting Midden-Delfland into smaller slices. Without any stops or crossings, these infrastructures become barriers in the landscape rather than connections, from the perspective of flora and fauna. Public transport is focussed on the connection between Rotterdam-Schiedam-Delft-The Hague,

parrallel to the highways. A finer network of biking paths and pedestrian routes show the concentration of recreational space within Midden-Delfland.

Urban program



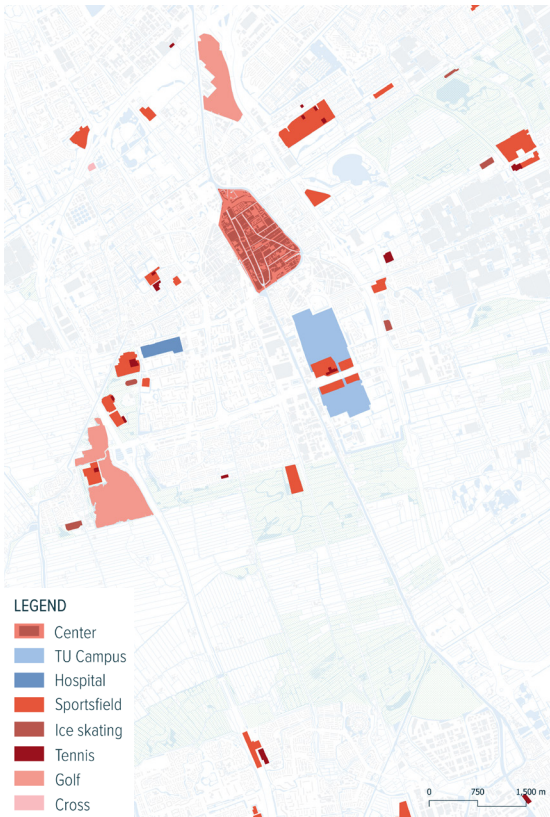
Mobility (pdok, 2022).



Offices, industry and horticulture (pdok, 2022).

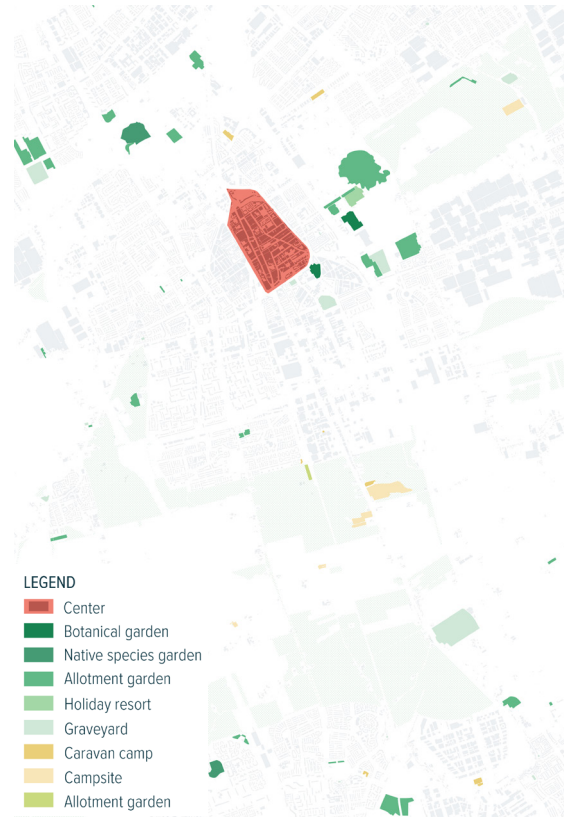
The infrastructure on the larger scale facilitates traffic between Rotterdam and The Hague. Delft is surrounded by villages and agrifood industry on the east and west. As Delft is belted by highway on the north, east and west, we see a certain openness between Delft and Midden-Delfland. In terms of public transport there is a great connection by train, with two train stations connecting Delft all the way to Vlissingen and Almere. The tram leads to surrounding towns all the way to the sea. The metro station is only accessible by bus.

The historical center of Delft has a relatively central position within the whole urban area of Delft. Industry is located alongside the Schie-canal and south to the TU Campus. A large part of the industry and office area in the south of Delft are to be redeveloped to living and working zones, a project known as the Schieoevers. The monofunctional image of the Schie will transform into a livable and accessible area to live, work and recreate.



Education, healthcare and sports (pdok, 2022).

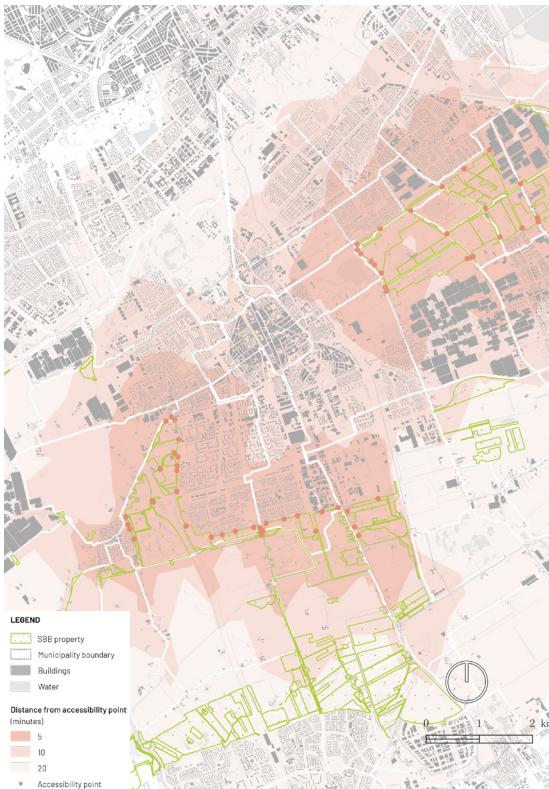
Delft is known for its higher education facilities, such as the TU Delft and Hogeschool Den Haag. It is a city for expats, (international) students, researchers and innovative offices. Sports facilities are located at the edges of the city, with little to no sports facilities in the south of Delft. A gap of sports facilities can be explained by the non-residential zone along the Schie. The expansion that will take place in the redevelopment of that area suggests that there will be more sports facilities in this central zone of Delft.



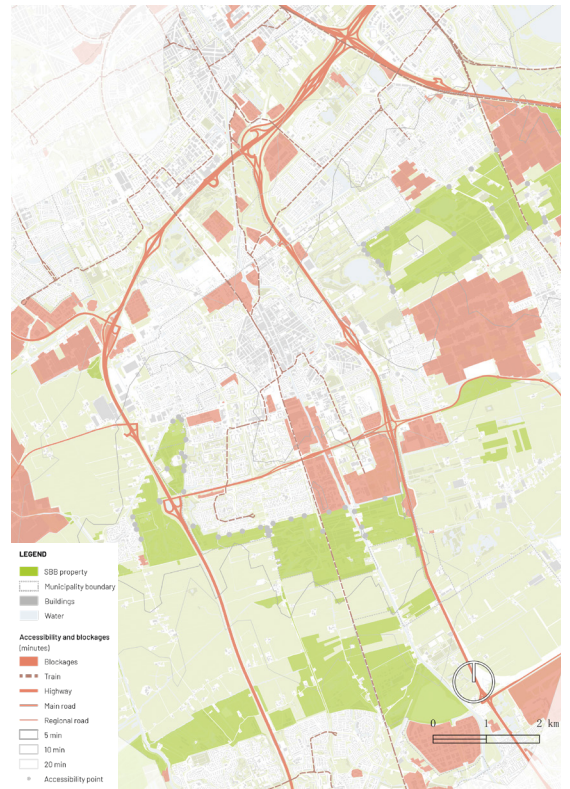
Recreation in green environments (pdok, 2022).

A concentration of recreational functions can be found east to the city center, explaining how the Delftse Hout is more popular than the southern Abtswoudse Bos as there are only private functions available such as the campsite and the soccer fields. A combination of greening along the Schie and functions in the Abtswoudse Bos and Midden-Delfland could upgrade the recreational value of these southern green areas.

Reachability & Trends



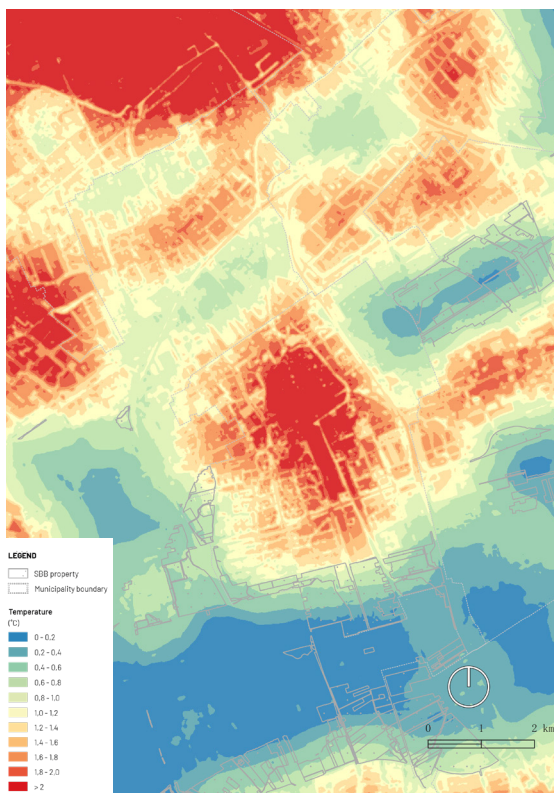
Accessibility of Staatsbosbeheer property in minutes by bike, by UEEC Lab, 2021.



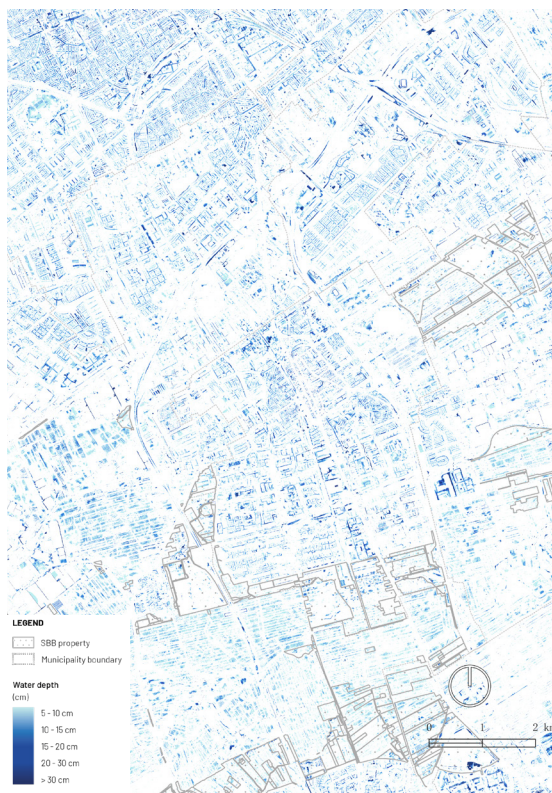
Staatsbosbeheer property and infrastructural or functional barriers, by UEEC Lab, 2021.

The image shows the accessibility of the two main properties of Staatsbosbeheer by bike. Thanks to the compact size of Delft, both areas are in theory easily accessible by bike within 15 minutes. However, the routes leading to the Abtswoudse Bos are not friendly to bikes, as the Abtswoude road is small and heavily used by cars and trucks, whereas the other road offers no aesthetic value as it is located between a traintrack and industrial zone.

The image shows an overview of the barriers, like large infrastructure and industrial areas, and green zoned in Delft. Barriers can be treated in multiple ways; create a bridge, transform the barrier, or to add facilities in the created island to minimize the need to cross the barrier. With a transformation of the Schiezone, the barrier effect can be transformed, and with the elevated traffic the Schie and the road along the train track will become important routes between the Abtswoudse Bos and the rest of Delft.



Urban heat island effect (UHI), by UEEC Lab, 2021.
(Klimaateffectatlas, z.d.)

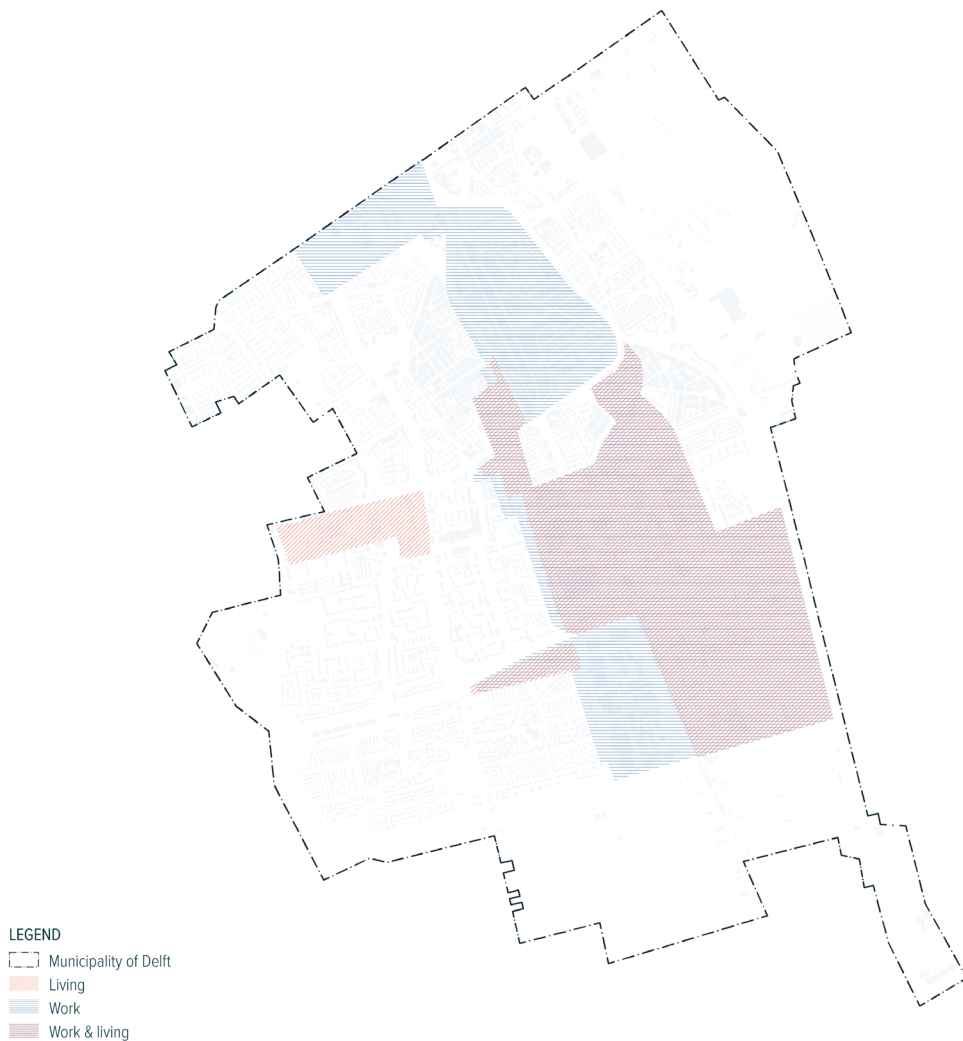


Water nuisance with heavy rainfall (1 per 100 yrs), by UEEC Lab, 2021. (Klimaateffectatlas, z.d.)

Extreme weather is a universal problem caused by climate change. The way cities are built could contribute to extreme heat, since stony materials retain the heat. On a hot day it is hot everywhere, but in cities the nights stay hot whereas green areas cool down. Trees with a dense canopy, flowing water and a combination of green and wind help cool down the city. Tanthof is in a relatively cool area, but even here change is necessary to make this a livable residential area in the future.

Climate change will lead to more dry and more wet periods, as the weather gets more extreme. If a neighbourhood is fully paved, the risk of flooding increases. Since the expansion of the draining system is a costly and often unfeasible solution to the water issues, we need other ways to retain the water before it enters the sewage system. Vegetation and permeable streets help to let the water infiltrate the soil. Native vegetation also improves the stability of the groundwater levels.

Development



Development areas, omgevingsvisie Delft 2040 (Gemeente Delft, 2021)

According to the Omgevingsvisie Delft 2040, a huge part of Delft is in development. The Schiezone south to the city center becomes a multifunctional living and working area. A bit more south, east to Tanthof, there will be a redeveloped working area. North to Tanthof, the existing working area will be intensified with the addition of dwellings. As the context of Tanthof is changing, the neighbourhood should adapt to this too in terms of accessibility to slow traffic, to create a better connection between the infrastructure in and around Tanthof.

The TU Campus is continuing to expand in education, work and living facilities, directed away from the city center, towards the south. Together, the development of the south puts pressure on the remaining green areas. Smart design interventions should provide with facilities for different users to optimize the use of the leftover green areas.



Transformation areas, omgevingsvisie Delft 2040 (Gemeente Delft, 2021)

The image shows which areas change in function during redevelopment. The focus lies on the area south-west to the city center. We see a direct link to Tanthof in the development along the Schie. Redevelopment has the potential to become a quality impulse for the larger area. The downside of redevelopment is that it could lead to gentrification. A good amount of social housing and quality public space are vital to these projects.



I went on site visits in all four seasons. By walking around, I made pictures and wrote down my own observations. As a former resident of the neighbourhood Voorhof, I used to walk through Tanthof to visit the Abtswoudse Bos almost weekly. I have observed the neighbourhood as an outsider.



Outside the station of Delft Campus, infrastructure rules over the public space. The place easily loses it's human scale and direction. The different uses of stone blend into each other as you lose any grip on your orientation. Functions, vegetation and materiality could help identify different routes leading from and to the place.



Following the route to the Abtswoudse Bos, one encounters an endlessness of infrastructural domination. The racing sounds of airplanes, trains and cars speeding by make you feel like you go too slow. As time slows down, you search for observations, finding yourself childishly hop on the basic square tiles to pass the time. Finally arriving at the entrance of Staatsbosbeheers young forest, one only faces the cars and fences that occupy the space.



Homes are shielded by stairs, sheds, storage, shrubs and vehicles. All these elements are intentionally put there to create an optimal level of privacy when leaving the house and entering the car. The space in front of the house is appropriated by the owner, by their fences, their car. Physical boundaries become social boundaries. This is my territory, it says. Don't look inside, it says. Don't say hi to the neighbour, it says.



The visitor encounters fence after fence, preferably as linear as possible, to emphasize that you have to move quickly, go! GO AWAY! This is mine, ours, you don't belong to our community so you have to go. The architecture cowardly expresses the phrase the owners don't dare to say: 'I don't trust you, stranger'.

A palette of grey is boldly interspersed with artificial colors of red, blue and yellow. Stuck between the gas station and the train track, the small sidewalk and bike road have only one direction; from the train station of Delft Campus to the Abtswoudse bos. Do you already feel the excitement of entering a nature area? Moving through the grey desert can be unbearable on sunny days, as asphalt is chosen over shadow.









Elements of reed, grasses, water and trees are reconfiguring as you move through the Abtswoudse Bos. The experience of space varies from save and enclosed to open and distant.



The overthinker recognizes the artificial composition of a planting scheme. The young forest has not transgressed the parental phase; it has not reached it's autonomy.





A ditch in Tanthof.



A ditch in Midden-Delfland.





Some see the beauty in the cultural landscape, seen as a 'collaboration between human and nature'. The phrase implies a synergy between the humans and the land. I think our role in the development of the landscape is rather parasitic. The beautiful architecture is weakly reflected in the contaminated water. The land has to follow the human hand in orthogonal restrictions. The peatlands are thirsty for water but the aesthetic and economy rule over groundwater levels. Could we give the land back to its natural rhythms and processes? What will we lose if we do that?



Willows cut to perfection, with a mathematical precision lining up along the Abtswoude road. A historical road, leading from the Kruidhuisweg through Tanthof to Midden-Delfland. The atmosphere is aesthetically pleasing with the symmetry of the road with ditches on both sides, the rhythmic placement of trees and some beautiful farm homes along the road.
- A place where you would like to wander, let your thoughts drift away as you are leaving the city.

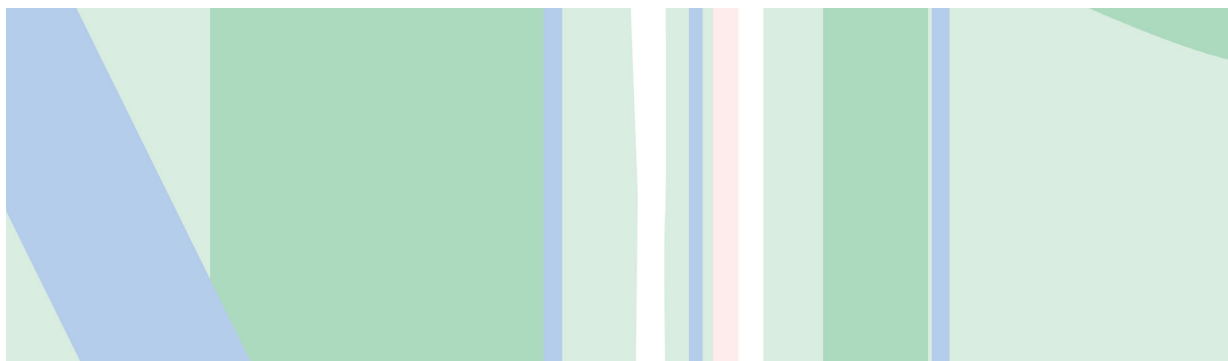
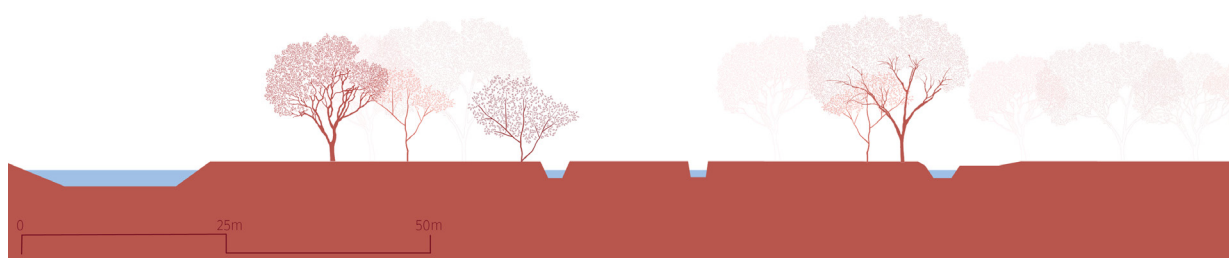
-Contrasting with big trucks and motorbikes dangerously trying to squeeze in on the modest road. Skaters and bikers, people by foot are forced to wait.-

How can we enjoy the place if it becomes too dangerous to wander?

Transition Abtswoudse Bos - Tanthof

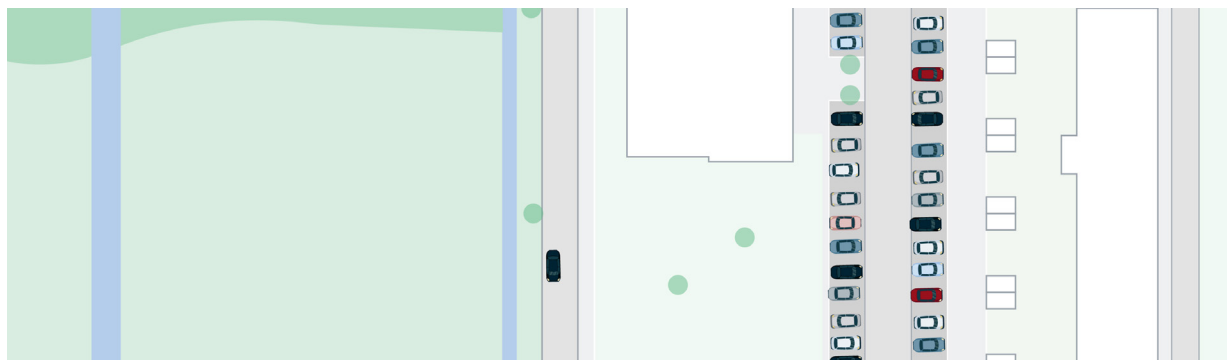
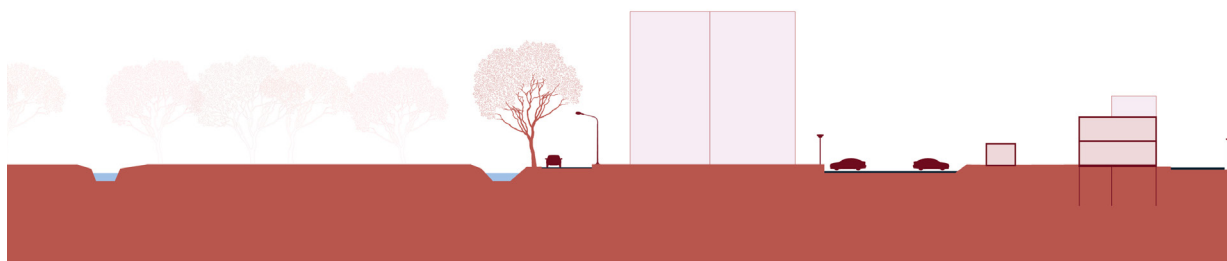
Deep into the forest one finds the small creeks, the smell of wet dogs, the trees with a graffiti stain on them. The open field that screams fakeness. A train passes by, expressing its weight and pace though the squeaking sound of metal. Then, an overwhelming silence.

Straight paths follow the straight ditches with straight rows of trees. Something feels off. Is it the grid that keeps the mind from wandering? Or is it the lack of vegetation under this pleasurable canopy? Is this forest alive?



A somewhat unimaginative, lifeless piece of grass functions as a guardian for the 'view' because we want to have a view on the forest, but we prefer it to be in the distance -not too close to our home.

Dwellings facing their backyards towards the Abtswoudse Bos. What a great location to live. The marketing fairytale is crushed by the sequence of shed, fence, lock, pavement, parking lots, yet another lifeless piece of grass, a small strip of pavement and a road.



Infrastructure in Tanthof



Left: Hierarchy of streets in Tanthof.

Right: Car traffic prioritized over slow traffic.

The image above shows the hierarchy in car streets in and around Tanthof. The highway and the Kruithuisweg are both important entrance ways for Delft, but have a barrier function for the local traffic. The Abtswoudse road, that separates Tanthof in East and West, functions as an alternative route to the highway and goes all the way through Midden-Delfland. The traintrack prevents easy access of the Schiezone, east to Tanthof. The track is crossed by the Kruithuisweg and the tunnel underneath the NS station.

The main roads are most present in the east-west direction, similar to the green structure, but located just in between these green zones. The pink roads show a potential to become part of the woonerf type.

The pictures on the right show a lack of attention to slow traffic, in using monofunctional streets and small pathways in green environments. The current infrastructure shows potential to facilitate slow traffic



Street types

To gain understanding of the public space, the area between buildings, a few street types are analysed in profile. These findings are adding to the site visits and spatial and theoretical research.

1. The residential street has no separate lanes for different users; it is a universal street. Home owners often use their frontyard as a parking lot.

2. One of the main roads in Tanthof West containing a tramroad, two car roads and an extra road that is part of the parking lot. Around 25 meters in width of this street profile is taken by parking space. The scale of this street impedes interaction between the residents on both sides of the street. The idea arises that the public space for the neighbours could increase. On the right side, the green spaces could be more diverse and could use some seating for more interaction on the street.

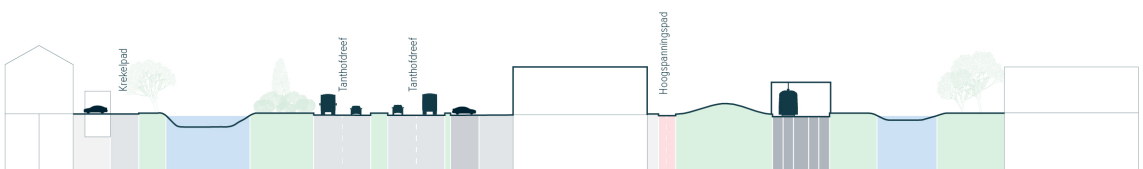
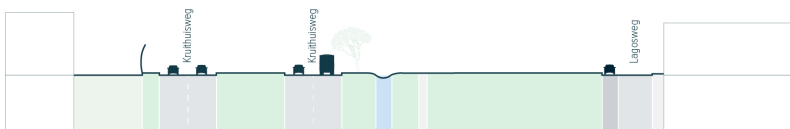
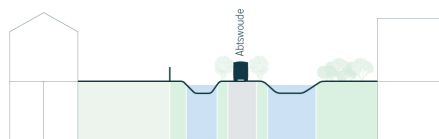
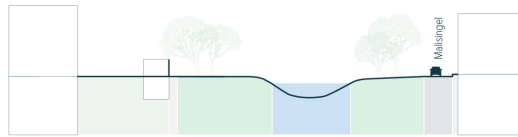
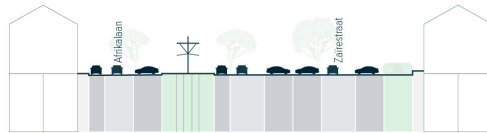
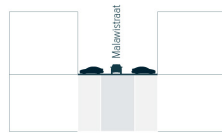
3. The green zone relates differently to the dwellings on both sides. One is facing the green zone with the backyard, the other with the front of the house facing the green zone. Here the road and the garden create a barrier between the residents and the green zone. A lack of benches and pathways limit the recreational value of the green zone.

4. The Abtswoude road is a historical road that separates Tanthof into East and West. The road is characterised by the small profile, the rows of willows and the ditches on both sides. The road was never designed to be used by trucks, and the increasing pressure of traffic creates unsafe situations, especially for slow traffic. Dwellings are facing their backyards or blind walls to the road.

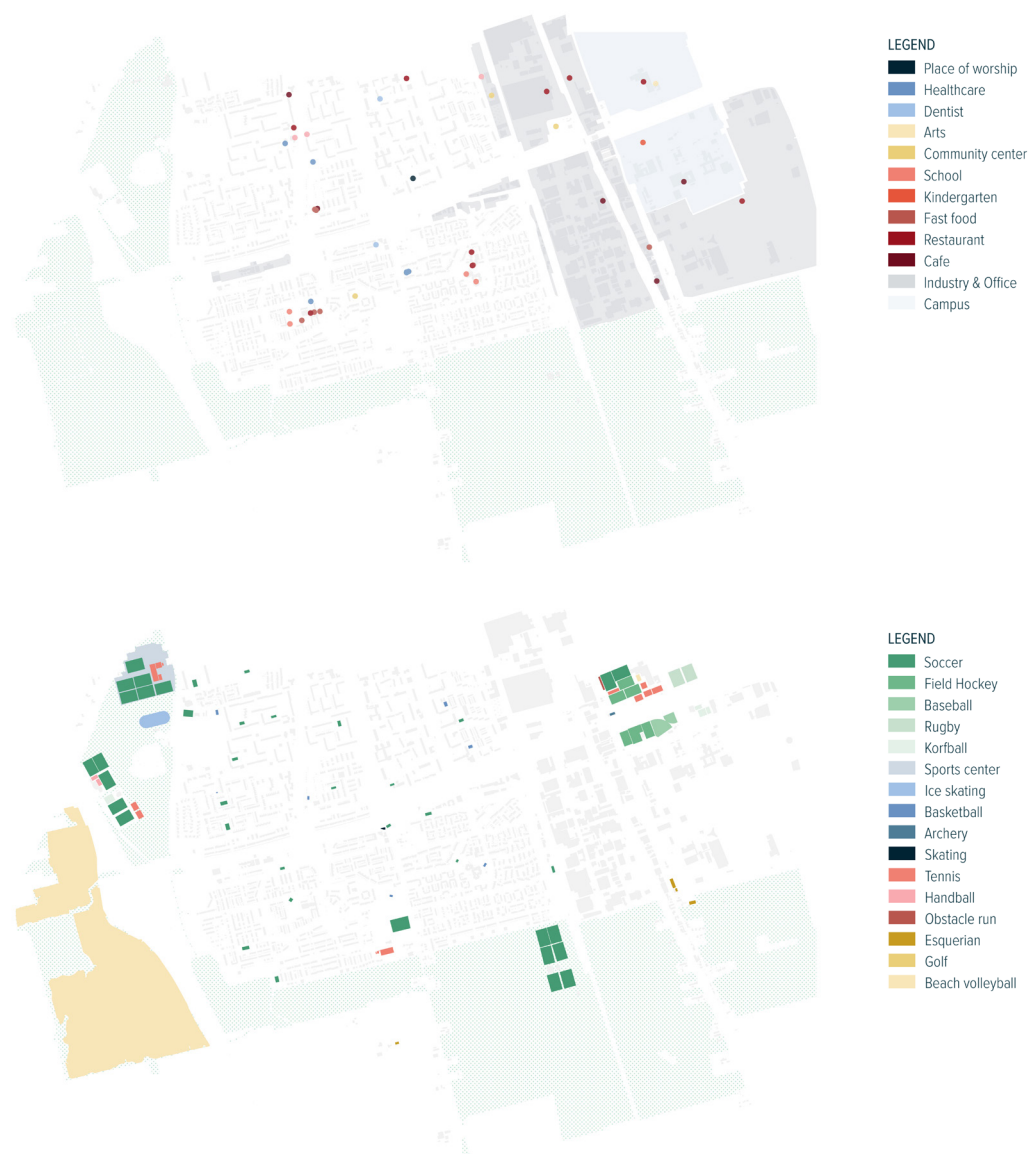
5. The Kruithuisweg is a regional road, connecting two highways and separating Tanthof from the northern side of Delft. Big patches of grass are used to buffer the sound of this 50/80 km/h road. The street profile is often 4 lanes wide, but can reach up to 10 lanes. On the left we see the dwellings north to the Kruithuisweg, on the right we see the industrial edge of Tanthof.

6. The section shows the edge of Tanthof on the east. On the left is are the dwellings in Tanthof, including a frontyard used as parking space, a garden shed and a universal street, thus lacking any pavement. Then follows a green buffer; this area does not include pathways or seating and right to the wide ditch grows a dense green wall of shrubs. Then follows a wide car road, leading the cars into Tanthof. In the middle of the profile is a strip of cheap office area, marked by cheap materials and blind walls facing the small route for slow traffic on the east.

The Hoogspanningspad forms the route between the NS station and the Abtswoudse Bos. The pathway is barely wide enough for two people, so if someone is walking their dog, the crossing person has to step on the bike lane. The lack of trees make the 1.3 km walk almost unbearable in summer. The users of this lane have a view on blind walls, pointy fences on both sides and every now and then: a train. The industry on the other side of the train track stays anonymous.



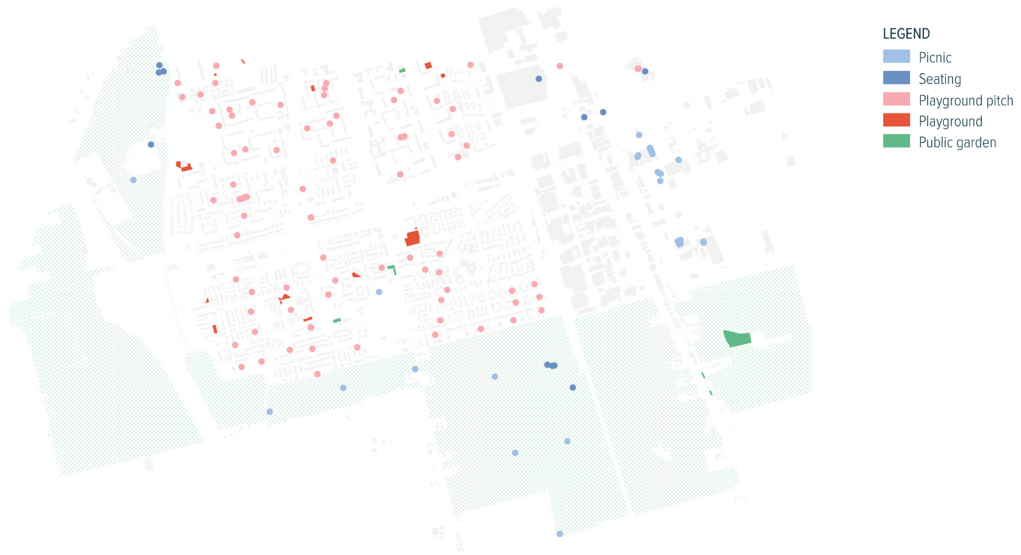
Program



It becomes clear how the south of Delft exists of a strong separation between the residential area in the west and the commercial district and campus in the east. Looking at Tanthof, there are some commercial areas north, adjacent to the Kruithuisweg. Making use of the accessibility of the place whilst being a sound buffer for the residential area. Program that facilitates the neighbourhood are concentrated in the center of the two areas; east and west.

Sports facilities are located at the edges of the city. In Tanthof, there are some smaller sports pitches used for playing basketball, soccer, tennis and for skating. Larger sports facilities are placed in the central park between Tanthof-East and -West. A larger soccer club is located at the edge of the Abtswoudse Bos.

Top: Urban program.
Bottom: Sports facilities.



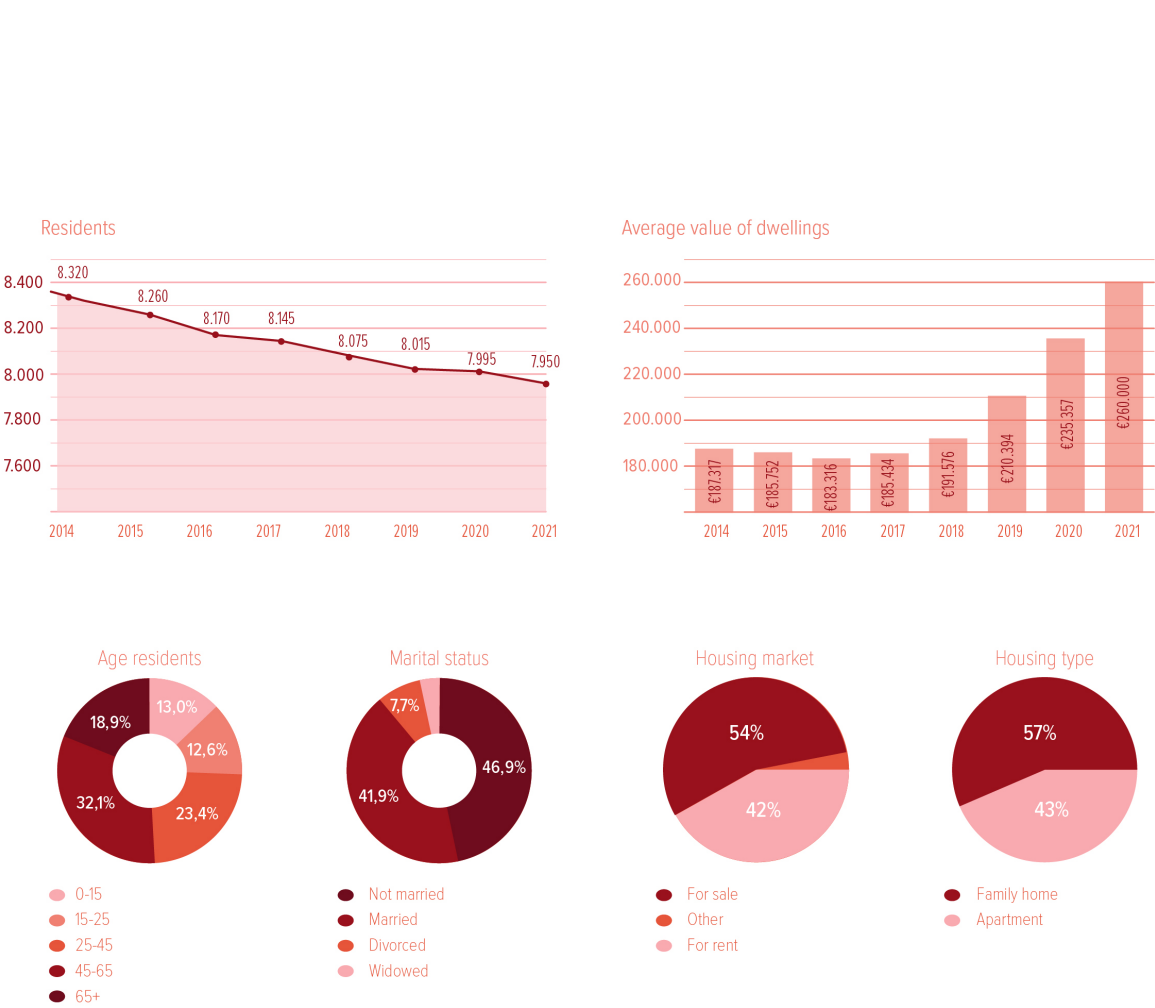
The neighbourhood contains sufficient playing spots for the amount of family homes in the neighbourhood. Numbers say that more and more elderly people are living in Tanthof. Looking at the amount of street furniture, leaving out the noisy playgrounds, there is a certain lack of sufficient public space for the elderly users. Better quality public space near the house or a better public transport to a central public space could solve the issue.

Outside recreation zones are not that much present in the area. The Abtswoudse Bos is a good place to walk the dog or even have a picnic, but other than that there aren't any public facilities (toilets, free sports, swimming ponds, etc.). The only facilities in the Abtswoudse Bos are semi-private, like the allotment gardens, the campsite and the soccer club. Along the Abtswoude road is a play nature, the only one.

Top: Public space.

Bottom: Green recreation.

Demographics of Tanthof

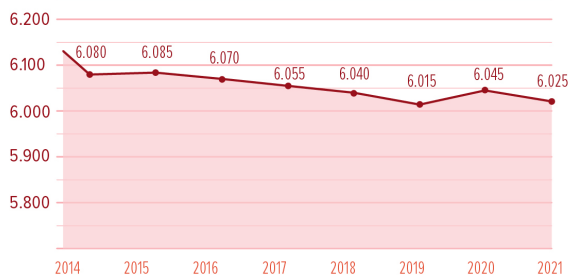


Tanthof West

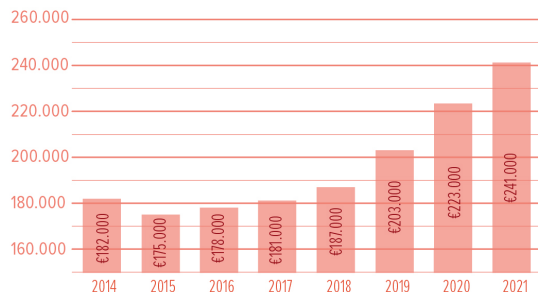
The demographics tell something about the type of dwellings and give information about the type of households. In Tanthof West is the number of residents decreased with 5% between 2013 and 2021. More than half of this population is above the age of 45. From this information we could take the educated guess that these residents are empty nesters.

Looking at the housing types, there are however more family homes than apartments, so the housing types do not match the composition of the population right now. Add the drastically increased housing prices and it can be concluded that the current housing market is affecting young families the most. To prevent further aging of the population, alternative dwellings need to be offered to the empty nesters, so they can make place for young families.

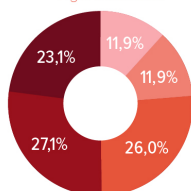
Residents



Average value of dwellings

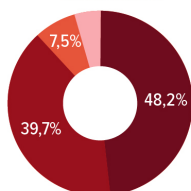


Age residents



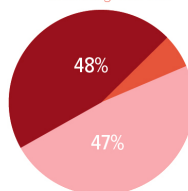
- 0-15
- 15-25
- 25-45
- 45-65
- 65+

Marital status



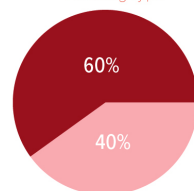
- Not married
- Married
- Divorced
- Widowed

Housing market



- For sale
- For rent
- Other

Housing type



- Family home
- Apartment

Tanthof East

In Tanthof East, the population is relatively stable. Similar to Tanthof West, about half of the population is above the age of 45. Besides resolving the housing market issues, a review of the public space is recommended. Does the current public space facilitate the needs of the aging population?

Tanthof East exists of even more family homes, and these dwellings are on average more affordable than the dwellings in West. Almost all buildings in Tanthof are built before 2000, so the neighbourhood was designed for families.

(Un)defined territory



A bicycle tunnel is used as a safe crossing underneath the Kruithuisweg.



The street turns into a bicycle road, forcing the car to take a turn to the left. On the left we see the entrance to a woonerf, which can be recognised by the threshold.



The woonerf can be recognised by the universal street; there is no hierarchy in pedestrian, bicycle or car. It still seems to be dominated by cars, since the entrance of the house is covered by the parked cars.

Paved public space

The center of this square is used as a playground, and is surrounded by parking space. Except for some trees, the whole space is paved. The wide sidewalks allow a gradient between public and private. Most frontyards are green.



The morphology of this building block allows for a community space facing the backyards. While the backyards are small, this space is mainly empty, paved and only used as a parking space. The houses all show a high level of privacy.



Would you like to sit on the bench? The hierarchy in this woonerf is resulting in an undefined space that looks more like a large parking space with a sad little tree.



Conclusions on Tanthof

The human territory is examined on the scale of the neighbourhood Tanthof. This neighbourhood is separated by a road into east and west, but in the analysis perceived as one territory, since it is designed as one area.

1. Tanthof is surrounded by larger infrastructure, which is both a blessing and a curse. The neighbourhood is cut off from the rest of Delft, but at the same time gains a maximum mobility due to its position close to the highway. On top of that, Tanthof has a direct connection to the nature south to Delft.

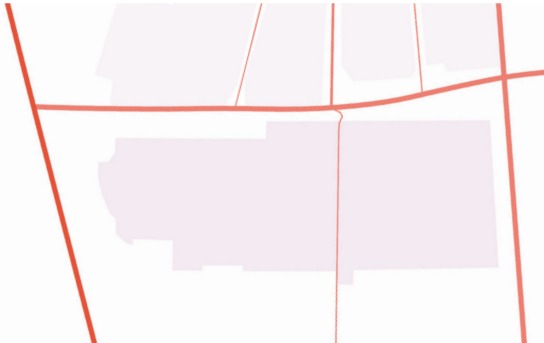
2. Tanthof is located closely to the NS station 'Delft Campus'. There is a buslane going through the neighbourhood, a road only used by busses and a tram track only going halfway in the west of Tanthof. The buslane could be perceived as a waste of space, since other vehicles can't use that space. Extending the tramline has potential, since the tramline could be connected to the east of Delft and the train station.

3. Industry and offices are placed at the northern and eastern edges of the neighbourhood. These monofunctional districts feel unwelcome to slow traffic, due to a lack of public program, green and safe traffic. Most commercial program is located at the center of each part of the neighbourhood. The healthcare and recreational functions are located in the center, alongside the Abtswoude road.

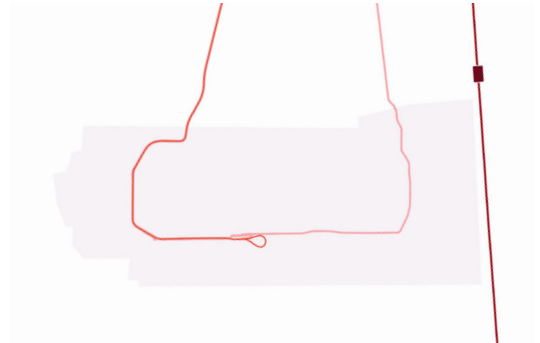
4. Due to the morphology of the streets, a lot of residential streets have the potential to become a woonerf street. The benefits of this would be that the streets are not bothered by car traffic and the streets could have a better transition to the green zones.

5. The green zones are the veins of the neighbourhood. They offer a green experience to all residents within a 300m radius. The quality and management of these zones could be improved, as some areas feel cramped and private due to their position towards the garden fences.

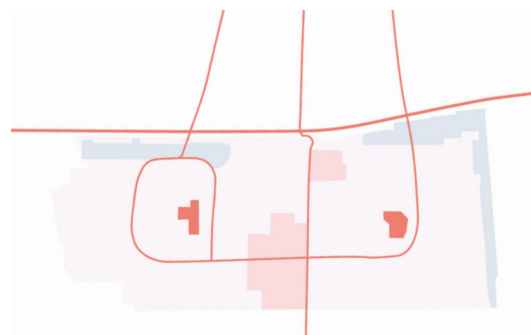
6. Private parking is a huge issue in Tanthof. Taking into account that there used to live a lot of families in the neighbourhood, it makes sense to have sufficient parking spots. People, however, started to park in their frontyards too as they started to own 2 or 3 cars per household. The parking spots are an issue because they are fully paved, thus have a negative impact on the urban heat island effect and a negative impact on rainwater infiltration. Moreover, the parking spots take up a lot of space in the streets, preventing any social interaction between neighbours.



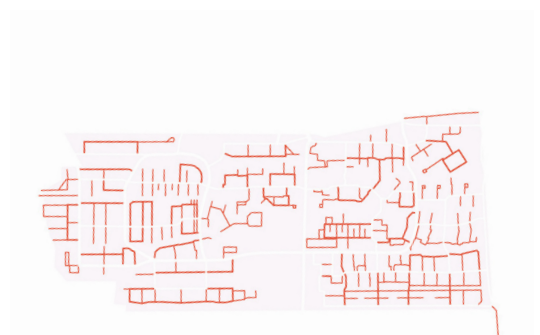
1. Heavy infrastructure.



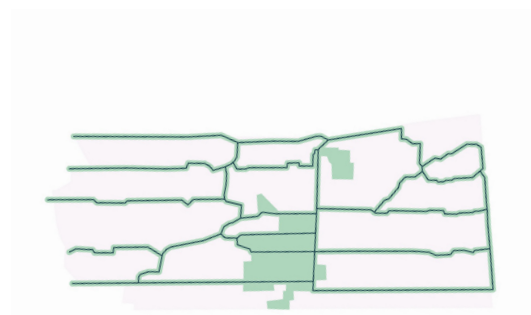
2. Public transport.



3. Urban program.



4. Potential woonerf streets.



5. The green zone.

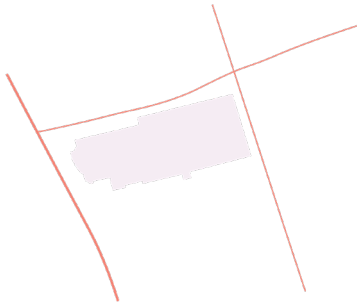


6. Dominant parking spots.

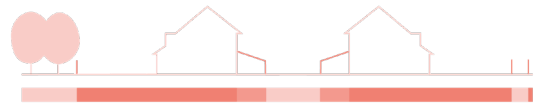
Conclusions on the Woonerf

From the theory chapter, we learned how the woonerf was designed to be a residential public space, limiting the car in pace and space. However, over time the living standard changed and people could afford more cars. The woonerf today is not more than just a traffic sign. Based on the site visits, the following observations reflect on the design of the woonerf:

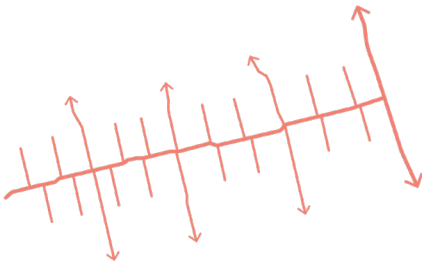
1. Due to heavy infrastructure and the green buffer around the neighbourhood, Tanthof is an enclave.
2. A gradual transition from public to private is created through an adding a shed or utility room in front of the house (attached or not). These buildings are made of blind walls, and prevent any interaction between the home owner and the life on the street. Additionally, the parked cars, fences and sheds, the street seems to have lost its public qualities.
3. The infrastructure is based on the Cul-de-sac principle, meaning that the streets are dead-end streets. However, the desire for easy mobility results in these streets being packed with parked cars.
4. The layout of the house is oriented with the living room to the backyard. With the kitchen in the front, an empty facade remains from the perspective of the street.
5. The street was meant as a universal street which looks more like a residential public space than a traffic space. Unfortunately, due to the rise of the car, the streets are now cramped with parked cars and delivery busses.
6. The unattractive street layout, the lack of green and excessive interventions to improve the privacy of the home, result in an introverted atmosphere, with homes shut off from the street and opening up to their private backyard.



1. An enclave



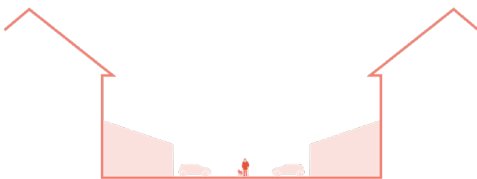
2. A gradual transition to ensure privacy.



3. A cul-de-sac infrastructure.



4. Living area oriented to the backyard.



5. The universal street.



6. Introverted character.

Conclusions & Design suggestions

1. Potential in adding quality to Midden-Delfland are found in the natural and cultural layers of the landscape.

2. Groundwater management serving cattle and milk production in Midden-Delfland, lead to subsidence of the peatland and the causing CO2 emissions (appendix p256). Maintaining the dry landscape required for the agricultural practices, cause an ongoing cycle of lowering groundwater levels and subsidence of the land.

3. The division of Midden-Delfland according to the ownership of the farms lead to the fragmentation of the ecological network, as different forms of management are applied to the land.

4. Cattle farming is not beneficial anymore in the light of the glooming climate crisis (appendix p259). The farms show potential in making a transition from urban territory to natural territory by transforming them into circular facilities, like restaurants or bed and breakfasts.

5. The barrier effect of infrastructure affects the ecological network of Midden-Delfland and Staatsbosbeheer properties. The focus should be on softening the barrier effect of the train and the Abtswoude road and focus on a stronger north-south connection within the borders of the A4 and the Schie.

6. Harsh borders between city and the Abtswoudse Bos are created by contrasting use in vegetation in the green zones of Tanthof versus the Abtswoudse Bos, excessive roads at the southern edge of the neighbourhood.

7. For other visitors, not living in Tanthof, the routes leading to the Abtswoudse Bos are dominated by fast traffic. Improvements could be made by making more space for the slow traffic along a strong green infrastructure and adding program along this route.

8. The entrances to the Abtswoudse Bos are often hard to be found, due to a lack of program, a discontinuity of street hierarchy and a lack of attention to materialisation

of routes for slow traffic.

9. The area around station Delft Campus is still very unattractive for slow traffic, as it lacks public programming and green public space.

10. The hierarchy in infrastructure is unclear throughout the whole neighbourhood, as strong separation of functions are followed by universal streets. Especially the inconsistency of the sidewalks stress the idea that Tanthof's mobility is still focussed on people using the car.

11. The neighbourhood lacks a good, continuous infrastructure for public transport. Potential is found in continuing the tram track and connect it with the east-side of Delft. A large intervention, but not impossible when one takes into account that the Schieoevers and TU Campus will expand and densify in the near future.

12. Dominating presence of private territory in the form of fences, sheds, shrubs and parked cars add to an unwelcome atmosphere in the public space of Tanthof. Streets and squares are turned into parking lots with a single tree. Collective outdoor functions like the soccer fields and the allotment gardens are pushed outside the neighbourhood and marked by huge fences.

13. The green zones in Tanthof have great potential, but due to the use of high fences around the backyards, it feels like an enclosed space.

14. Due to the layout of the homes, most life in the house happens at the back of the home. The parts that face the street are completely closed off, to maximize the feeling of privacy. Streets remain empty, with the exception of the mailman delivering a package.

Right: Vision map for Delft, based on the research done by the UEEC-Lab for Staatsbosbeheer (2021)



LEGEND

- | | |
|--------------------------|------------------|
| Water | Soft shore |
| Staatsbosbeheer property | Green corridor |
| Urban park | Development area |
| Contour former creek | Program |

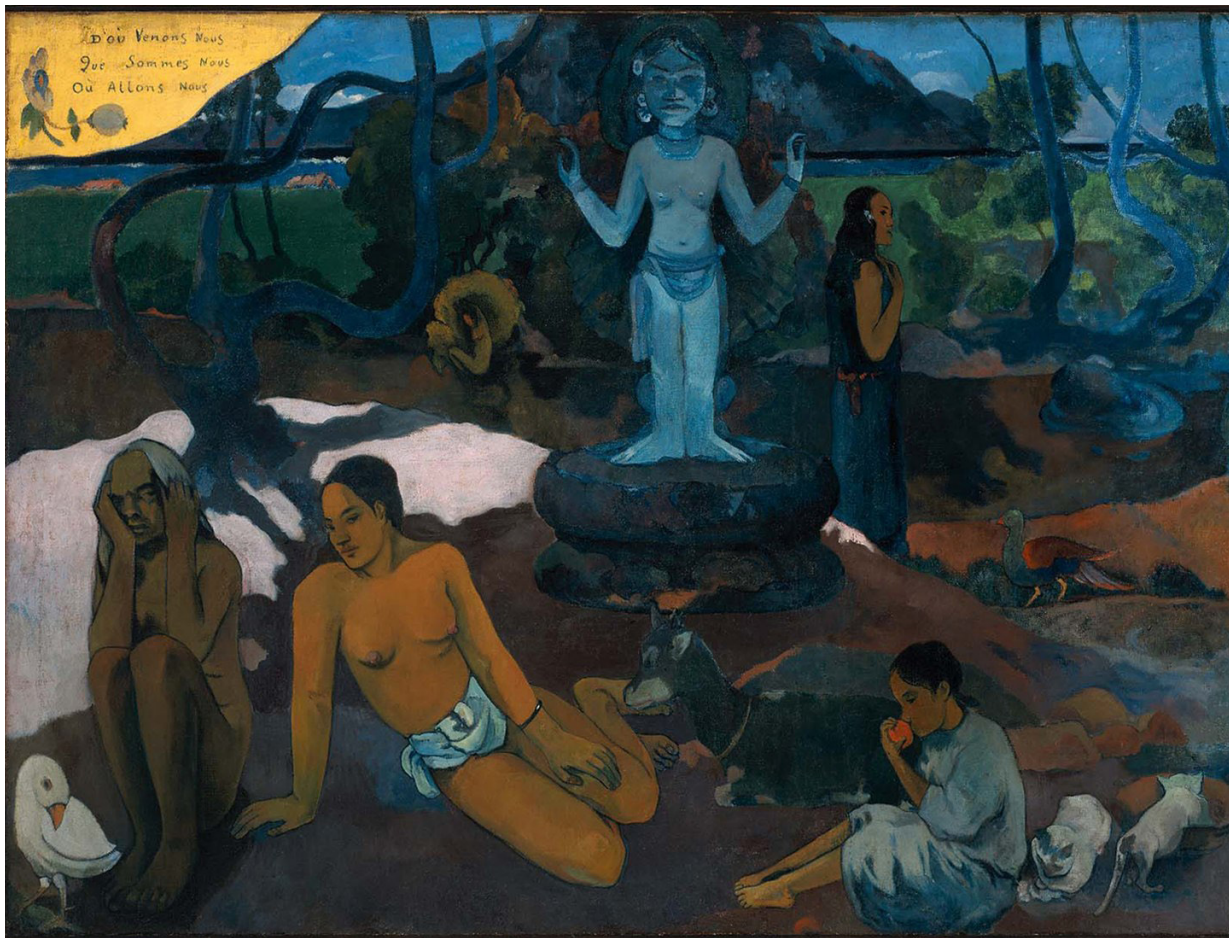




05 Experiment + Design

The previous chapter provided with a deeper understanding of the spatial issues in the design area of Tanthof, the Abtswoudse Bos and Midden-Delfland. A set of design suggestions form the basis of the following chapter.

The chapter takes you on a journey starting from a holistic and abstract idea on the position of humans in time and place, looking for a deeper motivation to change. Then, a set of design principles are both questioning the position of the urbanist (should we really be calling ourselves urbanists? Aren't we moving towards a living environment kind to all forms of life instead of creating yet another human dominated artificial desert?) and seduces humans to take responsibility in transforming their direct living environment towards a balanced living environment with lush and flourishing nature.



D'où venons-nous ? Que sommes-nous ? Où allons-nous ?

*Oil on canvas by Paul Gauguin,
1897–1898*

This piece by Gauguin is made near the end of his life, more accurately, he tried to take his own life. By this time the man lived on Tahiti. The golden touch is a historical reference as if we are watching a fresco instead of a four meters wide canvas. The piece is full of symbolism. In the middle of the piece, we recognise again this Eve-like figure expressing the sins of life. on the right of the painting, we see mature woman with a baby. Left from the Eve-like figure, we see a young girl with white kittens, showing the innocence of a child. Next to her is a married woman, chained by the bracelet around her arm. The older woman on the far left seems to be drawing back from the scene and more introvert.



Where do we come from? What are we? Where are we going?

Image via <https://en.wikipedia.org>

In the background is a blue figure that represents the god of the beyond. All together the piece demonstrates the cycle of life. It resembles the phases in life and the corresponding dilemmas that come with each phase of life. I think it is inspiring to think about how people are always so afraid of death. The questions raised by this piece are still relevant today. We see all around the world how increasing wealth is encouraging people to battle the faith of death. Money and success are the indicators that we do well in life and we are willing to gain that over the lives of others (including all life on earth). I imagine a society in which we focus on legacy; what we leave behind for our kin.

*To you, my love
I leave the second best beds*

*The worlds dragged up dregs and drowned regrets
Lakes that have bled their dappled beauty are long
dead and dread*

*So that every time you place a foot
The thought that the ground could come loose
Parades through your head*

*I'll leave your lungs and loves unfed
Your green spaces stained red
I'll leave*

*Taking with me all I've found and instead
You can have whatever's left*

*To you I hand down a horizon
Marked by my mistakes*

Fires, fakes

*Days comprising a season-less haze
And a lifetime's fight for intangible change
A place void of brightness
Not the world I knew
But a charcoal likeness
And a tightness in your frail chest
So that, at best?
You'll get to see your twenties through*

*And I would give you
The sky if I could
But it's too scored and scorched from long haul holidays*

*So for my youngest I leave an apology
That you will never let the citrus lick of dew stain your
fingers
Nor the smell that lingers after the rain
Frame your autumn days*

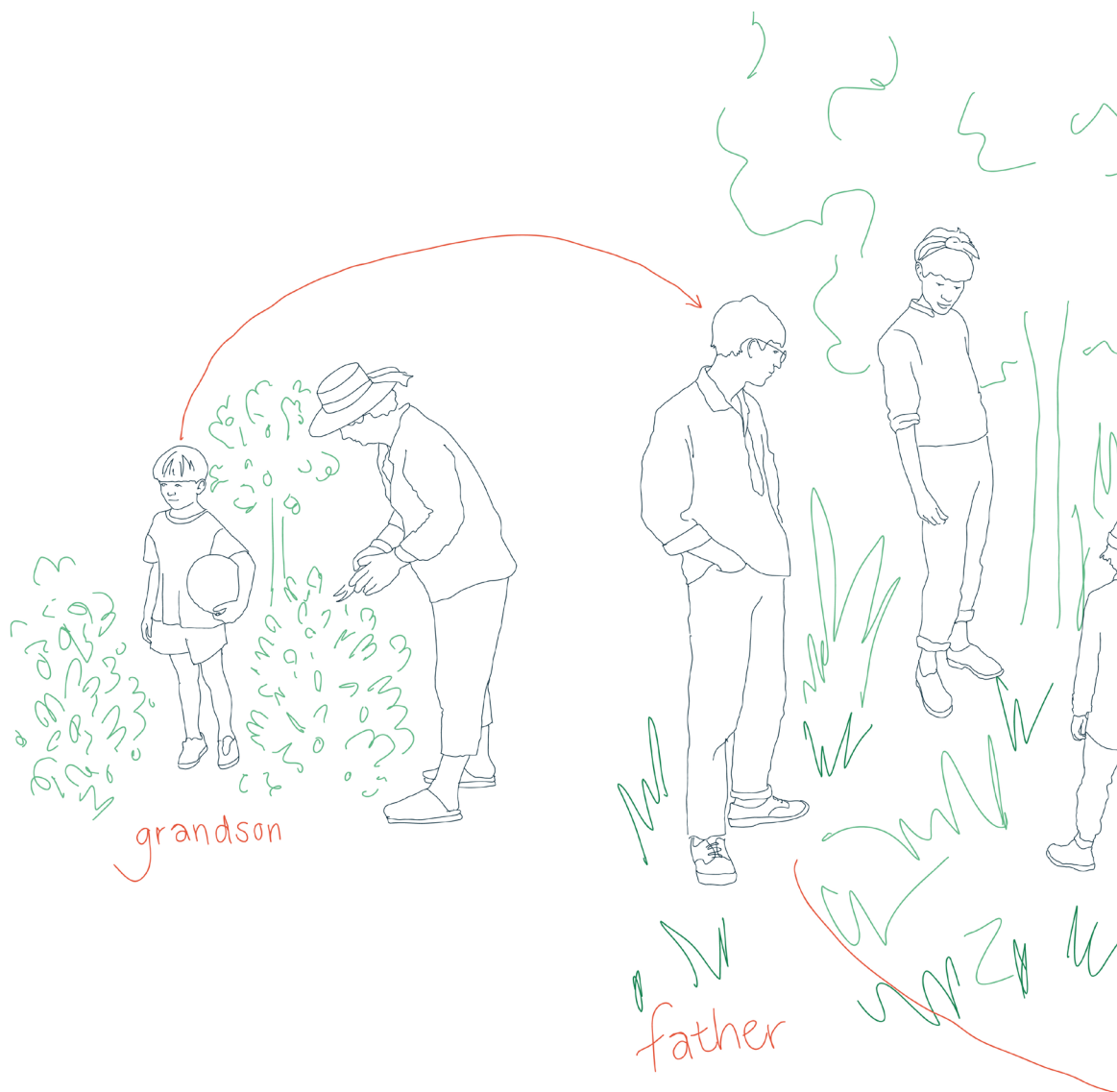
*I'm sorry
For the still nights
When you won't be looking up at stars
Charting those stories that should have been ours;*

*The powerless pyre in the pit of your being
For bequeathing that feeling
I can only apologise*

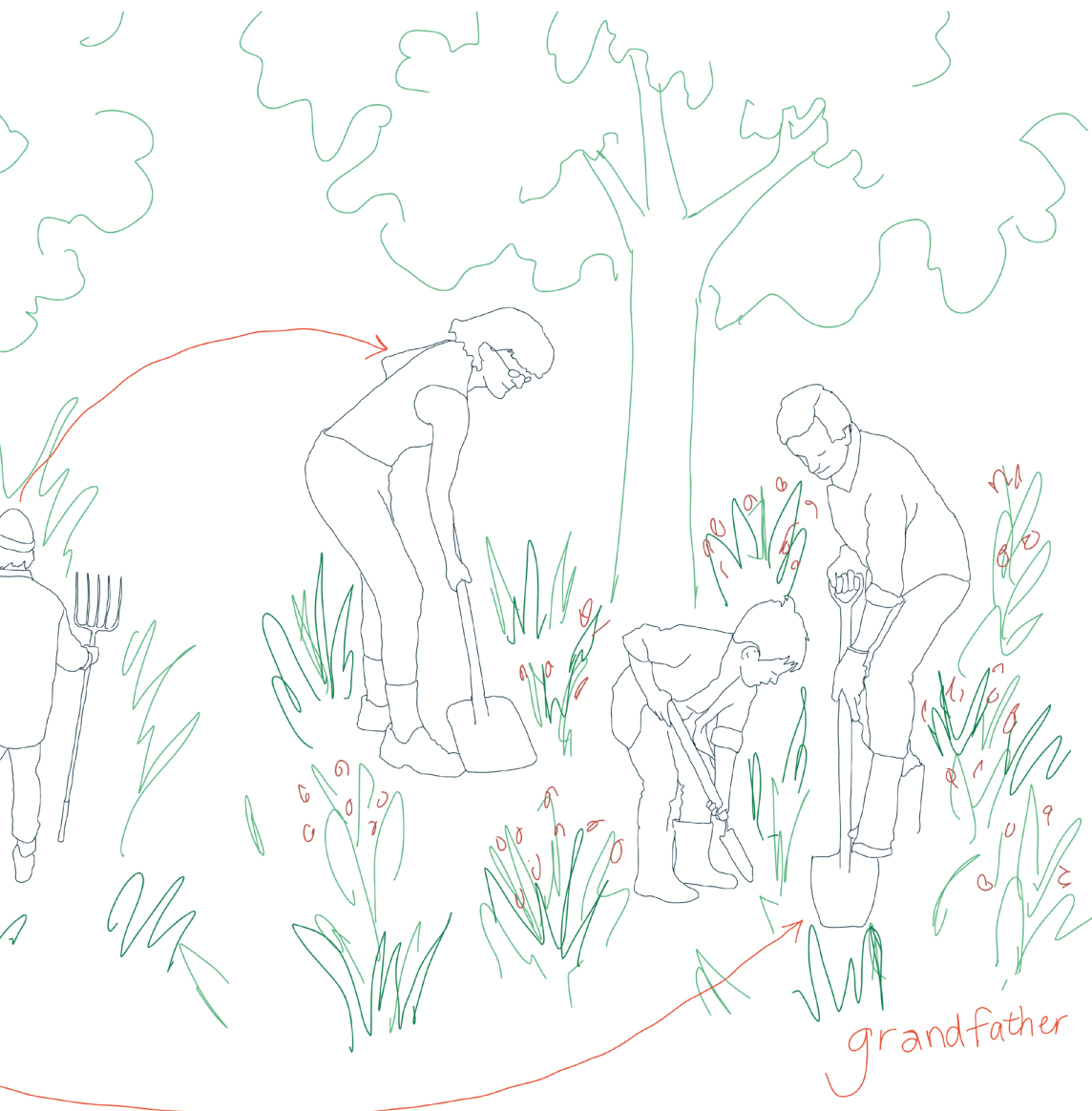
*Cos I chose to turn the other cheek
Turn my back
Keep my eyes firmly closed...
As if I didn't know
That this world is not a temporary home
It's not on loan
It's not due back as soon as I am gone*

*We might just be passing through
What are we passing on?*

Ellen Renton, 2015



Gardens of Responsibility is a project that calls upon the sense of responsibility of people, to build an environment that is more kind to non-human life. Children today grow up as digital nomads, nevertheless the physical environment is still essential to ensure their future. In Tanthof, children grow up in a street that provokes different types of interaction with nature. They grow food and reuse organic matter, they play in the bushes and trees, jump over the ponds and use branches to build their own hut. They go to school in the Abtswoudse Bos, and visit Midden-Delfland to spot birds.



The Gardens of Responsibility are not build in a day. It is a dynamic and ongoing process of natural succession. It all starts with making space for nature, by sacrificing the paved front gardens and transform them into a community garden. Some elements are build -like a pond, and other spontaneously arise -like some native species popping up. The impact of people reduces when moving closer to Midden-Delfland. Nature is capable of taking care of itself, so it might teach us that life is selfsustaining, when we only take what we need. Nature might teach us that growth is never without decay, and that endless growth is a myth, at least as long as we stay within the earths boundaries.

Design steps

Midden-Delfland

1. Changing the function of the landscape in the regional planning (Bestemmingsplan). Midden-Delfland is now partially used for cattle breeding. The water management leads to subsidence of the peatlands, with water management issues and carbon emissions as result. With regard to improving the land for a sustainable future, a restoration of the peatland as carbon storage and nature reserve will be chosen over maintaining a mediocre productive landscape.

2. Move a part of the Polderdijk to the very edge of the Staatsbosbeheer Property to allow for abiotic rewilding in the Midden-Delfland area. To maintain the forest type in the Staatsbosbeheer area, the ground water levels need to be as low as in Tanthof. If I would want the Staatsbosbeheer property to become wetland, a dike had to be placed around Tanthof to prevent the area from flooding, which would have a negative impact on the connectivity between the nature area and the neighbourhood. By letting the Staatsbosbeheer area to be part of Tanthof's water management, the forest can move a bit into the neighbourhood, reinforcing that physical connection between city and nature.

3. Through the water management system, a base level of water can be achieved to prevent the subsidence of the peatland. Dynamics in the water system will be created as the rainwater drainage of Delft will be directly flowing into Midden-Delfland. The wetland is a great habitat for several birds and aquatic animals.

4. The train track can be perceived as a barrier. In the design proposal for Staatsbosbeheer property is emphasized that tunnelling the train track here would be beneficial for the accessibility for visitors, as well as for flora and fauna. In Midden-Delfland the train will stay above ground, to avoid any further disturbances in the peatland. Instead, the barrier will be used to create a zone where people are not allowed, in between the train track and the Schie. This zone could be used as a breeding place for birds.

5. The historical farmers routes remain the same, only the land belonging to the farmers homes will change. This route is used by bikes and destination traffic, but can also be used by skaters and pedestrians, since cars need to drive slowly. The farmers routes will be representing the remains of the cultural landscape and form the transition from urban territory to natural territory. Besides the Airbnb's and recreation businesses that are already present along this route, there could be a café to facilitate the cyclists and other visitors. These functions will help creating attractive entrances to the nature area.

6. The experience of the landscape gains meaning by improving the readability of the palimpsest of the land. The current heightmap of Midden-Delfland is showing the sandy hills remaining from the former creeks. This historical landscape element will stand out in the landscape once the land is turned into a wetland. The structures will be amplified by adding elevated walking routes along and in between these structures. These walking routes sometimes cross the Cultural routes, to allow hikers to have a break.

7. Through design interventions that have borrowed their characteristics and statue from land art, demand a change of perspective on the landscape. These elements are meant to empower the landscape as it allows the viewer to observe the natural processes. These interventions ideally provoke a sense of smallness, similar to what one would experience on a boat in the ocean. The hypothesis is that this kind of experiences create a humble attitude towards the environment.



The Accumulator , Otobong Nkanga (2021)
www.otobong-nkanga.com

How to add meaning to Midden-Delfland?

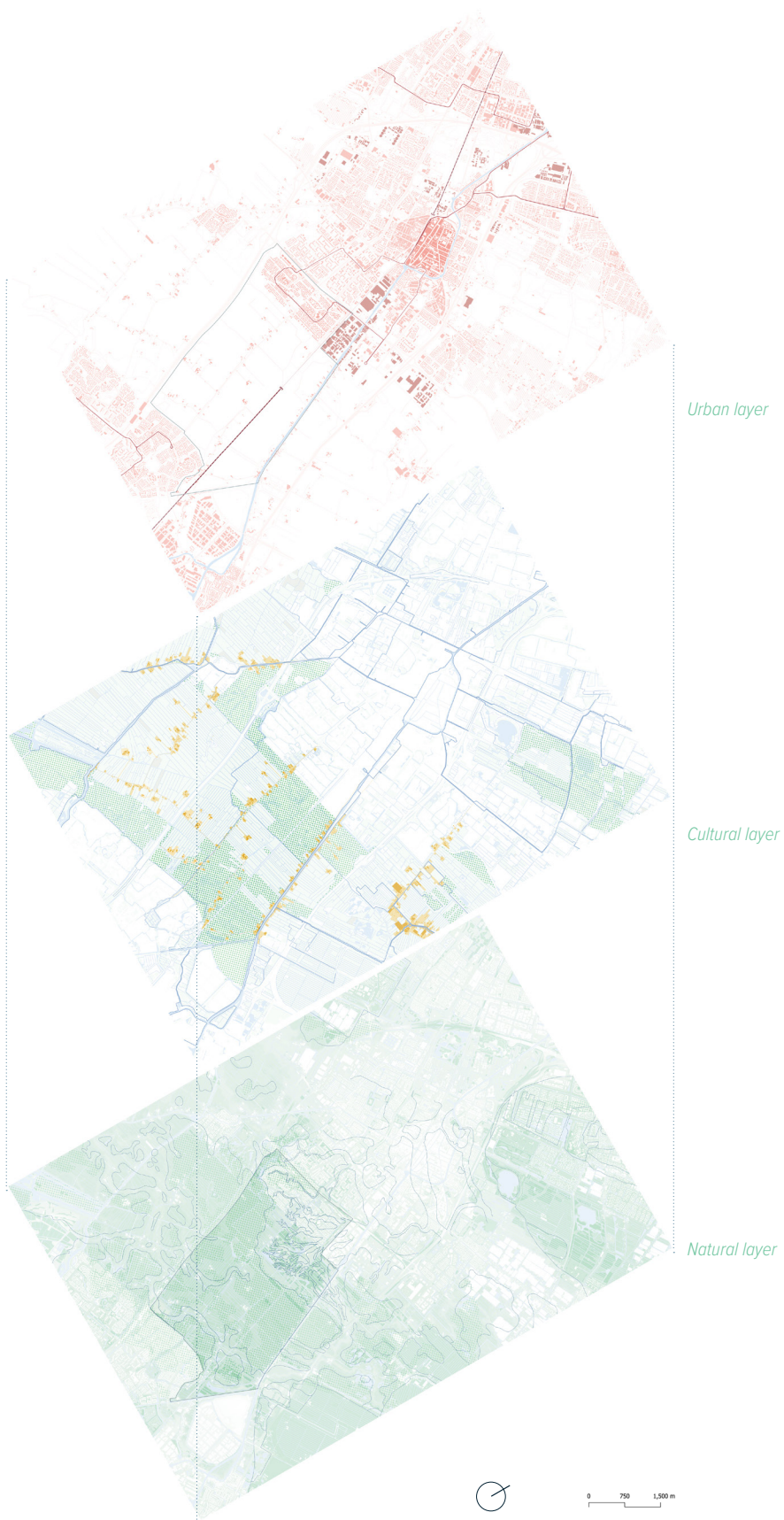
Midden-Delfland always functioned as the green buffer in the exponentially growing Metropolitan region of Rotterdam-The Hague. As cities are intensifying and densifying; the need for a buffer zone grows. The Netherlands has a policy to densify cities instead of building further into the green. However, today the green is still human territory, as groundwater levels are regulated and ecological networks follow the ruler of the urban planner and the boundary of the farmers plot. I can imagine that, in times of exponential growth of the Metropolis, citizens are longing for a strong contrasting environment. Besides the planning and regulations of the urban life, people desire experiences of wild nature. Today, these are found in long haul holidays, if we quote Ellen Renton.

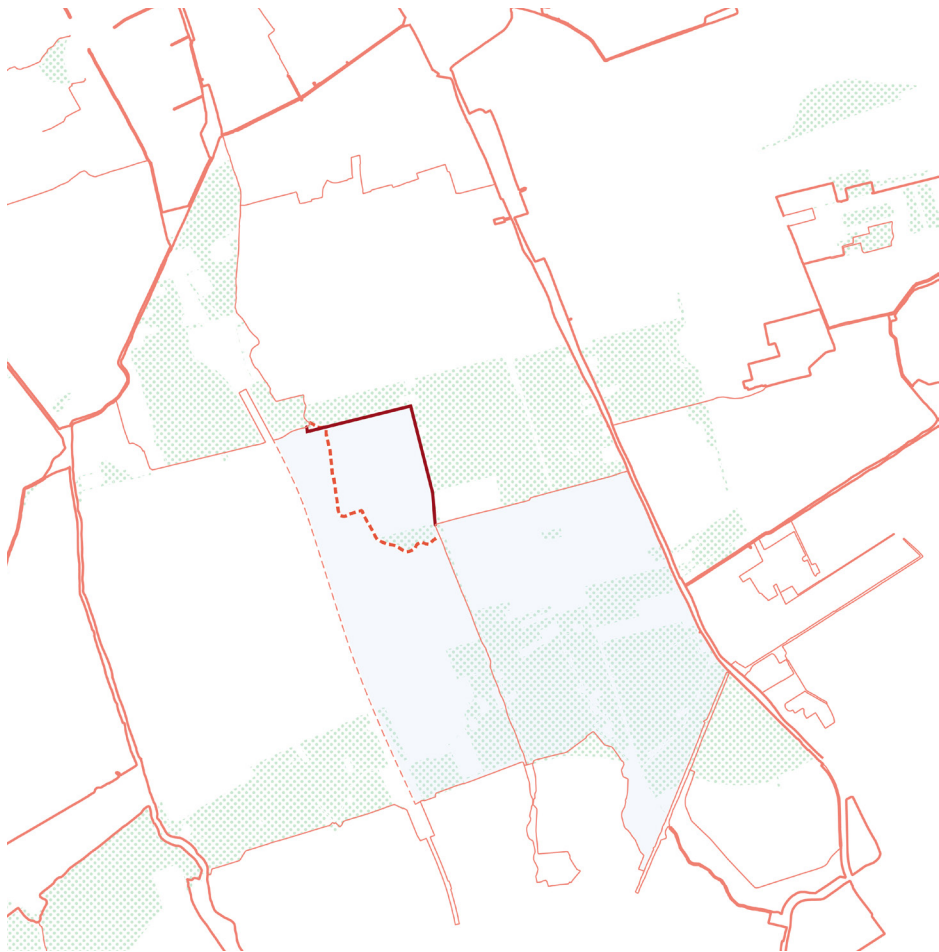
The historical and spatial analysis of Midden-Delfland revealed its historical layers. The landscape might seem like every other polder, but by getting to know its past, one starts to see meaning in the land. A common way to approach landscape architecture is through the *palimpsest*. The word palimpsest originates from the era of papyrus, where paper was such a costly product that people would erase their writing to write something new. The paper would still show the original text as the letters were pressed into the paper.

For the design of Midden-Delfland three layers are featured; the natural layer, the cultural layer and the urban layer. The natural layer is not really present anymore in the current landscape of Midden-Delfland, as the whole area is subject to strict watermanagement. To add more depth and meaning to the experience of the landscape, I thus want to bring back the original landscape by wetting the peatland.

Nature is dynamic so the landscape will always be developing. People tend to maintain the landscape as a static element, as one could read in the term 'nature preservation'. I believe that change is interesting. *So why do you want to work with historical layers then?* I hear you thinking. Well, this is because cultivation of the land has destroyed the original ecosystem, or better put; it concealed the original landscape. Though applying the right management strategies, the land can reveal its true nature. It can develop to a more self-sustaining state. Instead of recreating the historical landscape, we will restore the conditions similar to the historical state, and let the native species flourish again in perhaps a new composition.

*Right: Axo of the tree layers
Nature, Culture, Urban.*

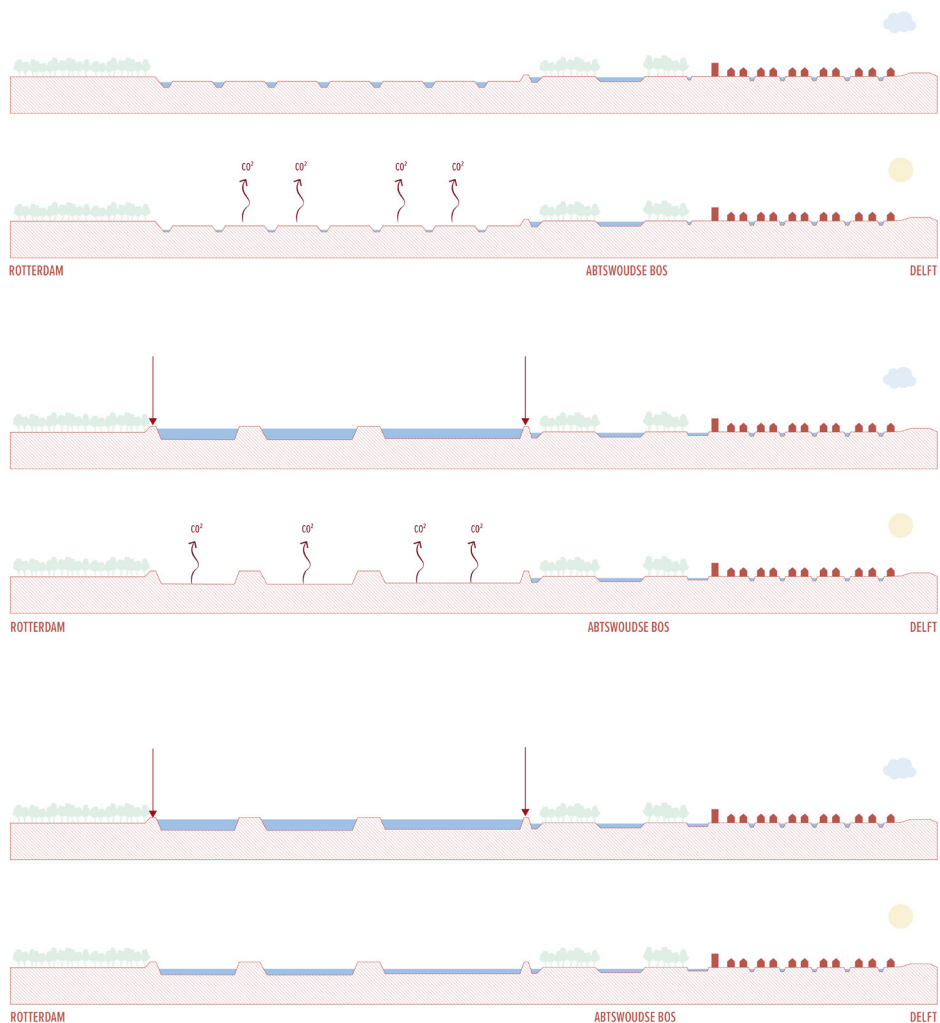




- LEGEND**
- Regional weir
 - Polder weir
 - Polder weir
 - - - Polder weir

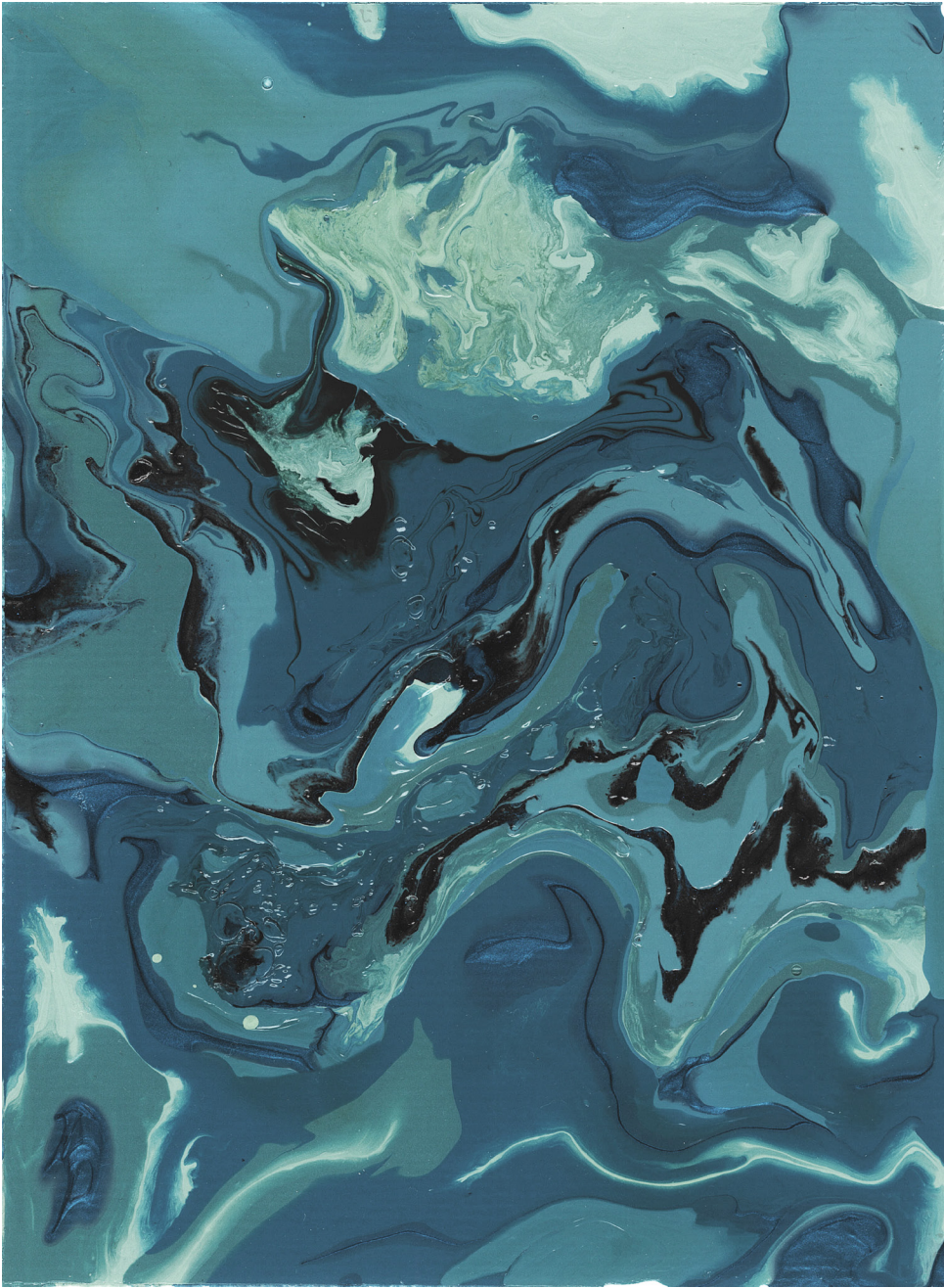
Repositioning of the polderdike to make a clear separation between the city and the urban park with low groundwater levels, and the wetland area of Midden-Delfland.

The management strategy of abiotic rewilding will be applied to Midden-Delfland; this is done by wetting the land. To prevent the city to flood, or the forest to die because of draining trees, a dike separates Midden-Delfland from the Abtswoudse Bos and Tanthof. Now, the groundwater levels of the whole area between Delft and Rotterdam can become wetland.

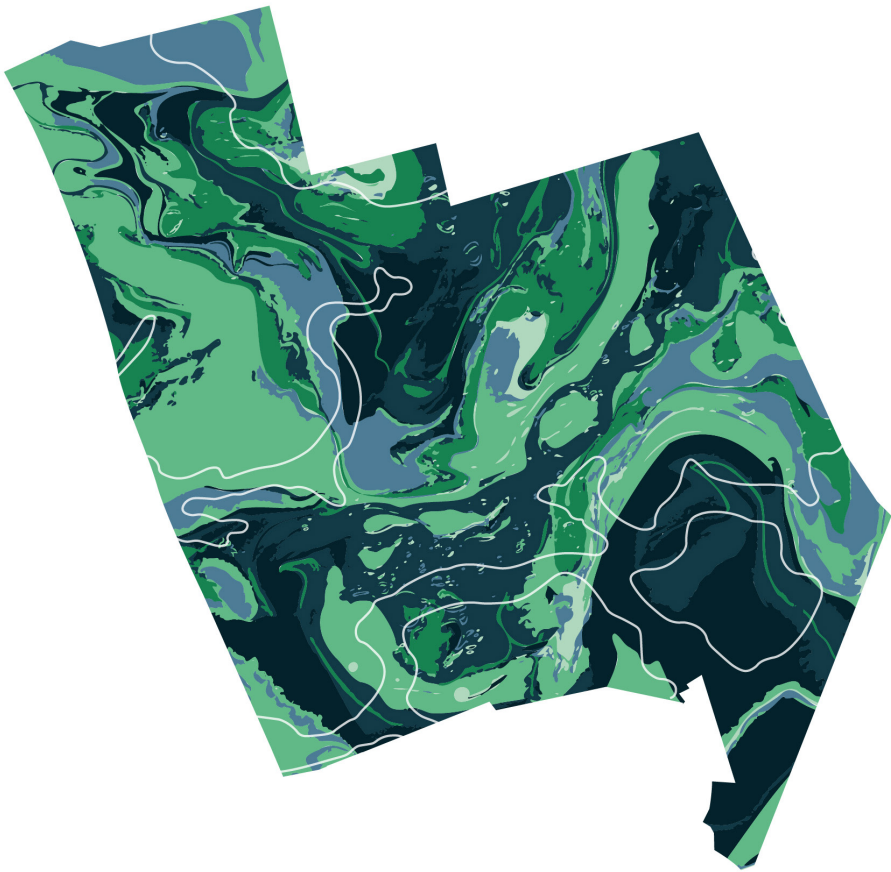


Section scheme of the water management options for Midden-Delfland in relation to Delft, represented by a winter and summer situation.

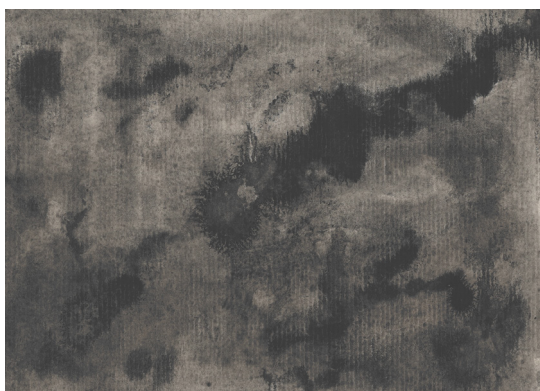
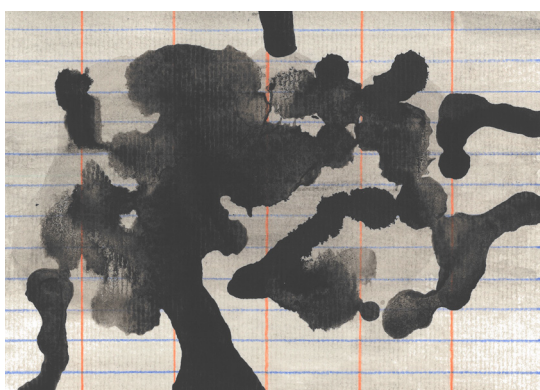
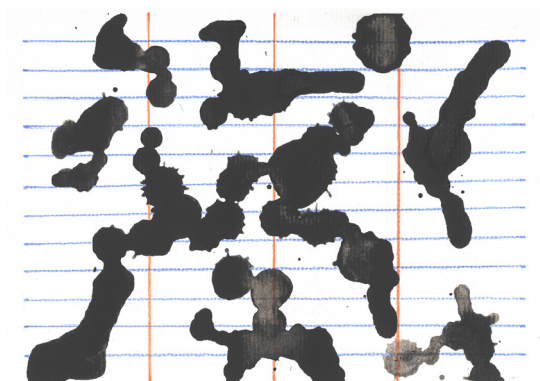
In section, you can see how the current landscape is functioning under the winter and summer conditions. In winter there is a need to store rainwater and in summer there are issues with drought. The second and third option both show the same landscape, but differ in water management. The second shows how the land is only flooded by rainwater, making the quality of the wetland dependent on the climate. In the third option, a minimum of water is always ensured by water from the boezemsysteem. This way, the land doesn't dry out in summer, preventing any subsidence of the soil and providing a continuous habitat for aquatic animals and amphibians.



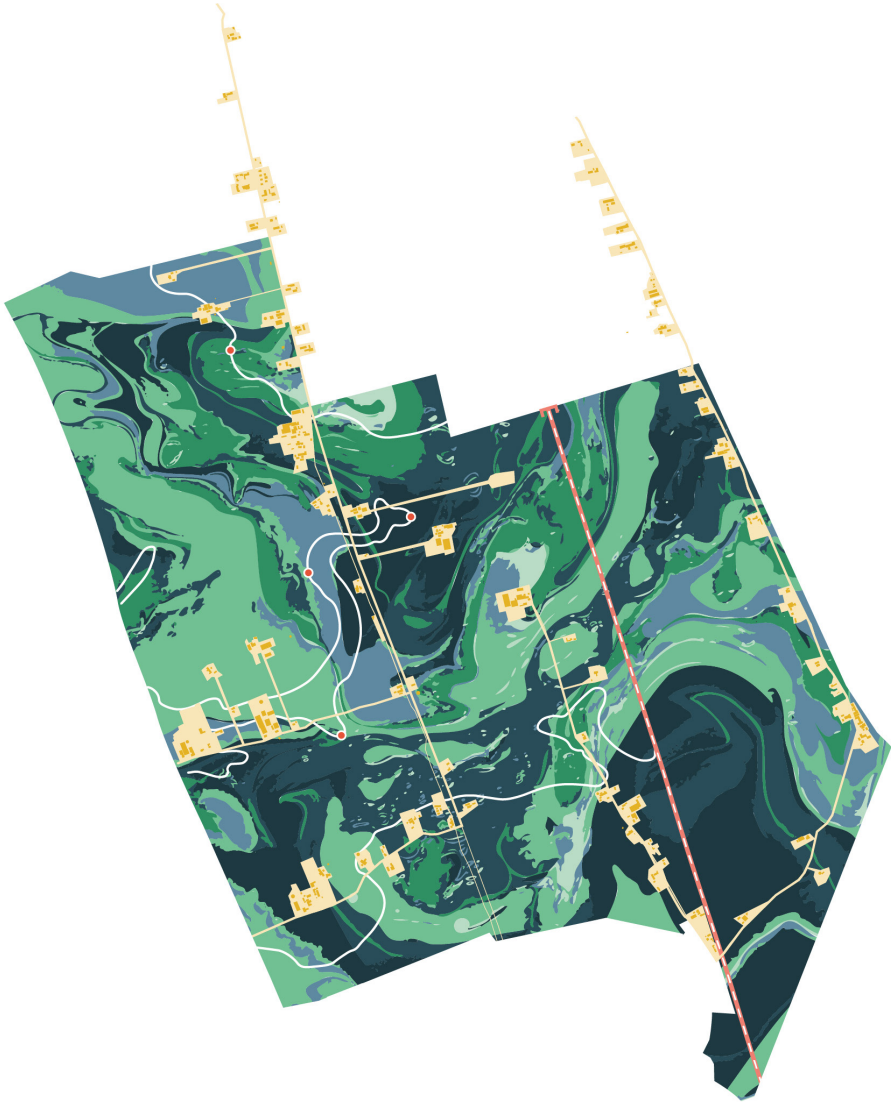
I use the rewilding Midden-Delfland as a strategy to drive the revival of the peatland. Designing the place would be contradicting to the concept of rewilding (meaning that nature develops with little to no human intervention). The nature should be shaped by the abiotic conditions, based on trial and error. To still get an idea of what this land would look like, I did a lot of experiments with watercolor, inkt, and lastly also with nail polish. The watercolor and inkt still didn't work, because it was too predictable how the endresult would be. I needed a level of surprise whilst maintaining control. The viscosity of the nailpolish differed per brand, so the way the colors would mix and flow was constantly different. The long drying time gave me enough time to manipulate the outcome of the piece. The experiment will be used to give an idea of what the natural succession will look like.



The nature of the landscape is dynamic. Dynamic in light, reflection, shadow, sound and color. Dynamic in water, soil, flora and fauna. All elements move at a different pace, some repetitive, some in continued growth. The rigidity of the rhythms in day and night and the unpredictability of the evolution of the land occur in harmony.

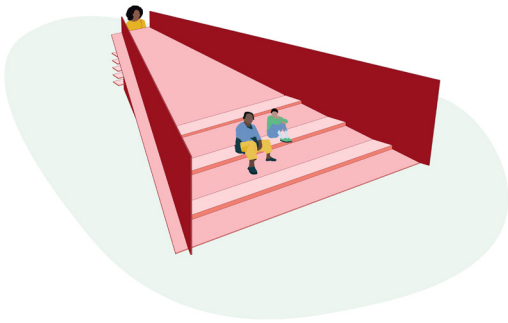


One of the ideas I wanted to test is to which extend the cultivated and urban layers should be erased. I think the experiment shows that the composition becomes interesting in the second drawing, as the orthogonal pattern starts a dialogue with the stains. It makes me curious about the erased layers whilst making me wonder how the stain will take over the page. It is this kind of tension as a result of a dynamic element that will be used in the design.



The landscape can be read as a palimpsest; layers of the past and present fuse to form a new language together. The layers of the landscape arrange into new compositions, evolve into new shapes, new words, reconfigure the sentences as the days pass, each page a different story.

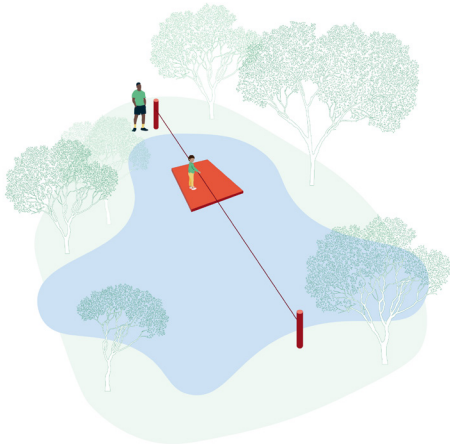
1. The frame emphasizes the complexity of the Metropolitan Garden; Midden-Delfland, forest, city skyline.



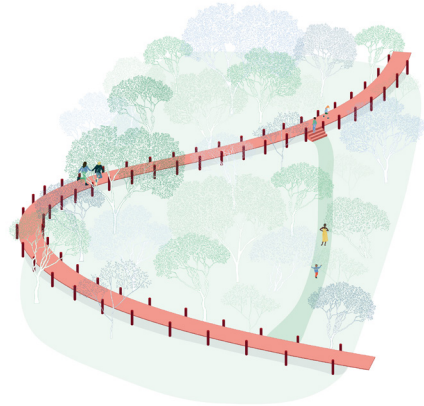
2. Similar to the work of Turrell, the seating frames the view on the sky, but this time it is placed in such a way that it shows the tree canopy.



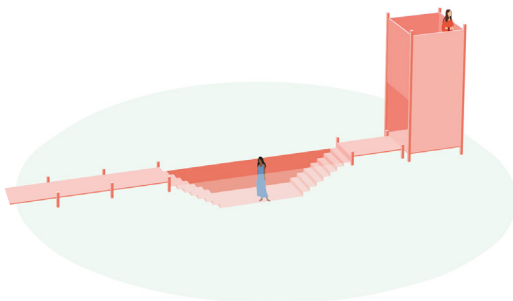
3. A crossing raft, where people experience the resistance of the water in a playful way.



4. An optional elephant path and an elevated path that shows the dirty footsteps.

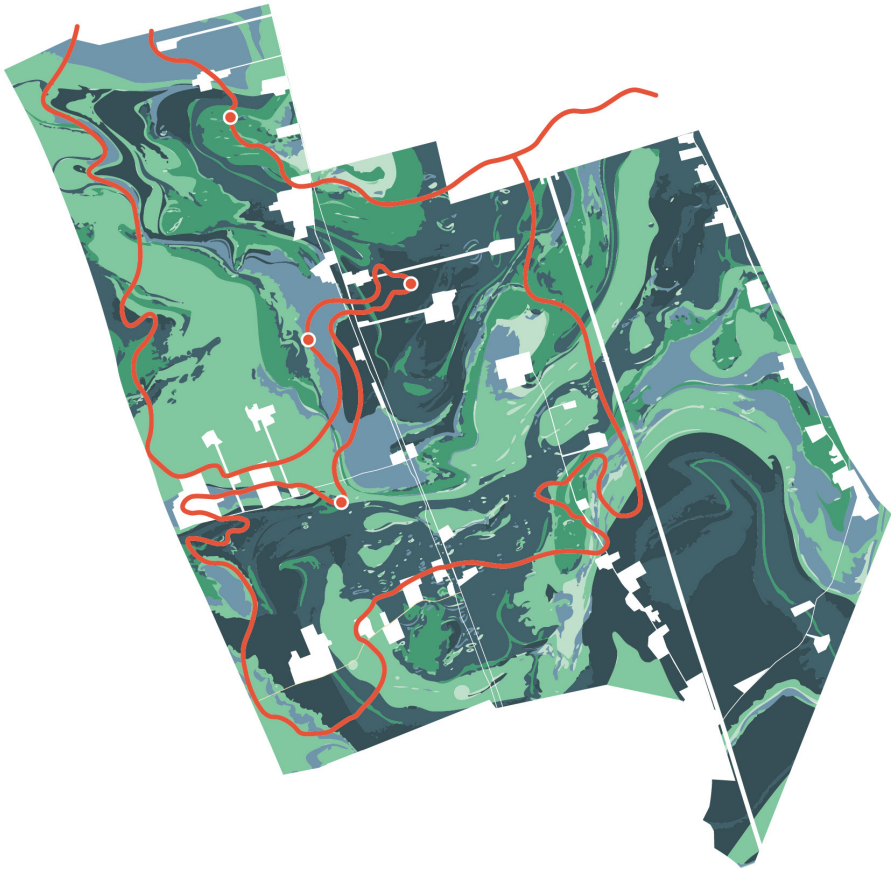


5. A birdwatch with a deepened path which can be flooded. Human access is here dependent on the weather.



6. The floating bridge, moving along with the dynamic swamp, creating a place to reflect.





The walking routes follow the outline of the former creeks. These routes cross the cultural route, enabling multiple entrances to the nature reserve. Along the route a series of land sculptures invite the visitor to perceive the landscape from a different perspective.

Vision

We present Midden-Delfland as a regenerative nature region in the Rotterdam-The Hague metropolis. This regional park provides a habitat for birds, aquatic species and land animals. This landscape compliments the surrounding mega-cities as it is in continuous development itself. Here one experiences the dynamics in water levels, seasons and years as the peatsoil grows. This CO2 captivating, biodiversity regenerating, breathtaking landscape tells us about history and future, it helps citizens understand the rich history of our country and allows us to get in touch with the actual soil like the city doesn't. The train track is used as a barrier to humans, to allow for a safe breeding zone between train track and Schie canal. Farmroutes facilitate daily visitors, fanatic campers and eco-food enthusiasts. The former farms fulfill the cultural purpose of a symbiosis between human and nature. Land art interventions lure you into the pits of the swamp, where a physical experience provokes an intimate and personal interpretation of our purpose on earth. These works highlight the beauty of the outdoors and make us humans humble towards the great spread nature.

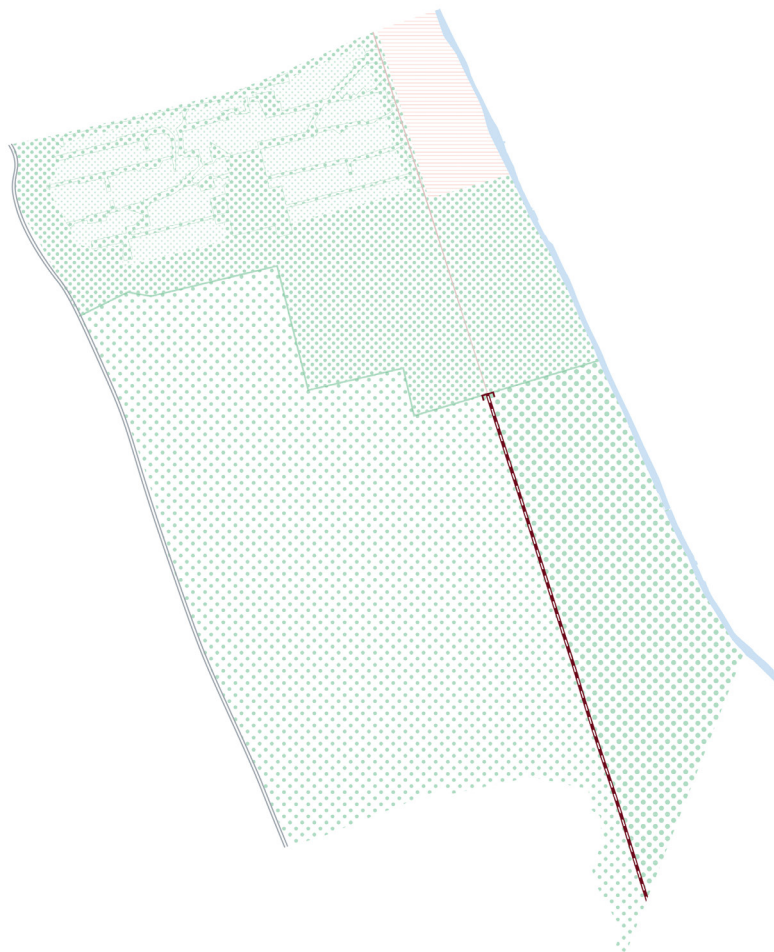
The Abtswoudse Bos stays a forest and improves to facilitate the needs of new users as the south of Delft redevelops and intensifies. The train track is brought underground to enlarge the experience of the park all the way to the Schiecanal, to adapt to development in the Schiezone. The forest becomes more wet, as the ditches are removed and the former creeks are restored. The creeks tell the story of the origin of Delft, makes the area more resilient to climate change and creates new habitats for aquatic flora and fauna. The waterbodies move into the neighbourhood to soften the transition between residential area and urban park. The entrances to the park become more attractive by placing public buildings like canoe rental, schools, restaurants and shops along the entrances. These functions all relate to circular or eco friendly living and help educate the visitors in an informal way. Through passive management, the forest becomes more wild and dense.

The Abtswoudse Bos continues into the green zone of Tanthof. A green-blue buffer that separates the neighbourhood from larger infrastructure, and green-blue fingers that create an alternative infrastructure throughout the neighbourhood. Similar vegetation to the Abtswoudse Bos is planted, but with more open spaces to gather and recreate. Backyards are opening up towards this green route, removing garden fences and replacing them by shrubs and trees.

The overall infrastructure of Tanthof improves as the tramline will be linked to the TU Campus, connecting east and west of Delft, and connecting Tanthof and the TU Campus to the NS station 'Campus Delft'. The buslane is removed to make place for a main road. Within Tanthof, a part of the residential streets become a woonerf: a street with minimized pavement and maximized green experience. People create a community garden with their neighbours, so the different uses of the garden fit the composition of the residents. Playing nature, urban farming, native vegetation and waterponds are just a few possibilities. The design is not delivered as a magazine cover, but rather grows along with the future generations.

The gardens of responsibility is a network of green that integrates nature experiences in the daily lives of citizens. Interventions that provoke a sense of responsibility, the skill of long-term thinking, which allows for intergenerational growth of the natural environment as well as the growth of a respectful worldview towards nature.



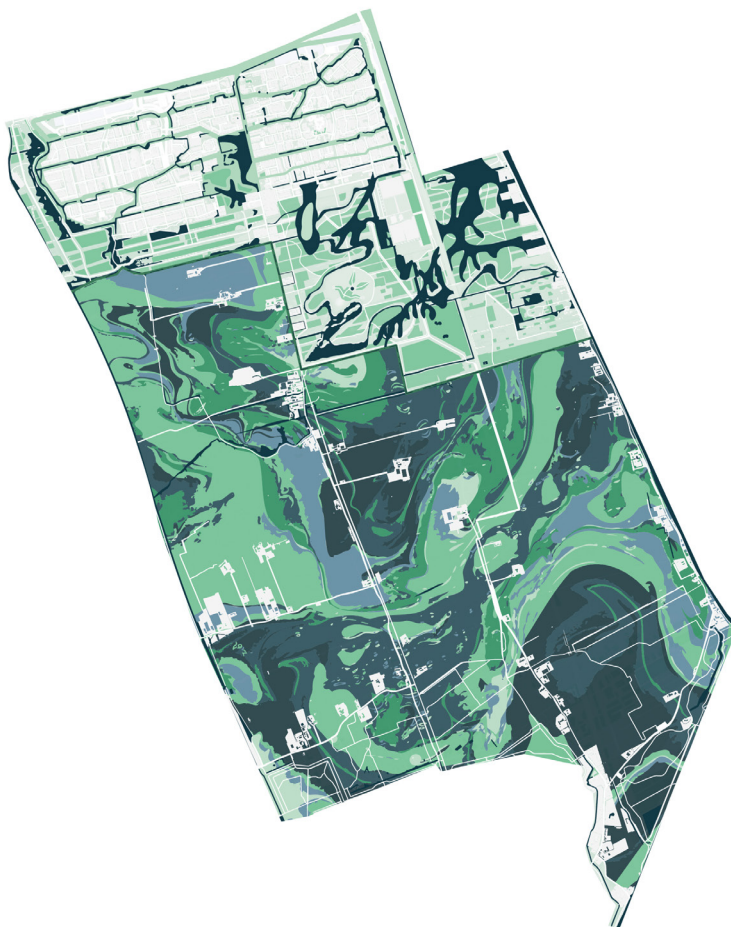


Zoning

The zoning plan uses existing barriers to their advantage, like the train track and the dike, since they are essential for Delft. In Midden-Delfland, the train separates the human accessible area from the silent bird breeding area. The other side of the traintrack is accessible by people, under the condition that they stay on the path. Midden-Delfland is a low maintenance nature zone. The train goes underground to enlarge the accessible area of the Abtswousde Bos and allows for the future urban development along the Schie-oever to be embedded within the current

urban system. Due to different water levels, the dike marks the different nature types, that emphasize the difference between an urban park and a regional nature reserve. Staatsbosbeheer territory is taken into the neighbourhood and around the neighbourhood to provide a strong green connection towards the park. The park is managed by Staatsbosbeheer. Tanthof is the residential zone where residents, and in some cases the municipality, are in charge of the green management.

*Left: Zoning plan
Right: Biotopes*



Biotopes

As a consequent of the replacement of the polderdijk, different biotopes can develop. Midden-Delfland transforms into a regenerative peatland. Due to abiotic rewilding, using rainwater from the city, a dynamic swamp is created. The Abtswoudse Bos remains a forest on clay soil. Through wetting a part of the forest, a gradual transition is made to the neighbourhood, where waterways narrow down to a human scale. Since the Abtswoudse Bos and Tanthof are part of one watersystem and share the same soil type, the clay forest can be drawn into the neighbourhood. The green

zones of Tanthof will thus have similar vegetation as in the Abtswoudse Bos. Differences between the two areas will be made through management, to maintain places of openness for wayfinding and urban program, like small play nature or a small soccer field. Here a good balance between habitat development (succession) and human use is achieved through zoning. On streetlevel there is more variety in vegetation, as people are allowed to grow their own food as well. As the neighbourhood is built upon a great pile of sand, the consistency of the soil in the former built area is more sandy.

Wetland

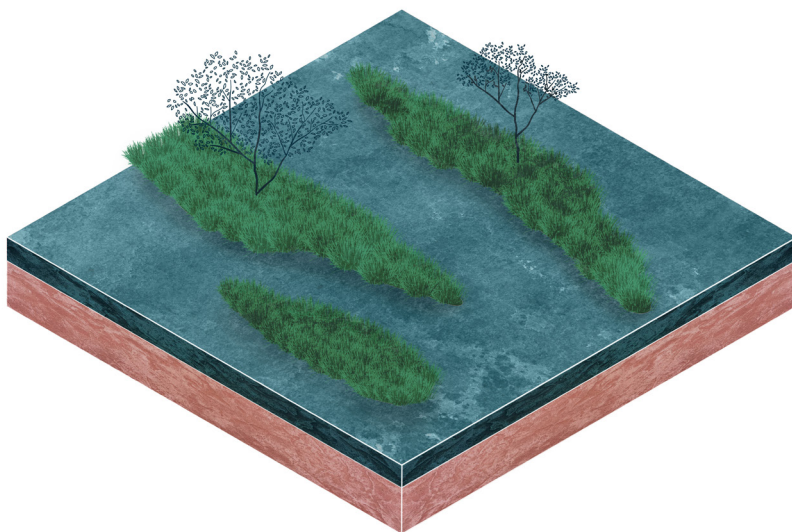
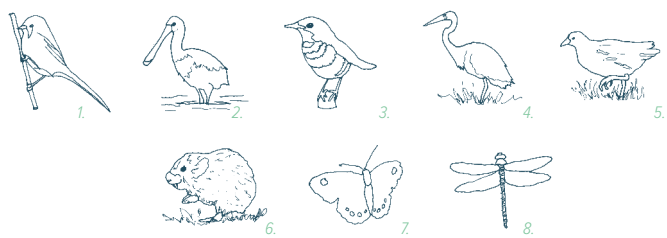
Midden-Delfland

A swamp is exists on the transition between land and water. Dynamic wetlands originally exist around large waterbodies and rivers, but former agricultural lands are suitable too, as long as a dynamic water level can be achieved. The theory chapter already elaborated on the topic of abiotic rewilding. The dynamic wetland is a type of swamp that exists under high water levels and are periodically flooded by surface water. This way, the nature doesn't transform into a forest and is less vulnerable to acidify. It is important that the soil stays wet, and that the water is nutrient rich and moderately acid to neutral.

The swamp is home to typical swamp vegetation like sedges and bogbean. It is the habitat to a wide range of animals like birds, fish, amfibians and a few mammals. A few key species are presented on the right.

People will have limited access to this area, and they will be asked to be quiet, with exception of the farmers routes. This way, people can enjoy the nature without disturbing the animals.

1. Bearded reedling
2. Common spoonbill
3. Bluethroat
4. Purple heron
5. Waterhen
6. Root vole
7. Wall brown
8. Green hawk
9. Marsh fern
10. Southern marsh orchid
11. Slender sedge
12. Saw-sedge
13. Common meadow-rue
14. Common mare's-tail
15. Cowbane
16. Bogbean





Collage of Abtswoudse road, with the remaining farm but transformed landscape. One feels how humans are visitors of this natural territory.



Collage of the bird watch in the swamp of Midden-Delfland. The scale is impressive and literally puts our power into perspective.

Design steps

Staatsbosbeheer property

1. Soften the edges with city borders. The necessity of the car roads are assessed and removed if possible. On the edge of Tanthof this means that the backyards facing the Abtswoudse Bos should be using native plants. In addition, water from the Abtswoudse Bos are drawn into the neighbourhood.

2. Combine 'urban' program with the experience of nature. Examples of this could be:

- Education
- Sports
- Cafés and restaurants
- Recreation
- Offices

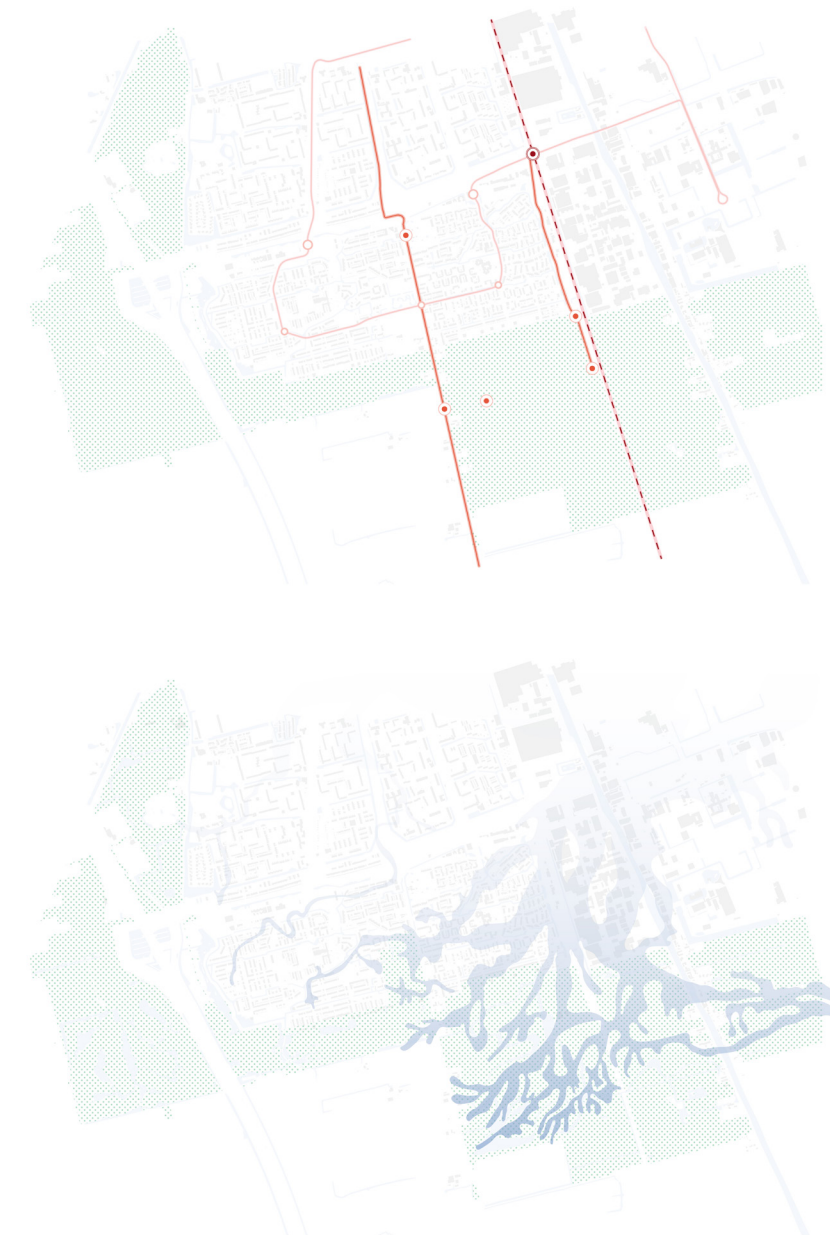
Adding urban program could help attract people, facilitate their needs when they are spending time in nature. The focus will mainly be on recreational facilities and education, as education in nature has proven to be beneficial for children's development whilst improving their affection with nature.

The challenge here lies in using enough program to attract people to nature, but not too much that the built is dominating the natural site. Whatever is built, will thus be done with respect to the natural environment, meaning that the buildings are made out of natural materials and can be demolished without harming the environment.

3. The experience of the landscape could gain meaning and depth by adding layers from the palimpsest. In the Abtswoudse Bos the former creeks can be restored (partially). Wetting the area also adds to the biodiversity of the place

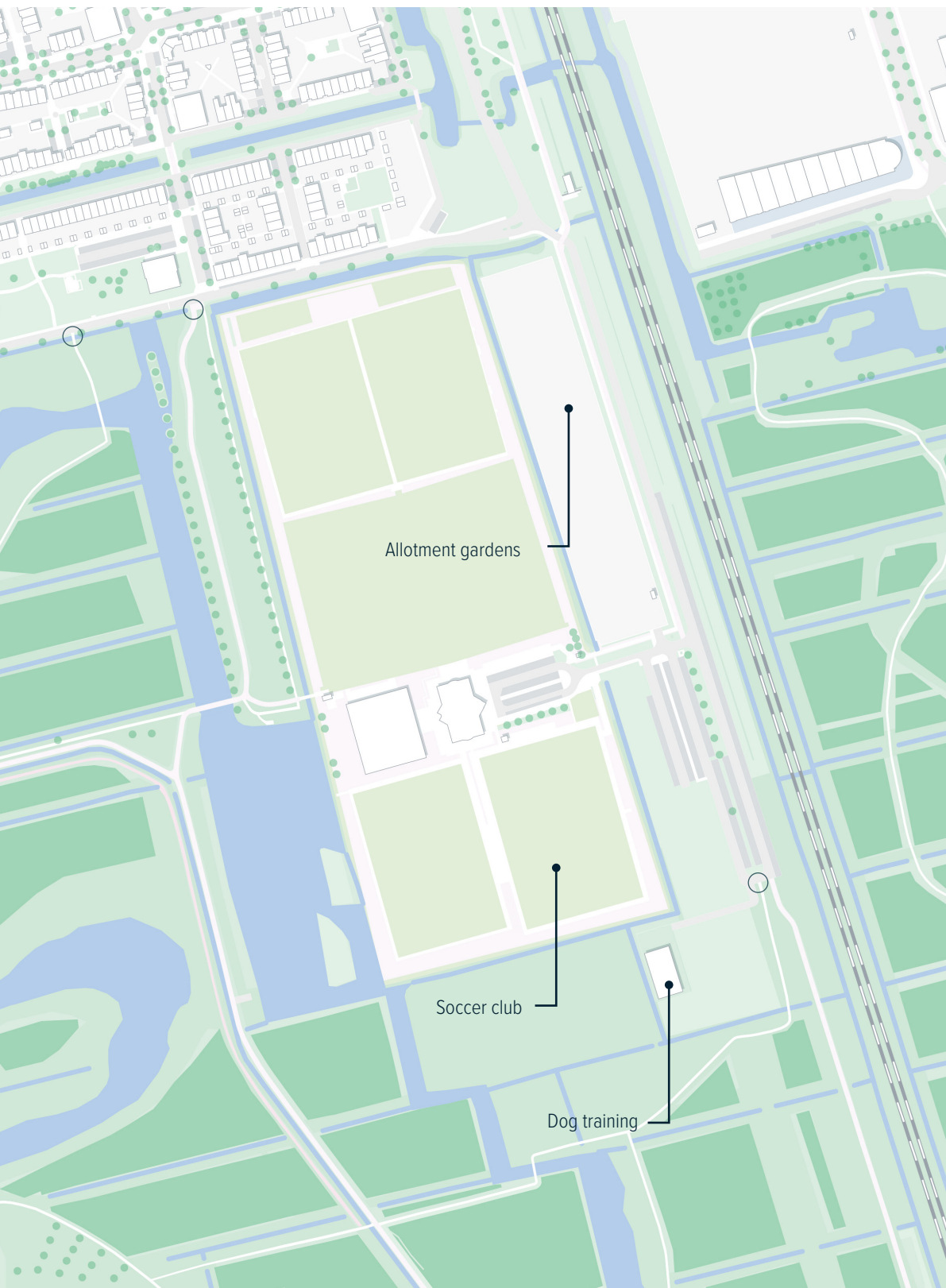
4. In an ideal situation, the train would be going underground at the transition from Abtswoudse Bos and Midden-Delfland, creating a continuity in the landscape. Removing boundaries has positive effects on the biodiversity, and enlarges the recreational area of the park. Additionally, the use of similar vegetation and new routes for biking and walking help creating a feeling of unity in the Staatsbosbeheer property.

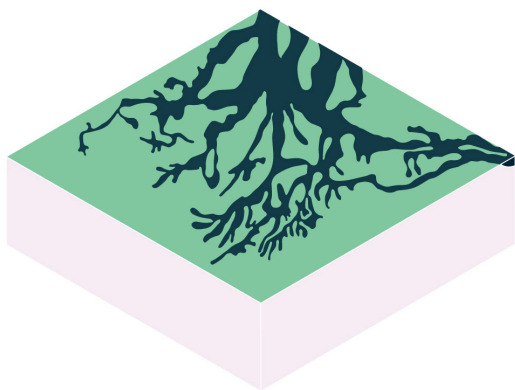
*Right top: Routing and urban program in Tanthof
Right bottom: Use of natural layer to soften the
edge between the Abtswoudse Bos and Tanthof*



Tanthof South

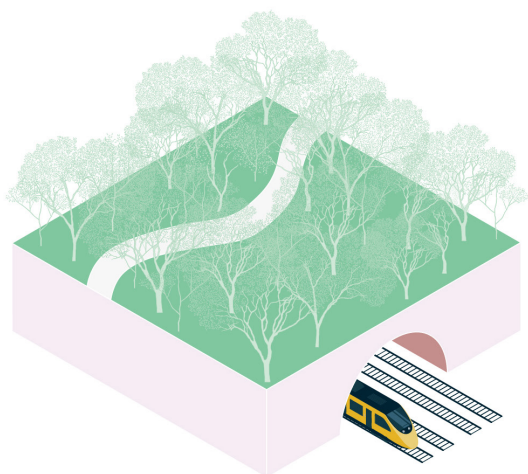






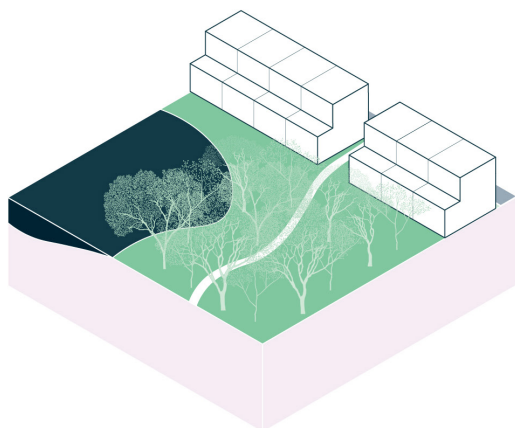
Creek

Replace the orthogonal structure of the ditches with larger waterbodies that follow the structure of the former creek.



Underground train track

Enlarging the accessible area of the Abtswoudse Bos by letting the train go underground. The park can become a neutral recreational area for the residents of Tanthof and the future neighbourhood along the Schie. Noise disturbance from the train also decreases.

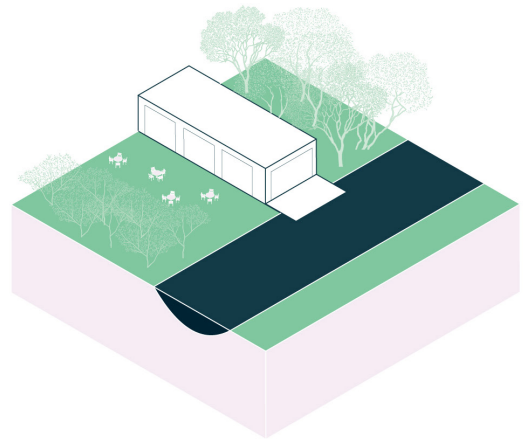


City edge

The original car roads make place for a soft transition from city to park as the forest and the water moves closer to the neighbourhood edge and even continues in the green zones. Backyards gradually transition into forest and waterbodies.

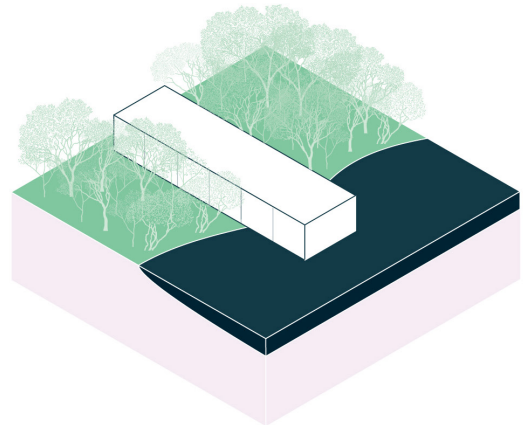
Café & Canoe rental

Placing a cafe at the edge of the Abtswoudse Bos, creates a meeting place and facilitates visitors of the forest. Combine this with a canoe rental and you encourage people to experience the forest from a different perspective.



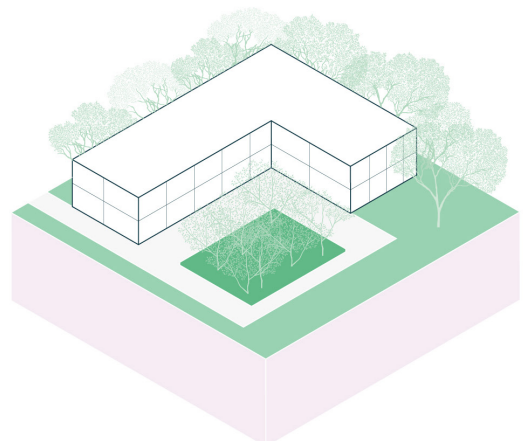
Staatsbosbeheer center & office

A Staatsbosbeheer center placed in the middle of the forest, functions as an office and a learning center. They can organise workshops and events for the local community and provide recreational visitors with some fun education on the types of nature in the area.



High school

Research shows how people create an affection with nature protection in childhood. Placing schools in forests and adding biodiversity and circularity courses in the curriculum helps growing a skilled and responsible generation that is capable of taking care of the world.



Tanthof South





Abtswoudse Bos - Tanthof

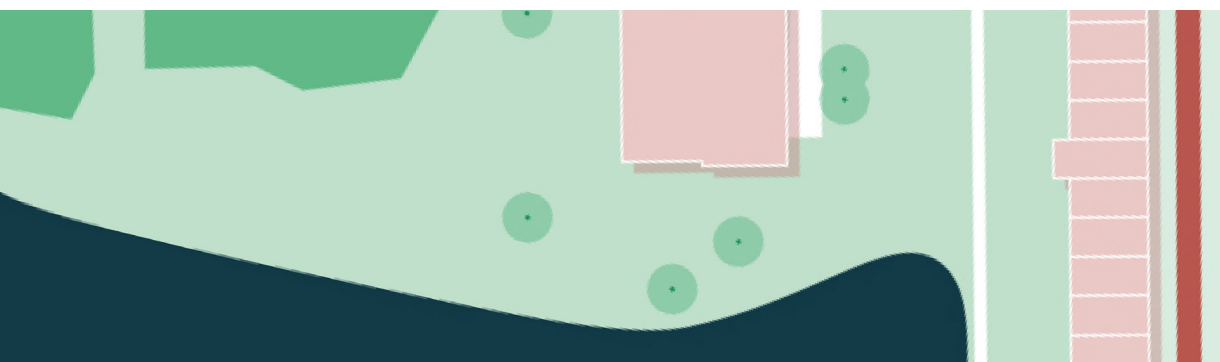
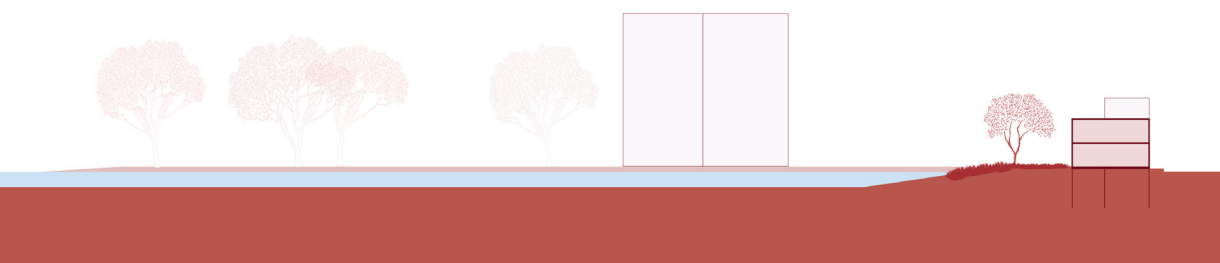
The introvert walks their dog in the forest, just before the dads wake up. The morning is the best moment of the day, as the light is at its best. The whole atmosphere of the forest changes within 15 minutes, like a change of the season.

They sit down on a mossy, dead tree, picks up a stick to throw away. The sound of crushed leaves reverberates through the woods. Deep smells arise from the soil after the rain.



Birds shoot away from the trees as they hear the enthusiastic trot of the four-legged foe. The dog barks and runs after them for a bit and returns with a wagging tail.

Dwellers of Tanthof wake up to the glittering reflection of the morning sun, reflected by the water, peaking through the curtains.



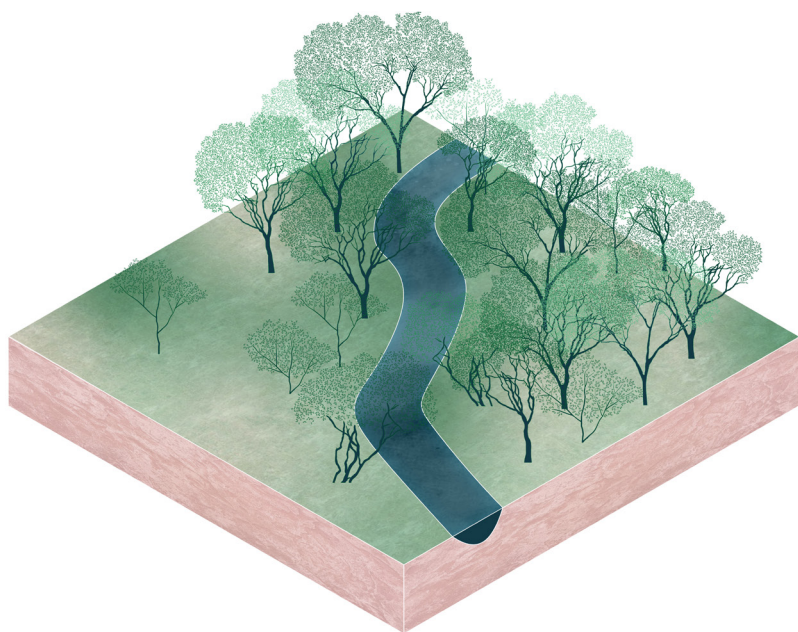
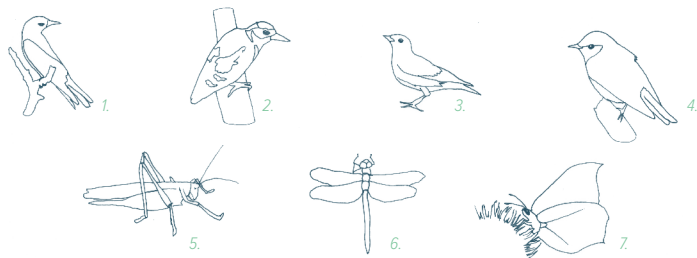
Alm and Ash forest

Abtswoudse Bos

The forest already exists, so the strategy here is to make some spatial changes and to change the management strategy. The current design of the forest shows its artificial nature, due to the orthogonal ditches and the land art in the center of the forest. This land art piece is a hill in the shape of a human, as an attempt to add meaning to the experience of the forest. As an urbanist, I do not agree with this choice, but it would be a waste to not benefit from the conditions that are already there. Another attempt to add meaning to the experience of the forest is done in recreating the former creeks.

A gradient from wet to dry creates all sorts of sub-habitats and therefore has a positive impact on the biodiversity in the forest. On the dryer patches there will be more herbs and trees, moving to the wetter zone there will be more willows and reeds and sedges. Increasing the open water surface will create better living conditions to fish and amphibian animals.

1. Golden oriole
2. Lesser spotted woodpecker
3. Woodlark
4. Wood wabler
5. Grasshopper
6. Dragonfly
7. Common brimstone
8. Field thistle
9. Cleavers
10. Fen orchid
11. Common alder
12. Greenland buttercup
13. Muskroot
14. Wild basil
15. European buckthorn
16. Brittle bladder fern





Collage of the Staatsbosbeheer centre in the Abtswoudse Bos. Source: Architecture for London (z.d). Image altered by author.



Collage of the edge of Tanthof zuid, transitioning into the Abtswoudse Bos. Image by author.

Design steps

Tanthof Streets

In the redevelopment of Tanthof the current morphology of the buildings stay the same. The design focuses on changes in the public space, including the infrastructure, parks and gardens.

1. Public transport needs to be improved win the mobility-battle from the car. Transport needs to be accessible, affordable, functional and sustainable. Private cars are not contributing to this goal. Let the tram route continue through the east side of Tanthof and connect it via the train station 'Delft Campus' to the TU campus.

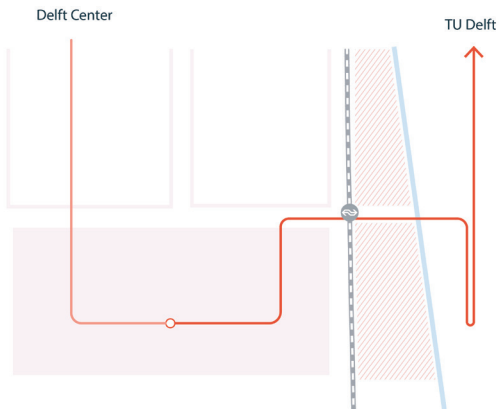
2. Create parking hubs near the train station and near the highway. Here people can go further by foot, bike, tram or shared mobility. The location of these mobility hubs are attractive locations for businesses. Adding some local program, like healthcare and daycare make a lively area.

3. A clear hierarchy is applied in Tanthof. One lane for the tram, a simple network for cars and busses and a continuous network for bikers and pedestrians. Allow the buslane to be used by (shared) cars to limit the amount of paved area for motorised traffic.

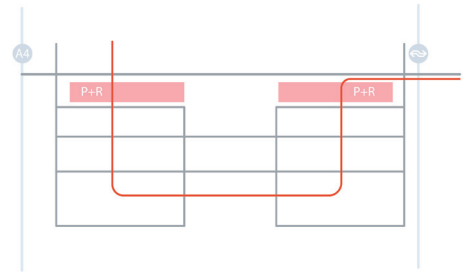
4. Cut off most of the streets to make it a dead-end street for car users. Cars can only enter for a kiss-and-ride or delivery. The bike-paths remain a connected network, and will be usable for emergency vehicles.

5. Add a green network as an alternative to the grey network; a network of parks with paths for pedestrians and bikers that has little to no interaction with the car roads and provides a green route from home to the Abtswoudse Bos.

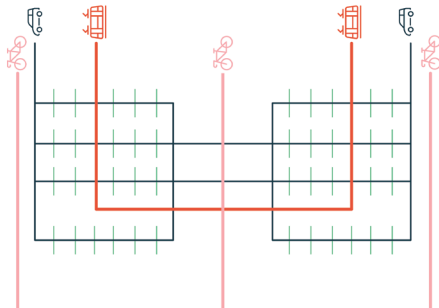
6. Limit parking spaces to the continuous car roads and neighbourhood entrances and take out the parking spots from the dead-end streets. The streets are depaved and regreened (rewilded) to improve local biodiversity and to connect the residential street to the green network.



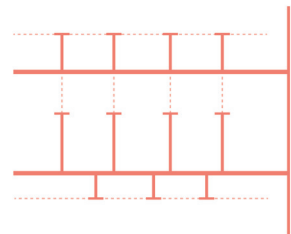
1. Improve public transport



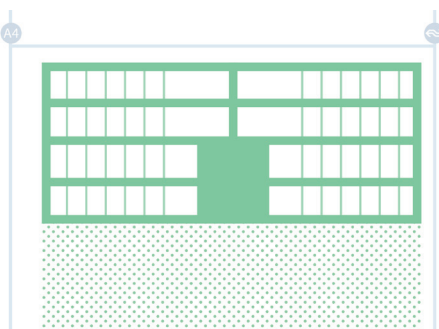
2. Mobility hubs are located at the edge of the neighbourhood, near the train and highway.



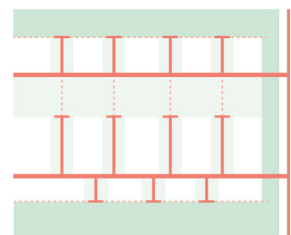
3.. A clear infrastructural hierarchy, prioritizing public transport, shared mobility and slow traffic.



4. The car is limited to a dead-end street where the paths for slow traffic continue.

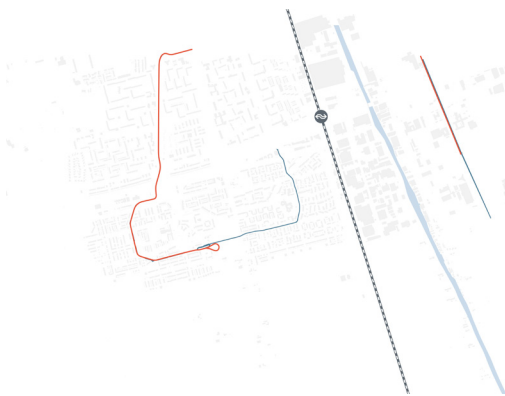


5. An alternative green route connects home to the Abtswoudse Bos.



6. Depaving of the streets to increase green public space and add to the green network.

Mobility



Public transport Tanthof, situation 2022



Public transport Tanthof, design intervention

LEGEND

- Tram
- Train track
- Buslane
- Water
- Buildings
- NS station

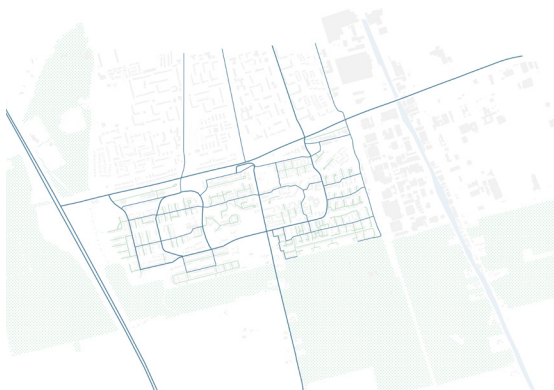
Tramline

The tram is going until the midst of the neighbourhood, via the west side. Other local public transport is provided by the buslane; a car-free street that runs through the neighbourhood. The tramstops are often not accessible for people who use a walker or wheelchair due to small height differences and the lack of benches. Busses in general are often not that inclusive to people with mobility issues. The buslane has the benefit of allowing a bus to drive faster. At the same time this asphalted buslane takes up a lot of space in the street, which can't be used for other vehicles. A waste of space?

On a more conceptual note, the buslane contrasts with the idea of the woonerf, where cars are limited to give more space to slow traffic and recreation. Creating a road that asks for traffic lights and fences, a gesture that obviously prioritises motorised vehicles, contrasts heavily with the infrastructure system present in the neighbourhood. This contrast creates a certain level of confusion, as the buslane is both a barrier and a passway.

If we are talking about space, it might seem like a strange idea to swap the buslane for a tramline as they are taking up roughly the same amount of space. The tramline however, can be filled with grass instead of asphalt. The tram is also a preferred vehicle as it is more cost effective than the bus and provides with more space for travelers.

The continuation of the tramline would also be an appropriate intervention, given the current redevelopment of the NS station 'TU Campus' finished in 2024, (ProRail, z.d.), the plans for redevelopment of the Schie-Oevers and the extension of the TU Campus (Gemeente Delft, 2021). Connecting the tram to the east of Delft, can give a new impulse to each of the redeveloped areas and provides with alternative routes as the amount of dwellers is increasing in these areas.



Infrastructure Tanthof, design intervention



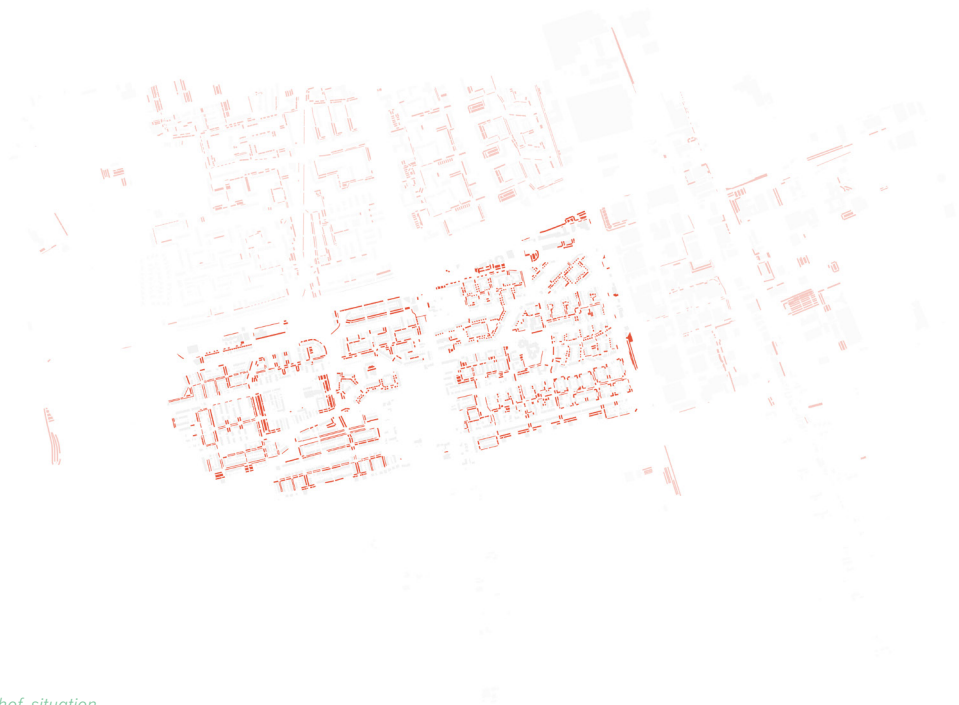
Infrastructure Tanthof in relation to the green zones

Revival of the woonerf

Chapter three offers insight into the elements of the woonerf. For the redevelopment of Tanthof, the woonerf type will be implemented in most residential streets, to allow for more interaction between dwellers and their direct environment. To create this space, car mobility will be limited. In the image above, the hierarchy of the infrastructure is classified by its main users. First the public transport, then a big network for the (shared) cars, with separated lanes for each user. The network of woonerven fades into an even finer network of bike and footpaths. Changes in the infrastructural system allow for a gradual transition from private car to shared mobility.

As parking spots are removed from the street, extra space is created for green, inviting dwellers to interact with nature on a daily base. The woonerven are linked to the existing green network. In some cases there is an exception, solved by an additional route along the backyards from the woonerf to the green zones. Residents can use the green infrastructure as a recreational route from home through the Abtswoudse bos, all the way into Midden-Delfland.

Parking



Parking spots Tanthof, situation 2022

Private mobility

To get an estimation of the amount car spots necessary to facilitate the people in Tanthof, a calculation is made based on the amount of homes, the type of homes and the parking norms. In Tanthof Oost, there are 3023 homes of which 1814 family homes and 1209 apartments. In Tanthof West there are 3787 homes, of which 2159 family homes and 1628 apartments. For a broad estimation I chose a family home to be $90 \leq 130\text{m}^2$ and the apartment to be $60 \leq 90\text{m}^2$. Using these estimated housing types, we can look at the corresponding parking norm today; for the family home that is 1,5 car per home and for the apartment 1,3 per home.

The amount of parking spots it then calculated as:
 $(1814 + 2159) \times 1,5 = 5959,5$ parking spots for family homes
 $(1209 + 1628) \times 1,3 = 3688,1$ parking spots for apartments
Which brings us to a total of 9.647,6 parking spots.

If a parking spot is $12,5\text{m}^2$, then we would need 120.595m^2 of parking space. According to CBS, people drive about 56 km a day with their car. That is an hour of driving, traffic jams not included, so we are using 120.595m^2 of space for expensive devices that are used only 1/24 of the time. Research from Ministerie van Infrastructuur en Waterstaat (2021) looked at the development of shared mobility, giving us some interesting insights. The report shows an exponential growth in shared cars since 2016 internationally. The report also makes clear that car sharing is more popular with young people (≤ 50 years old). It also states that car sharing is more popular under single people than it is for couples with children. There are roughly 47% singles living in Tanthof who might be interested in shared mobility. Car sharing definitely leads to less private car use and might be a solution for those who can't reach their destiny by public transport.



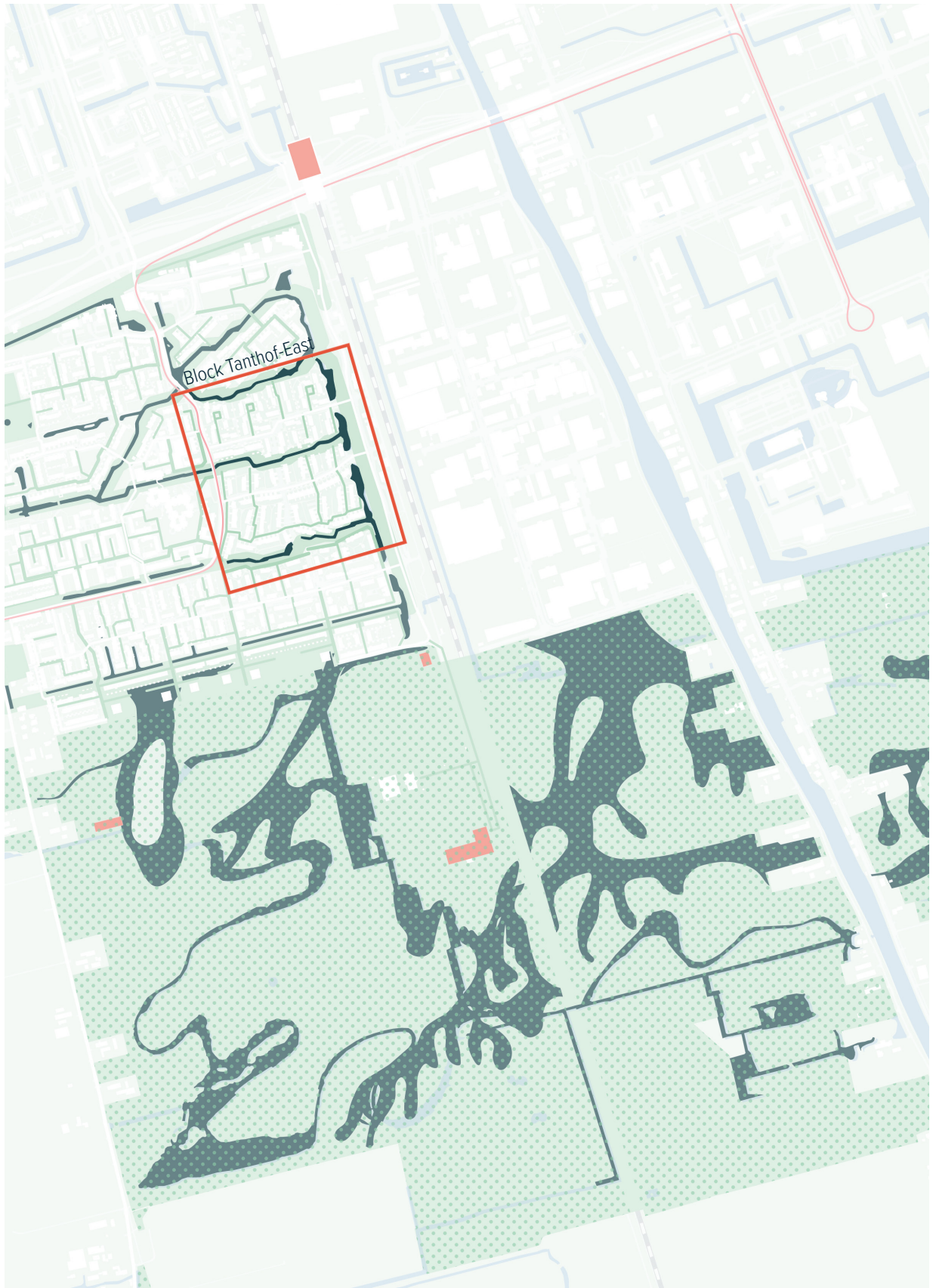
Parking spots Tanthof, proposal

Transition to shared mobility

The transition to shared mobility will not be happening within a day, so as we are exploring all options, it is important to see where alternative parking Hubs could be created. Tanthof has a great location regarding mobility, as it is near the redeveloped train station 'Delft Campus' and near the Highway. Taking into account that the area along the Schie will be developed to become a dense living- and working environment, a parking hub is not a bad idea. The parking hub could make the transition from private vehicles to shared mobility and public transport a lot easier.

From site visits, it became clear how some of the office buildings on the north side of Tanthof were to be redeveloped. The scheme shows a rough estimation of the amount of m^2 possibly available. This could come down to 490000 m^2 , keeping in mind that this is the area for parking + routing. If the parking hubs turn out to be necessary, they need to be build in a way that they can be redeveloped to other uses. In light of the design it is not preferred to make new parking spots. The focus will be more on facilitating good public transport and attractive biking routes.





Tanthof West

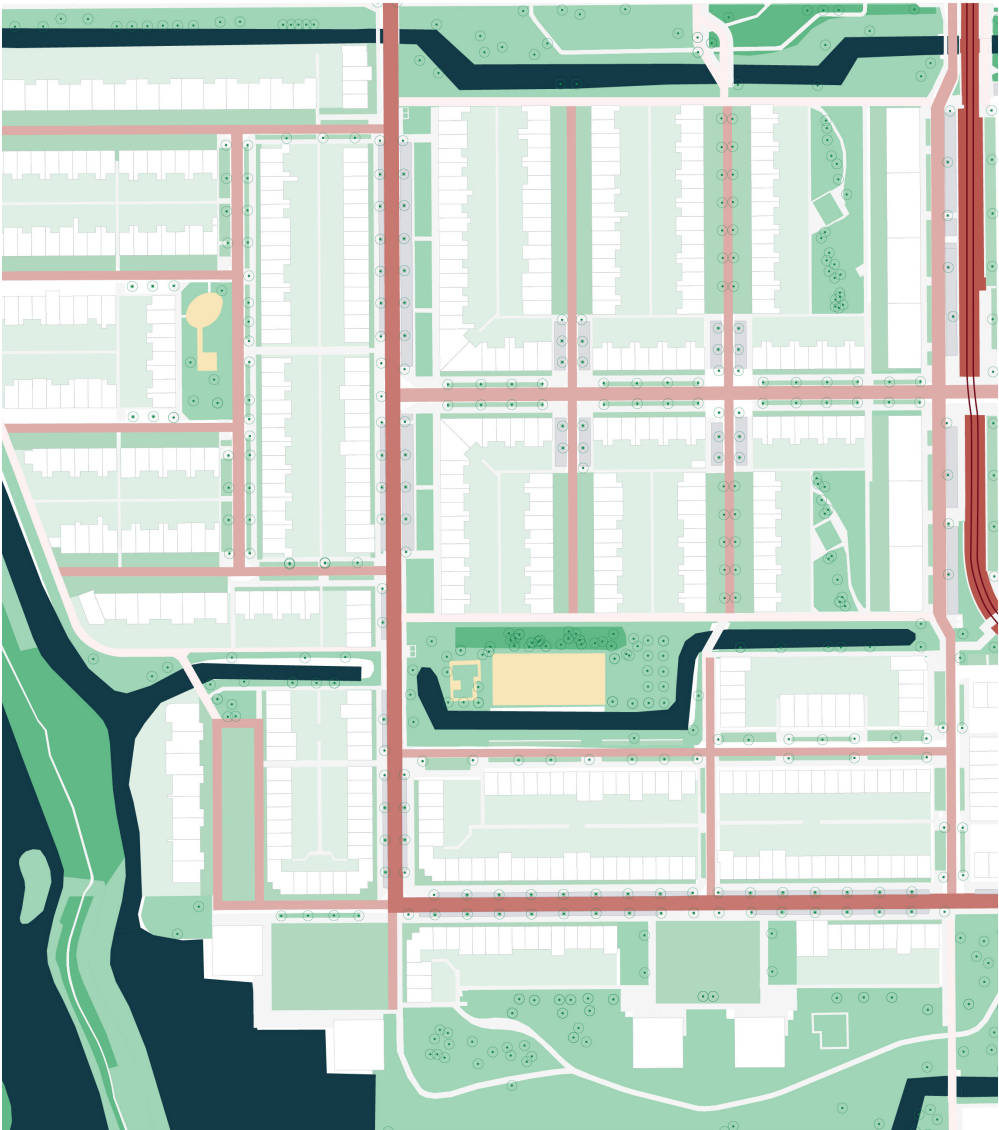
Now



Tanthof West is in its morphology orthogonal and logically structured. The image shows how the frontyards are used as private parking spots. The diagram on the right shows the paved area in the public space, excluding all pavements that people have used in their backyards.

Although the area is pretty green, the area around the house is mostly paved and dominated by cars.





The hierarchy in the neighbourhood prioritises accessibility for slow traffic and limits car movement to the main streets. This way, most residential streets can become part of the green network that is connected to the existing green zones. Dead-end streets are partly depaved to allow for more green space. These streets connect to a biking path to encourage slow traffic and to facilitate a flee route for emergency vehicles.

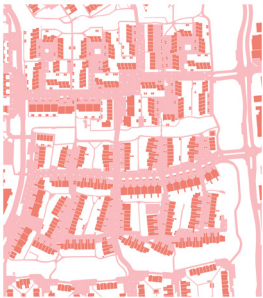


Tanthof East

Now



Tanthof East, there is a difference in morphology, and a similarity in the horizontal layout of the green zones and the main streets.





In Tanthof East, the same principles apply, although the morphology allows for green courtyards to arise within the building blocks.



A livable future



Depaving is part of a larger strategy to mitigate climate change. The sections show four ways of how depaving affects the liveability of the direct living environment in Tanthof.

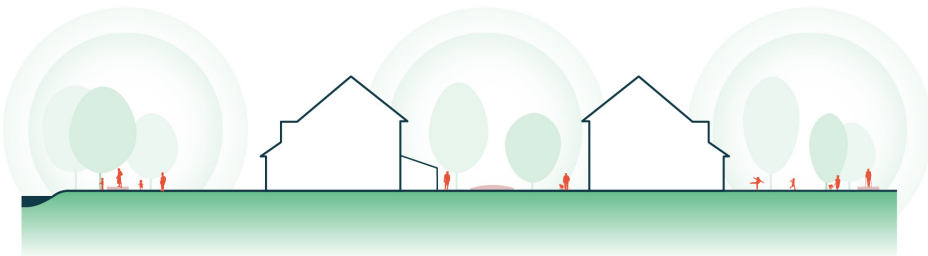
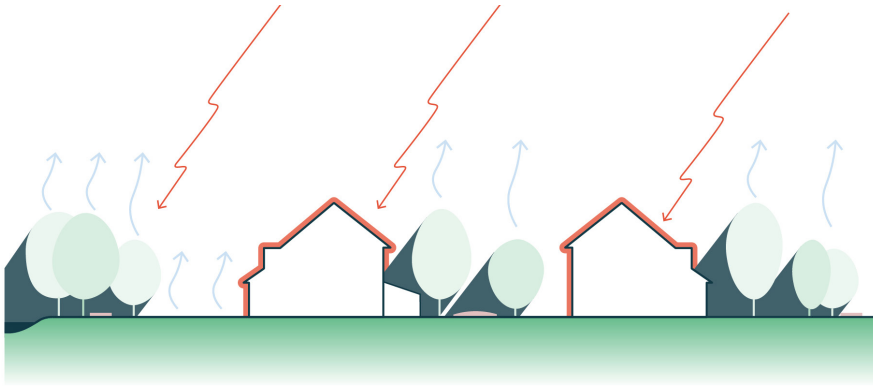
Today, water falls onto the pavement and is lead into the sewage system, where the rain and black water are competing for space. Porous pavement helps infiltrating the rainwater in the soil. Even better are open areas with lot's of green; vegetation retains the water to prevent

flooding.

Through replacing the pavement with native vegetation and by adding wet and dry areas, the local biodiversity can be improved. Native vegetation has deeper roots and is more resilient to changes in climate. Since people are part of the ecosystem, we too benefit from a great biodiversity.

Top: Rainwater infiltration.

Bottom: Creating different habitats.



Buildings and pavement are often made of brick or concrete. These materials are great at storing heat; they heat up during the day from the sun, and at night, they slowly release that heat. Pavement thus contributes to the increased temperature in cities compared to rural area, the so called Urban Heat Island effect, which forms a serious health threat. Vegetation does not heat up like stone, and has the quality to evaporate water, which - like sweating - has a cooling effect. Trees play an important role in preventing UHI effects, as their

shadow prevents buildings from heating up. Using the depaved area for green public spaces facilitate a healthy lifestyle as spending time outside benefits mental health. Community gardens also have a strong social value as it is a neutral place where co-operation takes place between different people. The garden itself is a public good.

Top: Mitigating heat stress through depaving and smart placement of trees.

Bottom: Green public spaces benefits physical and mental health.

Design steps

Tanthof Green zone

1. Use the enclave characteristics of Tanthof as an advantage by greening the zone around the neighbourhood. This way the people from Delft could always take a green route to enter the Abtswoudse Bos without having to go through the neighbourhood. The green zone also forms a buffer between the heavy infrastructure and Tanthof.

2. Open up the experience of the green zone by making the backyards fence-free. Instead, the private territory is enclosed by hedges and reed.

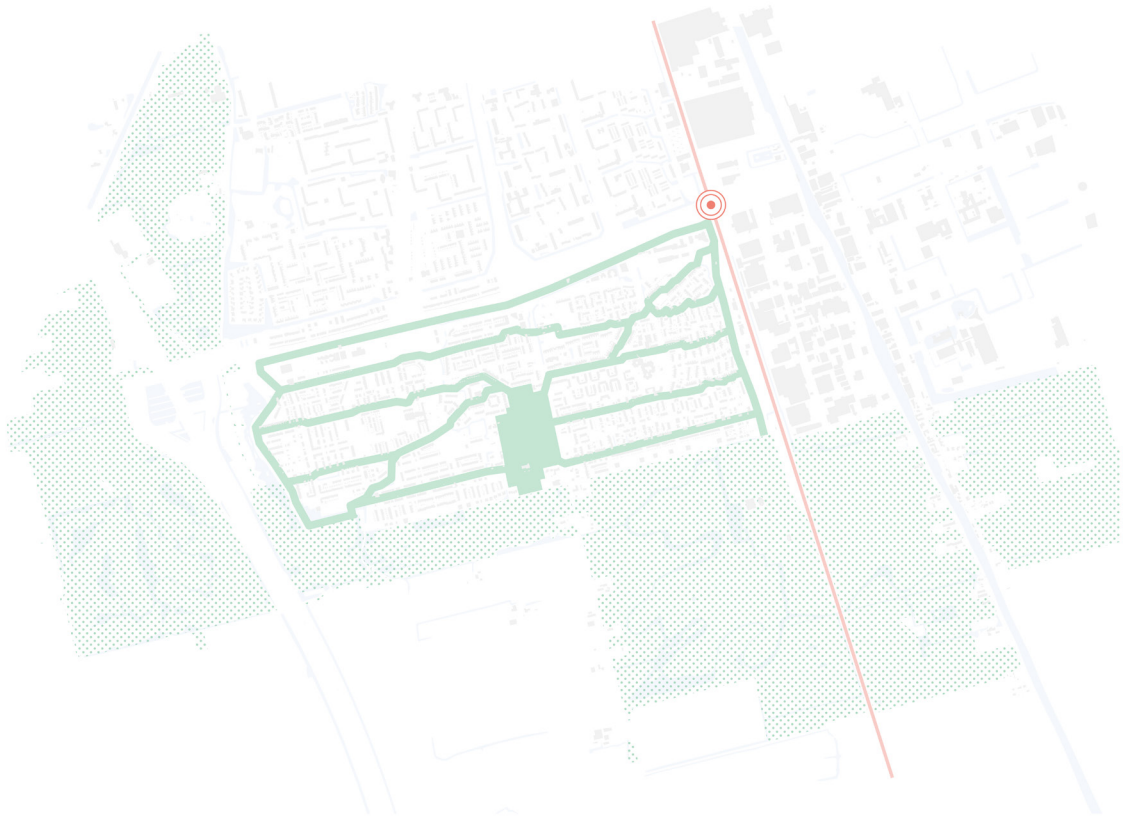
3. Backyards have a private area and a community area. The private zone is relatively small to prevent the backyards to become completely paved. The community area opens up the space and allows for a wilder type of vegetation. And adds to the connectivity with the green zone.

4. Let the Abtswoudse Bos move into the neighbourhood by forestation of the green zone. The current centre place of the green zone is designed as a reference to the cultural landscape. The polder like structure thus serves no use other than aesthetics.

5. Use façade green on the blind walls of building blocks.

6. Create pathways and cycling roads in the same materials as the Abtswoudse Bos, to increase the continuity in experience from the neighbourhood to the forest.

Right: Using the green zone as a green infrastructure in Tanthof



Neighbourhood park

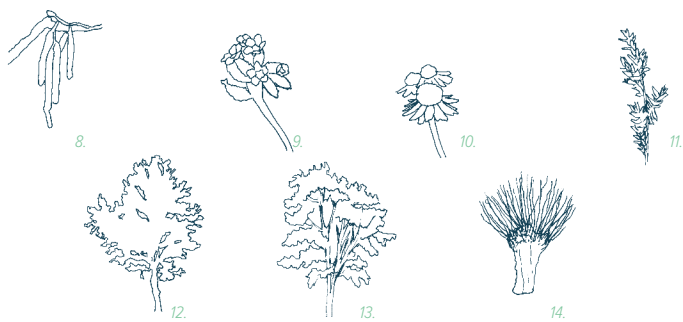
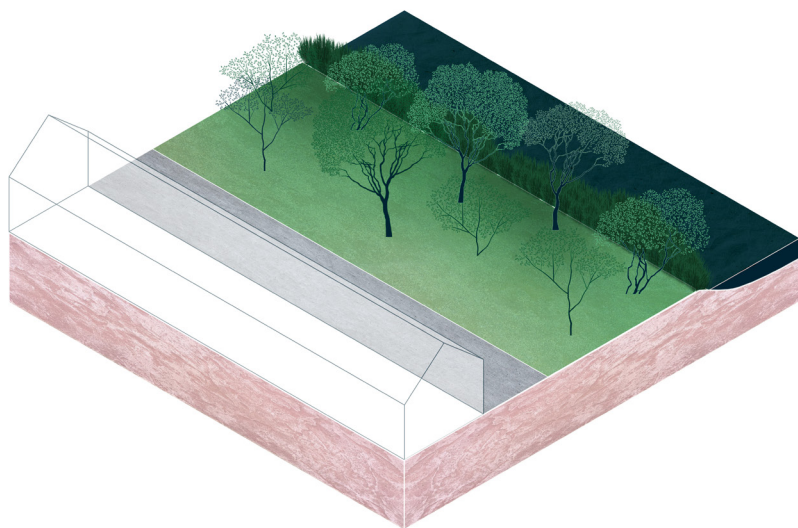
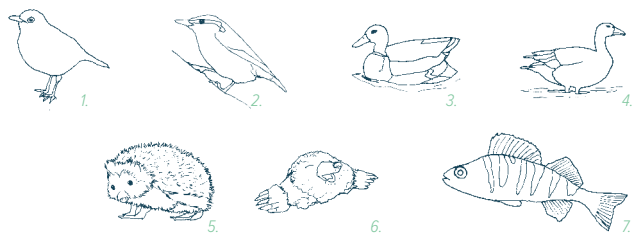
Green zone

The green zones are the backbone of Tanthof. The backyards facing the green zone transition from private to community garden. In vegetation this gradient becomes clear as the tree species and shrubs are similar to the rest of the green zone. Shrubs and reeds are used to create a sense of privacy. The green zone is a public green route, containing some open areas to play soccer or other games, and places with playnature alternated with areas that are more dense in vegetation.

Through the use of similar vegetation to the Abtswoudse Bos, the green zone functions as a soft transition from neighbourhood to forest.

The green zones are under municipal management, they require a bit more frequent management to maintain the open spots and to prevent eutrophication of the water.

1. Blackbird
2. Nuthatch
3. Mallard
4. Gray goose
5. Hedgehog
6. Mole
7. Perch
8. Hazel
9. Forget-me-nots
10. Chamomile
11. Elongated sedge
12. Common alder
13. Elm
14. Willow





Dancing women (no reference)

Kid in the tree, from 'What's Eating Gilbert Grape' (Hallström, 1993)

Image via: <https://i.pinimg.com/originals/5f/53/d0/5f53d0b16b594789ac934d79252a0aee.jpg>.

Kids in front of the hut, from 'Petite Maman' (Sciamma, 2021).

Image via <https://filmkrant.nl/recensies/petite-maman/>



Collage of a backyard along the green route in Tanthof.

Design steps

Woonerf

1. The woonerf exists of a dead-end road, attached to a continuous road. Shared facilities like trash collection and shared vehicle parking is located at the crossing of street, facing the blind walls of the dwellings. Smart built in trash containers are placed here for residual waste. Organic waste will be reused within the street.

2. The width of the street is minimized and excess pavement in the fronyards are removed to make place for nature-based interventions.

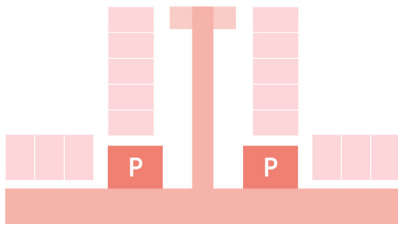
3. The dead-end road has a turning point at the end to minimize paved area. The increased open (green) surface helps softening the transition between residential street and green zone.

4. Different types of nature are realised: urban farming, wild nature, ponds and playing nature creating diverse habitats. The composition of the built and unbuilt area also impacts the conditions of the habitat depending on their position to the sun and wind. Exotic trees or dead material can be reused to create play-nature.

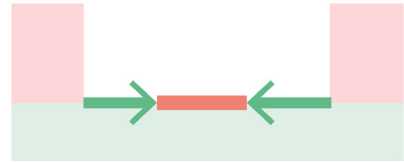
5. Pick community over private in designing the gardens. Turn the front yards from paved private space into community gardens, make the pathways from semi-paved material and let the paths of two homes be a shared path to limit the paved surface whilst maintaining accessibility for people with disabilities.

Community gardens help create stronger communities, and facilitate social interaction outside the house. Knowledge, tools and enthusiasm is shared. Existing indoor parking spaces, may stay part of the house, but will be used as greenhouses, to allow people to enjoy the gardens even in wintertime, whilst maintaining the interaction with the street.

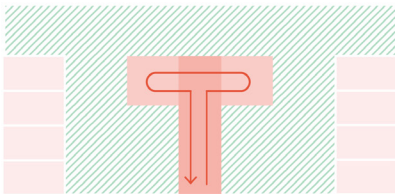
6. The composition of these nature types is dependent on the users; safe playing space for toddlers, challenging routes for older children, places to sit for parents and elderly, food gardens etc. The gardens don't have to be 'finished' at some point. It is a dynamic, growing piece of interaction between humans and nature. Generations see trees grow, plants die and regrow, they might see new species as the vegetation intensifies.



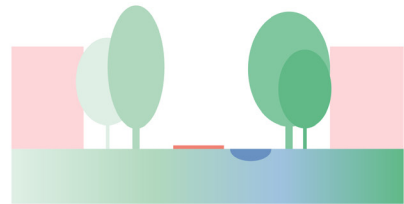
1. Hierarchy of the streets and shared facilities at the nodes.



2. Minimize paved area.



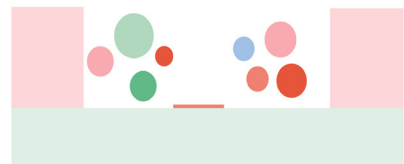
3. Create a turning point for the car at the end of the road, create a continuous green area.



4. Diverse habitats can be realised by placing ponds, trees, shrubs and edible vegetation.



5. Collective space over private space.



6. The composition of the street is dependent on the composition of the residents

Reclaiming the street



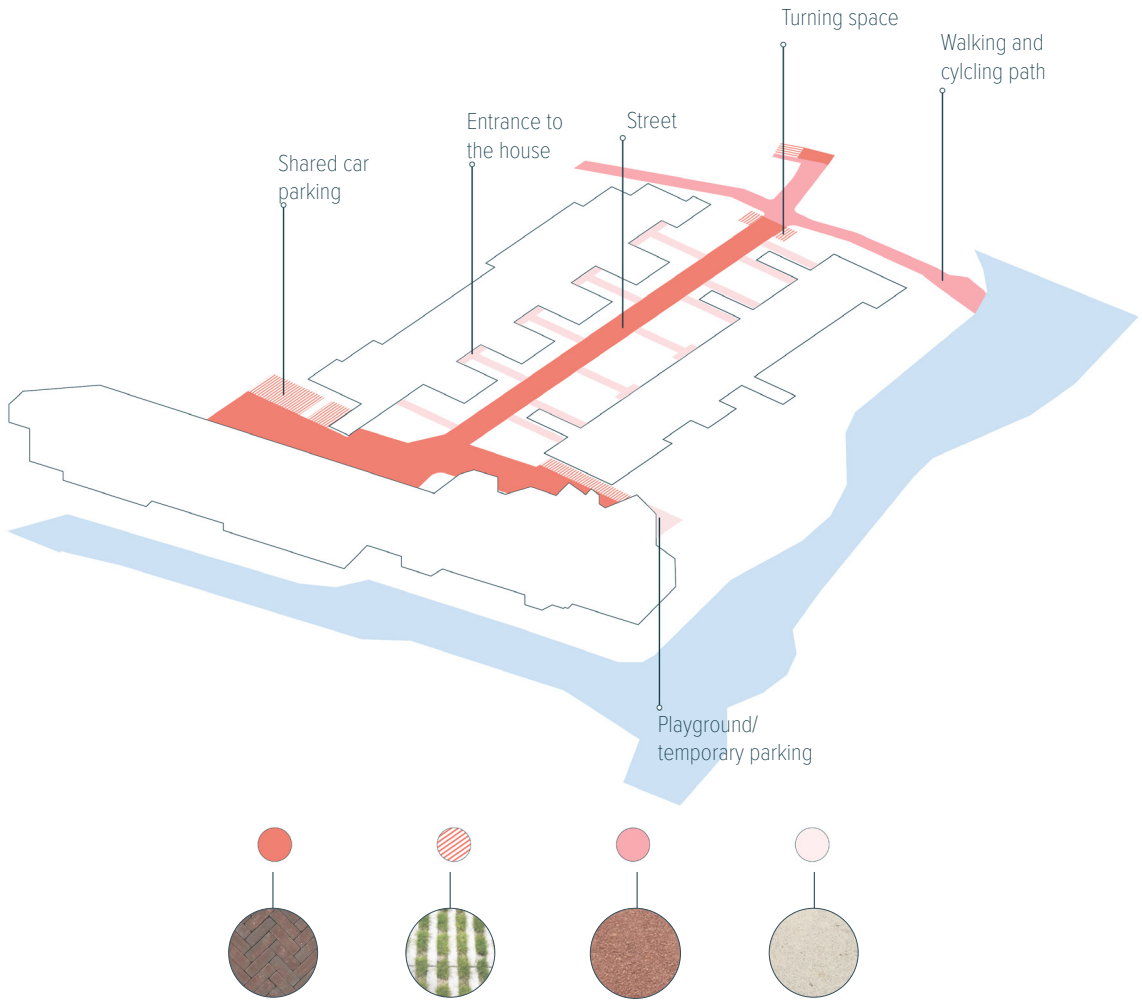
We zoom in on four streets, to show how a new interpretation of the woonerf could be applied. With great effort, these four streets are selected to represent the street types in Tanthof (excluding the larger continuous roads). It must be mentioned that no street in Tanthof is the same. The design interventions are applicable to a variety of streets, and are flexible in use and scale.

The four streets:
1. Namibiëstraat
2. Wielewaalstraat
3. Medinastraat
4. Eekhoornhof



How to redesign the woonerf in such a way that people reconnect with nature? To answer this question I took two pictures: one in the Abtswoudse Bos and one in Tanthof. What would the street look like if nature took over? What elements of the street are necessary for the street to function? What elements from the woods can we use in the design?

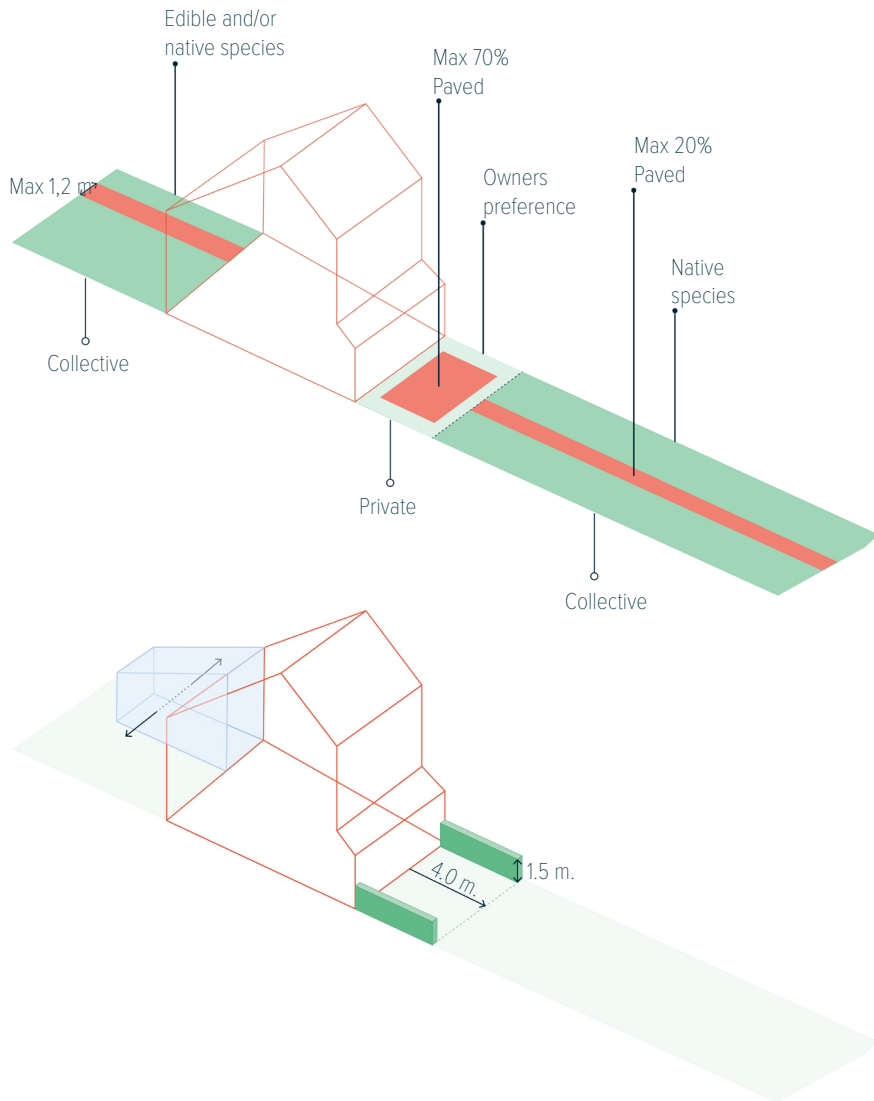
Design rules



Isometric scheme of the design rules that apply to the woonerf.

De redevelopment of Tanthof allows for more freedom in the use and layout of the street. To achieve this goal, design rules are made to ensure a desired level of mobility, safety and quality. All excess pavement is removed and semi-paved or porous materials are used for different elements in the street. The materials fit the pressure and frequency in which it is used to maximize durability.

The design uses materials that are somewhat firm, to enable easy use by wheelchairs, strollers and walkers. Some of the removed stones are reused in other projects in Delft, but other stones are used to build eco-cathedrals.



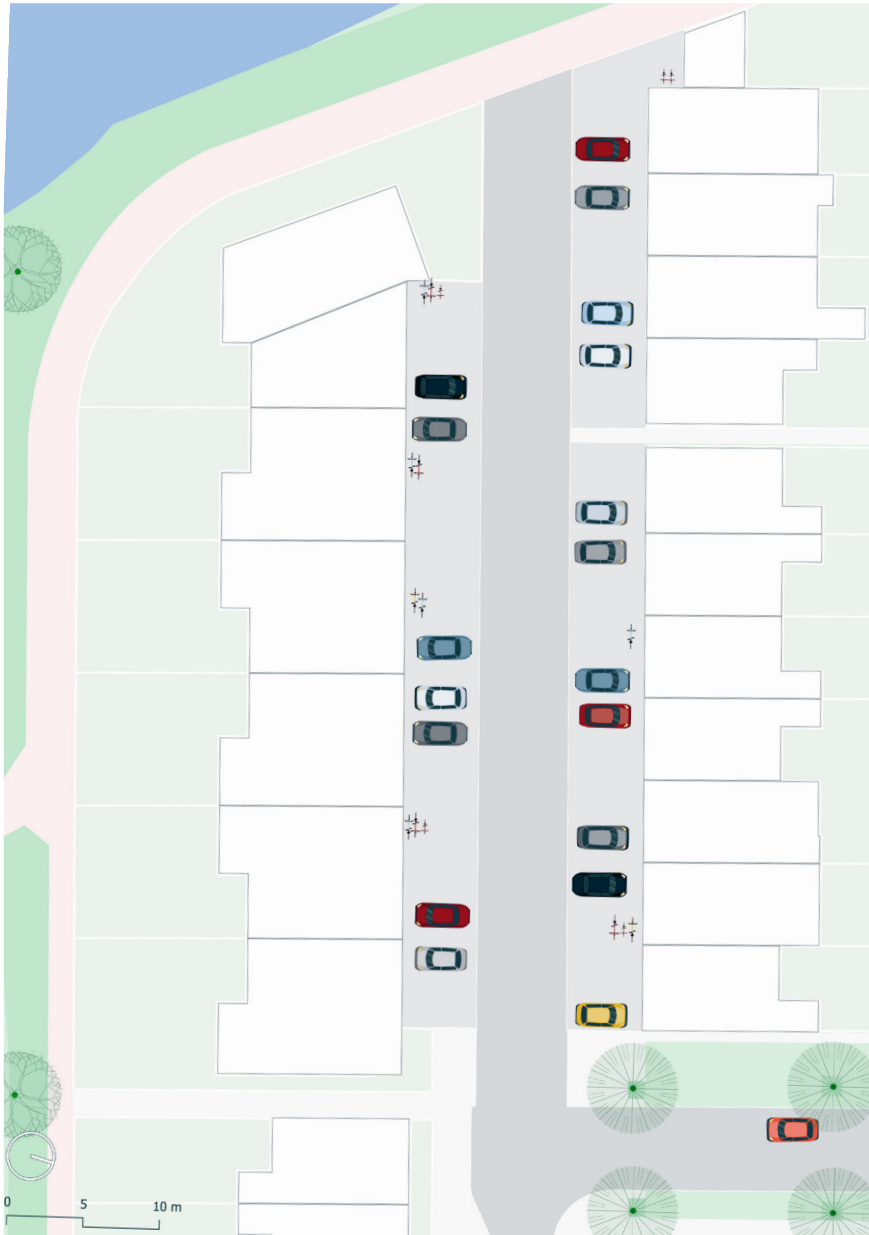
Isometric scheme of the design rules that apply to front and backyard.

Do you also think you never have enough storage space? No matter how big your house is after moving, it gets packed in a few years? In a society full of consumerism and easy fix services, it is no surprise that people have a no-effort garden. The stony garden with the even more abominable square of fake grass. Change is found in providing with a better alternative to the current situation.

In residential neighbourhoods, gardens have the potential to have a great impact on the local biodiversity. The design rules for the front- and backyard help open up the garden space for flora and fauna. Turning these former private areas into community space, helps in sharing the work, and helps in creating a continuous habitat.

Namibiëstraat

Now



Although the street is a woonerf in terms of traffic rules, one can hardly find any of the principles mentioned in the theory chapter in layout of this street. Most frontyards have become a parking spot. All the vegetation in the street is used to create boundaries and all backyards have a high fence that blocks the view on the green zone.



A clear hierarchy is present between the continuous road and the woonerf. A visitor notices the difference between a place to move through or a place to stay. The street is full of detail as a result of personal interventions. The street is reclaimed by the people.

Wielewaalstraat

Now



The street is designed in a zig-zag motion to force the car to slow down . At the same time, most of the public space is dedicated to facilitate the car. In the north area of the map there is a nice pathway leading to the water. Alongside this path are the backyards, which are enclosed by fences.



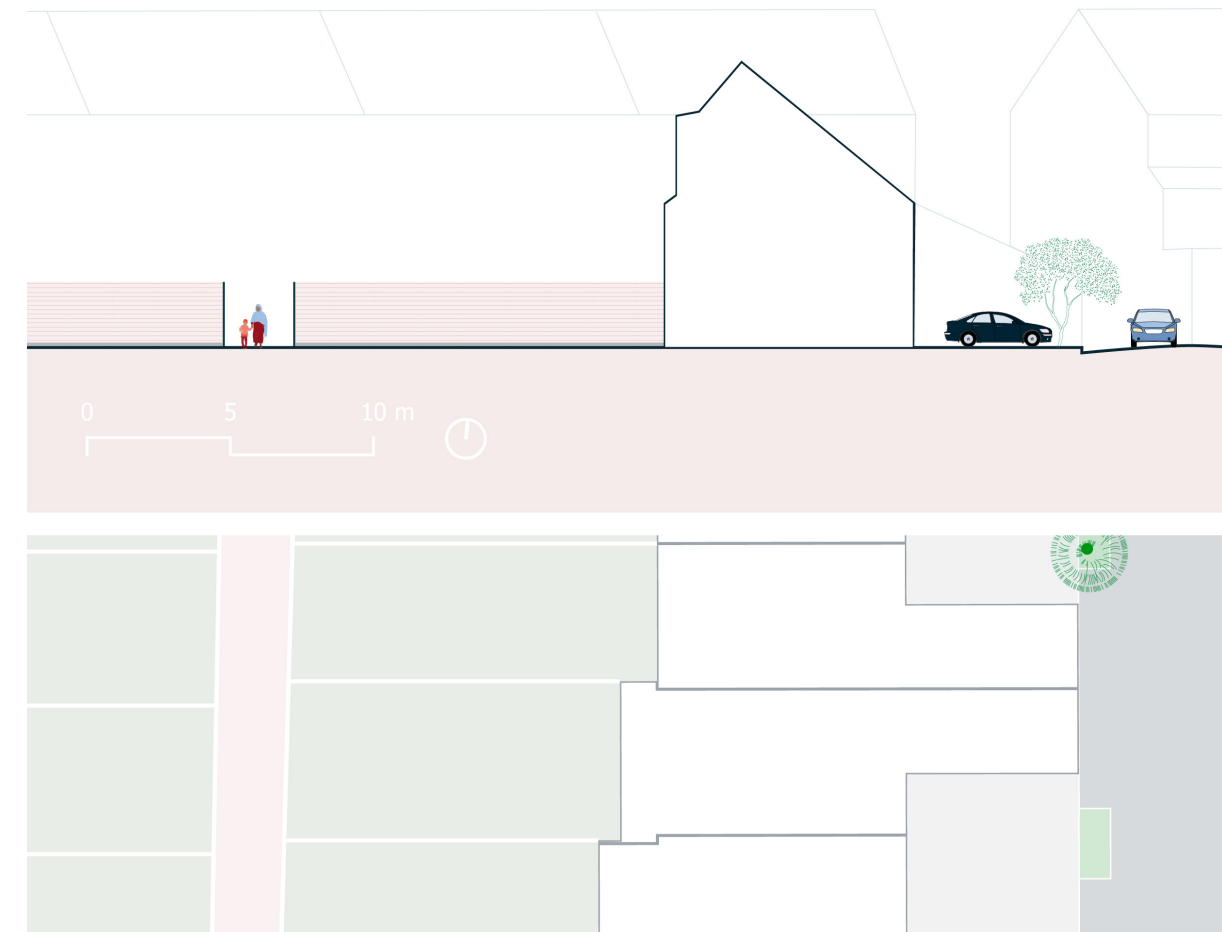
The street is designed in a zig-zag motion to force the car to slow down while at the same time, most of the public space is dedicated to facilitate the car. On the top we see a nice pathway leading to the water. Alongside this path are the backyards, which are enclosed by fences.

Wielewaalstraat

Now

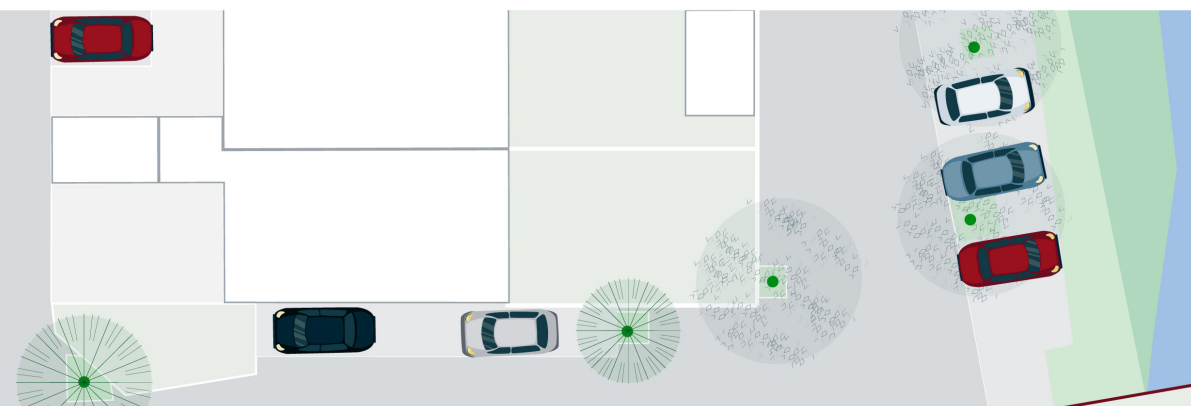
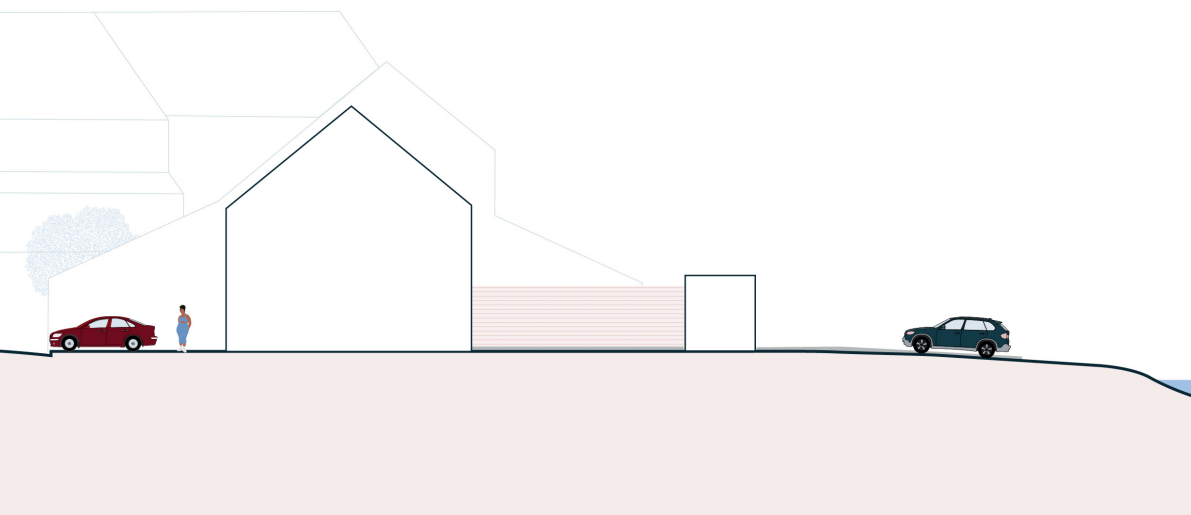
Clara leaves her house after a tumultuous morning. Her mom is sick so she had to find a babysitter before she went off to work. It almost doesn't make sense to go to work now as the babysitters from the app are so ridiculously expensive.

She is happy to leave the house, as a single mom with two toddlers, she is glad to talk to an adult every now and then. As she walks to the car, she notices her neighbour quickly jumping into his car-earpods in. She waits for him to drive away and then starts her car.



She bought the car for her kids, but she got lazy and now uses it every day to work. The false promise of comfort and ease betrays her when she waits in yet another traffic jam. Tanthof is such a maze. She arrives 10 minutes late.

Around lunchtime, the new babysitter sends her a picture of the kids on her ipad, sitting on the lounge in their backyard. "At least I got them out of the house" she texts.

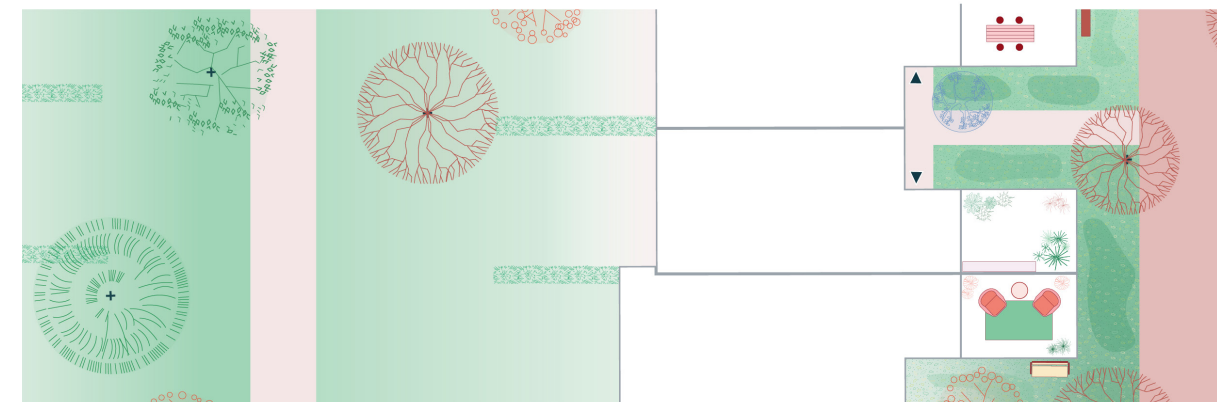
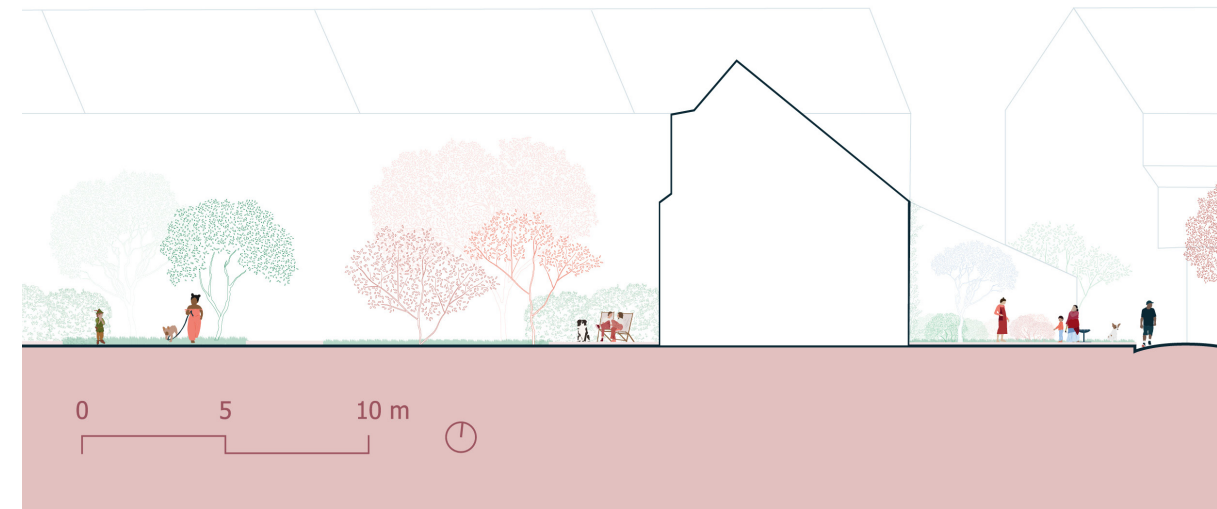


Wielewaalstraat

Design

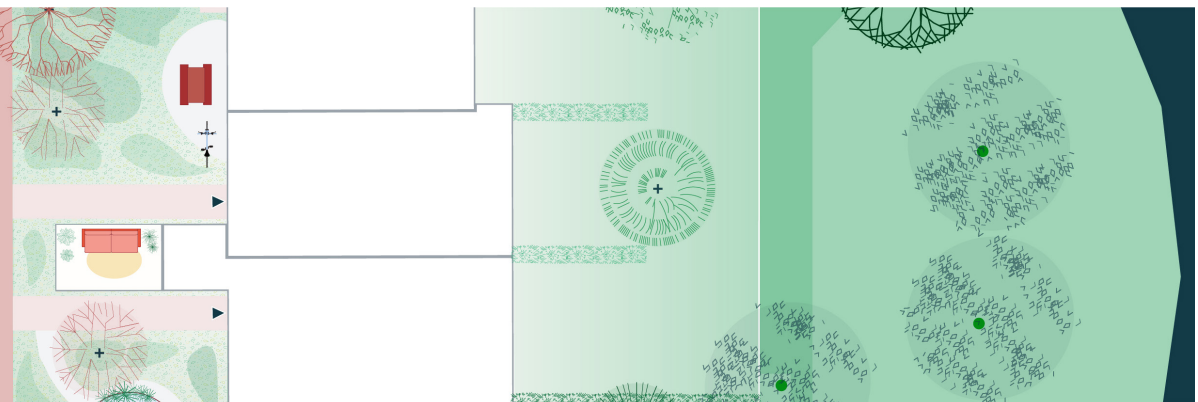
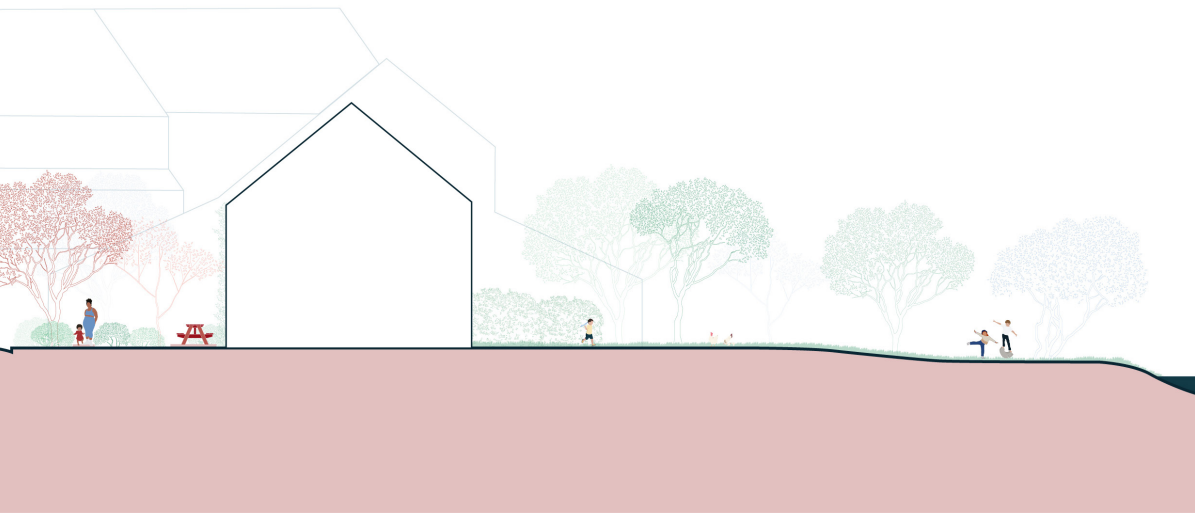
Clara's mom had to move to an elderly home. Her oldest kid goes to school now, but for the youngest she found a new babysitter. It turned out that there are a lot of lonely, retired people in her neighbourhood. She walks her kid to David, who lives at the end of the street, greets Ann who is working in the garden and

rushes back to get to her bike. Her work is just a 15 minute ride, and saves her a lot of stress as she avoids the traffic jams. It even helped her to become more fit, which helps her to keep up with her hyperactive kids.



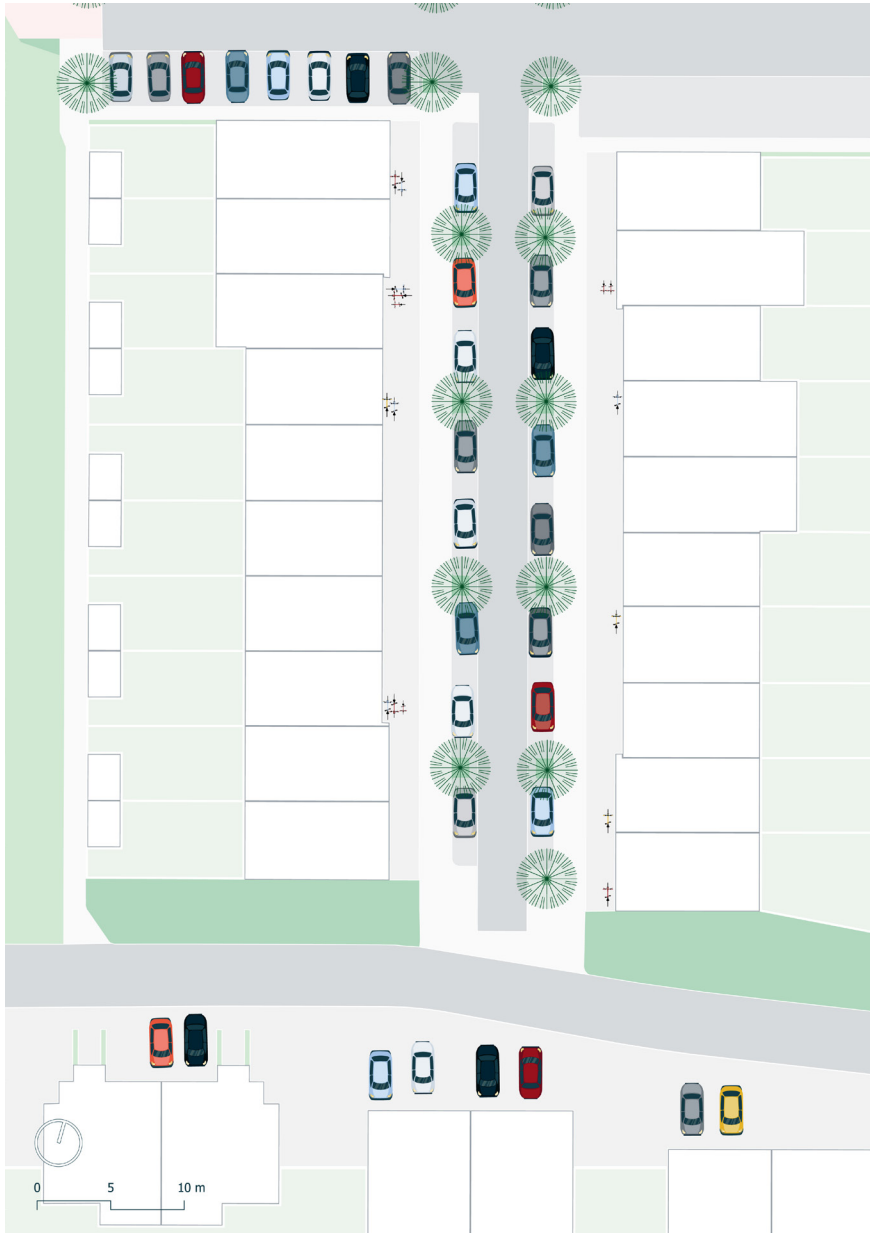
Her oldest stays at friends from the neighbourhood, so she can easily pick her up after work. The children helped Suzie with plucking the fruit, their hands stained purple from the berries. The elderly woman used to be very lonely, but now she and Clara have a weekly coffee.

Her kids have a great social network and so many places to play. Clara's world has also grown over the year, she can always reach out to her neighbours to help her out with assembling a closet or hanging a lamp. In return, she makes the best roti in town.



Medinastraat

Now



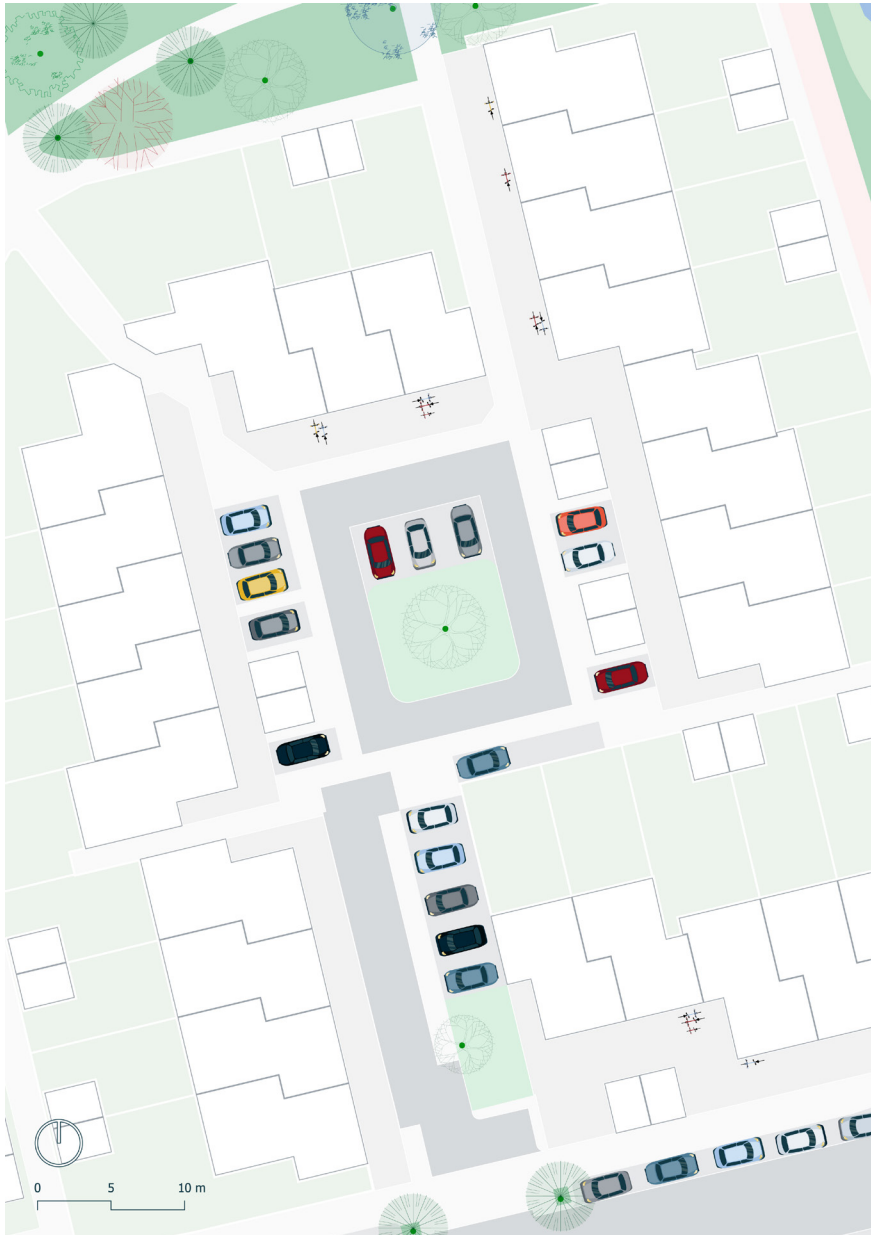
This street is a continuous road, but one at the edge of Tanthof. Only residents of these three streets have to use the street. Similar elements can be found in the plan, like sheds, blind walls and simple vegetation. The same tree is used in all streets, as it is the cheapest, easiest or most indestructible species. Although planting trees can counteract the heatstress and have aesthetic value, these trees often don't add anything to the local biodiversity.



In the redesign of the streets, the parking spots are limited to the area along the blind walls. The street opens up for a variety of vegetation, seating and waterponds. Depending on the time of the day, the residents will use their frontyard or their backyard. The backyards are opening up to a view on the Staatsbosbeheer property. Both in vegetation and in use of water, these steets show a continuation of the Abtswoudse Bos, with a residential scale as important difference.

Eekhoornhof

Now



This courtyard has a strange layout, as frontyards and backyards are facing a middle square that shows that there is a fine line between courtyard and parking lot in Tanthof. Through traffic rules, the area has a speed limit of 15 km/h which allows for a more fluent transition of street and pavement. Although almost all dwellings have a great connection to the adjacent green zone, there is little public space in the courtyard. Why would one want to live around a parking lot?



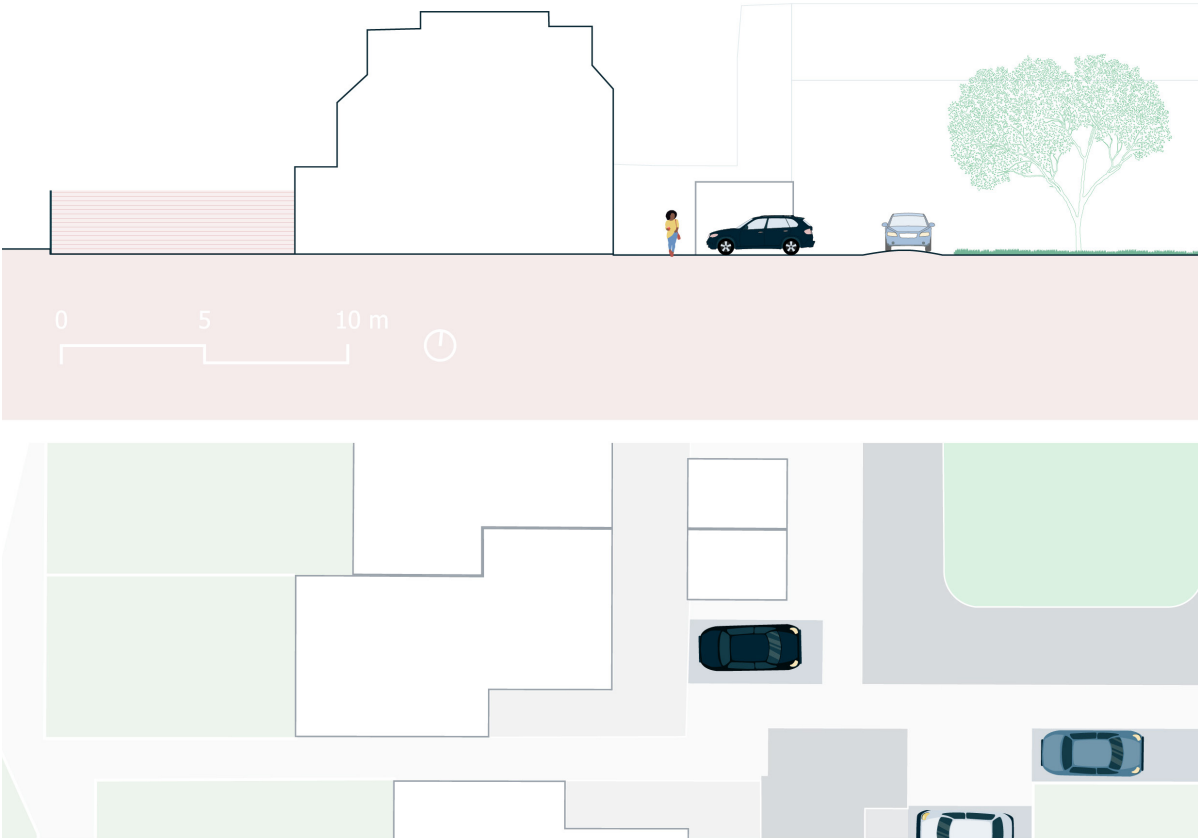
Here the transition from 30km road to 15 km road is clear; no curves or signs are necessary. The dwellings are facing a central park that offers safe spaces to play for young children, picnic benches for community activities and a great variety of vegetation to explore. Compact and safe playing spots close to home are perfect for younger children to explore nature. Compared to the transformed frontyards where openness is preferred to improve interaction, the design of the courtyard contains herbs and shrubs.

Eekhoornhof

Now

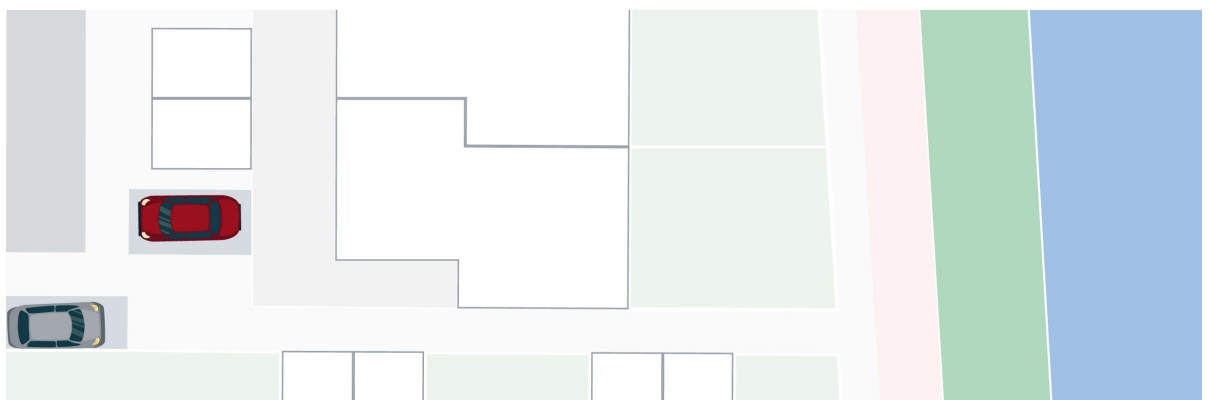
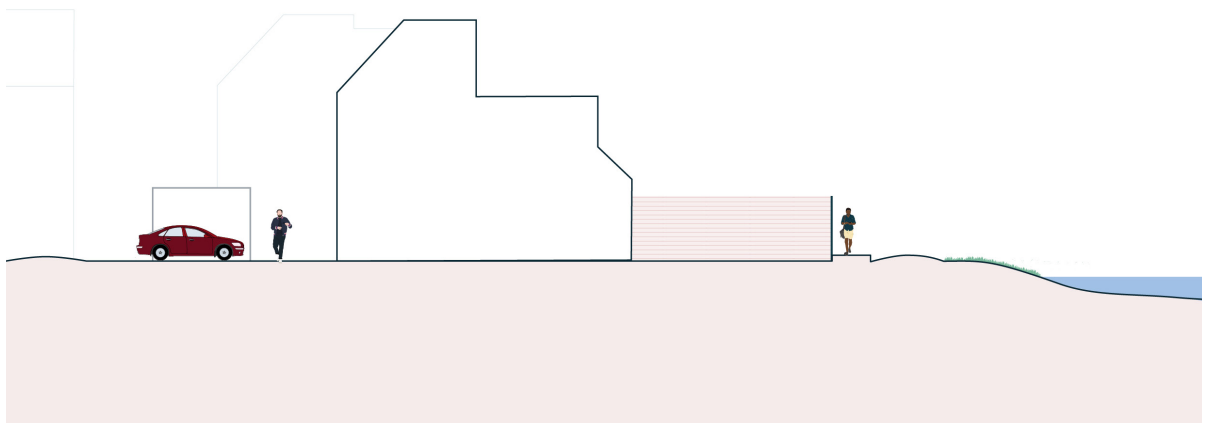
Sami is 10 years old, next year he will go to 8th grade and he notices how the children up to the 5th grade look up to him. He loves climbing the trees or playing soccer with his friends. Outside of school, he feels very restricted. He always has to walk home with his mom or his older brother, because it is “too dangerous”.

The big contrast in authority and freedom, in combination with his pre-puberal body, makes him burst into rages at home. He throws with stuff, shouts and curses. His mother is desperate. She tried time-outs and even grounded him for a week. Is this how she raised him? What must they think of him at school?



She talks about it with his teacher. He reacts shocked and says that Sami is always so kind and funny at school. He even gets special tasks in the school garden. "Are there any problems at home? Any stress?" - "No, not at all!" Sami's mother starts questioning herself.

Only on the weekends she sees her little boy glow up, as he plays midfield at the local soccer team. He is almost 4 years younger than his brother but you wouldn't see the difference. Now she is the one shouting, having her little soccer "hooligan" moment.

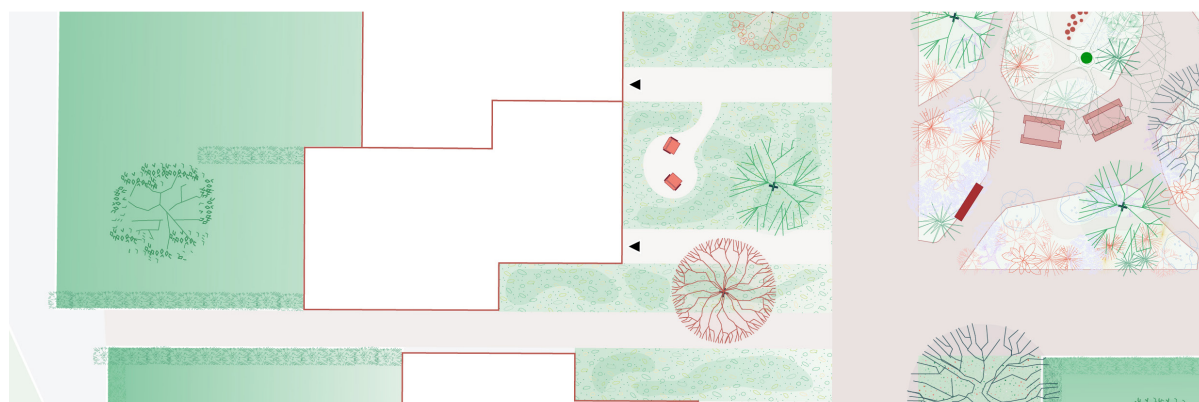
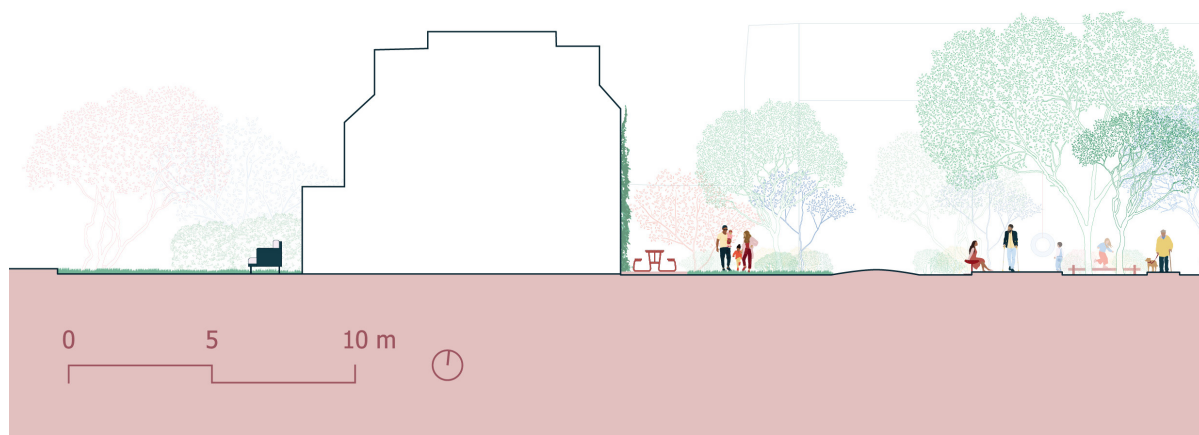


Eekhoornhof

Design

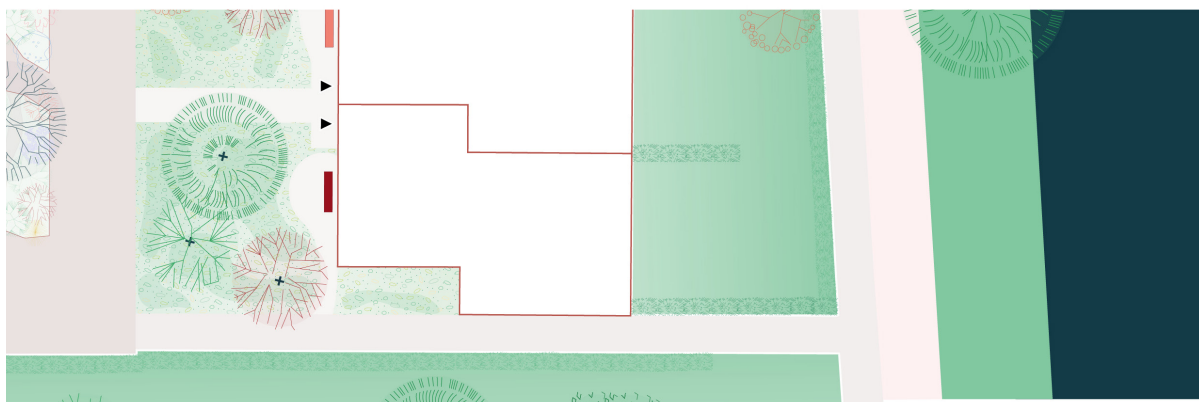
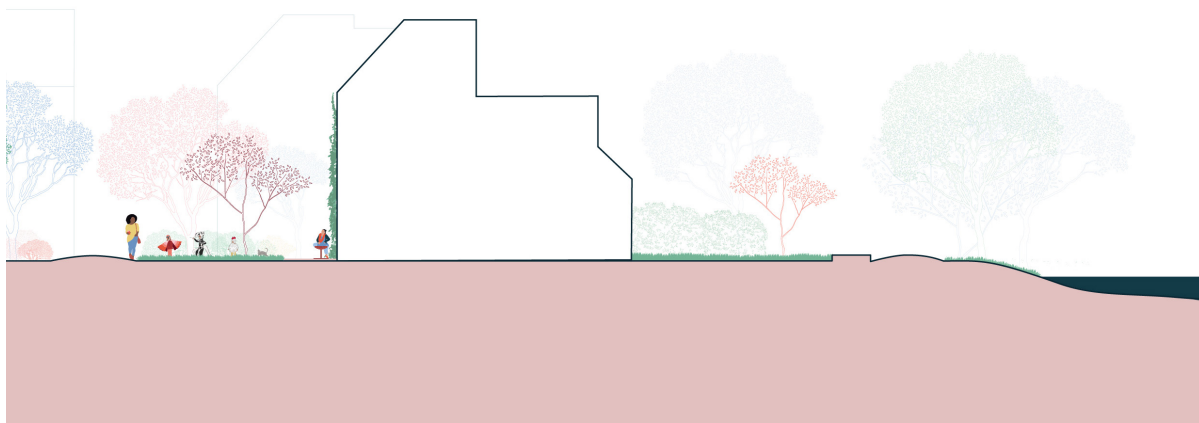
When Sami turns 11, the neighbourhood redevelopment is done. He takes the green routes from school to home like most children from his class. It takes a bit longer to come home, as the children play and sing along the way.

Sami made up the home olympics, where at every point they measure who is the fastest, who can jump the highest and who can hold on to the tree branch the longest. When he arrives at home, he is thirsty and tired, and above all very happy.



Now that he released all that energy, he likes to sit down for a bit to tell his mom about his day. Then, he runs out again, with his new phone. He and some kids in the street are going for a treasure hunt.

At home he shows his brother all the pictures he made of the birds, butterflies and WORMS. His mom is still a bit worried, but she also sees how the whole mood in her house improved. No broken toys anymore.



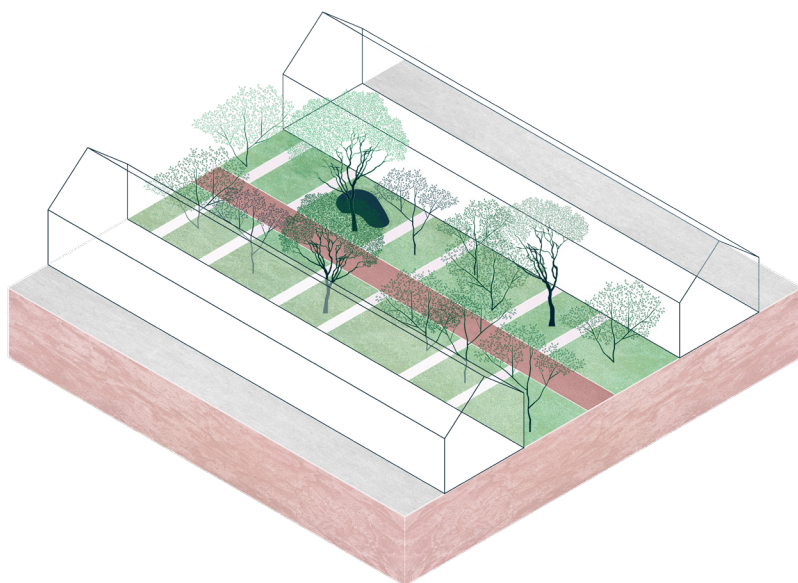
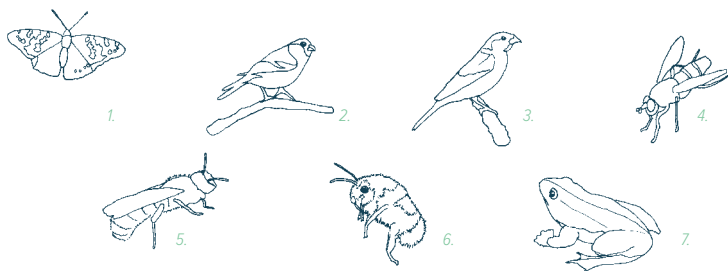
Community garden

Woonerf

The woonerf will be used as a community garden. The layout and use of the garden depends on the composition of the residents. The street will be a mix of different uses, and different microclimates created by the shadow of the buildings and trees or the differences in density of the vegetation and by garden ponds. This description of the woonerf relates to the original farmyard, although the focus is not on producing food, but rather on creating a habitat for flora and fauna that adds to the urban lifestyle.

Management is done by the residents, like in all community gardens. A lack of management will lead to natural succession, in the Netherlands this means that the place will turn into forest over time. It is up to the gardeners responsibility to interact with their living environment, and to care for the type of nature they prefer to live in.

1. Thistle butterfly
2. Bullfinch
3. House sparrow
4. Hoverfly
5. Solitary bee
6. Bumblebee
7. Common water frog
8. Raspberry
9. Tomato
10. Broccoli
11. Purple salsify
12. Hawthorn
13. Chives
14. Parsnip
15. Common violet
16. Blackthorn



The elements

The elements in the street are born from the initiative of the residents. In the theory chapter it became clear how childhood plays an important role in gaining a healthy relationship with nature, through playing in nature on a daily base. I remember the shrubs around my primary school I used to hide in, the smell of the roses and the feel the sharp thorns on my skin. The elements on the right give an idea of what the playing elements could be.

The waterpump and sandbox allow for children to learn about the qualities of the elements (water and sand) to see how hot or cold it is, how the material follows the shape of the mold etc. These elements are quite artificial and safe to use for small children.

Then follows two examples of reusing cut off trees and branches. This brings me back to my own youth, where me and my siblings would spend a whole afternoon building a hut in the forest. Building things out of tree trunks activates childrens creativity and is in line with reusing organic material locally.

The last two examples are a habitat in itself, where children can play around. The elements act as a driver for local biodiversity and the people are secondary. Both elements are thus not designed for the kids, and ask for their own interpretation of nature instead of a predesigned way to use the element.



Waterpump



Sandbox



Tree trunks



Self-made hut



Eco-Cathedral



Play-nature



I'm having breakfast with the giggling sound of the toddlers of my right neighbour. The street is alive! The garden is a growing, flourishing, place with children playing, people relaxing, gardening or chatting on this beautiful sunny day.



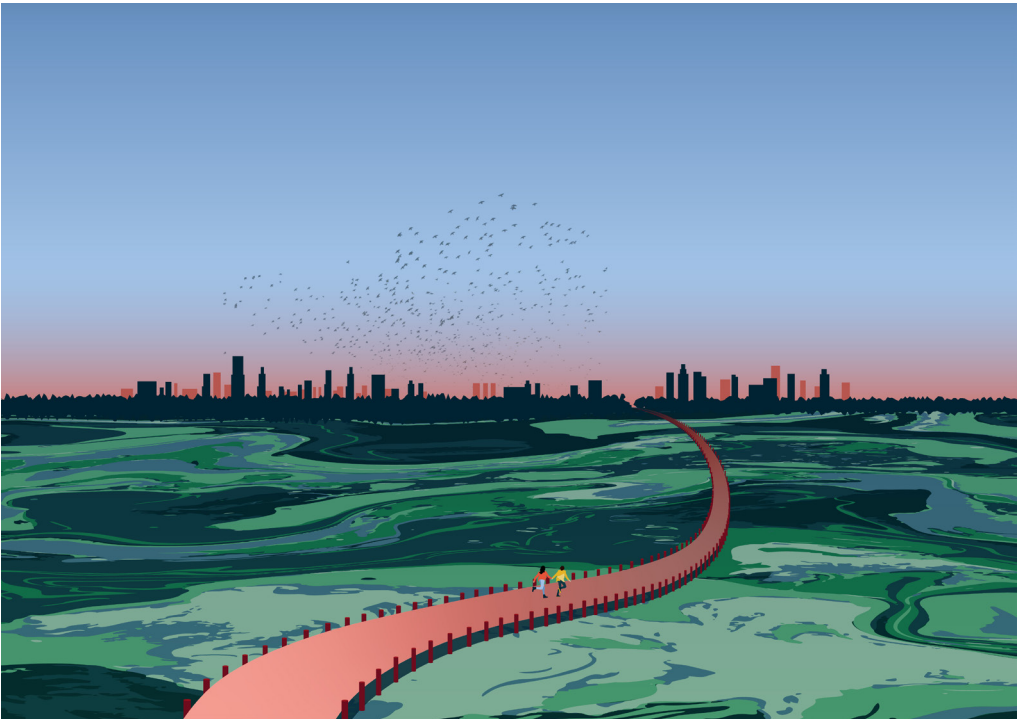
The green zone is the best way to get to the Abtswoudse Bos. Along the walk you see a young couple being in love, children playing sports, and dogs having being a good boy. I hear that there is a birthday party going on somewhere....



Cafe Canoe is the best hotspot for a coffee, or just for visiting the restroom (let's be honest here). The blisters on my heels from friday night are stinging and I choose to take a canoe today.



Canoeing through the Abtswoudse Bos is a complete different experience. I see so many new things, and I don't feel my feet - I do feel my arms instead.



After dinner, I cycle a little route along Midden-Delfland to find a still place to enjoy watching the sunset behind the skyline of Rotterdam.



06 Conclusion

The following chapter includes a summary of the answers to the research question and the scope of the research and some recommendations for further research and design.

Urban Ecology & Ecocities

The Dutch have a long history of gaining control over nature, and for a long time this dominance over nature kept people safe. However, since the industrialization the impact of human activity lead to a decrease in nature area and biodiversity. People have full control over every square meter of the Netherlands, so even nature is managed and measured. Today, the lack of wild nature in cities and the increasing indoor lifestyle are resulting in people caring less about nature protection. The current urban lifestyle confirms the perspective of human versus nature. Nevertheless this perspective is based on a false dichotomy, as humans are dependent on the natural system. The perspective of Oneness expresses the mutual relationship between humans and their environment. Literature confirms that urbanisation decreased the accessibility of nature and that the urban lifestyle resulted in a limited experience of nature, and that both have a negative impact on the commitment to protect nature.

The elements of the woonerf elaborated on the intentions set in the original design of the woonerf. Inspired by the farmyard, the woonerf is supposed to represent the residential urban space. However, cars have dominated the street as welfare increased, taking up all the (public) space. Due to the layout of the houses, a high level of privacy is created in the front of the house, leaving the street to be just a parking lot without any life.

The design aims to test an alternative perspective on our living environment by answering the question: How can urban design of the woonerf type in Tanthof contribute to reconnecting people to the natural landscape system of Midden-Delfland, by facilitating meaningful gardens of responsibility?

Theory on reconnecting humans with nature to improve sustainability, explained how there are multiple ways to reconnect humans with nature and also ranked them in order of effectiveness achieve positive effect on sustainability in the socio-ecological system (Ives et. al., 2018). Shallow and external effect is found in the material and experienced connection with nature. Deep and internal effect is found in the cognitive, emotional and above all; philosophical connection with nature. Examples in practice show how different forms of reconnection can be triggered by one type of intervention, like community gardens or schools in natural environments. The examples given in literature show similarities in addressing a certain community, contain an aspect of gaining skills through exploration. Interventions that provide with material and experienced connection with nature could thus result in an emotional and cognitive relationship with nature.

Similarly the hypothesis of the thesis is that creating meaningful interaction with nature on a daily basis could result in a change of worldview. The design is meant to test a change of environment and provides with an alternative lifestyle to provoke a sense of responsibility. Responsibility calls upon the internal motivation to take actions to protect nature. The way 'Responsibility' is used in this thesis is to express the culture in which children grow up in natural environments and are being nurtured with a sense of commitment to protect nature. Everyone can contribute to this culture of Responsibility, by making their living environment more kind to non-human life.

Looking at the design site, in urban landscape of Tanthof and in the cultural landscape of Midden-Delfland the quality and quantity of the nature can be improved. The accessibility of the Abtswoudse Bos and Midden-Delfland is of poor quality, as large infrastructure and the train track leave an unwelcome feeling for slow traffic. The design thus provides with an alternative green route leading from home to Midden-Delfland.

To be able to green the streets, the design provides an alternative for the car, whilst maintaining a certain level of mobility, using public transport and shared vehicles and promoting walking and cycling by improving the path network. Parking spaces are cut down drastically in the residential streets, to be transformed into public spaces. Interventions on the scale of the street gain meaning in contributing to community building and intergenerational gain of environmental knowledge, meaning that children grow up to live in nature and care for nature.

Interventions in the property of Staatsbosbeheer and Midden-Delfland gain meaning through restoring historical layers to create a palimpsest. The Abtswoudse Bos is used as an urban park, where urban functions attract people to experience nature on a daily basis. Midden-Delfland is transformed into a nature reserve, although it is meant to develop as a dynamic landscape rather than reserve the existing nature. Here the concept of abiotic rewilding is used to flood the land and restore the peat wetland it used to be. Humans are just a visitor here. Meaning in the interactions between human and nature are created through creating routes that refer to the palimpsest layers and through interventions that borrow some ideas from land art, as they invite the visitor to change their perspective on the environment.

The gardens of responsibility represent the green spaces from the community garden in Tanthof to the regional garden; Midden-Delfland. The gardens are characterized by their dynamic nature, one that is not decreasing, not reserved as the same, but growing over the generations. It provides a living environment in which children grow up to become responsible, attached and skilled caretakers of the world of tomorrow.

Scope

Urban design often overlaps with history, politics, sociology, psychology and ecology. The thesis shows how design can be used as a tool to inspire other designers, planners and residents to think outside the existing norms and values. This thesis is an attempt to show an alternative future, set loose from the current economic and anthropocentric system. It does not guarantee that a change of worldview is the result of greening the living environment, it rather facilitates interactions that could have a positive impact on peoples engagement in improving the environment for non-human life and for our future generations. A somewhat radical approach to express activism in urban design.

The concept is tested on a generic neighbourhood type that is present in most Dutch cities, so the design principles could apply to other neighbourhoods in the Netherlands. The graduation studio is collaborating with Staatsbosbeheer, so the thesis aims to contribute to the Green Metropolis Ambition in providing design interventions that improve the attractiveness of the Abtswoudse Bos as well as the routes leading to the park. The thesis challenges the value of polder landscapes used for cattle, compared to the advantages of restoring peatland for ecology and climate mitigation.

Recommendations

A suggestion for further research is to investigate and calculate the climate effects of this scenario per nature type to negotiate with stakeholders. A complete calculation would include the costs of the changes to the landscape versus the costs that are saved through storing CO₂, the health benefits, the individual costs of using a bike and public transport instead of owning a car, the saved energy as a result of the reduced UHI effect etc.

To the designers that would like to continue with this vision, I recommend them to explore other scenarios and compare these with each other. To organise workshops with residents and municipalities, to organise a convention where people from different disciplines think about the new urban lifestyle and long-term urban planning. Ideally, the eco-thinking will be implemented in primary education, and activating the green lifestyle part of the governmental vision for our country.



07 Reflection

In the reflection, the author shows a more personal perspective on the research, process and graduation experience. An academic reflection on the scope, methods and results is complimented by a personal reflection showing how a graduation thesis is always a work of a person and the result of a teamwork with other people. This last element is more relevant to personal development.

Reflection

Urban Ecology & Ecocities

The graduation project Gardens of responsibility was born from my interest in the crossover between landscape Architecture and Urbanism, found in the graduation studio of Urban Ecology and Ecocities. The year roughly consisted of four periods. Starting of with the masterclasses, partially mandatory for the studio and partially electives. Then followed by the research part, leading up to p2. Then the initiation of the research through design, leading up to a vision and first design proposals by the time of p3. Lastly, the concluding phase, where the research questions are answered and the final design becomes visible.

The studio is working together with Staatsbosbeheer to help them in creating a vision for their Green Metropolis ambition in sixteen cities in the Netherlands. The first semester of the year was dominated by the research we did for Staatsbosbeheer. This research included policy research, a bit of theory on landscape analysis and a lot of spatial analysis using Qgis, municipal development reports, interviews with Staatsbosbeheer's multidisciplinary team and site visits. The students then picked each one city to make their graduation design. Students were free to decide how much of the green metropolis ambition would be integrated into their design.

Reflecting on the groupwork

The scope of this assignment was not clear at the beginning and the team often felt lost in the research process. This had multiple reasons. The first thing is that studio started with split schedules, as the Landscape Architecture students had different workshops than the Urbanism students. Full schedules made it impossible to communicate with the whole group. The urbanism students started the research without the majority of the studio. Secondly, the communication with Staatsbosbeheer went via Nico, at least the first months. The students therefore received too little information about what was expected from the client, Staatsbosbeheer. Additionally, the tutors expressed the importance of a holistic view on the national scale, as a foundation for the city visions. Looking back, there was not enough time to do both an analysis on the national scale, as well as on the provincial and city level. This resulted in a too broad analysis on the National scale and too little analysis on the city scale. Third, there was a huge shortage in expertise over the software we had to use for the analysis. The Urb students had some experience in using Qgis, but they were busy with their masterclasses as the Landscape students started with the analysis. Rookie mistakes were made due to a lack of knowledge, making this a time consuming and stressful activity for the LA students. In the first six weeks only about 5-8 maps were created, whereas after the Urb students gave some helpful tips, up to 5 maps a day were created.

It must be clear that the studio performed a lot better when they could start working as a group. However, there was a great challenge in doing a professional analysis, meaning that every product would have the same look, legend, description and academic reference. Companies take years to improve the structure and style of their studio, whereas we had to learn it on the go. Lots of time were lost in endless discussions on colour schemes, the list

of products, dividing tasks etc. Group dynamics played a big role in our decision making. People who did the most, often made the final decisions. It was hard to get everyone on board, and often it seemed as people were only involved if they were asked to do something. It bothered me that the people who stayed quiet had less tasks than the natural leaders in the group. In a group meeting we reflected on the progress and started dividing the work more evenly.

Making use of the application 'Miro'. Here we would track our work, make notes in meetings, make to do lists and schedule new meetings, divide tasks, make an overview of the results, and we made a guide to find information on the shared drive. To me, this was too much information, and since it wasn't my routine to constantly check the Miro, I often was still uninformed about what was going on in the group. I tried to limit my own handicap (related to my ADD) by creating my own to do list and by finishing everything before the set deadlines.

Reflecting back on the approach of the research, too much time was spend on the research for Staatsbosbeheer resulting in an instable foundation for the individual graduation. The hypothesis of the studio was that the outcome of the research would be beneficial for the individual project. I experienced this task more as an obstacle to overcome to be able to start on my individual design. The benefit of this experience is that I learned a bit about the work as a professional. Topics creating a research plan, knowing when to ask an expert, communicating with the client and with the team are all skills to develop when working as a professional. So although I might have seen the assignment as otiose, I did learn a lot to help me with my career. A lot was learned from organising and managing the project and the communication skills necessary for the assignment. It was also nice to have some insight in the process of doing a research for a multidisciplinary team and making a report and presentation for an audience that has no background in landscape or urban design.

Reflecting on the groupwork

Doing research on the natural layer, the cultural layer, the urban layer and the trends, gave the studio some insight into the issues and opportunities that most cities had in common. I was slightly disappointed by the generic outcomes of the research. Most vision maps contained the same interventions, but in a different shape or scale. Of course there was some difference depending on the soil types and the corresponding nature types. It made me think why we had these results. Was it laziness? A lack of time? A lack of interest in further developing an original, detailed vision for each city? Maybe, but I find it way more interesting to think that the origin of the generic outcome lies within the similarity found in urban settlement. The solutions are similar every city is making the same mistake, by maximizing the paved area, by breaking down ecological structures and by polluting the air, the soil and the water. This realisation, how tragic, made me hopeful that the studio of Urban Ecology and Ecocities will be able to make a difference in these Dutch cities, even in the little thought experiment called 'graduation'.

Topic development

Next to the research assignment for Staatsbosbeheer, each student did some inventory analysis to developing a problem statement for their graduation thesis. I had a pretty clear idea what I wanted to do for my graduation already in the introduction week, so I had some time to dwell on the different themes associated with my initial idea. Thanks to the conclusions of the research for Staatsbosbeheer, I came to the idea to test a way of design thinking onto a quite generic neighbourhood. This turned out to be Tanthof, as this site is located adjacent to the property of Staatsbosbeheer. The content of the research is maybe only used partially, but the abstraction of the problem helped my define my projects problem statement.

Individual research

In this research I tried to find the relationship between our cultural beliefs and the physical world, though an anthropological, philosophical lens and working from the disciplines of my studio. I researched the relationship between human and nature, but also the relation between human territory and non-human territory. The literature research helps understanding the Western perspective that implies a human-nature dichotomy. Opposing tot that is the literature of the Asian theory about Oneness, that tells us about the mutual relationship we have with our direct environment. By positioning myself as a designer, but also as a civilian, within this range of environmental philosophy, I could try to take the responsibility of caring for this environment. The design is used as a tool to research how to make the transition from home to urban nature to wild nature. The design explores a future scenario that might provoke a sense of responsibility for our direct living environment. The design is just an example of a place where generations grow up to be caring adults.

The design location is used to test what urban design would look like from the perspective of Oneness. The goal here is to improve the availability of nature, the accessibility of nature and the experience of nature. Ideally every citizen should be able to walk from their home into nature. The ideology, based on Staatsbosbeheers ambition, is realised on the in different scale levels. The smallest scale is the street in a typical Dutch neighbourhood from the 1980's, Tanthof in Delft. Then we have the neighbourhood's green structure. Then follows the urban park Abtswoudse Bos and then Midden-Delfland as biggest scale level. This design location has an interesting background, since delft was found onto the sandy hills formed by the creeks, the peatland that became a cultivated land and the interesting urban development of the woenerf, that combines the cultural heritage of the Boerenerf with the desire to live in an ecological neighbourhood in the late 70's, as a counteract to the rise of the car. The site is not only a plain area to project my ideas on, it enriches my research with new insights on how human territory and non-human territory interacts with each other. The problem statement therefore consisted of a theoretical and philosophical problem, and a physical problem statement.

Methods

It was difficult to move from a philosophical understanding to something detailed as a design. The issues addressed to the physical analysis of the place asked for a pragmatic approach and I was afraid to lose depth. I wanted to avoid the banality found in the vision making for Staatsbosbeheer. I needed it to be touching on a personal level, I envisioned my design to inspire other people.

I thought first I have to be inspired to make something inspiring. My ADD tempts me to search for a continuous dopamine rush, so I can go on for weeks finding more and more things that inspire me. In desperate need for new ideas, I was jumping from art to documentaries, from poetry to literature, from policy to site visits. For a long time it felt like I was floating in this pool of possibilities. A pool of swirling ideas that wouldn't mix. It resulted in a lack of focus, and I certainly lost the ability to communicate these ideas to my graduation tutors. This phase felt like I was losing track, which was also the feedback from my tutors. And in a sense I was, but I think the real issue wasn't that I was going off track, it was rather that I didn't document my track. Looking back at this period, I wish for every student to sometimes seek for inspiration that doesn't directly translate into a product, or an impressive map, or a pretentious presentation. I wish for every student that they are able to explore abstract shapes and ideas, to experiment with new drawing techniques that might fail, that do fail, that have to fail. I spend a lot of time making things that are not useful to explain the project, but it certainly helped me to move from a thinking state of being to a producing state of being.

Some experiments made it into the thesis. I did many experiments with fluids on paper, to come to a conceptual design for a wetland. I tried to find control in the uncontrollable. I found that the materials used for the experiment were determining how much control I had over the outcome. The less I knew what was going to happen with the substance, the better the outcome. It made me question why we are designing landscapes on a computer? Why do we ban the influence chance and accidents while designing with and/or living beings? Other experiments were used to get an understanding of site, like using clay to cover and map the height difference of Midden-Delfland. Merging street photos with photos taken in the Abtswoudse Bos, helped me being more radical in designing for more nature in the street.

So, by now I had a theoretical base, an analysis of the site, a set of art pieces, free writing and poems as inspiration, some experiments and a still quite vague description of the design goal. To be able to move from this collection of ideas to an integral design, I made use of the masterclass on the Delft Approach, which I followed in the beginning of the year. The approach simply helps to cut complex design problems into smaller problems: atomizing. These smaller bits are then solved by thinking out of the box. Finding inspiration was one of the possibilities to tackle the design problem in the Delft Approach, so I already had so many ideas to implement onto the different design themes and scales.

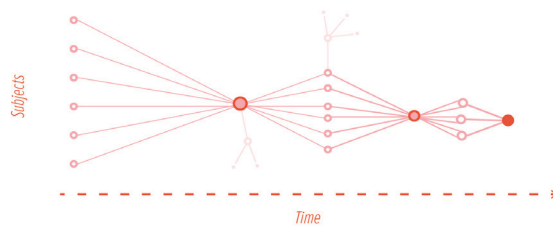
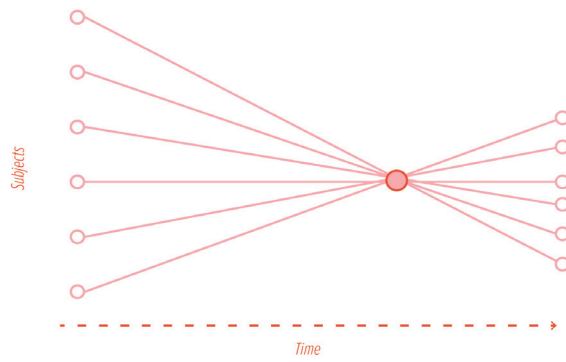
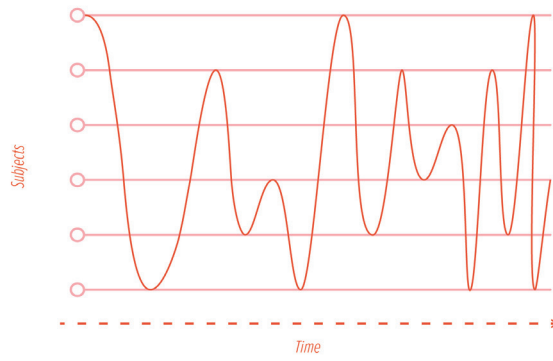
Scope of the thesis

Besides the difficulty of the endlessness of the world of ideas, I struggled with the scope of my thesis. I had difficulty dealing with the methods and planning I made prior to p2. Back then, I still had the idea to work with the people from Tanthof. In the period after my p2, I noticed I was stuck because some of my methods were directing the project into different directions. Did I want my design to be a pragmatic and participatory design or did I want to use the design to test an ideology? I noticed how passionate I was in my p2 about the thought experiment on what it means to live in a Tanthof that represents the ideology of Gardens of Responsibility. I came to a crossroad, where I had to choose if my project would be based on the conditions of the site today, including the anthropocentric standard of living urbanists are designing for today or if I wanted this project to be a bit less realistic and pragmatic, but one that inspires others and challenges the current way of urban design. I chose the last one, which meant I had to break loose from the design approach and the urban context that I know. My hypothesis was that my design could reach a more radical outcome if I didn't use the design as a mediator between the different interests of the stakeholders, but rather use the theory and art to inspire the stakeholders in thinking differently.

Now that I had solved this dilemma, I encountered another issue addressing the scope of the design. From the problem statement, I derived not three but four different scale levels, so I had to decide to which extend I could execute the design. Many scale levels asked for different approaches. Moving through scales, from the abstract world of ideas to the pragmatic problem solving, the design process was without doubt very complex. Both issues came down to curating my thoughts and work to sharpen the narrative.

Tutoring

Looking back at my design progress, I believe I spend too much time in my head, I would have benefitted from putting all the ideas into a booklet as I started to do near the deadline. Visualising and combining my ideas into one document helped in decision making and sharpening the narrative. All of my drawings were hiding in piles of sketching paper, in unseen pages of a messy, chaotic booklet. They were forgotten. I believe I could be way more productive if someone was able to guide me better in keeping track of the ideas. With all due respect, I noticed having two successful, fully scheduled, multiskilled teachers, researchers and designers as my tutors, was not as fantastic as it sounds. I kept thinking if it was my lack of communication skills and my lack of drawings that flattened the tutoring, but I also wonder if my tutors were always present, mentally present during our meetings. I noticed how I was just one of the multiple projects they were doing; research, presentations, designing, and teaching so many different groups. They had so much responsibility, that I sometimes just felt like a break from the busy lifestyle. I do still believe I am lucky to have tutors who let me use my chaotic thinking as a strength, who let me play with the graduation rules, but a bit more presence of their interesting expertise could have definitely lifted the project to another level.



Peer tutoring

In an attempt to cover for the lack of feedback, I started organising peer review afternoons. After years of Covid measures, students often were tempted to stay at home and keep their projects a secret until the moment of presentation. Some students were immediately enthusiastic about the proposal and joined every session. The feedback I received on this initiative was that most people felt like they had more feedback than from their mentors. In the sessions, you could practice your narrative, test the readability of the drawings and learn from others. To be able to see the work of other studio members, we could reflect on our own progress and learn from the design steps or themes other people were researching. Resources, drawing techniques, theoretical knowledge were shared. Something I haven't ever experienced within the competitive atmosphere in all my years in Delft. I truly believe in community building within the group of graduates as peer tutoring turned out to be helpful in the design progress, but also in helping students fight feelings of demotivation, stress and even depression.

Scientific relevance

Most literature is adequate at describing the cause and effect with regard to the climate crisis. A great deal of scientists are researching within their field how to mitigate climate change. As an urban designer it is our task to combine scientific research with input from history, society and spatial analysis and to think of possible scenarios towards sustainability. The thesis explores the human perspective on nature and makes use of unconventional sources, like art and poetry to gain deeper understanding of the personal experiences and motivation to introduce the change our living environment to sustainability. The thesis aims to change our way of thinking about nature conservation and about the meaning of 'urban' territory. I advocate for more space for art forms, philosophical discussion and participatory work in the development of urban design. Urban design should not only challenge the spatial conditions, but also the social and cultural context in which we live.

Families	Research about art	Art as research	Art in research
Definition	Investigates art-related topics without artistically shaping the object or installation under study, or without necessarily (re)creating a material or bodily reality to understand the process of art making itself.	Artist-researchers aim to gain a deeper understanding of the potential of art in changing personal experiences or environmental circumstances	Art is actively applied by participants and/or artist-researchers as a creative process in one or more phases of a research process studying social and behavioral science phenomena.
Nature	Both qualitative and quantitative inquiry	Artistic inquiry	Qualitative inquiry
Primary identity of the artist-researcher	Researcher	Artist	Researcher
The role of art	Art as a content area	Art as a way of inquiry	Art as a method
The relationship between art and research	Qualitative (or quantitative) inquiry into artistic topics	Research methods supporting artistic inquiry	Artistic forms supporting qualitative inquiry
Perspective of the artist-researcher	Outsider	Insider	Insider
Example	Evaluating an art piece to gain understanding of a particular social context	Architect Jeanne Gang organised workshops with the citizens to design a police station which contributes to a sense of community.	The art component may be used to determine the focus of the research, formulate research questions, generate/collect/analyze data, present findings, respond to the findings, evaluate research, and/or generate meaning and trigger responses from the audience.

Authors summary of Arts-based Methods in Socially Engaged Research Practice: A Classification Framework (Wang et al., 2017).



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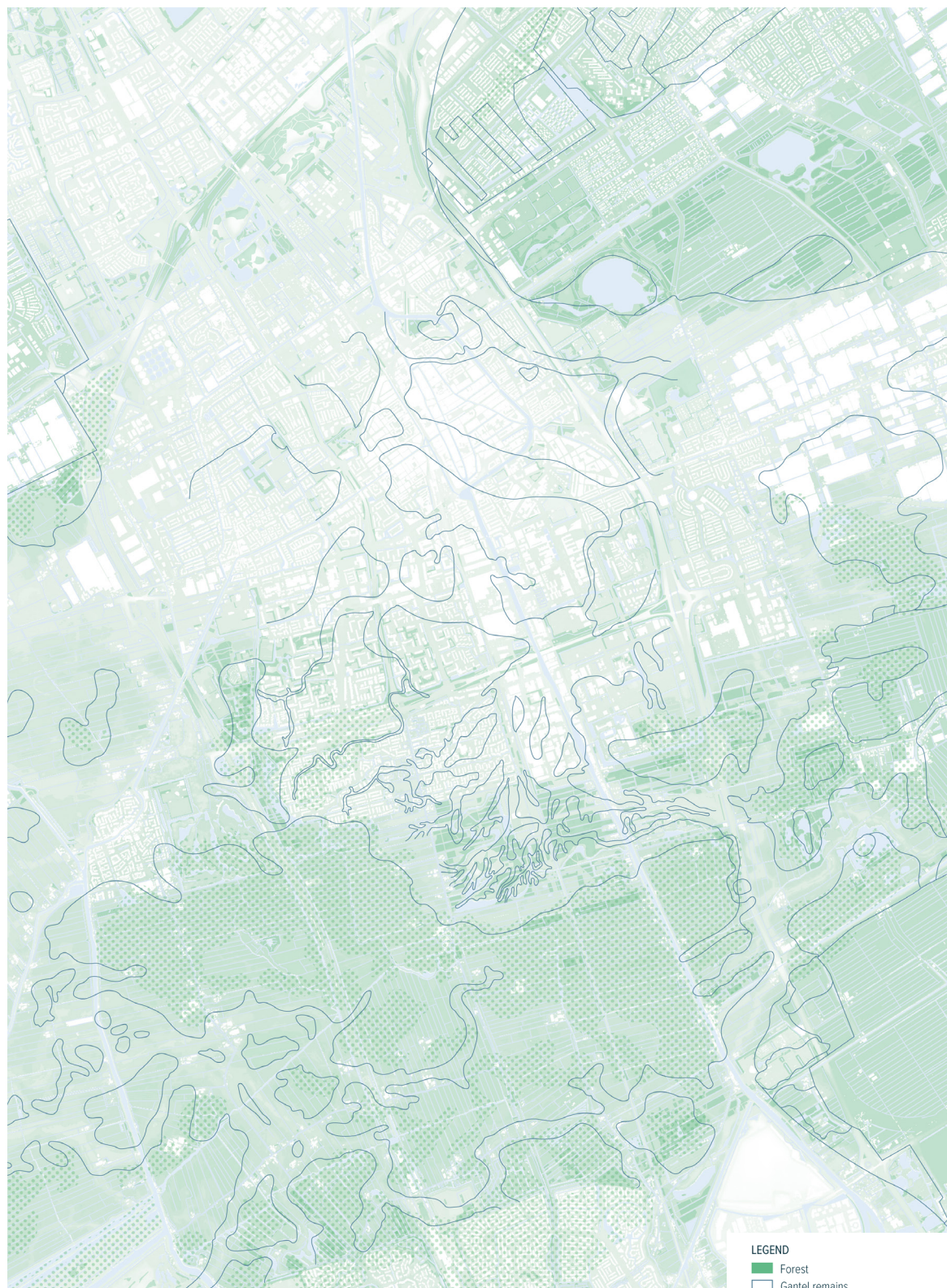


Appendix

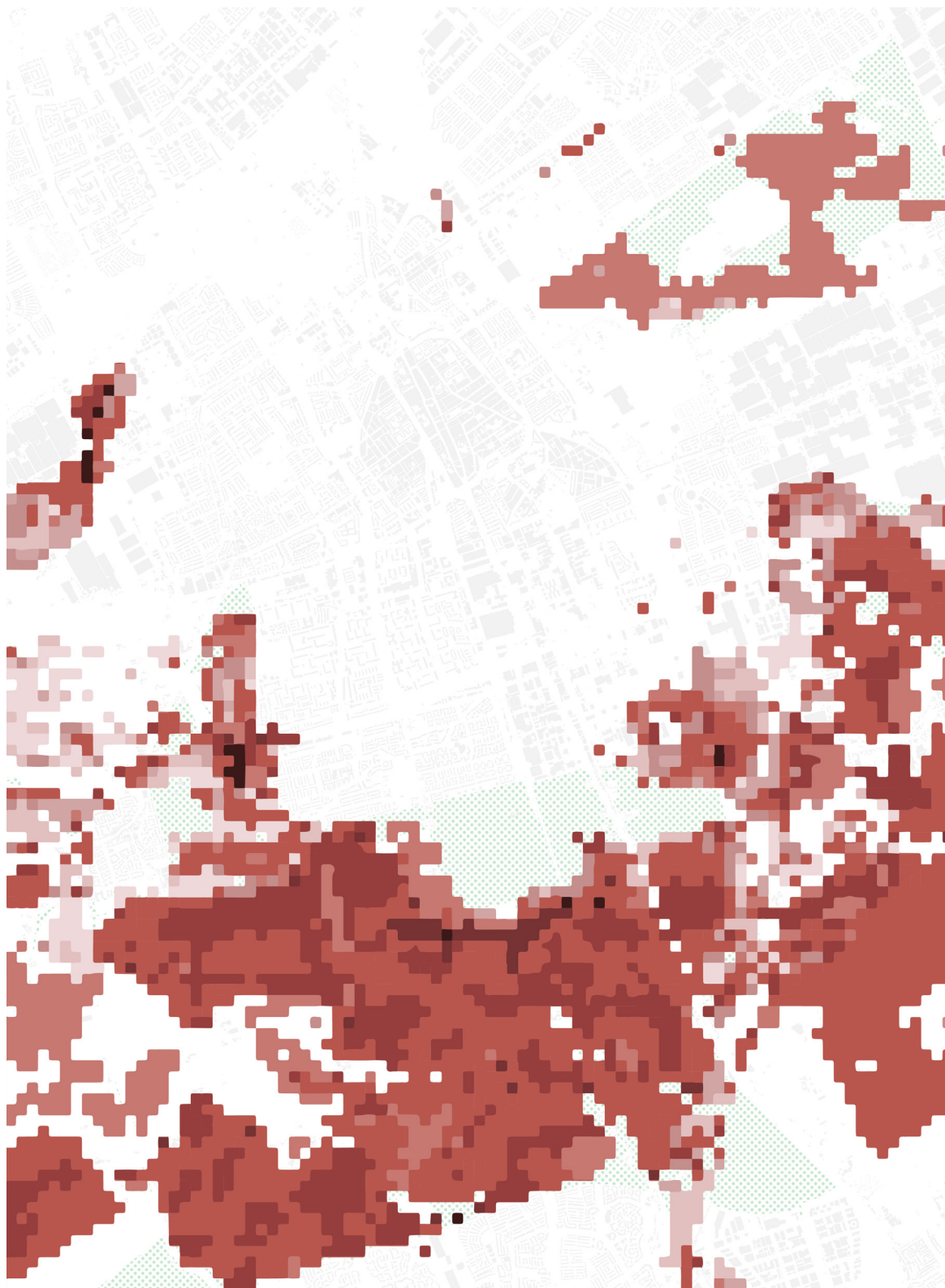
The following material is been as part of other analysis products or is used in the argumentation in the thesis.



Geomorphological map of the current situation. (BRO via pdok, z.d.)

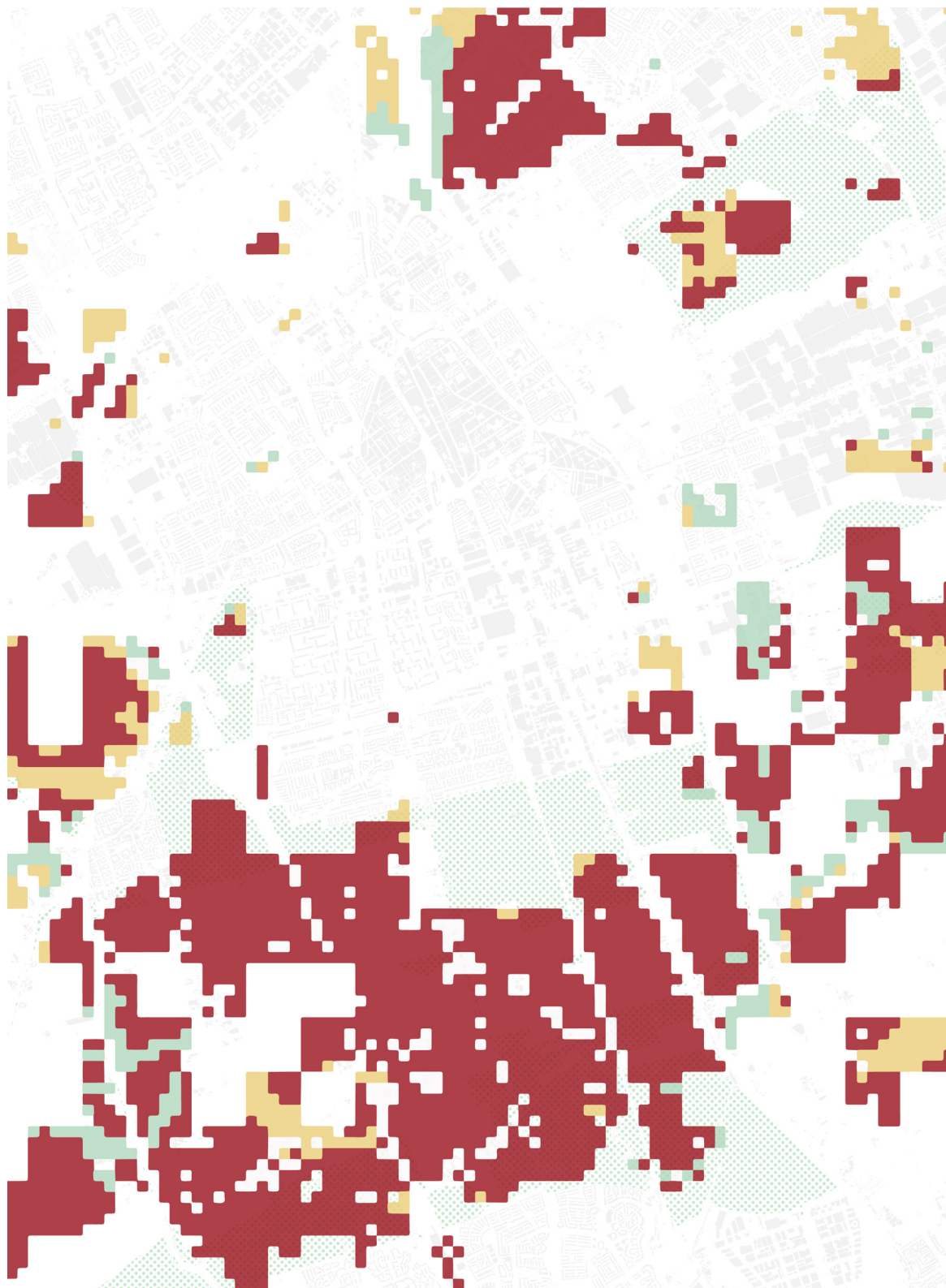


This map is part of the AXO on the three layers of the design site. It highlights the natural layer of the AXO.



The map shows the pace in which CO₂ oxidizes from the soil. (PZH, z.d.)

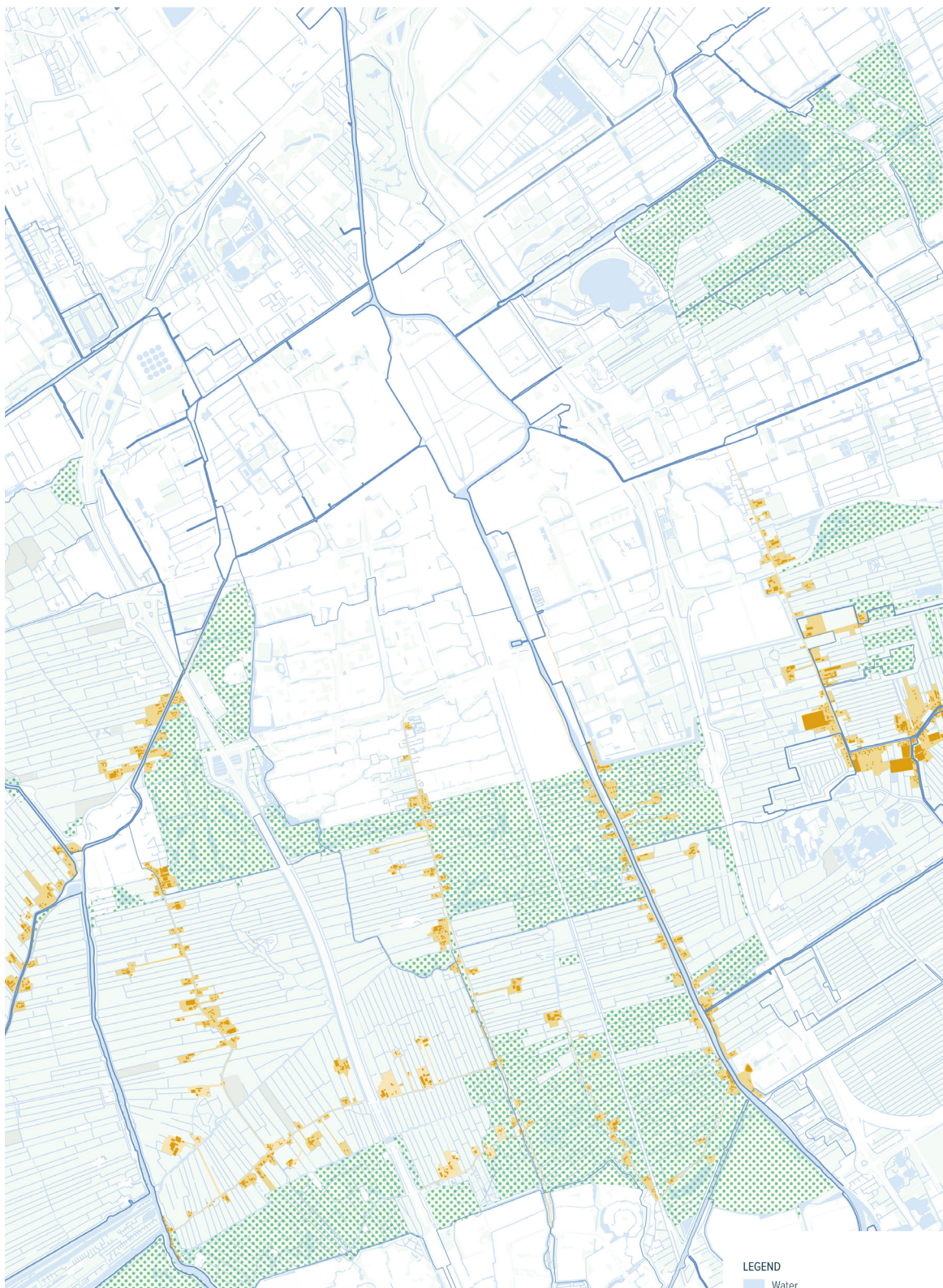




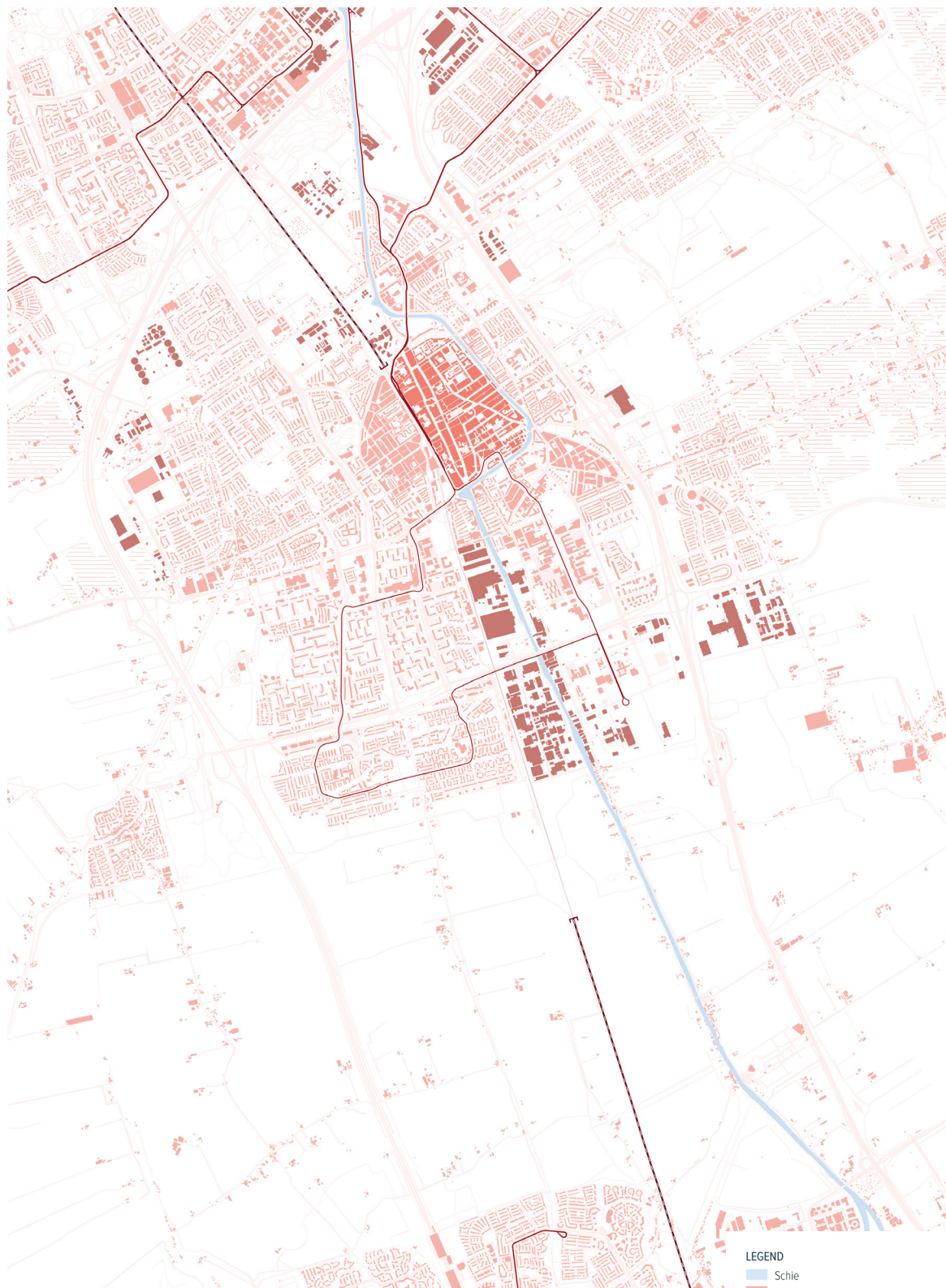
Conclusion map on the suitability of the land for food production practices (agriculture and cattle breeding). Results are based on the produce versus the impact on the lands physical conditions and the environment in general. (PZH, z.d.)

LEGEND

- Not suitable
- Not really suitable
- Suitable



This map is part of the AXO on the three layers of the design site. It highlights the cultural layer of the AXO.



- LEGEND
- Schie
 - Buildings
 - Center
 - Industry
 - Horticulture
 - Road
 - Public transport

This map is part of the AXO on the three layers of the design site. It highlights the urban layer of the AXO.



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