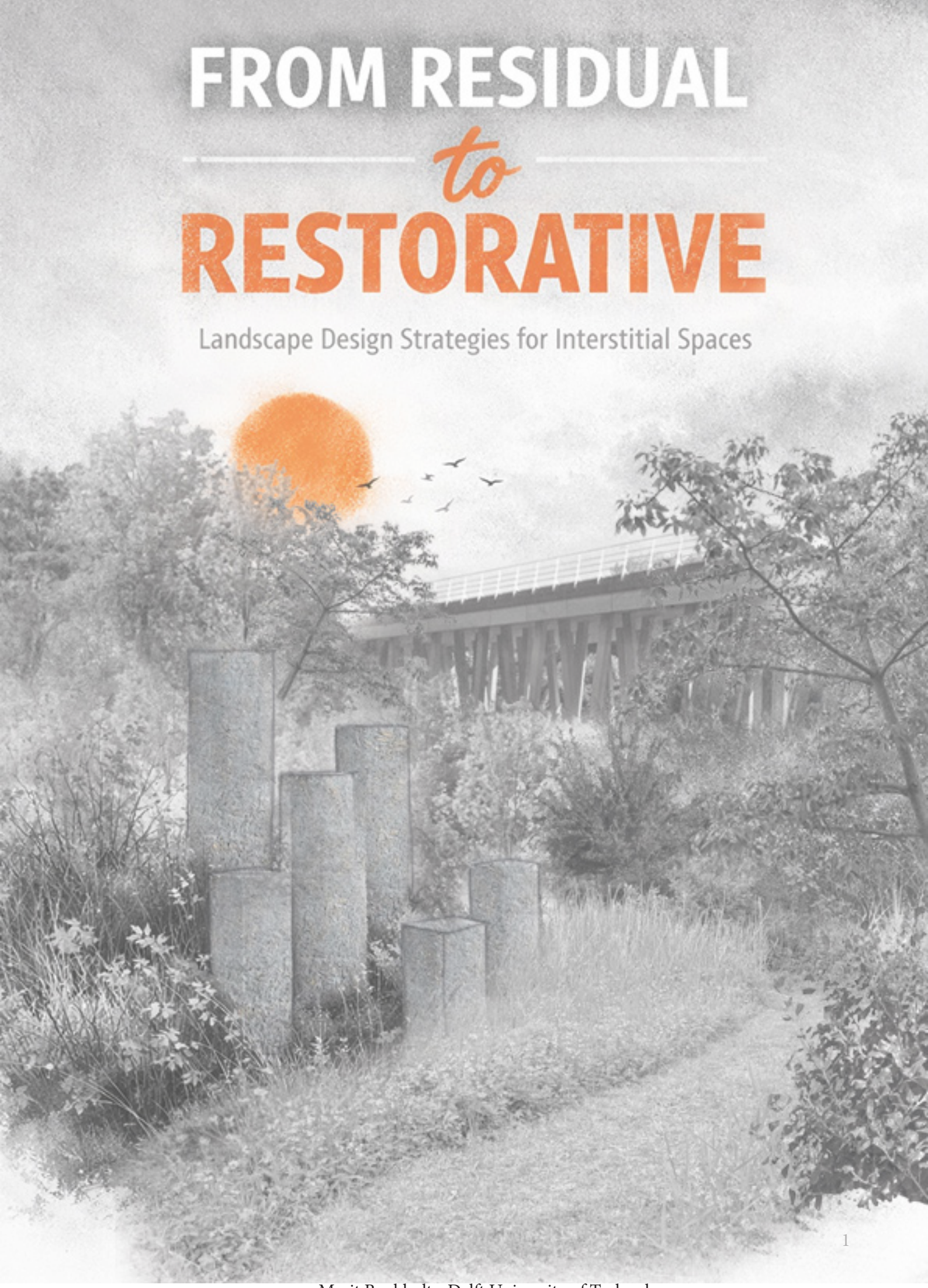
FROM RESIDUAL *to* RESTORATIVE

Landscape Design Strategies for Interstitial Spaces



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From Residual to Restorative
Landscape design strategies for interstitial spaces

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Abstract

Urban life has become increasingly fast-paced and mentally demanding, intensifying the need for environments that support psychological restoration. While natural environments are widely recognised for their restorative effects, many cities contain overlooked interstitial spaces, informal, fragmented areas shaped by infrastructure and residual planning, that remain underused despite their ecological and experiential potential. In Rotterdam, these interstitial spaces often exist close to everyday urban life but lack visibility, legibility, and intentional engagement.

This thesis explores the relationship between interstitial urban spaces and psychological restoration from a landscape architectural perspective. By drawing on theories from environmental psychology, this research investigates how environmental experience, natural qualities, and spatial characteristics can contribute to restorative experiences. The project focuses on Rotterdam as a case study, examining how interstitial spaces might be revealed, interpreted, and thoughtfully engaged with through design.

Rather than aiming to fully transform these spaces, the research seeks to understand how their existing qualities can be acknowledged and expressed, and how landscape architectural design can support psychological restoration while respecting their informal and ecological character. In doing so, the thesis positions interstitial spaces as a meaningful component of the urban landscape and as a potential network of restorative environments.

How to Read this Research

This thesis is structured using a clear visual hierarchy to support readability and orientation. Different background layouts are used to distinguish different parts of the research and design process. This visual structure allows readers to quickly recognise which type of content they are engaging with, while still enabling the thesis to be read as a coherent whole.

The method

If the page has an orange background, it contains the methods and how they will be applied.

The analysis

If the page has an orange dotted line around, a complementary part of the analysis is showed.

Literature synthesis

If the page has a white-background it represents a literature synthesis that forms the theoretical basis for the design exploration.

Case study

If the page has an orange background and orange dotted line around it, it shows existing projects that show what a certain method or theory can look like in practice.

Design components

If the page has an orange line around with a white background, it contains the developed design components.

How to Read this Research

This thesis is structured around the logic of the design process that emerged from the site itself. Because the project began with a specific location rather than a predefined design brief, the work first examines the physical and ecological conditions of the interstitial spaces in Rotterdam. This initial analysis establishes the spatial, ecological, and experiential characteristics that form the foundation for the rest of the research.

Building on these observations, the thesis introduces the conceptual lens through which the site is interpreted: psychological restoration. The spontaneous and semi natural character of the interstitial spaces made the relationship between natural environments and psychological wellbeing a relevant starting point. The thesis therefore first explores how green environments contribute to psychological restoration, and why this connection is particularly meaningful in the context of these overlooked urban spaces.

From there, the focus shifts to how variations in vegetation structure influence human behaviour, a relationship that also emerged clearly from the site analysis, and how such behavioural responses form an essential component of restorative environments. This leads to the identification of two key restorative dimensions, perceived biodiversity and behavioral differentiation, which together provide the conceptual basis for understanding how interstitial spaces can support psychological restoration.

Once these restorative principles are established, the thesis returns to the site to examine how they can be translated into spatial strategies that reveal, preserve, and strengthen the existing ecological and experiential qualities. These strategies are then positioned within the broader urban context, showing how interstitial spaces can contribute to a larger network of restorative environments across the city.

The thesis concludes with a detailed design proposal that demonstrates how different users, with different restorative needs, may experience the site. This final part illustrates how the earlier analytical and theoretical insights come together in a spatial intervention that responds to both the ecological potential and the psychological value of the interstitial landscape.

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Introduction

This chapter outlines the foundations of the thesis by introducing my interest in health-oriented design, my position as a landscape architect and the design responsibility within the chosen site. It presents the interstitial spaces of Rotterdam and the specific project location, identifies the missing framework and explains how this gap leads to the central research question, the design assignment and the sub-research questions that structure the rest of the thesis.

An Interest in Human Experience and Wellbeing

My fascination within this research originates from personal as well as study-related interests. From a personal perspective, I have a long-standing interest in how people function and experience the world around them. I have always been curious about human behaviour and wellbeing in a broad sense. This often leads me to questions such as: what makes people feel comfortable, what triggers certain behaviours, and what do people need in order to live a healthy and balanced life?

In addition, my experiences during my bachelor thesis and internship have shown me the significant impact that outdoor environments can have on people's wellbeing and everyday functioning. This has further strengthened my interest in how environments influence wellbeing, shaping it into a sustained personal motivation within my design practice.

In recent years, this interest has become even more relevant as it feels like everyday life has grown increasingly fast-paced and mentally demanding. Contemporary urban environments place constant pressure on attention, productivity, and social interaction, making it more difficult for people to find moments of mental rest. This personal, but also shared observation, as noted in recent research, "urbanization often brings … a fast-paced lifestyle, all of which can exacerbate stress and mental fatigue" (Magomedova & Fatima, 2025), has strengthened the relevance of exploring how environments can support mental wellbeing within everyday urban life.

My Position

As a landscape architect, I position myself as a designer who works toward healthy and livable cities by harmonizing built structures with natural systems. Landscape architecture has the capacity to guide people, improve environmental quality and shape human experience through the design of outdoor environments. As said by Frederick Law Olmsted (1870), landscape architecture can mediate between urban development and ecological presence, a tension that remains relevant today.

Within this project, I argue that landscape architects should recognize the existing built environment while optimizing Rotterdam's limited green space, as green environments positively influence physical and mental well-being. This requires a shift in viewing the city. Rather than treating these sites as residual, they should be understood as opportunities to reveal what spontaneous nature can offer in a busy city. By designing with, rather than against, spontaneous vegetation, these spaces can become places where human and non-human life are equally considered and able to support one another. As Maike van Stiphout (2023) in her book Second guide to nature-inclusive design states, "We now stand at a crossroads of change. Where nature was considered subordinate, we now have the chance to give it the space it deserves." And in doing so, we start to see how people and nature can positively influence one another.

My focus therefore lies on interstitial spaces where spontaneous nature and the built environment intersect. Meyer (2008) argues in her text Sustaining beauty, that spaces will be more valued when beauty is seen as an active force: "Landscapes that emotionally engage people are more likely to be protected and sustained." This perspective is particularly relevant for interstitial spaces, where ecological richness is present but not always legible to the public. At the same time, uncertainty remains inherent to these spaces. As James Corner (1999) explains, landscapes operate as dynamic systems shaped by processes beyond design control. My position therefore embraces uncertainty while aiming to guide perception, use, and care through spatial design.

Mental Health and Psychological Restoration

This personal curiosity about how environments affect wellbeing naturally connects to broader research on mental health and the restorative potential of certain environments, forming the theoretical foundation for understanding the role of landscape in supporting everyday psychological recovery.

The increasing mental demands of contemporary urban life highlight the importance of mental health within the built environment. Mental health can be understood as a state of wellbeing in which individuals are able to cope with everyday stresses, function productively, and contribute to their environment (World Health Organization, 2004). Within this context, the concept of psychological restoration becomes particularly relevant.

Psychological restoration refers to the process through which individuals recover depleted cognitive and emotional resources, often as a result of exposure to certain environments (Kaplan & Kaplan, 1989; Ulrich, 1983). Two key theoretical frameworks describe this relationship. Attention Restoration Theory (ART) explains how environments that provide qualities such as being away, fascination, extent, and compatibility can support recovery from mental fatigue. Stress Reduction Theory (SRT), on the other hand, emphasises how natural environments can reduce physiological stress and promote emotional wellbeing (Ulrich, 1983).

These theories demonstrate that environments are not neutral, but actively influence human mental functioning. In particular, natural and semi-natural landscapes have been shown to support processes of restoration by offering opportunities for reflection, reduced cognitive demand, and sensory engagement.

From this perspective, landscape architecture plays an important role in shaping environments that can support mental wellbeing. Understanding which spatial characteristics contribute to psychological restoration, and how these can be embedded within everyday urban contexts, forms a key foundation for this research.

Design Responsibility

Within the field of landscape architecture, it is essential to recognise that design goes far beyond shaping physical space. Landscape architects actively influence how people feel, behave, and relate to their surroundings. At the same time, they carry the responsibility of engaging with existing landscapes, understanding their qualities, preserving their values, and carefully embedding new interventions within them. This dual role positions landscape architects not only as designers of space, but as mediators between people, place, and ecological systems.

Landscapes are therefore not neutral backdrops. They shape emotional responses, guide behaviour, and influence everyday experiences. This creates both a responsibility and an opportunity: to design spaces that respond to fundamental human needs, such as psychological restoration. Questions such as where people feel at ease, which spatial characteristics reduce stress, and how environments can support meaningful experiences are central to the practice of landscape architecture. Equally important is the balance between preserving the intrinsic qualities of a place and carefully steering how it is experienced.

This responsibility becomes even more relevant in the context of ecological awareness and the changing relationship between humans and nature. As Van Stiphout (2023, p. 15) argues in The Aesthetics of Urban Wilding, there is a challenge “to create a space where wild animals and plants are not only allowed to come to, but where it is intended for them to be there.” This statement emphasises a shift in perspective in desiging the landscape: from reducing nature to intentionally making space for it. At the same time, she highlights that “how this space will be designed, however, is up to us,” underlining the crucial role of the designer in shaping this coexistence.

According to Van Stiphout (2023), society now stands “at a crossroads of change,” where nature is no longer seen as subordinate, but as an equal and necessary presence within our environments. We need nature and nature can benefit from us. Integrating the aesthetics of spontaneous into design is therefore not only an ecological act, but also a spatial and experiential one. It calls for landscapes that are both spontaneous and legible, both autonomous and inviting, places where beauty and wilderness are not opposing forces, but work together to create environments that are healthy, inclusive, and meaningful to both human and non-human life.

In this context, the responsibility of landscape architects lies in navigating this balance: creating spaces that invite human engagement while allowing natural processes to unfold; designing with intention, without over-prescribing use; and shaping environments that support both ecological richness and human experience. In doing so, landscape architecture functions not only as a tool for spatial design, but also as a means of fostering deeper relationships between people and the landscapes they inhabit.

Interstitial Spaces

Rotterdam offers compelling opportunities to explore how landscapes can be designed to respond to fundamental human needs, guide human behaviour, and simultaneously allow nature to exist as an equal presence within urban environments. Within the city's complex landscape, the layering of infrastructure, planning histories, and residual green zones has namely produced a wide range of spaces that fall outside clearly defined urban functions. These areas, often located along roads, railways, and waterways, have developed with limited formal intervention, resulting in unique spatial, ecological, and experiential qualities.

In academic literature, such spaces are discussed under a variety of terms, including terrain vague, lost spaces, interstitial landscapes and urban interstices, all referring to parts of the urban fabric that "remain distinctive in spatial, social, and political terms" and cannot be easily classified according to conventional urban functions, e.g., vacant land, undeveloped areas, or leftover spaces (De Solà-Morales, 1995). In this thesis, these spaces are referred to as interstitial spaces.

A working definition for the purpose of this research is therefore: interstitial spaces are spatially ambiguous or 'in-between' areas within the urban fabric that emerge through processes of urbanisation, remain outside established urban programming, and possess distinct spatial, ecological, and social characteristics that can inform alternative forms of engagement and design. This definition aligns with landscape architectural perspectives that address the marginalisation of such spaces in formal planning and highlight their latent potential as ecological and experiential landscapes. From a landscape architectural standpoint, interstitial spaces are significant because they challenge 'normal' notions of public space and open space typologies. Instead of being planned, programmed places, they often retain complex spatial relationships, spontaneous ecologies, and informal uses that are shaped by natural processes, infrastructure systems, and everyday human activities. Scientist note that this informality and indeterminacy, rather than being a deficit, can be a resource for landscape design, enabling alternative approaches to ecological stewardship, social interaction, and multifunctional spatial use (Luo & Havik, 2020).

Figure 1: Photographs of the interstitial spaces in Rotterdam. The spaces contain spontaneous vegetation and informal uses and are shaped by infrastructure.

Location

Because of the interesting qualities interstitial spaces contain, this research will focus on a series of interstitial spaces in Rotterdam North, where the neighbourhoods of Noord, Overschie, and Hillegersberg intersect and where infrastructural elements, water networks, and residual green zones come together. In historical maps it is illustrated how successive expansions of railways, roads, waterways, and zoning decisions have fragmented the urban fabric. It can be imagined that besides the larger zones that are created, many by-prodcuts came to existence. Such by-products frequently appear in the areas between roads, or alongside the edges of waterways, forming interstitial spaces within the urban fabric where formal planning did not prescribe a specific function.

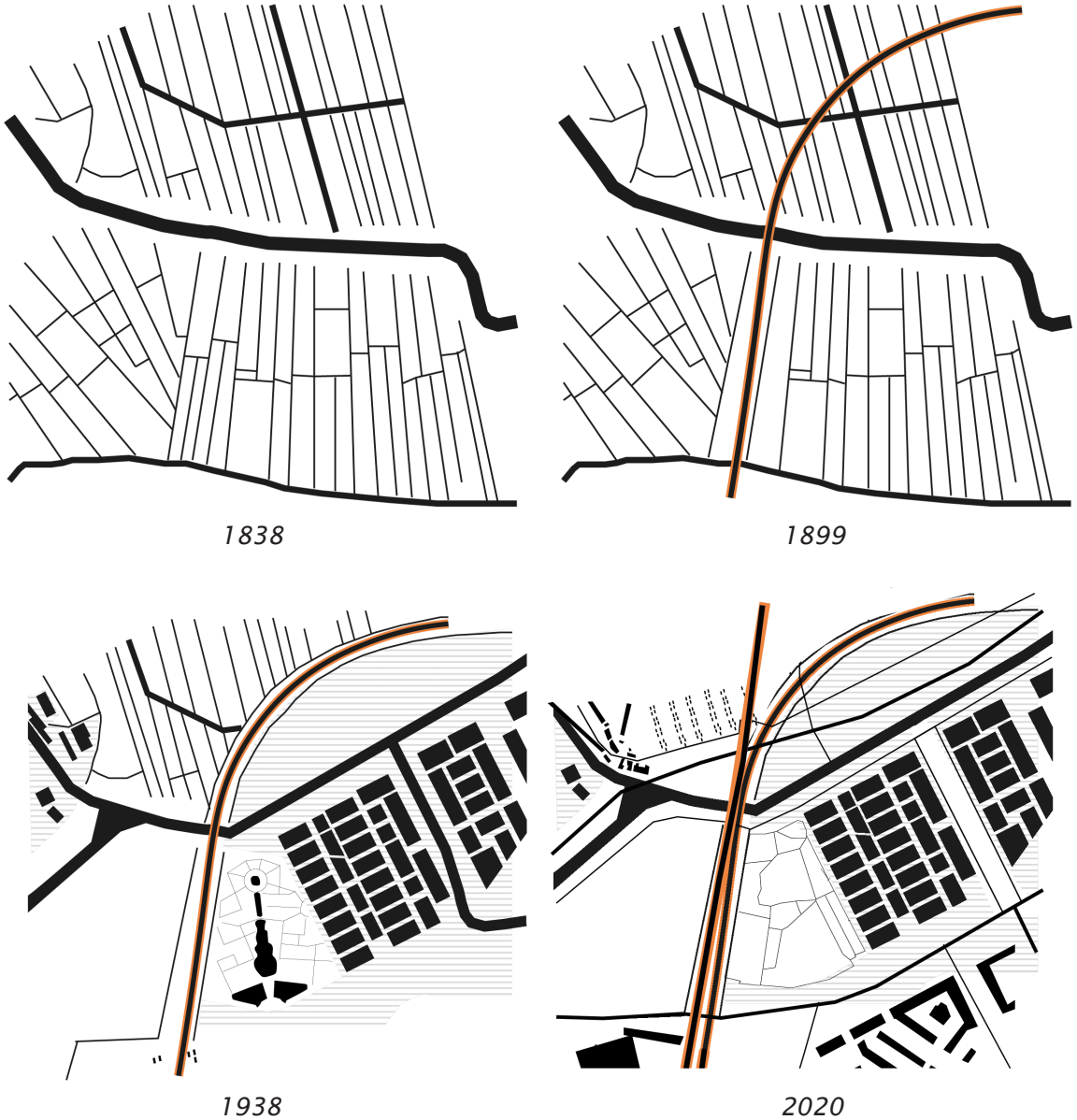


Figure 2: Transition of the landscape in the northwest of Rotterdam due to planning decisions. More and more interstitial spaces come to existence (Topotijdreis, n.d.).

The Missing Framework

Most interstitial spaces in urban areas have a natural or semi-natural character. Because they are rarely programmed or maintained in the same way as conventional urban spaces, vegetation is able to grow spontaneously, following its own patterns. This characteristic of self-organised growth distinguishes interstitial spaces from formal urban areas and raises important questions about how such informal, flexible landscapes might influence human perception and behaviour. At the same time, because of thei informal and ambiguous appearance means that people often do not immediately recognise these places as ‘nature’. Unlike parks or designed green spaces, interstitial landscapes lack familiar cues of care and intention, which can make their ecological value and restorative potential less visible or less intuitively understood.

Because of the often natural character of interstitial spaces, the knowledge about natural environments in relation to mental wellbeing is very interesting. Natural environments are namely increasingly and widely recognised for their positive effects on mental functioning, including support for psychological restoration. In today’s fast-paced and densely urbanised world, opportunities for mental recovery are limited but increasingly necessary, as everyday life places growing pressure on attention, emotional balance, and stress regulation. The unstructured, semi-natural character of interstitial spaces suggests that these areas may serve as accessible restorative environments within cities, offering alternative experiences outside highly programmed urban spaces.

As stated, Rotterdam provides a particularly relevant context for exploring this potential. Interstitial spaces may support psychological restoration, yet there is currently no clear framework for designing, perceiving, and managing them in ways that preserve their natural qualities while making their restorative potential accessible to urban residents.

By examining the overlap between the semi-natural character of interstitial spaces and their potential to enhance mental wellbeing, this research addresses a knowledge gap in landscape architecture: How can interstitial spaces be designed to enhance mental wellbeing without losing their existing character?

Reframing Interstitial Space as a Restorative Landscape

Research Question

The absence of a design framework that addresses how interstitial spaces can support psychological restoration presents a key challenge for landscape architecture: how to transform these spaces while preserving their spatial and ecological qualities. Rather than seeing these spaces as either untouched or fully transformed, there is an opportunity to use design to carefully add, reveal, and structure elements in ways that strengthen their existing qualities and enhance their capacity to support psychological restoration. By working with, rather than against, the inherent characteristics of these interstitial spaces, the project investigates how these urban spaces can support psychological restoration in everyday urban life.

Therefore, this research seeks to understand how such design interventions can contribute to the experience of interstitial spaces and their role within the wider urban landscape, leading to the following research question:

> *In which way does revealing and preserving the inherent qualities of interstitial spaces correlate with the creation of a diverse network of places that support psychological restoration among urban residents?*

Design Assignment

While the research question establishes a theoretical understanding of the relationship between interstitial spaces, design intervention, and psychological restoration, it also points toward the need for a design-based exploration. Understanding this relationship cannot remain purely analytical; it requires spatial translation and testing through design. This therefore leads to the dessign assignment:

> *The aim is to demonstrate how landscape architectural design can unlock, frame, and express the inherent spatial, ecological and social qualities of Rotterdam's interstitial spaces, enabling them to function as a legible and connected network of places that support psychological restoration among urban residents.*

This design exploration operates across multiple scales, ranging from Stadspark West to a series of site-specific interventions on a smaller scale. It focuses on a selection of interstitial spaces in Rotterdam that are spatially fragmented by infrastructure, yet strategically positioned within the urban fabric. Through the design of a coherent network, a sequence of differentiated restorative spaces, the project investigates how these spaces can become perceptually and functionally connected to each other and to the surrounding city.

Sub Research Questions

To address the research question and design assigment, a deeper understanding is required. The subquestions structure the research and design process by moving from identifying restorative landscape qualities to understanding the existing conditions of interstitial spaces, and finally to exploring how landscape architectural design can respond to and enhance these conditions.

By addressing the following questions, the research builds a foundation for design interventions that both preserve the inherent spatial and ecological characteristics of interstitial spaces as well as strengthen their capacity to support psychological restoration within the urban environment.

This leads to the following sub-research questions:

What characteristics can natural landscapes offer to provide psychological restoration for people?

What spatial, ecological, and functional characteristics define the use of interstitial spaces and in particular in Rotterdam?

Which landscape architectural design interventions can enhance psychological restoration while responding to the specific spatial and ecological conditions of interstitial spaces?

Which landscape architectural design interventions can clarify and enhance the inherent qualities of interstitial spaces while preserving their existing spatial and ecological character?

How can individual interstitial spaces collectively function as a diverse and connected network that supports psychological restoration among urban residents?

Methodology

This chapter outlines the methodological approach used throughout the thesis. Each chapter describes its own method in detail, reflecting the specific questions addressed. Across the project, a combination of literature research, case study analysis, field work, interviews and design experiments was used. Together, these methods provided both theoretical grounding and on site, practice-based insights, allowing the interstitial spaces to be understood and designed from multiple perspectives.

Interstitial Spaces and Their Characteristics

My understanding of interstitial spaces in Rotterdam began not with maps or definitions, but by physically entering the sites themselves. Because these places are often hidden, fragmented, or visually obscured, I started with an immersive site analysis to build an embodied understanding of how they appear in the urban structure, how they are accessed, and how they are used. Walking through these areas allowed me to experience their ambiguity firsthand and to notice details that would remain invisible from a distance.

The first characteristic that became important was the accessibility: whether the spaces could be reached at all, and how thresholds, fences, vegetation, or infrastructural edges shaped that experience. I documented these observations through drawings, tracing sightlines and points where the landscape opened or closed. Visibility became an important theme since many of these places are not seen simply because they are closed off by vegetation or withdraw people with certain signage. Mapping these conditions helped reveal why they often remain unnoticed.

As I spent more time on site, I began to read the traces of human presence. Waste patterns, desire paths, and informal seating spots offered clues about how long people stayed, what they did there, and that the spaces served as places for gathering, withdrawing, or movement. Mainly the trash that I found told me a lot, with photographs and drawings this is placed into context. Observing who used these areas, and at what times, helped me understand the kinds of activities these spaces afford. At the same time, I looked for ecological signs: fallen leaves and ground cover in autumn and winter indicated spontaneous vegetation, while footprints of foxes and rabbits revealed that these spaces also function as multispecies corridors. Comparing different sites gradually showed how variations in enclosure and openness shaped human use.

Only after these on-site experiences did I turn to desktop research. Mapping the locations made clear that these spaces are scattered remnants created by decades of infrastructural expansion, small pockets where systems intersect. Yet their fragmented nature also made them difficult to interpret them for people from behind their desks; maps alone could not explain their character or use. This tension between what is visible on paper and what is experienced on the ground reinforced the need for a combined approach.

To deepen this understanding, I consulted literature that theorizes interstitial spaces. De Solà-Morales' terrain vague helped articulate their spatial ambiguity, Desimini's concept of Fourth Nature provided an ecological lens for these type of areas and Relph's notion of placelessness explained why these areas often evoke limited attachment or recognition (De Solà-Morales, R.,1995; Desimini, S., 2014; Relph, E., 1976). These sources helped me situate my observations within a broader spectrum and clarified how interstitial spaces can be read, interpreted, and valued.

Together, the on-site deep map analysis, the desktop-based mapping, and the literature on interstitial spaces provided a coherent and comprehensive framework for observing and understanding these environments.

Psychological Restoration in Natural Environments

My understanding of how to design for psychological restoration did begin with tracing the theoretical foundations that shape how people perceive, use, and recover in outdoor environments. I chose this method to establish a scientific basis for understanding how natural environments support mental well-being, and to identify the specific landscape qualities that contribute to psychological restoration. A literature-based approach was appropriate here because the concept of restoration is grounded in decades of empirical and theoretical research, and these established frameworks provide the conceptual clarity I needed before moving toward spatial analysis or design.

My review draws on three major bodies of work that together form the core of contemporary restoration theory. I first examined studies by Hartig et al. (1991, 2007) for their definitions of psychological restoration and their empirical demonstrations of how natural environments facilitate mental recovery. These texts offered the conceptual grounding for understanding restoration as a measurable psychological process.

I then analysed the work of Kaplan and Kaplan (1989), and Kaplan (1995) to understand Attention Restoration Theory (ART). Their descriptions of being away, extent, soft fascination, and compatibility provided a detailed explanation of how specific environmental characteristics reduce cognitive fatigue. I also included Ulrich's Stress Reduction Theory (1983,1991) to complement ART with evidence on affective and physiological responses to nature, highlighting the immediate emotional benefits of natural settings.

Besides grounding the fact that natural environments have a positive influence on psychological restoration, I returned to thinking how can I spatially work with this. Siltanen & Puhakka (2025) highlights the role of biodiversity in this. It is not only its ecological value, but the richness of sensory cues it provides. Furthermore, studies by Fuller et al. (2007) show that mosaics of vegetation types, rather than uniform planting, can simultaneously support biodiversity and psychological well-being.

These sources provided concrete insights into the environmental qualities that support psychological restoration with regard to natural environments and offered guidelines for how such spaces might be designed. But literature alone could not answer how these principles work out in the specific context of Rotterdam's interstitial spaces.

For that reason, I returned to the field. Because perceived biodiversity emerged as a key factor, I began by examining the vegetation on site. First, I looked closely: identifying species, observing seasonal changes, and noting spontaneous growth. Yet I quickly realised that actual biodiversity does not automatically translate into perceived biodiversity. When stepping back and viewing the area from a broader perspective, the vegetation appeared as a set of large, undifferentiated masses. From this distance, the richness I had seen up close dissolved into a visually monotonous whole. This gap between ecological and perceived diversity became a central design challenge. To address it, I explored maintenance strategies and successional management as tools to create varied vegetation structures, allowing spontaneous vegetation to remain, but guiding it into different stages that could enhance perceptual richness.

Combining these different methodes, leaded to theoretical and site specific grounded interventions.

Psychological Restoration Through Behavioral Differentiation

In addition to understanding the role of natural environments and perceived biodiversity, I realised that behavioural differentiation is equally important for psychological restoration. I arrived at this insight through an extensive literature review. From this review, several key principles emerged. Kaplan and Kaplan (1989) emphasise the importance of “being away” and effortless fascination; Gibson (1979) shows that environments restore us through the behaviours they invite; Hartig et al. (2007) highlight the value of low-effort activities; and more recent studies, such as Wen et al. (2025) and Albeag & Al-Bazzaz (2025), underline the importance of opportunities for social interaction, physical activity, coherence, and legibility.

After identifying the three behavioural modes through literature, the next step was to understand how these behaviours were already present in the interstitial spaces of the site. This required a spatial analysis that could reveal where people currently gather, withdraw, or move, and which affordances, such as enclosure, openness, vegetation density, or elements shape these tendencies. Analysing the site in this way allowed me to see how the existing landscape already guides behaviour, even in its unmanaged and often unnoticed state.

However, spatial analysis alone could not fully explain how these affordances are interpreted by the people who use or live around the area. To ground the findings in lived experience, I conducted interviews with residents and users. By discussing different vegetation scenarios and asking how they would feel or behave in each one, I could explore how they themselves connect spatial differentiation to behavioural differentiation. These interviews translated theoretical principles into the social and cultural context of Rotterdam, ensuring that the design would respond to local perceptions rather than abstract models.

With both spatial and experiential insights in place, I turned to case studies. These examples helped me understand how other landscapes support behavioural differentiation through spatial means guide behaviour. Studying these precedents allowed me to see how the patterns I observed on site could be strengthened through design, and which strategies might be appropriate for an interstitial landscape that must remain informal, wild, and lightly touched.

From here, the design process began with the entrances. If behavioural differentiation is to be strengthened, the way people enter the interstitial spaces must also shift. By repositioning access points and vegetation the design reshapes how people can enter and move through the area.

Bringing these layers together made it possible to determine which parts of the site most strongly invite which behaviours in their current state. This synthesis formed the foundation for the design.

Ultimately, enhancing behavioural differentiation relies on legibility. Clear spatial cues help people recognise where different behaviours are supported, allowing the restorative potential of the interstitial spaces to become perceptible and accessible. This final step ties the entire methodology together: understanding behaviour, analysing space, listening to users, learning from precedents, and translating these insights into a design that remains subtle, contextual, and grounded in the existing landscape.

Revealing and Preserving the Characteristics

My approach to revealing and preserving the characteristics of the interstitial spaces began with the realisation that these areas, although difficult to access and often visually obscured, contained distinctive qualities that I did not want to erase through design. Their spontaneity, roughness and ecological richness were essential to their identity. The challenge was to understand how these qualities could be made perceptible without formalising or diminishing them.

To explore this, I turned to literature that examines how landscapes communicate their ecological and spatial qualities. Here sensory perceptibility became important in understanding how a landscape can communicate their characteristics. Research by Fuller et al. (2007) and Siltanen & Puhakka (2025) reinforced that wild and less managed environments often provide stronger restorative effects because of their naturalness, unpredictability and soft fascination. However, Meyer's Sustaining Beauty (2008) clarified that ecological performance alone is not enough for a landscape to endure. People must be able to experience and recognise its value. That's where I came across the term "hypernature", which focuses on intensifying natural processes so that they become more perceptible in everyday experience. This formed the inspiration for my design.

Understanding how people interpret such landscapes required another layer of insight. Nassauer's concept of cues to care (1995) became essential here. People rely on subtle signals to understand whether a landscape is intentional. These cues help them accept and value environments that might otherwise appear messy or unmanaged. To deepen this understanding, I explored Land Art as a communicative tool. In this context, Land Art functions as a kind of meta cue, an additional layer that clarifies meaning and draws attention to ecological and spatial qualities without overpowering them.

Besides literature being the basis understanding of how I can reveal while at the same time preserve the interstitial, case studies revealed how this knowledge has been put into practice. Also the field trip to Berlin formed inspiration on what the interventions could look like to enhance certain characteristics. After I knew how I could reveal and preserve these spaces I went into the field to test this. The materials I brought were different from material and measurements but it helped me showing the spatial relations in the field.

By using again the combination of literature, case studies and fieldwork I could synthese everything into the perfect solution.

A Diverse Network

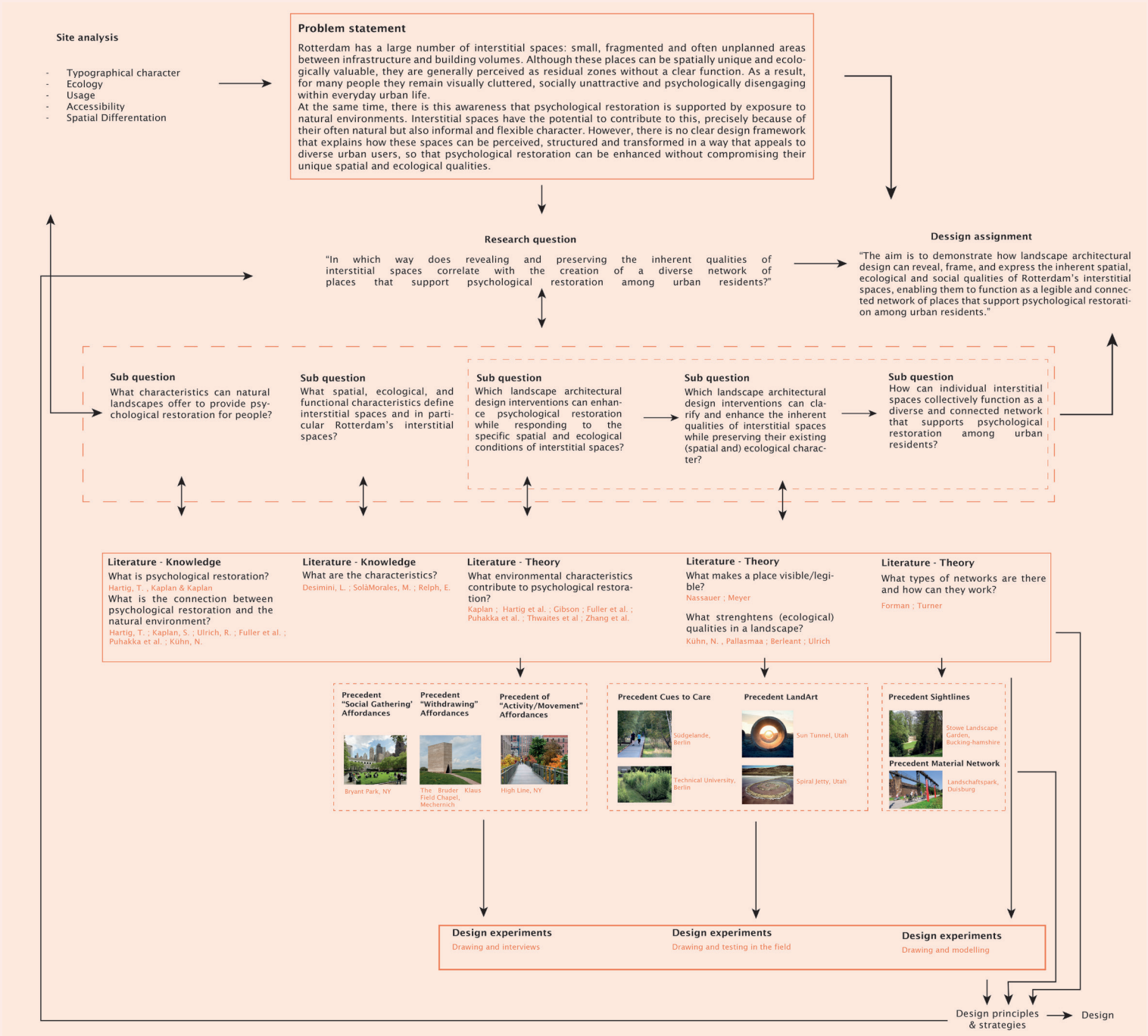
My understanding of how a network can emerge within a fragmented urban landscape began with exploring the theoretical foundations of landscape ecology and environmental psychology. The literature made clear that networks are not only ecological structures but also perceptual and experiential systems. Fuller et al. (2007) showed that even small or scattered green spaces can contribute to psychological restoration when they support ecological diversity, suggesting that fragmented patches can still function as a meaningful whole. Forman's patch, corridor and matrix model (1995) helped me understand how isolated areas interact within a larger system and how subtle connections can strengthen ecological and spatial coherence. Kaplan and Kaplan (1989) added a psychological dimension by explaining how natural environments support a sense of being away and attentional recovery, which helped me see how a network can operate not only physically but also cognitively. Turner's work on English garden design (1980) offered another perspective by showing how sightlines and sequential experiences can create a coherent landscape, even when spaces are not directly connected.

These sources together clarified that a network does not need to be continuous to be perceived as one. It can emerge through repetition, ecological relationships, visual cues and experiential sequences. This insight became essential for my design approach.

To translate these theoretical principles into practice, I turned to case studies. I examined how repetition in material can create a sense of continuity across a fragmented area. The example showed that when certain elements return consistently, they form a recognisable family that ties dispersed spaces together. I also studied a project where visual connectivity played a central role. The case demonstrated how short sightlines, framed views and subtle alignments can guide movement and perception, allowing people to intuitively understand that separate places belong to the same system.

Through this combined process of reading literature and analysing case studies I developed an approach that treats the network not as a physical connected structure, but as a perceptual and ecological system. It is a network that emerges through repetition, visibility and subtle spatial cues, allowing fragmented interstitial spaces to be experienced as a coherent whole.

Methodology Diagram



1. Interstitial Spaces and Their Characteristics

This chapter introduces the specific type of urban environment of this project, interstitial spaces, on a deeper level. It moves from broader environmental principles toward a focused examination of how these spaces emerge within the urban fabric and which spatial, ecological, and experiential qualities define them. Interstitial spaces are explored through multiple theoretical perspectives, tracing their origins, characteristics, and roles within the contemporary city, alongside an in-depth site-based investigation. Through desktop research and, primarily, immersive site analysis using a deep-mapping approach, this chapter interprets the particular qualities of the selected site and relates them to their potential to support psychological restoration. In doing so, it establishes the contextual foundation for the subsequent design exploration.

1.1 Immersive Site Analysis on Interstitial Spaces

1.1.1 Public/Private

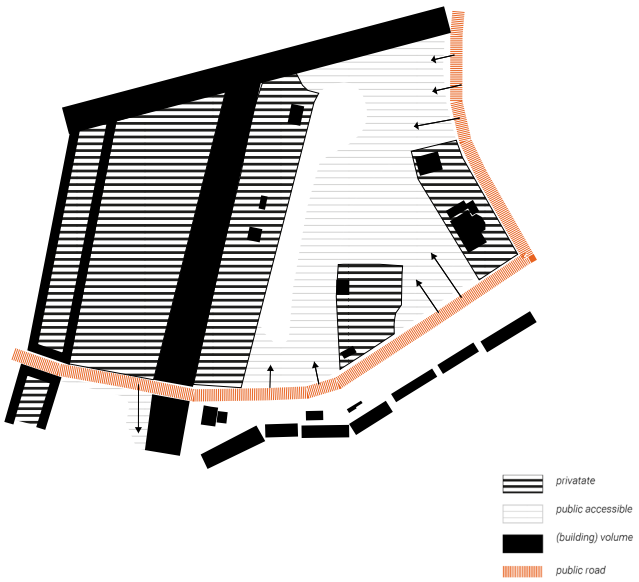


Figure 3: Location 1 - Public/Private map

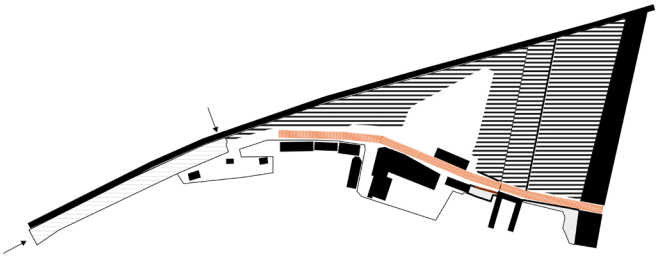


Figure 4: Location 2 - Public/Private map

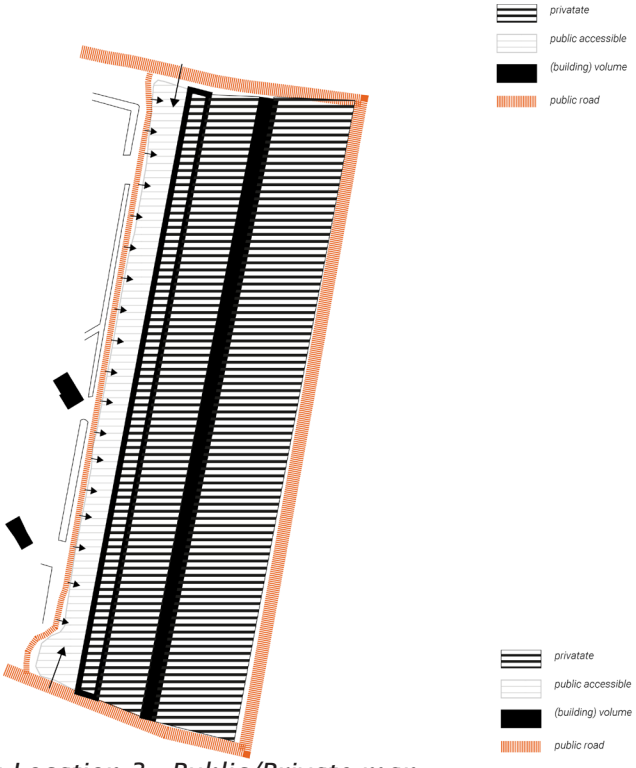


Figure 5: Location 3 - Public/Private map

Starting the deep map analysis, accessibility appeared as the first aspect to be encountered and therefore the first to be examined.

The sometimes poor accessibility became therefore also the first characteristic of interstitial spaces.

What first stood out, was the lack of clarity of these spaces. This is, among other things, reinforced by the fact that not all of the interstitial spaces are public accessible. A big part of the interstitial spaces researched is owned by railway institutions or rented by people from the municipality.

1.1.2 Accessibility

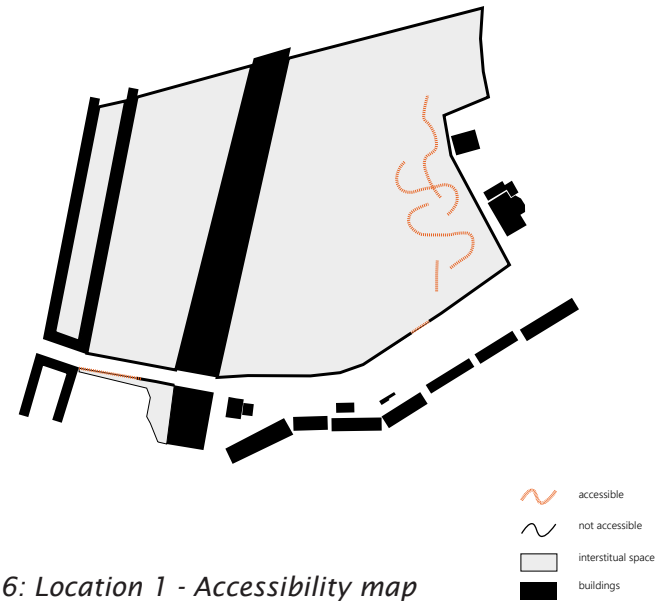


Figure 6: Location 1 - Accessibility map

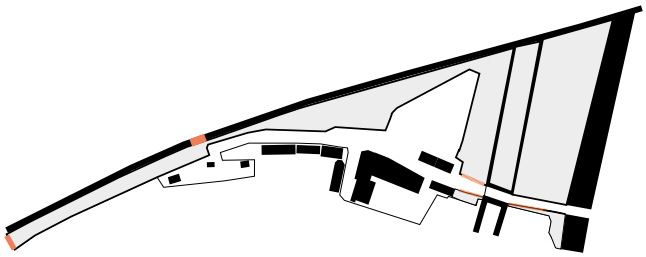


Figure 7: Location 2 - Accessibility map

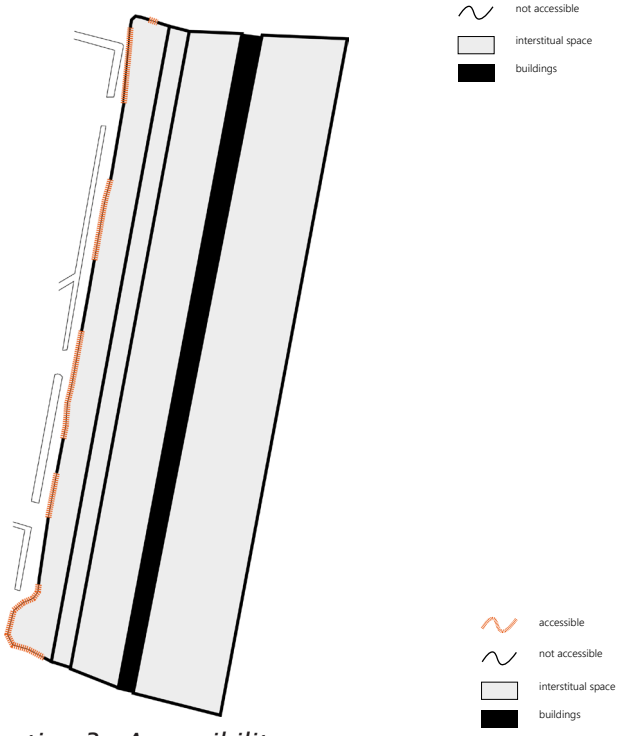
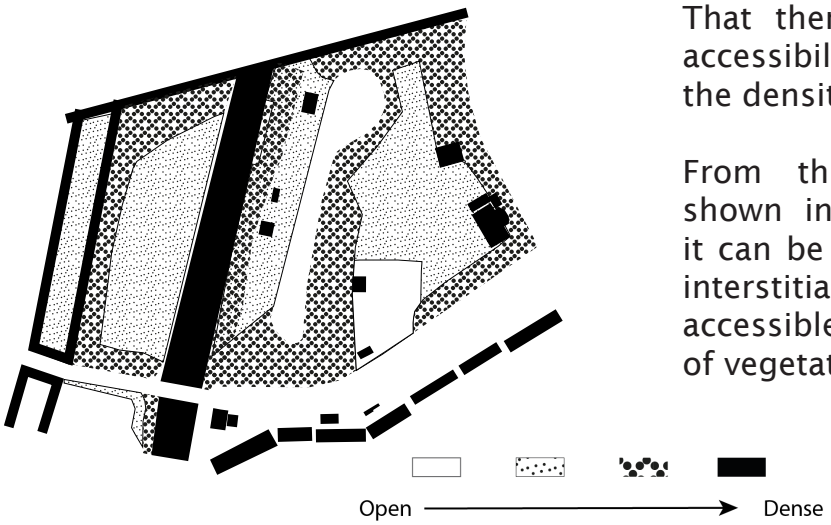


Figure 8: Location 3 - Accessibility map

Limited physical accessibility further reinforces the perception that many interstitial spaces are not enterable or intended for use.

At the researched spaces, it shows that there is limited accessibility at the border and in the interstitial spaces. This has to do with vegetation, fences and walls which form obstacles and therefore limit the physical accessibility towards these spaces.

1.1.3 Density



That there is limited physically accessibility is also the result of the density of the vegetation.

From this analysis, which is shown in the following figures, it can be derived that not all the interstitial spaces are physically accessible because of the density of vegetation.

Figure 9: Location 1 - Density map

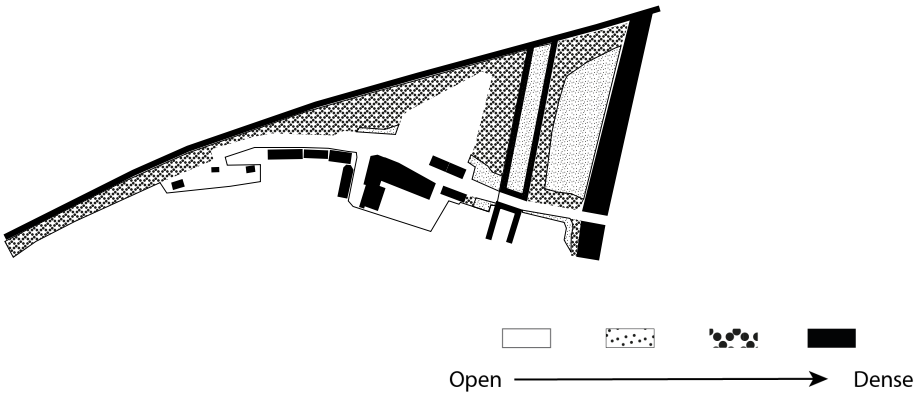


Figure 10: Location 2 - Density map

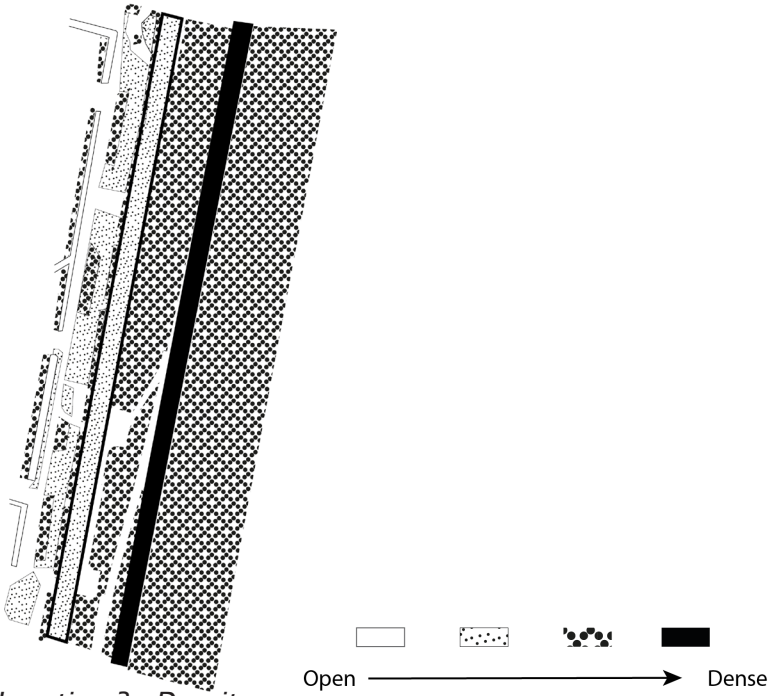


Figure 11: Location 3 - Density map

1.1.2 Edges

Figure 12: Location 1 - Edge

At a more local scale, the analysis which focuses on the edges and transitions reveals that these can function as perceptual and behavioural thresholds.

These abrupt transitions with no signs of invitement, discourage entry and engagement, causing people to pass by without noticing or accessing the spaces. As a result, interstitial spaces are not absent from daily urban life, but remain visually and experientially disconnected from it.

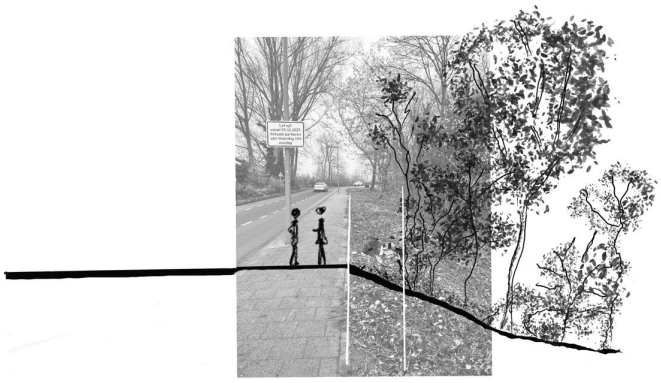


Figure 13: Location 1 - Edge

Figure 14: Location 3 - Edge

1.1.5 Signage

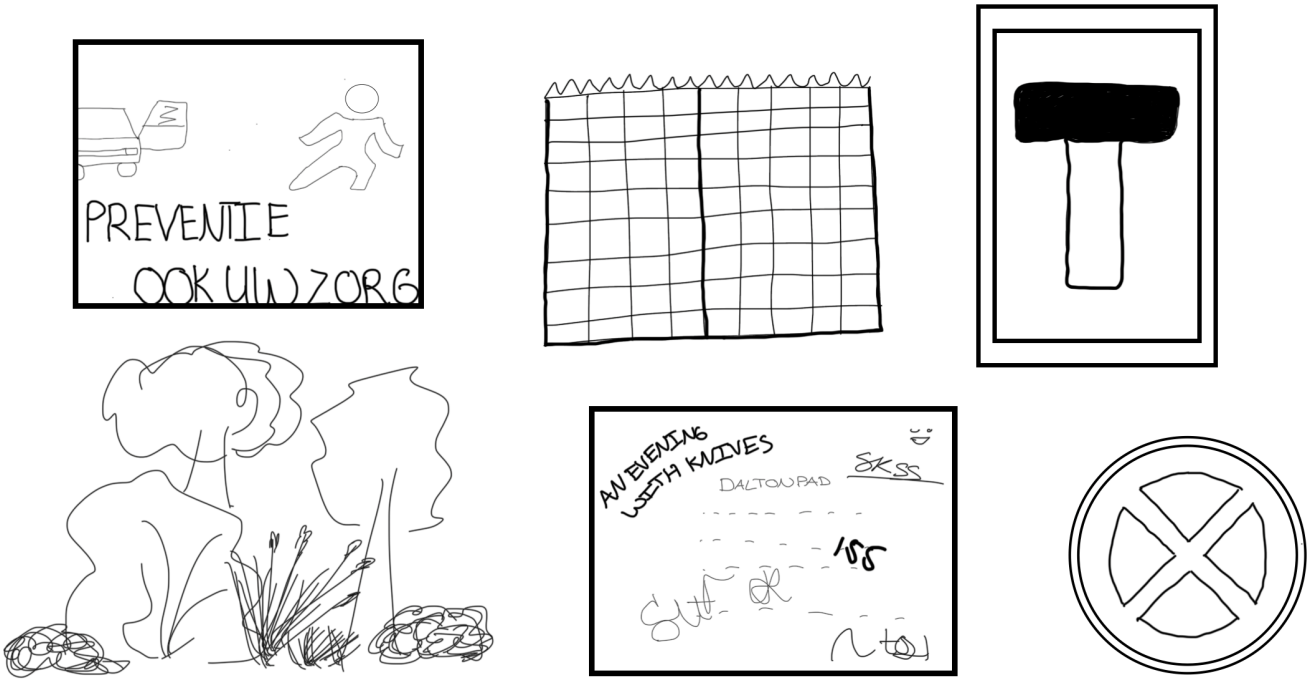


Figure 15: Signs at interstitial spaces. These kind of signs withdraw most people from entering the space.

During the site analysis, it became evident that signage plays an important role in how interstitial spaces are perceived and used. Elements such as warning signs, dead-end indications, fences, and poorly maintained information signs communicate implicit messages about access and legitimacy. Rather than inviting exploration, these cues often suggest that there is “nothing there,” that the space is private, unsafe, or not intended for public use. As a result, together with the density of vegetation as being a spatail cue, they discourage a lot of people from entering or even visually engaging with these spaces, strenghtening their minor position within the everyday urban experience.

1.1.6 Movement Pattern

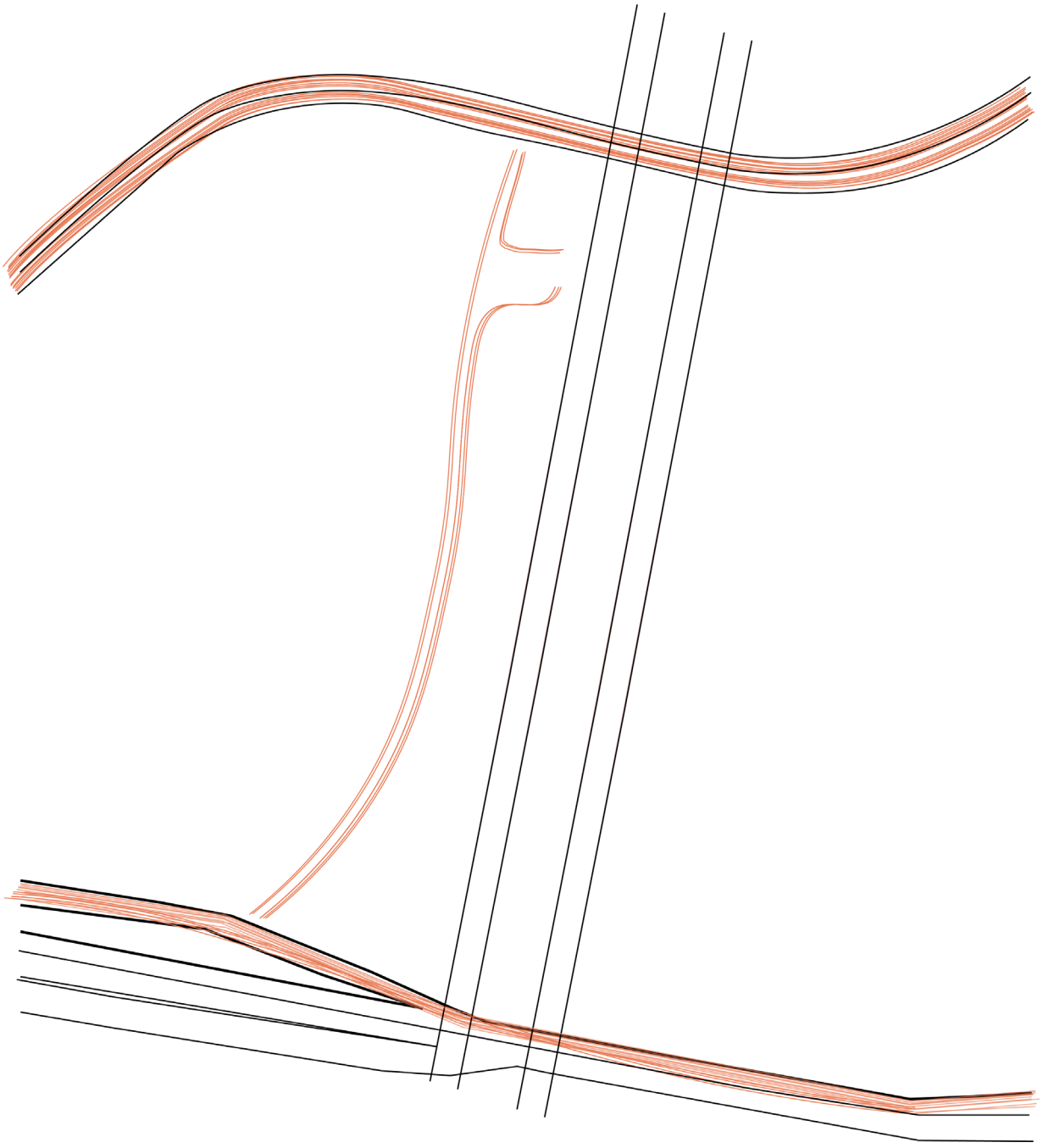


Figure 16: Movement of passersby. This movement pattern shows that not a of people are entering this space.

Observations of movement patterns over a half-hour period further confirm this condition. While large numbers of cars and other forms of traffic pass alongside this interstitial space on a daily basis, only a very limited number of movements indicate entry or engagement with these interstitial spaces. The spaces are primarily experienced from a distance, functioning more as a background rather than a destination.

This imbalance between passing-by and entering strenghtens the idea that interstitial spaces are present within everyday urban routes, but remain functionally and experientially disconnected from daily use for a lot of people.

1.1.7 Spontaneous Vegetation

However, although these spatial conditions make the sites less inviting to most people, they form the perfect space for specific groups of human and non-human users. This is particularly visible in the spontaneous vegetation that has developed in these areas.

A variety of species can be found, diverse from the ‘regular and maintained’ urban fabric. When designing, it is important to take the current ecology into account since it makes the spaces special and different from ‘regular’.

Building on this, it is important to see the non-humans equal to humans since the design is intervening in their habitat. In the interview, a tree is heard and this knowledge is taken up.

Different Spontaneous Vegetation








Figure 17: Spontaneous vegetation at the interstitial spaces in Rotterdam. A diversity of plants can be found within the interstitial spaces.

1.1.8 Interview with the non-human

Me: Hi, my name is Marit. I am not a standard visitor of this place, but you attracted my attention, so I hope it is okay if I speak to you? How are you?

Tree: Hi, nice to meet you and yes I would like to speak to you. However, today I feel... heavy. The rain is dripping down my bark which I like, but the cold is creeping into my wood. It's also quiet. More quiet than in the warm months. Nevertheless I appreciate you staying, despite the weather.

Me: How do you like this place now, in this season, in the cold?

Tree: If I am really honest I feel a bit abandoned.. The young people, as I call them, are not here that often anymore. Only their traces remain: the hut that is half soaked, the plastic bottles full of rainwater and the rubbish stuck in the wet ground. The ground is cold and hard-packed. Where there used to be plants, now I only see wet earth with rubbish scattered here and there. The silence is sometimes pleasant... but also chilly. I miss the company, but not the chaos. I am sorry if that sounds confusing.

Me: That's okay. So if I understand correctly, you do not prefer it without the young people but also not really much when they are all here?

Tree: Yeah, it's a mixed feeling. The silence lets me rest, that's for sure. No screeching brakes, no new scratches on my bark. My roots can breathe for a moment without being flattened by bicycles. But I also feel a kind of... alone. Over the years I am used to company, however they've left their things behind as if this place no longer exists once it gets cold. That hurts, in a different way than a scratch in my bark. It says, 'You're only useful to us when the weather is good.'

Me: Do the young people never come here in wintertime?

Tree: They sometimes are here but not as often and long as in the summertime. On the other hand, these times also invites parents with their children since it is more often not in use by the group of younger people. That is something I like.

Me: I can imagine. And how does this day itself feel? The rain, the cold?

Tree: The rain is great for me. I like the water and the sounds of it as well as the sounds of the birds and other animals I can hear clearly when there are no other people due to the rain. The birds are sometimes sitting on my branches. Their company is comforting. I like it when the sound of birds is louder than that of the cars and the train and the people. However, early darkness makes it hard to tell when the day actually ends, that is something weird to me.

Me: You told me earlier about the sratch in your bark. How did that happen?

Tree: Oh yes.. I think that some time ago they were playing a game or something. I don't understand why they did it either. I couldn't say anything... At those moments I wish they could speak my language. Then I would scream and tell them not to hurt me so much. The scratches feel still raw. It takes a long time for such wounds to heal.

Me: Are there more things happening which you don't like or understand?

Tree: Yes the rubbish... It is scattered throughout the whole area I heard from other trees, however in fornt of me there is so much.. I can not believe that people would leave it just like that. Animals are now searching hard for food. Sometimes I think they're getting sick from what they find here. That makes me uneasy.

Me: What would you like to say to them if you could speak to them?

Tree: 'Look around you, even when it's not summer.' This place is not a disposable place. Care does not disappear with the nice weather. I don't want them to stop coming, I miss their laughter, but I want them to remember that this is also my home and that I can't go away to avoid this for a while. I feel that when they take their things with them and put less strain on the ground, I would go into spring much stronger.

Me: What are your hopes for the coming months?

Tree: Something simple: that they come back, but with care. That someone cleans up the plastic so that the soil can recover. That maybe a little bit of green can grow back as soon as the weather gets warmer. So that I have some direct company, also during the nights and winterdays. And that, even in this cold drizzle, I am not just an object in a trail, but a being that they recognise as part of their place. Often I feel anonymous, they don't know who I am. They see me as the tree in the middle, but they don't name me by my name, which I actually also often forget.. You can't see my leafs often since I am not doing great. That makes me sad. I want to be here for so much longer. And what is weird is that I do think that they like me as a sort of obstacle, but there is not much appreciation. I hope one day that would different.

Me: Thank you for sharing this, you opened my eyes.

Tree: Thank you for standing here while it is this weather. I enjoyed giving you an insight into my life.

Figure 18: Tree at an interstitial space. This tree was interviewed as the Non-Human.

1.1.9 Diversity of Usage

Besides non-humans, certain human groups also find their place in the interstitial. Urban residents have diverse needs, and in the highly regulated city fabric, some behaviors or desires are often labeled as “inappropriate” or “out of place.”

Interstitial spaces provide opportunities for those whose needs are not accommodated elsewhere. For example, unhoused people can find temporary shelter, while others may seek privacy, solitude, or informal areas for exercise, play, or reflection in a more natural setting. Observing the activities that occur in these spaces reveals this diversity of use.

Different Observed Activities at Interstitial Spaces

Figure 19: Observed activities at interstitial spaces in the research area. A diversity of activities has been withnessed, from withdrawing to gathering to movement.

1.1.10 Trash in Relation to Usage

Documented Trash

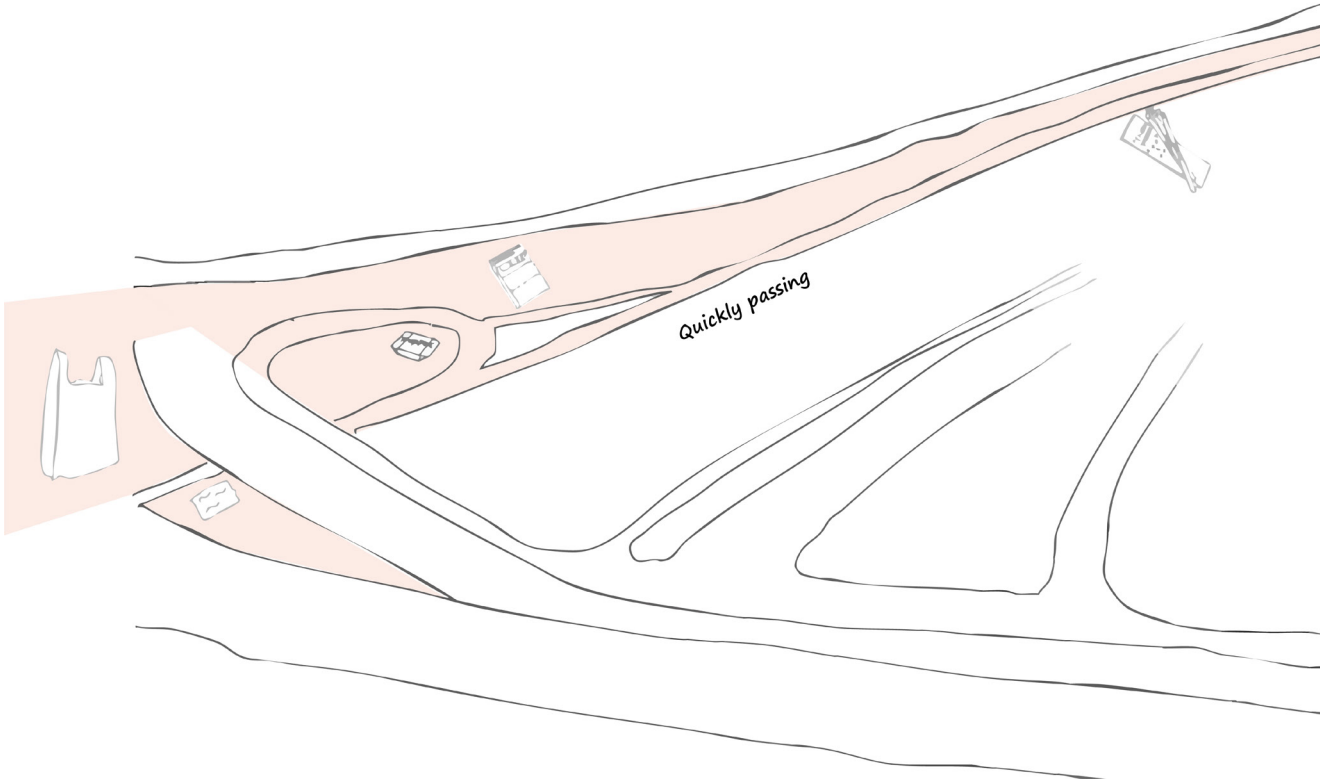


Figure 20: Documented trash at location 2. Trash has only been found at the edges of the biking path which implied quickly passing by of people.

Besides observing humans and non-humans, waste told a lot about the activities that take place in these spaces. Only observing did not tell us everything. It felt like there was more to be seen, but maybe not directly. The type of waste, such as beer cans, textiles and nitrous oxide capsules, told us for each interstitial space how the space is used when no one is looking. In the drawings, the waste is documented for each specific area to get a better understanding of what people do in these spaces and for what activities people need/find their space here.

Documented Trash

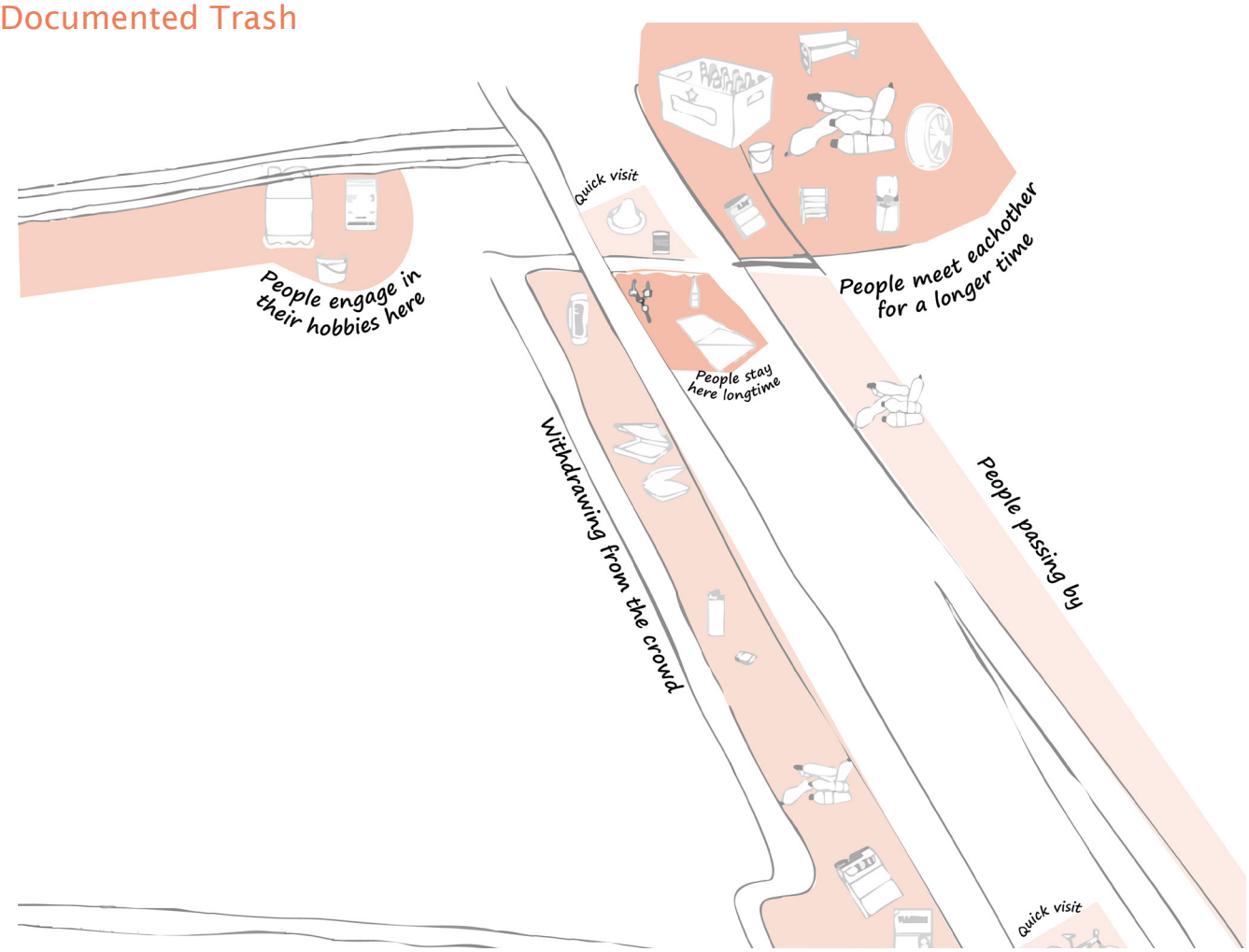


Figure 21: Documented trash at location 1 and 3. At these spots more trash was found, which implied staying of people.

From documenting the waste, conclusions could be drawn. The main conclusion was that each interstitial space accommodates different activities. One space being a place where people would sleep and thus withdraw from the crowd, while another space is used as a get together area for a longer time and another one is used to just move though.
While this was not all seen by the naked eye, waste told more than we would ever see.

1.1.11 Environment in Relation to Usage

Location 1

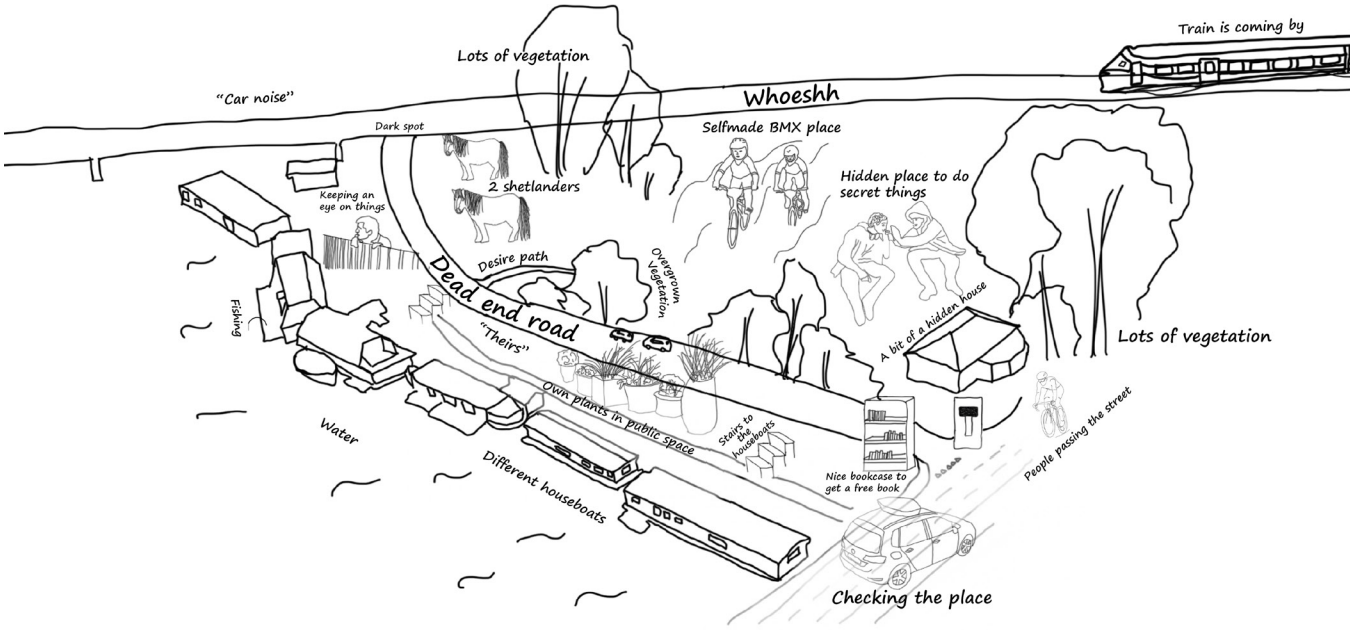


Figure 22: Environment in relation to usage at location 1. The secluded environment, because of vegetation and signs, resulted in a withdrawing spot of people.

By taking the knowledge of the observations and the trash into account activities could be placed into context. By using the drawings of Jan Rothuizen as an inspiration, the relation between spatial charactistics and activities is showed. The context is giving answers to question like, "Why are these things happening here?" and "What is the environment giving the people to feel like they can participate in such activities there?"

For location 1, it can be seen that people do their secret things behind a lot of vegetation, because they do not want to be seen. And because of the signage that says it is a dead end road, the people who live there, take good notice of who is walking in the street.

Location 2

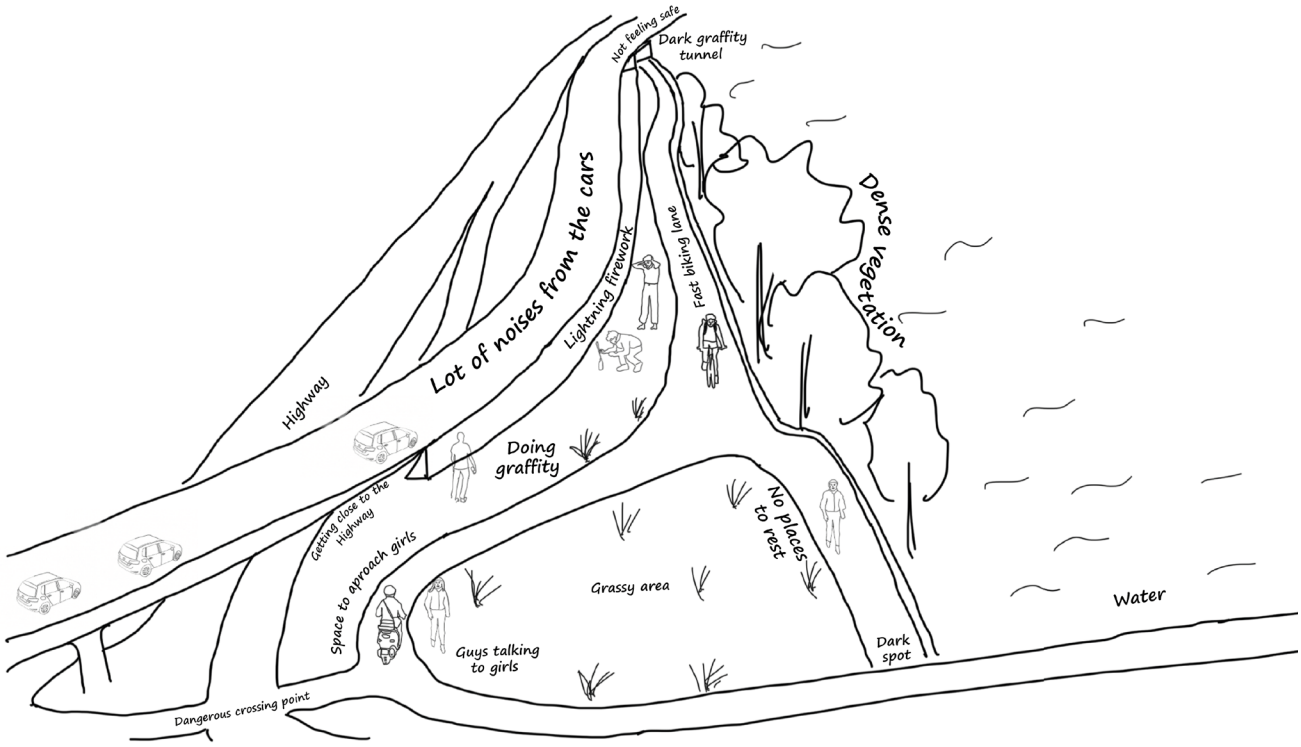


Figure 23: Environment in relation to usage at location 2. Because of the spatial conditions, this spot can be seen more as an area to move through.

For location 2, whole other activities have been observed. This has ofcourse to do with the spatial conditions. What can be seen is that this space is very open and a biking lane and walking path cut through the area. Left and right from this, interstitial spaces have emerged.

From waste and observation, it can be said that this space is mainly used as a space to pass through. For example, waste was only seen at the edges, which implies that people throw it on the ground when moving by.

The only waste that does not fit the spatial conditions are the graffity spray cans. This however could be substantiatedby the place being a legal graffity area.

Location 3

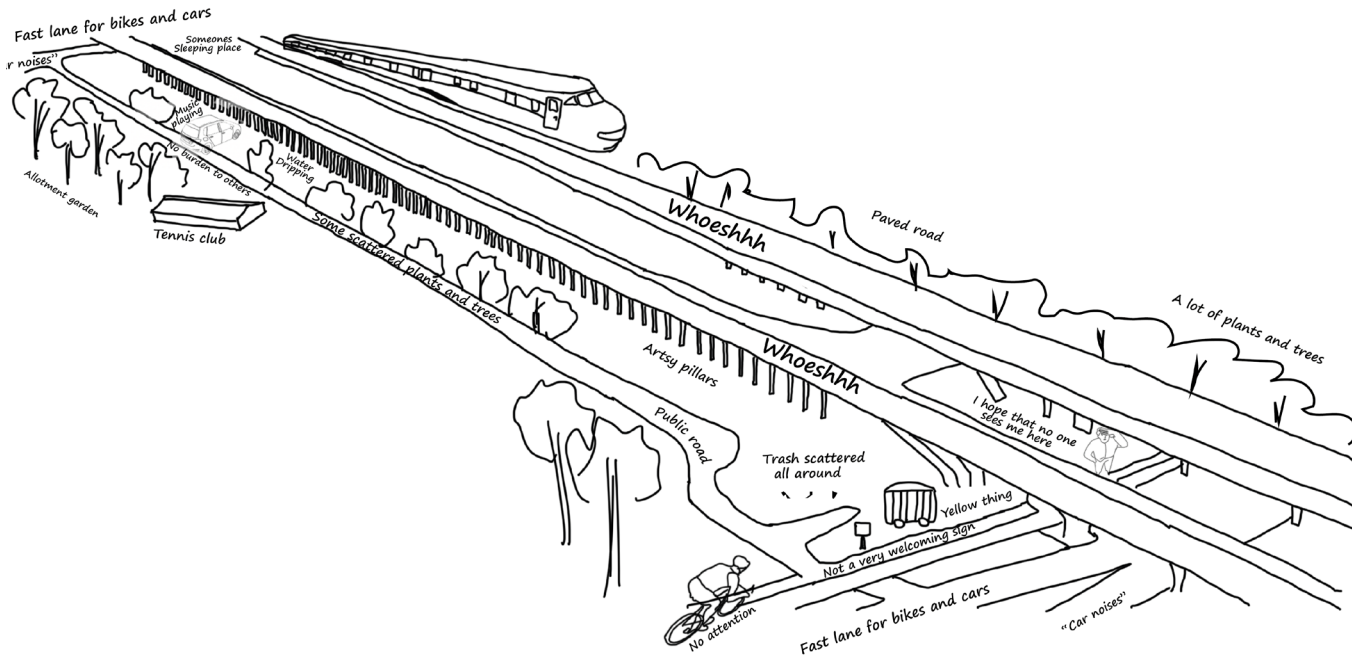


Figure 24: Environment in relation to usage at location 3. Multiple acitivities hava been found in these interstitial spaces, from withdrawing to meeting eachother, as a result of signs and vegetation.

For these interstitial spaces, another diversity of activities could be placed into conext. Because of people passing by quickly, people find their place to withdraw here in different forms. Because of the dense vegetation, people sleep in here. They do not want to be waken up by the police so they hide and that is possible due to the spatial characteristics.

Furthermore, because of the somehow hidden parking space, people come together to chill in their cars and smoke. Next to this, traces of horses and dogs indicated that people also use the spaces to walk through. By observing it could be concluded that they like to walk here since it offers a natural, diverse area where animals can walk freely.

Activities Placed into Perspective

Figure 25: Activities placed in context. The activities seen in the 'Jan Rothuizen' drawings are placed into perspective to better understand the situation.

To bring the activities even more into context, these visuals show how the spaces are used based on observation and the study of waste. From these visuals it again becomes evident that in the more dense spaces, peolpe withdraw on their own or do things that they do not want other to know. And in the more open spaces, people move through or meet eachother in most cases.

1.1.12 Zooming out

Infrastructural Network of Rotterdam

Figure 26: Infrastructural network of Rotterdam. Due to larger planning decisions this infrastructural network of Rotterdam has come to existence.

What we saw from the site analysis is also confirmed by desk-top analysis. Multiple scattered spaces next to or cut through by infrastructure. When seeing these spaces from above it all begins to make sense.

As a result of large-scale spatial decisions, interstitial spaces emerge as by-products of infrastructural and planning systems. Mapping infrastructure networks and water systems reveals that these spaces frequently occur at points where multiple large-scale systems intersect, such as highway crossings, roads intersecting watercourses, or rail lines cutting through neighbourhoods. These locations are not incidental, but structurally produced by the overlap and interaction of different urban networks.

At a systemic level, interstitial spaces often form continuous spatial structures that extend along infrastructural corridors and water systems, shaping a scattered but still interconnected layer within the urban landscape.

1.1.13 Infrastructural Networks in Relation to the Interstitial Spaces

Infrastructure in relation to the Interstitial Spaces in northwest Rotterdam

Figure 27: Creation of interstitial spaces because of infrastructure. Larger planning decisions have led to many by-products.

Figure 28: Interstitial spaces in the research area Rotterdam northwest. Creation of interstitial spaces due to infrastructure.

1.1.14 Landuse Rotterdam

Landuse Rotterdam

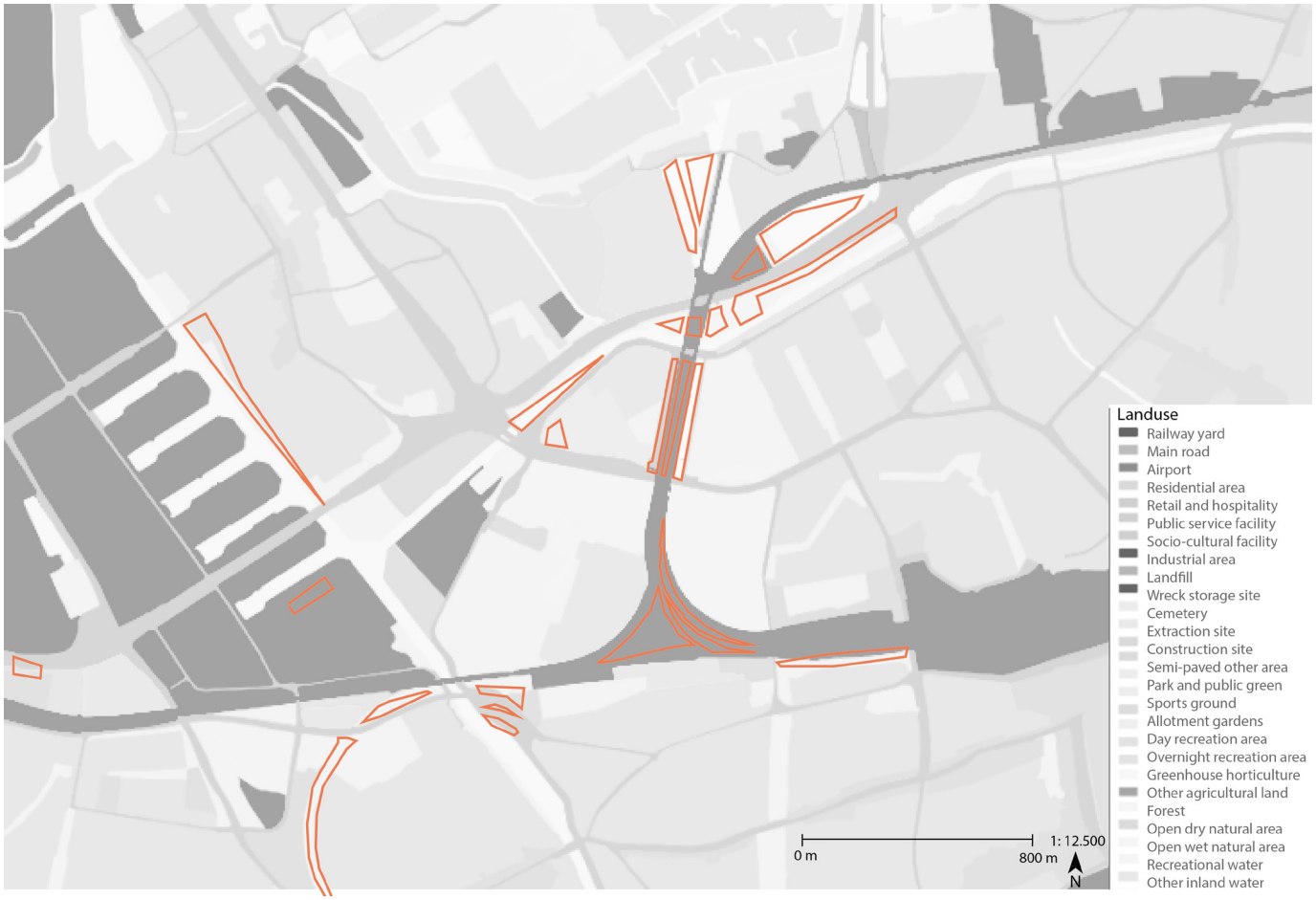


Figure 29: Landuse Rotterdam overlapped with interstitial spaces. By looking at these maps, it is clear that these interstitial spaces are not understood.

Landuse Rotterdam Analysis Location

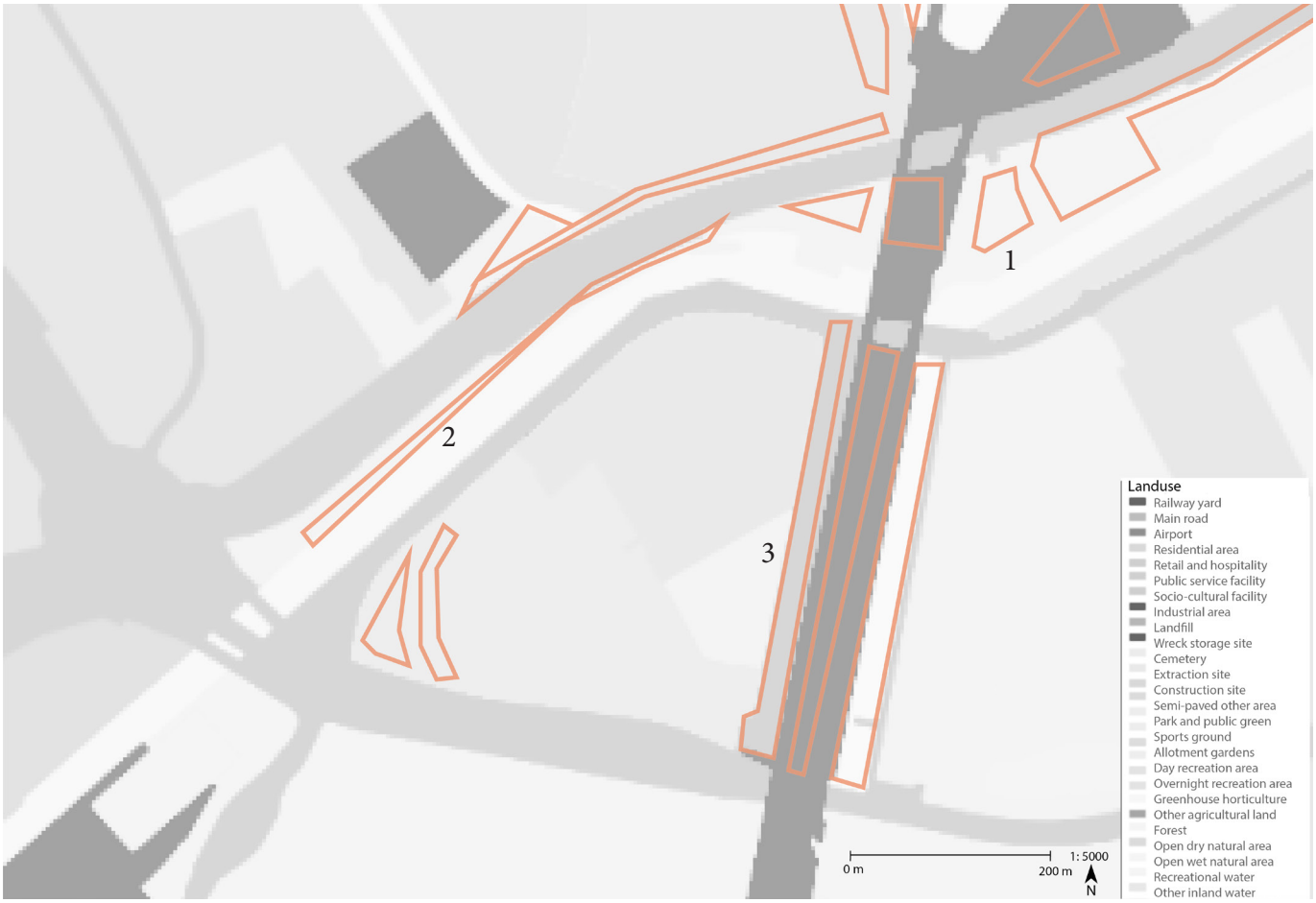


Figure 30: Landuse Rotterdam northwest overlapped with interstitial spaces.The interstitial spaces are named all different uses on this landuse map, which implies that there is not a good understanding of these spaces.

Land-use mapping shows that interstitial spaces are classified in inconsistent and sometimes contradictory ways. According to the Centraal Bureau voor de Statistiek (PDOK Viewer, n.d.), these areas fall under categories such as park and public green, railway yard, day recreation area, semi-paved other area, or industrial terrain. This inconsistency reflects a broader misunderstanding of their role within the urban fabric. Rather than being recognised as a distinct spatial category, they remain visually and conceptually obscured, difficult to read on maps and equally difficult to interpret on the ground.

1.2 Theoretical Grounding of Interstital Spaces

The site analysis confirmed the ambiguity of the spaces. While walking through the spaces, it became clear that their accessibility, visibility, and spatial fragmentation strongly influence how they are encountered and used. Many sites are screened by vegetation, bordered by infrastructural edges, or lack clear signage, which contributes to their hiddenness. At the same time, traces of human and non-human presence, waste patterns, informal paths, spontaneous vegetation, and animal footprints, revealed that these spaces nonetheless support a variety of activities and ecological processes.

In addition to these spatial and ecological observations, the site analysis revealed that interstitial spaces currently support three types of human activity: social gathering, withdrawing, and moving through. These behavioural patterns were visible in traces of use, informal paths, and the ways people paused or passed through the sites. Although subtle, these activities form part of the character of interstitial spaces. This insight forms an important foundation for developing design strategies that engage with their unique qualities rather than overwrite them.

Desktop research further showed that these fragments are the by-products of decades of infrastructural expansion and redevelopment, emerging in the gaps where systems intersect. Together, these observations highlighted that interstitial spaces cannot be fully understood through spatial analysis alone, their ambiguity is both physical and conceptual.

To deepen this understanding, literature theorises interstitial spaces and offers frameworks for interpreting their spatial, ecological, and experiential qualities. These theoretical perspectives help articulate what was observed on site and provide language for describing the characteristics that make these spaces so difficult to classify yet so rich in potential. Literature gives an explanation on three levels, namely a theoretical understanding, an ecological interpretation and lastly a phenomelogical perspective.

Ignasi de Solà-Morales' essay Terrain Vague (1995) offers the first explicit theoretical articulation of what is now understood as interstitial space. He describes these landscapes as undefined, abandoned, and outside dominant systems of control. Rather than treating them as empty or failed, Solà-Morales emphasises their openness and indeterminacy, qualities that resonate strongly with the ambiguous and unregulated fragments encountered in Rotterdam.

Building on this spatial understanding, Jill Desimini (2014) introduces an ecological interpretation through the concept of Fourth Nature. Fourth Nature refers to landscapes shaped primarily by spontaneous vegetation, successional processes, and non-human agency. While not all interstitial spaces constitute Fourth Nature, many of the ecological traces observed on site, such as unmanaged growth and multispecies presence, align with this framework and help explain their ecological significance.

From a phenomenological perspective, Edward Relph's notion of placelessness (1976) provides insight into why interstitial spaces often evoke limited emotional attachment or recognition. Their lack of defined function, identity, or symbolic meaning contributes to their marginal status within the city. Yet placelessness is not fixed; interstitial spaces can also be understood as potential places, environments whose meanings may emerge through experience, use, and interpretation.

In some cases, they may already function as meaningful places for specific groups, even if this remains unnoticed at a broader scale.

Finally, situating the interstitial spaces of Rotterdam within their historical development reveals how they have gradually taken shape through infrastructural growth, planning decisions, and redevelopment cycles (Topotijdreis, n.d.). These processes have produced the spatial conditions observed today: fragmented, ambiguous, and often overlooked, yet ecologically active and experientially rich.

Together, the site analysis, desktop research, and theoretical groundings create a coherent understanding of interstitial spaces. The empirical observations reveal how these spaces function in real life, while the literature provides the conceptual tools to interpret their theoretical, ecological, and phenomenological characteristics.

1.3 Analysis Conclusions

Three Main Outcomes

Not accessible/inviting | Natural green character | Different human usages

Figure 31: Conclusions of the site analysis. Three main characteristics were the result of my analysis, that the spaces are not always good accessible/inviting, that they have a natural green character and that different human uages have been recognized at the sites.

As a conclusion from the analysis, interstitial spaces can be understood as places that are neither clearly visible nor easily recognised for what they are or what they could offer. The observations show that these spaces possess a distinctly green character, often aligning with the qualities of Fourth Nature (Desimini, 2014). The analysis also indicates that interstitial spaces are primarily used as places to withdraw, though this occurs in different forms. Three recurring types of human activity emerge: meeting others, withdrawing alone, and moving by or through. For the design process, it is essential to engage with these existing qualities rather than overwrite them, building on the subtle forms of use and ecological richness that are already present. This to preserve these valuable green informal spaces within the dense city.

1.4 Project Location

Project Location

Figure 32: Thesis poject site. Three closely related interstitial spaces have been chosen as the focus area of my design.

For this design, the focus is placed on a specific area (highlighted on the map) that contains three interstitial spaces located in close proximity to one another. This cluster forms a typical example of how interstitial spaces emerge within the urban fabric: the three sites are shaped by the intersection of train tracks, roads, waterways, and larger urban zones.

As a result of these overlapping infrastructures, each space has developed a distinct atmosphere, with different social characteristics and varying spatial-ecological conditions. Despite their geographical closeness, the three areas therefore offer different opportunities and affordances.

Together, they form a particularly compelling basis for the design exploration.

2. Psychological Restoration in Natural Environments

This chapter establishes psychological restoration as the central theoretical framework of the thesis. It examines how environments influence mental wellbeing, and more specifically how natural environments contribute to psychological restoration, given that Rotterdam's interstitial spaces have a distinctly green character. Drawing on theories from environmental psychology, the chapter introduces the key concepts and mechanisms that explain why natural settings can support mental recovery, including the qualities that make certain environments more restorative than others.

Building on the outcomes of the site analysis, the chapter connects these theoretical insights to the specific context of interstitial spaces. The chapter explores not only why natural environments are beneficial, but also which specific characteristics of green spaces contribute to restorative experiences and how these qualities can be strengthened within interstitial spaces. In doing so, it establishes the theoretical basis for interpreting the restorative potential of interstitial spaces and for guiding the design exploration of how their natural qualities can be enhanced.

2.1 Why Natural Environments?

An initial analysis of Rotterdam's urban fabric reveals that many of the interstital spaces are characterised by spontaneous vegetation. At the same time, contemporary urban life places increasing cognitive and emotional demands on residents. Because mental wellbeing is strongly shaped by everyday environmental exposure, this thesis focuses on psychological wellbeing as an essential dimension of desiging public spaces. It offers a meaningful framework for understanding why and how such semi-natural spaces can support mental recovery within a highly infrastructural city. This suggests the relevance of seeing the interstitial spaces as the perfect space for enhancing their potential for mental wellbeing.

In a city shaped by infrastructure, movement, and continuous redevelopment, opportunities for mental relief are increasingly limited. Rotterdam's urban fabric is dominated by large-scale systems of mobility and production, leaving little space for environments that support stillness, reflection, or psychological recovery. At the same time, urban residents are continuously exposed to sensory and cognitive demands, underscoring the need for environments that can mitigate mental fatigue and support well-being.

Within this context, Rotterdam contains numerous fragmented and often semi-natural remnants of land along railways, waterways, and infrastructural corridors. These so-called interstitial spaces remain outside formal programming and everyday attention. Although marginal and often visually ambiguous, they frequently exhibit qualities such as openness, natural succession, spatial variability, and informality. These characteristics align with environmental factors associated with restorative experiences, suggesting that such spaces may hold underutilised potential for supporting psychological recovery in the urban environment.

To examine this potential, this thesis adopts psychological restoration as its central theoretical lens on mental health. This perspective offers an interdisciplinary and evidence-based understanding of how environments shape cognitive, emotional, and physiological functioning, while remaining sufficiently flexible for spatial and design-oriented interpretation.

The concept of psychological restoration provides a theoretical foundation for understanding how natural environments can support human mental functioning and wellbeing. The term has been first explicitly articulated by Hartig, Mang, and Evans (1991), who described psychological restoration as the process wereby psychological resources which are depleted by everyday demands are renewed. Hartig et al. (1991) built upon two complementary theoretical traditions that emerged independently within environmental psychology.

The first being the Attention Restoration Theory (ART), developed by Kaplan and Kaplan (1989), which conceptualises restoration as the recovery of directed attention after experiencing cognitive fatigue. It proposes that environments characterised by being away, extent, soft fascination, and compatibility facilitate the replenishment of attentional capacity, which is continuously taxed in urban life.

Complementing this cognitive perspective, Stress Reduction Theory (Ulrich, 1983; 1991) explains restoration as an affective and physiological response to environmental exposure. Ulrich demonstrates that natural environments can rapidly reduce stress and negative affect, even after brief encounters, functioning as a positive form of perceptual engagement.

His empirical work demonstrated that even brief exposure to natural scenes can lead to measurable improvements in mood and stress-related physiological indicators.

By integrating these cognitive and affective perspectives on restoration, Hartig et al. (1991) positioned psychological restoration as a multidimensional process, consisting of:

- Restoration of attentional capacity,
- Reduction of stress and
- Emotional balance.

Building on these theoretical insights, Hartig et al. (1996) demonstrate that environments perceived as more natural tend to score higher on restorative qualities, indicating that psychological restoration is closely linked to the experience of nature rather than to environmental exposure in general.

Concluding on the understanding of psychological restoration as a process of attentional recovery, stress reduction, and emotional balance, environmental psychology literature consistently identifies natural environments as particularly supportive of these restorative processes (Kaplan, 1995; Ulrich, 1991; Hartig et al., 1996).

This understanding highlights the relevance of semi-natural interstitial spaces as potential settings for restorative experiences. While these spaces are not yet intentionally designed or widely recognized for this purpose, their openness, variability, and natural character provide a strong foundation for fostering experiences of soft fascination, being away, and stress reduction. On top of that, studies have shown that wild, less-managed environments often produce stronger restorative effects than highly controlled, ornamental parks, due to their sense of naturalness, unpredictability, and soft fascination (Fuller et al., 2007; Siltanen & Puhakka, 2025).

In this sense, interstitial spaces hold untapped potential: it position interstitial spaces not as residual areas, but as meaningful sites of everyday nature experience within the city. Their informal, semi-natural qualities complement formal urban green spaces, offering alternative encounters with nature that are less controlled and more dynamic. This is particularly relevant in increasingly urbanised contexts, where everyday experiences of nature are largely mediated through public parks, whereas exposure to spontaneous, dynamic environments provides measurable psychological benefits (Fuller et al., 2007; Kühn, 2006).

2.2 Perceived Biodiversity

Understanding which environmental characteristics contribute to psychological restoration is essential for translating psychological theory into spatial and design-oriented knowledge. While psychological restoration theory explains what is restored, such as attention, stress levels, and emotional balance, and that natural environments have a positive influence on psychological restoration, research on environmental characteristics explains what specific conditions in these natural environments support or inhibit restorative processes.

While the general positive effects of green environments on human well-being are well established, less attention has traditionally been paid to how differences in ecological quality within green spaces influence these outcomes. Fuller et al. (2007) address this gap by demonstrating that psychological benefits derived from urban green spaces increase with higher levels of species richness, biodiversity. Their findings indicate that people are able to perceive differences in biodiversity, particularly in plant species, suggesting that biodiversity is not only an ecological attribute but also a psychologically perceptible quality.

Importantly, Fuller et al. (2007) shows that the only mere presence of green space is insufficient to psychological restoration. Green spaces vary substantially in their capacity to support biodiversity, provide ecosystem services, and enhance human well-being. The quality of green space, expressed in biological complexity and habitat diversity, determines its contribution to these multiple functions (Fuller et al., 2007; Miller, 2005). Management approaches that emphasize mosaics of habitat fragments rather than uniform vegetation types may therefore enhance biodiversity and the psychological well-being of urban populations simultaneously (Thwaites et al., 2005; Fuller et al., 2007). Although Fuller et al. (2007) identify a consistent relationship between biodiversity and psychological benefits, they do not propose a specific causal psychological mechanism, leaving open the question of why biodiversity produces these effects.

Insights into this mechanism are provided by studies focusing on how biodiversity is perceived and experienced by visitors. Research on urban forests demonstrates that the multisensory experience of biodiversity, also known as **perceived biodiversity**, plays a central role in its restorative and stress-reducing potential (Siltanen & Puhakka, 2025). Visitors reported that sounds, colours, and natural smells attracted their attention effortlessly, whereas textures, shapes, and ecological processes required more focused attention. These sensory experiences were influenced by factors such as mindset, ecological knowledge, perceived environmental quality, and familiarity with the forest.

The findings indicate that biodiversity contributes to restoration not only through its ecological composition but through the richness of sensory cues it provides, supporting both stress reduction and spiritual well-being (Siltanen & Puhakka, 2025).

More detailed evidence for these processes is offered by research linking visual and auditory landscape features to restorative outcomes through perceived biodiversity (Lee et al., 2022 ; Chen & Ma, 2025 ; Ha & Kim, 2021). Their analysis shows that visible plant height differences and natural sounds have direct positive effects on restoration, whereas plant colour diversity and species evenness influence restoration indirectly by enhancing perceived biodiversity.

Notably, species evenness was not directly associated with restoration but became significant when mediated through perception, demonstrating that restorative effects

depend not only on objective ecological structure but on how biodiversity is cognitively and sensorially interpreted by users. These results suggest that perceived biodiversity functions as a mediating variable between landscape features and psychological restoration (Ha & Kim, 2021).

Natural sounds further contribute to restoration by masking anthropogenic noise, thereby reducing its negative impact on well-being (Ratcliffe et al., 2013). In environments where traffic or industrial sounds are present, the auditory presence of birds, wind, and insects can partially counteract these disturbances, reinforcing the importance of acoustic biodiversity in urban green spaces. Sensory elements such as sounds, colours, and smells are particularly associated with feelings of relaxation and vitality, contributing to physical and emotional well-being (Siltanen & Puhakka, 2025).

These sensory effects can be understood through the framework of Attention Restoration Theory. According to Kaplan and Kaplan (1989), restoration occurs when environments support a sense of “being away” from everyday demands and evoke fascination without requiring effortful concentration. The findings of Siltanen en Puhakka (2025) indicate that sounds and smells reduce the sense of mental pressure by anchoring attention in the present moment, while forms and species richness stimulate fascination and curiosity. This fascination motivates exploration of the environment, which in turn reinforces other well-being outcomes by sustaining engagement with the landscape (Kaplan & Kaplan, 1989; Siltanen & Puhakka, 2025).

Emotional well-being is also linked to biodiversity through perceptions of ecological health. Visitors expressed feelings of joy and satisfaction in response to phenomena interpreted as signs of a functioning ecosystem, such as ants carrying pine needles or decaying wood. Spiritual well-being, including feelings of connectedness to nature and opportunities for reflection, was associated particularly with textures, ecological processes, and seasonal changes, suggesting that dynamic and evolving aspects of biodiversity contribute to deeper experiential meanings (Siltanen & Puhakka, 2025).

Taken together, restorative benefits of biodiversity arise not solely from ecological composition but from the multisensory and perceptual qualities it generates (Siltanen & Puhakka, 2025; Lee et al., 2022 ; Chen & Ma, 2025 ; Ha & Kim, 2021). Biodiverse environments provide a combination of visual variation, natural sounds, olfactory cues, and observable ecological processes that attract attention effortlessly, reduce stress, and stimulate fascination. This multisensory engagement enhances perceived biodiversity, which in turn mediates restorative effects (Lee et al., 2022 ; Chen & Ma, 2025 ; Ha & Kim, 2021).

Comparable findings by Deng et al. (2020) further support this interpretation, showing that audiovisual experiences of nature are more restorative and aesthetically appealing than purely visual exposure.

Consequently, biodiversity enhances psychological restoration because it produces rich, perceptible environmental complexity that supports attention recovery, emotional well-being, and experiential connection to nature (Siltanen & Puhakka, 2025; Lee et al., 2022 ; Chen & Ma, 2025 ; Ha & Kim, 2021).

The literature suggests that psychological restoration in natural environments is influenced by several spatial ecological qualities. These qualities can be synthesised into four key characteristics of restorative green environments:

1. Perceived biodiversity and habitat diversity

Psychological restoration increases with higher perceived biodiversity, as people are able to perceive differences in species richness and respond positively to ecological complexity. Landscapes that contain diverse vegetation types and habitats enhance restoration by increasing perceived biodiversity and ecological variation (Fuller et al., 2007; Thwaites et al., 2005).

2. Structural and visual complexity of vegetation

Vegetation structure, such as variation in plant height, layers, forms, and spatial arrangement, supports restoration by creating visual complexity that captures attention without demanding cognitive effort. This balance of interest and legibility contributes to restorative experiences. (Kaplan & Kaplan, 1989; Siltanen & Puhakka, 2025).

3.Multisensory nature experiences

Natural environments support psychological restoration when biodiversity is experienced through multiple senses. Natural sounds such as birds, wind, and insects can directly promote restoration and mask anthropogenic noise, while smells and other sensory cues help anchor attention in the present moment and support relaxation and vitality (Deng et al., 2020; Siltanen & Puhakka, 2025 ; Ha & Kim, 2021; Ratcliffe et al., 2013).

4. Observable ecological processes

Visible ecological processes, such as seasonal change, plant decay, and insect activity can evoke fascination, joy, and a sense of connection with living systems. These processes are often interpreted as indicators of ecosystem health and contribute to psychological well-being (Siltanen & Puhakka, 2025).

2.2.1 Key Characteristics

The restorative potential of urban green spaces is closely linked to specific characteristics of vegetation that make biodiversity, structure, and ecological processes perceptible. To support perceived biodiversity, vegetation should include a mix of species with varying forms, textures, and seasonal appearances, creating a visually rich and ecologically legible environment. In two words, habitat diversity. Variation in height and layering, from groundcovers to shrubs and trees, enhances structural complexity, guiding attention and fostering fascination without overwhelming the observer (Kaplan & Kaplan, 1989; Siltanen & Puhakka, 2025). Patterns and contrasts within the planting further reinforce visual interest while maintaining a sense of coherence in the landscape (Fuller et al., 2007; Thwaites et al., 2005).

In addition to visual qualities, vegetation should offer multisensory experiences that engage sound, sight and touch (Ratcliffe et al., 2013; Deng et al., 2020). Because of the present spontaneous vegetation, different textures are already observable as well as sounds from fauna which finds their place in these spaces.

Finally, ecological processes should be made legible through vegetation that highlights seasonal change, growth, decay, and interspecies interactions. Such dynamics communicate the vitality and health of the ecosystem, allowing visitors to observe, interpret, and emotionally connect with the living environment (Siltanen & Puhakka, 2025).

To sum up, the vegetation should exhibit key characteristics that support perceived biodiversity, structural complexity, habitat diversity, multisensory nature experiences and observable ecological processes to support restorative experiences, this includes enhancing the vegetation with:

- Height variation
- Structural diversity
- Plant colour diversity
- Decay

2.2.2 Analysis on Biodiversity

Biodiversity at Vroesenpad

Understanding the current vegetation characteristics is essential for identifying where improvements in perceived biodiversity may be possible.

In the interstitial space adjacent to the Vroesenpad, a variety of plant species is present, yet the spatial impact of the vegetation remains largely monotonous. Despite the diversity in species, the structure and height variation are limited, resulting in a uniform appearance that offers little perceptual richness.

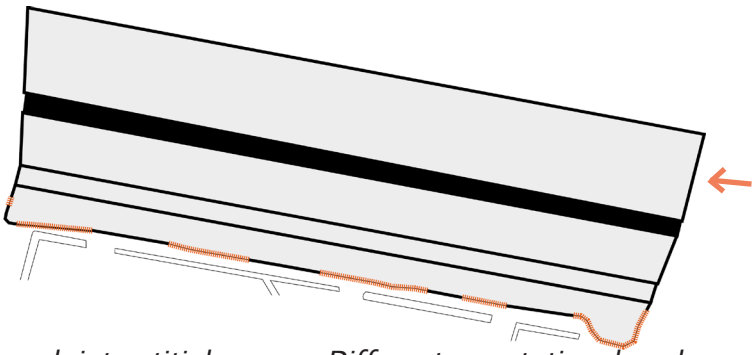


Figure 33: Vroesenpad interstitial space. Different vegetation has been found which implies spontaneous vegetation.

Dutch name	Latin name
Hondsdraf	Glechoma hederacea
Moseik	Quercus palustris
Ronde ooievaarsbek	Geranium rotundifolium
Zuidelijke brandnetel	Urtica membranacea
Bosboterbloem	Ranunculus lanuginosus
Grijs kronkelsteeltje	Bryum argenteum
Veldesdoorn	Acer campestre
Hybride-zuring	Rumex × pratensis
Fraaie zuring	Rumex pulcher
Zwarte els	Alnus glutinosa
Echte kervei	Anthriscus sylvestris
Fladderiep	Ulmus laevis
Fluitenkruid	Anthriscus sylvestris

Spatial impact of Vegetation

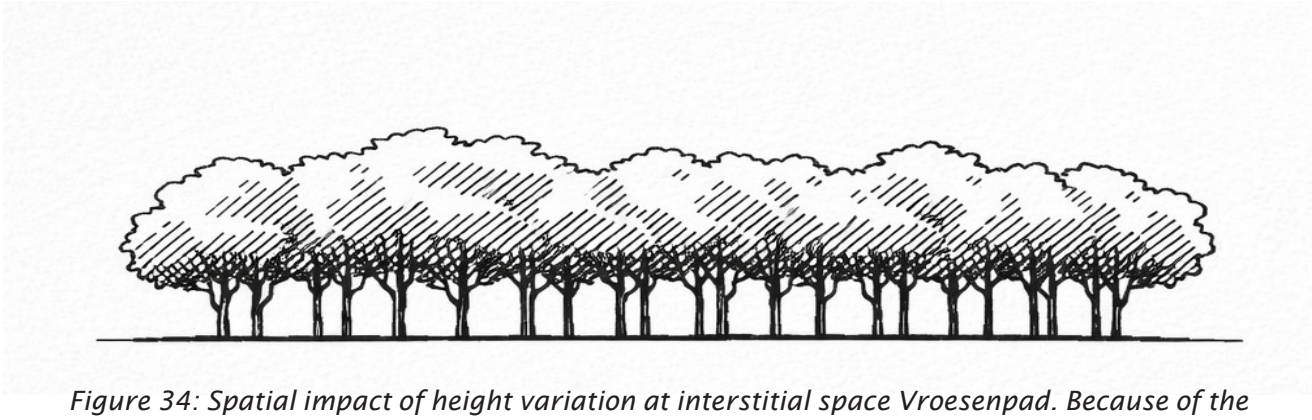


Figure 34: Spatial impact of height variation at interstitial space Vroesenpad. Because of the height of the vegetation, it reveals a largely open ground space with a roof.

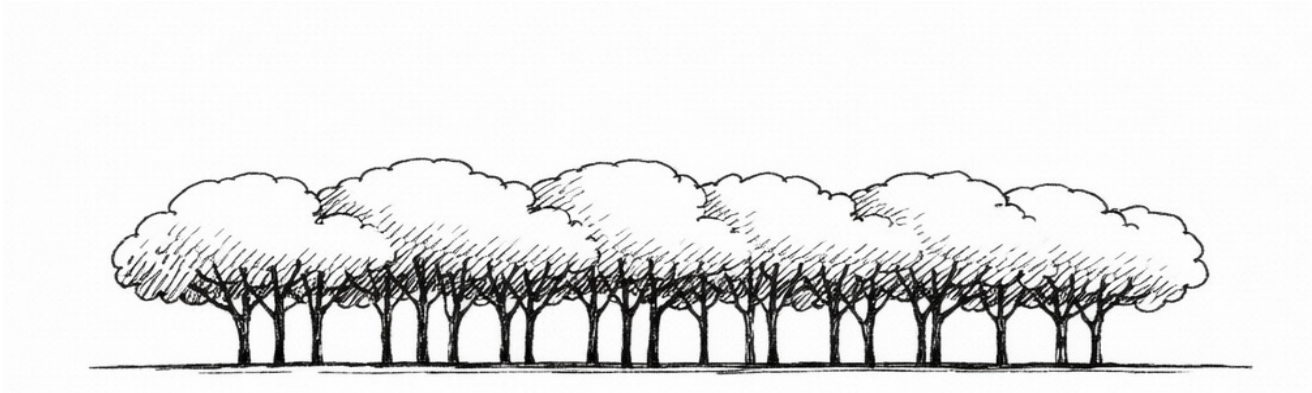


Figure 35: Spatial impact of structure variation at Vroesenpad. Because of the structure of the vegetation, is largely feels as a soft roof.

Biodiversity at Daltonpad

At the interstitial space at the Daltonpad, a range of plant species is present, likely representing only part of the vegetation that develops there throughout the year. Among the three plots, this site shows the greatest spatial diversity, with noticeable variation in height, structure, and density. Despite this structural richness, the repeated occurrence of similar vegetation types creates a degree of predictability, limiting the sense of perceptual variety.

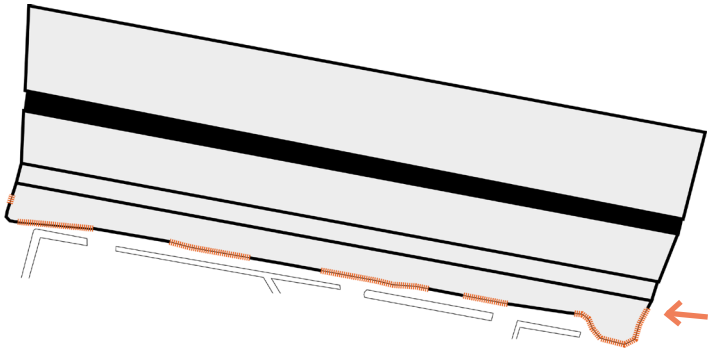


Figure 36: Daltonpad interstitial space. Different vegetation has been found which implies spontaneous vegetation.

Dutch name	Latin name
Riet	Phragmites australis
Slanke haagbraam	Rubus fruticosus-agg.
Moseik	Quercus palustris
Duindoorn	Hippophae rhamnoides
Kleine brandnetel	Urtica urens
Ruw vergeet-mij-nietje	Myosotis scorpioides
Rossige wilg	Salix atrocinerea
Zwarte els	Alnus glutinosa
Dijkviltbraam	Rubus caesius
Hangende zegge	Carex pendula
Vogelkers	Prunus avium
Krokus	Crocus spp. (genus)
Japanse duizendknoop	Reynoutria japonica

Spatial impact of Vegetation

Figure 37: Spatial impact of height variation at interstitial space Daltonpad. Because of the heigh of the vegetation, the space has this sequence in atmospheres.

Figure 38: Spatial impact of structure variation at Daltonpad. Because of the structure of the vegetation, it reveals a rough-soft-rough-soft-rough-soft feeling.

Biodiversity at The Interstitial Space Inbetween

The interstitial space situated between the two previous plots also contains a range of plant species, yet its spatial impact remains limited. The area is dominated by low, dense bushes, with only a few trees positioned at both ends of the site. This results in a relatively uniform and enclosed vegetation structure, offering little variation in height or form and therefore a modest level of perceptual richness.

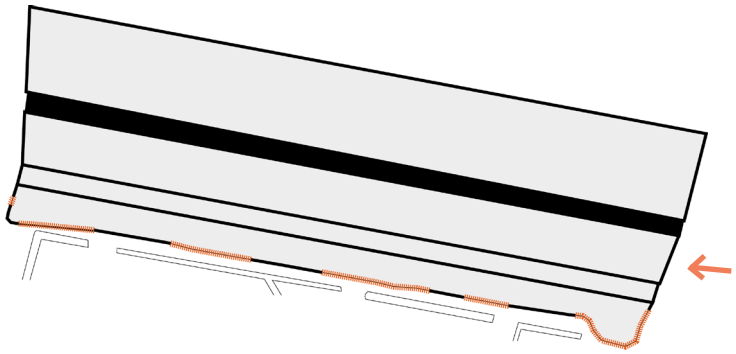


Figure 39: The inbetween interstitial space. Different vegetation has been found which implies spontaneous vegetation.

Dutch name	Latin name
Berk	Betula pendula
Wilg	Salix spp.
Es	Fraxinus excelsior
Vlier	Sambucus nigra
Bramenstruweel	Rubus fruticosus
Meidoorn	Crateagus monogyna
Klimop	Hedera helix
Brandnetel	Urtica dioica
Fluitenkruid	Anthriscus sylvestris
Kleefkruid	Galium aparine
Paardenbloem	Taraxacum officinale
Ridderzuring	Rumex obtusifolius

Spatial impact of Vegetation

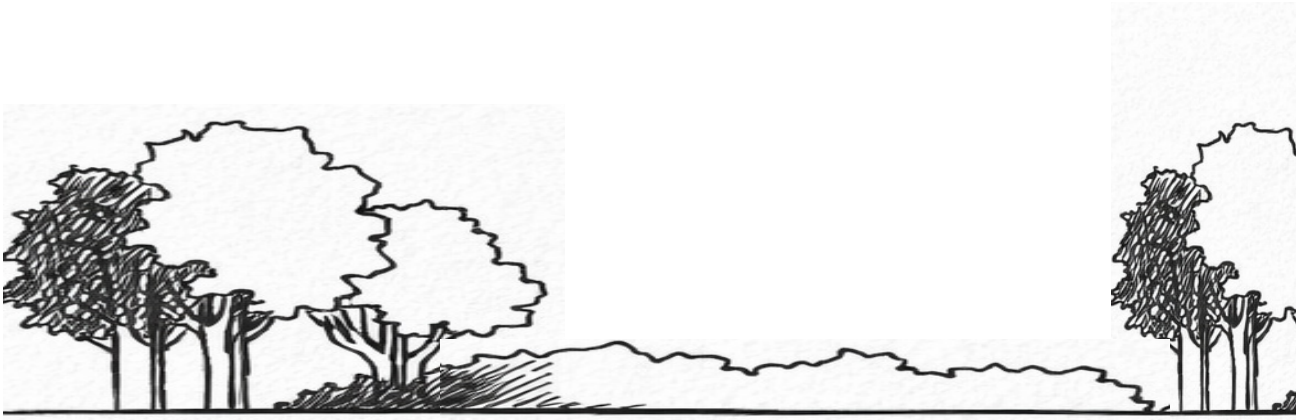


Figure 40: Spatial impact of height variation at the interstitial space inbetween. Because of the height of the vegetation, it feels as a secluded area.

Figure 41: Spatial impact of structure variation at the interstitial space inbetween. Because of the structure of the vegetation it feels as a largely rough area.

2.2.3 Enhancing Perceived Biodiversity

The existing vegetation demonstrates a notable level of biodiversity; however, much of this diversity remains largely imperceptible to visitors. Positive psychological restorative effects depends largely on perceived biodiversity (Fuller et al., 2007). In the case of this site, despite its ecological richness, the overall impression is often one of uniformity or monotony, which limits the potential benefits of the biodiversity present.

To enhance both perceived biodiversity and habitat diversity while building on existing vegetation, the introduction of differentiated management strategies is essential (Forman,1995). By applying varied maintenance regimes across the site, multiple successional stages can be sustained simultaneously. This increases structural complexity within the landscape, resulting in a richer and more diverse visual appearance that strengthens the perception of biodiversity.

The following sections present a series of conceptual sections and maps that depict the intended ecological development of the site. These visualisations clarify where specific successional stages are desirable and how differentiated maintenance regimes shape this. Together, they illustrate how varying successional dynamics contribute to a richer and more legible perception of biodiversity.

The analysis and the maintenance choices focuses closely on what is already present and how spontaneous vegetation can be encouraged to grow and develop largely in its own way. Many areas are allowed to progress naturally to the next successional stage, while others require more targeted maintenance to prevent the entire site from evolving into a climax stage, since excessive uniformity would again reduce perceived biodiversity.

By creating stronger contrasts between vegetation types and enhancing multiple stages of succession, the site's biodiversity becomes more legible to visitors, making ecological processes perceptible to the senses. In doing so, the landscape can more effectively support restorative experiences and foster a deeper connection between people and the natural environment.

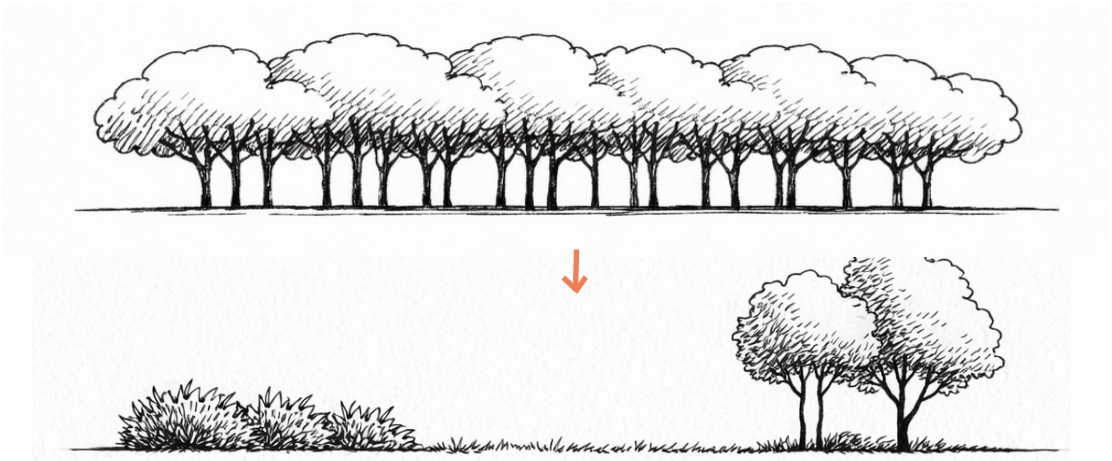


Figure 42: Spatial impact before and after Vroesenpad. Three different succesionstages are introduced into the area, early transitional vegetation, late transitional vegetation and climax vegetation.

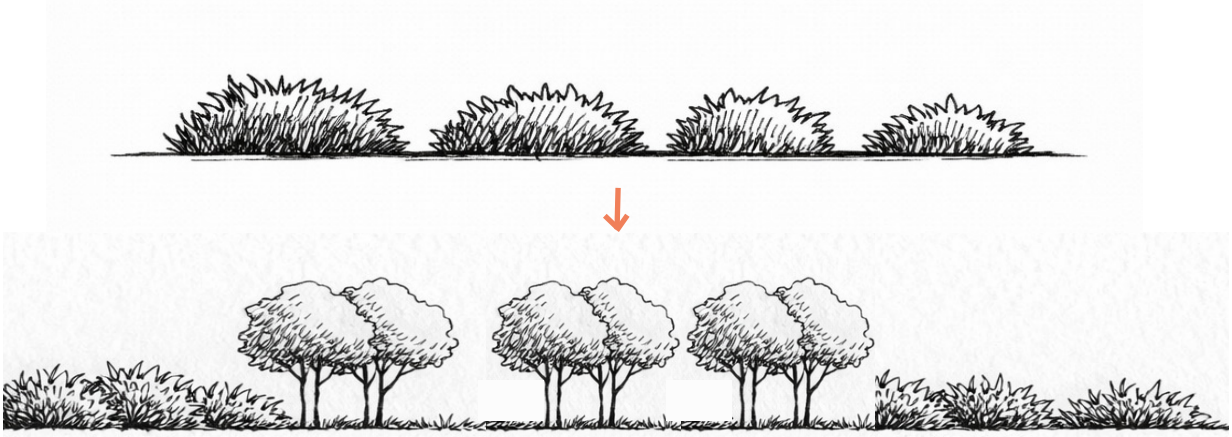


Figure 43: Spatial impact before and after Daltonpad. Three different succesionstages are introduced into the area, early transitional vegetation, late transitional vegetation and climax vegetation. This is implemented based on the already existing sequence.

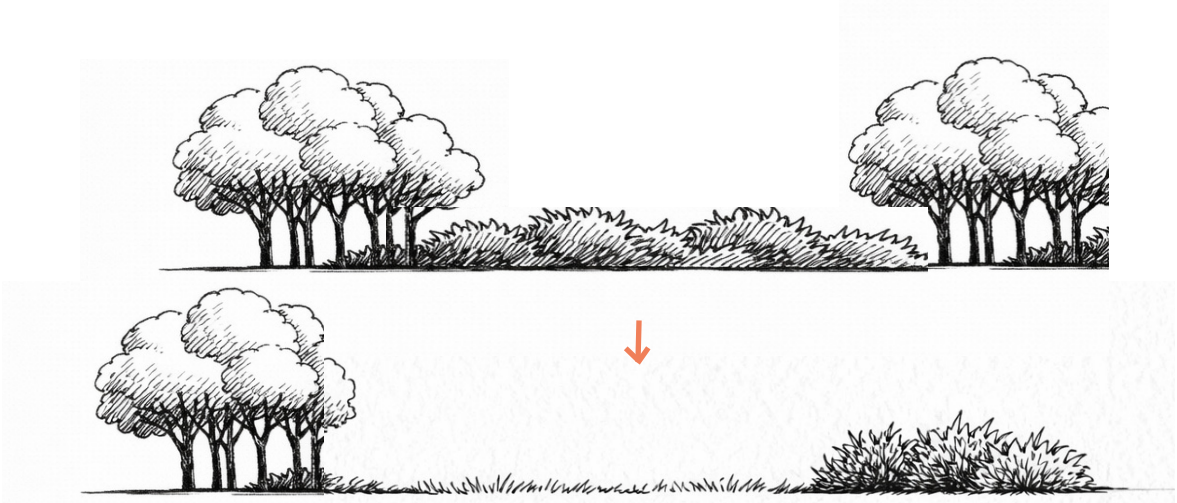


Figure 44: Spatial impact before and after in between space. Three different succesionstages are introduced into the area, early transitional vegetation, late transitional vegetation and climax vegetation.

Succession Stages Now

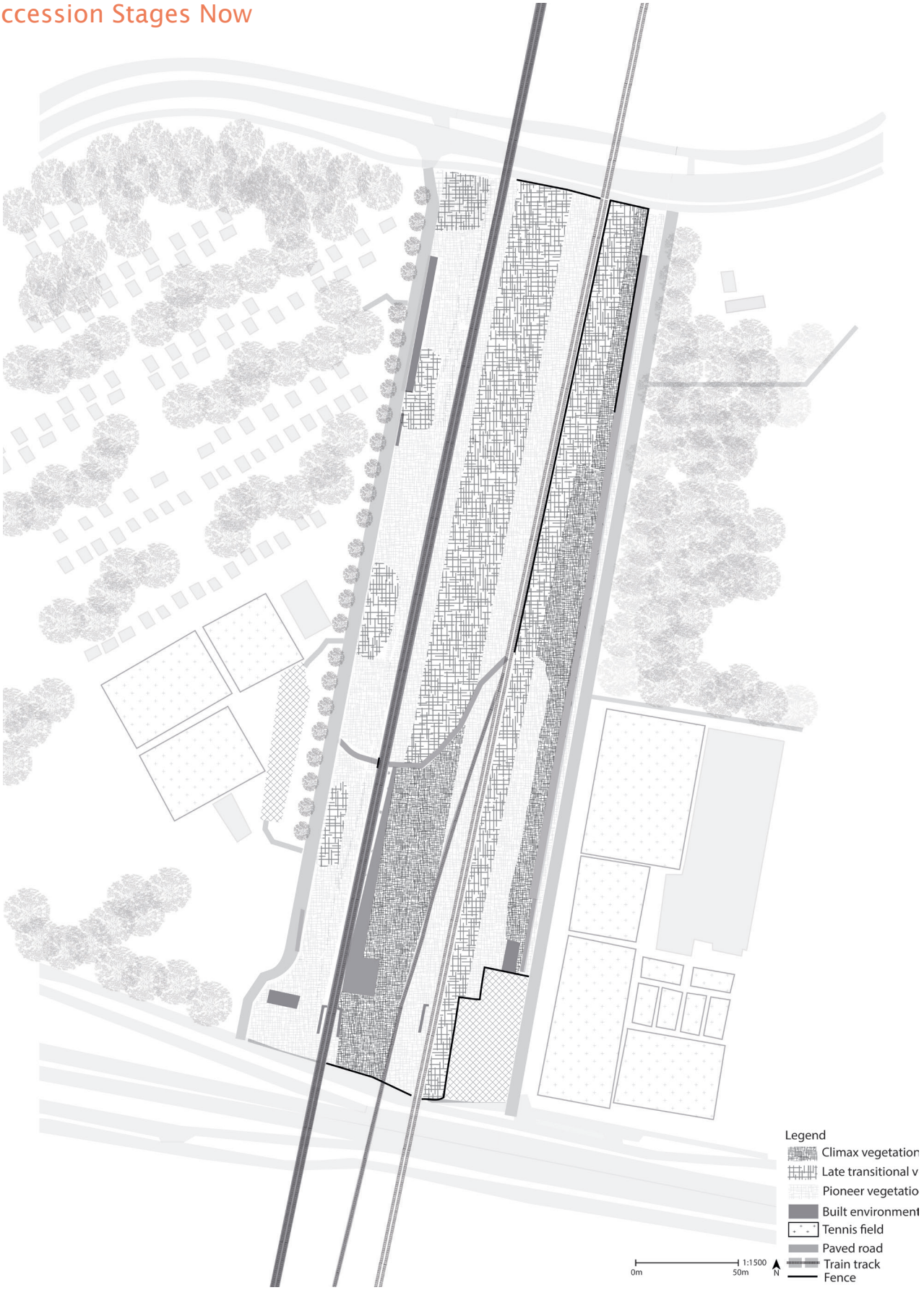


Figure 45: Succesion stages now. Three different succession stages are present in the area. Where each area has a different composition in succession stages.

Succession Stages New

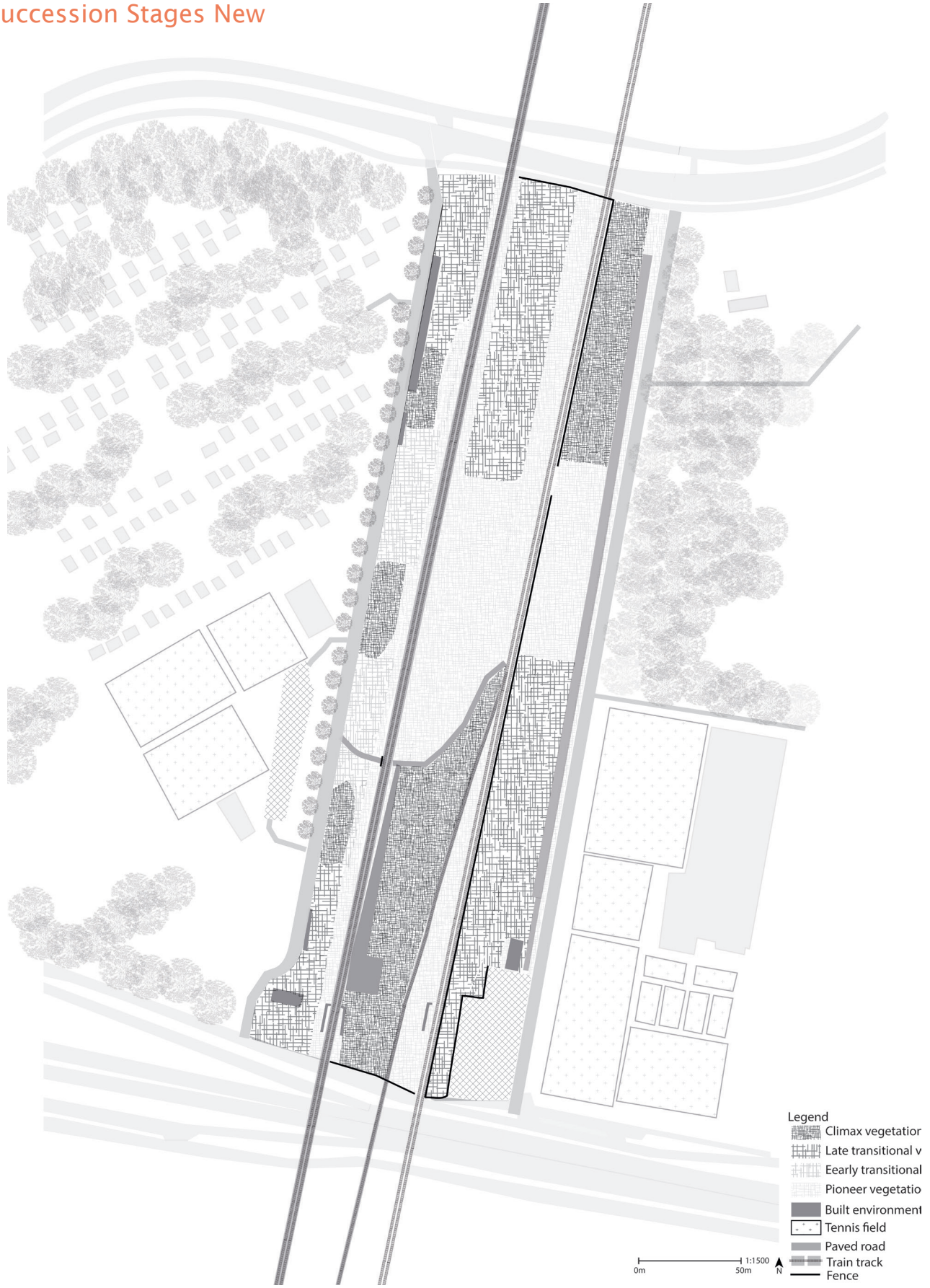


Figure 46: Succesion stages new. A new succession stage has been implemented, early transitional vegetation. New compositions are invited to be enhanced in the different areas.

2.2.4 Maintenance

The maintenance strategy for the site is directly tied to the desired successional stages, which are also reflected in the maintenance categories shown in the maps (Forman,1995). Areas marked as low maintenance correspond to the climax stage, where vegetation is allowed to develop freely with almost no intervention. Existing trees can grow and evolve without restriction, and the current shrub layer is left in place. Over time, these shrubs will naturally transition into young trees, gradually forming the climax vegetation. During the early years, however, minimal intervention is required to ensure basic accessibility. Where dense shrubs completely block movement, a single shrub may be removed to create a passage, after which visitors are encouraged to find their own routes. As the canopy matures, competition for light will reduce ground-layer vegetation, creating a more open understory and allowing multiple informal paths to emerge without further management.

In contrast, areas marked as medium maintenance on the maps correspond to the late transitional vegetation, where tall herbs, grasses, and developing shrubs dominate. Here, vegetation is largely allowed to develop spontaneously so that grasses can gradually transition into a more structurally complex shrub layer. However, some maintenance remains necessary to prevent this vegetation from progressing into the climax stage and to ensure that the area remains semi-accessible. Once every 5 years, the vegetation needs to be pruned. Once every year, a narrow one-metre-wide path is maintained to guide movement through the vegetation while preserving the sense of enclosure and refuge that characterises this successional stage.

The required pruning in these medium-maintenance zones is deliberately minimal and targeted. It consists of cutting back young woody stems that begin to get in the way of the path, removing these branches that obstruct movement, and reducing the height of shrubs where necessary to prevent canopy closure. Because foot traffic naturally helps keep the path open, only one inspection per year is needed to assess whether the route remains passable, followed by a single pruning round to prevent the area from developing into closed woodland.

A series of maps illustrates the differences between the current situation and the envisioned design outcome. These maps show how vegetation height, volume, and spatial structure change over time, highlighting their influence on perceived biodiversity as well as on the spatial impact of the landscape.

Maintenance Now

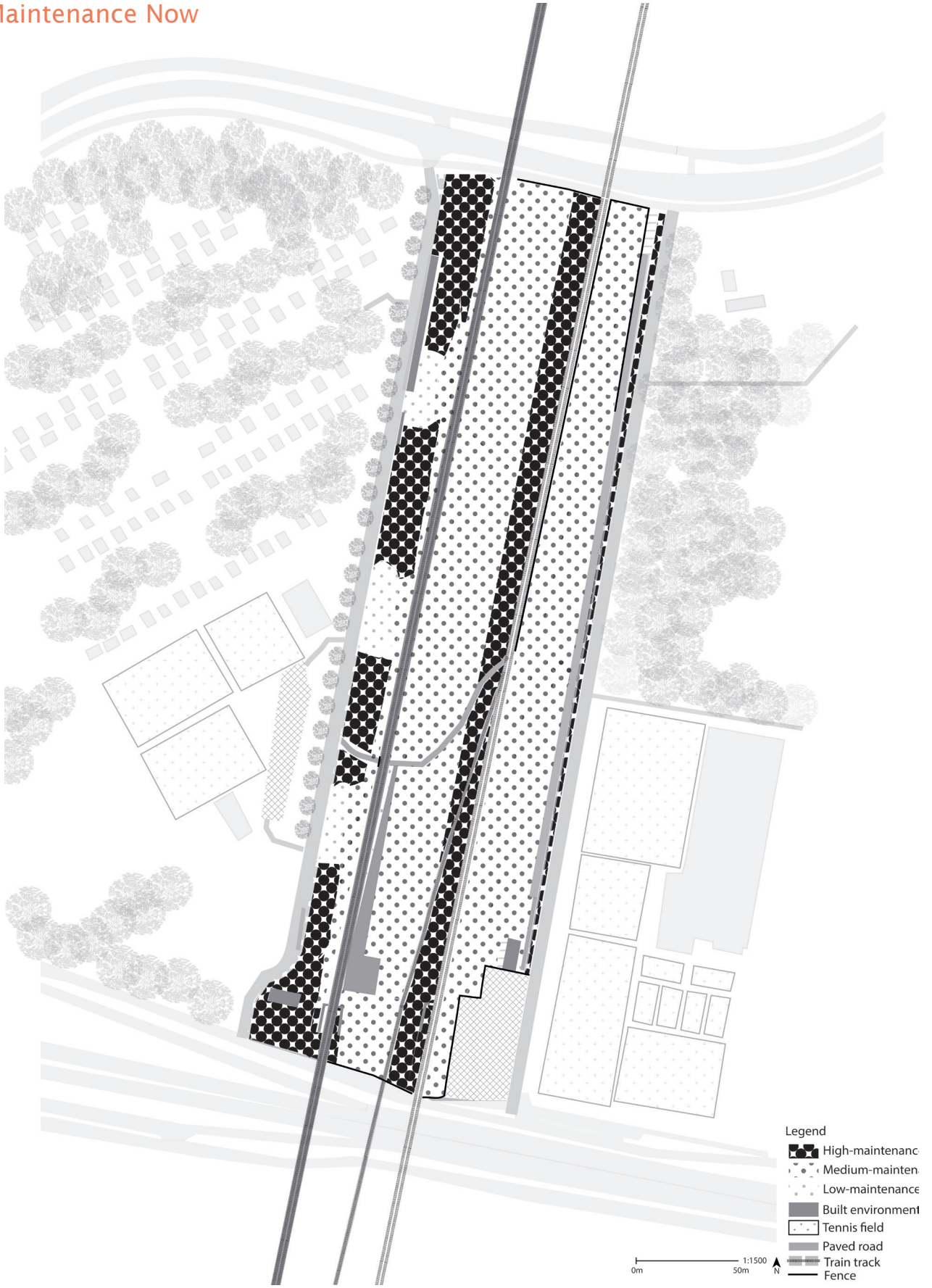


Figure 47: Maintenance now. The current maintenance in the area consist of a combination of high, medium and low maintenance.

Maintenance New - First Years

Figure 48: Maintenance new - First years. In the first years this maintenance plan is required to be able to enhance certain types of succession stages.

Maintenance New - After Trees have Grown

Figure 49: Maintenance new - after trees have grown. After years, a difference in maintenance can be introduced. When trees have grown, paths do not require high maintenance anymore.

Sinusoidal Mowing

Maintenance plays a crucial role in ensuring that the landscape ultimately develops into the spatial and ecological condition envisioned in the design. Although responsibility for this maintenance will lie with the municipality, the required effort is not necessarily greater than current practices. In many areas, the landscape actually demands less intervention: certain patches must be left undisturbed to allow spontaneous vegetation and successional processes to unfold. What the design does require, however, is a shift from uniform, large-scale mowing to more precise and selective forms of care. Instead of cutting everything down at once, maintenance becomes a matter of targeted pruning, selective clearing, and reinforcing ecological transitions.

For the early transitional vegetation, this level of precision is necessary. Where this is, can be seen in the maps of maintenance, where several plots are identified as requiring 'high maintenance'. In this context, high maintenance refers to the need for multiple mowing rounds per year. However, mowing all vegetation uniformly would undermine both the ecological value and the intended perception of biodiversity in this area. To avoid this, a sinus-mowing strategy is applied.

Sinus mowing is a management approach in which vegetation is cut in a curving, wave-like pattern rather than in straight, uniform strips (Parmentier et al., 2025). This creates a mosaic of mown and unmown zones within the same vegetation type, allowing different growth stages to coexist. In early transitional vegetation such as flower-rich meadows and mixed grasslands, this approach is particularly valuable. Plants that would otherwise be cut before they can flower or set seed are given the opportunity to grow for a longer time, which increases floristic diversity and strengthens the ecological resilience of the area. The resulting structural variation also supports a wider range of insects, birds and small mammals, making sinus mowing a highly effective biodiversity-enhancing strategy.

Within the design, sinus mowing is applied to balance ecological richness with spatial accessibility. Four times per year, a sinuous path is mown through the early transitional vegetation, creating an informal route that guides visitors through the landscape without imposing a rigid structure. Mowing 4 times per year is primarily necessary to prevent a single, permanent path from forming. If one route remains open for too long, the soil becomes compacted, eventually turning into a muddy track where little or no vegetation can grow. By periodically shifting the mown path, soil compaction is avoided and the vegetation is able to recover.

Twice a year, these path-mowing rounds are complemented by a broader cut of the surrounding early transitional vegetation. This prevents the early transitional vegetation from gradually shifting into late transitional vegetation, such as shrub encroachment. By periodically resetting the structure, the area remains open, light and species-rich, while still allowing for seasonal variation and spontaneous dynamics.
Sinus mowing fits seamlessly within the design vision. It supports spontaneous vegetation development, enhances biodiversity, maintains subtle and legible routes and prevents the landscape from closing up over time. As a management strategy, it is both ecologically responsible and spatially expressive, reinforcing the sensory and ecological qualities of the interstitial landscape.

Case Study - Sinusoidal Mowing

Figure 50. Sinusoidal mowing in the valley grasslands of North Brabant. A meandering mowing pattern as a result of sinusoidal mowing (Nature Today, 2024).

Figure 51. Microhabitats. Because of sinusoidal mowing different microhabitats come to existence (Nature Today, 2024).

Figure 52. Enhancement of biodiversity. Spatial and temporal variation in otherwise uniform grassland (Nature Today, 2024).

A clear and well-documented example of the ecological value of sinus mowing can be found in the Dutch practice described by Nature Today (2024). In this project in the stream valley grasslands in North Brabant, sinusoidal mowing has been applied for several years in flower-rich grasslands, where a gently meandering mowing pattern creates alternating strips of short and tall vegetation. This approach results in a continuous mosaic of microhabitats that support a wide range of species.

According to the Nature Today report, the areas managed with sinusoidal mowing show higher densities of butterflies, bees, grasshoppers and other invertebrates, as well as a more diverse and resilient plant community. Because parts of the vegetation are always left standing, species can complete their life cycles, find shelter, and recolonise freshly mown patches (Nature Today, 2024).

This example demonstrates how a relatively simple management intervention can significantly enhance biodiversity by introducing spatial and temporal variation into otherwise uniform grasslands. It also illustrates why sinus mowing is a relevant strategy for interstitial spaces: these areas are often maintained in the same way, mowing everywhere or not mowing at all. Interstitial spaces however already contain irregular structures, making them well suited for management that embraces heterogeneity rather than suppressing it.

By applying sinusoidal mowing in the interstitial landscape, the ecological richness of the spaces can be strengthened while maintaining their informal, natural character, supporting both biodiversity and the subtle sensory qualities that contribute to psychological restoration.

Sinusoidal Mowing Pattern Option

Figure 53: Sinusoidal mowing patterns options. By chosing each time a different mowing path plants are allowed to grow for a longer period of time.

Sinusoidal mowing can be applied effectively on site, allowing a different path to be mown each time. The drawing shows one possible configuration of mown paths, but this pattern can vary throughout the year. What matters most is that every section of the grassland receives extended intervals without cutting, allowing plants to develop, flower, and regenerate before the next mowing cycle just like animals. This mowing takes place four times per year, ensuring that no single route becomes permanently compacted while giving each part of the vegetation longer periods to grow undisturbed (Parmentier et al., 2025).

2.3 Development Through Time

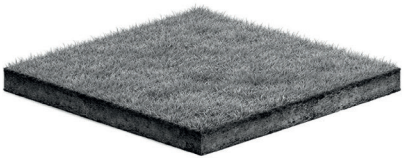
2.3.1 Through Four Periods of Time

The maintenance strategy clarifies how the landscape is expected to transform over time. For each vegetation type currently present in the area, four temporal conditions are shown: the present state, 0.5 years, 5 years, and 50 years. These time-based projections illustrate how each vegetation patch gradually develops toward its intended successional stage under the defined maintenance regime. Six distinct variants are included, each representing a different ecological trajectory within the site.

A sectional drawing of the Daltonpad provides a representative cross-section of the wider area, showing how the various successional stages unfold spatially and temporally along a continuous line. By illustrating how early, transitional, and mature stages appear and evolve in relation to one another, the section highlights how the landscape gradually develops a richer and more layered perception of biodiversity.

Succession Stages Through the Years

From pionier vegetation to late transitional vegetation

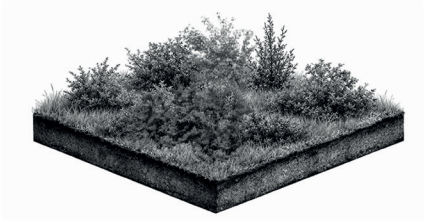


Now

The area is mowed regularly.

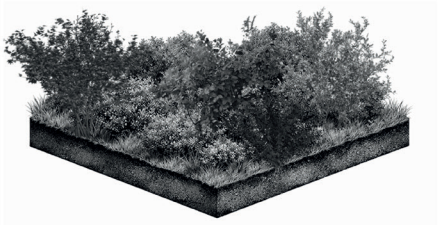
0,5 year

This area is intentionally left unmaintained to enhance the natural process.



5 year

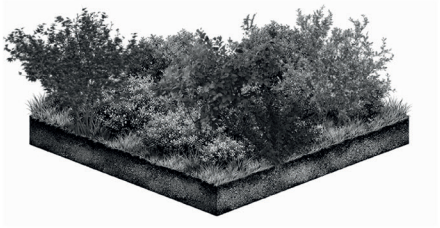
This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning.



50 year

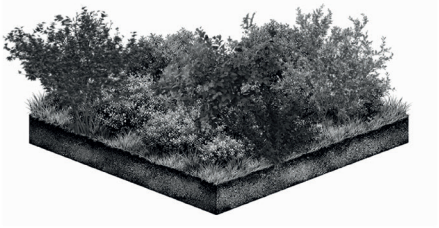
This area is largely left unmaintained to enhance natural processes, with occasional pruning and mowing.

From late transitional vegetation to climax vegetation



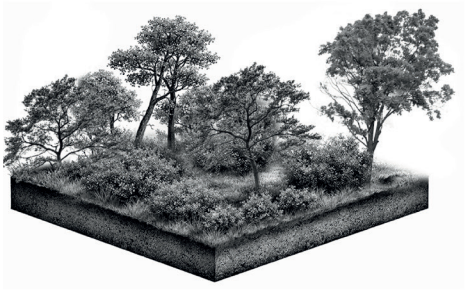
Now

This area is pruned regularly.



0,5 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning.



5 year

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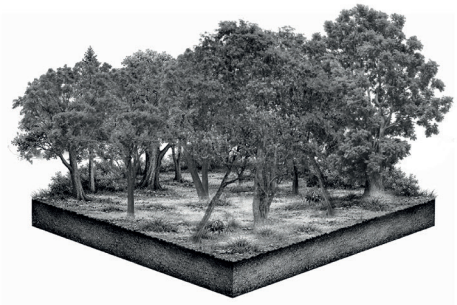


50 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning.

Figure 54. Succesion stages through the years. Two different transitions are visualized.

Succession Stages Through the Years

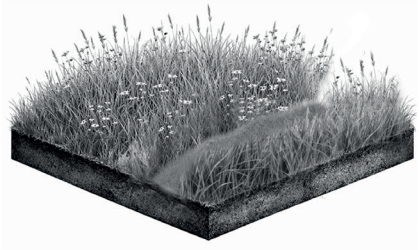
From pionier vegetation to early transitional vegetation

Now

The area is mowed regularly.

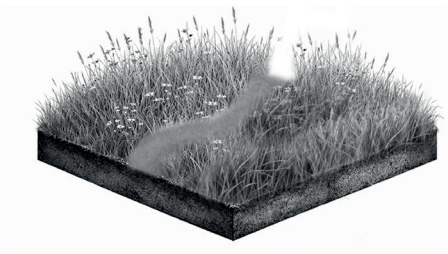
0,5 year

This area is intentionally left unmaintained to enhance the natural process.



5 year

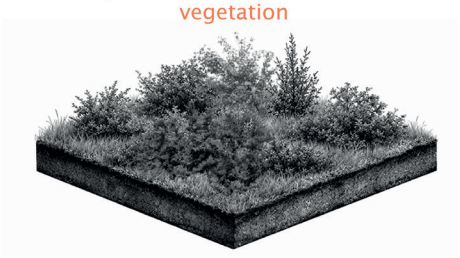
This area is intentionally left unmaintained to enhance the natural process, with occasional sinusmowing.



50 year

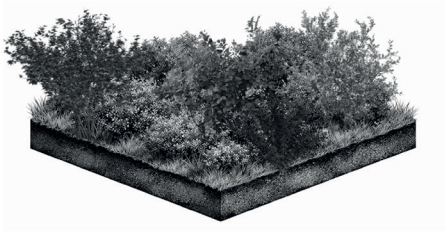
This area is intentionally left unmaintained to enhance the natural process, with occasional sinusmowing.

Enhancing and keeping the late transitional vegetation



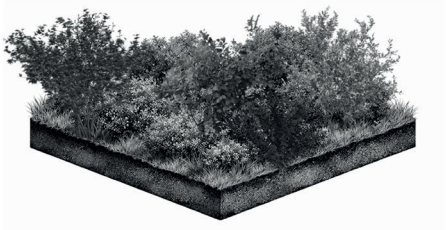
Now

This area is pruned regularly.



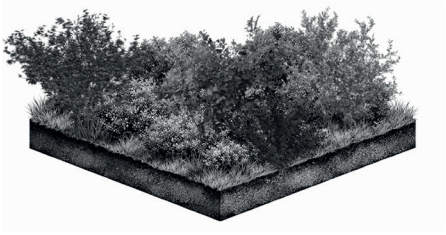
0,5 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning.



5 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning and mowing.



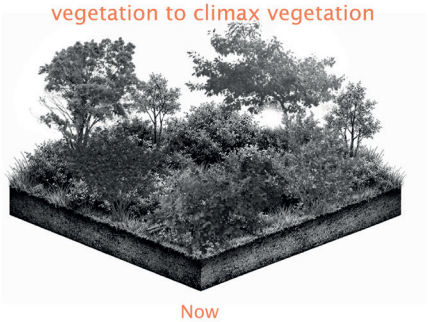
50 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional pruning and mowing.

Figure 55. Succesion stages through the years. Two different transitions are visualized.

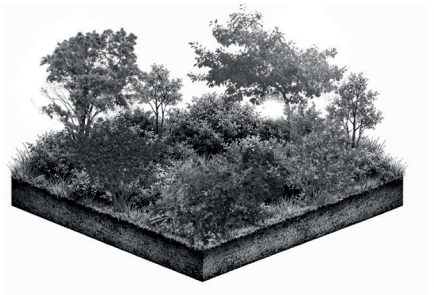
Succession Stages Through the Years

From late transitional vegetation + climax vegetation to climax vegetation



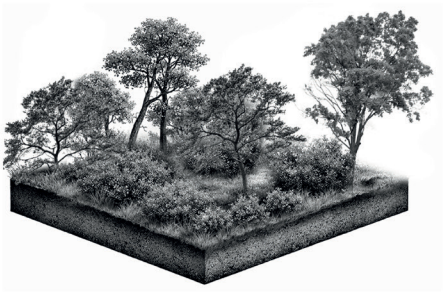
Now

The area is pruned regularly.



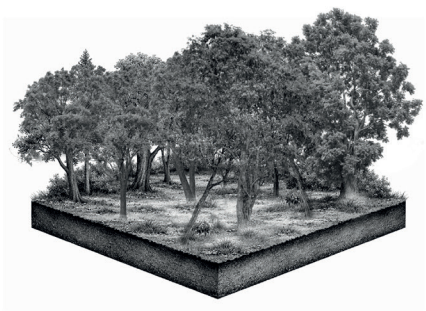
0,5 year

This area is intentionally left unmaintained to enhance the natural process, with occasional pruning.



5 year

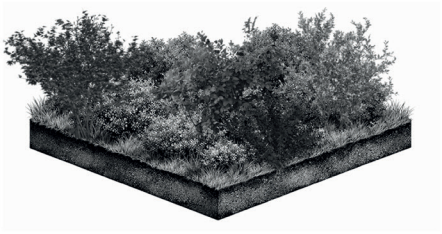
This area is intentionally left unmaintained to enhance the natural process, with occasional pruning.



50 year

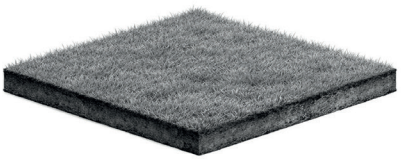
This area is intentionally left unmaintained to enhance the natural process, with occasional pruning.

From late transitional vegetation to early transitional vegetation



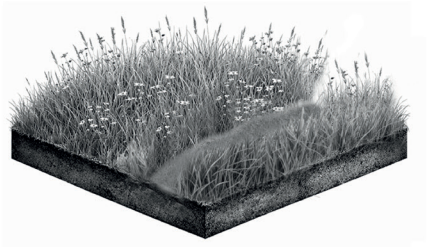
Now

This area is pruned regularly.



0,5 year

This area is mowed.



5 year

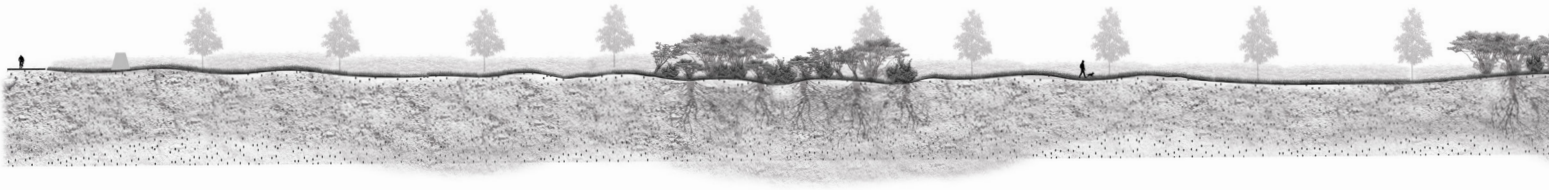
This area is intentionally left unmaintained to enhance the natural process, with some occasional sinusmowing.

50 year

This area is intentionally left unmaintained to enhance the natural process, with some occasional sinusmowing.

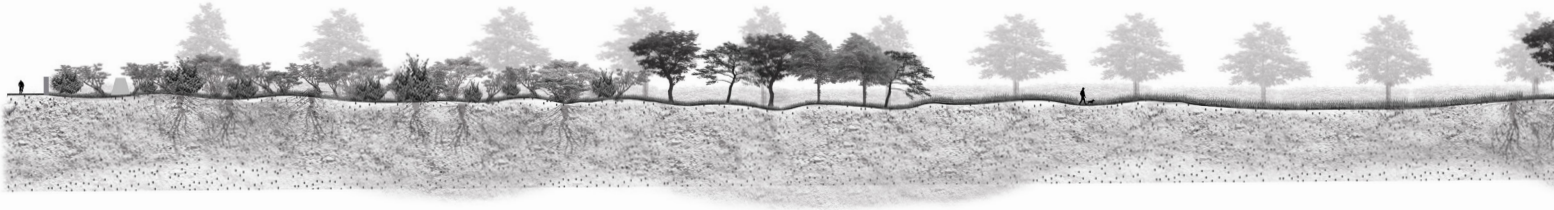
Figure 56. Succesion stages through the years. Two different transitions are visualized.

Succession Daltonpad Through the Years - Section



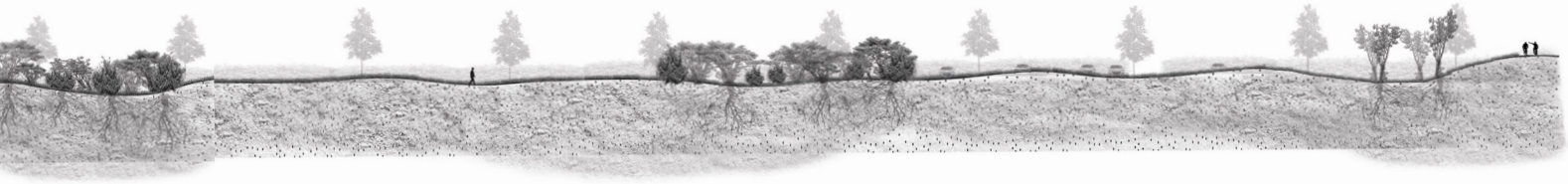
Now

Year 5



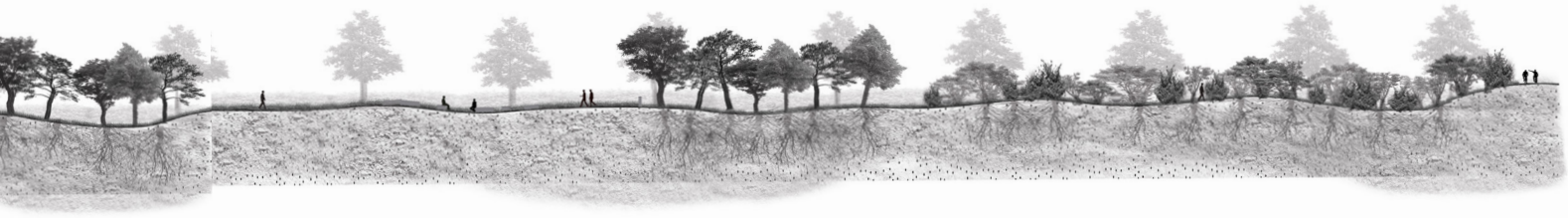
Year 50

Figure 57. Succesion stages through the years. A section of the Daltonpad shows how the different successionstages spatially relate to eachtoher.



1: 750
N
0m
30m

1: 750
N
0m
30m



1: 750
N
0m
30m

Height Differences Now

Figure 58: Height vegetation now. Eacht interstitial space is observed for its height in vegetation. Where the Daltonpad has a repitition in height, the in between space and vroesenpad are more monotoom.

Height Differences New

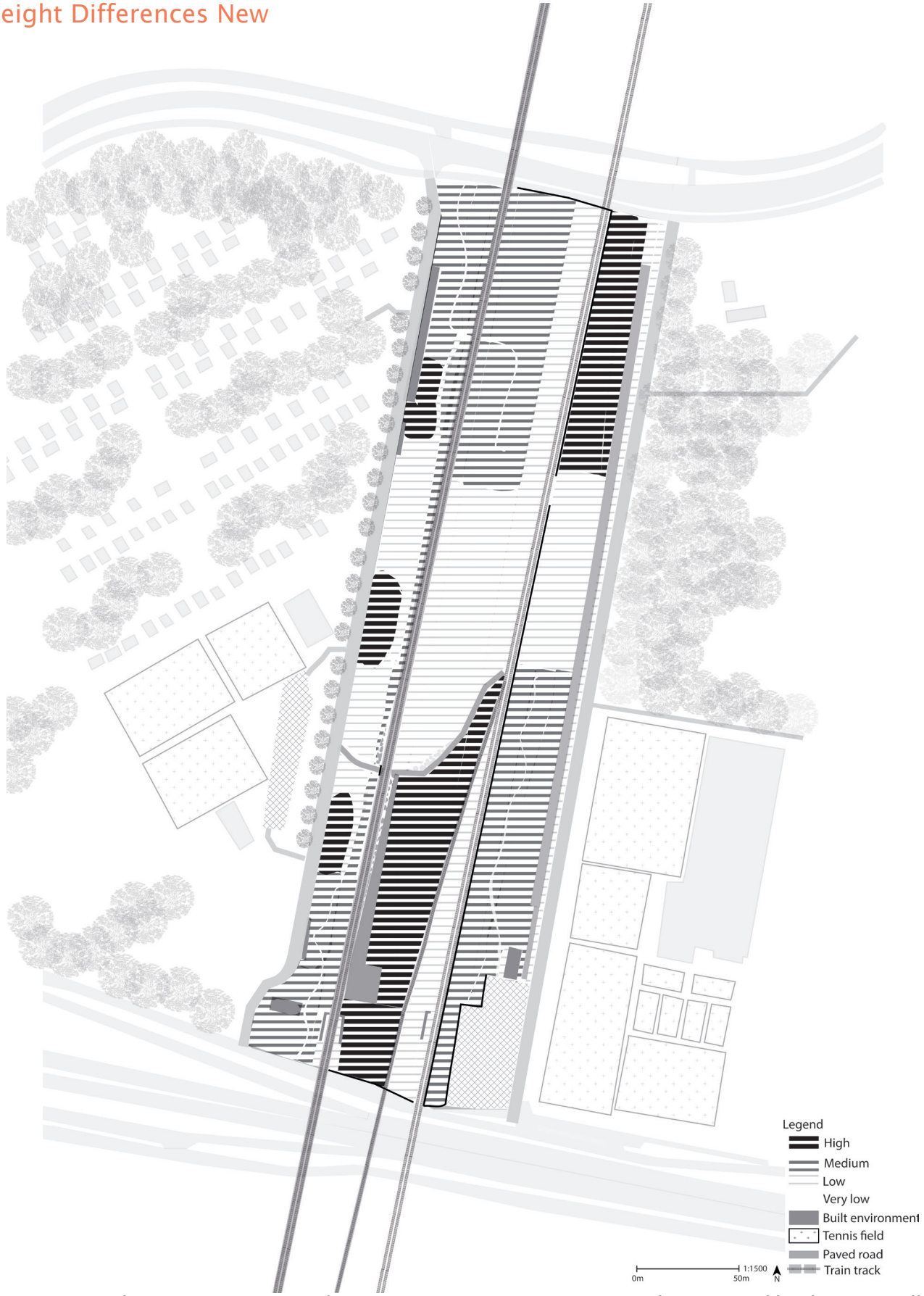


Figure 59: Height vegetation new. By having a new maintenance approach, perceived biodiveristy will be enhanced. More concreet differences in vegetation height is enhanced.

Volume Differences Now

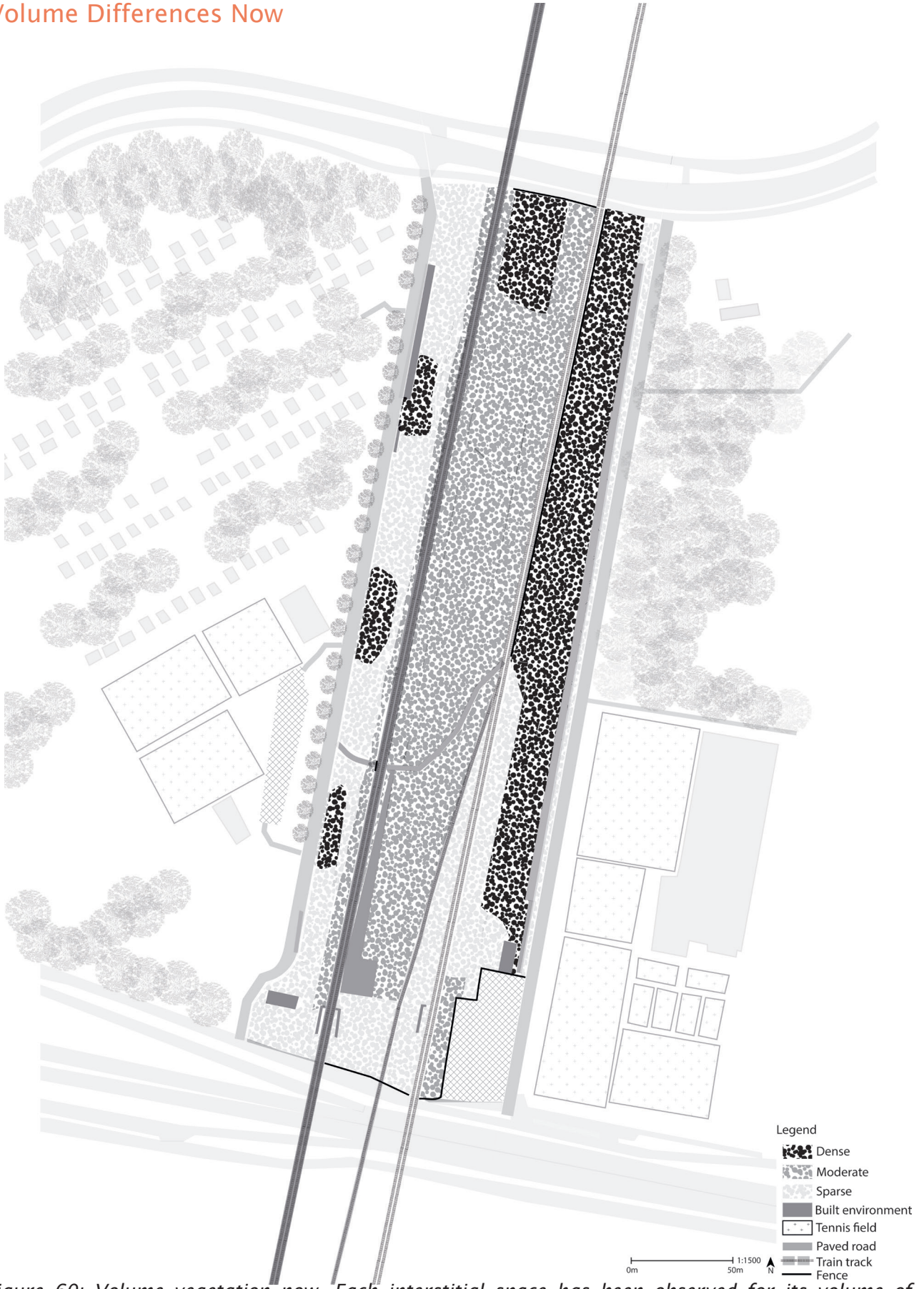


Figure 60: Volume vegetation now. Each interstitial space has been observed for its volume of vegetation. Where trees are regarded as the larger voluminous and grass as the least voluminous.

Volume Differences New

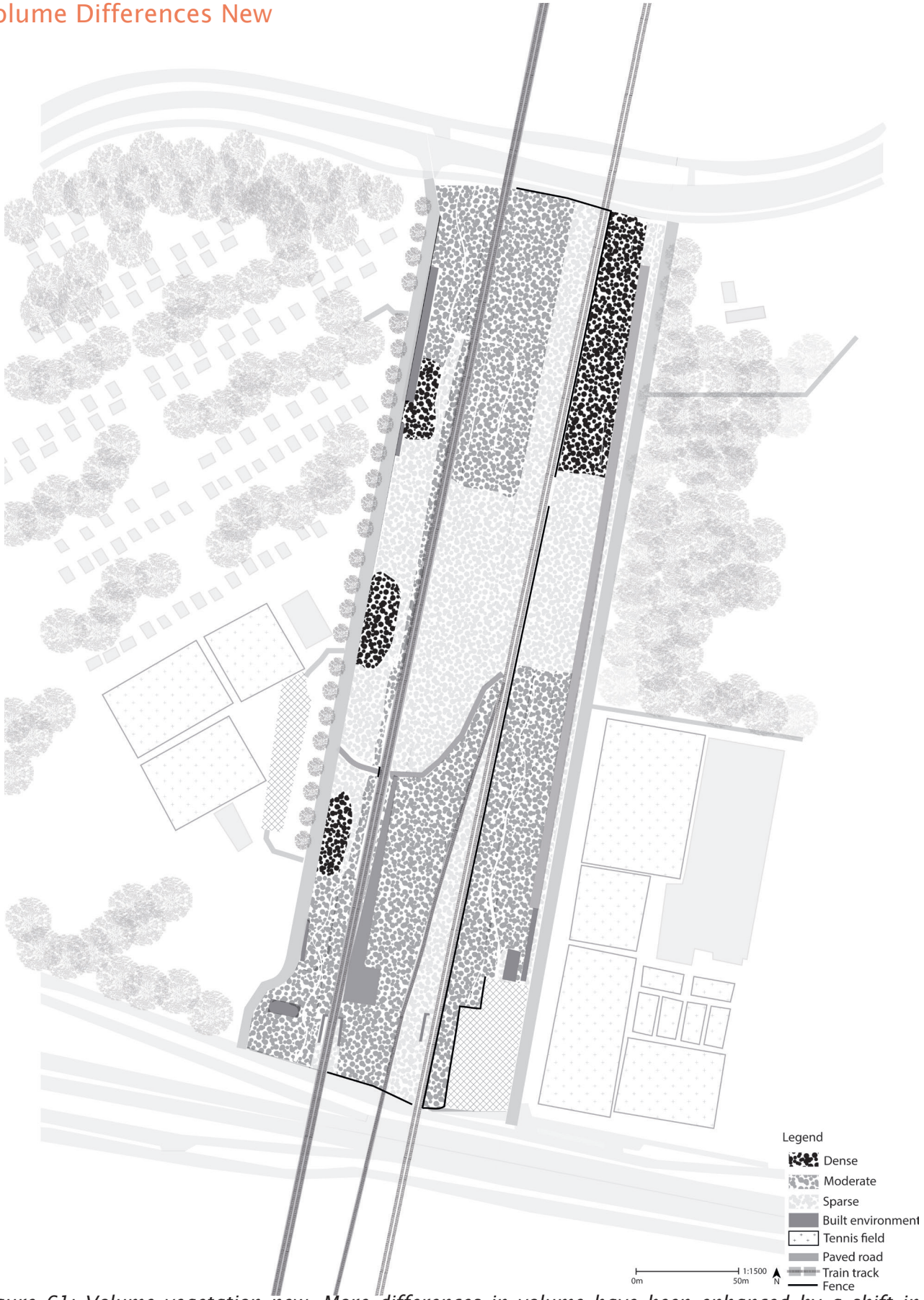


Figure 61: Volume vegetation new. More differences in volume have been enhanced by a shift in maintenance approach to gain perceived biodiversity.

2.3.4 Through the Seasons

Beyond long-term ecological development, the landscape also changes continuously throughout the year. Seasonal rhythms influence how vegetation grows, opens, closes, and shifts density, which in turn affects how the spaces are perceived and used. Summer vegetation may create more enclosed, sheltered moments, while winter strengthens openess, sightlines and reveals the underlying structure of the successional stages.

The drawings illustrate how each successional stage transforms across the seasons, showing how spatial qualities expand or contract throughout the year. These seasonal variations highlight that interstitial landscapes are not static but shaped by ongoing ecological rhythms, offering a dynamic environment that changes character with each visit.

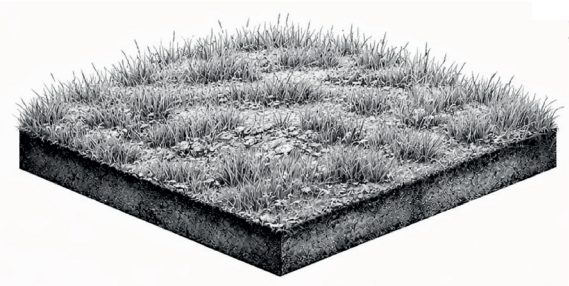
This also supports psychological restoration since visible ecological processes, such as seasonal change can evoke fascination, joy, and a sense of connection with living systems. These processes are often interpreted as indicators of ecosystem health and contribute to psychological well-being. (Puhakka et al., 2025)

Early Transitional Vegetation

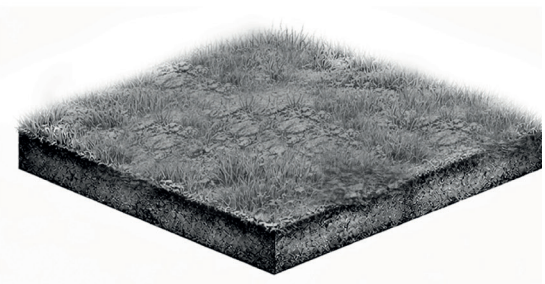
Spring

Summer

Autumn



Winter



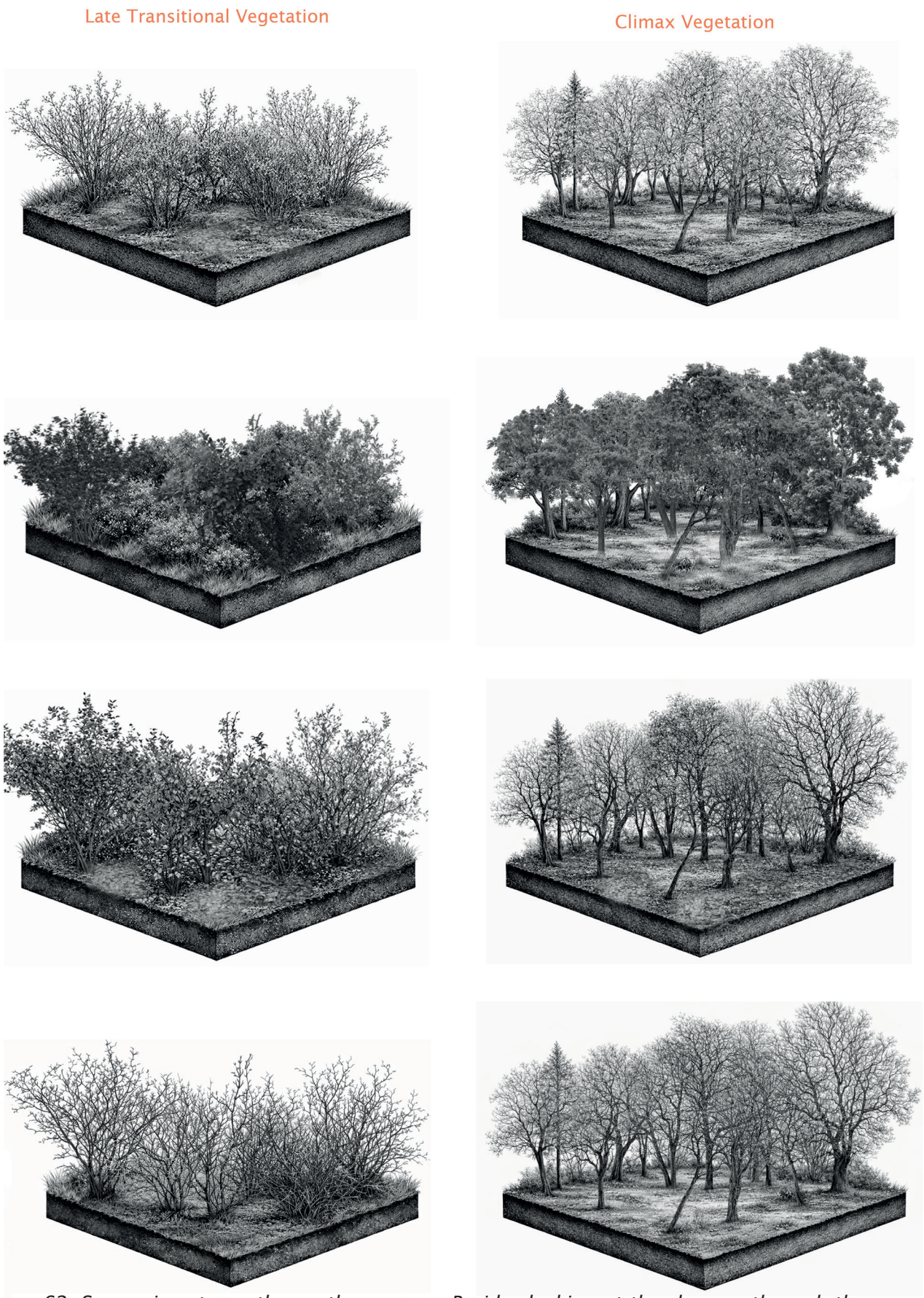


Figure 62: Succession stages throug the seasons. Besides looking at the changes through the years, seasons also play an important role. The atmosphere and the activities will change through the year.

3. Psychological Restoration Through Behavioral Differentiation

Psychological restoration depends not only on the presence of greenery and perceived biodiversity, but also on the extent to which a landscape invites diverse forms of engagement. This chapter examines the theoretical background of how different spatial conditions align with different types of activities and why these behavioral responses correspond to restorative needs. It identifies how the observed activity types within the site align with specific restorative functions. It connects behavioral differentiation to spatial differentiation, which in the previous chapter was shown to arise from variation in successional stages. Through case studies and interviews, the chapter illustrates how such spatial diversity supports a range of restorative behaviors. The chapter concludes by identifying the activity types most strongly supported by both the literature and the site analysis, and by outlining which locations within the interstitial field are best suited to accommodate them.

3.1 Actions and Behaviors as a Result of Spatial Differentiation

In addition to the well-established benefits of perceived biodiversity for psychological restoration, it is important to consider what biodiversity can offer beyond ecological value. Variation in vegetation can create distinct atmospheres within a landscape. The literature suggests that differences in plant types, structure, and arrangement are not only desirable for promoting perceived biodiversity and ecological complexity but also for shaping varied environmental experiences. Vegetation characteristics can communicate specific moods, guide behaviour, and influence how spaces are perceived and used (Gibson, 1979; Gehl, 2011).

Research in environmental psychology supports this idea. Spatial characteristics such as enclosure, visibility, and complexity have a significant impact on perception and the ways environments are used (Gehl, 2011). Enclosed spaces, often formed by dense vegetation, are associated with a sense of "being away" (Kaplan & Kaplan, 1989) and provide refuge (Appleton, 1975), while open areas enhance overview and legibility. Landscapes that combine varying degrees of enclosure and openness introduce a sense of "mystery," which has been shown to encourage exploration and movement (Kaplan & Kaplan, 1989). This indicates that the spatial configuration of vegetation can actively shape user behaviour and experience.

A clear example of spatially shaping withdrawal is the hortus conclusus, literally a "garden enclosed" (Aben en de Wit 1998). This spatial typology has long been associated with privacy, retreat, and introspection. In medieval Europe, the hortus conclusus was designed as a walled or enclosed garden that captured and isolated aspects of nature within a confined space, making them manageable and sheltered from the unpredictable outside world. This spatial form symbolised refuge and seclusion offering a protected setting in which users could sit, walk, or observe in peace, free from public intrusion or external disturbance (Aben en de Wit 1998). Vegetation and enclosing walls serve both ecological and psychological purposes, providing shelter while guiding behaviour toward calm and reflection.

Opposite in spatial character are open plazas and large public squares, whose design emphasises visibility, overview, and social interaction. Open spaces support clear sightlines in all directions, allowing people to see and be seen, which reinforces a sense of social presence, legibility, and communal gathering (Gehl, 2011). Research in environmental psychology shows that openness and visibility in the environment are positively linked to feelings of safety and preference, as clear spatial information reduces uncertainty and supports exploration (Kaplan & Kaplan, 1989; Appleton, 1975). Here, vegetation, if present, is often arranged to reinforce openness rather than enclosure, supporting social behaviour rather than privacy.

The spatial configuration of vegetation can also influence movement and exploration. Variations in enclosure, visibility, and complexity create a sense of mystery, prompting users to navigate through the landscape, discover hidden areas, and engage more actively with their surroundings (Kaplan & Kaplan, 1989).

Together this knowledge underscores how vegetation and spatial characteristics serve as active instruments in shaping human experience: beyond promoting biodiversity, they communicate, guide, and invite behaviour.

3.2 Different Behaviors Supporting Psychological Restoration

That an environment invites different actions and behaviors as a result of spatial differences in vegetation, does have a positive influence on psychological restoration (Wen et al., 2025; Hartig et al., 2003). Besides having a natural green environment and the enhancement of perceived biodiversity, differential behavior needs to be invited to respond to restorative effects for a divers group of people. Building on this understanding of environment–behaviour interaction and linking it to wellbeing, Hartig et al. (2003) demonstrate that environments promote psychological restoration when they invite people to engage in low-demand activities, such as walking, pausing, observing, or slow movement through the landscape. Such activities allow attention to recover without requiring intense cognitive effort.

Additional environmental characteristics also support restorative experiences. Wen et al. (2025) highlight that opportunities for physical activity and social interaction significantly enhance restorative outcomes.

This fits with the understanding that psychological restoration is not experienced uniformly. Individuals differ in what they experience as restorative, and what provides relief for one person may not do so for another. Many interstitial spaces inherently support this diversity through their openness, spatial variability, and perceptual complexity. These qualities allow experiences of soft fascination, engagement without cognitive overload, which further supports attentional recovery (Kaplan & Kaplan, 1989). Moreover, the informal and flexible ways in which people already use these spaces, ranging from solitude and quiet observation to informal private recreation and exploration, demonstrate their capacity to accommodate a wide spectrum of needs and behaviours that are sometimes excluded from more structured urban environments.

However, when environments clearly afford certain activities, they tend to support psychological restoration by reducing cognitive effort and enhancing compatibility between user intentions and environmental qualities (Kaplan, 1995; Hartig et al., 2003).

This idea corresponds with affordance theory, introduced by Gibson (1979), which explains how environments are directly perceived in terms of the actions they enable. Rather than requiring conscious interpretation, spatial and material characteristics intuitively invite behaviour through their physical properties. Paths afford walking, benches afford sitting, and open edges afford pausing or observing. These perceived action possibilities guide behaviour in an immediate and largely non-conscious way.

Taken together, Wen et al. (2025) and Hartig et al. (2003) indicate that psychological restoration rarely emerges from a single spatial condition. Instead, it benefits from a diversity of environments that support **behavioral differentiation**, ranging from quiet observation and withdrawing to movement and social interaction. On top of that, when these environments clearly afford certain activities, they reduce cognitive effort and enhance compatibility between people and place, which contributes to psychological restoration. So, the spatial character which vegetation can enhance, has an influence on the type of behavior that is invited. Enhancing these ecological and spatial qualities in a clear way enables interstitial spaces to contribute to psychological restoration for a broad range of users and their behaviors.

3.3 Behavioral Differentiation

Three Types of Behaviors

The combined insights from the literature and the site analysis show that the following activities already take place within the interstitial spaces: people are gathering together in a more private setting, people withdraw on their one and people use the itnerstital spaces to move by/through.

These type of activities are concluded in 3 types of behavioral differentiation:

- Social Gathering

- Withdrawing

- Activity/moving through

These activity types also appear consistently in the literature as beneficial for psychological restoration. For this reason, the design now focuses on strengthening and supporting these spatial conditions within the interstitial field.

Concept Drawing of the Three Types of Behaviors

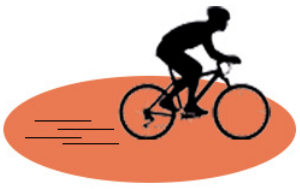
To meet other people in private

Social Gathering

To withdraw alone

Withdrawing

To actively pass by / through



Activity / Moving through

Figure 63: Concept drawing behaviors. Three behavioral differentiations were the result of the analysis. People take part in these three behaviors when in the interstitial landscape.

3.3.1 Analysis on the Three Types of Behaviors

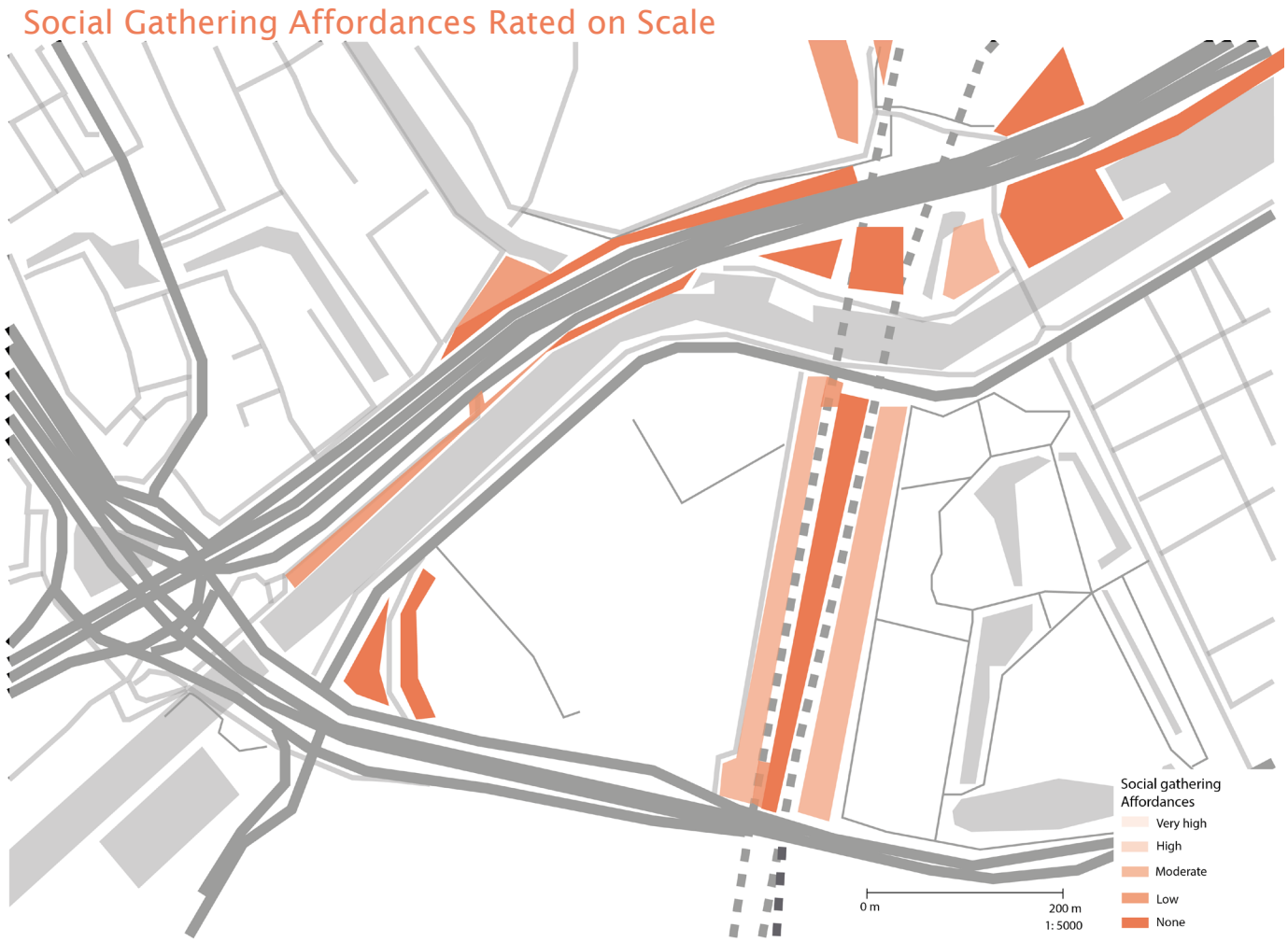


Figure 64: Social Gathering Affordances rated on a scale. Each interstitial space is rated on a scale to

These three types of behavior can be supported by specific spatial characteristics, as explained on page 94. When these three behavioral modes are invited, interstitial spaces are more likely to contribute to psychological restoration. An analysis is conducted to understand which type of space is present at which specific spot within Rotterdam's interstitial network.

The first behavior examined is social gathering. To identify which locations have the potential to function as social gathering spots or already function like this, both the spatial character and the current activities were analysed.

Some interstitial spaces have this open character. Here it is more likely to attract people and facilitate informal encounters. However, the analysis shows that almost none of interstitial spaces currently communicate the right affordances for social gathering. Although some interstitial areas contain open clearings, there are no further cues that show that people can sit or gahter together, which reduces their abbility to function as gathering places for the larger public right now.

Social Gathering Affordances at Project Location

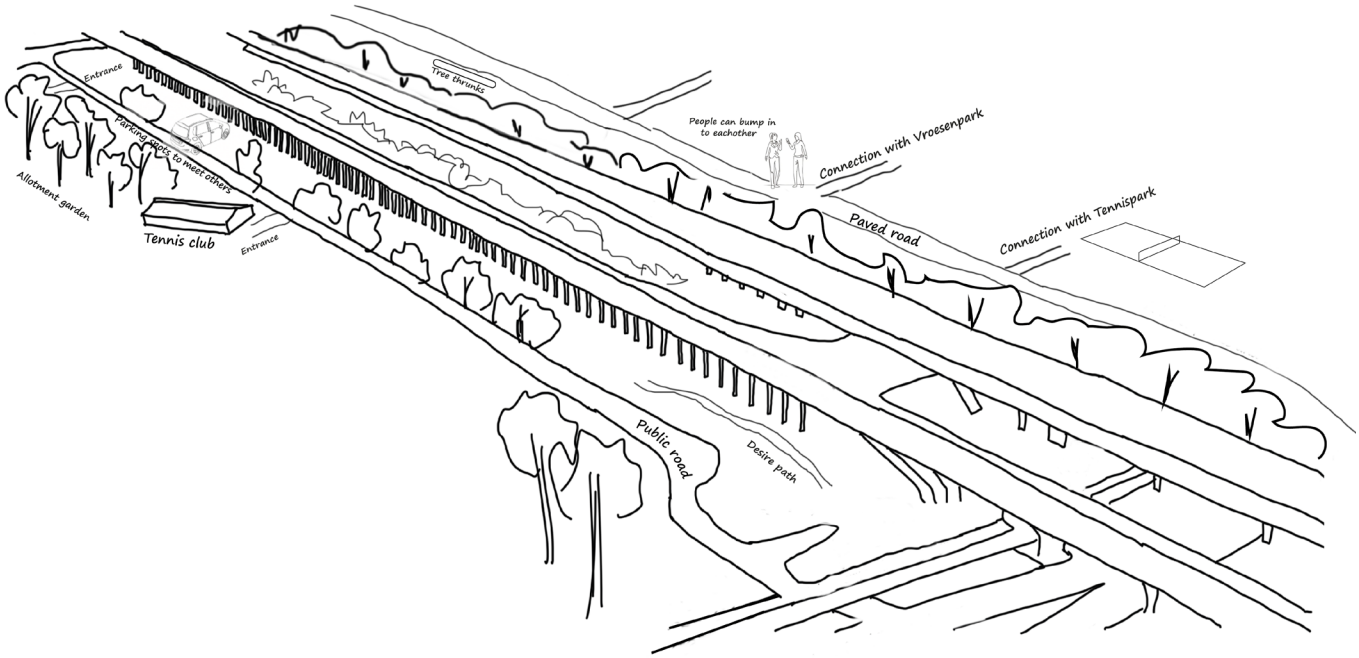


Figure 65: Social Gathering Affordances in context. In the 'Jan Rothuizen' style drawing, this drawing shows why places are rated the way they are and what the context is giving people in relation to social gathering.

The drawing inspired by the visual language of Jan Rothuizen (Rothuizen, n.d.), shows a drawing of the project location. It is visualised what the social gathering affordances in the chosen location are. The two interstitial spaces which are highlighted as medium in the analysis map are quite open spaces. However, there are besides some tree trunks on the Vroesenpad and parking spaces on the Dalton pad, no further cues that communicate gathering. The interstitial space inbetween, has no public entrances and is overgrown by dense vegetation. This place therefore has zero gathering potential at this moment.

Withdrawing Affordances Rated on Scale

Figure 66: Withdrawing Affordances rated on a scale. Each interstitial space is rated on a scale to compare the spaces to eachother.

Affordances which imply withdrawing is also one of the characteristics which is benifical for psychological restoration.

In this map it is showed that there are quite some spaces where people can withdraw themselves. For people to withdraw themselves they want to be in an enclosed space, where they can hide.

Withdrawing Affordances at Project Location

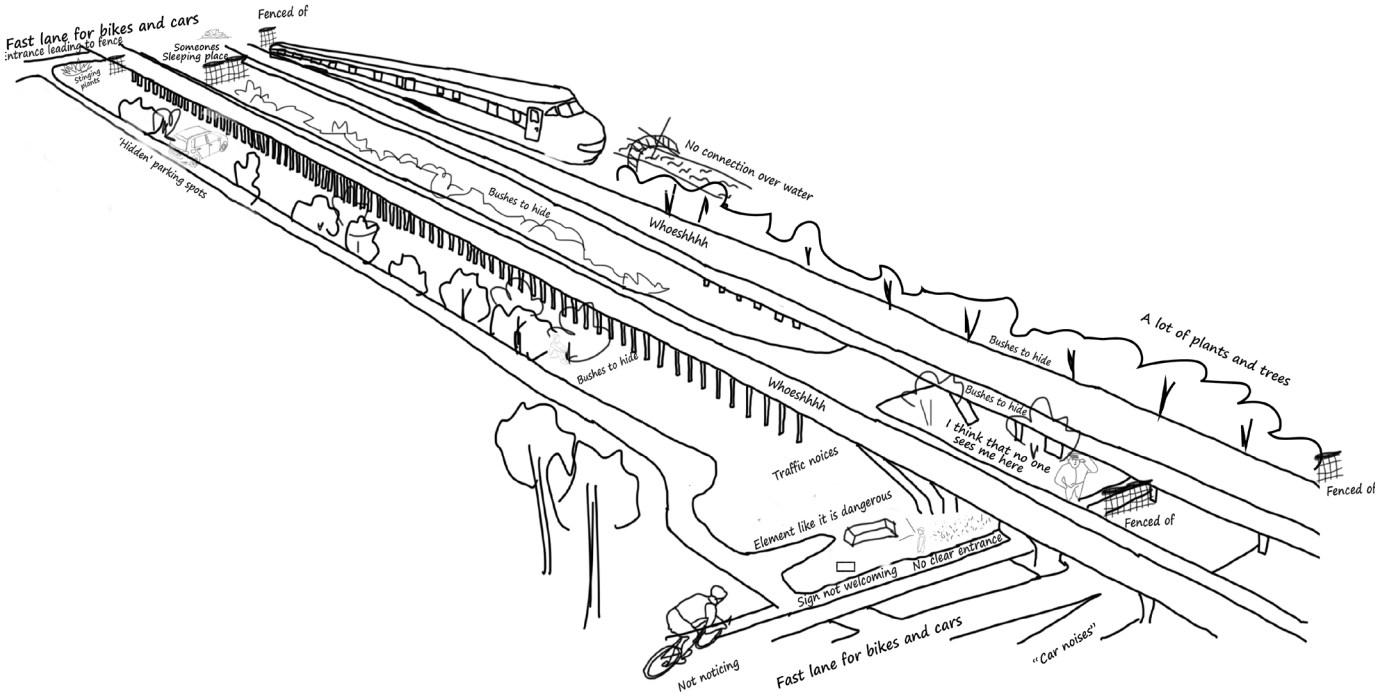


Figure 67: Withdrawing Affordances in context In the 'Jan Rothuizen' style drawing, this drawing shows why places are rated the way they are and what the context is giving people in relation to

In this 'Jan Rothuizen' drawing of the project location, the affordances to withdraw are showed in context. It can be seen that certain signs, like not maintenained information panels, keep most people out since it seems not cared for. Furthermore, the density of the vegetation at these spaces provides good spaces for people who do not want to be seen. They can hide in here while at the same time look out for other. Also the fact that two of the three interstitial spaces are fenced of, does support most people to enter the area, which results in being the perfect spot for people to withdraw from the greater urban context.

Movement/Activity Affordances Rated on Scale

Figure 68: Movement Affordances rated on a scale. Each interstitial space is rated on a scale to compare the spaces to eachother.

Attracting movement/physical activity is the third type of behavior which is desirable when creating a diversity of psychological restorative areas.

From the analysis it can be derived that multiple interstitial spaces have the affordances to move through or passing by. There is a biking or walking path along, a desire path or a self-made mountainbike trail. These are affordances which attract people to move by or through the area.

Movement/Activity Affordances at Project Location

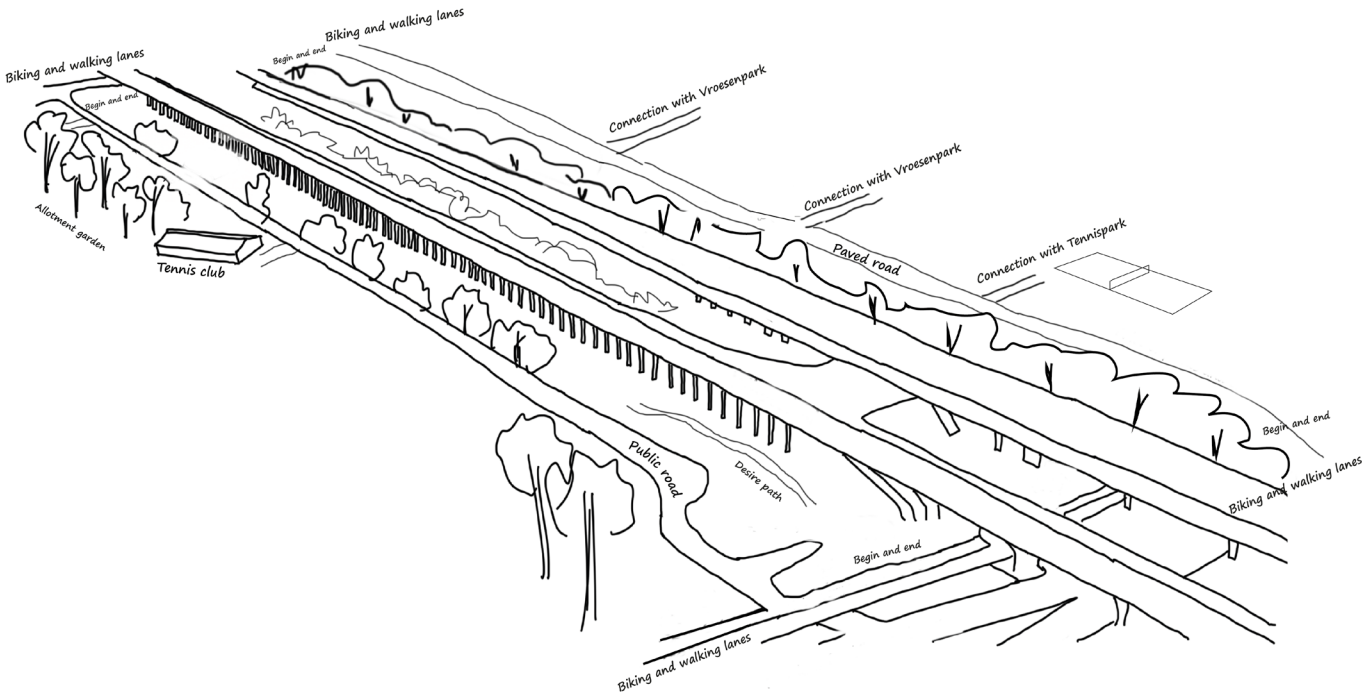


Figure 69: Movement Affordances in context. In the 'Jan Rothuizen' style drawing, this drawing shows why places are rated the way they are and what the context is giving people in relation to movement.

In this 'Jan Rothuizen' drawing of the project ocation, the affordances to move through or passing by the interstitial spaces are showed in context. Biking and walking paths are along the Daltonpad and Vroesenpad. Only Daltonpad is now accessible to move through. This is communicated via a desirepath. The area between Daltonpad and Vroesenpark is not entreable, is densly vegetated and therefore does not communicate moving through.

Behavioral Differentiation in Relation to the Edges

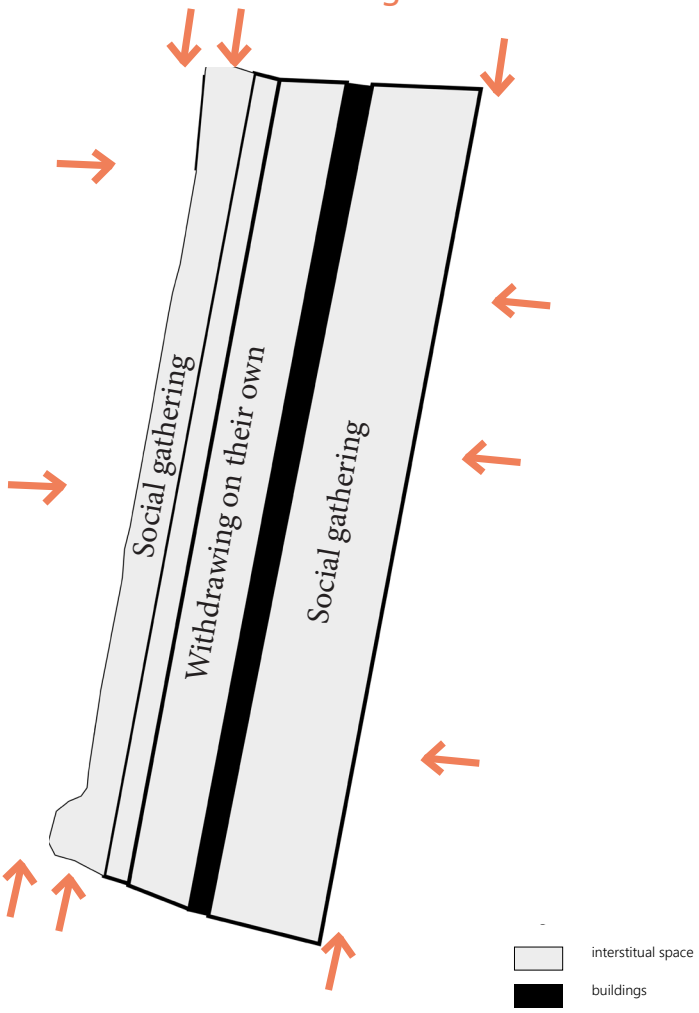


Figure 70: Current accessibility in and around the project location. By looking at the connections with the interstitial spaces it is determined what type of environment it has the potential to be.

As the analysis showed, each interstitial space invites certain behaviors through its affordances wihtin the space. However, boundaries and edges of a space reveal much about its capacity to function as a particular type of place: which edges are accessible, and which are not, directly shapes how people move in and around it. A space accessible from multiple sides suggests opportunities for social gathering: people can approach from different directions, meet, or use the space as a central point. A space with only one entrance, by contrast, tends to support withdrawal, offering a sense of privacy and reduced exposure. Spaces with two entrances on opposite sides often function as passage spaces, encouraging movement from one point to another (Gehl, 2011).

Zooming in on the project area, the current connections to the urban fabric become clear. The interstitial space between the two railway lines has only one entrance, which is not a public one, making it a secluded place where people can currently withdraw unseen. In contrast, both the Daltonpad and the interstitial space along the Vroesenpad have multiple (possible) access points, allowing people to arrive from different directions. This makes them suitable for social gathering, while also functioning as routes for passing through.

Behavioral Differentiation in Relation to Direct Surrounding

To understand what potential each space has to strenghten, the analysis consider the spaces also as part of the wider urban system.

The direct surroundings of the interstitial spaces and their role within the wider urban fabric provide important clues for understanding behavioral differentiation. When zooming in on the chosen area, it becomes clear that people come here for a variety of reasons. Some move through the area on their way to nearby destinations, such as the tennis courts. Others use the surroundings to gather, for example in the Vroesenpark, while some seek solitude in more private places like the allotment gardens.

Within this context, the interstitial spaces can function as an extra and flexible layer where different behaviors converge. Unlike formal parks, these spaces offer a more informal, raw, and uncurated environment that supports experiences the conventional urban landscape cannot provide. They create opportunities for withdrawal in quieter, more sheltered settings that feel genuinely hidden rather than publicly exposed. They can host small-scale social encounters in atmospheres that are more intimate and less programmed than the park. And they can serve as alternative movement routes between destinations, offering a calmer, more secluded passage that feels exploratory rather than infrastructural. In these ways, the interstitial spaces complement the surrounding city by providing restorative qualities that are otherwise scarce in the urban context.

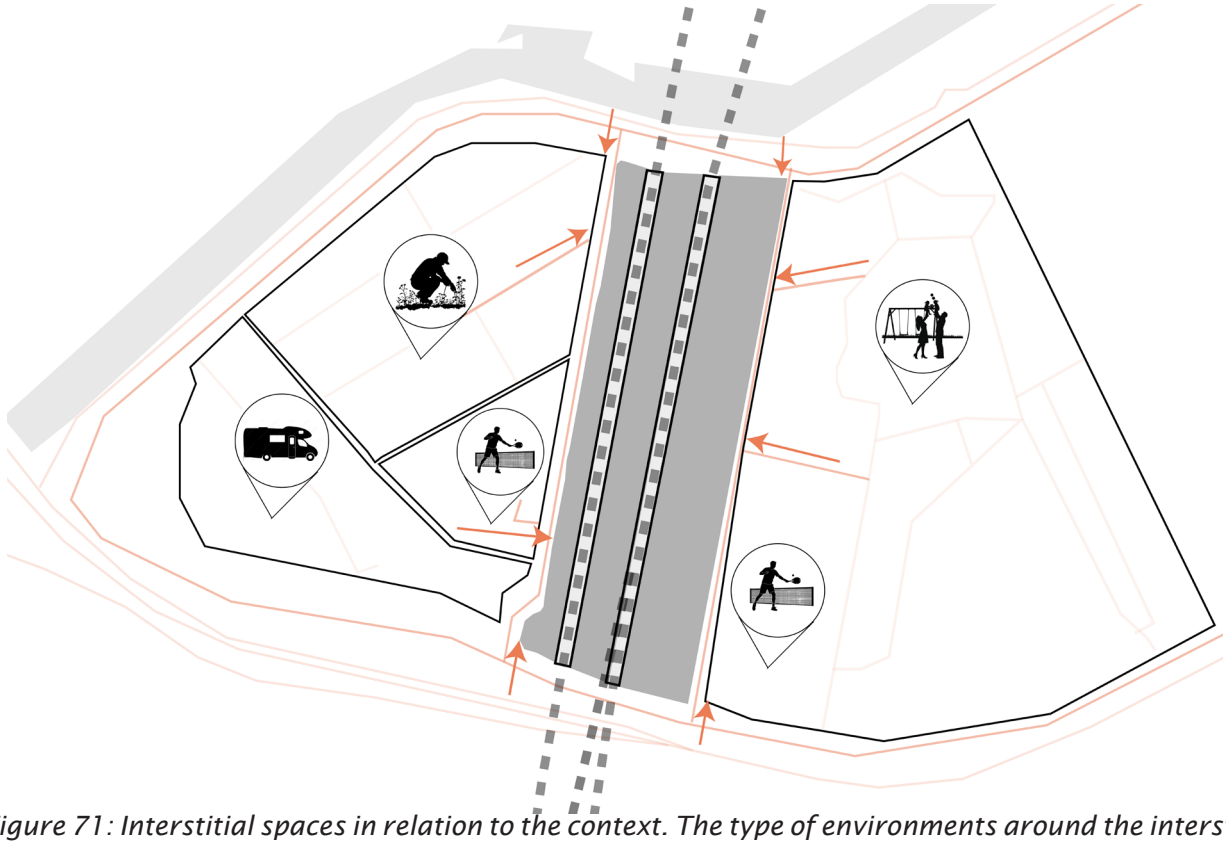


Figure 71: Interstitial spaces in relation to the context. The type of environments around the interstitial spaces are observed and this is brought into relation of the reason why people go to these areas.

Interviews with People Known to the Location

To complement the analysis of what activities the spaces afford, it is also essential to understand how vegetation shapes people's experience and behaviour. This is particularly relevant in this project, where perceived biodiversity is increased through different vegetation structures and spatial conditions. Knowing how users interpret these variations helps clarify their influence on experience, behaviour, and restorative potential. To explore this, I conducted interviews with users in and around the design location. I presented three spatial scenarios with different vegetation structures and asked participants how they perceived and would behave in each one. Their responses provided insight into how vegetation-driven spatial qualities are understood in Rotterdam Blijdorp and how the three behaviors can therefore be strengthened at the right location in the design.

The first interview

The first woman interviewed was walking on the 'Daltonpad' with her dog. It was a big dog who walked her done this area. The dog, according to her, liked the bunnies in the area. The woman wore old shoes and loved being in 'more natural environment' as she stated. I asked her if she came here often and she responded that she was every day. However, she felt like the more rough natural environment was not big enough for her and her dog. When I asked her about the opposite site of the Daltonpad and if she ever wondered what was there, she immediately said that she would love to go there but because of the fences she is not in the position to do so. She kept telling me that she loved the fact that it wasn't a clear path, that she could walk on grass and feel like she is surrounded by nature, more than in the Vroesenpark. When I showed her the 3 different drawings of vegetation-places, she answered the next thing: she would like to go to the first one to clear her head, at least when it is not a endless path because that would scare her. For the second situation she said, 'picknicking is the first thing that came to mind'. The third one would fit her best this time, since she would love to walk her dog there.

Figure 72: The first interview visualised. Three different spatial scenario's and a sketch of the woman of the interview.

The second interview

After walking on the Daltonpad, I entered the Allotment garden 'Tot nut en genoegen'. Here a lot of people were working in their small garden. One man said hi to me and I felt intvited to ask him a question. I was invited the enter his garden and he talked to me about what they did in the garden. I asked the man about the Daltonpad and he responded with 'is that the weird field across these gardens?' and I answered yes. I had walked there once or twice but it wasn't an attractive place to him. Because of the fact that he didn't knew much about the place or why he never entered it, I showed him the drawings I made. I asked about his feelings and first thoughts of every place. He answered that the first one looked like a place where secret things are happening, which is not really a place for him. He didn't really liked to be alone in such a place. The middle one he liked the most, he felt welcomed and imagined there to be find people around him. The one on the right felt like a route, something he could follow.

He said that it would be great if these senario's would be translated to the Daltonpad and maybe in between the traintracks. He talked about the fact that he is a supporter of connecting places and mainly green spaces. He had a passion for plants and animals and gives workshops in the zoo called 'Blijdorp'. These workshops are about planttypes and why they grow such plants in Blijdorp. I asked him, why he does not enter Daltonpad that often if he has these kind of interests and he says that he first did not know that he could enter and that later on there was not really somehting that attracted him.

Figure 73: The second interview visualised. Three different spatial scenario's and a sketch of the man of the interview.

The third interview

The last woman I came across was also a woman from the allotment garden. She saw me with a notebook and asked if we were doing some kind of scavenger hunt. I asked her about what she was doing and if she new the Daltonpad and the green areas inbetween and on the other side of the train tracks. She replied with “You mean that green area where all the youth is hanging in the night?” She immediately made clear that she did not really liked that place. It was full of trash and not a place where she wanted to be alone. Which she found really upsetting, since she loved green environments.

I showed her my drawings and also asked her about her feelings and thoughts. She talked about that the first situation she really likes and see herself going there to be alone, thinking about nothing after a long day. The middle situation she liked very much because of the flowers. She said that the flowers are attractive to her and she feels invited. She imagined people together in this place. The situation on the right got her thinking about a garden, somewhere she would straw through.

When we were wrapping up the conversation she mentioned that she knew that people were maintaining the Daltonpad since there is this sign in front of it, but she said
“They said to us that the place would be a blooming, vibrant place for plants and animals, however I can not see it. The sign is also almost unreadable and I can see nothing else but a mess. I would love if that place would be more inviting, but also very inviting for plants and animals. I think that know you have to pay to park here, people who want to smoke will stay out more

Figure 74: The third interview visualised. Three different spatial scenario’s and a sketch of the woman of the interview.

Case Study - Spatially Enhancement of Withdrawing

Figure 75: The Bruder Klaus Field Chapel. A space intented for individual retreat (Architectuul, 2020).

Figure 76: The entrance of Bruder Klaus Field Chapel. Small entrance offers only one person to go in (Architectuul, 2020).

Figure 77: Inside the Bruder Klaus Field Chapel. An enclosed space where light and sound are absorbed (Architectuul, 2020)

To see how other environments enhance a certain type of behavior, case studies have been conducted on the spatial characteristics of environments. To start with the spaces where people withdraw from the public realm. The Bruder Klaus Field Chapel in Germany, designed by Peter Zumthor, provides a clear example of a space that is explicitly intended for individual retreat, introspection, and solitude within a broader landscape. The chapel is located in an open agricultural field, deliberately positioned away from urban or collective activity. This isolation is a fundamental design principle, the journey towards the building already initiates a process of withdrawal, as visitors leave behind the surrounding environment and move into a more introspective state.

Spatially, the project is defined by a single, enclosed volume. The entrance is narrow and low, requiring a physical adjustment that heightens awareness and marks a clear transition from outside to inside. Once inside, the space expands vertically into a tall, monolithic chamber. The rough, charred interior surfaces absorb light and sound, creating a quiet and immersive atmosphere that minimizes external distractions (De Bedachtzamen – Bruder Klaus Feldkapelle – een Plek Die Resoneert, 2024).

From a landscape architectural perspective, the Bruder Klaus Field Chapel illustrates how isolation, minimal openings, and a small path, can create conditions for deep individual retreat. While such an extreme level of enclosure may not be directly transferable to urban interstitial spaces, the underlying principles, such as controlled access, surrounded by walls and a clear separation from surrounding flows, can inform the design of smaller urban green spaces that allow individuals to withdraw from the public realm.

Case Study - Spatially Enhancement of Social Gathering

Figure 78: Seating spots in Bryant Park. Moveable seating and a field (Project For Public Spaces, 2024)

Figure 79: Keeping people in Bryant park. People are invited to stay in the area by having this square and seatings. (Project For Public Spaces, 2024)

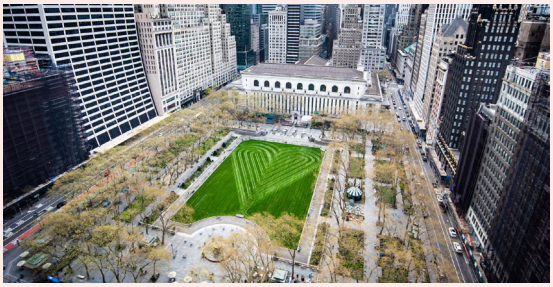


Figure 80: Bryant park from above. Edges form enclosure without isolation for the city (Project For Public Spaces, 2024)

Figure 81: Open lawn in Bryant park. Openess ensures visibility across the space. (Project For Public Spaces, 2024)

To further learn from other environments, a case study on spatial characteristics that invite social gathering has been conducted. Bryant Park, redesigned by Bryant Park Corporation, offers a clear example of how landscape design can actively support staying, meeting, and collective use within a dense urban environment.

Located in the center of New York City, the park is embedded within a highly active urban fabric, yet functions as a place where people come together to sit, meet, and spend time. The design deliberately prioritizes staying over movement, creating conditions that encourage people to remain in place rather than pass through.

An important characteristic of the park is the possibility of seating. Chairs are placed through the area, which invite people to pause and sit together. Next to this, the big open lawn invites people to gather together.

Therefore, the key spatial characteristic is the creation of a clearly defined central space. The large open lawn acts as a visual and social anchor. The openness ensures visibility across the space, enabling people to observe others and feel part of a shared setting.

The edges create a sense of enclosure without fully isolating the space from the city. These edges provide comfortable zones for informal meeting, while also buffering noise and movement from the surrounding streets.

This balance between enclosure and openness creates a condition where people feel both protected and socially connected (Bryant Park | Projects — Project For Public Spaces, n.d.).

Case Study - Spatially Enhancement of Movement/Activity

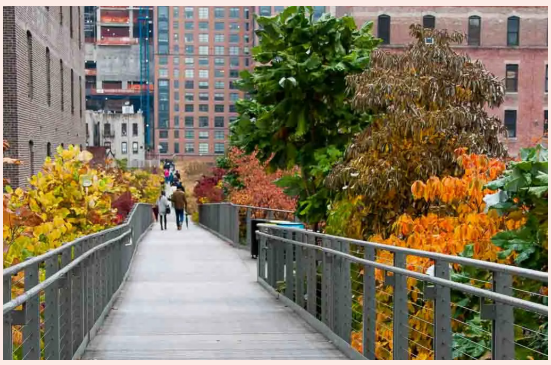


Figure 82: High line Park. Long path leading people (Groenblauwe Netwerken, 2023).

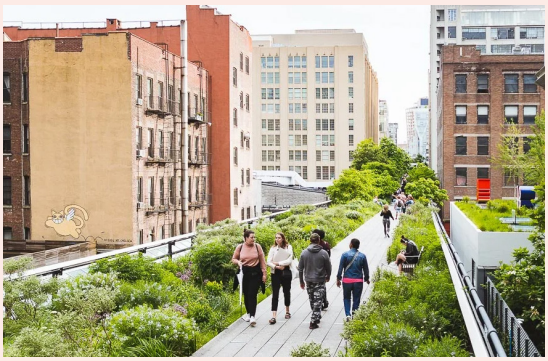


Figure 83: Keep people walking. The path keeps people walking (Groenblauwe Netwerken, 2023).

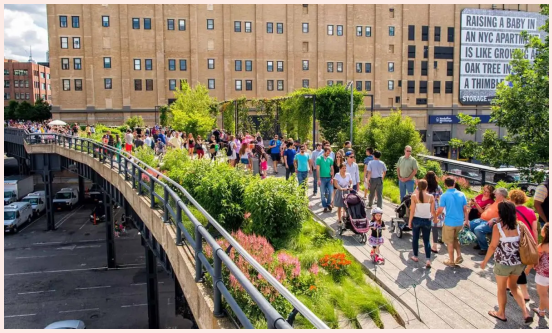


Figure 84: Moments to pause. These pauses also imply peopel to move further. (Groenblauwe Netwerken, 2023).

Figure 85: Art installations on the Highline. These installations encourage people to move further (Groenblauwe Netwerken, 2023).

Another environment examined is High Line Park. This case study investigates which spatial characteristics have been used to encourage movement and circulation within the area. The High Line, designed by James Corner Field Operations in collaboration with Diller Scofidio + Renfro and with planting design by Piet Oudolf, transforms a neglected elevated railway into a linear park that actively draws visitors to walk.

A defining characteristic of the High Line is its continuous linear pathway, stretching over two kilometers and connecting multiple neighborhoods. Framed sightlines, gentle curves, and changing perspectives reveal new views of the park and city, motivating visitors to keep moving. Oudolf's layered perennial meadows, tall grasses, and seasonal variation create visual interest and subtle cues for circulation, guiding visitors through a sequence of spaces without signs or instructions.

Spatial sequencing alternates between open plazas, intimate niches, and partially enclosed walkways, providing moments to pause while maintaining the need to move further. Art installations and seating clusters cut the route, offering brief stops and reinforcing exploration to the next spatial "episode." This combination of linear layout, perceptual variety, planting interest, and spatial rhythm sustains movement throughout the park.

From a landscape architectural perspective, High Line Park demonstrates how linear circulation, visual sequencing, and layered planting can attract people and guide movement, transforming a former railway into a dynamic, continuously engaging urban landscape (The High Line, New York | Groenblauwe Netwerken, n.d.).

3.4 Conclusion - Relation Spatiality and Behavioral Differentiation

3.4.1 Design Strategies

Bringing together literature, analysis, case studies and interviews with people familiar with the area, the three types of behavioral differentiations can be linked to spatial differentiation. These differentiations can be translated into design strategies that guide the transformation from the residual to the restorative.

The first strategy focuses on using open spaces for social gathering. The analysis showed that when there is a high degree of openness, people tend to have a clear overview, see one another, and are inclined to pause and stay. Such spaces support social interaction and collective use.

The second strategy aims to enhance dense and enclosed spaces as places for individual withdrawal. Research and observations indicate that enclosed environmentscreate a sense of refuge and being away. This spatial intimacy reduces external stimuli and allows people to shift attention inward, facilitating calmness and reflection, so that they can fully withdraw for the crowd and stimuli.

The third strategy emphasizes strengthening contrasts between open and closed vegetation, as these differences encourage movement and exploration. Diversity in spatial surroundings stimulates curiosity and keeps people engaged in discovering their environment, thereby enhancing people to engage in movement.

In the drawings, these design strategies are illustrated in relation to vegetation structure. Together, they form the foundation for the design development.

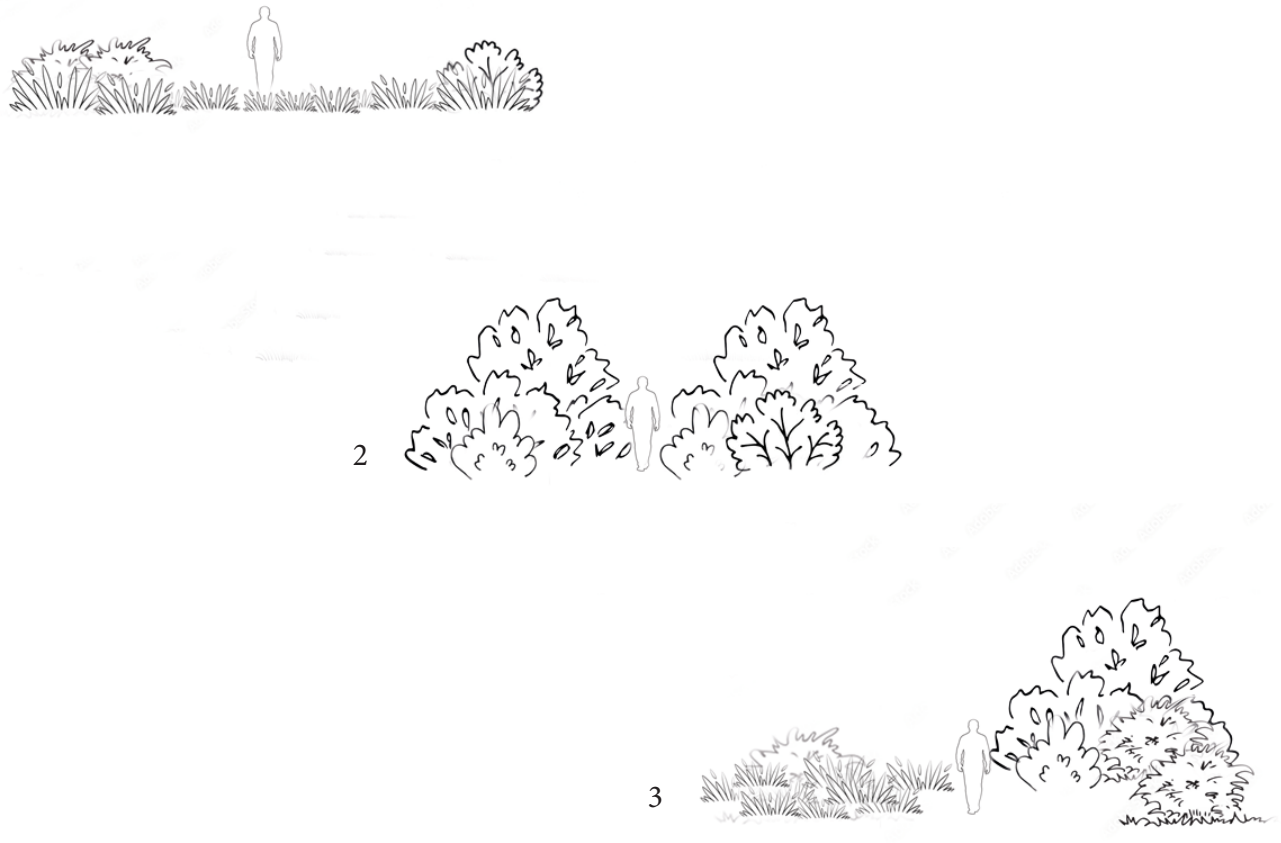


Figure 86: Three design strategies with regard to behavioral differentiation. Open spaces for people to come together, enclosed spaces to withdraw and a differentiation in this for movement.

3.4.2 Conclusions Translated to the Project Location

In the conclusion map of the current situation, the combined insights from the literature and the spatial analysis are visualised. The map shows where open and enclosed spaces occur as a result of vegetation density, how the area connects to the surrounding urban fabric, and which affordances are present in the landscape. Together, this information makes it possible to differentiate which interstitial spaces are most likely to accommodate specific types of behaviour.

This differentiation, however, is not prescriptive. Although each interstitial space shows a tendency toward a particular behavioural type, this does not mean that only that behaviour will be invited there in the new design. Rather, the analysis provides a framework for understanding which areas are best suited to support certain activities.

In the design, where new successional stages are introduced to increase perceived biodiversity, three locations are selected to explicitly enhance one behavioural type through targeted interventions (shown in figure 88). It is important to note that, because of the new vegetation structures and successional stages, each interstitial space will still be able to accommodate all behavioural types, just as interstitial spaces currently do. Not every strip will communicate every behaviour equally clearly, but this does not limit the possibility for such activities to occur or be invited there.

Although the enhancement of these three different places in relation to the specific place will be discussed in the next chapter, the design process begins with reconsidering the entrances. To support the different behavioural tendencies identified in the analysis, the connections to the surrounding urban fabric need to be adjusted in ways that are suitable for each activity type.

By analysing the existing connections to the surrounding city, the new entrances are positioned at locations that strengthen these relationships. Rather than functioning as direct extensions of the surrounding routes, the entrances introduce a subtle redirection of movement into the interstitial space. This shift shapes how people enter and experience the area: they transition from the familiar urban environment into a different spatial condition. The placement of these new access points is shown in the following maps.

Conclusion Analysis map - Spatiality in Relation to Behavioral Differentiation

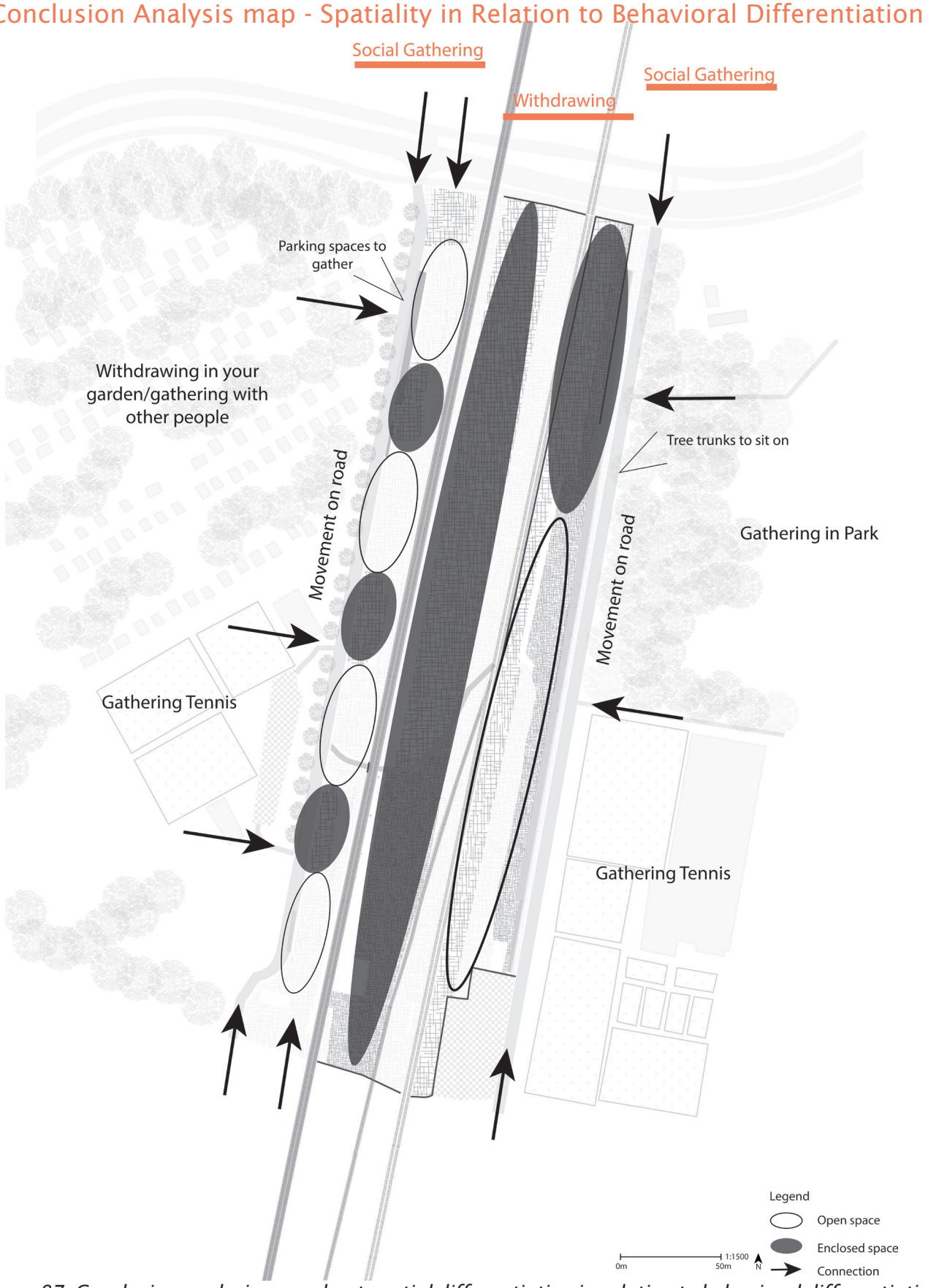


Figure 87: Conclusion analysis map about spatial differentiation in relation to behavioral differentiation. Open spaces and multiple entrances are related to gathering places, where enclosed spaces with one or 2 entrances are related to withdrawing places.

Selected Three Locations

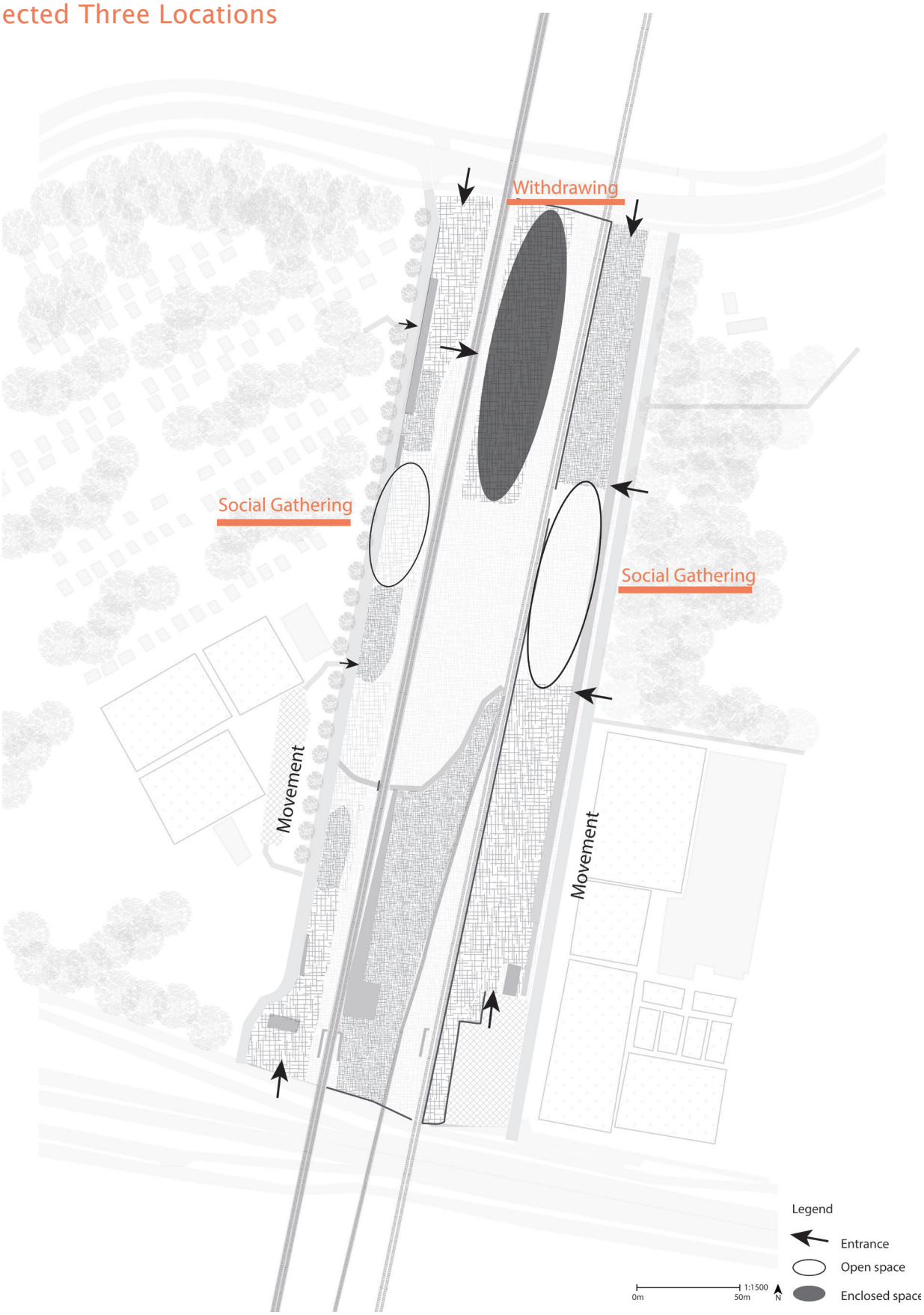


Figure 88: Selected three locations. Three locations withtin three different interstitial spaces are selected as the spots where certain behavioral activities can enhanced because of their spatial character en placement withtin the urban farbic.

3.5 Design Aspects

3.5.1 Entrances

Entrances Now

Figure 89: Entrances now. The entrances that are marked withtin the drawing are the entrances leading directly to the interstitial spaces. At other points these is no direct or possible entrance right now.

Entrances New

Figure 90: The entrances new. By having multiple entrances people are invited to the area. These entrances are (not directly, but) connected to the already existing entrances.

3.5.2 Accessibility

The introduction of new entrances and vegetation types creates a shift in the accessibility of the area. Their placement is based on existing sightlines, current connections to the surrounding urban fabric, and safety considerations related to the railway. Dense vegetation without paths communicates that certain areas are not intended for access, while entrances and paths carved through thicker vegetation signal the opposite and invite movement.

Accessibility will also change over time. As vegetation undergoes succession, trees may establish themselves in new locations and the ground layer may open up, gradually reducing the need for intensive path maintenance.

The strategic enhancement of vegetation in some places, the deliberate preservation of it in others, and the positioning of entrances together define how accessible the interstitial spaces become. This is illustrated in the following maps.

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Accessibility Now

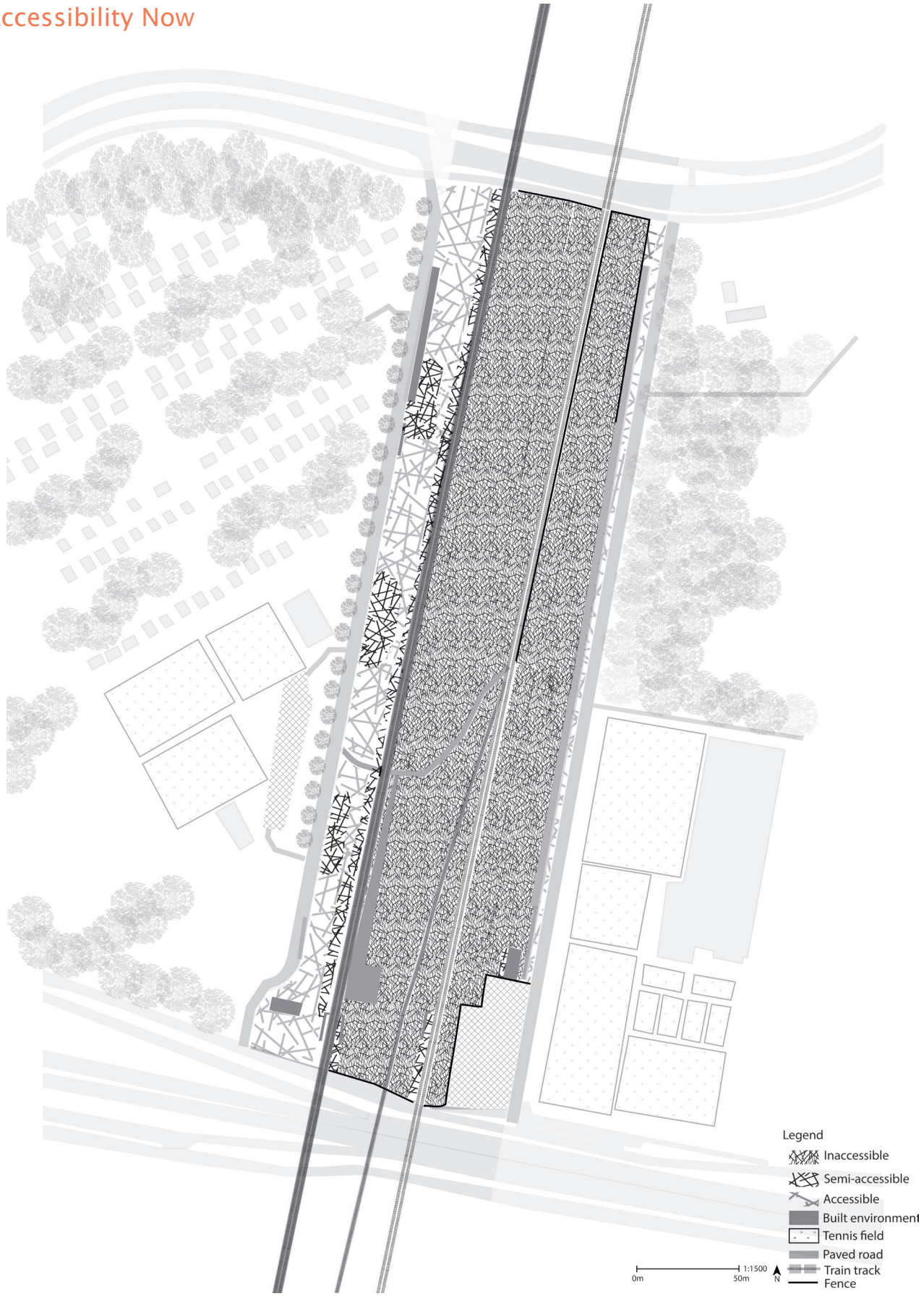

Figure 91: Accessibility now. The current accessibility is analysed based on entrances and vegetation density.

Accessibility New - First Years

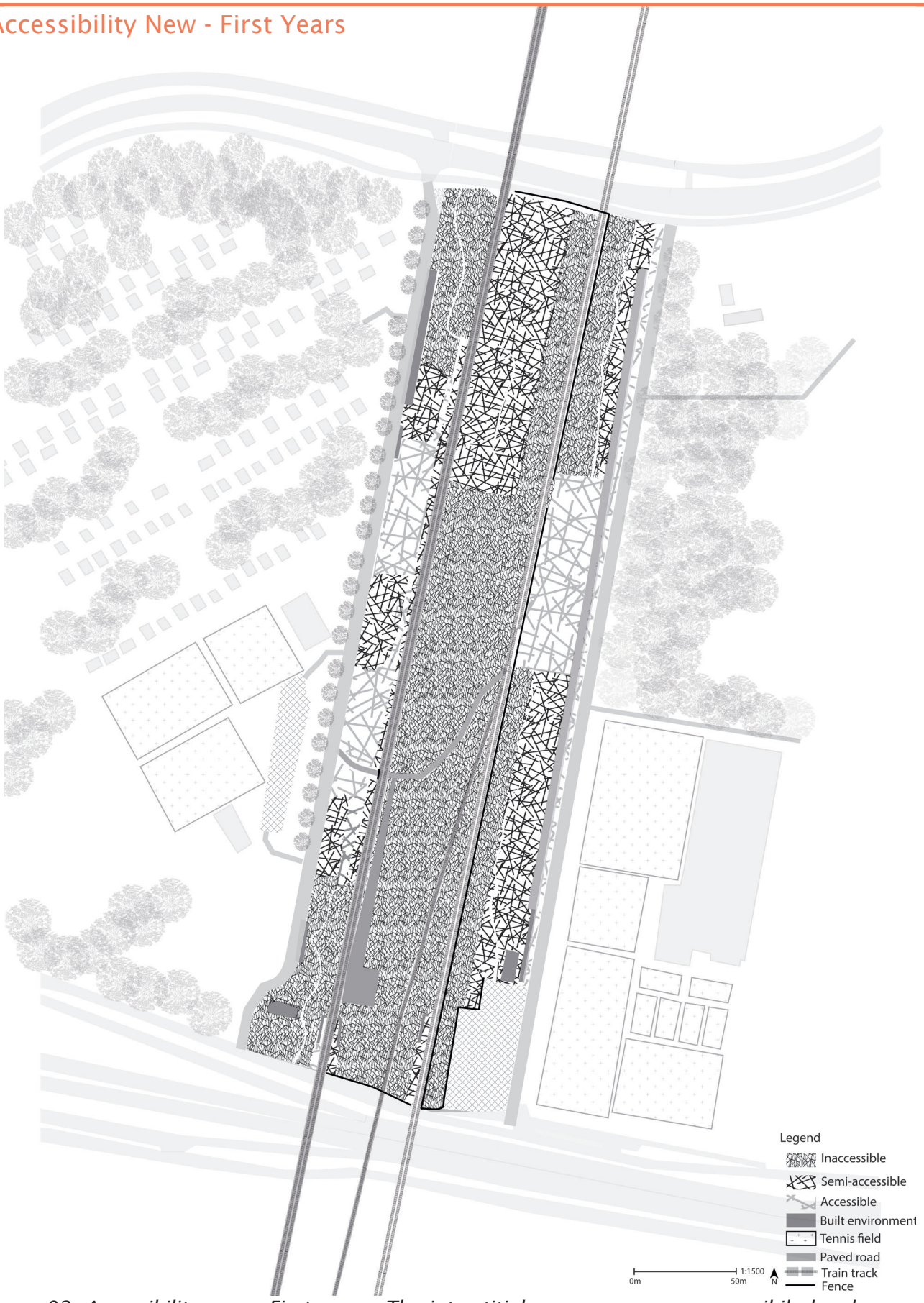

Figure 92: Accessibility new - First years. The interstitial spaces are more accessibile by changes in entrances and connections and density of vegetation.

Accessibility New - After Trees have Grown

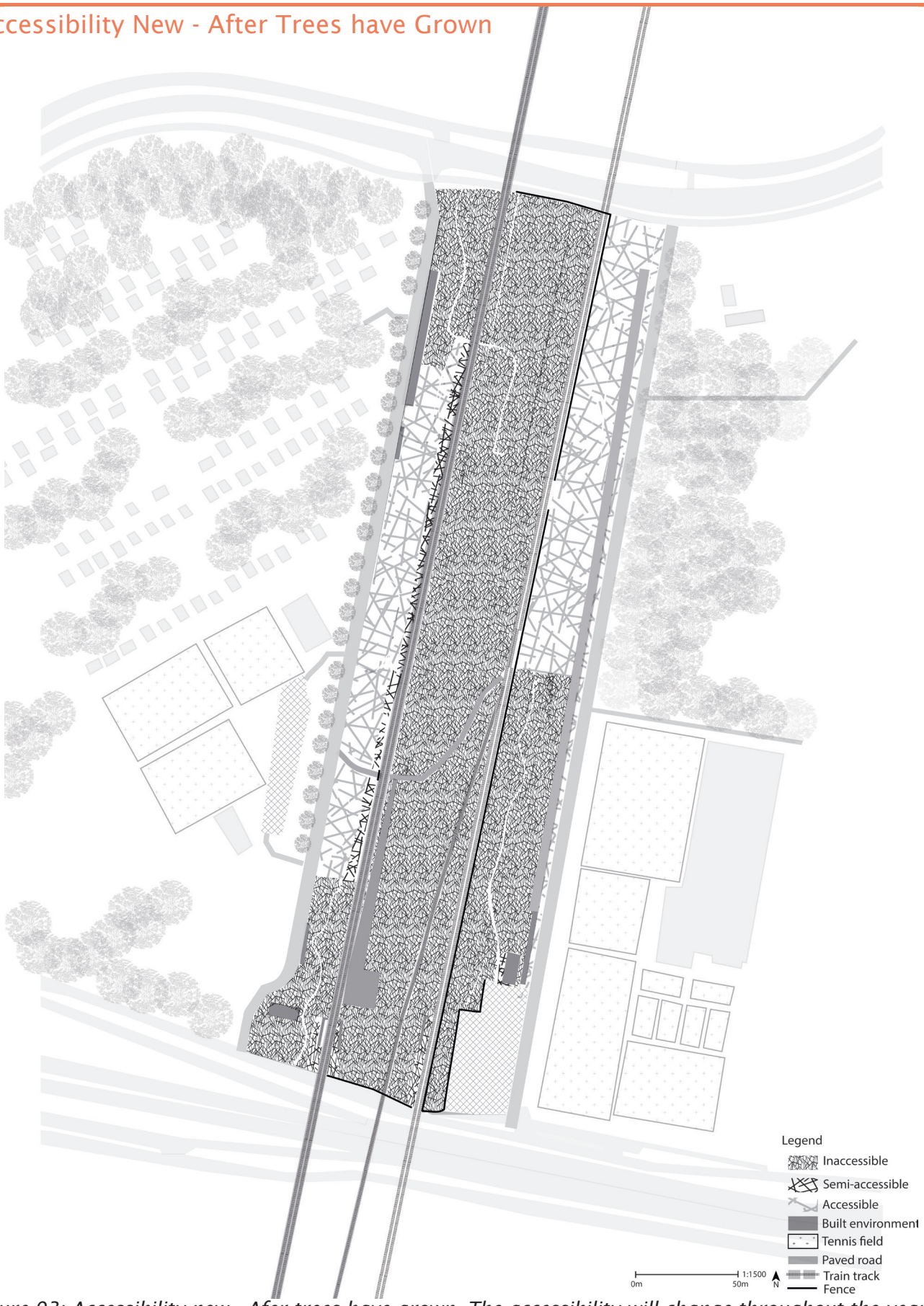

Figure 93: Accessibility new - After trees have grown. The accessibility will change throughout the years because of changes in succession stages.

3.6 Legibility

To enhance behavioral differentiation as a result of spatial differentiation, legibility is an important aspect.

Environmental legibility refers to how easily people can understand, navigate, and make sense of a space (Lynch, 1960). A legible environment allows users to form accurate mental maps, feel oriented, and move efficiently. Kevin Lynch's seminal work, The Image of the City (1960), identifies five key elements that contribute to environmental legibility: paths, edges, districts, nodes, and landmarks. Paths are routes along which people travel, edges are boundaries between areas, districts are recognizable sections, nodes are focal points or intersections, and landmarks are prominent objects that help with the orientation.

A landscape that is legible and easy to interpret supports psychological well-being because clear spatial structure enhances orientation, safety, and cognitive ease. The ability to read spatial cues, boundaries, and patterns, often described as landscape legibility, helps people form a coherent mental image of their surroundings, which strengthens their sense of control and reduces cognitive load (Kaplan & Kaplan, 1989; Lynch, 1960). Such environments promote feelings of coherence and predictability, lowering stress levels and facilitating psychological restoration (Ulrich, 1991; Hartig, Mang & Evans, 1991).

This relationship is supported by environmental psychology research, which demonstrates that environments with a clear spatial logic and recognizable structure are more likely to promote stress reduction and attentional restoration. As Kaplan and Kaplan argue, legible environments help individuals form mental maps more easily, lowering cognitive load and enabling restorative experiences (Kaplan & Kaplan, 1989).

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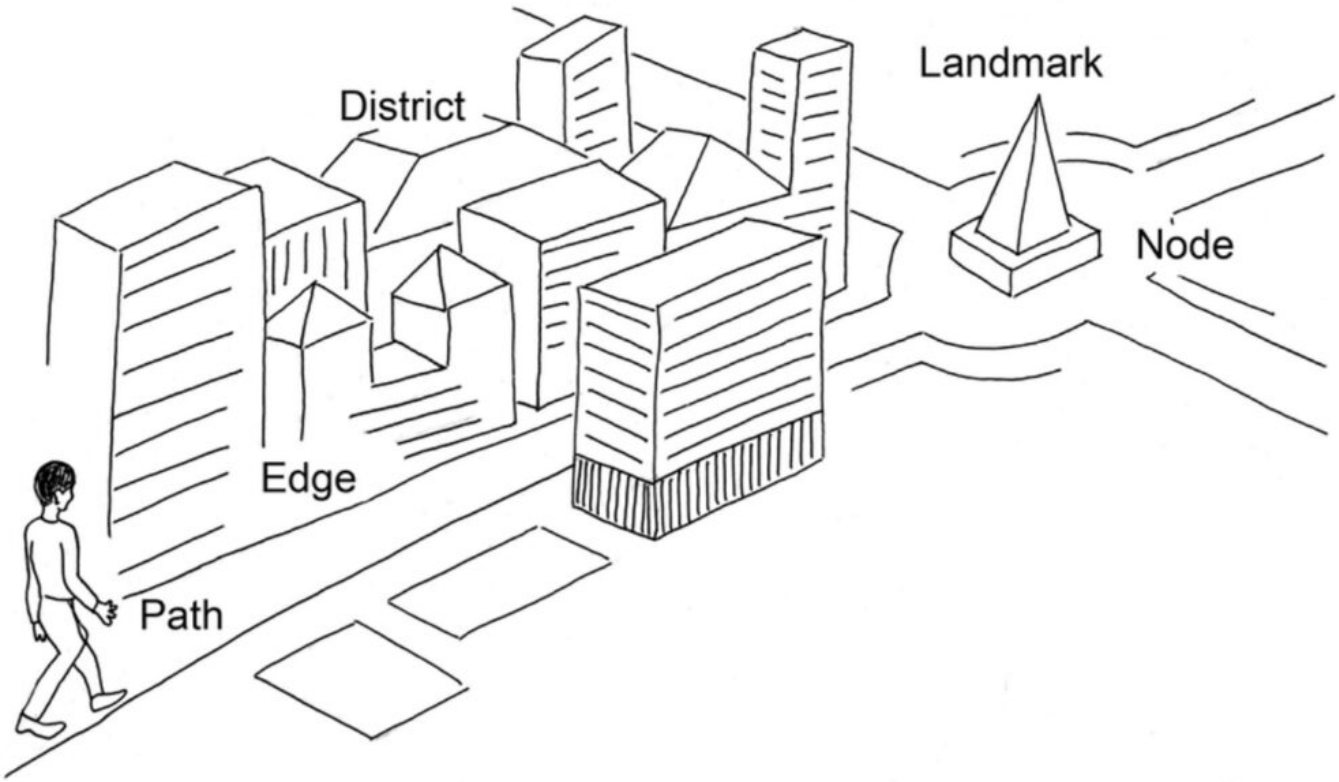

Figure 94: Kevin Lynch's five key elements in a landscape. A drawing to better understand the five elements in a landscape (Dua, 2025).

Legibility Rated on a Scale

Figure 95: Legibility rated on a scale. Most interstitial spaces are not legible for most people. They lack landmarks, nodes and paths.

In the analysis done on legibility in the current interstitial spaces, it can be noticed that many interstitial spaces do not have a legible layout or communication in how the space is open to the public or can be used. While all of the interstitial spaces are in fact the result of harsh edges, almost none spaces has one of the other 4 key elements that Kevin Lynch describes. Hardly any of these spaces has clear paths, there are no clear nodes and no landmarks visible.

This is can be the underlying cause of why many people do not know that they can enter the space or did not even notice there was a green space closeby (see interviews on page 108-110).

3.7 Concept

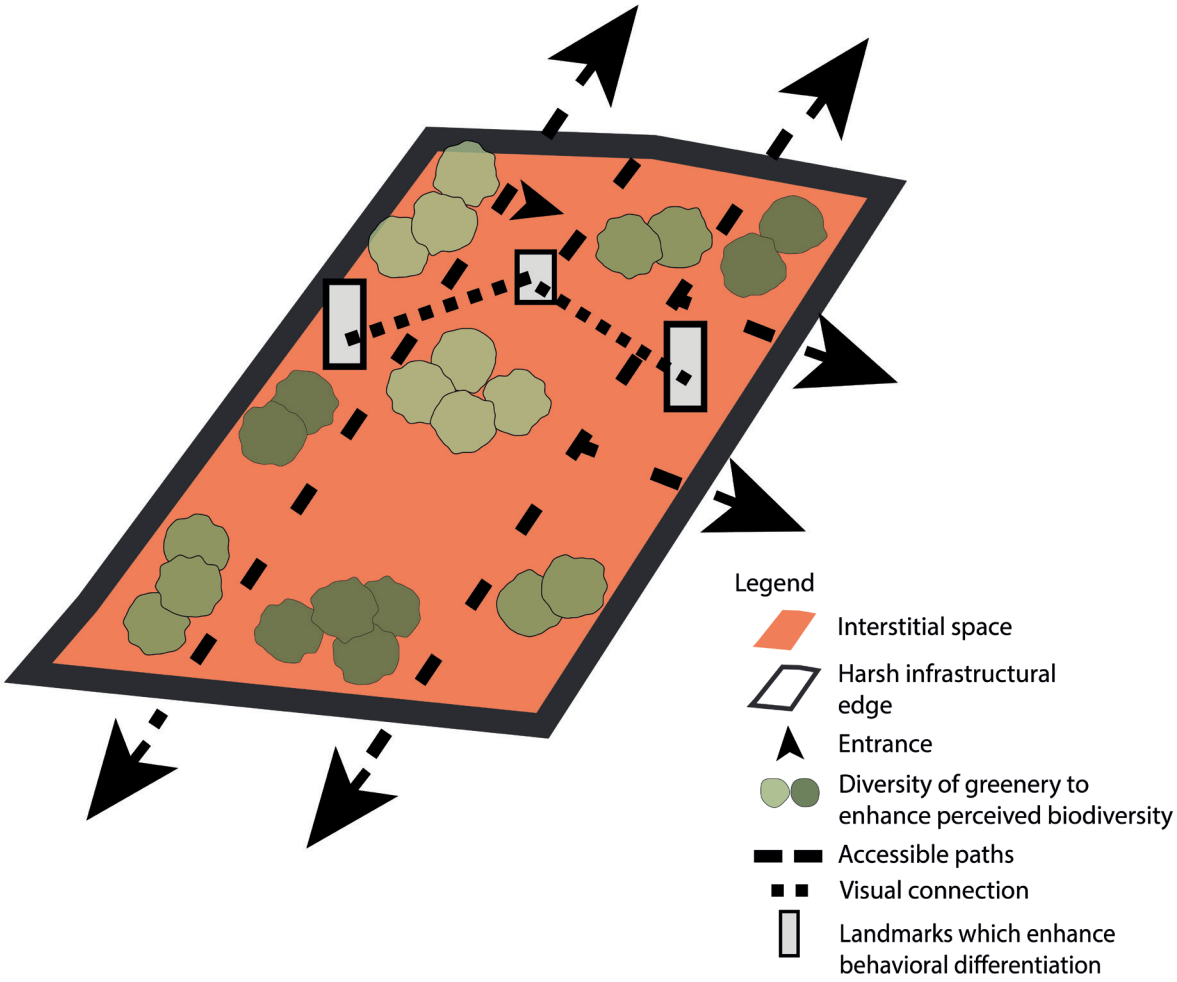

Figure 96: Concept drawing on site. The concept drawing illustrates interstitial spaces being defined by harsh edges, having a diverse green character, are accessible from multiple sides, entreable, having landmarks that enahcne certain behavior and work with visual connections.

All insights gained about designing a restorative environment can be brought together and visualized. In this concept drawing, the interstitial spaces are shown with a diverse green character, supporting perceived biodiversity. The characteristic harsh edges remain visible, they are part of the identity of interstitial spaces and contribute to the legibility of the landscape.

The spaces are made accessible through a system of nodes and paths, allowing people to enter and move through them. In addition, landmarks are introduced that enhance specific types of behavior, such as social gathering or individual withdrawal. On a smaller scale, the design works with visual connectivity, enabling people to see other similar spaces. This stimulates curiosity, encourages people to walk further, and supports movement, which is the third form of behavioral differentiation.

While the functioning of perceived biodiversity has already been discussed and illustrated, the next chapter focuses on how this behavioral differentiation can be further supported, and how the legibility of interstitial spaces can enhanced without losing their existing character.

4. Revealing and Preserving the Characteristics

Where the previous chapter established the environmental and spatial conditions that support psychological restoration, this chapter turns to the question of how these insights can be translated into landscape-architectural design for interstitial spaces which are currently difficult to see, understand, and appreciate.

The focus lies on how subtle yet clear interventions can make these overlooked environments perceptible and experientially accessible, without compromising their informal and ecological character. Through relevant theoretical perspectives, the chapter explores design strategies that work with what is already present: enhancing visibility, clarifying spatial cues, and strengthening the restorative potential embedded in the landscape. In doing so, it investigates strategies how design can help people recognise, interpret, and engage with the inherent qualities of interstitial spaces, allowing their restorative effect to become tangible in everyday experience.

4.1 Sensory Perceptibility

When examining the characteristics of interstitial spaces and the processes that have shaped them, it becomes evident that these environments are capable of accommodating forms of human and non-human presence that do not easily always fit within the highly designed and regulated urban system. Interstitial spaces enable spontaneous vegetation, urban fauna, and people whose activities, needs, or ways of using space fall outside conventional urban norms. Through this capacity to host alternative forms of life and use, interstitial spaces have developed into distinctive urban environments that support inclusion, adaptability, and diversity. Rather than functioning merely as residual fragments, they constitute a specific type of urban space that should be recognised for its ability to accommodate alternative practices and ecologies within a densely populated and intensively planned city such as Rotterdam.

Their current position within the city makes them vulnerable; spaces that are not clearly valued within the urban landscape can easily be dismissed or transformed through planning processes.

Landscape theorist Elizabeth K. Meyer addresses this challenge by arguing that ecological performance alone is not sufficient to sustain landscapes over time or to make them meaningful to people. In many contemporary planning and design frameworks, sustainability is primarily evaluated through measurable ecological indicators such as biodiversity, water management, or carbon storage (Meyer, 2008).

While these criteria are important, Meyer emphasises that they do not necessarily create a meaningful relationship between people and place. In her book Sustaining Beauty, she argues that beauty must be understood as an active cultural force: landscapes need to be experienced, recognised, and appreciated in order to be sustained (Meyer, 2008). When people perceive beauty in a landscape, they are more likely to value it and to support its continued existence. According to Meyer, beauty is therefore not merely a visual quality, but an active, sensory and cultural force that engages people with a landscape, fostering awareness, attachment, and long-term care.

Building on this insight, **sensory perceptibility** emerges as a crucial design principle for interstitial spaces. Multisensory engagement namely enhances aesthetic appreciation by stimulating sight, sound, touch, smell, and movement, thereby fostering active involvement with the environment (Berleant, 1998; Lee et al., 2022 ; Chen & Ma, 2025 ; Ha & Kim, 2021). Environmental psychology research demonstrates that such embodied, multisensory experiences are associated with positive emotional responses and restorative effects, particularly in natural settings (Kaplan & Kaplan, 1989; Ulrich, 1983). These studies suggest a cascading effect: increased sensory stimulation encourages active engagement, which deepens spatial experience, taps into humans' innate preference for natural, sensory-rich environments, and ultimately leads to greater aesthetic valuation and the perception of beauty (Tuan, 1974; Daniel, 2001).

To fully unlock the restorative and ecological potential of interstitial spaces, their inherent qualities must therefore be made legible and experientially accessible. The sensory richness described above forms the foundation for both legibility and behavioral differentiation: people can only recognise, interpret, and respond to a place when its qualities are perceptible. This creates the need for carefully positioned interventions that reveal rather than redesign.

4.2 Hypernature

Sensory perceptibility in landscape design refers to the degree to which a space can be directly experienced and understood through the senses: sight, sound, touch, movement, and the perception of time through change. It extends beyond legibility. A landscape is not only something to be intellectually interpreted, but something to be felt and absorbed through bodily experience, often while people are distracted, in motion, or only briefly present.

Within this broader framework, hypernature introduces an design layer of perceptual clarity. As articulated by Elizabeth K. Meyer and expanded in contemporary landscape practice, hypernature can be understood as the deliberate intensification of natural processes so that they remain perceptible even within the sensory overload of urban life (Meyer, 2008). Hypernature amplifies the agency of the landscape itself. Growth, seasonal change, density, and ecological dynamics are brought into sharper focus, allowing nature to assert itself as an active and expressive presence rather than a passive backdrop. Importantly, hypernature is not simply an increase in vegetation or visual drama. It is a design attitude in which natural processes are consciously constructed and accentuated so that they remain experientially present in contexts where attention is fragmented.

This approach builds on a long theoretical lineage that positions landscape architecture as an art form. Nineteenth century theorists J. C. Loudon (1840), A. J. Downing (1841), and Frederick Law Olmsted (1870) argued that designed landscapes belong within the realm of the fine arts. Contemporary practitioners including Michael Van Valkenburgh, Laura Solano, and Matthew Urbanski extend this tradition by working with intensified or constructed versions of nature (Landscape Theory, 2009). Their work acknowledges a contemporary condition in which landscapes are rarely experienced with full attention. Instead, they are encountered in passing, in motion, or under cognitive pressure shaped by urban routines and digital stimuli. In such conditions, clarity is not achieved through simplification but through emphasis. Hypernature responds directly to this condition by heightening the perceptual presence of ecological processes.

Meyer's concept of hypernature relies on tactics such as amplification, condensation, deliberate discontinuity, and formal juxtaposition (Meyer, 2008). These tactics heighten contrast, sharpen transitions, and make ecological dynamics more immediately perceptible. The landscape becomes readable through intensity rather than restraint, and through expressive presence rather than quiet neutrality. Hypernature operates across multiple layers of design, including spatial composition, material contrast, and the structuring of experience through time and movement.

Interstitial spaces offer a particularly relevant context for hypernature. They are encountered at the edges of attention, in moments of transition, or while moving through the city. Hypernature provides a way to make these spaces perceptually present by foregrounding natural processes and intensifying their expressive qualities. In this sense, hypernature does not simply beautify interstitial spaces. It reveals them. It allows them to register within everyday perception and to operate as meaningful environments within the rhythm and distraction of contemporary urban life.

4.3 Cues to care

While hypernature amplifies the nature within the interstitial, people still need to be guided in how they encounter and move through these environments. To ensure that these intensified qualities are actually experienced rather than overlooked, additional design interventions are required. When this guidance is absent, the space can easily be perceived as neglected or abandoned.

As Kühn (2006) notes, "...their aesthetic effect is often limited without creating visual contrast with the surrounding urban environment'. For this reason, everything must be put into effect in accordance with the appropriate landscape architectural design in order to create the desired effect." This underscores the importance of design strategies that clarify the structure, patterns and affordances of the space, so that the qualities of the landscape become perceptible and meaningful. By enhancing users' ability to perceive and interpret the environment, such strategies actively support sensory engagement and appreciation within interstitial spaces.

Building on the importance of making ecological and spatial qualities legible, Joan Iverson Nassauer (1995) emphasizes that aesthetics serve as a form of communication. Landscapes convey subtle signals of care and intention that shape how people perceive and interact with them. In this context, her concept of "messy ecosystems, orderly frames" becomes particularly relevant: ecologically rich but visually "messy" environments require recognizable landscape language to communicate human intention. Without such cues, ecological value often remains invisible or is misinterpreted as neglect. Cues to care, small, deliberate signals of stewardship, provide this cultural frame. Rather than restructuring ecological processes, these cues operate at the perceptual level, signaling that the landscape is deliberately maintained while allowing spontaneous vegetation to retain its self-organizing, dynamic character. In doing so, cues to care complement and strengthen the effects of hypernature: by clarifying intention and guiding perception, they ensure that amplified ecological processes become not only visible but also meaningfully understood and experientially accessible, enhancing the behavioral differentiation observed earlier.

It is important that the elements communicating this stewardship align with the informal character of the site. **Informality** is therefore an essential design principle, ensuring that interstitial spaces are not absorbed into the formal urban landscape but retain their distinct identity and capacity for diverse, user-driven activity. In this way, cues to care function as a strategic tool that mediates between informality and perceived biodiversity, between spontaneous ecological processes and the need for legibility, precisely the balance that "messy ecosystems, orderly frames" advocates.

Case Study - Cues to Care

Figure 97: The steeply sloping embankment of the Metra rapid transit railline. This is the vegetation after clearance by the rail authority (Gobster, 2010).

Figure 98: The steeply sloping embankment of the Metra rapid transit railline. This is th situation with overgrowth of ruderal vegetation (Gobster, 2010).

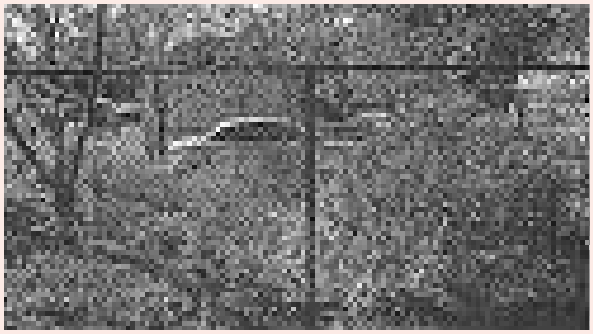

Figure 99: The community flower garden. Culturally approved but wild ecological processes are preserved (Gobster, 2010).

A compelling example of how cues to care can mediate between ecological richness and human perception comes from the Lakeshore rail corridor in Chicago, where Paul H. Gobster observed and participated in a neighborhood greening project along a 150-meter section of the embankment. Over time, this stretch of land had developed into a patchwork of native and exotic plant communities, including tall fescue, quackgrass, cottonwoods, evening primrose, and silver maples, creating a vibrant but visually irregular wildscape. Local residents often found these volunteer plants messy or unattractive, and many were inclined to replace them with conventional ornamental plantings requiring intensive care. Gobster and his spouse, actively involved in the project, sought to guide the community toward more sustainable solutions that preserved ecological richness of the site while introducing subtle elements to signal care. As Gobster reflects, *"By using these plants and other 'cues to care' such as signage, and exposing an attractive limestone terrace wall that is part of the original embankment (Nassauer 1995), I believe that there may be a happy middle ground between an unmaintained wildscape and one with some human intervention."* (Gobster, 2010) Their approach allowed the wild vegetation to remain largely intact while incorporating human made ornamentals and visual markers of stewardship, making the landscape legible and appreciated by local residents. This case demonstrates how small-scale, thoughtful interventions can transform overlooked urban margins into spaces where wild ecological processes are preserved, yet culturally approved, showing the potential of cues to care to enhance urban wildscapes in densely populated cities (Gobster, 2010).

Case Study - Cues to Care

Figure 100: Boardwalk in Nature Park Südgelande. The boardwalk shows stewardship while preserve the existing ecology (Berlin.de, n.d.).

Figure 101: Elevated platform in Nature Park Südgelande. This shows stewardship and invites certain behavior (Berlin.de, n.d.).

Figure 102: Signage in Nature Park Südgelande . This shows stewardship (Berlin.de, n.d.).

How spontaneous vegetation and visible stewardship can coexist is also visible in other remarkable landscape projects. One of these projects is Nature Park Südgelande in Berlin, Germany. In this park a former railway yard is converted into a public park and nature reserve.

Here, spontaneous vegetation intertwines with remnants of railway tracks, creating an interplay between wildness and design. Design elements such as boardwalks, interpretive signage show stewardship, while elements like elevated platforms, ivite certain behavior. These elements operate as cues to care, guiding visitors through a seemingly untamed landscape while revealing the site's ecological and cultural narrative.

The park celebrates both natural succession and human memory, showing how legibility can coexist with ecological spontaneity.

Case Study - Cues to Care

Figure 103: La Petite Ceinture, walking space . People are invited to walk here. (France Today, 2025)

Figure 104: La Petite Ceinture spontaneous vegetation. Vegetation is growing on its own everywhere (France Today, 2025).

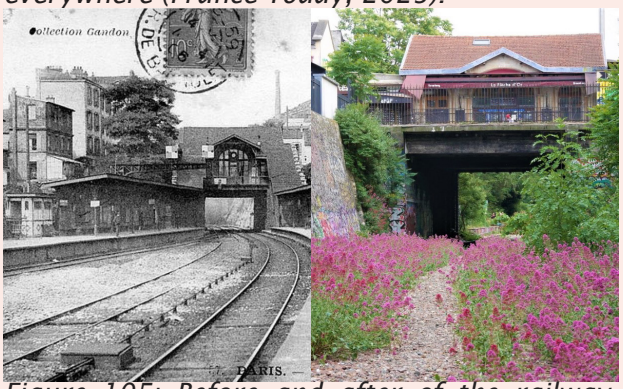

Figure 105: Before and after of the railway. Vegetation is taking over. (France Today, 2025)

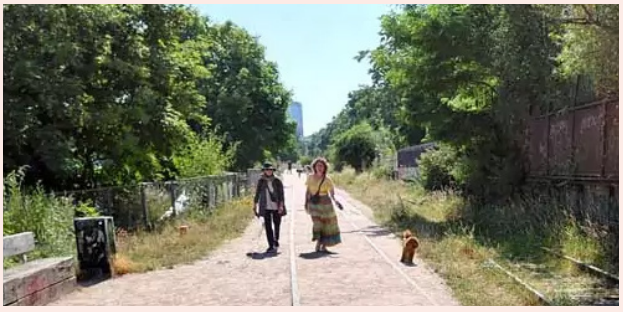

Figure 106: Walking path at La Petite Ceinture. It is created to invite people into the area. (France Today, 2025)

Another example of an area where cues to care are implemented, is La Petite Ceinture. This area is a former 32 km circular railway line that once encircled Paris and was built in the mid-19th century before being abandoned for regular passenger and freight service in the 20th century (Atlas Obscura, n.d.; France Today, 2025). After decades of disuse, much of the line has been overtaken by wild vegetation, becoming one of the city's most significant spontaneous urban nature corridors. Here, grasses, shrubs, and trees grow on and around the old tracks, providing habitat for a rich variety of flora and fauna; in certain sections, more than 200 plant and animal species have been recorded, demonstrating high biodiversity for an urban context (France Today, 2025; Paris Je T'aime, n.d.).

Sections of La Petite Ceinture have been gradually opened to the public as linear green walkways, preserving remnants of the original railway infrastructure alongside natural growth. In these accessible stretches, subtle design interventions, such as walking paths, benches, and informational signs about the site's history and ecology, act as cues to care, making it clear that the space is both intended for public use and supportive of ecological processes, without fully formalizing it like a conventional park (City Or City, 2025).

These cues help visitors read the space and understand that nature has been allowed to reclaim the corridor intentionally, while also providing safe and inviting areas to walk, rest, and connect with the natural environment.

Case Study - Cues to Care

Figure 107: Vegetation at the Berlin Technical University. Mowing around spontaneous vegetation communicates stewardship (Kühn, 2006)

A more subtle example of a place where the approach of cues to care was applied is at the Berlin Technical University trials. By creating contrast between spontaneous vegetation and mown lawns, the wild plants became more visually prominent. This simple intervention helped visitors perceive and appreciate the spontaneous growth without formalizing or over-managing the area (Kühn, 2006).

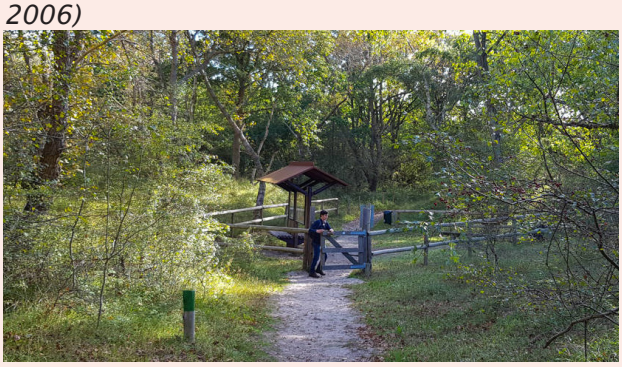

Figure 108: Entrance at Meijendel. This entrance shows that people are able to enter the area (Mascha, 2024).

Meijendel forms another a great example of showing that the landscape is cared for in a more subtle way. In Meijendel benches, paths, fences and signs are placed to stir people but also show that is allowed to be there. In such a great area, it can be questioned if is it allowed to enter. Also because it is known for it's animals, ecology and water extraction. By implementing these signs of care, it is commuicated to people where they can go and where not.

Figure 109: Signs at Meijendel. These signs show stewardship (Mascha, 2024).

Because of this, people feel invited to enter the area to immerse oneself in nature, while at the same time the ecology is preserved and enhanced.

Figure 110: A bench at Meijendel. Benches communicate that people are allowed to be there (Mascha, 2024).

4.4 Land Art

Building on the concept of cues to care introduced by Nassauer, Land Art can be understood as an amplified, interpretive form of these cues, a kind of “meta-cue” that communicates human attention, stewardship, and care. Rather than merely signaling maintenance through small interventions, Land Art situates artistic gestures directly within the landscape, emphasizing its processes, rhythms, and material qualities. By working with natural materials and site-specific conditions, it draws attention to ecological and spatial dynamics, making the latent qualities of a place perceptible and meaningful.

Emerging in the late 1960s, Land Art treats the earth and its natural processes as both medium and message (Weilacher, 1996; Kastner & Wallis, 1998). Its interventions reveal existing spatial, temporal, and material characteristics, allowing people to experience the landscape as an active, dynamic system rather than a static backdrop (Smithson, 1972). When applied to urban interstitial spaces, Land Art functions as a cue to care that highlights ecological value while signaling intentionality and attention. In this context, Land Art also operates alongside hypernature: while hypernature intensifies ecological processes themselves, Land Art clarifies and frames these processes, ensuring that their amplified presence becomes perceptually legible and experientially accessible to users.

In this way, the proposed interventions act as a hybrid between artistic inspiration and functional design. They steer behavior, frame attention, and enhance engagement with ecological processes without compromising the spontaneity and autonomy of interstitial vegetation. By positioning these elements strategically, the landscape can communicate care, encourage interaction, and focus user attention on key features of the environment, such as areas of high biodiversity or restorative natural qualities. In essence, Land Art serves as a conceptual model, while the realized interventions remain firmly grounded in landscape architectural objectives, translating inspiration into spatially and functionally meaningful designs.

For landscape architecture, the relevance of Land Art lies not in replicating its artistic autonomy but in translating its principles into spatially legible and functional interventions. While traditional Land Art often prioritizes conceptual meaning, a landscape-architectural approach adapts its strategies to create spatially and functionally meaningful designs.

Used strategically, Land Art–inspired interventions can direct views and therefore focus attention on ecological processes that support psychological restoration. At the same time, they can subtly steer behavior, inviting social gathering, offering opportunities for withdrawal, or encouraging movement through the site. By revealing the qualities of interstitial spaces while preserving their character, these interventions operate as a hybrid between artistic inspiration and functional design.

Precedent studies therefore explore the different forms and scales Land Art can take, and how these can inform the design of elements that both reveal the landscape and guide human engagement with it.

Case Study - Land Art

Figure 111: Spiral Jetty in Utah showing the interactions between water salt and sediment. Nature is made more visible (Holt/Smithson Foundation,1970)

Figure 112: Spiral Jetty from above. It highlights the spatial characteristics. (Holt/ Smithson Foundation, 1970)

Figure 113: Visitors on Spiral Jetty. They can engage with the dynamics of the landscape (Tribune, 2004).

Figure 114: The Spiral Jetty at the northern portion of the Great Salt Lake. Reflection the sky (Tribune, 2009).

Land Art comes in many different forms, from big installations to minimal objects. An example of a bigger form of Land Art is the Spiral Jetty of Robert Smithson. This Land Art transforms a stretch of the Great Salt Lake shoreline into a large-scale spiral composed of basalt rocks and earth. Rather than imposing a new form onto the environment, the work accentuates the inherent rhythms, textures, and temporal qualities of the landscape (Smithson, 1972). The spiral follows the natural contours of the lake, highlighting interactions between water, salt, and sediment while revealing patterns that would otherwise remain unnoticed.

In the context of Land Art as an interpretive layer, Spiral Jetty exemplifies how a site-specific intervention can make latent ecological and spatial characteristics understandable. It does not control or “correct” the landscape; instead, it frames natural processes and cycles, allowing observers to engage with the dynamics of the site in a meaningful and experiential way (Tribune, n.d.).

From this approach it can be seen that it parallels the objectives of cues to care, in that it communicates intentionality and attention, but it forms an extra dimension since it operates at a conceptual and perceptual level, emphasizing the landscape’s intrinsic qualities rather than its maintenance. Land Art therefore creates an extra layer of perception to a landscape and forms an inspiration for the visibility of interstitial spaces and their valuable characteristics.

Case Study - Land Art

Figure 115: The Sun Tunnel frames your view. It shows the surrounding landscape (Holt/Smithson Foundation,1977)

Figure 116: The Sun Tunnel shows the setting sun. It shows nature. (Holt/ Smithson Foundation, 1977)

Figure 117: The positions of the cilinders . This is based on the positions of the sun and stars on the days of solstices (Holt/ Smithson Foundation,1977)

Figure 118: The sizes of the holes. They vary relative to the magnitude of the stars to which they correspond (Holt/Smithson Foundation,1977).

Another Land Art project is the one of Nancy Holt. Her Sun Tunnels consists of massive concrete cylinders placed in a remote desert landscape, oriented to frame the rising and setting sun during solstices and to align with key celestial events. Rather than altering the land itself, the installation guides the observer's attention to subtle patterns of light, shadow, and seasonal change, making the temporal and spatial qualities of the environment tangible (Holt/Smithson Foundation, n.d.)

In this sense, the work transforms perception into a form of engagement: the landscape is experienced not simply as a backdrop, but as an active system with rhythms, cycles, and structure that might otherwise go unnoticed.

When considered in relation to Land Art as an interpretive layer for interstitial urban spaces, Sun Tunnels demonstrates how more minimal, site-specific interventions can reveal ecological and spatial processes in environments that are often overlooked.

While cues to care make wild or spontaneous landscapes legible through signs of human stewardship, Holt's work shows that perception itself can become the medium of interpretation, allowing observers to recognize the special vegetation and the inherent character of the space.

Case Study - Land Art

Figure 119: Land Art Wood Line. How branches can highlight the movement of the landscape (U.S. National Park Service, 2012)

Figure 120: Observers can experience the nature. They get a better understanding of the surroundings landscape (U.S. National Park Service, 2012)

Figure 121: The contours of the landscape. Beams reveals the inherent rythms of the landscape (Min Zhou, 2014)

A last example of how Land Art directs attention toward the landscape is found in the work of Andy Goldsworthy. He differs from many other Land Art artists since he emphasizes short term natural processes rather than large-scale, permanent interventions. His site-specific installations engage directly with natural materials such as stones, twigs, branches, or leaves, and are designed to reveal the inherent qualities and rhythms of the landscape.

For example, in Wood Line (1980), Goldsworthy created a long line of branches and sticks following the contours of a valley floor in North Yorkshire, England. By arranging natural materials along a path dictated by the terrain, the work draws attention to the shape, movement, and scale of the landscape itself, highlighting how even simple materials can articulate spatial dynamics and ecological processes.

Such interventions illustrate how Land Art can make hidden ecological and spatial dynamics perceptible, encouraging observers to experience the landscape in a more attentive and reflective way (Wood Line By Andy Goldsworthy (U.S. National Park Service), n.d.) and therefore forms an inspiration for the interstitial landscape.

4.5 Conclusion

Differentiation in vegetation is already a central design intervention within the project, yet when understood through the combined lenses of hypernature, cues to care, and Land Art, it gains a deeper conceptual and experiential significance. Hypernature provides the ecological foundation: by positioning different successional stages directly beside one another, natural processes are intensified so that they remain perceptible even in moments of distraction or movement. Ecological time becomes spatially legible, and contrasts between youth and maturity, density and openness, emergence and decay are sharpened. In this way, the interstitial landscape does not merely display variation but condenses and amplifies it, allowing ecological dynamics to register immediately and bodily.

However, intensifying ecological processes alone does not guarantee that people will actually perceive or engage with them. This is where cues to care become essential. Rather than functioning only as subtle signals, cues to care actively guide people through the landscape. They help users understand where to enter, where to be, ensuring that the amplified ecological qualities are interpreted as intentional rather than neglected. These cues communicate stewardship and structure the way people encounter the interstitial environment.

Land Art adds yet another layer on top of this. As a kind of meta-cue, it strengthens and extends the communicative power of cues to care. Through its sculptural clarity and spatial emphasis, Land Art steers attention, shapes different forms of behaviour, and reveals the underlying qualities of the interstitial spaces. With this, it creates places instead spaces.

Together, these three strategies, hypernature, cues to care, and Land Art, have been brought together into a single design element within the project: concrete poles. Their material presence acknowledges the infrastructural origins of interstitial spaces, while their placement creates places that invite specific forms of use and perception. The poles guide movement, signal intention, and frame ecological contrasts, allowing the intensified vegetation to be experienced rather than overlooked. In this way, one element synthesises ecological amplification, perceptual guidance, and artistic framing, transforming interstitial spaces from residual fragments into legible, engaging, and meaningful parts of the urban landscape.

4.6 Three Different Applications

This design approach builds on the inherent condition of interstitial spaces, where infrastructural hardness and spontaneous vegetation meet. Rather than softening this tension, the design uses it as a productive dialogue: the human-made and the organic are brought into deliberate relation so that each heightens the presence of the other. The solidity of the concrete poles frames the dynamism of the vegetation, making its textures, densities, and temporal rhythms more perceptible, while the wildness of the vegetation softens and contextualises the infrastructural edge. The poles do not control or domesticate nature; they provide a legible structure within which ecological processes can unfold.

Within this framework, the concrete poles operate as a single spatial instrument applied in three ways. First, they create entrances that guide people into the interstitial landscape and signal that the space is intentional rather than leftover. Second, they articulate transitions between different vegetation-succession stages, making ecological time spatially legible and allowing hypernature's intensified contrasts to be experienced. Third, they form places where views are framed and attention is directed, drawing from Land Art's capacity to focus perception, while simultaneously supporting behavioural differentiation by offering cues for how the space can be used and moved through.

Because these applications emerged from an iterative design process, the outcomes have been consolidated into a separate booklet: "A Manual for Designing the Interstitial: Using One Element as a Spatial Instrument". This manual presents the decisions, and design principles behind the poles, translating the process into transferable guidelines that can inform similar interstitial conditions elsewhere.

Here, the process behind the three different applications of the concrete poles will be examined.

4.6.1 Edges - Entrances

Figure 122: Entrance at Vondelpark Amsterdam. Example of a great entrance (Amsterdam-Nu, 2020).

Figure 123: Entrance at Braham Street Park in London. This is an example of a subtle entrance (WordPress, 2024).

Figure 124: Entrance in the field. Analysis in the interstitial spaces.

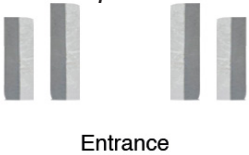

Figure 125: Concept of the entrances for the interstitial spaces.

When we think of park entrances, we often imagine the iconic examples such as the Vondelpark in Amsterdam.

Entrances like these, define a clear boundary, signal that one is entering a specific type of environment, and often communicate rules or expectations. They can also imply ownership and control.

While entrances do invite people to enter a certain area, this form of explicit communication does not align with the character of interstitial spaces. These spaces require a more subtle form of guidance, where movement is encouraged almost unconsciously.

Further research showed another form of entrances. A lot of entrances do not rely on large structures, signs or strong visual cues only. It is maybe not seen at first sight, but the underfoot textures plays a big role in this transition too (Wordpress, n.d.)

Because of their subtlety, these examples offer valuable inspiration for inviting people into the interstitial spaces in Rotterdam while avoiding the creation of a formal park atmosphere. They suggest how an entrance can remain open, informal and unobtrusive. At the same time, it is important to recognise the limitations of this approach. In the examples the surrounding space is relatively open, which makes the transition legible even without additional elements. However, when the surrounding vegetation is dense or when the entrance is located in an unexpected place, such a small opening can easily be overlooked.

As a result of case study analysis and field work, a compromise between the two studied entrances is created. The precise measurments are further clarified and illustrated in the accompanying manual.

Zoom-in - Entrance

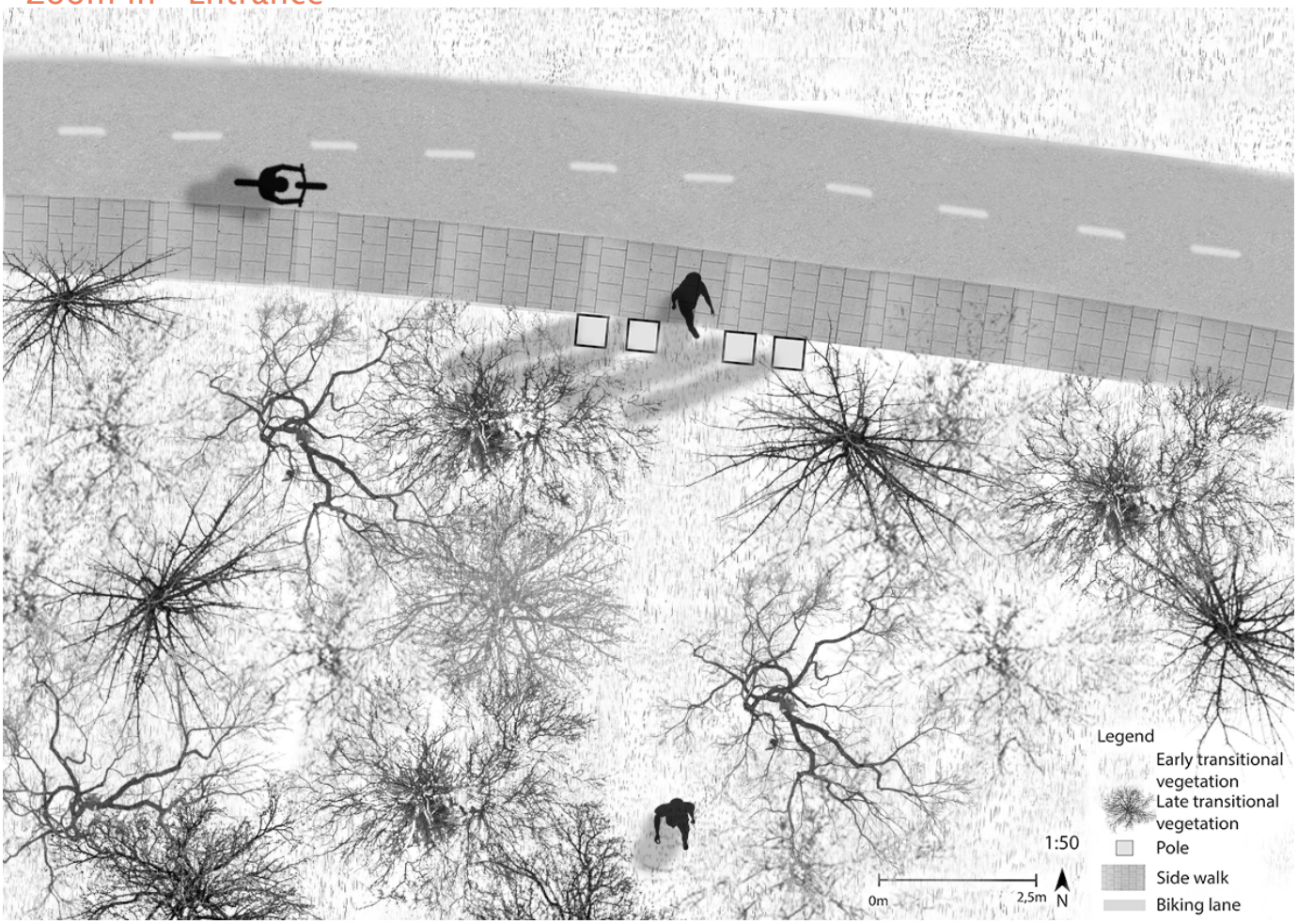

Figure 126. Zoom-in entrance Daltonpad. In this zoom-in is can be witnessed that there is a small but visible entrance which invites people into the area.

In this zoom-in drawing and visualisation, the entrance demonstrates how the edge is strengthened and made legible. The edge no longer functions solely as a boundary separating infrastructure from the interstitial space; it also communicates that this line can be crossed. The entrance signals that access is permitted and that you are transitioning into a different spatial condition. It marks the moment of stepping into another world, one that contrasts with the surrounding urban environment.

Visualisation of the Entrance

Figure 127. Visualisation entrance Daltonpad. In this visualisation the entrance of concrete poles is showed. A small entrance, yet visible communicates that people are allowed to enter the place.

Zoom-in - Entrance over Water

Figure 128. Zoom-in entrance Vroesenpad. In this zoom-in is can be witnessed that there is a new entrance created on the Vroesenpad interstitial space. Stepping stones in the water invite people in a informal way that people can enter the area.

In this zoom-in drawing and visualisation, the second type of entrance demonstrates how the edge of water no longer functions as a boundary but as an informal invation to enter a whole different area.

Visualisation of the Entrance

Figure 129. Visualisation entrance Vroesenpad. In this visualisation the entrance of concrete poles in the form of stepping stones.

4.6.2 Transitions

Figure 130: Berliner Mauer monument. This worked as an inspiration for the transitions in the interstitial spaces.

Figure 131: Transition on site. Fieldwork at the interstitial spaces.

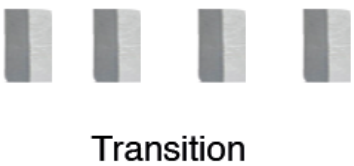

Figure 132: Concept of the transitions for the interstitial spaces. Concrete poles next to eachother of a small height.

A transition is proposed to enhance the hypernature effect and strengthen the perception of biodiversity within the interstitial landscape. The idea for this transition emerged during the fieldtrip to the Berliner Mauer. Where the interplay of separation and transparency generates a interesting spatial effect.

Fieldwork on the project site confirmed that a similar spatial strategy worked exceptionally well: when two distinct vegetation communities were placed in close proximity, their differences became more perceptible, and the landscape gained a heightened ecological intensity.

Based on these observations, the length and proportion of the transition were carefully determined, resulting in a design concept that uses spatial adjacency to condense ecological time and amplify perceived biodiversity.

This transition therefore functions not only as a structural element within the planting strategy but also as a key mechanism for achieving hypernature in the interstitial context.

Zoom-in - Transition

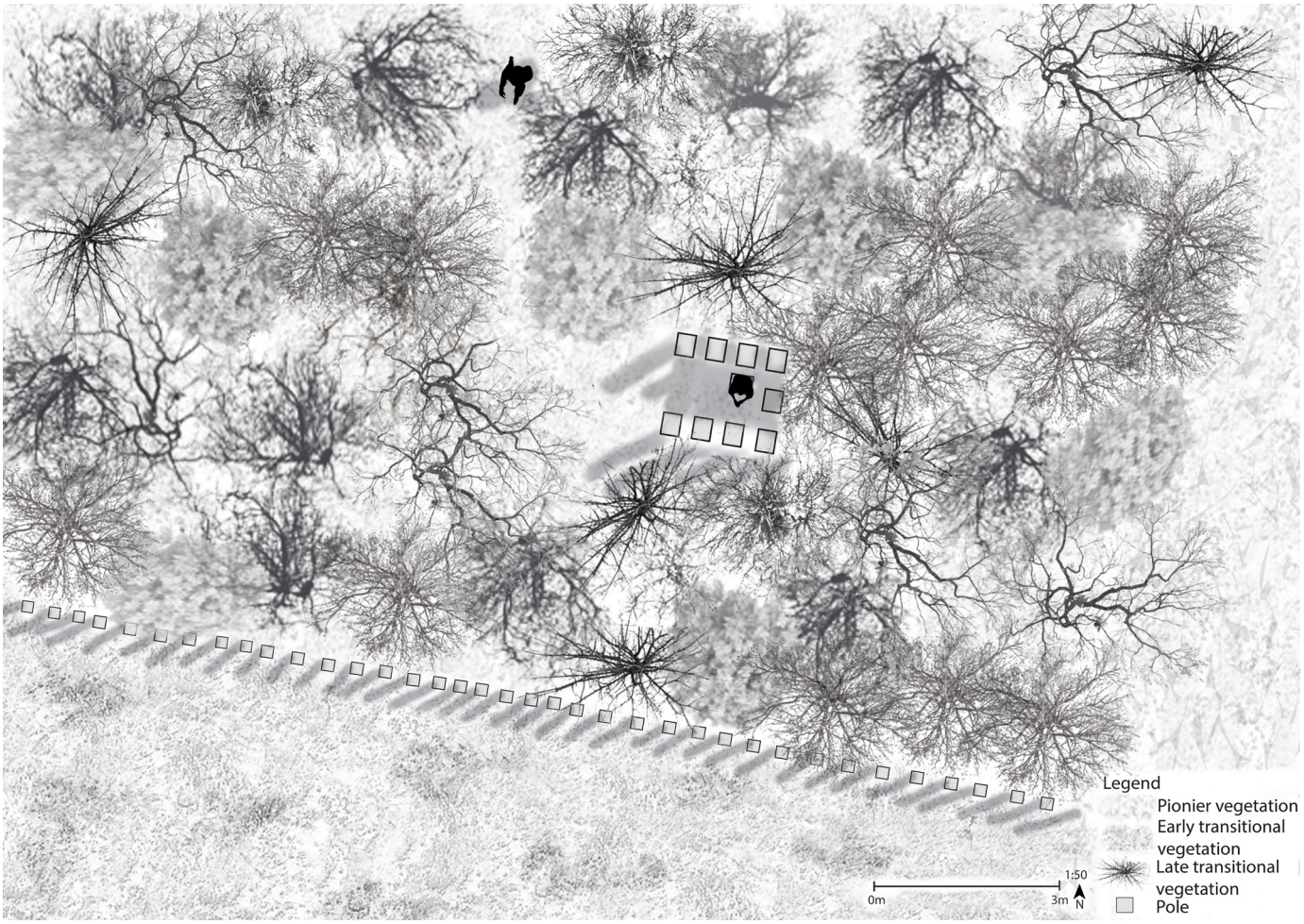

Figure 133. Zoom-in transition. In this zoom-in of the in between interstitial space, the transition between two types of successional stages is enhanced by introducing concrete poles.

In this zoom-in drawing and visualisation, the way small concrete poles can enhance a transition is showed. The transition between two types of successional stages is highlighted because of the use of a different material.

Visualisation of the Transition

Figure 134: Visualisation transition. The transition between pioneer vegetation and late transitional vegetation is enhanced by the poles. A small passage makes you go from one atmosphere to another.

4.6.3 Open and Closed Spaces

Figure 135: Frame placed in landscape. This frame draws attention to the environment (Magnific, 2024).

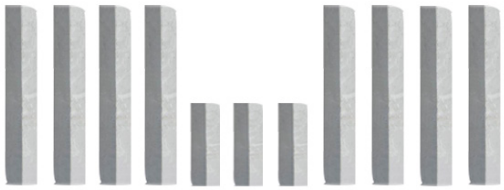

Figure 136: Concept frame. This frame directs people's view while also functions as a basis for influencing behavioral differentiation in the interstitial spaces.

Drawing on Land Art, the project takes inspiration from the way artistic interventions can be positioned within the landscape to direct people's focus toward their surroundings.

A key reference is the act of literally placing a frame in the landscape, an approach that makes viewers pause, look, and become aware of what is already present. Translating this principle into the design, the concrete poles are used in both tall and low configurations to create spatial frames that guide attention toward specific ecological qualities.

The underlying concept for this framing strategy is shown in the accompanying image.

Beyond directing people's view, the frame can also influence behaviour when combined with additional elements. By placing concrete poles horizontally on the ground, informal seating opportunities emerge. When these ground elements are positioned in relation to the frame, they guide people toward a specific spot while simultaneously inviting them to stay.

Explanation the specific measurements and spatial characteristics is provided in the booklet "A Manual for Designing the Interstitial: Using One Element as a Spatial Instrument".

Design Experiment - Social Gathering Place

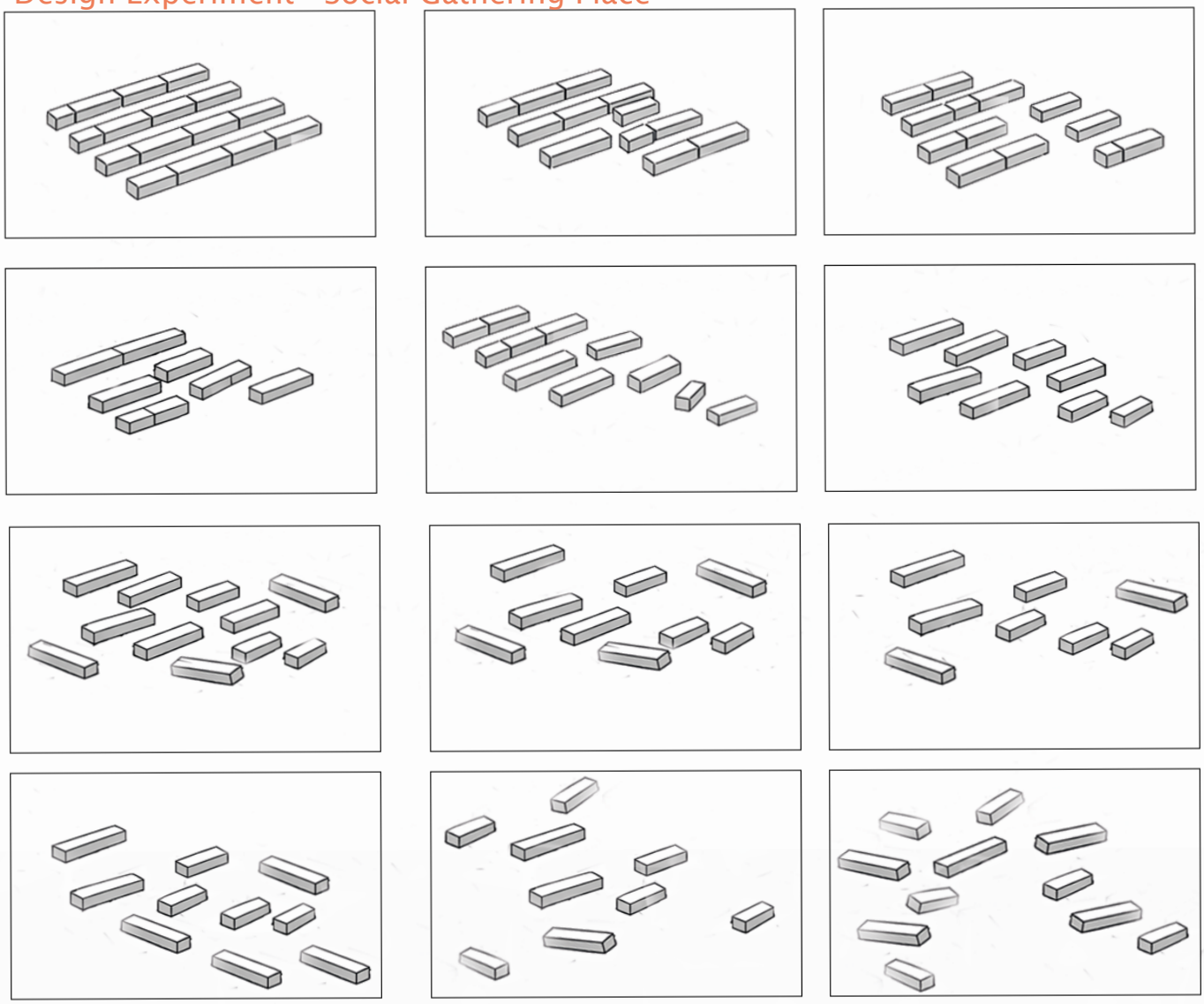

Figure 137: Design experiment social gathering place. Starting with a formal way of creating a tribune, resulted in an increasingly informal composition.

The positioning of these beams was not arbitrary. Because at this spot, the site is sloped and the atmosphere needed to remain informal, a series of design experiments was carried out to determine the most effective arrangement. Different configurations were tested to understand how the beams could both respond to the terrain and support the intended behavioural cues.

Zoom-in - Social Gathering Place Vroesenpad

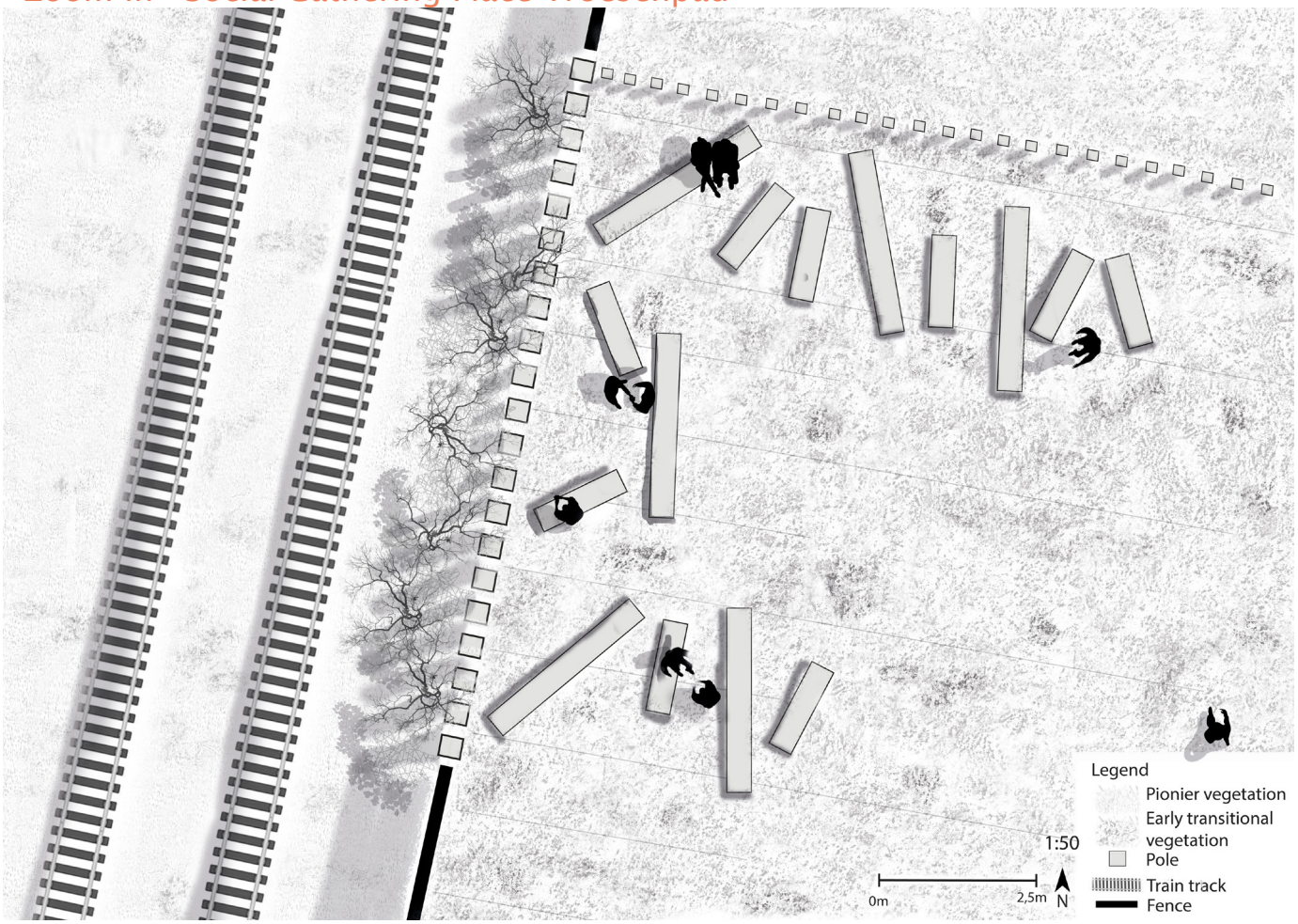

Figure 138. Zoom-in social gathering place Vroesenpad. In this zoom-in social gathering is enhanced by creating a place where people can informally come together. It feels not forced and not formal, own interpretation and seating is possible. In combination with the transition poles, the feeling of a room is enhanced where people feel comfortable being in.

At the Vroesenpad a layout has developed that is placed around the frame but still feels natural within the landscape while subtly structuring how people move, pause, and engage with the framed view. Combining this with the position of the transition between the vegetation types, the feeling of a room is created. A room where people come together while being in nature and withdrawed from the greater urban fabric.

Zoom-in - Social Gathering Place Daltonpad

Figure 139: Zoom-in social gathering place Daltonpad. At this place another composition of concrete poles is created to informally invite people to come together at this spot. In combination with the transition poles, the feeling of a room is enhanced where people feel comfortable being in.

At this spot at Daltonpad another social gathering place is enhanced. The open character of the place already invites people to come together and meet each other, however by implementing the frame in combination with the horizontal placed poles this effect of communicating gathering is enhanced.

Zoom-in - Revetment at Social Gathering Place Daltonpad

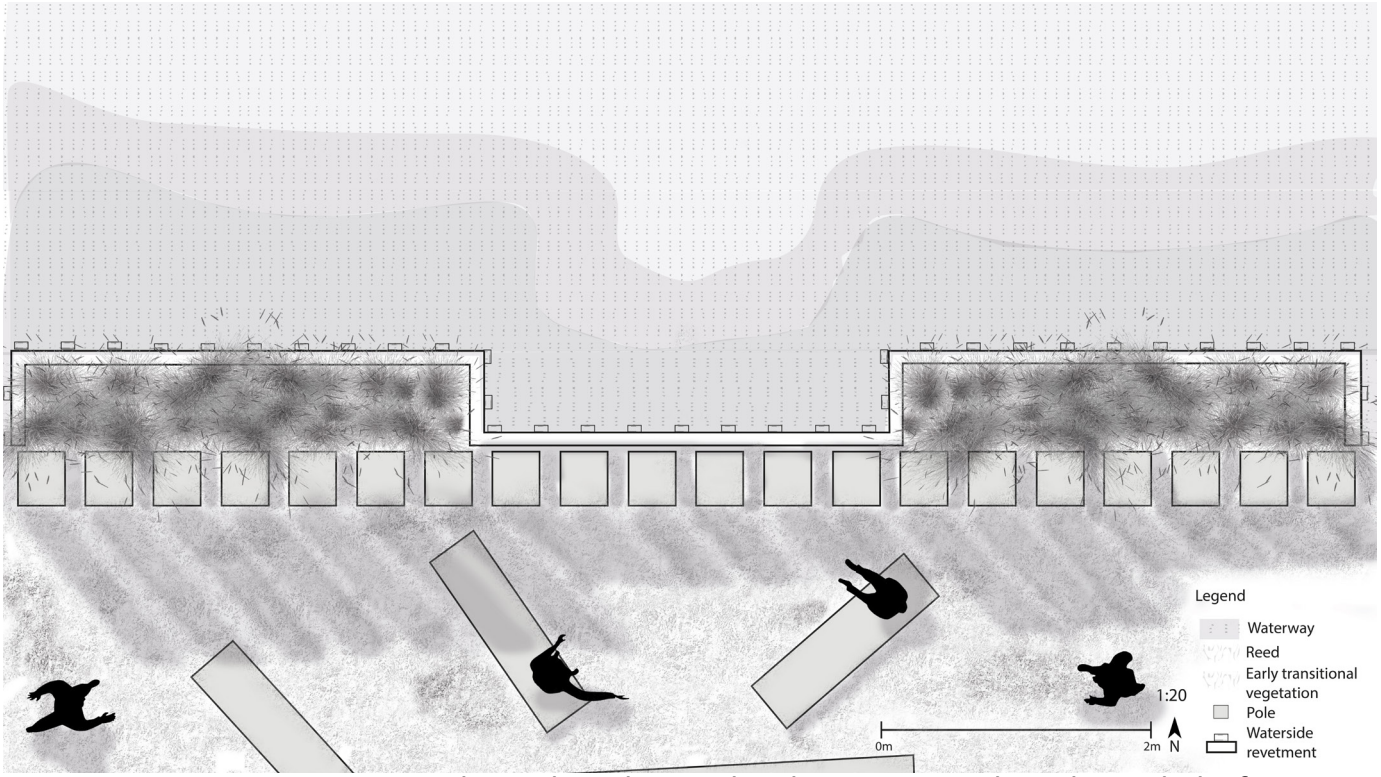

Figure 140: Zoom-in revetment Daltonpad. At the social gathering spot at the Daltonpad, the frame is to enhance visual connection and steering people's view on nature. This view needs to be free from reed, therefore revetment is implemented.

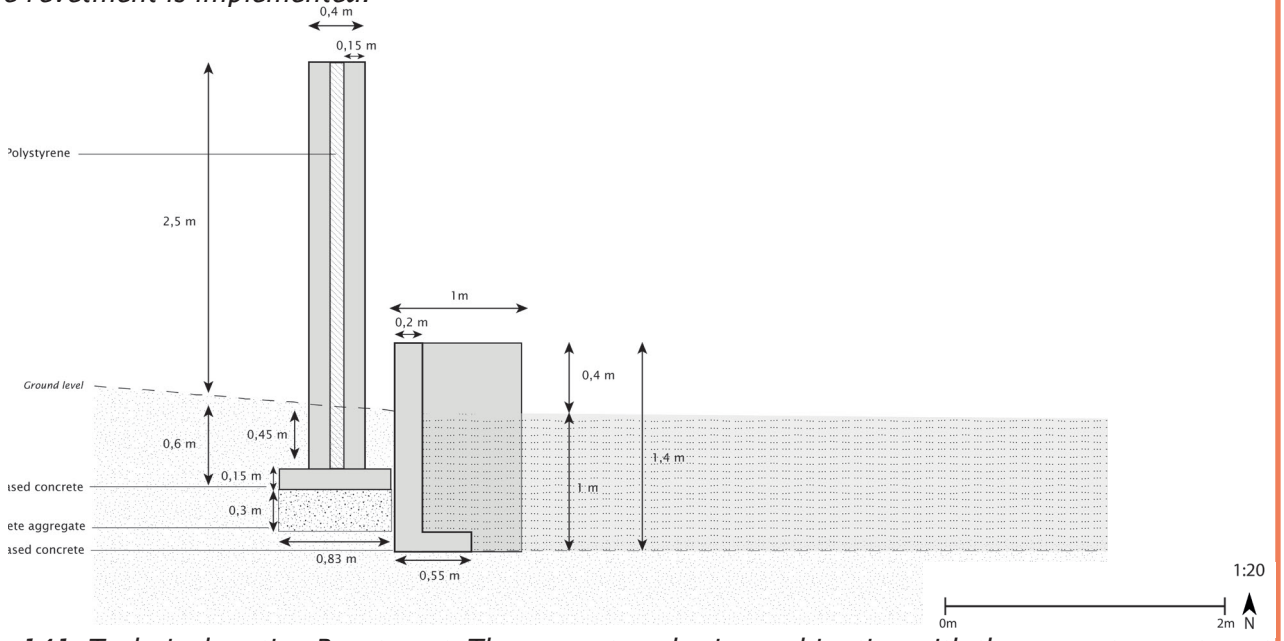

Figure 141: Technical section Revetment. The concrete poles in combination with the concrete revetment.

At the Daltonpad, extensive reed growth is present. To ensure that the frame functions as intended, allowing people to look through it, maintain visual connectivity, and perceive the surrounding natural environment, additional intervention is required. A revetment will be installed along the water's edge to limit reed expansion in this specific zone. By reducing reed growth at the base of the frame, the view remains open and the framing effect is preserved.

Visualisation of the Social Gathering Place Daltonpad

Figure 142: Visualisation social gathering place Daltonpad. Here the combination of the frame, horizontal placed poles on the ground en the transition poles form the feeling of a room.

Zoom-in - Withdrawing Place

Figure 143. Zoom-in withdrawing place. In this zoom-in is can be witnessed that besides a place to enhances the behavior of social gathering, there is a place where people can withdraw from the crowd. This place is located in the dense late transitional vegetation to enhance the feeling of being away.

In addition to creating places for social gathering, the design also needs to accommodate moments of individual withdrawal. The enclosed space already offers favourable conditions for solitude, but this effect is further strengthened by using the poles to create a small frame combined with a one-person seating place. Together, these components create a clearly defined yet subtle place for retreat. The drawing illustrates how this spot is positioned within the context of the vegetation and how it relates spatially to the social gathering area at the Vroesenpad.

Visualisation of the Withdrawing Place

Figure 144. Visualisation withdrawing place. The concrete poles form a small room, the frame will steer your view to nature and the dense vegetation will make you feel secluded.

4.7 Disruption

Introducing material into a landscape always brings change. In this project, that change
occurs because these biobased concrete poles are placed within an environment currently shaped largely by spontaneous vegetation. This intervention introduces a new spatial layer that influences the existing ecological dynamics. The poles for example, alter microtopography, cast shifting shadows throughout the day, create sheltered zones and disturb the soil at the point of installation. These adjustments affect light, temperature, moisture and soil contact in ways that are immediately perceptible to the species inhabiting the site.

In interstitial landscapes, such variations are not anomalies but defining qualities. These places derive their identity from a certain roughness, irregularity and ecological layering. Heterogeneity is not something to be smoothed out, but a strength that can be preserved and amplified. By allowing space for contrast, conflict and unexpected growth, the landscape begins to resemble a form of urban wildness: dynamic, autonomous and rich in niches that different species can occupy.

The disturbance caused by the poles creates new ecological opportunities. The combination of rough mineral surfaces and disturbed soil generates microhabitats that attract species that often struggle to find space elsewhere in the city. Urban ecology research shows that such conditions are favourable for pioneer mosses, algae, lichens, drought-tolerant herbs and a range of invertebrates such as spiders, ground beetles, woodlice and insects that use warm surfaces for shelter and reproduction (Gilbert 1989; Lundholm 2006; Kattwinkel et al. 2011). The transition zones between concrete and soil also form niches for solitary bees, springtails and shade-tolerant moss communities. The edges of the poles often act as germination sites for ruderal plant species that thrive under disturbance and are typically removed in more intensively managed urban spaces. This can be withnessed in figure 145. In this visualisation it is showed how the new habitat develops with minor maintenance through the years.

The disturbance created by the poles is therefore not a drawback, but a meaningful contribution to the ecological functioning of these places. The poles do not act as a biological substrate, but as a spatial addition that introduces new niches and invites spontaneous nature to settle. In doing so, they become catalysts for ecological diversity and help shape a landscape in which human interventions and autonomous natural processes do not exclude one another, but together form a richer and more layered environment.

Visualisation of the New Ecologies around the Concrete Poles

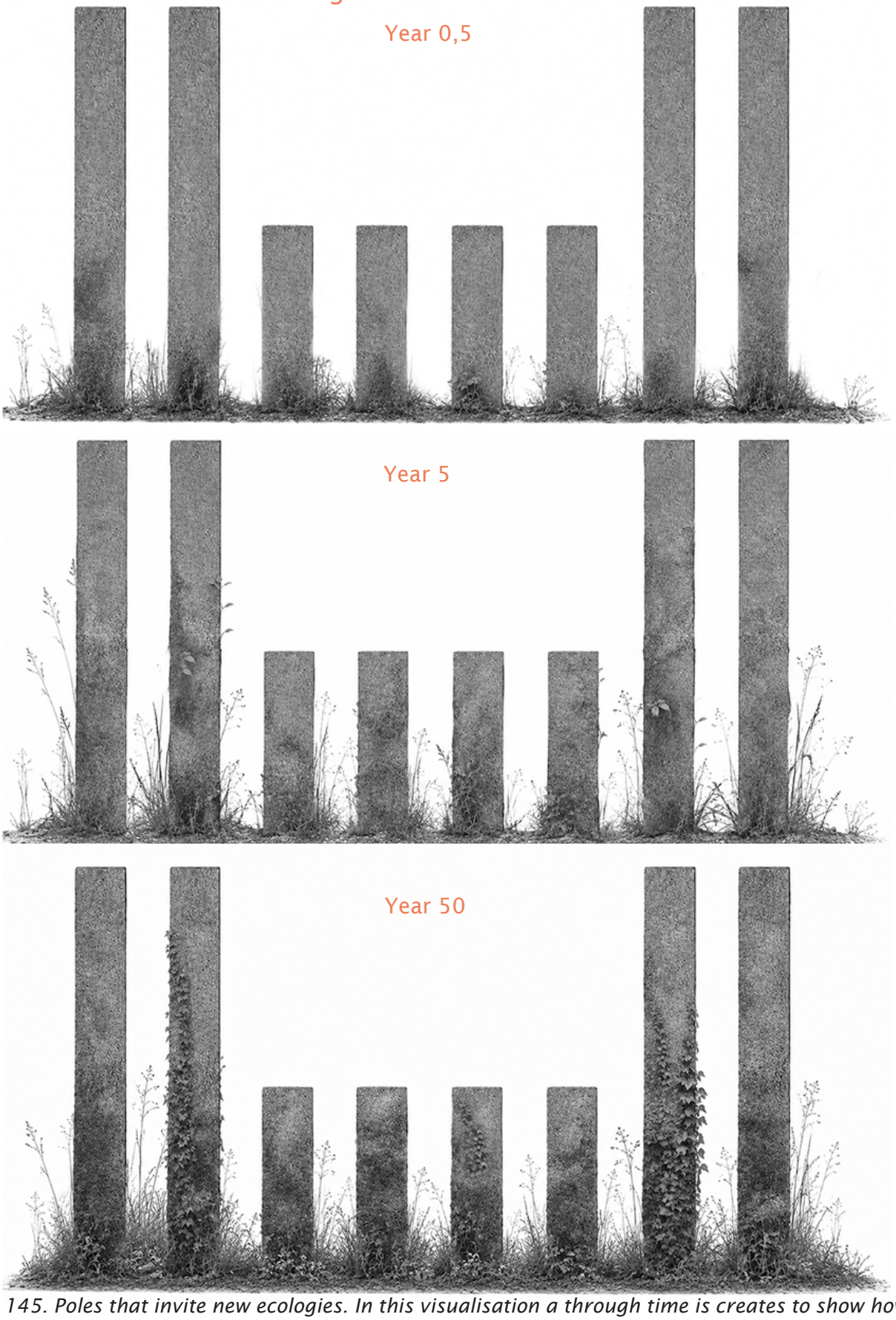

Figure 145. Poles that invite new ecologies. In this visualisation a through time is creates to show how the poles have impact on the current landscape en wat little maintenance only will create.

5. A Diverse Network

The previous chapters established how different types of interstitial spaces can support psychological restoration at a site-specific level, while being preserved for their specific distinctive characteristics. This chapter shifts focus to the collective dimension of these spaces within the city. Rather than aiming for a continuous or closed system, it explores how individual interstitial spaces can function together as an open and fragmented network. The chapter addresses how relationships between dispersed spaces, through perceptual, ecological, and experiential connections, can support psychological restoration among urban residents.

5.1 Mosaic Network

Interstitial spaces gain meaning not through their size or formal status, but through the way they punctuate the urban fabric as recognisable experiential moments. Within a mosaic perspective, the city can be understood as a pattern of diverse yet interconnected patches that collectively contribute to its visual, ecological, and experiential richness (Fuller et al., 2007). Landscape ecology reinforces this view by describing the city as a system of patches, corridors, and matrices (Forman, 1995). Interstitial spaces function as semi-natural patches embedded within the dominant urban matrix, often defined by hard infrastructural borders such as roads, viaducts, rail embankments, and retaining walls. Despite their fragmented condition, these green pockets offer openness, spontaneity, and a contrast to the efficiency-driven city. Their informal and vegetated character supports experiences of being away, stress reduction, and attentional recovery (Kaplan & Kaplan, 1989).

Insights from the English landscape garden and cognitive psychology help explain how these dispersed fragments can still be perceived as part of a coherent urban system. English gardens were composed as sequences of perceptual episodes that guided movement, attention, and curiosity (Turner, 1980). A similar principle applies to interstitial spaces: coherence emerges through short-range visual relationships and repeated spatial cues. To strengthen their recognisability throughout the city, a coherent design language is introduced through the consistent use of bio-based concrete poles. Appearing in different sizes and functions, the poles mark entrances that clarify nodes and edges, create subtle separations that intensify perceived biodiversity, and form landmarks that establish places within the green interstitial field. Through repetition, these elements provide a shared identity while allowing each space to retain its own ecological and spatial character.

Taken together, these insights reveal the broader significance of interstitial spaces within the urban landscape. They form a mosaic network that is fragmented yet coherent, green yet shaped by infrastructural hardness. Their autonomy remains intact, but their collective meaning is strengthened through repeated spatial cues that foreground informality, spontaneity, and ecological richness. The poles and frames heighten the experience of biodiversity, clarify transitions, and create recognisable moments that support psychological restoration. In a dense and highly regulated urban fabric, these green interstitial spaces offer forms of freedom, quietness, and multisensory engagement that formal parks cannot always provide.

The conclusion is clear: interstitial spaces should not only be preserved but actively reinforced. Their ecological heterogeneity, perceptual legibility, and cognitive recognisability make them essential components of a healthy urban environment, places where people can withdraw, recover, and reconnect with natural processes. By strengthening their visibility, identity, and experiential depth, the city gains a distributed system of restorative landscapes that enrich both everyday life and long-term urban resilience.

Concept Drawing of the Big Scale

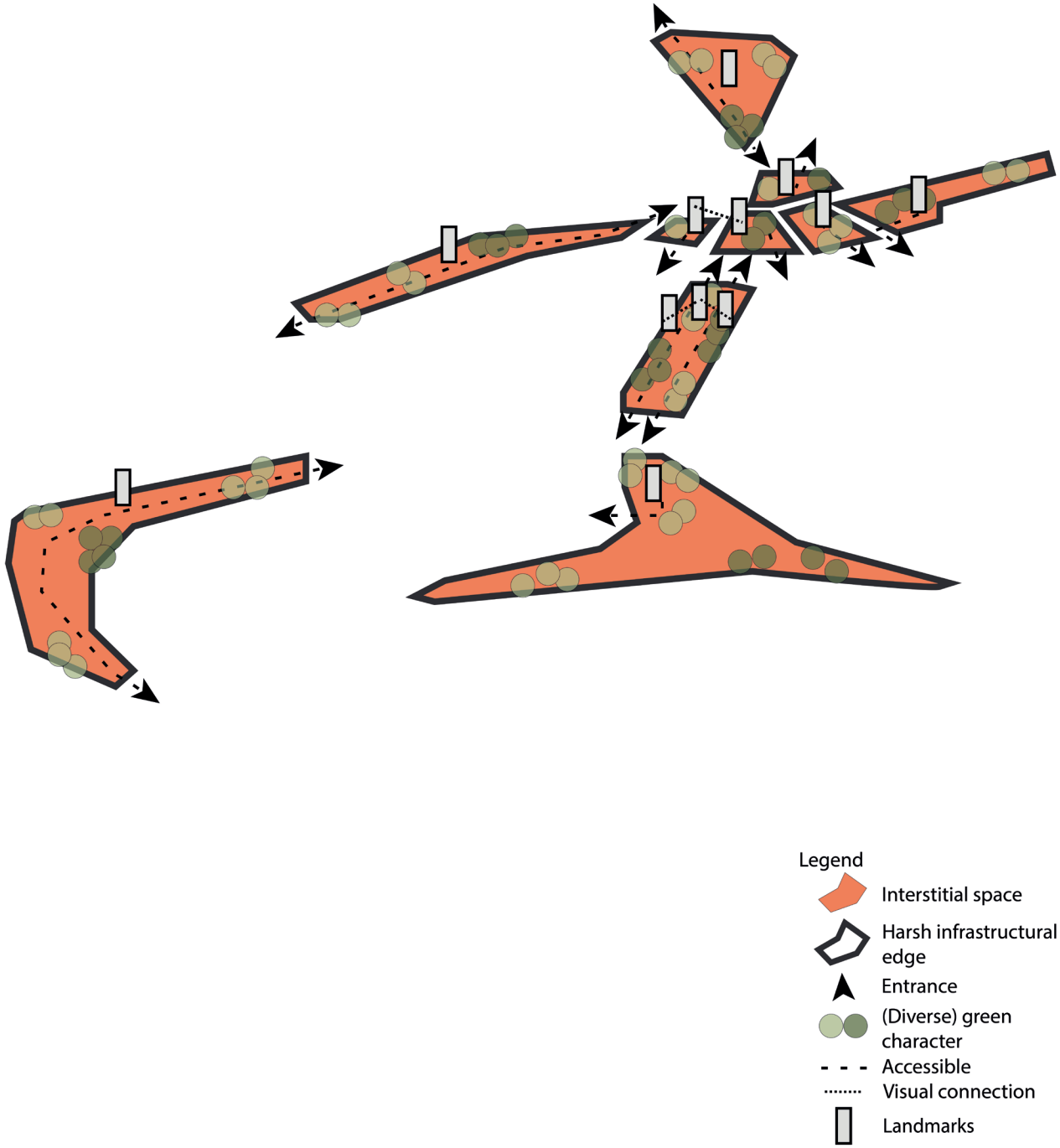

Figure 146. Concept drawing of the big scale. On the big scale, the interstitial spaces will form a network through repetition in material and element language, en through sightlines. The interstitial spaces will all have these harsh edges, diverse green character, entrances and landmarks.

Figure 147: Dispersed collection of former industrial structures (Groenblauwe Netwerken, n.d.).

Figure 148: People experience a network, they can follow a route by looking around (Groenblauwe Netwerken, n.d.).

Figure 149: Moving from one room to another (Groenblauwe Netwerken, n.d.).

Figure 150: Repitition of material language (Groenblauwe Netwerken, n.d.).

Landschaftspark Duisburg-Nord offers a compelling example of how a large and fragmented landscape can still be experienced as a coherent whole through the repetition of material and spatial language. The park consists of a dispersed collection of former industrial structures, gardens, water systems, and open fields, each with its own character and scale (Landschaftspark Duisburg-Nord | Groenblauwe Netwerken, n.d.).

Yet despite this diversity, visitors intuitively recognise the landscape as one unified environment. This coherence emerges from the consistent use of industrial materials, rusted steel, exposed metal frameworks, concrete edges, and reused factory components, that appear throughout the site.

These elements function as a continuous visual thread, anchoring perception and guiding movement across otherwise disconnected spaces.

As visitors move from one ‘room’ of the park to another, the recurring material palette reinforces a sense of identity and belonging, demonstrating how repetition can bind spatial fragments into a legible and memorable whole.

Case Study - Network

Figure 151: Network Stowe Landscape Garden. Through visual sightlines a network forms (Capability Brown, n.d.).

Figure 152: Glimpses of more. Everytime something else makes you move further (Capability Brown, n.d.).

Figure 153: Moments of pause. People get to experience the landscape (Capability Brown, n.d.).

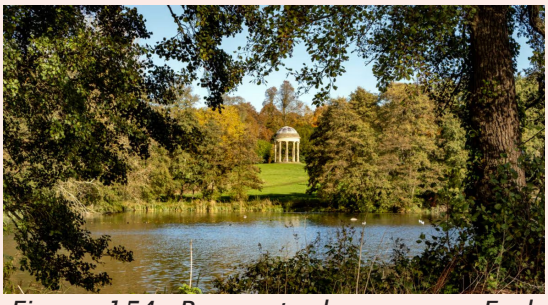

Figure 154: Perspectual sequence. Feels as a whole (Capability Brown, n.d.).

Stowe Landscape Garden in Buckinghamshire, UK is one of the most cited examples demonstrating the power of sightlines within the English landscape tradition.

The garden is composed as a sequence of carefully orchestrated visual relationships that guide visitors through the landscape. Long, diagonal, or strategically framed sightlines reveal temples, bridges, and sculptural elements only gradually, encouraging people to keep moving in order to discover what lies beyond the next turn (Leafy Learning, 2023).

This choreography of views creates a sense of curiosity and anticipation, drawing visitors deeper into the landscape. At the same time, these sightlines frame perception: they direct attention toward specific compositions of landform, water, and architecture, prompting moments of pause.

Visitors are invited not only to walk, but also to look, to stand still and engage with the landscape as a series of intentional visual episodes. Stowe demonstrates how dispersed spaces can be experienced as a coherent whole through the design of perceptual sequences that structure movement, attention, and emotional response.

5.2 Network of Restorative Interstitial Spaces

Current Visible Structure of Rotterdam

Figure 155. Structure Rotterdam. The dominant spatial components.

Rotterdam is commonly understood through its dominant spatial components: extensive housing districts, large urban parks, and a dense network of infrastructural corridors (Rotterdam maps, n.d.). This is the version of the city that most maps foreground and that most residents and visitors recognise (See figure 155). Yet beneath this familiar structure lies another spatial layer that often remains unnoticed. This hidden layer consists of the interstitial spaces, small, irregular, and frequently overlooked fragments that exist between buildings, infrastructures, and planned green areas (See figure 156).

When these interstitial spaces are made visible, a different image of Rotterdam emerges. The city no longer appears solely as a composition of residential blocks, parks, and transport routes, but as a mosaic in which unplanned green pockets punctuate the urban fabric. Revealing this layer shifts the perspective from a conventional, top-down understanding of the city to one that acknowledges the subtle, often invisible spaces that contribute to its ecological and experiential richness. In this alternative reading, Rotterdam becomes not only a structured metropolitan landscape but also a network of spontaneous, semi-natural environments that shape how the city is perceived, navigated, and lived.

New Visible Structure of Rotterdam northwest

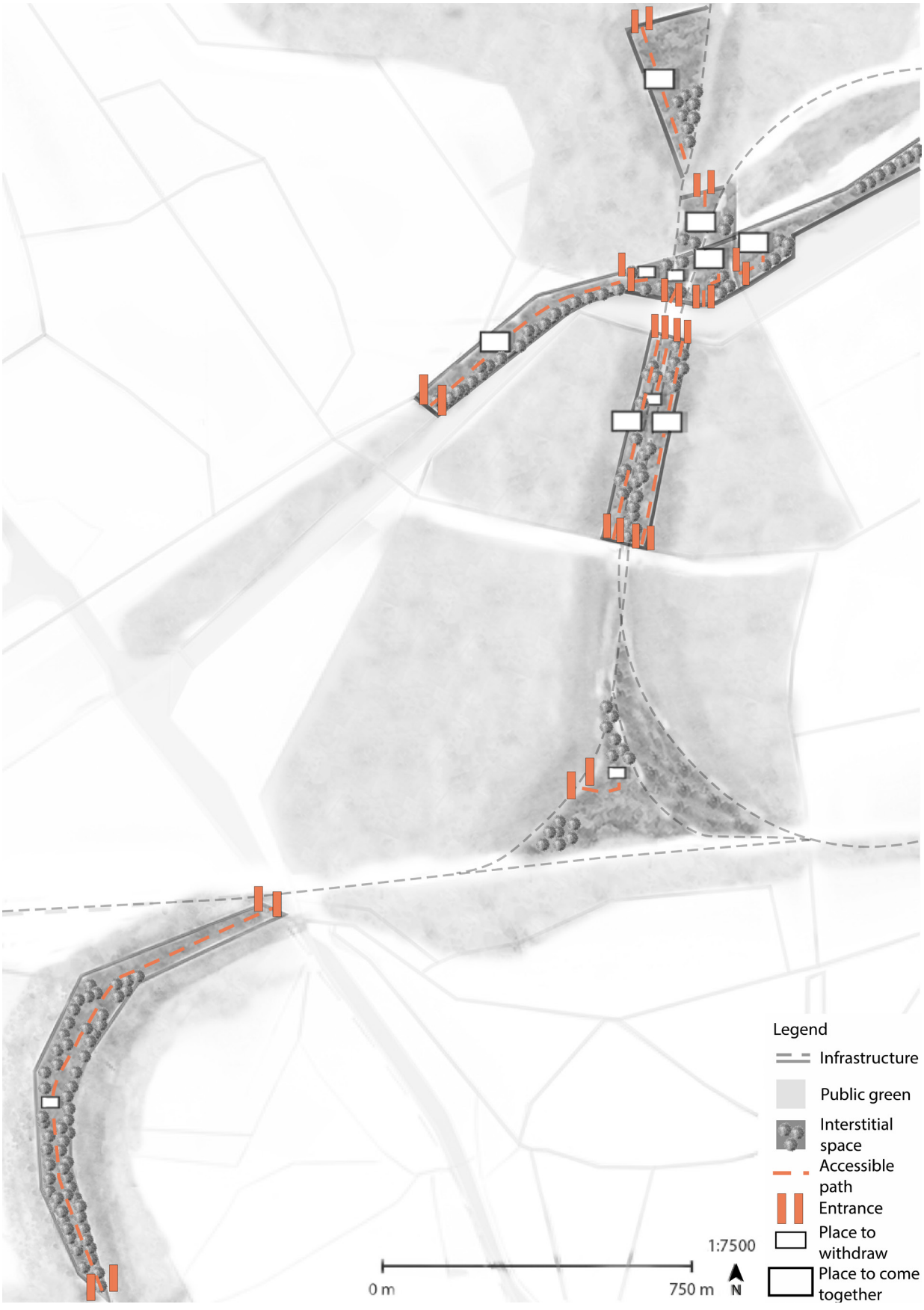

Figure 156. Detailed big scale plan. A new visible structure of rotterdam northwest comes to life.

6. Revealing the Restorative Landscape

Synthesising the theoretical framework, spatial analysis, design principles for revealing spaces and reacting to psychological restoration and the mosaic network developed in the previous chapters, this final chapter presents the integrated design proposal. Where earlier chapters introduced and showed individual spatial interventions, this chapter brings next to principles and strategies, design interventions together into a coherent landscape architectural design for the whole chosen site. Through mappings, and visuals this chapter illustrates how residual spaces are tranlated into restorative spaces within the city of Rotterdam.

6.1 Conceptual diagram

From the combined insights of the literature review, case studies, design experiments, and fieldwork, a conceptual framework can be formulated. This framework builds on the definition of health, which was the inspiration for this project as introduced in An Interest in Human Experience and Wellbeing.

By looking at the definition of health, reactive health addresses illness after it has developed, where preventive health aims to reduce the likelihood of people becoming sick in the first place (Inclusive Healthy Places, 2017). The conceptual diagram illustrates how landscape architects can contribute meaningfully to this preventive dimension.

Within this project, the emphasis lies on psychological restoration. The analysis revealed several key conditions required to create restorative environments. First, the landscape must invite behavioural differentiation, offering opportunities for social interaction, movement, and individual withdrawal. Second, perceived biodiversity is essential, as it enhances fascination, supports stress reduction, and strengthens the sense of being away.

Achieving these qualities depends on sensory perception and visual connectivity, which allow people to understand, explore, and engage with the environment. To ensure that these principles fit the specific context of the site, informality also plays a crucial role, reflecting the spontaneous and semi-natural character of the interstitial spaces.

Together, these insights form the basis of the conceptual diagram, which synthesises the project's theoretical foundations and translates them into a coherent design direction for creation psychological restorative places.

Conceptual Diagram

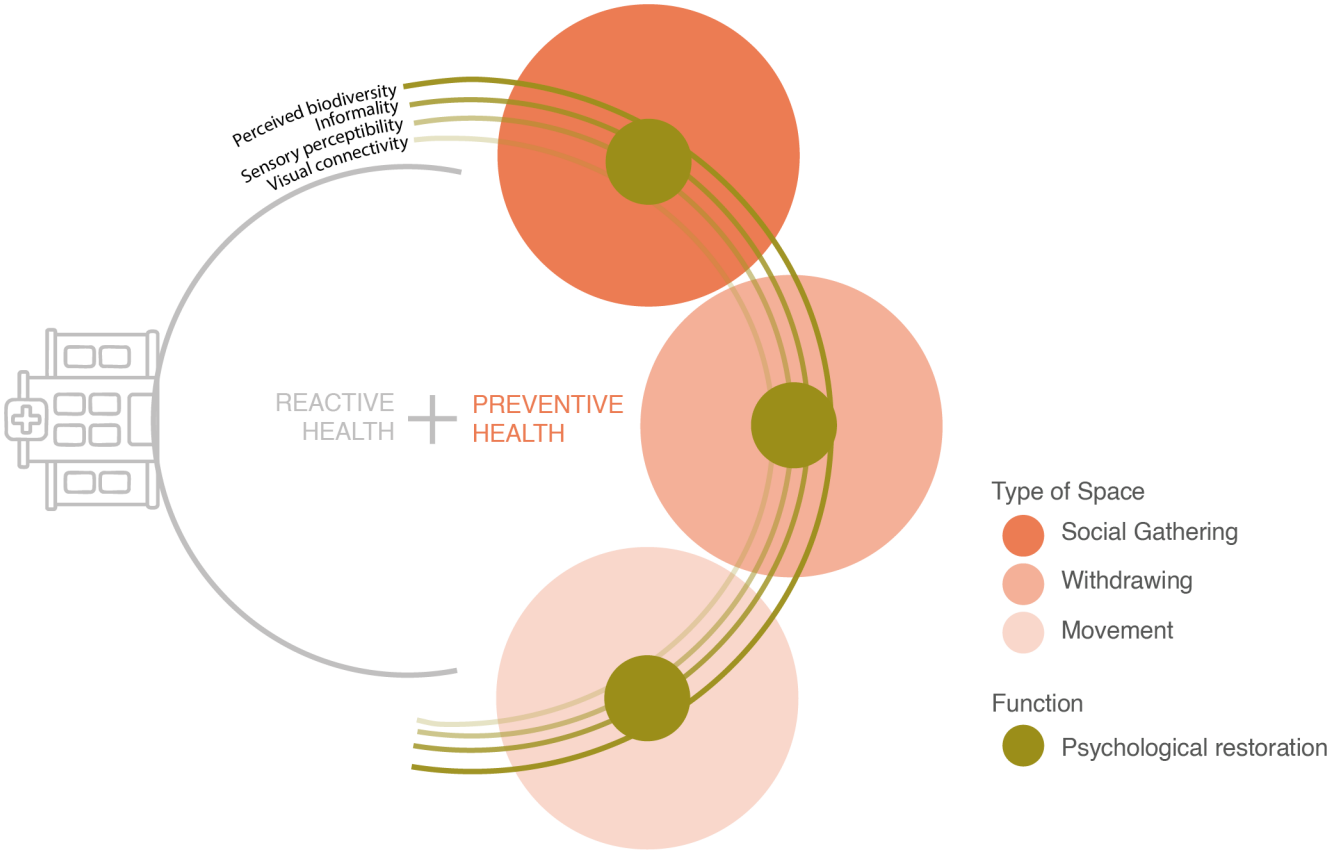

Figure 157. Conceptual diagram. Everything from literature and analysis is coming together in this diagram where the focus is on what we as landscape architects can do to work towards restorative environments.

6.2 Design principles

Building upon the previous analysis and theoretical framework, a set of design principles is brought together to guide the spatial and experiential development of interstitial spaces. While these principles have been introduced throughout the text, they are here articulated collectively to clarify their role within the design approach. Each principle addresses a specific aspect of how interstitial spaces can be perceived, used, and valued, linking ecological processes to human experience. Together, they form a coherent basis for exploring how these spaces can support psychological restoration while maintaining their informal and site-specific character. The design principles are:

Perceived Biodiversity
Perceived biodiversity refers to the perceptible variety of plant species within a landscape. Its strength lies in how it communicates the difference in succession stages. This complexity contributes to psychological restoration, as users experience richness and complexity in a setting that feels nurtured and alive (Rozario et al., 2025).

Sensory Perceptibility
Sensory perceptibility emphasizes the role of beauty as an active force. By engaging the senses, sight, sound, touch, and smell, these environments cultivate an appreciation for the beauty of the space, guiding users from an egocentric toward a biocentric perspective. Experiencing beauty in this way helps people recognize the value of care and stewardship, fostering a more conscious and responsive interaction with the environment.

Behavioral Differentiation
Behavioral differentiation focuses on creating areas that invite a variety of activities, from withdrawal and quiet reflection to movement and social interaction. By clearly signaling possible uses while maintaining opportunities for self-directed behavior, the landscape supports diverse experiences for different users. This variation in behavior not only enhances engagement but also contributes to psychological restoration, as individuals can choose activities aligned with their needs and intentions.

Informality
Informality refers to the sense of spontaneity and openness in the landscape and vegetation. By enhancing the spontaneous vegetation and having space for personal interpretation and self-directed use, the area stays informal. The environment provides affordances, cues that suggest possible actions, while leaving room for exploration and personal appropriation. The perception of informality encourages engagement and discovery, strengthening the restorative potential of the interstitial space.

Visual Connectivity
To create a sense of these spaces being a network visual connectivity is desirable on a smaller scale. This forms connections but it also stimulates people to move further, to discover the interstiital which will result in a more restorative effect.

6.3 Design strategies

Each principle comes with the right suitable strategies.

The first design principle of perceived biodiversity needs the design stategy of **creating habitat diversity**, were interventions as stimulating height differences, different structures and color diversity needs to be enhanced.

The second design principle called informality, asks for a design strategy of **preserving and enhancing the openess of the space**. This counts for the spontaneous vegetation as well as leaving room for own interpretation and self-directed use within the space.

The third design principle, sensory perceptibility, comes with the design strategy of **enhancing and engaging our senses** in the design. This involves creating contrasts, enhance differentiation in spaces and materials and invite people into this diverse area.

For the fourth design principle, behavioral differentiation, the right design strategy is **spatial differentiation**. For spatial differentiation, interventions as creating differences in vegetation, in places, in path width and in entrances are required.

The fifth and last design principle of visual connectivity comes with **creating sightlines** on a smaller scale.

These principles in line with strategies are visualised as different layers of the design and ultimately come together in the detailed design.

Perceived Biodiversity
Creating habitat diversity

Informality
Preserving and enhancing the openess of the space.

Sensory perceptibility
Enhancing and engaging our senses

Behavioral differentiation
Spatial differentiation

Visual connectivity
Creating sightlines

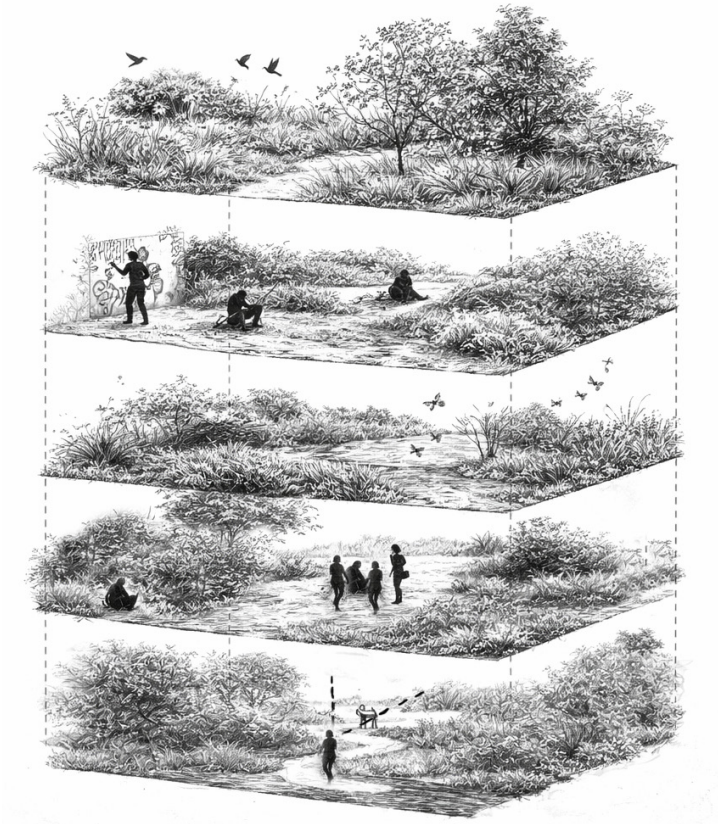

Figure 158. Design strategies. Each design strategy is visualised as a layer of the design.

6.4 Restorative Interstitial Spaces

Interstitial Space Now

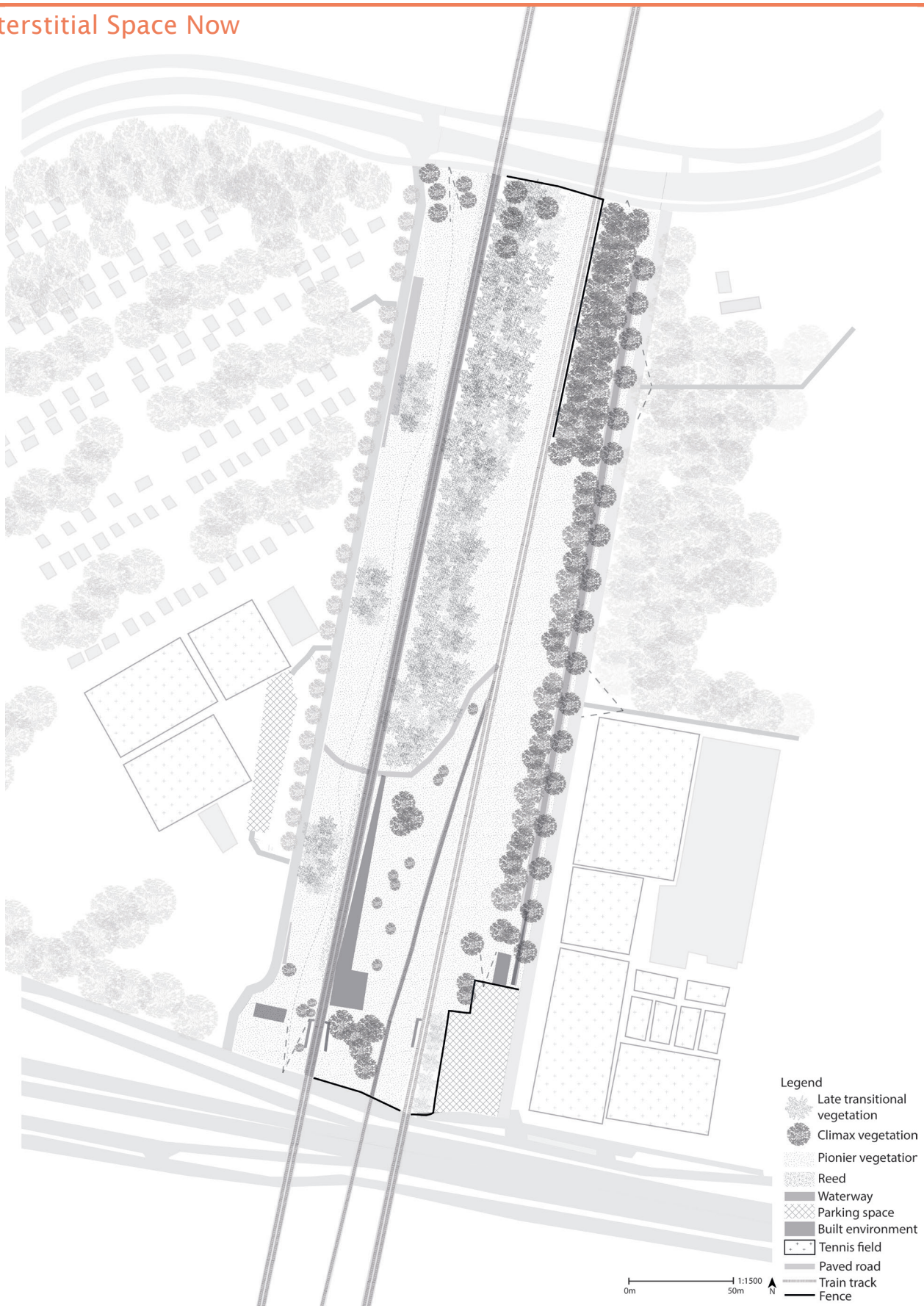

Figure 159: Interstitial space now. This map shows the current interstitial spaces.

Interstitial Spaces New

Figure 160: Interstitial spaces new. This map shows the interstitial spaces after implementing this design. Where the spaces are opened up, where there is more perceived biodiversity and behavioral differentiation is enhanced.

Zoom-in - Design Aspects Coming Together

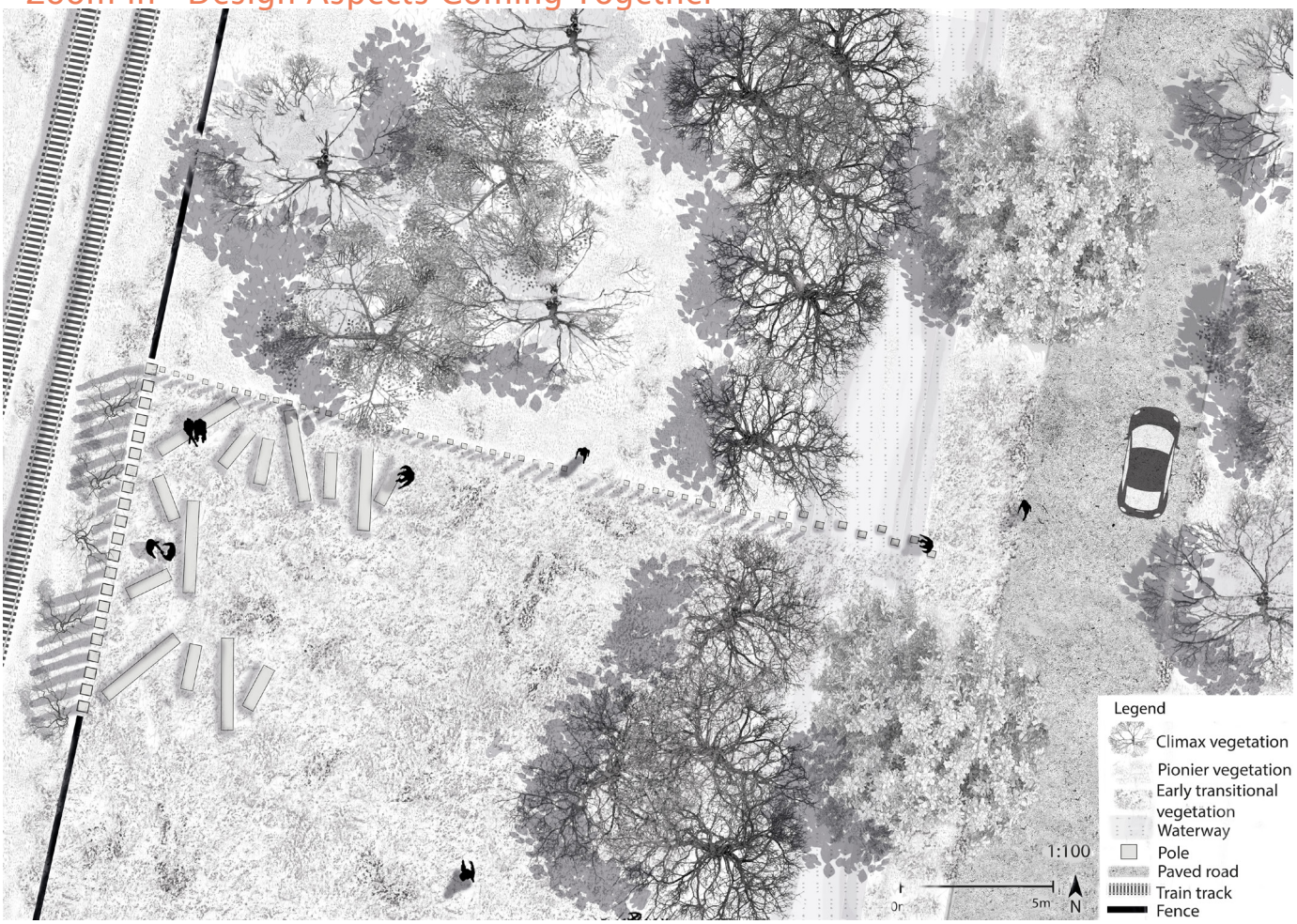

Figure 161: Zoom-in synthesis. People are invited in an informal way to the area, by having stepping stones. Behavioral differentiation and perceived biodiversity is enhanced by the introduction of concrete poles and lastly the harsh edges are still defining the interstitial spaces.

In this zoom-in, several key aspects of the design converge. The frame defines the spatial focus and strengthens the social gathering areas, supported by the horizontal poles that create informal seating and resting places. A transition between two successional stages of vegetation enhances the sense of perceived biodiversity, revealing ecological depth within the site. The edge no longer acts as a threshold but as an invitation to enter, a subtle cue that encourages movement into a new spatial condition. At the same time, the harsh boundary between the interstitial space and the larger urban fabric remains visible, maintaining the tension between infrastructure and ecology. Together, these elements form a dynamic interplay where the infrastructural edge and the interstitial landscape co-create an engaging and layered environment.

Place of Sections in the Interstitial Spaces

Figure 162: Place of sections. At four different places, section illustrate how the spaces change.

In the following sections, the current situation is placed alongside the new condition after the design intervention. These drawings illustrate how the area opens up to the people, how vegetation evolves, how this transformation influences behaviour and accessibility, and how the newly introduced concrete poles interact with the landscape. Four representative locations have been selected to show these sectional comparisons, providing an overview of the entire design and highlighting the most significant spatial and ecological transformations.

Section A

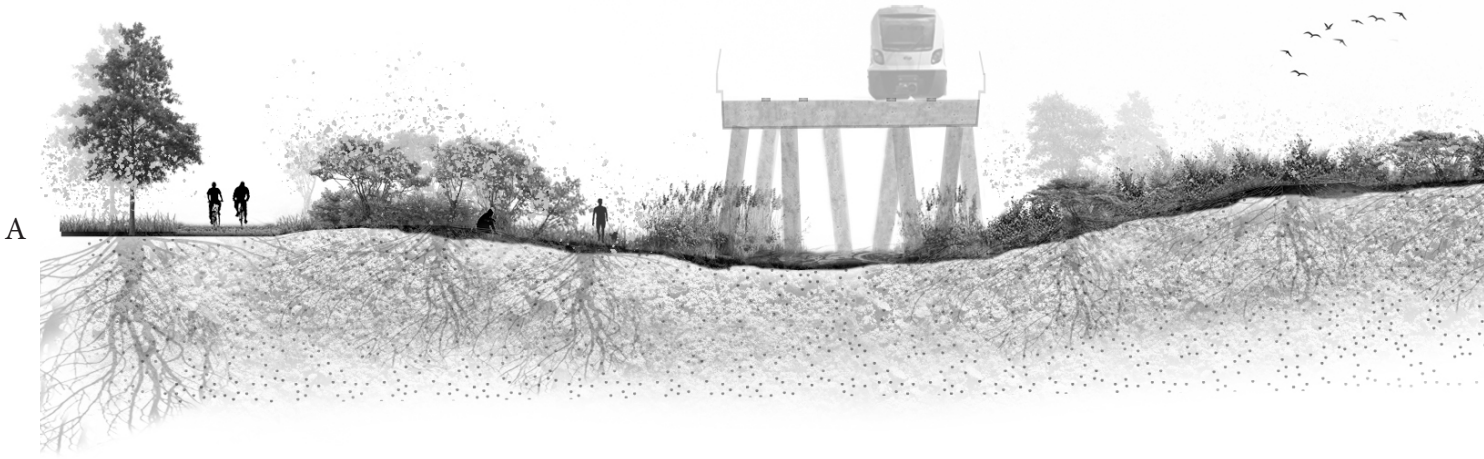

Figure 163: Section A. At daltonpad is spontaneous vegetation enhanced which will result in climax vegetation. At vroesenpad the late transitional vegetation is cut back, to enhance perceived biodiversity. Because of the area being more accessible and these spatial changes, the behaviors also change.

1:500

0m 25m 50m

N

1:500

0m 25m 50m

N

Section B

B

B

Figure 164: Section B. In this section it becomes visible how people enter the inbetween interstitial space. Via stepping stones, people are guided towards the area where late transitional vegetation is enhanced and creates enclosed environments to withdraw in. On the Vroesenpad, the climax vegetation is enhanced which again positively influences the perceived biodiversity.

1:500

0m 25m 50m

N

1:500

0m 25m 50m

N

Section C

Figure 165: Section C. In this section of the area the concrete poles in the form of the transition enhance the perceived biodiversity when the late transitional vegetation is enhanced to the climax vegetation. Also the withdrawing place in the inbetween interstitial space is illustrated inside the dense vegetation. Here two spatially different places are the result.

Section D

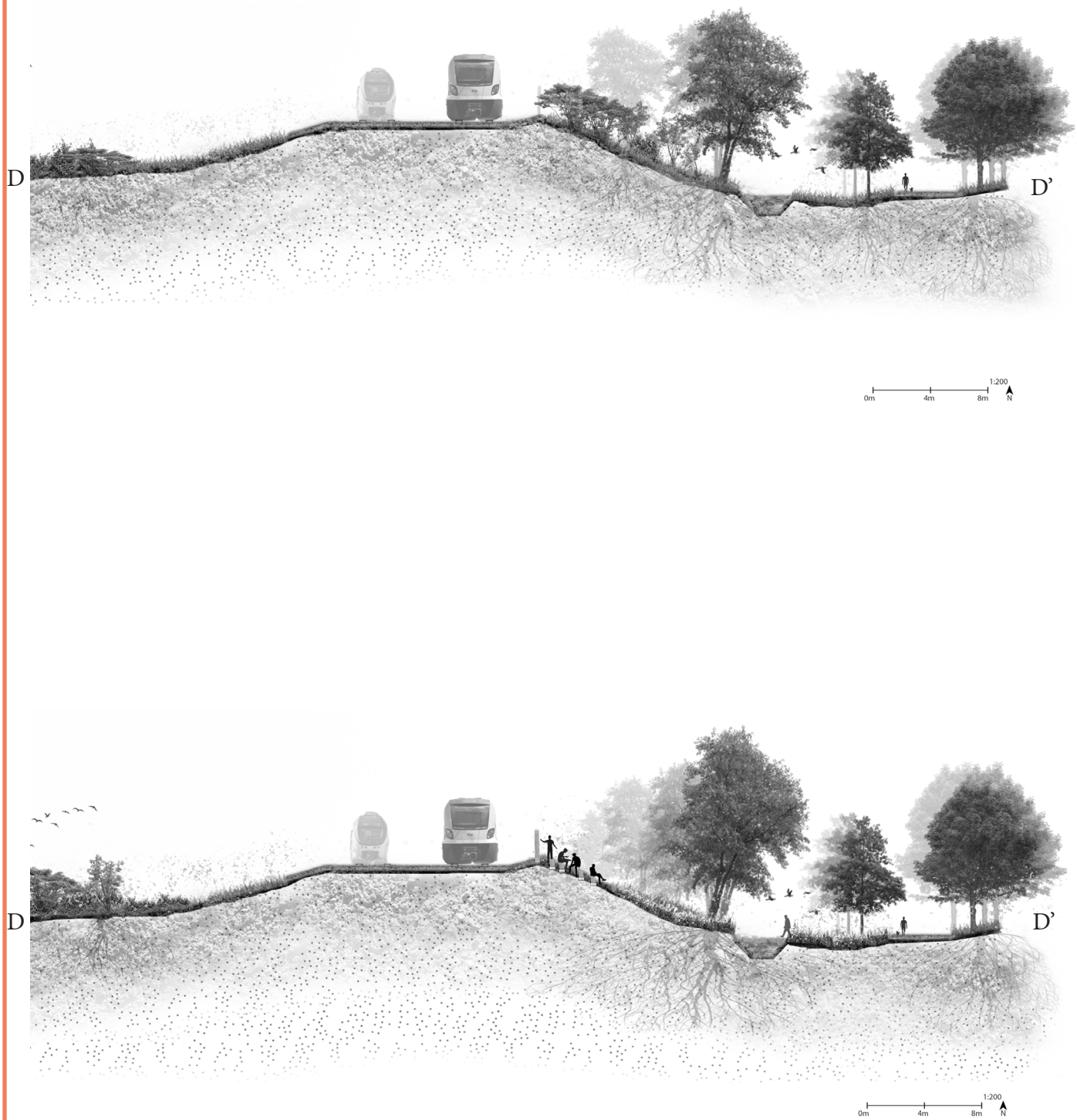

Figure 166: Section D. In this section the social gathering place at the Vroesenpad is showed, Late transitional vegetation makes room for early transitional vegetation and concrete poles. Besides, people from the Vroesenpark are indirectly invited to enter the area via stepping stones. In this way, people can gather together outside the formal structured city.

6.5 Scenarios

Designing for interstitial spaces requires acknowledging that psychological restoration does not only arise from passive withdrawal into a natural setting. As Hartig, Mang and Evans (1991) argue, restorative experiences can also emerge and be strenghtened from active engagement, agency, and meaningful interaction with one's surroundings. People do not only experience a place by moving through it or retreating into it, they also shape it, mark it, care for it, and appropriate it in ways that influence both their wellbeing and the evolving character of the landscape. Recognising this broader spectrum of restorative engagement is therefore essential. It underscores the importance of remaining open to multiple forms of interaction, as interstitial spaces can support psychological restoration not only through their spatial qualities, but also through the diverse ways in which people actively inhabit, modify, and relate to them.

Although a design proposal has been developed for this site, its eventual outcome can never be fully predicted. As discussed earlier in My Position, "landscapes operate as dynamic systems shaped by processes beyond design control" (Corner, 1999). Acknowledging this inherent uncertainty makes it essential to consider multiple possible futures.

To explore this, three plausible scenarios have been projected onto a small yet representative portion of the site. The first scenario imagines the area becoming a hangout spot for young people, where graffiti is tolerated and informal use becomes dominant. The second scenario envisions the neighbouring allotment association taking interest in the space, adopting it as an extension of their activities by planting and maintaining native vegetation. The third scenario considers the possibility of unhoused people appropriating the area as a living space, using it as a base where they create their room and daily routines unfold.

Any one of these scenarios could emerge, or a combination of them may develop simultaneously. These sketches are not predictions but explorations that illustrate how the design embraces uncertainty while still aiming to guide perception, use, and care through spatial design.

Visualisation of the Hang-out Place for Graffiti

Figure 167. Visualisation hang-out place for graffiti. In this drawing one of the tree scenario's is visualised. People do graffiti on the concrete poles, just as they do at other concrete elements in interstitial spaces.

Visualisation of the People from the Allotment Garden

Figure 168. Visualisation of the people of the allotment garden. Here people have taken over the interstitial space. The peoplewant to take care for it and make it even more 'beautiful'.

Visualisation of the Unhoused People

Figure 169. Visualisation unhoused people taking over. The concrete poles in an somewhat hidden space invite unhoused people to make their house here as it feels a bit like a room.

6.6 Sequences

The design intentionally enhances perceived biodiversity through varied vegetation structures, spontaneous growth, and subtle ecological transitions. Such environments tend to feel more natural and alive, and Kaplan and Kaplan (1989) note that environments with higher perceived complexity and natural variation support psychological restoration by offering soft fascination, sensory richness, and a sense of being away. This ecological complexity not only shapes how the landscape is experienced, but also invites a wider range of behaviours, from slow movement to more active forms of engagement.

To understand how these qualities may support different people with different needs, a series of sequences has been drawn. These four sequences do not merely illustrate potential patterns of use; they demonstrate how the design enables behavioural differentiation and how this differentiation can lead to distinct restorative outcomes. As Wen et al. (2025) and Hartig et al. (2003) argue, restorative environments must accommodate multiple modes of engagement, movement, exploration, quiet immersion, and moments of interaction, allowing individuals to relate to the landscape in ways that align with their intentions, preferences, and psychological states.

By presenting contrasting forms of movement, attention, and interaction, the sequences reveal how the same environment can be restorative for some users while offering limited restoration for others. They show how perceived biodiversity, spatial openness, and legibility interact with personal needs and behaviours, illustrating the nuanced ways in which interstitial spaces can support or constrain psychological restoration.

Man with the Dog

Figure 170: Sequence route. This route is followed by a men with a dog, he wants to discover the whole area.

The first sequence follows a man walking his dog. He already visited this area before the intervention, but now that the two adjacent spaces have been opened to the public, he can finally explore the rest of the landscape. Both he and his dog are drawn to the rougher, more natural parts of the site, where spontaneous vegetation and uneven terrain create a sense of informality and subtle unpredictability. His route now extends across the entire area, illustrating how increased legibility and permeability allow for a more continuous and immersive experience of the landscape.

From the perspective of psychological restoration, this form of movement-based exploration is significant. According to Kaplan and Kaplan (1989), restorative environments support “soft fascination,” a gentle attentional engagement that arises from natural variation, textures, and sensory cues. As the man walks through the site, the shifting vegetation, open sightlines, and small spatial transitions provide precisely this kind of low-effort attentional engagement. The expanded route also enhances the feeling of “being away,” offering a temporary mental shift from everyday routines. Together, these qualities make the act of walking through the site not merely functional, but restorative.




Figure 171: First part of the route. The man with the dog enters the area, walks through dense bushes , walks under the trees where he sees people chilling and ends in an open area.

Figure 172: Second part of the route. The man comes across the concrete poles and feels that there is a shift again in atmosphere. He sees people doing graffiti but ignores it. He walks further.

Figure 173: Third part of the route. The man sees a opening and walks on the stepping stones towards the other side. Through dense bushes he enters somewhere he can stand still to see nature.

Figure 174: Fourth part of the route. The man walks back and sees an exit. He thinks that is already over, but then he sees an entrance just like the first one. He descides to enter again.

Figure 175: Fifht part of the route. He walks underneath the trees just like before and he sees the same smaller poles. When walking further these poles appear again and he shifts to another space.


Figure 176: Last part of the route. The man walks through the space and enters suddenly at the parking space. The difference is big, but he liked to walk this route and thinks already about the next time he will go and that he will stay longer in the environment then.

Two Girls

Figure 177: Sequence route. This route is traveled by two girls who enter from the Vroesenpark.

The second sequence follows two girls arriving from the Vroesenpark, looking for a more private place to sit together, somewhere out of sight from their parents, who probably will also sit in the park with this nice weather. As they wander through the area, they notice that they can now cross the water using the stepping stones. Once inside the space, the see-through to the other side and the horizontal poles on the ground create a subtle sense of enclosure. For the two girls, this combination of partial shelter and openness makes the place feel like a distinct kind of gathering spot, more secluded and informal than the formal park, yet still clearly a place where they can comfortably sit together.

In their own way, the girls experience psychological restoration. Being young, they seek a place where they can chat about their lives, unwind, and momentarily step out of the social visibility of the park. Kaplan and Kaplan (1989) en Wen et al., (2025) note that environments offering a sense of being away and gentle refuge can support mental restoration not only through solitude, but also through relaxed social interaction. For the girls, this quiet, semi-hidden spot provides exactly that: a calm setting where conversation becomes a form of relief, and where the nature and human-made elements help create an atmosphere of ease and emotional rest.

Figure 178: The two girls see the stepping stones and descide to cross the water. When there, they see poles on the ground to sit on which was excatly what they needed at that moment.

Man with Graffiti

Figure 179: Sequence route. This route is traveled by a man with graffiti during the early night.

The third sequence follows a young man looking for a place to paint graffiti. He already knows the more secluded corners of the area and heads directly toward the locations where the concrete poles are placed. He usually comes at night, when the reduced visibility allows him to act without drawing attention. The poles and the surrounding vegetation create a shielded atmosphere that feels suitable for the kind of focused, expressive activity he seeks.

Although his presence is different from the other users, this form of engagement can also carry restorative qualities. As Hartig, Mang and Evans (1991) discuss, restoration does not only arise from passive immersion in nature, but also from opportunities for agency, self-expression, and meaningful action within a landscape. For this young man, painting graffiti provides a moment of concentration, creativity, and temporary escape from everyday demands. The sense of being away at night create conditions of soft fascination and reduced social pressure, allowing him to focus on his work and experience a form of psychological relief (Kaplan and Kaplan, 1989).




Figure 180: The man enters the area, which he already knows quite well. He walks straight to the withdrawing place to spray graffiti on the poles. He wants to make it his own place.




Figure 181: Second part of the route. When the man is done with painting the withdrawing place, he walks back and quickly writes something on the entrance pole.

Figure 182: Last part of the route. The man walks to his last destination of the night, the social gathering spot at Vroesenpad. Here he meets a friend. Together they spray graffiti over the painting of another artist.

Unhoused Man

Figure 183: Sequence route. This route is traveled by a unhoused man.

The last sequence follows an unhoused man entering the area in search of a place to sleep for the night. He is not looking for a nature experience nor for being there for just a moment of time; his presence in the landscape is shaped primarily by necessity. What matters to him is finding a spot where he can remain unnoticed and undisturbed. Drawn by the density of the vegetation, he moves into the bushes and identifies a small, hidden pocket that offers enough cover to feel temporarily protected. Using a tarp he collected from the roadside, he creates a modest shelter that enhances the sense of having a small, private room.

Because of the high density of shrubs and the informal character, the space does hold significance for him. It provides a momentary sense of safety, particularly because it is a location where he is unlikely to be asked to move on. In this sense, the design does not actively offer restoration, but the preservation of dense, unmanicured vegetation unintentionally maintains the kind of hidden micro-spaces that some individuals rely on for temporary refuge.

Figure 183: Unhoused man finding a place. This route is really short. The man is drawn by the density of the bushes and is send away from the Vroesenpark. He enters the area and finds a spot which is already a bit more open. He places his tarp over his head to feel even more secluded.

Concluding

This final chapter brings together the main outcomes of the thesis through both a conclusion and a reflection. The conclusion summarises the main findings and answers the central research question, while the reflection looks back on the process, methodology and broader implications of the work. Together, they provide a final perspective on the project and its contribution to the field of landscape architecture.

Conclusion

This thesis has answered the general research question of: In which way does revealing and preserving the inherent qualities of interstitial spaces correlate with the creation of a diverse network of places that support psychological restoration among urban residents? The research demonstrates that the already exisiting qualities of the interstitial spaces, informality, spontaneity, natural character and the tension between infrastructure and nature, form the foundation for restorative experiences. When these characteristics are made perceptible rather than redesigned, interstitial spaces can function as meaningful environments within the city.

Through literature research, fieldwork, case studies, interviews and design experiments, it became clear that psychological restoration does not require highly curated environments. Instead, it emerges from landscapes that offer fascination, retreat, low-effort engagement and a sense of being away. Interstitial spaces already contain these conditions, but they often remain unnoticed. The design assignment therefore focused on unlocking, framing and expressing their inherent spatial, ecological and social qualities. By preserving their informal structure and revealing spontaneous vegetation and spatial differentiations to enhance behavioral differentiations, the project shows how these landscapes can become legible and restorative without losing their ambiguity.

The resulting design demonstrates that a network does not need continuous paths or physical connectivity. It can arise through perceptual connections, returning material language and the recognition of shared spatial characteristics. The interstitial landscape becomes a constellation of places, each distinct, yet part of a larger whole, that collectively support psychological restoration. At moments, the space may feel paradisiacal; however, this effect stems from heightened awareness of existing qualities rather than idealisation. It is a rough paradise, shaped by the coexistence of ecological processes and infrastructural presence. The interstitial spaces are shaped by harsh infrasuctural boundaries, to work with the current characteristics the design does not hide the infrastructure but uses it, extending its formal language into the intersitial and transforming it into a layered spatial experience.

The thesis contributes new knowledge by showing how unintentionally produced spaces can be engaged through carefully placed interventions that enhance legibility and inherent qualities without imposing formality. It demonstrates that interstitial landscapes do not require formal planting and regular furniture to become meaningful. What they need is recognition, access and a design approach that amplifies what is already there.

Looking ahead, this work suggests opportunities for further exploration. Rotterdam contains many interstitial spaces, and similar landscapes exist throughout the Netherlands and beyond. Applying and testing the strategies developed here in other contexts could deepen understanding of how such spaces function socially and ecologically over time and how places may differ. More broadly, this thesis invites designers, planners and policymakers to reconsider the overlooked margins of the city as places with restorative potential, cultural significance and a good basis for enhancing humans and non-humans to live together in a more equal way.

In the end, the value of interstitial spaces lies not in perfection but in offering a different way of experiencing the city, through spontaneity, informality and moments of unexpected beauty. This conclusion is therefore not a closure but an opening: an invitation to continue observing, experimenting and engaging with the interstitial landscapes that quietly shape urban life.

Reflection

Looking back on the graduation process, the sequence of methods I used proved essential for understanding the interstitial landscape and shaping the design. Beginning with fieldwork allowed me to experience the site directly, without theoretical filters. Only after walking, observing and sensing the place did I turn to literature and case studies, which helped me interpret what I had encountered on a deeper conceptual level. This order, first experiencing, then understanding, was crucial. Had I started behind my laptop, the design would have been far more conventional and disconnected from the lived reality of the site.

Working in the grey zone between “too much” and “too little” intervention was one of the most challenging aspects of the project. Interstitial spaces resist clear categories, and so does their design. I constantly questioned whether an intervention risked turning the area into a park, or whether doing too little would fail to reveal its beauty and prevent people from engaging with it. Navigating this tension required continuous testing, reflection and adjustment. In the end, I would not change this process; the uncertainty was productive, and the gradual unfolding of the site’s logic shaped the design in meaningful ways.

This project has also reshaped my understanding of myself as a designer. I learned how important it is to approach a site with openness rather than assumptions. My early impressions of the interstitial spaces were coloured by preconceptions, but spending time there shifted my perspective. I developed a deeper respect for these overlooked environments and for the people who already use them. This experience will influence my future work: I will enter new sites with more curiosity, humility and willingness to listen to what the landscape communicates.

The project therefore also changed my view of the discipline. I now see more clearly how landscape architecture can contribute to preventive health by creating environments that support psychological restoration in everyday life. We are not merely decorators of public space; we shape conditions that influence behaviour, perception and well-being. This project reinforced that roughness, informality and spontaneity are not qualities to be corrected but potentials to be amplified. Not every place needs to be accessible or appealing to everyone. Diversity in landscapes mirrors diversity in people, different needs require different environments.

At the same time, uncertainty remains an inherent part of designing interstitial spaces. It is impossible to predict exactly how people will respond to the design or whether perceived biodiversity will increase as intended. Yet this uncertainty is not a flaw; it is part of the character of these landscapes. Designing for interstitial spaces means accepting that multiple outcomes are possible and that none of them invalidate the project. New conflicts or unexpected uses may emerge, but these shifts can enrich the site and generate new meanings over time.

In a broader perspective, this project contributes to the discipline by demonstrating that interstitial spaces can be approached as valuable landscapes rather than residual ones. It shows that minimal, carefully placed interventions can reveal qualities that already exist, and that embracing roughness and informality can lead to environments that support both ecological processes and human well-being. As cities like Rotterdam contain countless interstitial spaces, this approach offers a way to rethink the margins of the urban fabric, not as problems to be solved, but as opportunities for restorative, layered and meaningful landscapes.

Discussion

This thesis examined how revealing and preserving the inherent qualities of interstitial spaces can contribute to a network of places that support psychological restoration. One of the key findings is that perceived biodiversity plays an important role in shaping restorative experiences. By introducing habitat diversity, varying vegetation structures by enhancing different successional stages, the perceived biodiversity in the area increases. This ecological differentiation provides the sensory richness, fascination and sense of “being away” that are essential for restoration.

The results also show that behavioural differentiation is crucial in how restoration manifests. The three behavioural modes identified in the literature were clearly recognisable on site. Spatial analysis, interviews and case studies demonstrated that these behaviours are shaped by existing affordances such as openness and enclosure. The design therefore built upon what was already present. Through interventions such as creating entrances, clarifying spatial cues and working with vegetation differentiations, the existing potential was strengthened rather than replaced.

Despite these insights, several limitations must be acknowledged. A first limitation is that the design cannot demonstrate whether users will actually experience psychological restoration. The project did not measure stress reduction or emotional responses. However, all conditions for a restorative landscape are present, meaning that future studies could investigate whether and how these effects occur. Further research could explore how much time users need to spend in the area before restorative effects emerge, whether these effects apply to all users, and how they change across seasons.

A second limitation concerns the social use of the space. It remains uncertain whether current users will continue to find their place in the redesigned landscape, whether new user groups will be attracted, and how different groups will coexist. Though, interstitial spaces are, by nature, places where tensions, unexpected encounters and conflicting uses can arise. This uncertainty is not a flaw, it is part of their character. Engaging with conflict, allowing multiple practices to coexist and enabling new meanings to emerge over time are intrinsic to the value and dynamism of these landscapes.

Contrary to what might be assumed, the focus on a single case does not limit the transferability of the method. The design includes a reusable approach for similar interstitial spaces, based on analysing behavioural modes, affordances, perceived biodiversity and vegetation succession. This method can be applied elsewhere.

The project demonstrates that restorative networks do not require continuous paths or formal programming, but can emerge through shared spatial language, material expression and ecological character. For design practice and policy, this suggests that informal, spontaneous landscapes do not need to be transformed into parks or housing to become meaningful.

Despite the limitations, the project contributes to the discipline by re-positioning interstitial spaces as valuable landscapes rather than residual ones. It shows that minimal interventions can reveal existing qualities, that behavioural differentiation, legiblity and perceived biodiversity can be a powerful lens for restorative design, and that roughness and spontaneity are not shortcomings but opportunities.

In doing so, the thesis expands the conversation about what restorative environments can be, not polished, curated parks, but rough, layered and dynamic spaces where ecological processes and human experiences coexist.

Glossary

This chapter provides an overview of the key terms used throughout the thesis, in others words a glossary. It provides the collection of essential concepts in this thesis, accompanied by brief, clear definitions that support the understanding of the document.

Aesthetically beautiful	Aesthetically beautiful refers to an environment or object that is visually pleasing, harmonious, or inspiring, evoking a sense of admiration or enjoyment through its form, color, texture, or composition.
Affordance Theory	A theory that explains how environments are directly perceived in terms of the actions they enable, guiding behaviour through spatial and physical properties without requiring conscious interpretation.
Attention Restoration	The recovery of directed attention following mental fatigue, supported by environments that allow for effortless engagement, mental distance from everyday demands, and reduced cognitive load.
Behavioral Differentiation	Behavioral differentiation refers to the variation in how people use, move through, and experience different spaces based on their needs, preferences, or activities.
Cues to Care	Visible signs of care and intentional management in a landscape that signal accessibility, safety, and value, influencing how people perceive and engage with a space.
Deep map analysis	An intensive, layered exploration of a place that combines physical, cultural, ecological and experiential information without hierarchy.
Design Experiments	Iterative and exploratory design studies used as a research method to test spatial strategies, principles, and interventions within specific contexts.
Emotional Balance	A state of affective regulation in which emotional responses are stabilised and supported through environments that feel safe, coherent, and supportive.
Formal	A spatial or ecological condition that is intentionally structured, ordered and shaped by clear design decisions, boundaries and maintenance regimes.

Fourth Nature	A type of landscape in which spontaneous ecological processes dominate within abandoned or post-industrial contexts, allowing non-human dynamics to shape the space with minimal human intervention.
Hypernature	.A design strategy that amplifies existing ecological processes to make them more visible, legible and experientially powerful.
Informal	A spatial or ecological condition that is unstructured, spontaneous and not shaped by strict design rules.
Immersive site analysis	A method of understanding a place through direct, multisensory engagement by walking, observing and experiencing it on site.
Interstitial spaces	Urban spaces that emerge between dominant structures, infrastructures, and land uses, often lacking a clearly defined program or identity, yet containing spatial, ecological, and experiential qualities.
Land Art	Land art is a way of making art, in which artists create site-specific works directly in the natural landscape to shape and shift focus to the direct environment.
Legibility	The degree to which a landscape clearly communicates its structure, use, and accessibility, enabling intuitive understanding and engagement by users.
Low-Effort Activities	Activities that require minimal physical or cognitive effort, such as sitting, pausing, observing, and slow movement, which are strongly associated with psychological restoration.
Mental wellbeing	A state of psychological health characterised by calmness, clarity, resilience and the ability to cope with daily demands.

Mosaic network	A mosaic network is a spatial system in which discrete patches, connected by corridors and embedded in a matrix, function together to create ecological, perceptual, or functional cohesion across a fragmented landscape.
Natural Environment	An environment characterised by the presence of natural elements and ecological processes, such as vegetation, water, and non-human life, which are associated with restorative psychological effects.
Network of Places	A connected system of diverse spaces that together support different forms of use, experience, and psychological restoration across an urban area.
Non-humans	All ecological actors other than people, including plants, animals, fungi and other living systems.
Perceived Biodiversity	Perceived biodiversity is the variety of plants, animals, and other natural elements in an environment as experienced and noticed by people, influencing their perception of complexity, richness, and connection to nature.
Placelessness	The experiential condition in which a space lacks clear identity, meaning, or emotional attachment, often due to ambiguity, fragmentation, or absence of social recognition.
Psychological Restoration	The process through which depleted psychological resources, such as attentional capacity, stress regulation, and emotional balance, are renewed through interaction with supportive environments, particularly natural and semi-natural landscapes.
Restorative landscape	A landscape that supports psychological recovery by offering conditions such as retreat, fascination and low-effort engagement.
Spatial cues	Subtle design elements that guide how people perceive, move through or interpret a landscape.

Spatial Differentiation	Spatial differentiation refers to the variation in layout and physical characteristics of spaces that create distinct functions, experiences, or identities within a landscape.
Spontaneous vegetation	Plants that establish and grow without intentional planting or maintenance, driven by natural processes.
Stadpark West	Stadspark West serves as a platform connecting experts in the field, local residents, and government agencies to mae an insignificant part of Rotterdam which can be seen as a valuable “green lung” that connects the Nieuwe Maas with the polders to the north, visible. It’s not a manicured park, but rather a mosaic of spaces ranging from community garden associations to playgrounds.
Stress Reduction	A process of physiological recovery in which exposure to supportive environments leads to reduced stress, arousal, and negative emotional states.
Succession stage	A phase in the ecological development of a site, from pioneer species to climax vegetation.
Terrain Vague	Urban landscapes that are abandoned, undefined, or outside dominant systems of control, characterised by indeterminacy, openness, and latent potential.
Wild nature	This refers to areas of the environment that are largely self-regulating and minimally influenced by human management, where natural processes, vegetation, and wildlife develop freely.

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