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THE PATH TO JUST URBAN GREEN SPACES

EXPLORING THE ROLE OF SPATIAL JUSTICE IN THE MANAGEMENT OF URBAN GREEN SPACES: A CASE STUDY IN THE MUNICIPALITY OF MAASTRICHT

Anne Erven
5912229
20 - 06 - 25

AR3MBE100
MSc 3 Graduation Laboratory
Delft University of Technology

Master Thesis

The path to just urban green spaces

Exploring the role of spatial justice in urban green spaces management:
A case study in the municipality of Maastricht

A study into the role of spatial justice in municipal management of urban green spaces, linking policy aims to lived realities as a foundation for socially sustainable cities

Colophon

Delft University of Technology
Academic year 2024 – 2025

Faculty of Architecture and the Built Environment
Master Architecture, Urbanism, and Building Sciences
Track Management in the Built Environment

Publication thesis report	Maastricht, June 20th, 2025
Thesis defence	Delft, June 27th, 2025

Author	Anne Erven
Student number	5912229

Supervisors	Delft University of Technology
First mentor	Yawei Chen
Second mentor	Ellen Geurts
Board of examiners delegate	Reinout Kleinhans

Graduation organisation	Municipality of Maastricht
Department	CERK (Cultureel Erfgoed en Ruimtelijke Kwaliteit)
First supervisor	Saskia Hendricks (Groen, Natuur, en Landschap)
Second supervisor	Peter de Ronde (Stedenbouw)

"If the *injustices* in our *cities* originate from *human decisions*, then surely we have the *power* to *challenge* them through ***more intentional, conscious choices***"

Abstract

As cities in the Netherlands continue to densify, the availability and fair distribution of urban green spaces face pressure. While these green spaces play a crucial role in advancing socially sustainable urban development, their spatial justice remains underexplored in Dutch planning practices. Although municipal (policy) documents do increasingly address social inclusion, the extent to which these ambitions reflect in the lived experiences of residents is still unclear. Without a better understanding of this relationship, there is a risk that densification may worsen existing spatial injustices.

This study investigated how spatial justice is addressed at the municipal policy level, and how this is translated into residents' experiences with urban green spaces through a case study design in the municipality of Maastricht. A mixed-methods approach was employed. First, the three dimensions of spatial justice were used to analyse relevant (policy) documents from the municipality of Maastricht. Second, a primarily quantitative survey captured residents' experiences with spatial justice in relation to a specific urban green space, along with their usage of and satisfaction with this space. These two components were then compared to assess how there was alignment between policy intent and lived reality. Based on this analysis, the study offers recommendations to the municipality for improving the management of urban green spaces at the municipal (policy) level with regards to spatial justice.

The research ultimately sought to answer: *"To what extent can urban green spaces be managed at the municipal level to ensure spatial justice within the built environment, thereby stimulating socially sustainable urban development?"*

Through answering this research question, the thesis aimed to promote spatial justice as a core principle in urban green space management, supporting broader social sustainability goals.

Key words

Spatial justice, urban green spaces, policy, socially sustainable urban development, municipality, Maastricht

Preface

Who does not enjoy spending time in green space? Be it at home, in the neighbourhood, or on holidays. And did you know that spending your time surrounded by green, be it consciously or unconsciously, benefits you in many ways? Not only socially, economically or environmentally, but also psychologically and physically!

With a bachelor's degree in Landscape Architecture and Spatial Planning from Wageningen University & Research, this knowledge has always been very valuable to me. When I moved from Wageningen to Delft to do my masters, I kept this in mind and made it come forward whenever possible in my chosen track Management in the Built Environment. And what a better opportunity than to also make it come forward in my graduation research! During one whole year, of which the first half year part-time and the second half year full-time, I worked with pleasure, enthusiasm, and curiosity on this report in which I focussed specifically on the spatial justice of urban green spaces. Even though I only got to learn more about this topic in the second year of my Master's, I loved to dive deeper into it.

I would like to say ***thank you*** to my supervisors, Yawei Chen and Ellen Geurts, for guiding me this year, providing me with feedback, and keeping me on the right track in this tough, but rewarding, process. ***Thank you*** to Roberto Rocco and Hugo Lopéz for introducing me to the topic of spatial justice, and for enthusiastically providing me with new information and feedback via mail. ***Thank you*** to the municipality of Maastricht and its employees, where I was given the opportunity to do my research within the city I love most, and where I got to ask questions at the office that were answered with pleasure and were very helpful and insightful to me. Especially, a big ***thank you*** to Saskia Hendricks and Camiel de Bruijn for engaging with me in lively discussions and giving me clear and direct answers to my questions. And lastly, my biggest ***thank you*** to my mom, dad, and Niels who have supported me through *thick and thin* ;) ***Thank you*** for listening to my endless doubts, brainstorming with me about ideas, and always being there for me. ***Thank you*** mom and dad for offering me your home-offices and moving away from Alphen aan den Rijn to Belfeld, where the (public and private) green spaces are way more beautiful than in the Randstad. And ***thank you*** Niels for being the Excel – and SPSS nerd that you are, and for going on runs to blow off steam whenever needed.

With that being said, I am proud to present to you the report that marks the end of my university journey.

I hope you enjoy reading!

Anne Erven
Belfeld, June 12th, 2025

Personal motivation

From an early age onwards, I spent my holidays hiking and cycling through nature, most often in France. The open space there always felt richer than in the Netherlands, where green space is already quite limited due to our smaller land area. My experiences in these contrasting environments sparked my early appreciation for nature in daily life.

In 2018, I began studying Landscape Architecture and Spatial Planning at Wageningen University & Research, where I learned to design green spaces and started to understand its deeper significance. The creative process of designing was satisfying, but I was often hit by a disconnect. Despite what I was learning in theory and applying in the design studios, real-world practices did not seem to reflect the same level of commitment to creating accessible green environments.

During my minor in Sweden in 2021, I took additional courses on landscape architecture and saw first-hand how different it can be when green space is genuinely appreciated. Sweden's cities seemed to have more valuable green spaces, and people there showed genuine awareness of nature's benefits, integrating it meaningfully into their lives. It reminded me of the thought that our relationship with green spaces in the Netherlands could be much improved. But how?

Returning to the Netherlands and finishing my bachelor's degree, I felt ready for a new direction: management. I was excited to discover that my passion for green spaces could overlap with the built environment. Yet, the transition was not without challenges. The pre-master programme I had to follow was very architecturally-oriented, and I felt like green spaces were often seen as secondary or even less important. Thankfully, when starting my master's Management in the Built Environment, I could build further on the importance of green spaces within the urban management context.

And so, I immediately did. The first course I followed, *Research Methods 1*, involved writing a research proposal on Urban Development Management. I chose to explore the relationship between socio-economic factors and public green space availability. A topic that combined my background in landscape architecture with the social dimensions of space. Writing that proposal was inspiring, and I was proud to present it to my class where it was awarded first place. This experience confirmed for me that I was on the right path, exploring an issue I care about, but feel is still undervalued in society today.

I do explicitly want to point out: *I am not an activist*. However, I do believe we are at an important moment in time. With urban populations growing and housing demands on the rise, green spaces risk being further overshadowed, even though they are crucial for creating liveable, healthy environments. If we fail to rightly manage them, we may soon find ourselves solving issues that could have been avoided through forward-thinking management. I am committed to ensuring that new developments consider these (un)conscious green needs by proactively and fairly establishing them into the built environment, so residents feel connected, comfortable, and valued in their homes, communities, and cities.

And, as injustice within cities is often a product of historical social actions, could it not, then, be addressed through new, intentional (social) actions?

My aim with this thesis was to explore how we can create more just and thoughtful management practices to prevent the problems of tomorrow and, in doing so, create more inclusive, resilient urban landscapes today, and in the future.

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1. Introduction

1.1 Research background

Urbanisation is happening at an extraordinary pace, with the number of people living in urban areas said to rise from 50% in 2010 to nearly 70% by 2050 (United Nations, 2013). This growth requires the cities worldwide to expand and densify, driving the demand for sustainable urban development. In such densely populated environments, achieving sustainability involves more than creating resource-efficient systems. It includes fostering attractive and appropriate urban settings that enhance the quality of life for its residents as well (Haaland & Van Den Bosch, 2015). However, the spatial constraints, uneven distribution of public spaces, and mismatches between demand and supply present significant challenges to these efforts (Schirpke et al., 2019; De Koning, 2025).

Public open spaces, such as squares and parks, are finite resources that are often subject to competing claims for access, control, and representation. These conflicts come from bigger political and economic processes, demonstrated by the *urban growth machine* concept that highlights how land-based elites frequently prioritise economic exchange values over the social and environmental use values of land (Smith & Floyd, 2013). Such priorities show a tension between financial growth and social equity, a dilemma formulated by Doreen Massey's question "*How are we going to live together?*" (Massey, 2011). Addressing this question requires spatial planning, management, and governance frameworks that balance economic competitiveness with collective welfare, guaranteeing fair access to public goods and safeguarding the rights of marginalised communities (Rocco, forthcoming).

Cities seem to be confronted with the dilemma between planning a compact city and a green city (Wolff & De Jong, 2025). Both the development of the compact city and urban green spaces are claimed to be important for sustainable development, yet densification within limited space is also shown to put urban green spaces under pressure (Team Stadszaken, 2014). Even though densification is an important strategy in tackling housing and sustainability goals, focussed and integrative measures on policy-level seem essential to overcome these conflicts. Particularly in a time of continuing climate change, urban green spaces play a valuable role in lessening the effects of more extreme weather events, such as heavy rainfall and heat waves (environmental sustainability). The urban green spaces also play a crucial role for the physical well-being of urban dwellers (social sustainability). Without strong management principles that order the provision of just urban green spaces, its loss is said to be unavoidable in densification processes (Universiteit van Amsterdam, 2021).

In the Netherlands, the pressures of urban densification have resulted in significant reductions in public green space, particularly in high-urban municipalities. Over the past five years, public green space per household has decreased by 24%, resulting in a net loss of 658 hectares (2,5%) across the country's thirty largest municipalities. Despite the widespread recognition of the value of green spaces for, among others, climate resilience, physical well-being, and social cohesion, these benefits are increasingly overshadowed by urbanisation and residential development pressures (Jansen, 2024).

As the Netherlands continues to densify its already highly urbanised cities, the availability of public green spaces is expected to further decrease, especially on a per capita basis. However, ensuring universal access to safe and inclusive public spaces, including green areas, is a key target of the United Nation's Sustainable Development Goal (SDG) 11, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable (De Vries et al., 2020; United Nations, 2015). This challenge is part of the broader global concern for sustainable cities, which gained prominence with the introduction of the SDGs in 2015 (United Nations, 2015). As urbanisation increases, cities must adopt strategies that build resilience across social, economic, and environmental dimensions. This multidimensional approach means that urban development success is no longer measured by economic growth alone. Instead, it also depends on how effectively cities integrate environmental and social dimensions (Syahid et al., 2017).

1.2 Problem statement

Urban green spaces are becoming increasingly scarce in the Netherlands, even though they are vital to people's well-being, social inclusion, and quality of life. As cities continue to densify, it becomes even more important that the green spaces that do exist are well-suited to the needs and preferences of local residents (Jansen, 2024). The concept of spatial justice can help ensure that the urban green spaces are more appropriately tailored to their users by promoting distributive, procedural, and recognitional justice. However, in the Dutch context, the spatial justice of urban green spaces remains underexplored.

Research has shown that more urbanised municipalities often include a higher number of disadvantaged neighbourhoods, where access to green space is even more limited and the quality is generally poorer (The Health Foundation, 2024; Pendleton, 2024; European Union, 2023; Mommers, 2023; De Vries et al., 2020). This imbalance matters, because green space is not just about leisure or aesthetics, it is strongly tied to health outcomes, social connection, and the experience of inclusion (Landy & Saglio-Yatzimirsky, 2014). Moreover, spatial justice is about more than just fair distribution. It also involves looking critically at the social and institutional structures that maintain these inequalities over time (Pereira et al., 2017).

Current planning and sustainability policies increasingly talk about social inclusion, whilst the lived experiences of residents, and how they actually experience and use these spaces, are still often missing from the conversation. Without a clear understanding of these experiences, and without stronger coordination between policymakers, planners, and local communities, there is a real risk that spatial injustices will only deepen as urbanisation continues.

1.3 Research objective

The objective of this research was to explore how spatial justice can be meaningfully integrated into municipal planning to support the development of more inclusive and resilient urban green spaces, both now and in the future. Focussing on the municipality of Maastricht, the study examined whether the way spatial justice is addressed in local policy influences how residents use and experience urban green spaces. By doing so, it aimed to assess whether improvements at the municipal level could lead to more spatial justice, greater satisfaction, and more usage of these spaces. Given Maastricht's shifts towards participatory management, this research offers a timely opportunity to embed spatial justice principles into long-term urban strategies. Ultimately, the study sought to highlight the added value and practical implications of this integration, supporting a more socially sustainable urban vision that reflects the diverse needs and lived experiences of the city's residents.

1.4 Research questions

Main research question

Building on the issues discussed before, this study turned to the municipal level as a key actor in addressing spatial injustices in urban green space management. Municipalities shape not only policies, but also how those policies are implemented and experienced by residents. By examining this link between policy and lived experience, the research positions municipal practice as a powerful instrument for driving more inclusive, socially sustainable urban development.

The main research question guiding this study is:

"To what extent can urban green spaces be managed at the municipal level to ensure spatial justice within the built environment, thereby stimulating socially sustainable urban development?"

This central question was investigated through three sub research questions, which are elaborated upon below.

Sub research question1

"How is spatial justice currently integrated into municipal management of urban green spaces as a means to support socially sustainable urban development?"

The first sub research question investigated how spatial justice is currently integrated into municipal management of urban green spaces to support socially sustainable urban development. This was addressed through a combination of literature and document analysis focussing on Dutch national frameworks, regulations, and planning guidelines that influence urban green space management. Recognising spatial justice as a vital component of social sustainability, the research examined how this concept is embedded in municipal policies. To further understand the decision-making environment, stakeholder mapping identified the key actors and their roles in shaping urban green space management. The study then concentrated on the municipality of Maastricht, where a thorough review of municipal (policy) documents and semi-structured interviews with municipal representatives provided detailed insights into how spatial justice has been interpreted and applied in both historical and current urban green space management practices.

Sub research question 2

"How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces?"

Building on the previous sub research question, this part of the study examined how spatial justice is experienced by residents at the neighbourhood level in Wittevrouwenveld, specifically regarding their satisfaction with and usage of the Groene Loper urban green space. A primarily quantitative survey collected data on residents' perceptions and behaviours, while qualitative responses provided additional context. These findings were further enriched through observations and semi-structured interviews, offering a deeper understanding of the challenges residents face and capturing the lived experiences that shape their relationship with the urban green space.

Sub research question 3

"How do the policy levels of spatial justice align with the experienced level of spatial justice in the neighbourhood, and what lessons can be drawn from this comparison?"

The final sub research question investigated the alignment between the policy-level of spatial justice and residents' lived experiences at the neighbourhood level. To answer this, the findings from the first two sub research questions were compared to evaluate how spatial justice, as addressed in policy, corresponds with its actual manifestation in daily life. Building on this comparison, two focus groups were conducted, one with residents of Wittevrouwenveld and another with municipal employees, to discuss the results and explore the practical implications of integrating spatial justice more effectively within urban green space management.

Conceptual model

The conceptual framework shown in Figure 1 formed the foundation of this research. In the figure, spatial justice is positioned as the *moderating variable* between urban green spaces, seen as the *independent variable*, and socially sustainable urban development, the *dependent variable*. This study viewed spatial justice as a concept that modifies the strength of the relation between urban green spaces and socially sustainable urban development. The framework also clarifies how each sub research question connects to the specific components of the model. Together, these elements collectively address the overarching main research question that guides this research.

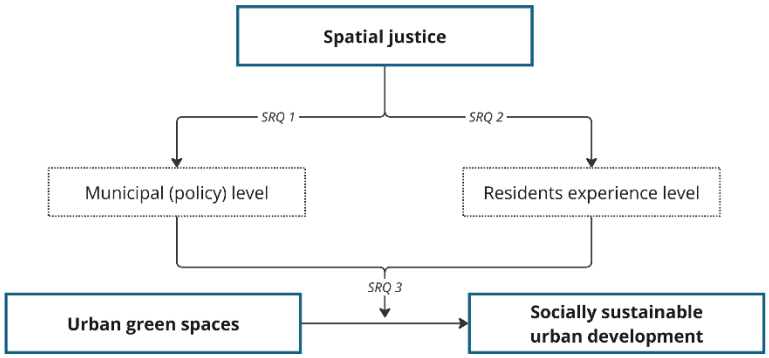

Figure 1: Conceptual framework of this research, illustrating how spatial justice moderates the relationship between urban green spaces and socially sustainable urban development. Image by author.

1.5 Relevance

The relevancy of (socially) sustainable urban development, spatial justice, and urban green spaces has become increasingly prominent in current urban discussions, as these concepts together highlight how the benefits and challenges of urban environments are distributed across different communities. Examining urban green spaces through the lens of spatial justice provided a deeper understanding of the systems that shape access to these fundamental resources. This perspective not only looked critically at social injustices, but also underscored the importance of integrating spatial justice into academic research to drive meaningful improvements in urban management.

1.5.1 Societal relevance

In the context of sustainable urban development, the focus lies in meeting the present societal needs without compromising the ability of future generations to meet theirs (Mehan and Soflaei, 2017). By incorporating socially sustainable urban development into this research, key issues such as governance, social justice, and community well-being were addressed specifically.

Urban green spaces play a fundamental role in enhancing the quality of urban life by providing essential ecosystem services. They offer a range of benefits, including environmental, economic, social, and psychological well-being, as well as physical health improvements (Schipperijn, 2010). Beyond their immediate benefits, urban green spaces are crucial for climate change adaptation. However, these resources often do not receive the attention they deserve in urban management discussions (Derkzen et al., 2015). Rapid urbanisation has further intensified pressure on green areas, threatening their availability and the benefits they provide (Zhou & Wang, 2011). As urban green space scarcity increases, it becomes more crucial that the existing spaces are better-suited to the needs and preferences of the local population, ensuring they align with their wishes and desires as optimally as possible. Without proactive strategies, cities, particularly those experiencing significant population growth, face the risk of losing the benefits of these crucial spaces for its residents (Derkzen et al., 2017).

These challenges posed by urbanisation highlighted the urgent need for research into the spatial justice of urban green spaces. Understanding how spatial justice functions in urban settings and how it can be applied to create more inclusive cities will ultimately contribute to a more just and socially sustainable society, and a potential better well-being and higher quality of life for its individuals.

1.5.2 Scientific relevance

Beyond its societal implications, exploring spatial justice in relation to urban green spaces also carried substantial scientific relevance. A critical gap remained in understanding to what extent urban green spaces can be effectively managed within a municipal context to advance spatial justice. This shortcoming was evident in both academic literature and urban planning practice, particularly in relation to the development of strategies. Moreover, the literature lacked sufficient insights into how the dimensions of spatial justice are experienced by residents in their everyday lives, as the studies tend to emphasise policy frameworks or spatial analysis rather than residents' perspectives.

By addressing these gaps, this thesis aimed to contribute meaningful knowledge to the academic field. In doing so, it tried to expand discussions on spatial justice and urban green space management, deepening the understanding of how these elements can be integrated to foster more just and socially sustainable urban environments.

1.6 Dissemination and audiences

The study has been made available online to ensure broad accessibility, allowing researchers, students, and professionals to engage with the findings and potentially build upon them in future work. Given that the research was conducted as part of an internship at the municipality of Maastricht, it holds particular relevance for the organisation to actively integrate these insights into their urban planning practices and strategies where appropriate.

The research primarily targets urban managers, planners, policymakers, and sustainability professionals who can directly apply the findings to increase awareness of spatial justice in Dutch urban green spaces and drive positive change. Additionally, the thesis aims to inform academic researchers and students within urban studies, contributing to ongoing scholarly discussions. The municipality of Maastricht remains a key audience as well, positioned to benefit from the practical implications of the research. By addressing this diverse group, the thesis seeks to promote greater awareness and foster action toward more spatially just and socially sustainable urban environments now and in the future.

1.7 Structure of the report

This report is structured as follows. *Part I* outlines the theoretical background, introducing the key concepts of socially sustainable urban development, spatial justice, and urban green spaces. *Part II* presents the methodology, detailing the research design, data collection methods, and analytical approach. *Part III* provides the research findings of the different research instruments, integrating them with one another by focussing on the policies on paper, the realities on the ground, and the alignment of policy and reality. *Part IV* offers a synthesis of all findings through a critical discussion, followed by an assessment of the research's validity, generalisability, and limitations, as well as recommendations to the municipality and ideas for future research. This section concludes with the final answers to the sub research questions and the main research question. Finally, *part V* concludes with a reflection on the research process, followed by the references and appendices.

Part I Theoretical background

Part I provides the theoretical background for this research, outlining the core concepts of socially sustainable urban development, spatial justice, and urban green spaces. This part thereby established the foundation upon which the research framework and analysis are built.

2. Socially sustainable urban development

2.1 The evolution and dimensions of sustainable urban development

The idea of sustainable urban development has evolved over time, formed by changes in urban planning principles and the responses to socio-environmental crises. In the early 20th century, a Modernist urban planning, characterised by strict zoning and a focus on functionality, dominated the built environment. By the 1960s and 1970s, critics started arguing that Modernism's lack of human scale contributed to, among others, social fragmentation, crime, and declining community vitality (Smith, 1997). As urban crises increased across environmental, economic, and social dimensions, the need for alternative urban development approaches increased (Jansson et al., 2020).

The concept of sustainability itself gained importance with the publication of the Brundtland Commission Report by the United Nations, which defined sustainable development as *meeting the present needs without compromising the ability of future generations to meet theirs* (United Nations, 1987). This guiding principle became the basis for global policy frameworks such as the Millennium Development Goals (MDGs) and later the Sustainable Development Goals (SDGs) (Sachs, 2012; United Nations, 2015). Researchers further explored urban sustainability, of which the discussions shaped urban policymaking at multiple scales, from local governance to international initiatives (Jansson et al., 2020).

Sustainable development can be broadly understood as a multidimensional concept including environmental, economic, and social sustainability (Figure 2) (Perman, 2003; Rocco et al., 2024). *Environmental sustainability* emphasises ecological balance and green justice, ensuring that both human and non-human stakeholders are valued. *Economic sustainability* focusses on the long-term economic viability of the sustainable development. *Social sustainability*, often the least understood dimension, addresses governance, social justice, and community well-being (Rocco et al., 2024).

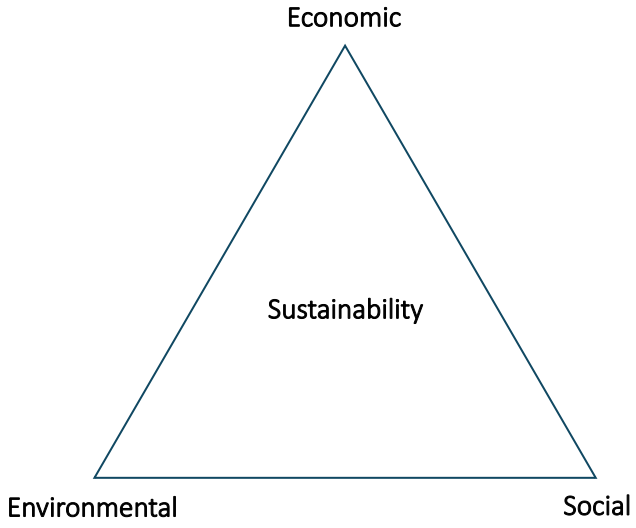

Figure 2: The three dimensions of sustainability: economic, environmental, and social sustainability. Image by author, inspired by Rocco et al. (2024).

Historically, debates on sustainability have prioritised environmental and economic aspects, with social considerations becoming more important only in the 2000s, as can be seen in Figure 3 (Colantonio, 2007). The later integration of social concerns into sustainability conversations has resulted in a scarcity of practical resources on promoting socially sustainable communities (Mehan and Soflaei, 2017). As sustainability definitions frequently centre on human needs, social sustainability remains an evolving and context-dependent concept (Ročak et al., 2016).

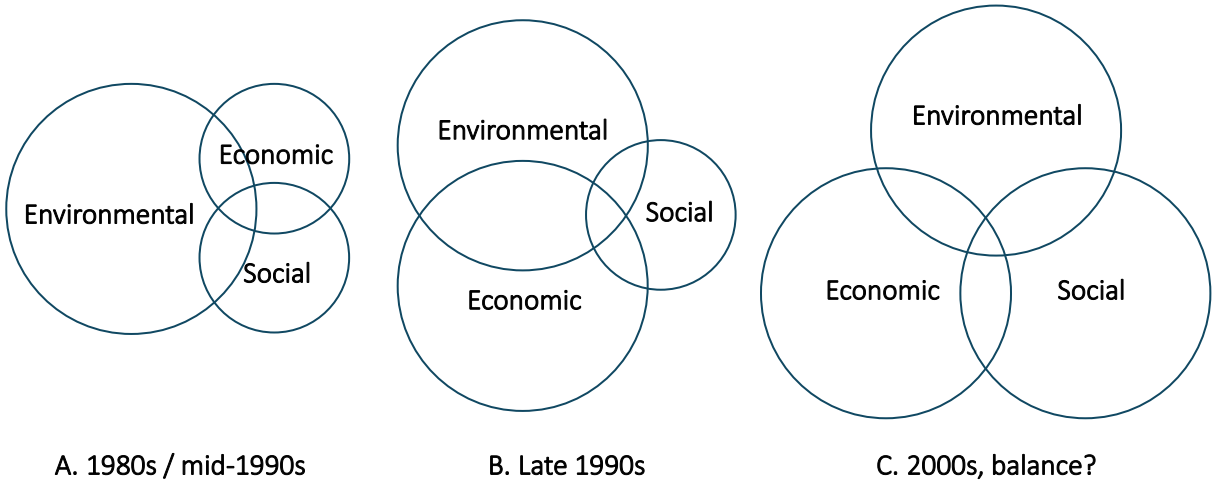

Figure 3: The different dimensions of sustainability and their relative importance over time. A. Importance of environmental aspect (1980s/mid-1990s), B. Importance of economic and environmental aspects (late 1990s), C. Balanced importance of all three aspects (2000s). Image by author, inspired by Colantonio (2007).

2.2 Social sustainability as a dimension of sustainable urban development

Social sustainability emerged as a separate concept of sustainable urban development, emphasising people-oriented development. Although the aspects of social sustainability, such as maintaining social life in cities, have been recognised for a long time, researchers continue to try to theorise this complex concept in relation to society, people, and the built environment. Table 1 presents the various definitions of the concept, revealing that there is a common emphasis on the *human* aspect as the central focus in defining the concept of social sustainability.

Theoretical framework	Researchers	Socially sustainable urban development definitions
Conditions framework	(Chiu, 2002)	Social sustainability relates to social norms and conditions in that any environmental or economic decision must not exceed the *community's tolerance* for change.
	(Laguna, 2014)	A condition where an extended set of basic needs are met for *all residents* regardless of their race/ethnicity, age, religion, gender, socioeconomic status and/or level of ability and the highest possible level of *social inclusion* and *participation* in community life is promoted.
Measurement framework	(Colantonio, 2010)	Traditional hard social sustainability themes such as employment and poverty alleviation are increasingly being complemented or replaced by the emerging *'soft'* and less measurable concepts such as happiness, social mixing, and sense of place.
	(Barron & Gauntlett, 2002)	Socially sustainable *communities* are equitable, diverse, connected, and democratic, and provide a good quality of life.
Future focus framework	(Chiu, 2003)	Social sustainability is the maintenance and improvement of well-being of *current and future generations*.
	(Magis & Shinn, 2009)	Social sustainability concerns the ability of *human beings of every generation* to not merely survive, but to thrive.
Process framework	(McKenzie, 2004)	Social sustainability is a *life-enhancing* condition within *communities*, and a process within communities that can achieve that condition.
	(Holden, 2012)	A process of urban development, supported by policies and institutions that ensure harmonious social relations, enhance social integration, and improve living conditions for *all groups*.

Table 1: Defining socially sustainable urban development., with the 'human' aspect of the definition in italics. Table by author, inspired by Mehan and Soflaei (2017).

Social sustainability is inherently context-dependent, varying across different socio-political and geographical settings (Shirazi & Keivani, 2017). Unlike environmental sustainability, which includes universally accepted goals, the goals of social sustainability are more subject to political and cultural interpretations (Davidson, 2010). Consequently, social sustainability is a complex and dynamic concept that adapts to specific urban settings (Jansson et al., 2020). The review on social sustainability literature by Mehan and Soflaei (2017) highlights the three core characteristics that reoccur in all the definitions on socially sustainable urban development. These are depicted in Table 2.

Core characteristics	Definition
Future orientation	Social sustainability aims to keep cultural and social values while ensuring long-term urban resilience. It promotes conditions that enable communities to succeed across generations.
Satisfaction of human needs	Inspired by Maslow's hierarchy pyramid, social sustainability incorporates access to fundamental resources such as food, water, health, safety, social relationships, and self-actualisation opportunities.
Social cohesion and urban integration	The built environment should facilitate social interactions, inclusivity, and quality of life, fostering well-balanced, well-connected communities.

Table 2: The three core characteristics of social sustainability across literature (Mehan and Soflaei, 2017).

For the purpose of this thesis, these recurring core characteristics are combined into one definition. Socially sustainable urban development can thus be understood as "*an approach that prioritises human well-being, fosters social interaction and cohesion, and remains future-oriented to enhance quality of life for present and future urban populations*".

2.3 Challenges in (socially) sustainable urban development

A key challenge in sustainable urban development is balancing compact city growth with open spaces, especially concerning the preservation of urban green spaces. The compact city model promotes urban densification to reduce urban sprawl, it minimises energy consumption, and enhances public transport efficiency (Balikçi et al., 2022). However, research highlights that densification also often leads to the loss of urban green spaces, undermining, among others, climate adaptation and people's well-being (Krigsholm et al., 2022; Schipperijn, 2010). Without strong planning frameworks, urban growth pressures are more likely to result in insufficient and inadequate green provision (Khoshkar et al., 2018). As densification remains a dominant strategy, other strategies to combine urban expansion with green infrastructure are becoming increasingly crucial (Krigsholm et al., 2022).

Ensuring *social* sustainability in urban development requires addressing the needs of marginalised groups, including women, ethnic minorities, and disabled individuals (United Nations, n.d.; Mir et al., 2020). Policy measures, social movements, and community-driven governance models are known to enhance their participation in urban decision-making (Mirzoev et al., 2022). Public-private partnerships can also play a role in promoting sustainable urban development, though private sector profit motives must be carefully managed to avoid exclusionary outcomes (Patrose, 2023).

3. Spatial justice

3.1 Conceptual foundations of justice

The European Green Deal's promise to *leave no one behind* and the European Pillar of Social Rights' goal of *building a fairer, more inclusive society* serve as key guiding principles for advancing justice in sustainability transitions. These commitments acknowledge that social, environmental, and economic issues in Europe are interconnected, and that addressing them requires an approach that considers fairness, inclusion, and equal opportunities for all (European Environment Agency, 2024).

Justice is a multi-layered concept, often discussed in relation to equality and equity. While *equality* ensures that everyone receives the same resources, *equity* acknowledges the varying needs of individuals and aims to provide tailored support. *Justice*, however, goes beyond equity, addressing and breaking down the systematic barriers that contribute to disparities (Opolentisima, 2022). Figure 4 provides a clear illustration of the distinction between equality, equity, and justice. Understanding this distinction is key to applying the principles of justice within urban spaces and the distribution of resources.

Figure 4: The distinction between the definitions of equality, equity, and justice (Equality, equity, and justice, n.d.).

Numerous perspectives define justice in different ways, each contributing to urban planning frameworks in their own distinctive way. Drawing from the work of Van Vulpen (2023), a coherent set of normative perspectives on justice is identified in Table 3. These perspectives (utilitarianism, egalitarianism, sufficientarianism, and prioritarianism) each propose different principles and aims for achieving justice, offering urban professionals varied perspectives through which fairness and resource distribution can be addressed in planning decisions.

Perspective	Principle	Aim
Utilitarianism	Maximise well-being for the largest public	Create general growth
Egalitarianism	Reduce relative inequality	Close the gap
Sufficientarianism	Guarantee minimum standards of living for everyone	Bring up to standard
Prioritarianism	Advance the least well-off	Support the left behind

Table 3: Conceptions of justice (Van Vulpen, 2023).

Utilitarianism prioritises maximising overall well-being, aiming for general growth. This approach tends to guide policies that promote efficiency and collective benefit, though it may risk overlooking marginalised groups. *Egalitarianism*, in contrast, emphasises reducing inequality by closing the gap between different social groups. It supports planning measures that address relative disparities in access to resources such as housing, green space, and infrastructure. *Sufficientarianism* focusses on guaranteeing a minimum standard of living for all, ensuring that basic needs are met before additional gains are considered. This principle is particularly relevant in addressing social deprivation in under-resourced neighbourhoods. Finally, *prioritarianism* advocates for advancing the well-being of those who are worst off, aiming to support the left behind. It brings attention to the importance of equity and targeted interventions in planning processes (Van Vulpen, 2023).

Whilst these conceptions of justice differ in emphasis, they are not mutually exclusive. Together, they provide urban professionals with a rich ethical foundation for developing policies that strive for just, inclusive, and sustainable urban environments (Van Vulpen, 2023).

3.2 Urban justice

The concept of urban justice started emerging in response to the worsening social inequalities due to capitalist urban development in the mid-20th century (Table 4). During the 1960s and 1970s, urban scholars and activists started to challenge the inequities created by the unhindered economic-driven urban growth. They recognised the city's space as a social product. Something that should belong to the people who use and shape it in their everyday lives. It was not just about having access to the city, but also about having a say in how it is run and who benefits from its economic value. Today, economic pressures continue to drive urban development, highlighting the need for fairer and more inclusive outcomes (Veldacademie, 2019).

Rawls (1971)	Young (1990)	Soja (1996)	Fainstein (2014)
Justice outcomes	*Justice processes*	*Spatial justice*	*Just City*
Ensuring equality and fairness	Respecting difference and considering non-distributive issues	Territorial justice, radical urbanism, rights to the city, urbanisation of justice	Criteria for policy making: democracy, equity, and diversity

Table 4: The evolvement of the concept of urban justice (Veldacademie, 2019).

Justice has traditionally been viewed within the boundaries of social structures, but in the urban context, it is not just a legal or ethical issue, but it is deeply spatial. The spatial dimension has gained increasing importance in recent years, with Edward Soja (1996) playing a crucial role in highlighting its significance. Zoning laws, land-use policies, and the accessibility of public spaces all contribute to systematic inequalities in the city. As Soja (2010) describes, the *friction of distance* refers to how proximity to resources shapes social opportunities and outcomes, further deepening spatial disparities. Fainstein (2014) sums it up clearly, concluding that a Just City is a "*city in which policy is not only determined by economic returns, but also assessed by its social consequences*". She has particular confidence in a government to act in ensuring the right balance.

3.3 Spatial justice

Soja (1996) introduced the concept of spatial justice, arguing that justice cannot be completely understood without considering geography. Spatial justice examines how location influences access to resources and opportunities, addressing inequalities that arise from both physical and social geography. Soja (2010) defined spatial justice as "*the fair distribution of societal benefits and burdens across space.*" His work stresses that the physical spaces people occupy significantly shapes their access to opportunities and resources, which in turn impacts justice.

Since the late 2010s, spatial justice has become more widely acknowledged due to its interdisciplinary character and its connection to concepts such as sustainable urban development, socio-environmental justice, cultural diversity, and environmental justice. This growing relevance has positioned it as both a critical academic focus and a valuable tool for policymaking (Dadashpoor & Dehghan, 2025).

Rocco (2021) builds further on Soja's theory by identifying three essential and interrelated dimensions of spatial justice, each accompanied by three corresponding indicators (Figure 5). These three dimensions and their indicators are fundamental in understanding how spatial justice functions in urban settings and how it can be applied to create more inclusive and fair cities (Lopéz et al., 2024).

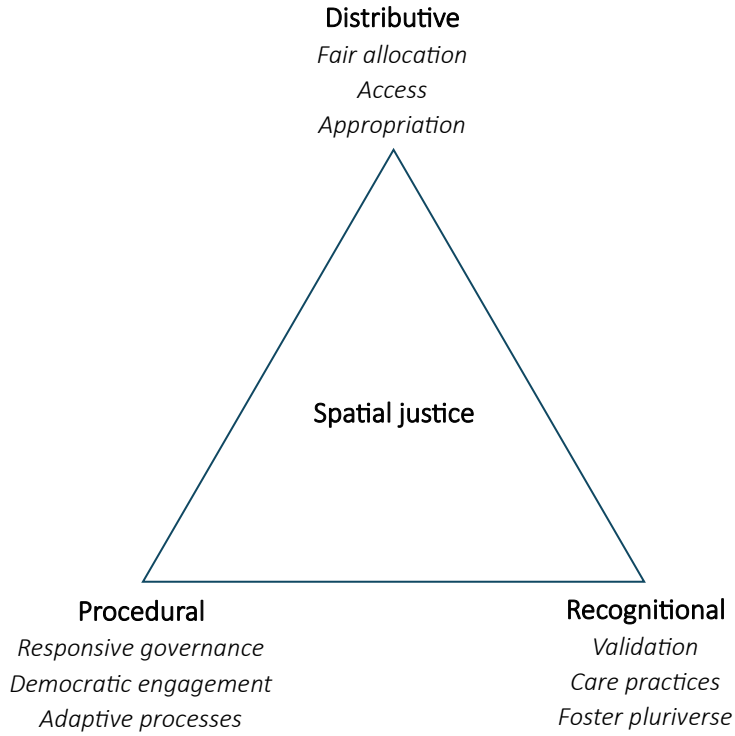

Figure 5: The three dimensions of spatial justice: distributive, procedural, and recognitional justice. Each with their own indicators. Image by author, inspired by Rocco (2021).

3.3.1 Distributive justice

Distributive justice centres on the fair allocation, access, and appropriation of the benefits and burdens of humans in cities and communities. It involves ensuring a *fair allocation* of resources and services, as well as the responsibilities and benefits attached to sustainability transitions. *Access* focusses on making these resources and services available, empowering individuals to take opportunities and shape their lives. *Appropriation*, meanwhile, is about enabling people to adapt, use, and transform the resources and services they have access to, allowing them to meet their needs and fully engage with what is provided (Rocco, 2022; Lopéz et al., 2024).

3.3.2 Procedural justice

Procedural justice puts an emphasis on the governance and decision-making processes surrounding the built environment to prevent the creation or continuation of inequalities. It strengthens democracy by prioritising resident engagement at various levels. Central to this is *responsive governance*, which promotes trust through negotiation and builds agreement among stakeholders, ensuring that social sustainability is both just and widely accepted. The dimension also emphasises *democratic engagemen*t, encouraging active participation, involvement, and empowerment of residents throughout the decision-making process, while creating a basis of trust that supports constructive negotiations. Lastly, procedural justice promotes *adaptive processes*, highlighting the need for institutions to remain flexible, incorporating feedback and adjusting policies, practices, and programmes to better align with evolving spatial justice considerations (Rocco, 2022; Lopéz et al., 2024).

3.3.3 Recognitional justice

Recognitional justice concentrates on acknowledging, safeguarding, and promoting the identities, practices, and socioeconomic or established structures of individuals, groups, and communities that are outside the mainstream or more dominant norms. It emphasises the *validation* of diverse identities and communities, ensuring their rights and roles are respected in both procedural matters and the distribution of benefits and burdens. It also focusses on *care practices*, which involve learning from, supporting, or implementing alternative approaches that protect and empower marginalised or vulnerable individuals and groups. Lastly, it seeks to *foster pluriverse* by strengthening the contributions of marginalised communities, focussing on their values, territorialities, and knowledge to influence new institutional arrangements (Rocco, 2022; Lopéz et al., 2024).

3.4 Measuring and evaluating spatial justice

Despite growing interest in spatial justice, measuring its presence and effectiveness remains a significant challenge. Many existing frameworks currently focus primarily on the dimension of distributive justice, often ignoring the procedural and recognitional aspects of spatial justice. This imbalance limits the understanding of how spatial justice can be fully evaluated and implemented (Rocco, forthcoming). Thus, refining methods of evaluation and measurement is essential for advancing spatial justice in urban contexts.

Lopéz et al. (2024) have created a valuable and useful analytical tool to analyse and understand issues related to the unfair distribution of benefits and burdens, processes that preserve inequalities, and misrecognition. It helps identify the strengths and weaknesses of urban planning and management, guiding improvements towards more spatially justice-oriented policies and practices. The "*Spatial Justice Package*" they created helps improve analysing and communicating by creating a clearer understanding of spatial justice. The package provides a systematic framework for continuous monitoring and development, encouraging critical reflection by outlining the different dimensions and indicators of spatial justice. Additionally, it aids in locating gaps and weaknesses in how spatial justice is being addressed, showing areas where different parts of spatial justice are lacking.

By assessing the Visions, Strategies, Objectives, and Actions (VSOA) in the documents in the first step, and categorising them into the Spatial Justice Package in the second step, it shows how spatial justice is integrated at different stages, supporting socially just urban sustainability transitions, or not.

The VSOA-technique was developed through both theoretical insights and practical use in evaluating urban plans and interventions (H. Lopéz, personal communication, February 15, 2025). Originating from planning experiences, it serves as a toolbox to align diverse stakeholder perspectives through vision-building and action-oriented decision-making. Influenced by strategic spatial planning (Albrechts, 2004), it reflects a shift towards more results-driven, inclusive, and adaptive planning approaches. It is rooted in transition management and adaptive governance (Frantzeskaki et al., 2012; Folke et al., 2005), and the technique supports continuous evaluation and refinement of urban strategies. This enables responsive and collaborative decision-making (H. Lopéz, personal communication, February 15, 2025).

The three tools, as part of the Spatial Justice Package, are relevant for measuring and evaluating spatial justice in socially sustainable urban development (Table 5). These tools provide valuable findings for urban professionals that are seeking to assess and integrate spatial justice into their practices, although challenges remain in achieving a fully inclusive approach (Lopéz et al., 2024). The process is further elaborated upon in Part II on the Methodology.

Tool	Description
Spatial Justice Conceptual Model (SJCM)	Breaks down spatial justice into practical components for wider application.
Spatial Justice Benchmarking Tool (SJBT)	Assesses, analyses, and reflects on spatial justice considerations.
Justice Readiness Level (JRL)	A visual tool for comparing and tracking levels of justice-readiness.

Table 5: The tools needed to measure and evaluate spatial justice, derived from the Spatial Justice Package (Lopéz et al., 2024).

Concluding, spatial justice can be better understood by reimagining space not as a neutral container, but as a social construct, a 'thing' shaped by social relations and processes (Rocco et al., 2024). This aligns with Soja's (2010) view of space as a dynamic process, rather than just a passive setting for social activity. Instead of striving for absolute justice, which is unachievable, assessing spatial justice through the Spatial Justice Package provides a more practical approach in which acceptable ranges of inequality can be established and developed to achieve more tolerable levels (Rocco, forthcoming).

4. Urban green spaces

4.1 Definition and effects of urban green spaces

Urban green spaces play an important role in all dimensions of sustainable urban development (environmental, economic, and social), providing essential benefits especially to the environment and urban communities. Research by Dong et al. (2024) indicates that justice within urban green spaces has a significant positive impact on psychological responses, physical activity, and mental health. This provides a scientific basis for the development of healthy cities. As cities face the increasing pressures from population growth and environmental challenges, the provision and spatially just distribution of urban green spaces has become crucial. Research on urban green spaces, particularly in the Netherlands, addresses these concerns by contributing to global efforts towards sustainability and improving urban living conditions (Syahid et al., 2017).

A clear definition of urban green spaces is necessary for understanding their scope and for developing indicators to evaluate them (Rodenburg et al., 2003). Urban green spaces refer to public or private open spaces in urban areas that are mainly covered by vegetation. These spaces support active and/or passive recreation opportunities and provide direct and indirect benefits. Examples of urban green spaces include parks, natural areas near urban centres, gardens, schoolyards, and workplace green spaces (Stigsdotter, 2005). They can be classified based on factors such as size, usage, functionality, and location (Byrne and Sipe, 2010). While they can be privately owned or may require an entrance fee, their overall purpose remains to enhance urban life (Schipperijn, 2010). Understanding urban green spaces as goods highlights their potential to foster justice within urban societies, addressing disparities in access and benefits across different socio-economic groups (Nesbitt et al., 2018).

The characteristics and the availability of urban green spaces differs greatly across city types. In *new cities*, the urban green spaces are designed with sustainability and quality of life in mind. The new cities often feature more extensive urban green spaces, whilst in *peripheral cities*, characterised by low population and adequate housing densities, the green and natural spaces are less significantly present. In the *intermediate cities*, the urban green spaces' coverage is more limited, even though these cities do contain moderate amounts of green spaces. However, the lowest amount of urban green spaces can be found in the *large cities* with high population and high housing densities. This results in less available urban green spaces, making its presence even more critical for urban residents (Rodenburg et al., 2003).

In recent years, urban green spaces have increasingly become a focus of attention and research into them has grown considerably. This is not only due to their significant health benefits, but also due to the many other advantages they offer. The conceptual model of park benefits by Bedimo-Rung et al. (2005) explored how this type of green space is used within a certain city or region. Schipperijn (2010) has broadened this models' scope, as depicted in Figure 6, to include all forms of urban green spaces, rather than just parks.

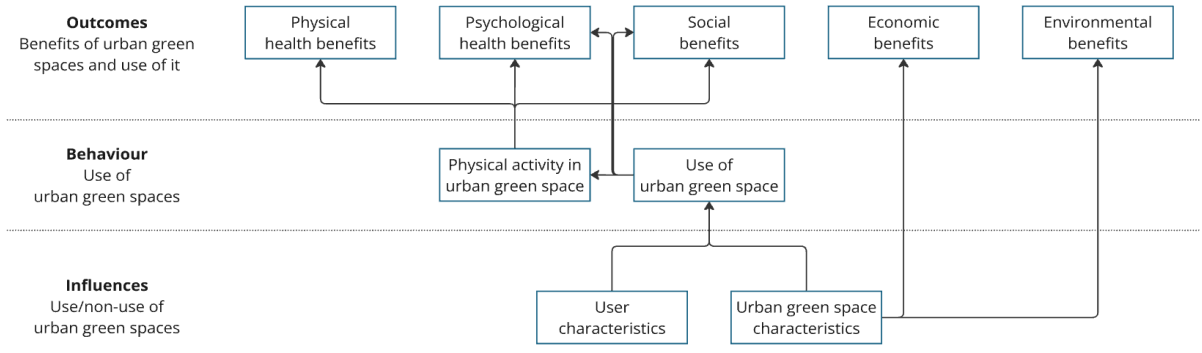

Figure 6: A conceptual model for the benefits of urban green spaces. Image by author, inspired by Schipperijn (2010).

The model helps explain how various factors influence the use and impact of urban green spaces. On the one hand, the *characteristics of the users*, such as their age, gender, education, and personal preferences play a role in shaping how users engage with urban green spaces. On the other hand, *characteristics of the urban green spaces* itself, like its size, type, proximity, and specific attributes also affect usage patterns. Together, these factors give a general insight into the extent and nature of visits to urban green spaces, ranging from casual strolls to more organised activities, with varying levels of physical activity involved. Ultimately, the benefits derived from these spaces fall into several categories. *Psychological* and *physical health improvements*, such as stress reduction and enhanced mental well-being, are among the most recognised outcomes. *Social benefits*, like fostering community connections or promoting cohesion in the community, are also significant benefits. Moreover, there are *economic* and *environmental advantages*, such as increased property values, better air quality, and support for urban biodiversity (Schipperijn, 2010). Additionally, longer and more varied uses of green spaces lead to deeper satisfaction (Jabbar et al., 2022). And overall, a greater satisfaction with one's living environment has a positive impact on someone's well-being and quality of life (Aragonés et al., 2016).

Despite these numerous benefits, urban green spaces are not without its downsides. For some, urban green spaces can evoke feelings of fear or discomfort, with concerns about safety being particularly noticeable in isolated or poorly lit areas (Jorgensen & Anthopoulou, 2007). Additionally, environmental issues such as the release of allergenic pollen from vegetation can negatively impact individuals with allergies (Ribeiro et al., 2009). Overcrowding is another concern, as high levels of use can lead to conflicts between different groups of users, and may result in damage to vegetation, weakening the quality of these spaces over time (Kissling et al., 2009). Furthermore, greening efforts in disadvantaged neighbourhoods, while mostly well-intentioned, can sometimes even worsen social inequalities. By making these areas more appealing, property values and rental costs often rise, which may force long-time, lower-income residents to relocate. This phenomenon, known as eco-gentrification, highlights an unintended consequence that can arise from urban greening initiatives (De Vries et al., 2020).

4.2 Ownership and accessibility

The relationship between ownership, management, and accessibility of urban green spaces significantly influences its spatial justice. Ownership determines who controls access and the activities permitted within a space (Shaffer, 2009). In Western contexts, the ownership of urban green spaces falls into two main categories. With *public property*, the urban green spaces are managed by the state or public entities. These spaces include urban parks, forests, playgrounds, and sport fields. Accessibility ranges from very high in urban parks to moderately restricted in special public spaces like botanical gardens. With *private property*, the urban green spaces are managed by individuals or associations. These spaces include domestic gardens, private community green spaces, and urban teaching farms. Accessibility varies widely, from exclusive access for members to fee-based entry for everyone (Chiodelli & Moroni, 2014).

The blurred boundaries between public and private green spaces complicate the discussions of spatial justice. A typological framework based on the ownership and management of urban green spaces provides a useful tool for analysing these complexities. Chiodelli and Moroni's typology framework (2014), depicted in Table 6, categorises the urban green spaces based on ownership and management, affecting their accessibility and therefore also their spatial justice (Barchetta & Chiodelli, 2015). This framework highlights how property regimes influence the distribution of benefits and the potential for just access to urban green spaces.

Property model	Property regime	Examples	Accessibility
Public property	*Stricto sensu* (strictly defined) public green spaces	Urban parks and forests; green ways; grass verges; tree pits; tree alleys	Very high: restrictions refer to the protection of the environmental quality and the public character of the space
	Special public green spaces	Children's playgrounds; sports fields; pocket parks; historical parks; cemeteries; botanical gardens	Rather high: limitations can apply to what a person can bring into the space
	Privately run public green spaces	Community gardens and intercultural gardens	Diverse: from high (rather unrestricted) to very low (access to the members of an association)
Private property	Simple private green spaces	Domestic gardens; green roofs; green walls	Minimal, at the almost complete discretion of the owner
	Complex private green spaces	Green spaces within private residential communities; urban gardens	Restricted to the members of the club or association
	Privately owned private green spaces	Urban teaching farms; bio-parks; golf courses	High: sometimes related to payment of an admission fee

Table 6: The property regimes and types of urban green spaces (Chiodelli and Moroni, 2014).

4.3 Stakeholder mapping

The management of urban green spaces is a process that involves the interaction of various stakeholders, including the private sector, society, and government. Each group plays a distinct role in shaping how these spaces are managed, contributing to both opportunities and challenges in achieving effective management (Hafni, 2009).

The *private sector* has a significant influence over urban green spaces management, particularly through its ownership and funding. With the introduction of New Public Management (NPM; Figure 7), the management of urban green spaces has moved away from being solely a government concern, primarily handled by organisations like local governments. Instead, it has become more of a market-driven issue, with contractors and private companies' taking on more central roles. Over time, this shift has evolved from a purely *governmental* approach to one of *governance*, in which public entities now work together with various stakeholders, including the end-users of the urban green spaces (Hafni, 2009; Dempsey and Smith, 2014; Jansson et al., 2020).

New Public Management

New Public Management (NPM) emerged as a reform movement in the 1980s, based on the idea that resources were limited. As a result, the main goal was to improve efficiency. NPM aimed to 're-invent' government by focussing on results and using privatisation and outsourcing as strategies to enhance the performance of the public sector. In this new management approach, the public was viewed as the provider of services for the users, who can be seen as the customers of these public goods.

Figure 7: The introduction of New Public Management (NPM) (Jansson et al., 2020).

Society plays a critical role as well by relying on community engagement and building social capital. Active participation from local residents in the management of urban green spaces should ensure that these spaces align better with the values and needs of the community. Strong social networks help communities deal with complex governance and access to resources, which can improve the quality and use of urban green spaces. On the contrary, weaker social ties can result in disparities in access and the overall quality of these spaces, underscoring the importance of inclusive engagement (Hafni, 2009; Jansson et al., 2020).

The *state* and the *local governments* provide the foundational policies and frameworks that support urban green spaces management. Their responsibilities include resource allocation, regulation, and the facilitation of community involvement. With the shift from traditional top-down governance to collaborative approaches, the need to engage a diverse group of stakeholders is emphasised, including the private entities and community organisations. However, challenges such as funding constraints and the risks associated with privatisation demand careful governance to maintain transparency and accountability. By ensuring balanced participation, governments can co-develop management strategies that address the diverse needs whilst safeguarding public interests (Hafni, 2009; Jansson et al., 2020).

4.4 Management of urban green spaces on different levels

The management of urban green spaces covers a strategic and inclusive approach to planning, designing, constructing, and maintaining green spaces within urban settings (Jansson et al., 2020). This process involves a variety of professionals, including green space managers and city planners, who collaborate across multiple policy levels to ensure that these spaces meet the needs of urban communities (Schipperijn, 2010). In the Netherlands, this management is shaped by a combination of government frameworks, provincial responsibilities, municipal actions, and increasing citizen participation.

The *central government* in the Netherlands sets the overarching frameworks and ambitions for nature policy, as defined in the 2011 nature policy decentralisation agreement. The *provincial governments* play an important role in implementing these policies, managing urban green spaces around towns and villages, linking nature reserves, maintaining woodlands, protecting flora and fauna, and supporting sustainable agriculture. Meanwhile the *municipalities* oversee the establishment and maintenance of public green spaces, such as parks, verges, and ornamental green spaces, as well as water features (Rijksoverheid, n.d.).

As discussed, a shift in the urban green spaces management practices by introducing the New Public Management has moved away from traditional government-led oversight toward more collaborative governance models (Jansson et al., 2020). An innovative development in this new approach includes *citizen participation*, where local residents take on a more active role in managing nearby green spaces. This approach aims to foster social cohesion, strengthen neighbourhood identity, and enhance community engagement. When residents collaborate to care for local urban green spaces, it creates a sense of belonging and collective responsibility, improving the overall quality of urban living as well (Rijksoverheid, n.d.).

The management of urban green spaces must also go through the complexity of sustainable urban development and land-use policies. Researchers emphasise the importance of long-term planning that integrates urban green spaces needs within broader urban strategies. The compact city development is known to reduce urban green spaces availability, especially in the high-density areas where financial incentives favour the construction of apartments and offices over green spaces (Balikçi et al., 2022). However, these areas do generate higher profits, which can, in its turn, fund green space creation. This reveals the tension between compact city development and preservation of urban green spaces as mentioned earlier. Institutional factors, such as governance structures and land ownership, also have a significant influence on urban green spaces' outcomes. Municipalities with higher land ownership can more effectively regulate and create urban green spaces, whereas fragmented governance complicates their integration into the urban management (Balikçi et al., 2022).

With the increasing demand for multifunctional and high-quality urban green spaces, encouraged by challenges like climate change and densification, the need for adaptive and inclusive management strategies is underscored. Effective governance must address the ownership complexities, engage users in decision-making, and respond to evolving societal needs. By fostering collaboration and prioritising spatial justice, urban green spaces management can aid in ensuring just access and benefits for all communities, boosting the role of urban green spaces in creating socially sustainable and liveable places (Jansson et al., 2020).

4.5 Phasing of urban green space management

Several interrelated phases can be recognised in the management of urban green spaces. These are planning, design, construction, and maintenance, as depicted in Figure 8. The stakeholders should be engaged throughout these stages to ensure that the urban green spaces effectively meet community needs and contribute to socially sustainable urban environments as well (Jansson et al., 2020).

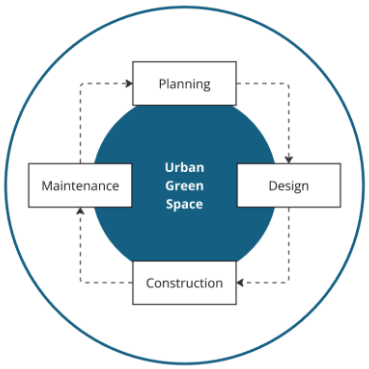

Figure 8: The phasing of urban green space management. Image by author, inspired by Jansson et al. (2020).

In the ideal situation, the *planning* phase serves as the foundation, focussing on the assessment of community needs, the existing conditions, and the available resources. Stakeholder engagement is central at this stage, enabling local residents, organisations, and other relevant stakeholders to provide input and set priorities. The outcome is often a comprehensive plan that outlines the vision, objectives, strategies, and actions for the management of urban green spaces (Hafni, 2009; Jansson et al., 2020).

Following the planning phase, the *design* phase translates the plan into real concepts. This phase involves the creation of detailed designs that balance aesthetics, functionality, and ecological considerations. The designers incorporate community feedback to ensure the plans reflect the user needs while addressing factors such as accessibility, safety, and environmental impact. The deliverables from this phase may include master plans and detailed drawings that guide the following construction (Hafni, 2009; Jansson et al., 2020).

The *construction* phase focusses on the implementation of the designs. Effective coordination among contractors, suppliers, and other relevant stakeholders is critical to address challenges such as budget constraints or unforeseen site conditions. Quality control measures ensure that the final urban green spaces aligns with the intended vision and meets the established standards that were established in the earlier stages (Hafni, 2009; Jansson et al., 2020).

Lastly, the phase of *maintenance* aims to safeguard the long-term functionality and the quality of urban green spaces. Regular upkeep, repairs, and enhancements are informed by user feedback and the initial design. This phase requires adaptability to respond to changing community dynamics and environmental conditions. The availability of capital and revenue funding is essential to sustain these efforts, with alternative sources such as partnerships, local charges, and taxes often extending budgets (Hafni, 2009; Jansson et al., 2020).

The level of participation may vary across these phases, reflecting different levels of engagement as described in Arnstein's Ladder of Participation (Arnstein, 1969) depicted in Figure 9. This model ranges from *non-participation* and *tokenism* to *citizen power*, where stakeholders actively collaborate or undertake decision-making roles. An effective and just management of urban green spaces should control this diversity in participation to create spaces that are inclusive, functional, and (socially) sustainable (Jansson et al., 2020).

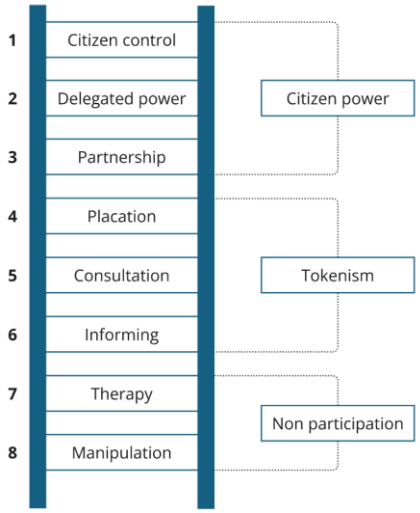

Figure 9: Arnstein's Ladder of Participation. Image by author, inspired by Arnstein (1969).

4.6 Usage and users

Building further on the conceptual model for the benefits of urban green spaces and exploring how urban green spaces are used within a specific context (Figure 6), the usage of urban green spaces can be broadly defined. This includes any form of visit, whether it involves recreational activities, transportation, or passive enjoyment. According to Schipperijn (2010), usage ranges from intentional activities, like sports or social gatherings, to incidental interactions, such as passing through on the way to another destination. Understanding these patterns requires a socio-ecological perspective that examines the interplay between individual characteristics and the environment of urban green spaces, related to both physical and socio-cultural aspects (Raymore, 2002). The socio-ecological model shown in Figure 10 functions as a framework for understanding the factors that are of influence on the usage of urban green spaces. These factors can be categorised as individual, physical environmental, and perceived environmental determinants, which interact in complex ways to consequently shape the behaviour (Schipperijn, 2010).

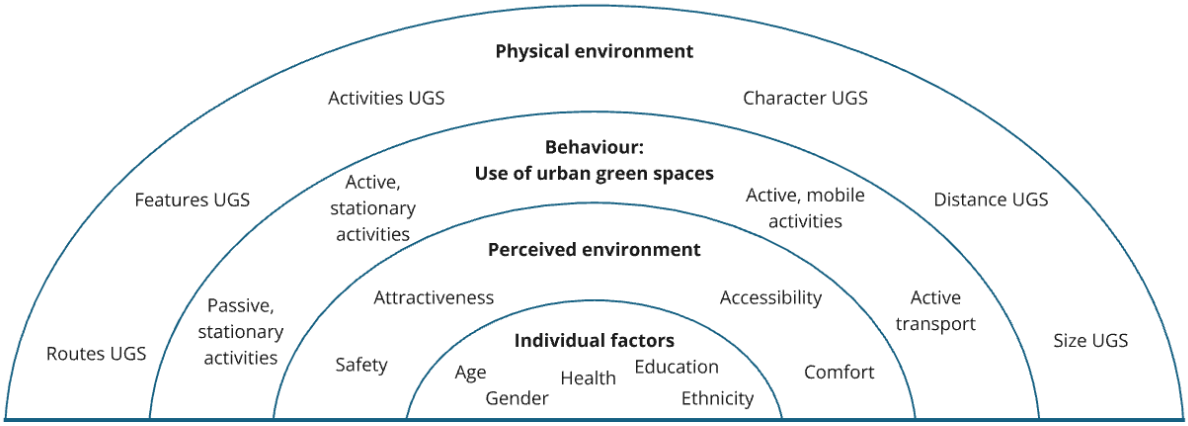

Figure 10: A socio-ecological model for the use of urban green spaces. Image by author, inspired by Schipperijn (2010).

4.6.1 Individual factors

The socio-ecological model highlights the role of *individual factors* in determining how urban green spaces are used. The variables of gender, age, education, health, and ethnic background have been found to be associated with patterns of urban green spaces usage (Yilmaz et al., 2007). For instance, individuals with better health and higher levels of education are more likely to engage in physically active behaviours within nearby urban green spaces (Schipperijn et al., 2010a). When considering a combination of these factors, different user groups emerge, each with their unique preferences for urban green spaces features, activity patterns, and frequency of visits (Schipperijn et al., 2010b). The proximity to urban green spaces also interacts with individual factors. People with limited mobility, such as those with young children, older adults, or individuals in poor health, tend to use the nearest urban green spaces more frequently (Schipperijn et al., 2010c).

4.6.2 Physical environmental factors

The *physical environment* is another critical determinant of urban green spaces usage. Key attributes, including routes, features, activities, character, distance, and size of urban green spaces significantly influence visitation patterns, even after accounting for individual factors. For example, closer urban green spaces are more frequently visited, while larger urban green spaces and those with diverse features, such as playgrounds or sport fields, attract a broader range of users (Schipperijn, 2010).

4.6.3 Perceived environmental factors

The *perceived environmental factors*, related to the perceived safety, attractiveness, accessibility and comfort often play the greatest role in determining the usage of urban green spaces. For example, self-estimated proximity to a well-liked or frequently visited urban green space is often a stronger predictor of usage than actual measured distance (Scott et al., 2007). People tend to underestimate the distance to familiar or more enjoyable urban green spaces, while perceiving less-known or less-favoured spaces as being farther away than they actually are. Additionally, positive experiences and perceived qualities significantly enhance a space's attractiveness and encourage more frequent visits (Schipperijn, 2010).

4.7 Implications for urban planning and management

Effective management of urban green spaces thus requires a basic understanding of the diverse needs and behaviours of its end-users. Neighbourhood analyses are necessary to be conducted in order to identify specific constraints and opportunities for enhancing urban green spaces usage. For instance, while adding more urban green spaces may not always increase its usage, ensuring that existing spaces are perceived as accessible, well-maintained, and appropriately designed can make the significant necessary difference for its end-users. This is where spatial justice becomes an essential component in urban planning and management.

Ultimately, adapting urban green spaces to the unique characteristics of a neighbourhood, including its residents, existing green spaces, and urban fabric, is key to maximising their impact. By aligning all phases of urban green spaces management with the preferences and needs of its users, one can foster more spatial justice and consequently contribute to the step to more socially sustainable urban development (Schipperijn, 2010).

Part II Methodology

Part II outlines the methodological approach applied in this research. This part includes the research design, followed by the chosen research instruments for data collection and data analysis.

5. Research design

This chapter outlines the research design and method used to collect the data needed to answer the posed research questions. It begins by explaining the type of study and the nature of the data used. The case study design is then introduced, followed by a description of the research method applied. Lastly, the chapter discusses the ethical considerations involved and the strategies applied for data management.

5.1 Type of study

In this section, the *research purpose* clarifies the study's multiple objectives and its intended contribution, while the *logic of inquiry* explains the approach taken to explore the research problem. Together, these elements provided the foundation for a coherent research process (Blaikie & Priest, 2019).

5.1.1 Research purpose

The research *explored*, *described*, and sought to *understand* spatial justice in the context of urban green spaces. It followed a structured approach, moving from identifying patterns to uncovering causes and exploring solutions. First, it examined how spatial justice was and is addressed in municipal policy and experienced by local residents, focussing on the *what.* Next, it quantified these experiences and investigated their impact on green space experience, focussing on the *why*. Finally, it explored the *how* by discussing potential interventions to improve spatial justice and enhance the usage of, and satisfaction with urban green spaces (Blaikie & Priest, 2019; Hoekstra, 2023a).

5.1.2 Logic of inquiry

The study primarily followed a *deductive reasoning approach*, complemented by *abductive reasoning* in its final stage. It started with the theory of spatial justice, from which the researcher built the main hypothesis of the study: that individuals' experiences of spatial justice influence their usage of, and satisfaction with an urban green space, moderated by policy integration of spatial justice (Figure 11). This hypothesis was tested through quantitative and qualitative methods in sub research questions 1 and 2. In the final phase, abductive reasoning was used to interpret these findings and, through qualitative methods, explore their implications for potential actions and policy interventions on the municipal level (Blaikie & Priest, 2019; Hoekstra, 2023b).

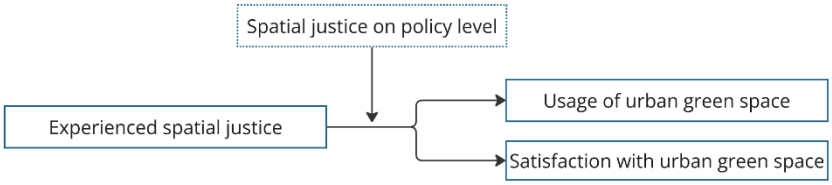

Figure 11: Main research hypothesis: individuals' experience of spatial justice influences their usage of, and satisfaction with, urban green spaces. This relationship is being moderated by how spatial justice is integrated into policy. Image by author.

5.2 Research method

The study employed a *single case study design*, integrating both *quantitative* and *qualitative research instruments*. A case study approach was chosen, explained in more detail in 5.3, as it provided an in-depth understanding of spatial justice within a real-life context. As discussed in the literature review, the concept of spatial justice is highly context-dependent. Therefore, a specific case study allowed for a detailed exploration of the complex interactions between stakeholders, processes, and experiences. This made it particularly valuable for assessing spatial justice and deriving insights that could inform broader strategies and policies within the chosen municipality.

Mixed research methods were applied, because the sub research questions required different approaches. More specifically, the study followed an *explanatory sequential mixed-methods design*, as illustrated in Figure 12.

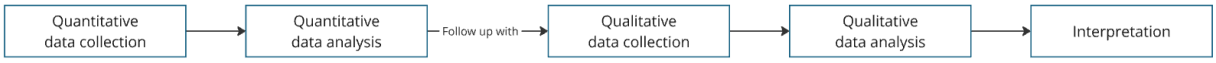

Figure 12: The explanatory sequential mixed-methods design. Image by author, inspired by Blaikie & Priest (2019).

The collection and analysis of the quantitative data was followed by the collection and analysis of the qualitative data, where equal priority was given to the two research methods. The primary focus was to explain the results of the quantitative research by discussing the quantitative results in more detail in the qualitative research (Terrel, 2012). By following this explanatory sequence, the study ensured a more comprehensive and nuanced understanding of the quantitative findings, ultimately leading to more informed conclusions through the qualitative findings. This methodological triangulation helped to ensure the overall validity of the research (Blaikie & Priest, 2019).

5.3 Case study design

In this section, the case criteria outline the key aspects that guided the selection process for the case, ensuring alignment with the research objectives. Following this, the selected case is introduced and connected back to these criteria, thereby demonstrating its relevance to this study.

5.3.1 Criteria for case selection

Based on the literature review and the objectives of this study, several case selection criteria were established. These are depicted in Table 7, divided into three categories: criteria for *the municipality*, for *the urban green space*, and for *the neighbourhood*.

The municipality	Dutch municipality with an emerging interest in spatial justice
	Policy engagement in inclusive urban development and green accessibility
	Experience in citizen participation
The urban green space	Multifunctional public space
	Open space with greenery
	Unpaved/paved trail(s), walking/cycling routes
The neighbourhood	Lower socio-economic status than average in the municipality
	Proximity to the chosen urban green space
	Known challenges with the spatial justice of the chosen urban green space

Table 7: The case criteria. Table by author.

5.3.2 Description of the selected case

The case of the Groene Loper (*the urban green space*) involving the residents of Wittevrouwenveld (*the neighbourhood*) in the municipality of Maastricht (*the municipality*) highlighted the complexities of integrating spatial justice into large-scale urban redevelopment. While the Groene Loper represented a promising intervention, a critical assessment was necessary to determine whether it successfully addressed historical inequalities or unconsciously reinforced them with regards to its spatial justice. The following sub-sections shortly elaborate on how the criteria from Table 7 were met within this particular case. A more detailed elaboration on their alignment can be found in Appendix A.

The municipality

The municipality of Maastricht is increasingly recognising the importance of spatial justice. While it has not yet become a top priority, the municipality is keen on integrating it into its policies, alongside citizen participation. This is particularly interesting for the new Environmental Vision, which is scheduled for completion by the end of 2025. This emerging curiosity signals that Maastricht is ready to engage with the concept of spatial justice in future urban development, which made it a relevant municipality for this research (De Ronde & Hendricks, personal communication, January 21, 2025).

Figure 13: The Groene Loper in the municipality of Maastricht, from above (West8, n.d.).

The urban green space

For the criteria that were set for the urban green space, the Groene Loper was a fitting case (Figure 13). This urban green space embodies a successful transformation of a former highway into a green corridor, with the highway now placed beneath the corridor. The space offers a multifunctional public open area with greenery, including unpaved/paved trails and walking/cycling routes.

The neighbourhood

Wittevrouwenveld (Figure 14) was as a valuable neighbourhood to explore with regards to the criteria set for the neighbourhood. This area has a relatively low socio-economic status when compared to other neighbourhoods in the municipality of Maastricht (Appendix A). Even though the Groene Loper was designed with the aim to make it accessible for residents of Wittevrouwenveld and better connect it to the city centre of Maastricht, the neighbourhood faces known challenges regarding the usage and accessibility of the Groene Loper. These issues made it an interesting neighbourhood to examine its spatial justice on both policy – and experienced level.

Figure 14: The location of Wittevrouwenveld in the municipality of Maastricht, depicted in a red square. The green line shows the position of the Groene Loper (Punt, n.d.).

5.4 Ethical considerations

The research conducted in this study was valid and met the standards of the scientific community. The research was transparent, legitimate research questions were posed, the literature study covered all the relevant aspects, and the right research subjects were involved. This was crucial, because not only participants needed to be respected, but also the scientific community in general. When unethical research is conducted, it could possibly lead to a decrease of trust by the community in social researchers. Therefore, research limitations were also mentioned, as well as 'negative' or contradicting results (Blaikie & Priest, 2019).

The research participants specifically were protected from any forms of harm and risk. This applied to the way the research was conducted and how the findings were reported. From the start onwards, the participants were made fully aware of any risks that were paired with the research. Also, they had to provide formal consent (Blaikie & Priest, 2019). For those reasons, the conducted survey was anonymous, and the results from the focus group were made anonymous.

The informed consent had to be *freely given* so that participants themselves could decide whether to participate or not. They were able to decline the request of participation. Also, the participants were *informed* properly, meaning that they were provided with sufficient information in understandable language about the research, the data processing activities, the purpose of processing, and the ability to withdraw consent. Also, participation was *unambiguous*, resulting in no question about whether or not the participant had consented to the research. Lastly, the informed consent was *specific* in order for the participants to be able to consent to each individual data processing activity. Throughout the data collection, consent could be revoked by the participants. They had the right to withdraw consent at any moment in time, and this was made easy for them (Strandberg, 2023).

5.5 Data plan

As this research involved personal data, a Data Management Plan (DMP; Appendix C) was created and approved by the Human Research Ethics Committee (HREC). The DMP described the practices of collecting, documenting, storing, and sharing research data throughout the research lifecycle. This was further supplemented by the Graduation Plan (Appendix D).

The DMP followed the FAIR principles for scientific data management: Findability, Accessibility, Interoperability, and Re-usability. *Findability* ensured that the data is easy to find for both humans and computers. *Accessibility* was about clearly defining the ways of accessing the data, including authentication and authorisation. *Interoperability* focussed on the idea that humans and machines should be able to interpret the data. Therefore, the data was made easy to integrate with other data and it was made interoperable with applications and workflows for analysis, storage, and processing. *Re-usability* is the ultimate goal of FAIR, as it optimises the re-use of the data. The data was well-described in order for it to be replicated and/or combined with other data in different settings (Strandberg, 2023; Wilkinson et al., 2016).

To ensure the protection of the personal data gained in this research, the General Data Protection Regulation (GDPR) principles were applied. Only personal data was collected that was required for the research project. It was kept for as long as necessary, and access was limited to only those who needed it for the purpose of the research. Also, transparency was given to the data participants, and appropriate security measures were followed when processing and storing the personal data (GDPR principles, n.d.).

With regards to the data collection methods, they enabled voluntary participation as mentioned before. The invitations to the survey and the focus group were not obligatory in any way. The planned legal ground that gave the right to collect the data was done with an opening statement in the survey (Appendix E and F) and a formal consent form with explicit consent points for the focus group (Appendix G and H). The participants were made aware of how their data was handled and distributed, and were allowed to withdraw at any moment.

The collected data was stored temporarily on Enalyzer in the case of the surveys, and on an mp3 device in the case of the focus groups. As quick as possible, the data was transferred to the project storage of the municipality of Maastricht in case of the survey responses, and to the project storage of the TU Delft in case of the focus groups. The data on Enalyzer and the mp3 device was destroyed after this task was finalised. The planned data storage was safe and could be accessed only by the researcher (Anne Erven), the supervisor (Yawei Chen), and the municipality of Maastricht. Risks were reduced by anonymising the gained data immediately to prevent any possible harm to the privacy of the research participants. This meant no risk of re-identification. This was done through the identification of personal information and irreversibly removing it from the data set. Combinations of indirect identifiers and information available in other sources was considered. Through data aggregation, anonymisation was eased further (Strandberg, 2023).

6. Data collection and data analysis

This chapter presents the used data collection strategies and techniques for analysis to address each sub research question within the study. It is structured per research instrument, offering a clear overview of how each instrument contributed to the overall research design.

Research method	Data collection instrument	Data analysis	Type of data	Source
Sub research question 1 *How is spatial justice currently integrated into municipal management of urban green spaces as a means to support socially sustainable urban development?*				
Qualitative	Literature / document review	Thematic review	Secondary data	Internet, TU Delft library
Quantitative	Municipal document analysis	Thematic document analysis	Secondary data	Internet, archive of the municipality of Maastricht
Qualitative	Interviews	Thematic analysis	Primary data	Employees of the municipality of Maastricht
Sub research question 2 *How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces?*				
Qualitative	Observations	Non-participant, naturalistic	Primary data	The Groene Loper
Quantitative and qualitative	Survey	Bivariate analysis	Primary data	Inhabitants of Wittevrouwenveld
Qualitative	Interviews	Thematic analysis	Primary data	Employees of the municipality of Maastricht, and inhabitants of Wittevrouwenveld
Sub research question 3 *How do the policy levels of spatial justice align with the experienced level of spatial justice in the neighbourhood, and what lessons can be drawn from this comparison?*				
Qualitative	Comparative analysis	Thematic analysis	Primary data	Findings from sub research question 1 and 2
Qualitative	Focus groups	Thematic analysis	Primary data	Residents of Wittevrouwenveld and pre-selected employees of the municipality of Maastricht

Table 8: Overview of all research design elements. Table by author.

As shown in Table 8, a range of both quantitative and qualitative research instruments were applied across the different sub research questions. This reflects a clear example of triangulation within the research design, as it involved the use of multiple methods and data sources to gain a more comprehensive and nuanced understanding of the researched concepts (Carter, 2014).

6.1 Literature and document reviews

Both the literature – and document reviews were based on secondary, qualitative data collected through (academic) databases available via the TU Delft Library and credible online sources. This included peer-reviewed journal articles and institutional reports related to socially sustainable urban development, spatial justice, and urban green spaces. These sources provided a theoretical foundation for the research and informed the development of the research framework and sub research questions.

The collected literature and document data were analysed using a thematic review approach. Key themes and patterns were identified across the sources to understand how the concepts of socially sustainable urban development, spatial justice, and urban green spaces were defined, related, and applied in existing research and documents. Additional documents were collected during the study to better understand and/or supplement the findings specifically related to the case.

6.2 Observations

Observations were conducted on-site at the Groene Loper to collect qualitative primary data. These observations aimed to gain a deeper understanding of the current physical and spatial characteristics of the area from the researcher's perspective, and to examine the various ways in which the space was utilised. Observing the site in its natural setting provided valuable contextual insights that complemented the other research instruments, and helped ground the analysis in the lived reality of the space.

The observational data was analysed using a non-participant, naturalistic approach, focussed on capturing patterns, behaviours, and spatial dynamics as they naturally occurred in the environment. Notes were thematically reviewed to identify relevant observations related to the physical layout, accessibility, and usage of the Groene Loper.

6.3 Interviews

Multiple interviews were conducted, mainly focussed on complementing the data of the other research instruments mentioned here. These included conversations with the municipal supervisors of this research, who provided insights into the relevance and potential impact of the research within their professional context. Additionally, interviews took place with other employees of the municipality, and with residents of Wittevrouwenveld. This qualitative primary data was essential for gaining a deeper understanding of the local context in which the research was situated and for identifying potential factors that may have influenced the findings.

The data analysis of the interviews was carried out using a thematic approach. The interviews were transcribed and carefully read to identify relevant themes and insights. These findings were not coded formally, but were interpreted and integrated into the results and discussion of the study where appropriate.

6.4 Municipal document analysis

A content analysis of municipal documents related to the Groene Loper project and the municipality of Maastricht was conducted to collect quantitative secondary data on spatial justice at the municipal policy level. These documents were obtained from the official archive of the municipality of Maastricht and reliable internet platforms. This analysis served as one of the core empirical components of the study. Therefore, the data collection process is discussed in more detail by outlining the data operationalisation, selection, and gathering procedures below.

Data operationalisation

The data operationalisation for the municipal document analysis was established through precisely identifying the different dimensions of spatial justice (Section 3.3) and their associated indicators (Table 9). By having explained them clearly, they became Specific, Measurable, Attainable, Realistic, and Time-bound (SMART). This ensured that each dimension was not only conceptually grounded, but also operationally well-defined.

Dimensions	Indicators	Specification
Distributive justice	Access	The need to enhance life opportunities by ensuring individuals and households have easy access to and can benefit from education, economic, and environmental opportunities
	Fair allocation	The fair distribution of burdens and benefits, with the goal of addressing socio-spatial disparities and tackling the underlying causes of inequality
	Appropriation	Empowering individuals to transform and make use of available resources, challenging inequalities, and highlighting the importance of redistribution to help people improve their capabilities and life outcomes
Procedural justice	Democratic engagement	Empowering individuals through ongoing, meaningful interactions between the community and government, guaranteeing that urban policies align with the needs and knowledge of the people
	Adaptive processes	The self-actualisation of institutions, promoting fairness in their processes and advocating for justice as a core principle
	Responsive governance	The importance of institutions to build trust by making sure their processes are fair, transparent, and sustainable
Recognitional justice	Care practices	The importance of learning from and supporting alternative collective practices that empower disadvantaged communities, such as participating in daily activities and managing shared resources
	Foster pluriverse	Advocates for a deep transformation, urging the consideration of values, qualities, and unique socio-spatial dynamics of non-hegemonic cultures and communities
	Validation	The importance of legal frameworks in acknowledging and safeguarding the intrinsic value and respect of individuals and groups as moral agents

Table 9: The three dimensions of spatial justice and its nine indicators. Table by author, inspired by Lopéz et al. (2024).

Data selection

The next step was to gather the relevant municipal documents. A list was compiled of potentially relevant documents and it was briefly noted what kind of information each could provide based on an initial scan. The list was reviewed by the researcher's supervisor from the municipality. After this thorough selection process, a final list of documents was established, which is depicted in Table 10.

Document	The document…	Date
Ruimte rond de A2 *Randvoorwaarden en uitgangspunten* (Gemeente Maastricht, 2004)	Outlined the project's scope, specifying the relevant conditions and guiding principles. It served as an initial framework and was intended to spark further discussion.	October, 2004
Ambitiedocument *De vraag aan de markt* (Projectbureau A2 Maastricht, 2007)	Aimed to share the client's enthusiasm for the project and inspire market parties to develop the best possible plan for the city and motorway. It served to illustrate the intentions of the public partners and forms part of the tender dossier.	April, 2007
Structuurvisie Maastricht 2030 *Ruimte voor ontmoeting* (Gemeente Maastricht, 2012)	Emphasised where and how the city had set clear directions for the future development and urban framework.	July, 2012
Stadsnatuurvisie Maastricht *De stad heeft goud in handen* (Gemeente Maastricht et al., 2017)	Presented the vision of Stadsnatuur Maastricht, written by a group of fifty local citizens, aimed at ensuring Maastricht's sustainability. It highlighted the significance of urban nature, outlined a long-term goal, and detailed the practical and policy steps needed to achieve this goal.	October, 2017
Evaluatie Participatiemodel *Project A2 Maastricht* (Projectbureau A2 Maastricht & Avenue2, 2018)	Evaluated the participation model implemented during the A2 Maastricht Project. It focussed on how stakeholders were involved in the decision-making, planning, and execution stages of the project. The evaluation assessed the effectiveness and outcomes of the participation process.	March, 2018

Table 10: The final list of documents to be analysed with regards to the document analysis for the case. Table by author.

These documents were all relevant in having shaped the development of the Groene Loper. However, to make any meaningful statements about how the municipality engages with spatial justice today, it was also necessary to look beyond this specific project. Since a lot changed since the '*Structuurvisie Maastricht 2030' (Structural Vision)*, analysing only older documents would not be sufficient to provide relevant or forward-looking insights. For this reason, the current version of the municipality's '*Omgevingsvisie'* (Environmental Vision) was included, allowing for a comparison between the older and newer Visions in terms of how spatial justice is, or is not, being addressed. Only by doing so could the research offer grounded suggestions for how spatial justice might be more effectively integrated in future municipal (policy) documents. Therefore, Table 10 was complemented with the document in Table 11.

Document	The document…	Date
Omgevingsvisie Maastricht 2040 *Koester de balans* (Gemeente Maastricht, 2020)	Identifies the challenges the municipality wants to work on in the coming years	October, 2020

Table 11: Supporting document identified for document analysis for the municipality. Table by author.

Data gathering

The data gathered for the data analysis was done using the VSOA-technique (Vision, Strategy, Objective, and Action). Each element is further elaborated upon in Table 12. All selected municipal documents were analysed using the software *Atlas.ti*. A test round was run with a large document related to the project, titled *The A2 Maastricht Model*, to fully grasp how the software could best be applied in relation to this research topic.

Code	Explanation
Vision	The broad, long-term goals that outline what a city or urban area aims to become in the future. They reflect the community's values and ambitions, serving as a guiding principle for planning efforts. A strong vision gives stakeholders a clear sense of direction and helps them understand the bigger picture of what they want to achieve. However, a vision alone is not enough to make change happen. It needs to be further developed through specific strategies, objectives, and actions, to become actionable.
Strategy	The overarching approaches that bridge the gap between a vision and its objectives. They lay out the general direction and key methods needed to move the planning process forward, ensuring that the vision is translated into meaningful progress through coordinated efforts.
Objective	The key outcomes that stakeholders prioritise to bring the vision to life, both in the mid- and long-term. They help connect different goals and city values, providing a clear focus for planning efforts. They are often structured using the SMART-framework (Specific, Measurable, Achievable, Relevant, and Time-bound) guiding decision-making, resource allocation, and progress evaluation, guaranteeing that plans stay on track and deliver meaningful result.
Action	The concrete steps taken to put strategies into motion. They include specific projects, policies, programmes, and initiatives designed to achieve the city's planning goals. Implementing these actions requires collaboration between various stakeholders and levels of governance, along with continuous monitoring and evaluation to track their impact and effectiveness

Table 12: Explanation of the VSOA-technique coding segments. Table by author, inspired by Lopéz et al. (2024).

The steps taken within the data analysis for the document analysis are visualised in Figure 15. Once the data gathering was complete, the documents were reanalysed using the framework of spatial justice dimensions (*Spatial Justice Conceptual Model*; Table 5) and its indicators (*Spatial Justice Benchmarking Tool*; Table 5). The results of this two-step coding process are presented through a series of visualisations and scored based on the benchmarking tool (Table 13).

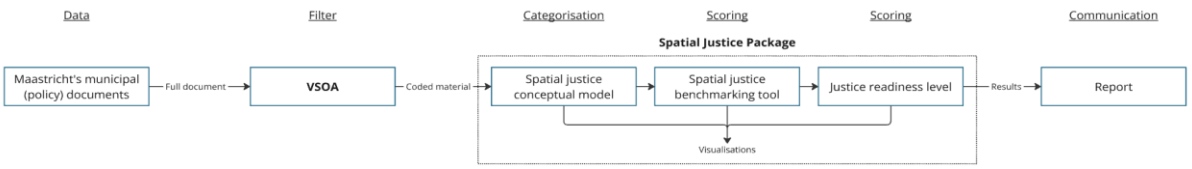

Figure 15: Visualisation of the steps taken within the data analysis for the document analysis. Image by author, inspired by Lopéz et al. (2024).

Score	Explanation
Low (- 3)	Shows a disregard for spatial justice, with no consideration of its ethical, moral, or political dimensions.
Standing (- 1)	Reveals early awareness of disparities, with initial attempts to acknowledge the issues, but without prioritising spatial justice or its key criteria and aspects.
Basic (0)	Demonstrates clear but limited attention to spatial justice, typically focussing on one indicator/dimension with vague details on what is being addressed, how, or who is involved.
Growing (+ 1)	Shows a deeper level of concern, linking at least two indicators/dimensions of spatial justice and providing specific details about what is being addressed, how, and who is involved in the action.
Embedded (+ 3)	Represents a thorough integration of spatial justice aspects, where all indicators/dimensions are interconnected with clear details about the involved locations, processes, and groups.

Table 13: The scores used in the Spatial Justice Benchmarking Tool. Table by author, inspired by Lopéz et al. (2024).

Lastly, the average of the scores of the benchmarking tool were added up into the *Justice Readiness Level* model. This model served as a complementary visual tool to track how spatial justice was incorporated in the analysed document. To score the Spatial Justice Readiness Level, a chi-square test was applied to the findings, comparing the observed results with the expected outcomes. A minimum score of 0 was chosen, as each document reflected spatial justice to a degree that would make negative scoring (-3 or -1) inappropriate. If a document showed a strong significant deviation, it received a score of 0; a slight deviation resulted in a score of 1; and if there was no significant deviation, a score of 3 was given.

6.5 Survey

The survey, distributed among all residents of Wittevrouwenveld, focussed on collecting both qualitative and quantitative primary data. The survey aimed to explore how local inhabitants use the Groene Loper, how satisfied they are with the urban green space, and how they perceive its levels of spatial justice. By capturing residents' personal experiences and perceptions, the survey provided valuable insights into how spatial justice is experienced on the ground, complementing the policy analyses, observational data, and interviews. The survey served as one of the core empirical components of the study. Therefore, the data collection process is discussed in more detail by outlining the data operationalisation, selection, and gathering procedures.

Data operationalisation

For the data operationalisation of the survey, the spatial justice framework (Figure 5; Rocco, 2021) and the socio-ecological model (Figure 10; Schipperijn, 2010) were combined into Table 14 to understand the usage of, and satisfaction with the Groene Loper, and connect it directly to the levels of spatial justice as experienced by the residents from a scientific perspective. As there was no corresponding factor from the socio-ecological model that directly related to the procedural justice dimension of the spatial justice framework, the factor incorporated into the survey focussed solely on the three indicators of procedural justice.

Spatial justice framework	Socio-ecological model
Distributive justice	Physical environmental factors
Recognitional justice	Perceived physical environmental factors
	Individual factors
Procedural justice	

Table 14: Combining the dimensions of the spatial justice framework with the factors of the socio-ecological framework. Table by author.

Each indicator of the spatial justice framework was measured with a single question to keep the survey accessible and not overly complicated. This resulted in a total of nine questions on spatial justice (due to three dimensions each with three indicators). A 5-point Likert scale ranging from strong disagreement to strong agreement with a separate option of 'I do not know / no opinion' was provided. A neutral midpoint was consciously chosen to differentiate between respondents who were undecided but engaged, and those who felt unqualified to answer or lacked a clear opinion.

The questions regarding spatial justice were complemented by questions about how satisfied people are with the Groene Loper, as well as how they use it. Additionally, background questions were added to gain an insight into respondents' socio-economic status (SES). Respondents' SES was calculated based on their housing type, financial situation (i.e., whether they can make ends meet), and the language(s) spoken at home. The specific calculation used in this study is shown and explained in Appendix I.

The survey was provided in both Dutch and English, in which all questions were optional. Most questions were closed-ended, with the exception of three open questions that allowed for additional comments. The choice to rely primarily on multiple-choice questions was based on the fact that most response categories were already well-established and easy for respondents to recognise and select. This design not only improved clarity for the respondents, but also made the analysis of the results more straightforward. The final question of the survey was also open-ended, giving respondents the opportunity to express anything they felt was not captured by the standard questions (Hoekstra, 2023c). The complete list of questions is available in Appendix J (Dutch) and K (English).

To ensure the validity and clarity of the questions in relation to the concept of spatial justice, the initial draft of the survey was reviewed by Roberto Rocco, an expert in the field of spatial justice. After incorporating his feedback, further refinements were made based on input from municipal staff in both communication and data analysis roles. Their comments focussed on making the language accessible, ensuring the completeness of response categories, and improving the overall clarity of the questions. This was very important, as the participants were part of a general audience most probably unfamiliar with an academic background in spatial justice. A small test round was conducted with local residents to check for any remaining vagueness. Based on that, minor adjustments were made and the template was finalised.

Data sample selection

The data selection for the survey focussed on the population of the 6,055 residents of Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2024). The unit of analysis was that of *individuals*. While the aim was to obtain a sample that reflected the characteristics of the population, the sampling approach was best described as *non-probability sampling* with an effort towards broad inclusion (Blaikie & Priest, 2019; Hoekstra, 2023d). Therefore, results were interpreted with caution regarding its generalisability.

The specific sampling method chosen was *purposive sampling*, as residents of Wittevrouwenveld were intentionally targeted based on their relevance to the research topic, without random selection (Blaikie & Priest, 2019; Hoekstra, 2023d). The target was to reach at least 362 survey respondents, which was the minimum sample size recommended by the CheckMarket Sample Size Calculator (Sample size calculator, n.d.), based on population parameters and desired confidence levels as presented in Table 15.

Total population	6,055
Confidence interval	95 %
Margin of error	5 %
Final required sample size	362 respondents

Table 15: Determining the sample size. Table by author.

Data gathering

With support from the municipality of Maastricht, an invitation letter (Appendix L (Dutch) and M (English)) was sent to all inhabited addresses in the Wittevrouwenveld, totalling 2,717 unique households. The letter invited all household members to participate in the survey. Residents could complete the survey online via a QR code or via the website of the municipality of Maastricht, or, alternatively, request a paper version by contacting the municipality. To encourage participation, an incentive was included: all respondents had the chance to win one of the ten €10 vouchers through a lottery draw.

On April 17th, 2025, residents were already informed about the upcoming survey during a neighbourhood meeting at the local café, which was organised for the redesign of the Leeuwenpark (a park situated parallel to the Groene Loper). As participation was the overarching theme of the meeting, it was a fitting moment to share the news of the survey. Residents were encouraged to help spread the word by sharing it with friends, family, and neighbours. Due to their enthusiasm regarding the topic and the research, they aided further in spreading the word by using Facebook, local websites, school bulletin boards, and other informal channels.

Quantitative survey data

The hypotheses tested in this study were developed based primarily on insights from the literature review. Table 16 provides an overview of these hypotheses. They were grouped into three themes: satisfaction with and usage of the Groene Loper, the experienced spatial justice of the Groene Loper, and the influence of people's socio-economic status.

Satisfaction with, and usage of the Groene Loper	
H 1	There is a positive relationship between satisfaction with the Groene Loper, and the frequency of its use
Spatial justice of the Groene Loper	
H 2.1	There is a positive relationship between distributive justice and the use of and/or satisfaction with the Groene Loper
H 2.2	There is a positive relationship between procedural justice and the use of and/or satisfaction with the Groene Loper
H 2.3	There is a positive relationship between recognitional justice and the use of and/or satisfaction with the Groene Loper
Influence of socio-economic status	
H 3	There is a positive relationship between the socio-economic status and the experience of spatial justice
H 4	There is a positive relationship between the socio-economic status and the usage of the Groene Loper
H 5	There is a positive relationship between the socio-economic status and the satisfaction with the Groene Loper

Table 16: The hypotheses tested through the survey data. Table by author.

In order to investigate the hypotheses outlined in Table 16 and to explore the relationships between the key variables derived from the survey data, several statistical techniques were applied. These included bivariate analysis, analysis of variance (ANOVA), and regression modelling. Prior to conducting these analyses, the assumptions for parametric testing were evaluated. Normality was assessed using the Shapiro-Wilk test, and homogeneity of variances was tested with Levene's test. The survey data met the assumption of homogeneity of variances, but the data was not normally distributed due to the design of the survey. However, the skewness was later assessed and turned out smaller than 2. So, the requirements for ANOVA and regression analyses were met.

Bivariate analysis was used as the initial step across all hypotheses to examine the basic relationships. This helped identify relevant associations and informed the direction of subsequent analyses.

Depending on the number and type of variables involved, either a one-way, a three-way, or a four-way ANOVA was used to test for statistically significant differences in continuous dependent variables across different groups. A *one-way ANOVA* was applied in cases with a single categorical independent variable. A *multiple-way ANOVA* was conducted where more than two categorical independent variables were included simultaneously, allowing for the examination of potential interaction effects.

Regression analysis was then used to assess the extent to which independent variables predicted variation in a dependent variable. A *linear regression model* was used when a single independent variable was considered, while a *multiple linear regression* was applied when two or more independent variables were included.

Qualitative survey data

The analysis of the qualitative survey data focussed on the open-ended responses collected in the survey. Using the Atlas.ti software, the responses were first examined with a set of two predefined codes, namely '*Positives*' and '*Negatives*'. In addition, in-vivo coding was applied to allow new themes to emerge within the predefined codes, based on participants' own wording. Through multiple rounds of coding and refinement, recurring themes were identified and grouped accordingly, ensuring that no relevant insights were overlooked.

The qualitative findings were linked back to the corresponding quantitative survey responses to enrich the quantitative analysis. This pairing made it possible to compare the qualitative input of participants with, for example, low satisfaction regarding their spatial justice experience to those with higher levels of satisfaction. This comparative touch provided a more nuanced understanding of how individual experiences and behaviour related to broader patterns observed in the quantitative data.

6.6 Comparative analysis

Through a comparative analysis between the findings from the municipal document analysis in Section 0 and the results of the resident survey in Section 6.5, qualitative primary data was collected. Although both sources were primarily quantitative, their comparison helped reveal underlying patterns, gaps, and contradictions, offering a clearer understanding of where municipal intentions correspond with, or diverge from, residents' realities.

A comparison between policy (document analysis) and lived experiences (survey) revealed four potential scenarios (Table 17), each capturing a different relationship between municipal ambition and resident experiences. This table played a central role in the analysis, as it helped structure the core findings and offered a clear lens through which to assess the (mis)alignment between policy intent and everyday experience.

	Policy (-)	Policy (+)
Experience (-)	A (- -)	B (- +)
Experience (+)	C (+-)	D (+ +)

Table 17: Possible scenarios when comparing policy and experience. Table by author.

Each scenario presented a distinct pattern with its own consequences. *Scenario A* reflects a weak incorporation of spatial justice at both policy and experience levels. Should this emerge as the case, it would point to the urgent need for policy revision. *Scenario B* shows a strong integration of spatial justice in policy, yet a disconnect in how it is perceived or felt by residents. In this case, further investigation would be required to understand the root of this misalignment. Whether it stems from shortcomings in implementation, external factors beyond policy control, a gap in communication and engagement, or something different.

Scenario C illustrates limited attention to spatial justice in policy, yet a more positive experience on the ground. This would suggest that current shortcomings in policy do not necessarily translate into negative lived experiences. While improvements in policy would still be advisable for future planning, they would not require immediate priority. Lastly, *scenario D* reflects alignment between strong policy incorporation and positive experience outcomes. If this scenario were to emerge, it would indicate a well-functioning relationship between policy intent and lived reality, and no immediate changes would be required.

6.7 Focus groups

In the final phase of the research, two semi-structured focus groups were organised separate from one another to validate the research findings from two different perspectives: the residents of Wittevrouwenveld, and the employees of the municipality of Maastricht.

The first focus group consisted of nine residents of Wittevrouwenveld who regularly take part in the '*Buurtnetwerkoverleg*' (neighbourhood network consultation), a meeting held every three weeks. The session focussed on presenting the research findings to the participants and verifying whether the conclusions drawn aligned with their own experiences. This also provided an opportunity for the residents to offer corrections, additions, or further input where necessary.

The second focus group brought together 11 municipal employees from the *Department of Cultural Heritage and Spatial Quality*, with backgrounds ranging from urban planning to landscape architecture. Some participants were directly involved in developing Maastricht's new Environmental Vision. The session served both to reflect on the research findings and to explore their practical relevance within the municipality, for example by raising awareness or connecting the concept of spatial justice to ongoing projects. The participants received a brief summary of the key findings in advance, allowing them to prepare questions and reflect on how the insights might relate to their work.

Both focus groups followed a conversational format, using open and accessible questions to encourage dialogue and shared reflection. Each session lasted no more than 90 minutes and was recorded with an MP3 device. The recordings were later transcribed, anonymised, and deleted to ensure confidentiality.

Part III Research results

Part III presents the findings derived from the research instruments introduced earlier. It starts by examining the policies as documented on paper, followed by an exploration of the realities observed on the ground. Finally, it compares both perspectives to assess the alignment, or misalignment, between policy intentions and actual experiences.

7. Policies on paper

This chapter presents the results on how policies addressed spatial justice, based on insights drawn from municipal document analysis and interviews. These research instruments provided the foundation for understanding how spatial justice was considered during the development of the Groene Loper, and how it is now reflected within the current municipal vision. The municipal document analysis was conducted using the VSOA-technique, followed by the categorisation under spatial justice considerations and the scoring of these. The detailed results per analysed document can be found in Appendix N.

7.1 Spatial justice in municipal (policy) documents related to the Groene Loper

The evaluation of spatial justice using the Spatial Justice Package of Lopéz et al. (2024) was employed to assess, analyse, and reflect on the extent to which spatial justice was addressed in the municipal documents related to the Groene Loper. This process started with the VSOA-technique. The accumulated results from this coding method are presented in Figure 16. The following subsections explore these findings in more detail by categorising them into the dimensions of spatial justice using the Spatial Justice Conceptual Model (Table 5), and provide a short debate on their implications.

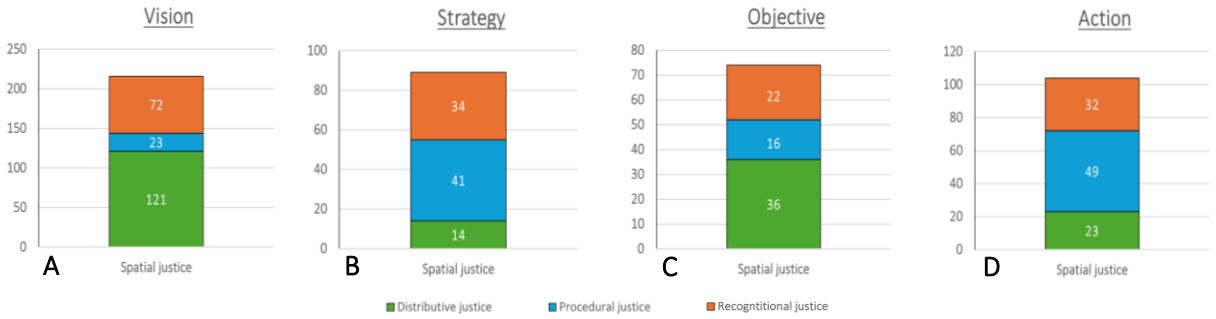

Figure 16: Coding Vision, Strategy, Objective, and Action across the documents as part of the VSOA-technique, followed by categorising them into the spatial justice dimensions. Image by author.

Vision

The *vision* section showed the strongest overall presence of spatial justice, with a total of 216 references across the documents (Figure 16, A). Most of these related to distributive justice (121), highlighting a clear concern with fair distribution of resources and opportunities when setting out long-term goals. Figure 17 provides an example of such a code. Recognitional justice was also well-represented (72), pointing to an awareness of different social identities and experiences. However, procedural justice lagged behind (23), suggesting that participatory governance and inclusive decision-making were not a major focus in this stage.

> *'Our aim: access to urban nature always close by.'*
> *(Appendix P, quote 1; Gemeente Maastricht et al., 2017)*

Figure 17: Quote showing how the Stadsnatuurvisie Maastricht document reflects the indicators 'access' and 'fair allocation' (distributive justice) under Vision. Image by author.

Strategy

The *strategy* section marked a noticeable shift. Across the documents, there were 89 total references, with procedural justice (41) taking the lead (Figure 16, B). This points to a stronger focus on governance frameworks and involving stakeholders in shaping the direction of policies, of which Figure 18 provides an example. Recognitional justice remained important (34), carrying through the inclusivity from the vision phase. Distributive justice, however, fell short here (14), suggesting that strategies were more concerned with how decisions were made than with who benefits from them.

> *'Optimise the path towards it through open, generous communication.'*
> *(Appendix P, quote 2; Projectbureau A2 Maastricht & Avenue2, 2018)*

Figure 18: Quote showing how the Evaluatie Participatiemodel document reflects the indicator 'responsive governance' (procedural justice) under Strategy. Image by author.

Objective

The *objective* section was more balanced overall (Figure 16, C). Across the documents, distributive justice lead slightly (36), followed by recognitional (22) justice, of which an example can be found in Figure 19. Procedural justice came last with 16 references. This suggests that, at the stage of setting objectives, there was a more conscious effort to address fair outcomes and inclusive processes together, even if the balance was not perfect.

> *'This acquisition aims to minimise uncertainty and, in doing so, limit the negative effects for residents and property owners as much as possible.'*
> *(Appendix P, quote 3; Gemeente Maastricht, 2004)*

Figure 19: Quote showing how the Ruimte voor de A2 document reflects the indicators 'foster pluriverse' and 'validation' (recognitional justice) under Objective. Image by author.

Action

The *action* section showed another shift, with procedural justice (49) becoming the most dominant dimension (Figure 16, D). This suggests that during implementation, transparency, accountability, and stakeholder engagement were noted more consciously, as can be seen in Figure 20. Recognitional justice stayed important (32), meaning inclusivity continued to matter even at this stage. Distributive justice, however, featured less (23), perhaps because the focus moved from deciding *what* is distributed to *how* decisions were actually carried out.

> *'In a co-design session, the area around the Scharnerweg roundabout was explored and given shape.'*
> *(Appendix P, quote 4; Projectbureau A2 Maastricht & Avenue2, 2018)*

Figure 20: Quote showing how the Evaluatie Participatiemodel document reflects the indicators 'democratic engagement' and 'adaptive processes' (procedural justice) under Action. Image by author.

Breakdown of the spatial justice dimensions

While the bar charts in Figure 16 showed how often each spatial justice dimension was coded per VSOA, the pie-chart in Figure 21 reflects the total number of individual indicators identified within the coded material. Since one coding could include multiple indicators, this lead to a different distribution of spatial justice dimensions in the pie-chart compared to the bar chart.

As illustrated in Figure 21, distributive justice emerged as the most prominent dimension, accounting for 42% of the total. Within this dimension, *access* was the most frequently addressed indicator (17%), followed by *appropriation* (13%) and *fair allocation* (12%). Procedural justice followed, including 30% of the total, with the indicators being set at *responsive governance* (12%), *democratic engagement* (10%), and *adaptive processes* (8%). Lastly, recognitional justice represented 28% of the distribution, with a relatively balanced emphasis on *care practices* (10%), *pluriverse thinking* (10%), and *validation* (9%).

Figure 21: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the documents as part of the VSOA-technique. Image by author.

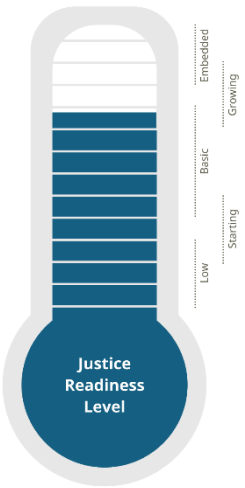

Figure 22: Justice Readiness Level for the case study. Image by author, inspired by Lopéz et al. (2024).

Justice Readiness Level

The Justice Readiness Levels was calculated for each separate document using the scores of the Spatial Justice Benchmarking Tool. This tool scored how often the dimensions of spatial justice and its indicators appeared throughout the documents. The level of balance determined the overall Justice Readiness Level. To assess this balance, a chi-squared test was used. After combining the individual scores of each separate document, the documents collectively received a Justice Readiness Level of 1 (*Growing*), indicating that the current approach to spatial justice was in an early/developing stage (Figure 22; Lopéz et al., 2024). The detailed scoring process and its results are presented in Appendix O, Table 20.

7.2 Spatial justice in the current municipal Environmental Vision

Multiple interviews were conducted with municipal staff from the Department '*Ruimte'* (Space) to understand how spatial justice is currently perceived within the organisation and its role in strategic thinking. The interviews revealed a growing interest in spatial justice, though there was uncertainty about how to operationalise the concept and what its practical implications are. While its relevance seemed to be acknowledged, the necessary tools and frameworks for implementation are still lacking. As one municipal employee explicitly noted, "*There are other priorities the municipality must focus on, which are seen as more important. That means this ends up lower on the agenda*" (*Appendix R, quote 5;* Municipal staff member, personal interview, 2025), highlighting the gap between ambition and realisation.

Additionally, insights from interviews with municipal staff of various other departments revealed a tension between the desire for participatory processes and the limitations of formal decision-making structures. While participation is often framed as involving residents in decision-making (*citizen power*, according to Arnstein's ladder in Figure 9), ultimate authority typically rests with the municipal council due to legal and procedural constraints. In practice, this means that residents are mostly invited to be informed or consulted (forms of *tokenism* according to Arnstein's ladder in Figure 9). This diminishes the perceived meaningfulness of their involvement.

As each project adopts its own participatory approach, it results in inconsistencies in how community engagement is carried out. According to municipal staff, this is further complicated by the recurring challenge of reaching beyond a small group of familiar and vocal residents. Marginalised groups remain underrepresented, often due to barriers such as language, limited digital access, or a lack of trust in public institutions. This highlights the need to rethink participation beyond a 'check-box' mentality, and to develop more inclusive and consistent methods of engagement. At the same time, it was acknowledged that not everyone will take part, whether due to a lack of interest, opinion, or time. While this is unfortunate, it is not necessarily problematic as participation has its limits.

Building further on the findings from these interviews, and regarding how spatial justice was addressed in the case of the Groene Loper, this section further examines how the concept is currently recognised and embedded in the municipality's broader Environmental Vision. To trace this evolution, both the *Structuurvisie Maastricht 2030* and the *Omgevingsvisie Maastricht 2040* were analysed and consequently compared to one another. The evaluation of spatial justice was again executed to assess, analyse, and reflect on the extent to which spatial justice was considered. In this case, only the Vision phase of the VSOA technique was relevant, as the documents were primarily focussed on articulating a vision.

Vision

The comparison between the two visions highlighted a significant shift (Figure 23). In the *Structuurvisie Maastricht 2030*, distributive justice dominated with 102 references, while procedural justice (16) and recognitional justice (58) were notably less addressed. This suggests a primary focus on fair distribution of resources and outcomes, but relatively little attention to inclusive decision-making processes and the recognition of diverse needs and identities. In contrast, the *Omgevingsvisie Maastricht 2040* showed a more balanced approach. Distributive justice was still prominent with 64 references, but procedural justice substantially increased to 54 references, and recognitional justice, although slightly lower at 33 references, was still clearly present.

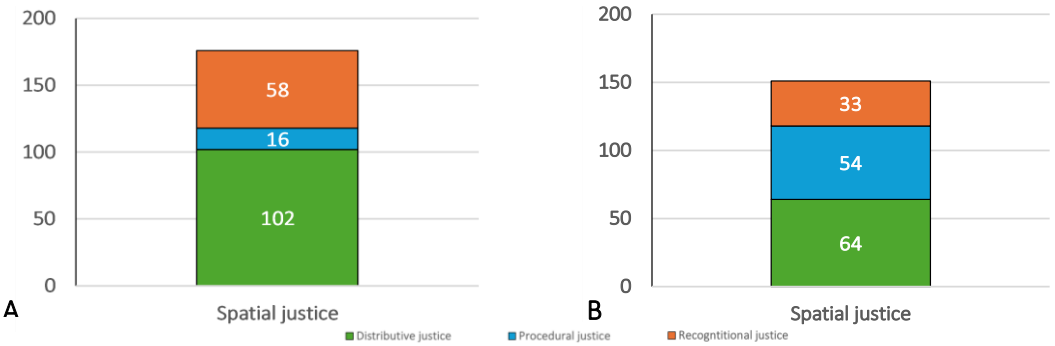

Figure 23: Accumulated results of coding the Vision, Strategy, Objective, and Action in the Structuurvisie Maastricht 2030 (A) and the Omgevingsvisie Maastricht 2040 (B) as part of the VSOA-technique, followed by categorising them into the spatial justice dimensions. Image by author.

Breakdown of the spatial justice dimensions

The bar chart in Figure 23 represented the frequency of the coded materials, while the pie-charts in Figure 24 illustrates the quantity of the indicators identified across those codes. The pie-charts show the difference between the two visions (Figure 24), clearly indicating that the different dimensions of spatial justice are more equally represented in the more recent vision, although distributive justice still holds a majority.

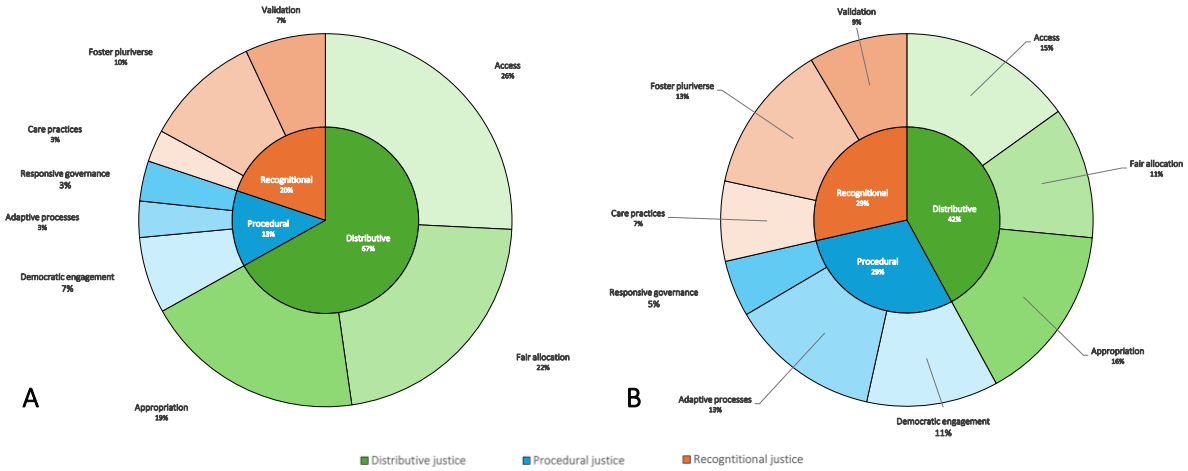

Figure 24: Pie-chart of the spatial justice dimensions. Based on the results of coding the Vision in the Structuurvisie Maastricht 2030 (A) and the Omgevingsvisie Maastricht 2040 (B) as part of the VSOA-technique. Image by author.

Justice Readiness Level

The Justice Readiness Levels were calculated for both documents based on the results from the Spatial Justice Benchmarking Tool, using a chi-squared test to evaluate the balance across the three dimensions and their associated indicators. As mentioned before, the Justice Readiness Level reflects the degree to which spatial justice is considered and integrated into a municipal (policy) document, based on how frequently relevant indicators are mentioned across the dimensions and how balanced they are compared to one another.

The *Omgevingsvisie Maastricht 2040* achieved a score of 3 (*Embedded*) on the Justice Readiness Level (Figure 25; Lopéz et al., 2024). This level represents a thorough integration of spatial justice aspects, where all indicators and dimensions are linked together with clear attention to the locations, processes, and groups involved. This marked a notable improvement compared to the *Structuurvisie Maastricht 2030*, which scored a 0 (*Basic*). The Basic level demonstrates clear but limited attention to spatial justice, typically focussing on one indicator or dimension. The detailed calculations can be found in Appendix O, Table 20 for the *Structuurvisie Maastricht 2030* and Table 21 for the *Omgevingsvisie Maastricht 2040*.

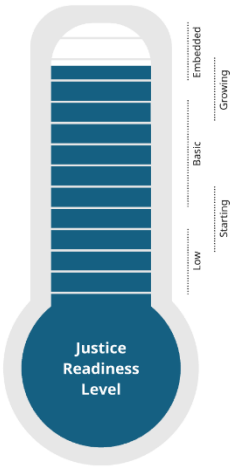

Figure 25: Justice Readiness Level for the Omgevingsvisie Maastricht 2040. Image by author, inspired by Lopéz et al. (2024).

8. Realities on the ground

This chapter presents the results on how spatial justice is experienced in reality, based on desk – and empirical research. These findings are based on qualitative insights from direct observations (conducted both on-site and from the temporary residence of the researcher, adjacent to the Groene Loper), alongside interviews with residents of Wittevrouwenveld and supplementary document reviews gathered throughout the research process. These findings are further complemented by quantitative and qualitative insights from a representative survey of the neighbourhood.

8.1 Spatial justice through observations, interviews, and documents

When observing the Groene Loper, a distinct public urban green space, usage seemed fairly consistent along its full length. There were no obvious contrasts between the northern and southern sections, nor between its start and end points. However, the space felt somewhat disconnected from the surrounding neighbourhoods, as there were no extensions or connections into the adjacent areas, and existing more as a single, separate strip between two roads. This created a sense of isolation, which also came through in how the project was visually represented during its development (Figure 13).

The benches situated along the route are used frequently, but the area was not often experienced as a place to linger. This aligned with the physical design: a linear structure made up of parallel lanes, clearly set up to prioritise movement along the north-south axis. Pausing, crossing, or simply occupying space seemed to interrupt that flow.

This prioritisation of movement and repetitive design elements tended to give little room for varied usage, appropriation, or expressions of local identity. Yet, these are precisely the ingredients needed for a public space to become embedded in daily life (Dear Hunter, 2023). With around 2,400 new homes added along the Groene Loper, it raised the question of how this space is serving existing and newcoming communities, and whether it is succeeding in building a sense of belonging. Despite its uniform layout suggesting openness and accessibility from all sides, stepping onto the Groene Loper can feel like entering an in-between space. It may fail to resonate with or represent the everyday life and character of the surrounding neighbourhoods.

Signs of resistance to change and perceived social displacement were also present. During a site visit, for instance, there was visible graffiti reading '*Fuck gentrification*' (Figure 26), indicating that not all residents or visitors view the new development positively.

Figure 26: Graffiti with a clear message at the Groene Loper. Image by author.

The municipal board that took office in 2022 expressed a clear ambition to govern the city in collaboration with its residents. This intention was translated into action through initiatives such as working visits, the introduction of the '*Burgerbegroting*' (participatory budgeting programme), and the appointment of '*Stadsdeelregisseurs*' (neighbourhood directors).

The *Burgerbegroting* is a participatory budget made available for projects proposed by residents themselves. Citizens submit ideas for projects, after which the municipality provides guidance and advice. Residents then vote on the proposals, and the selected projects are implemented (Gemeente Maastricht, n.d. c). In Wittevrouwenveld, this approach has been picked up, with numerous resident-initiated projects from the neighbourhood and the neighbouring district of Wyckerpoort illustrated in Figure 27 of 2024-2025.

Figure 27: Projects proposed by the residents of Wittevrouwenveld and Wyckerpoort. Imgage by Buurtnetwerk Wittevrouwenveld (2024).

The participatory vision of the municipal board also led to the appointment of '*Stadsdeelregisseurs'* across different areas of the city, including Maastricht East (of which Wittevrouwenveld is a part of). These neighbourhood directors provide residents with a direct and approachable point of contact within the municipal system. The role was not intended to enforce decisions from above, but instead to work from the bottom up: engaging with communities, picking up on what is needed, and responding in a personal and open-minded way.

The current neighbourhood director for Maastricht East stated: "*I want to be an additional point of contact for residents. Someone who can help when people feel lost in the municipal system. Ideally, I would become a kind of trusted figure in the neighbourhoods. For the municipality, I want to bring forward what is felt and said in these areas. Everyone at the municipality should know what is happening outside. As long as we are in conversation, there is progress*." (Appendix R, quote 8; Buurtnetwerk Wyckerpoort, n.d.).

Additionally, the municipality currently presents the Groene Loper as a public space that continues to '*groei en verander'* (grow and change). A leaflet for the public information market on May 17th, 2025 (Figure 28) stated: '*Then we will tell you more about all the plans and answer your questions*.' While this signalled a gesture towards procedural justice, it raised the question of how involved residents truly feel in such processes. Are they merely being informed, which Arnstein (1969) described as the lowest stage of participation (Figure 9)? Or does their involvement reflect a more meaningful form of engagement, such as consultation, placation, or something that approaches actual *citizen power*? This is further elaborated upon in the Discussion.

Figure 28: Leaflet distributed by the municipality concerning the information market on May 17, 2025. Image by author.

An interview with a resident of Wittevrouwenveld already revealed that this person believed that the challenge of participation is often made unnecessarily complex, stating: "*Participation is actually quite simple. People just need to be involved earlier on, not only after decisions have already been made. If you acknowledge resistance early on, it causes fewer problems later in the process. It is also important to clearly communicate that not everything discussed will necessarily happen. There needs to be understanding about the trade-offs being made, and how these influence both the process and the final outcome. The municipality should engage residents as early as possible, and this means more than just informing them*." This comment by the resident related back to an interview with a municipal staff member, who highlighted that "*A lot is promised, but more often than not the answer ends up being 'no'*." According to this municipal employee, more attention should and could be given to expectation management, ensuring communication remains realistic and that residents receive clear and timely feedback.

Another resident of Wittevrouwenveld also raised a critical point regarding the '*Omgevingswet'* (Environmental Act), stating: *"Legally, it is the responsibility of the initiative taker to ensure adequate participation, but in practice, this approach often falls short*." (Appendix R, quote 6). The resident suggested that the municipality should take a more active role in this process. This feeling was echoed by a municipal staff member, who added: "*Even when another party is leading the development, we as a municipality must still take responsibility for our role in the bigger picture*." (Appendix R, quote 7).

Further research by Dear Hunter (2023) highlighted the idea that if the ambition of the Groene Loper is to still be a welcoming and liveable environment for all, the diversity of its surrounding neighbourhoods must be more actively embraced and strengthened. Only then can the project be considered a true long-term success, offering not just housing, but also a sense of home to all residents. Feeling at home is a prerequisite for individuals to participate actively in their neighbourhood and to consequently be recognised as partners by the municipality and other stakeholders. Dear Hunter (2023) further stressed that mutual trust between all stakeholders, be it spatial and social actors, public authorities and market parties, and residents and policymakers, is essential in shaping the Groene Loper into an inclusive public urban green space. As they putted it: "*No policy measure can ever replace the experiential knowledge of residents*."

8.2 Spatial justice through a survey

A total of 455 survey responses were collected in this study. After an initial screening, 78 responses were excluded due to incompleteness, resulting in 377 complete survey responses. This exceeded the minimum required sample size of 362, and represented 6.2% of the population in Wittevrouwenveld. Regarding the alignment with CBS demographic data for the neighbourhood, the gender distribution of respondents closely mirrored the official statistics. However, notable differences were observed in other demographic characteristics. Younger residents (under the age of 25) were significantly underrepresented, whereas older age groups, particularly those aged 45 and above, were overrepresented. In terms of housing tenure, owner-occupiers were overrepresented relative to CBS figures, potentially due to recent housing market shifts not yet reflected in official data. Similarly, a slight overrepresentation of residents in houses rather than apartments was present. Income data, collected through subjective categories, showed some difference from CBS figures and also a relatively high non-response rate, likely due to the sensitive nature of the question. These discrepancies were taken into account in the interpretation of the socio-economic status variable, which was weighted accordingly. A detailed elaboration on the characteristics of the survey sample and deviations can be found in Appendix P.

8.2.1 Satisfaction with, and usage of the Groene Loper

A substantial 97% of the survey respondents reported using the Groene Loper in some way. The respondents used the space primarily in three ways: for *commuting*, for *sports*, and for *relaxation* (Figure 29). Seven in ten people (71%) used the urban green space for commuting purposes, and more than six in ten (66%) engaged in physical activity along the route, such as cycling or running. In contrast, only three in ten (31%) used the space for relaxation.

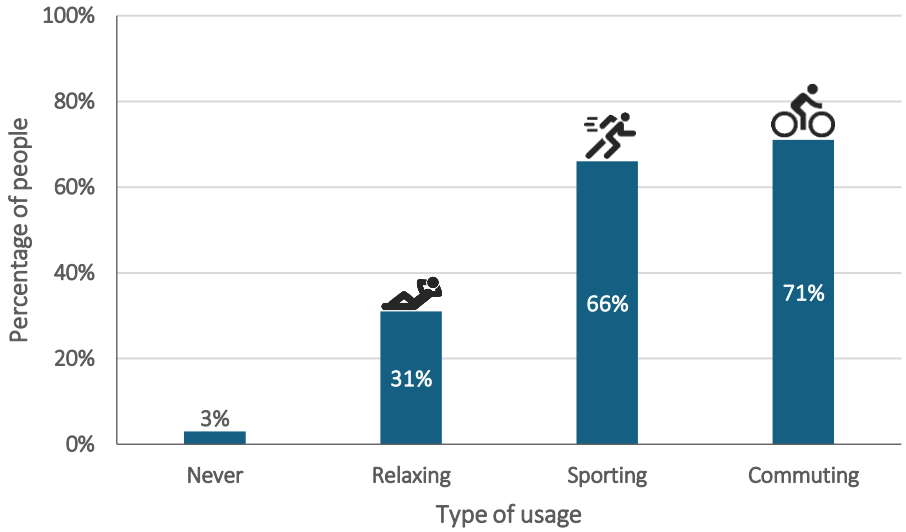

Figure 29: Type of usage of the Groene Loper, based on the survey results (n = 377). Image by author.

Amongst the respondents, there were those who made use of the space for multiple purposes, but there were also users who engaged with it exclusively for commuting. One resident shared: "*I live along the Groene Loper. I sometimes use it to get from A to B, to other addresses along the route. Otherwise, I try to avoid it.*" From the total sample, 29% stated they use the Groene Loper solely for commuting, without utilising any other opportunities for usage the Groene Loper has to offer.

Even though 97% reported using the Groene Loper in some way, not all were satisfied with the urban green space. The volume of traffic, particularly fast-moving cyclists and e-bikes, was described as excessive by many respondents, creating a sense of pressure rather than comfort. Furthermore, the allocation of zones or functions felt unclear, and users reported issues such as potholes and inconsistent paving materials. Questions regarding the actual 'greenness' of the Groene Loper were also raised. One resident ironically commented, "*As a neighbourhood, we have really progressed with the Grey Loper: from four asphalt roads to two asphalt roads*." (Appendix R, quote 9). Another remarked: "*The original residents of Maastricht are being pushed out of the neighbourhood, and eventually out of the city altogether*." (Appendix R, quote 10). A third respondent specifically highlighted the lack of connection between the Groene Loper and the adjacent neighbourhood of Wittevrouwenveld.

When examining the correlation between the *levels of satisfaction* and the *frequency of use* (*Hypothesis 1*), no significant correlation was identified. Even though the trend line in Figure 31 tends to be positive, it was not proven to be significant looking at the p-value derived from the regression analysis (Appendix Q, Figure 69). This supported the rejection of *Hypothesis 1*.

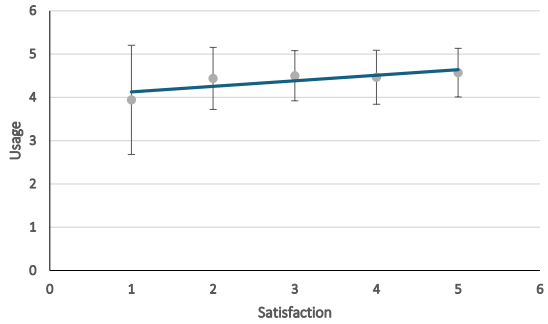

Figure 31: Scatter plot showing there tends to be a positive relationship between the levels of satisfaction and frequency of use (hypothesis 1), but it was not proven to be significant. On the x-axis, satisfaction ranges from 1: very unsatisfied, 2: unsatisfied, 3: neutral, 4: satisfied, 5: very satisfied. On the y-axis, usage ranges from 1: never, 2: yearly, 3: monthly, 4: weekly, 5: daily. Image by author.

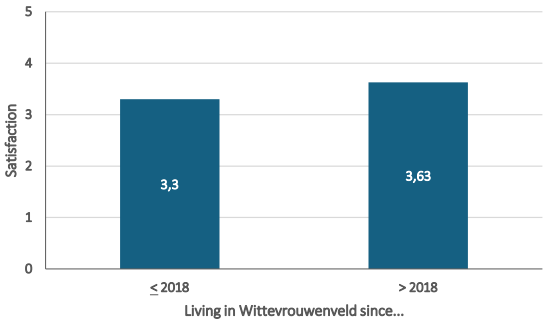

Figure 30: Average scores of the satisfaction of respondents living in Wittevrouwenveld ≤ 2018 and > 2018, showing a significant difference. Image by author.

When comparing the respondents who already lived in the area before the development of the Groene Loper with those who moved in after (respectively ≤ 2018 and > 2018), a significant difference in satisfaction between the two groups became apparent (Figure 30; Appendix Q, Figure 75). People living in Wittevrouwenveld since ≤ 2018 show an average satisfaction of 3,3 out of 5, whilst the residents living in the neighbourhood from > 2018 show an average satisfaction of 3,63. In this scale, a higher score indicated a greater level of satisfaction.

Several of the 'older' respondents further elaborated on their disappointment in the open response boxes. One respondent noted: "*It was a beautiful plan, and at first it seemed to turn out beautifully. Now I avoid the Groene Loper if I can, and I avoid the central path completely. We thought we were gaining a lovely walking route, but it has been a real let-down. A shame. That said, the Groene Loper is of course a thousand times better than the old motorway, and in that sense we are very happy with it.*" (Appendix R, quote 13). This suggests that the final outcome of the development fell short of the expectations initially raised by the municipality, something the 'older' residents may be more aware of than the 'newer' residents.

8.2.2 Experienced spatial justice of the Groene Loper

With the rejection of *hypothesis 1*, it was clear that satisfaction and usage did not demonstrate a correlation. For *hypothesis 2*, the focus was on the experienced spatial justice of the Groene Loper, and whether this correlated to satisfaction with and/or usage of the urban green space.

Based on the results from RStudio (Appendix Q, Figure 70), no interaction effects were found between the three dimensions of spatial justice. This justified examining each dimension of spatial justice independently.

Among the three dimensions, distributive justice received the highest average score from respondents (4.3 out of 5.0; Figure 32). This finding was supported by several open responses, such as: "*It is an amazing initiative for more green on this side of the city. You do not need to go until the Maas for a walk*.", highlighting perceptions of *fair access* and *allocation*. Procedural justice and recognitional justice followed at a considerable distance, with average scores of 3.1 and 3.0 respectively (Figure 32). These lower scores were also reflected in the open responses. One respondent commented: "*Please talk to residents. Everything has now been decided and arranged without anyone ever asking me, as a resident, for my opinion*." (Appendix R, quote 11), pointing to limited involvement in *democratic engagement* (procedural justice). Another stated: "*Make people feel that they are being heard*." (Appendix R, quote 12), underlining a perceived lack of *validation* (recognitional justice) and *democratic engagement* (procedural justice).

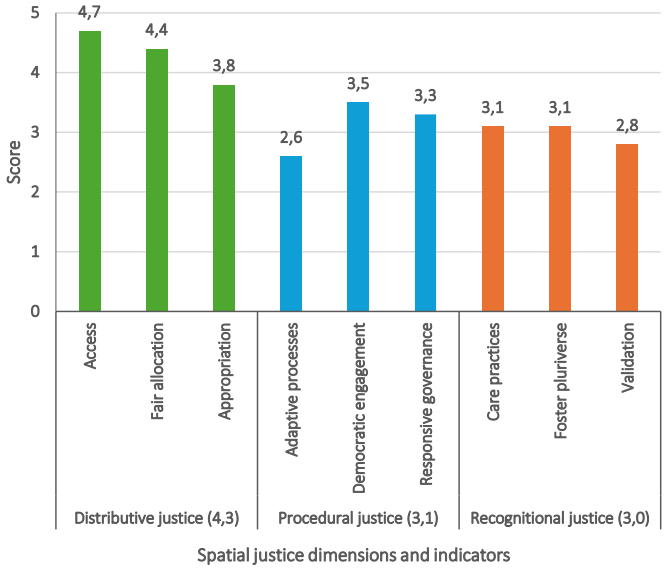

Figure 32: Average scores of spatial justice indicators, based on the survey results (n = 377). Image by author.

While the share of 'I do not know / no opinion' or unanswered responses remained low for the questions on distributive and procedural justice (around 5%), this number increased significantly for questions on recognitional justice (around 25%).

In general, the survey responses revealed a big pool of ideas among the residents. People were clearly engaged and full of suggestions for improvement. Mobility and perceived safety were frequently mentioned as the key concerns, but respondents also expressed a desire for greater social vibrancy: more seating, a friendlier atmosphere, and spaces that facilitate community-building.

However, despite the abundance of ideas, a recurring theme in the responses was frustration about a perceived lack of responsiveness from the municipality. Several respondents noted that they had already submitted ideas in the past, but felt ignored. As one respondent putted it: "*Fountains. Benches. If only the municipality had listened to the surrounding community instead of doing what it always does: inviting people only to proceed with its own plans!*" (Appendix R, quote 14). Another reflected cynically: "*We were invited to view a design. The drawing was covered in sticky notes with complaints and ideas, all for nothing. The final design was exactly as initially presented!*" (Appendix R, quote 15). Another respondent summarised the predominant sentiment concisely: "*In short, there is a lot of potential, but it now remains untapped.*" (Appendix R, quote 16).

As outlined in Figure 33, the trend line tends to be positive between spatial justice and usage, but it was not proven to be significant looking at the p-value derived from the regression analysis (Appendix Q, Figure 72). Thus, the experience of spatial justice did not significantly affect the usage of the Groene Loper. However, the interaction between distributive and procedural justice did show a significant positive relationship with how frequently the space is used (Figure 34).

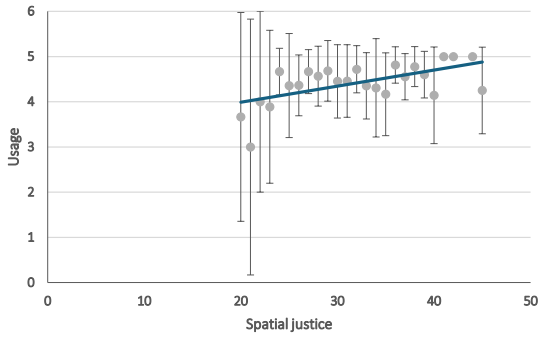

Figure 33: Scatter plot showing there tends to be a positive relationship between spatial justice and usage (hypothesis 2), but it was not proven to be significant. On the x-axis, spatial justice ranges from 9: lowest experience of spatial justice to 45: highest experience of spatial justice. On the y-axis, usage ranges from 1: never, 2: yearly, 3: monthly, 4: weekly, 5: daily. Image by author.

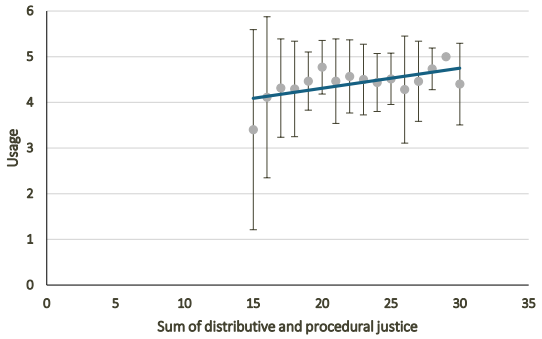

Figure 34: Scatter plot showing a significant positive relationship between the sum of distributive and procedural justice, and usage (hypothesis 2). On the x-axis, spatial justice ranges from 6: lowest experience of spatial justice to 30: highest experience of spatial justice. On the y-axis, usage ranges from 1: never, 2: yearly, 3: monthly, 4: weekly, 5: daily. Image by author.

Concerning the second part of *hypothesis 2* (the relationship between the experience of spatial justice and levels of satisfaction), the regression analysis revealed a statistically significant positive correlation between all dimensions of spatial justice and satisfaction levels (Figure 35; Appendix Q, Figure 73).

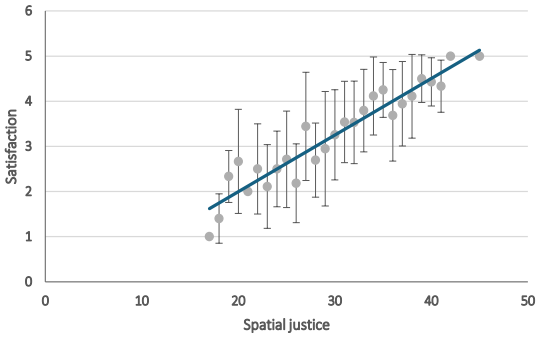

Figure 35: Scatter plot showing a significant positive relationship between spatial justice and satisfaction (hypothesis 2). On the x-axis, spatial justice ranges from 9: lowest experience of spatial justice to 45: highest experience of spatial justice. On the y-axis, satisfaction ranges from 1: very unsatisfied, 2: unsatisfied, 3: neutral, 4: satisfied, 5: very satisfied. Image by author.

Looking at each spatial justice dimension individually, the results showed a consistently positive relationship across all three dimensions. In each dimension, the greater the level of experienced spatial justice, the higher the reported satisfaction with the Groene Loper (Figure 36; Appendix Q, Figure 74). When examining whether the timing of someone's arrival in Wittevrouwenveld ($\leq$ 2018 or > 2018) correlated with their experience of spatial justice, no significant correlation was found (Appendix Q, Figure 74).

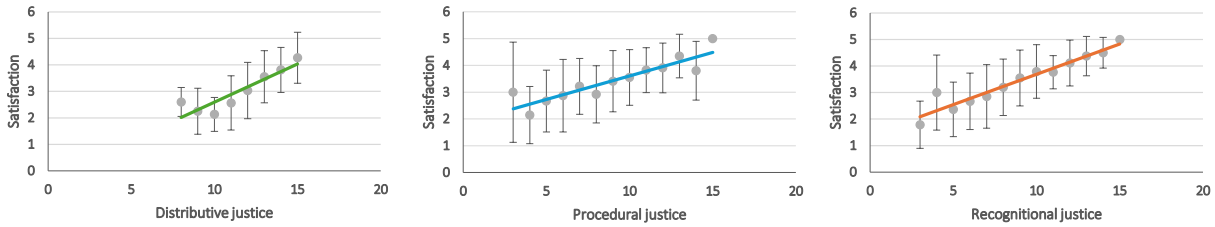

Figure 36: Scatter plots showing significant positive relationships between (the dimensions of) spatial justice and satisfaction (hypothesis 2). Distributive -, procedural-, and recognitional justice are depicted with respectively a green -, blue-, and orange line. On x-axis, the dimensions of justice range from 3: lowest experience of justice to 15: highest experience of justice. On the y-axis, satisfaction ranges from 1: very unsatisfied, 2: unsatisfied, 3: neutral, 4: satisfied, 5: very satisfied. Image by author.

These findings lead to the acceptance of *hypotheses 2.1, 2.2, and 2.3* in relation to *satisfaction*, while they were rejected in the case of *usage*. The only exception regarding usage was the interaction between distributive and procedural justice, which did show a significant positive effect on usage.

8.2.3 Influence of socio-economic background

This section explored the extent to which socio-economic background correlated with the experience of spatial justice (*hypothesis 3)*, as well as frequency of use (*hypothesis 4*) and satisfaction *(hypothesis 5*) with the Groene Loper.

First, a four-way ANOVA was conducted to validate the SES formula developed for this study. The results confirmed that all individual variables in the formula (*housing tenure*, *housing type*, *language(s) spoken at home*, and *income*) each contributed independently to the SES score. No significant interaction effects were observed between the factors, supporting the decision to treat each as a distinct variable and to apply weighted values accordingly (Appendix Q, Figure 76).

Considering *hypothesis 3*, the trend line in Figure 37 tends to be positive between SES and the experience of spatial justice. However, this was not proven to be significant looking at the p-value derived from the regression analysis in Appendix Q, Figure 77. However, a more detailed examination of the individual dimensions revealed a more nuanced pattern. No statistically significant correlation was found between SES and procedural justice, nor between SES and recognitional justice. A clear positive correlation was identified between SES and distributive justice (Figure 38; Appendix Q, Figure 77), indicating that respondents with a higher socio-economic status were more likely to perceive a fairer distribution of benefits within the context of the Groene Loper than those with a lower socio-economic status. These findings lead to the rejection of *hypotheses 3* in relation to procedural and recognitional justice. The only exception was the influence of SES on the experience of distributive justice.

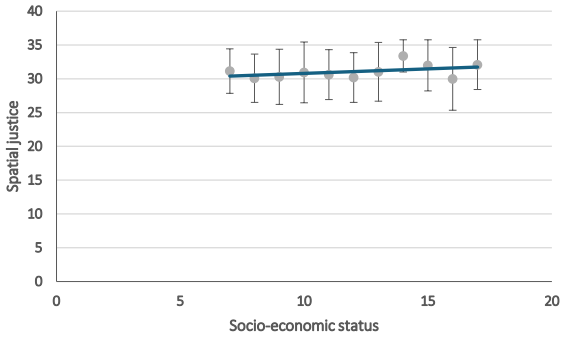

Figure 37: Scatter plot showing there tends to be a positive relationship between SES and spatial justice (hypothesis 3), but it was not proven to be significant. On the x-axis, SES ranges from 6: lowest SES to 17: highest SES. On the y-axis, spatial justice ranges from 15: lowest experience of spatial justice to 45: highest experience of spatial justice. Image by author.

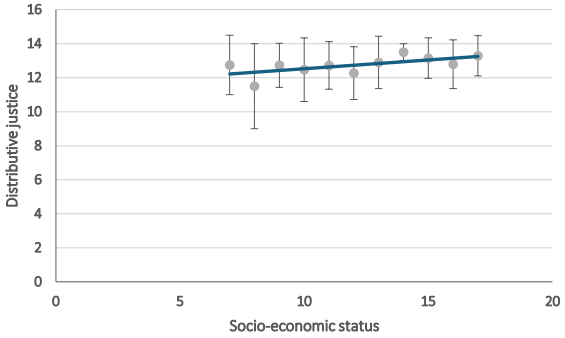

Figure 38: Scatter plot showing a significant positive relationship between SES and distributive justice (hypothesis 3). On the x-axis, SES ranges from 6: lowest SES to 17: highest SES. On the y-axis, distributive justice ranges from 3: lowest experience of justice to 15: highest experience of justice. Image by author.

Regarding the usage of the Groene Loper, SES was not a statistically significant explanatory variable, thereby supporting the rejection of *hypothesis 4* (Figure 40; Appendix Q, Figure 78). Also, SES did not appear to correlate with satisfaction levels of the Groene Loper (Figure 39; Appendix Q, Figure 79). This outcome lead to the rejection of *hypothesis 5*.

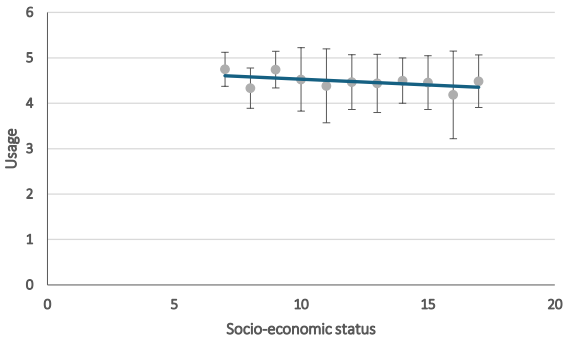

Figure 40: Scatter plot showing there tends to be a negative relationship between SES and usage (hypothesis 4), but it was not proven to be significant. On the x-axis, SES ranges from 6: lowest SES to 17: highest SES. On the y-axis, usage ranges from 1: never, 2: yearly, 3: monthly, 4: weekly, 5: daily. Image by author.

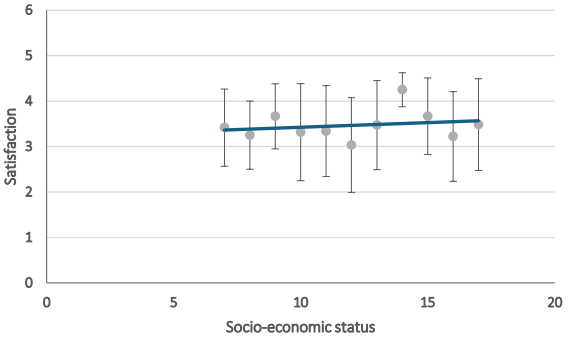

Figure 39: Scatter plot showing there tends to be a positive relationship between SES and satisfaction (hypothesis 5), but it was not proven to be significant. On the x-axis, SES ranges from 6: lowest SES to 17: highest SES. On the y-axis, satisfaction ranges from 1: very unsatisfied, 2: unsatisfied, 3: neutral, 4: satisfied, 5: very satisfied. Image by author.

9. Aligning policy and reality

This chapter examines the extent to which spatial justice at the policy level aligns with the experiences on the ground, based on the findings from the municipal document analysis and the survey through a comparative analysis. It thereby explores the insights the level of alignment reveals, and identifies opportunities for improvement.

As introduced in Chapter 6 (Table 17), four potential scenarios were developed to interpret the relationship between policy ambitions and practical outcomes. These scenarios provided a framework to better understand whether residents' experiences of spatial justice correspond with, exceed, or fall short of what policy aimed to achieve. The scenarios ranged from high or low levels of spatial justice in both policy and practice, to mismatches where one outperformed the other.

The comparison between the coding results of the municipal (policy) documents that shaped the development of the Groene Loper and the survey on experienced spatial justice showed a strong overall alignment (Figure 41). Although some small discrepancies appeared at the level of individual indicators, these did not significantly influence the overall pattern. The general correspondence suggests that the policy ambitions have largely been realised in the practical experience of residents.

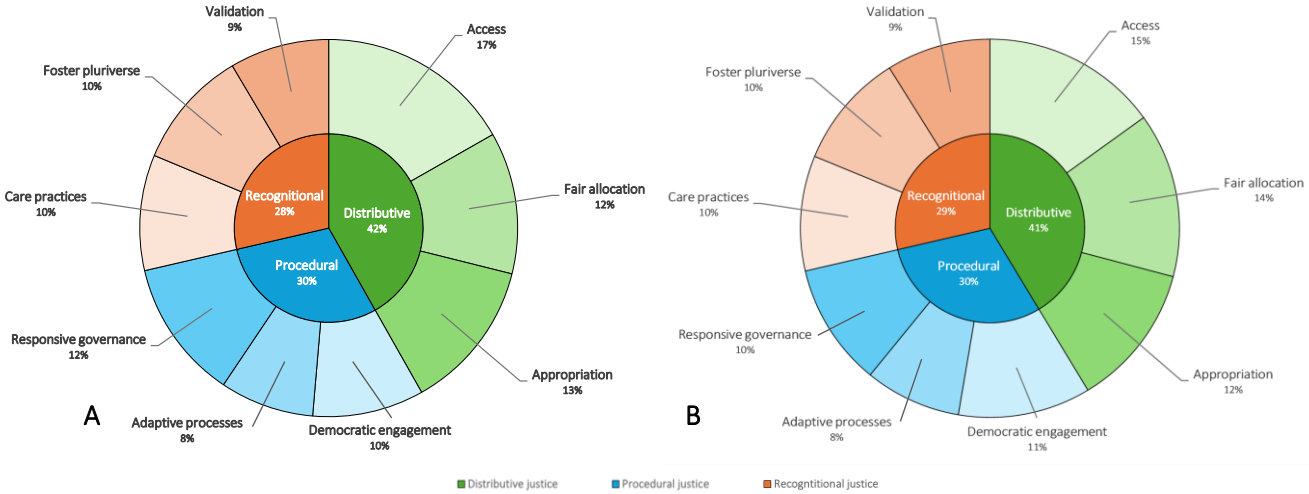

Figure 41: Pie-chart of the spatial justice dimensions and the division of indicators in policy (A) and reality (B). Image by author.

As a result, the case of the Groene Loper could be positioned within either scenario A or D from Table 17. Both scenarios describe a situation where policy and reality are aligned, but with one crucial difference: scenario A reflects a low balance of spatial justice in both policy and practice, while scenario D would reflect a higher balance in both. To distinguish between the two, further analysis was required.

Chapter 7 addressed this by calculating the Justice Readiness Level (Appendix O), which assessed to what extent the concept of spatial justice was embedded within the municipal (policy) documents. The analysis showed that while distributive justice was addressed to some extent, dimensions such as recognitional and procedural justice were significantly underrepresented. This limited the overall spatial justice potential of the documents.

Importantly, this imbalance was also reflected in the survey results. Since residents reported experiences consistent with the dimensions that were emphasised in policy, it was reasonable to assume that their lived reality mirrored the same limitations. Therefore, the Groene Loper corresponds most closely with Scenario A: alignment between policy and experience, but both at a relatively low level of spatial justice.

This was a critical insight. It suggests that while the municipality has succeeded in delivering what is intended, those ambitions were not sufficient. The absence of strong recognitional and procedural justice desires, meant that residents are not necessarily being underserved compared to the policy, but are rather experiencing the constrained level of spatial justice the policy had set out to deliver.

The implication here is twofold. First, the municipality should be credited for effectively implementing its stated visions, strategies, objectives, and actions in the Groene Loper. However, second, and more importantly, the policy ambitions showed to be in need of elevation. Without a more explicit and balanced integration of all three dimensions of spatial justice, future urban developments would risk repeating the same pattern of alignment without meaningful spatial justice.

In summary, the comparative analysis confirmed a strong consistency between policy and lived experience in the Groene Loper. Yet, this consistency reflected an imbalance of spatial justice in both domains. While this alignment avoids the risk of policy failure, it also revealed a significant opportunity for growth towards a more ambitious, spatial justice-oriented planning approach. One that does not merely match expectations, but actively raises them.

Part IV Discussion and conclusion

Part IV presents the discussion and conclusion of this research. The discussion reflects on the results, linking them to one another and connecting them back to the findings of the literature review. It also considers a discussion on the research process itself. The conclusion then directly responds to the sub research questions and the main research question, bringing together the central insights of this study.

10. Discussion

This chapter starts by reflecting on the final results of the research through discussing spatial justice as a lived reality, as a municipal objective, and as a pillar of socially sustainable urban development. It thereby places the findings of the case study in a broader municipal context, exploring their wider relevance and implications. After this, it considers the research process itself by addressing the limitations, assessing the validity and generalisability, offering recommendations to the municipality, and suggesting directions for future research.

10.1 Final results

Maastricht can be characterised as an *intermediate city.* While it does not show the high population and housing densities typical of larger metropolitan areas, it has a prominent urban centre, shaped by a moderate population size and a varied mix of residential, commercial, and historical zones. This urban structure is reflected in the provision of green spaces, which is sufficient to support both recreational and ecological functions, though not as extensive as in newer cities which are planned with sustainability as a central principle. Still, the green areas, such as parks and natural reserves, contribute meaningfully to the liveability of the city. But, as is often the case in intermediate cities, the distribution and accessibility of these spaces are not equal across the population. Despite ongoing efforts to expand green space availability, disparities stay, particularly in more densely populated or lower income neighbourhoods (Rodenburg et al., 2003).

The approaches to improving green space provision vary and span across different policy domains, and can be quantitative and/or qualitative in nature. This study focussed specifically on the concept of spatial justice within the domain of *Cultural Heritage and Spatial Quality*, focussing on the qualitative nature of green space provision.

10.1.1 Spatial justice as a lived reality

Undoubtedly, the Groene Loper has brought improvements to the urban environment as a public urban green space. The air quality has improved, traffic noise has reduced, and the green infrastructure now prioritises walking and cycling over car traffic (Green Cities Europe, 2022). These are the tangible and visible benefits. However, the ambitions of the project extended beyond these physical goals. The redevelopment also aimed to strengthen the surrounding neighbourhoods in Maastricht East, and to foster social connections by extending green areas into adjacent districts (Projectbureau A2 Maastricht, 2007). This ambition aligned closely with the concept of spatial justice itself, as it sought to include more disadvantaged parts of Maastricht and improve their integration with the western, more wealthy side of the city. The key question is whether this broader ambition relating to spatial justice has been realised, and whether it is experienced as such by the residents in Wittevrouwenveld.

While the Groene Loper is a publicly owned green space, aligning with the *stricto sensu* definition of a public green space (Chiodelli & Moroni, 2014), its current function raises important questions about its social impact. As a municipal property, Maastricht holds authority over its access and regulates the permissible activities (Shaffer, 2009). This type of public ownership supports accessibility and fair allocation, which was reflected in the high scores for distributive justice observed in the survey. The Groene Loper therefore illustrates clearly how the property regime influences the distribution of benefits associated with green spaces, and how public ownership can enhance spatial justice with regards to its distribution (Chiodelli & Moroni, 2014).

Nevertheless, ownership alone does not guarantee spatial justice in practice. Observations indicated that the Groene Loper is mainly used for commuting and sports, rather than for relaxation or social interaction. This is suboptimal, as brief and functional usage limits the depth of engagement. Longer and more varied usage, such as meeting others, sitting, or simply enjoying nature, could offer greater benefits for well-being and quality of life (Jabbar et al., 2022). Despite its accessible design, the space does not seem to fully succeed in fostering a strong sense of place or community connection. As shown by the survey results, it failed to meet residents' expectations and needs, explaining the lower scores in both recognitional and procedural justice. Its orientation towards movement limits opportunities for diverse use and local expression, which are key elements for creating socially sustainable and inclusive public spaces. Moreover, the presence of graffiti expressing frustration about gentrification signals underlying tensions and feelings of exclusion. This highlights that spatial justice involves not only physical access, but also emotional and cultural belonging.

The municipality shares responsibility for fostering residents' mental ownership of the space. As public owners and managers of urban green spaces, municipalities oversee the policy frameworks, resource allocation, and participatory processes (Rijksoverheid, n.d.). Increasingly, they are expected to shift from top-down approaches to more collaborative governance, engaging diverse stakeholders (including private actors and community organisations) throughout the planning and management process (Hafni, 2009; Jansson et al., 2020), contributing procedural justice. When managed carefully, this shift can lead to transparent, balanced participation that better reflects community needs, contributing to recognitional justice. By co-developing strategies with residents and adapting spaces to the local urban context, municipalities can better foster a greater sense of belonging and accountability. Something that currently appears to be lacking.

This more flexible form of governance is especially important when municipalities use their land to design green spaces to fit the local community's identity, needs, and everyday life. As Schipperijn (2010) and Balikçi et al. (2022) suggested, aligning all phases of urban green space management (from planning and design, to construction and maintenance; Figure 8) with user preferences can promote spatial justice and contribute to socially sustainable urban development. The Groene Loper showed that while public ownership facilitates distributive justice naturally, more attention is needed to ensure the space also invites inclusive, diverse, and long-term engagement across all communities in the neighbourhood. And in doing so, will also contribute to procedural and recognitional justice.

The importance of aligning public space design with community needs is supported by the survey results, which show clearly that residents who experience more spatial justice are also more satisfied with the space. Which, in turn, will contribute to improved well-being and a higher quality of life. This was researched in hypothesis 2, which showed that a stronger experience of spatial justice, across the distributive, procedural, and recognitional dimensions, correlates with higher satisfaction. Notably, approval of distributive justice scored significantly higher than procedural and recognitional justice. The data showed that all three dimensions functioned independently, so policy interventions targeting one dimension may not affect the others. Therefore, each dimension must be addressed separately and deliberately.

However, the levels of satisfaction were not found to have a correlation with usage in hypothesis 1, suggesting that some users rely on the Groene Loper more out of necessity rather than enjoyment. While continued use, regardless of enjoyment, supports public health, there is an opportunity to enhance the quality of engagement by encouraging more diverse, voluntary, and socially meaningful usage (Jabbar et al., 2022).

Returning back to hypothesis 2, the analysis did reveal a significant interaction between distributive and procedural justice in relation to usage. Individuals were more likely to use the space when they perceived both the outcomes and the planning processes as fair. Recognitional justice did not significantly influence usage, but its lower response rate compared to the other two dimensions may reflect issues with its measurement that deserves more investigation in future research.

The final set of hypotheses examined the influence of socio-economic status (SES). No relationship was found between SES and overall spatial justice experience in hypothesis 3, but SES was found to be positively correlated with distributive justice. This suggests that individuals with lower SES may have perceived planning processes and recognition as fair, but were less likely to feel that the space is just in terms of distribution. This could be due to greater physical distance from the space, limited free time, or subtle forms of social exclusion. Hypotheses 4 and 5 did not find significant correlations between SES and usage or SES and satisfaction, suggesting that the Groene Loper was evaluated similarly across the different SES groups. The extent to which these findings are meaningful remains uncertain, as the was SES was calculated was quite limited.

10.1.2 Spatial justice as a municipal objective

With a clear understanding of how spatial justice is experienced in reality and what the consequences are on usage and satisfaction, the focus can shift to discussing how spatial justice was addressed as a municipal policy objective. This also allowed for examining whether the former policy aligned with the lived experiences of the residents.

In recent years, there was a gradual but noticeable shift in municipal debate, with spatial justice gaining more explicit attention as a guiding principle in policies. The analysis of the municipal documents related to the Groene Loper revealed a lack of coherence in terms of spatial justice across the documents. While a combined reading of all documents presented a more balanced view, individual documents often seemed to emphasise only certain dimensions of spatial justice. In general, the majority of attention was directed towards distributive justice. This dimension took the lead, representing 42% of the coded content. The central concern revolved around the question of who received what, and where. This aligned with existing academic literature, which noted that many frameworks and policies prioritise distributive concerns while often neglecting procedural and recognitional aspects (Rocco, forthcoming).

Although the municipal documents reflected a *growing* awareness of spatial justice, the implementation of procedural and recognitional justice thus remained limited. Procedural justice was acknowledged through ambitions for participation, responsiveness, and democratic decision-making, but these often stayed at a general level without being translated into measurable outcomes. Recognitional justice, while present, played a more secondary role. Municipal documents showed some attempts to acknowledge diverse social values and lived experiences, yet this was inconsistently applied across planning stages. Residents, too, expressed a desire for more involvement, especially in the early phases of spatial planning. Altogether, the analysis indicated that while spatial justice was on the municipal agenda, its operationalisation was fragmented and largely aspirational.

When comparing the policy intentions with the lived experiences, there appeared to be alignment. Both suggested that spatial justice was only partially incorporated. The case of the Groene Loper therefore corresponded with what has been identified earlier as *Scenario A* (Table 17), in which both policy and experience reflected a limited engagement with spatial justice. This scenario implied that adjusting policy to better integrate and balance the dimensions of spatial justice could positively influence residents' experience of it.

Based on these older municipal (policy) documents, if spatial justice was to evolve from a policy vision into a real and tangible objective, municipalities would need to strengthen their capacity to ensure that spatial justice is balanced and integrated within municipal (policy) documents related to the project. Based on the combined findings from both the policy analysis and the survey, which displayed similar outcomes, it is evident that the most progress could be made in improving the procedural and recognitional dimensions of spatial justice in the specific case of the Groene Loper.

Naturally, these insights were specific to this particular case. For other cases, it is essential to first assess how spatial justice is experienced by users and how this aligns with the applied municipal policies. Only then can informed recommendations be made regarding whether, and how, policy adjustments could and should be considered.

10.1.3 Spatial justice as a pillar of socially sustainable urban development

The case study on the Groene Loper reflected on an earlier policy view with regards to spatial justice. Building on these insights, it is important to look beyond this case and see how spatial justice is expressed in current policy as a key part of socially sustainable urban development. Comparing the current environmental vision with the previous one showed a clear change. The newer policy presents a more integrated understanding of spatial justice, giving more attention to fair decision-making processes (procedural justice) and recognising the diverse identities and needs of communities (recognitional justice), alongside the fair distribution of benefits (distributive justice). This marked an improvement compared to the earlier vision, although procedural and recognitional justice still could be better balanced with distributive justice. And, as stated in literature, a balance among these dimensions is the ultimate goal (Rocco, 2022; Lopéz et al., 2024; Rocco, forthcoming).

Concerning procedural justice, there are still questions about how it works in practice. For example, communication about the Groene Loper seemed to mainly inform residents rather than truly involving them, which showed a low level of participation according to Arnstein's ladder (1969). To improve, the municipality needs to go beyond symbolic acts and build genuine trust with local communities. Interviews showed a clear gap between how participation is intended, and how residents experience it. Residents find participation often complicated and starting too late, which reduces its effectiveness and can cause resistance later on. Both residents and municipal employees agreed that meaningful participation requires early, open communication and active municipal involvement beyond just legal requirements. Although the municipality offers several participatory initiatives, these tend to attract the same active residents, while harder-to-reach groups are underrepresented. This limits the inclusiveness and risks the process being dominated by a narrow group. For spatial justice to be real, more diverse voices need to be heard and listened to.

A positive movement relating to procedural justice is the introduction of the role of neighbourhood directors, who are coordinators who help residents make their voices heard in the process. They also support recognitional justice by acknowledging different perspectives. Still, recognitional justice remained the hardest dimension for the municipality to advance. This is because this dimension focusses explicitly on the differences between marginalised groups and the dominant society, which does not always fit with the municipality's usual approach. The municipality tends to follow a mix of *utilitarianism* and *sufficientarianism*. Urban designers and other municipal employees try to serve the general interest and ensure public spaces remain manageable in the long-term, reflecting utilitarian ideas that aim to benefit the majority of residents. At the same time, they make sure minimum standards are met for all residents, which fits a sufficientarian approach. Sometimes, additional attention is given to the more vulnerable groups (*prioritarianism*), but this can clash with broader utilitarian goals. This tension partly explains why recognitional justice is difficult to strengthen. It would mean a significant shift towards valuing the needs and identities of those often left out in urban policy. Rather than aiming for absolute spatial justice, which is ultimately said to be unattainable, recognising its importance and integrating it in a balanced manner offers an approach through which acceptable levels of inequality can be defined and improved towards more tolerable outcomes, which Rocco (forthcoming) believed to be the ultimate goal in today's society.

In this process, ownership plays an important role in how the urban green spaces are accessed and how benefits are shared. According to Schipperijn's model (2010), the benefits people gain from green spaces depend on both who uses the space and the characteristics of the space itself. While municipalities cannot control who uses the public spaces specifically, as they are accessible to everyone, they do control how the spaces are planned, managed, and made accessible. This makes ownership a key factor. Public ownership allows the municipality to design spaces for the common good and optimise usage. Private ownership tends to serve smaller, more specific groups and reduces fairness and accessibility for others (Chiodelli & Moroni, 2014). This creates a divide between those who control the spaces, and those excluded from them.

Barrett (2023) argued further that access, in the case of publicly owned green spaces, is not just about the physical entry, but about whether the purpose of the space supports the public good. When it does not, the space risks becoming marginal and unjust, benefitting only a few at the expense of the wider community. Ownership also affects the governance, as municipalities with more land ownership can better integrate green paces into the wider urban plans (Balikçi, 2022), whilst fragmented ownership complicates this. This shows why strong public institutions are needed to create shared spaces that prioritise spatial justice and fair benefits for all communities (Jansson et al., 2020).

Ownership is also social. Growing citizen participation in managing local green spaces is changing feelings and experiences about belongings and responsibilities. Involving communities throughout the different phases of urban green space helps build a sense of collective care and local spatial justice. Dovey and Wood (2014) explained how everyday interaction with spaces lets residents 'claim' them through experience rather than legal rights, strengthening the local identity and social relationships. When residents feels connected and responsible, they are more likely to take care of the space and maintain social norms. While municipalities with significant land ownership can better coordinate spatial justice, working with residents helps keep the spaces inclusive and socially sustainable over time (Jansson et al., 2020). Even though adding more green space does not always increase its usage, making sure the existing spaces are accessible, well-maintained, and designed to meet the users' needs can make a significant difference (Schipperijn, 2010). This highlights why spatial justice should be considered as a pillar of socially sustainable urban development.

With the introduction of the new Environmental Act, effective collaboration around participation becomes even more important. Residents must be given the opportunity to provide input, and project initiators are responsible for using this input and translating it into tangible outcomes. The municipality is accountable to its residents and must take its responsibility seriously. Successful cooperation between these various parties is crucial.

10.2 Validation of the findings through focus groups

Two focus group sessions, one with the residents of Wittevrouwenveld and one with municipal employees, were organised to validate the findings presented in section 10.1 and to gain additional insights. The discussions helped to contextualise the data by incorporating lived experiences and professional reflections, thereby enriching the understanding of how the project of the Groene Loper is perceived and where key tensions and opportunities emerged.

10.2.1 Residential perspective

The focus group with the residents of Wittevrouwenveld provided valuable insights that deepened the understanding of the findings. A recurring theme was the sense of dissatisfaction among the long-term residents, particularly those who lived in the neighbourhood before 2018. Their frustration did not just come from unmet expectations, but from a deeper feeling of loss and disconnection. Many expressed that the neighbourhood no longer feels like theirs. "*It is their neighbourhood now*," one participant said, "*not ours anymore*."

This sense of exclusion is also reflected in how urban green spaces are now planned and re-designed. Residents pointed to a former grass field, once lively with students and families, which has been redesigned into a quiet, biodiversity-focussed area. Designers, mostly observing during office hours, saw underuse and adjusted the space accordingly. This shift from '*place*' (location understood through human experience, filled with meanings) to '*space*' (the physical location only, without social meaning) risks overlooking the informal, everyday ways people relate to their environment, thereby impacting recognitional justice by failing to acknowledge how spaces are valued and used by the local community. And this was not only the case for the Groene Loper, but also for other public spaces.

Frustration also surfaced around participation. Although opportunities exist, many residents feel their input is not genuinely considered. "*They listen, but they do not hear*," one participant said. The lack of feedback or visible impact leaves the impression that participation is largely symbolic, contributing to low perceptions of procedural justice. Some remembered meaningful engagement, but noted that platforms were often abandoned when residents felt unheard, resulting in the loss of valuable input for the project initiators and their projects. Interestingly, residents strongly believed that if participation would be handled with more care and inclusivity, recognitional justice would naturally follow. However, this relationship did not clearly appear in the statistical results.

More broadly, many residents voiced the belief that decisions around redevelopment are made long before they are consulted. At best, they are asked how specific aspects of pre-decided plans should be implemented, not whether redevelopment should take place at all. Even when participation is offered, it happens within highly unequal power relations. It is nearly impossible to guarantee informed consent, as the redevelopment process is complex and filled with risk and uncertainty. Residents said to face significant disadvantages in terms of knowledge, organisation, resources, and language, making it difficult to participate on equal footing.

As a result, the feeling among residents could be best described as one of meaninglessness and powerlessness. There was a sense of bitter defeatism with the belief that, regardless of what they do or say, neither the municipality nor project developers will truly listen. Without context, this could be mistaken for a lack of interest. One may question whether residents should be expected to adapt to the linguistic, procedural, and bureaucratic norms of government in the first place, especially when it involves fundamental changes to their own living environment. Perhaps those expectations should be reversed.

Finally, the discussion turned to the future. Concerns were raised about the municipality's role in steering development. The case of the KNP-site parallel to the Groene Loper, still undeveloped after two decades, symbolised frustration with the city's plans and their reliance on private developers. Residents called for more realistic, phased planning and stronger municipal coordination. "*We have waited 20 years, and all we have now there is a hole in the ground*," one resident said.

In sum, the focus group session underlined that spatial justice is really not only about the outcomes, but also about the processes. Inclusion requires more than being invited to participate. It means being heard, acknowledged, and involved in a way that shapes meaningful and shared public spaces for the people.

10.2.2 Municipal perspective

The focus group with the municipal staff members reflected on how they perceived and experienced the findings from their perspective as civil servants, and what value they might hold for the municipality of Maastricht.

One of the first topics discussed was the lower level of satisfaction reported by residents who moved into the area before the development of the Groene Loper, compared to those who arrived after its development. This was understood to come largely from a mismatch between early expectations and the current reality. What had initially been communicated, whether through ambition or optimism, did not fully align with what the project has delivered so far. This discrepancy created a gap between what residents believed would happen, and what has actually materialised.

There was reflection on whether the wording used in early communications, such as the ambition to '*bring neighbourhoods together*', may have unintentionally created the wrong impression. Alternatively, it could be that expectations were simply set too high by the municipality. In either case, it was acknowledged that large-scale developments like the Groene Loper take time. Ten years in, the project is still very much in progress. For that reason, the group emphasised the importance of continuously communicating that the development is "*ongoing and evolving*". The group also pointed out that people are naturally resistant to change. While residents often welcome the positive outcomes of redevelopment, such as improved amenities or improved green spaces, they are less receptive to negative effects like rising costs or changes in social dynamics, factors that are often associated with gentrification. This creates a complex situation where the benefits and drawbacks of development are not experienced equally, making it harder to meet everyone's expectations.

A key theme that emerged later in the discussion was the issue with recognitional justice. Because of its city-wide function and scale, the Groene Loper risks feeling distant or impersonal to nearby residents. The group understood that many residents of Wittevrouwenveld do not feel a sense of ownership over the Groene Loper, even though it is practically the only accessible urban green space in the area. This was seen as a significant concern. There was shared agreement that more attention should be given to developing smaller-scale green spaces within Wittevrouwenveld itself, rather than focussing solely on the Groene Loper, which is perceived as serving the broader city rather than the local community. Without a sense of ownership, people may struggle to feel connected to the space, something that can directly influence their satisfaction, well-being, and sense of belonging.

This led to the broader discussion on the challenges of addressing both current and future needs of the residents. Planning efforts must strike a balance by responding to today's community needs and wishes, while also anticipating the demands of future generations. Achieving recognitional justice in this context requires a flexible, adaptive approach to design. From this perspective, the continuous development of the Groene Loper was viewed as an opportunity to keep refining the project in response to changing needs and circumstances.

Closely tied to this was the role of procedural justice. Not all expectations can or will be met, and when certain choices are made, especially those that deviate from what residents hoped for or anticipated upon, frustration can grow. To manage this, clear and transparent communication was seen as vital. Municipal staff highlighted the need for more understandable language and regular feedback on decisions to the people. This could help reshape expectations early in the process and reduce the gap between what is anticipated and what is feasible. In doing so, it may contribute to greater satisfaction among residents.

Looking at the future, in relation to spatial justice, the group emphasised the strong focus on the general interest of the city and its neighbourhoods. With the introduction of area-based working in the upcoming updated Environmental Vision 2040, the aim is to better align top-down municipal objectives with bottom-up community interests. This way, efforts are made to find an optimal combination that does justice to both. A complicating factor is the shift in responsibility under the new Environmental Act, which placed the task of participation with the initiator. For public urban green spaces, the municipality typically remains responsible, either alone or in cooperation. But in other types of projects, this shift can create challenges. When developers are in charge, the group observed that participation tends to be approached more as a 'check-box exercise,' often lacking meaningful engagement. There were suggestions in the group that the municipality ought to take greater responsibility for this.

10.3 Limitations

While this research offers valuable insights into spatial justice on municipal (policy) level and in reality, several limitations must be acknowledged that have influenced the generalisability and interpretative strength of the findings.

The research design

The research focussed on a single case, the Groene Loper in Maastricht, which unavoidably limited the scope of the research. A single-case design provided depth, but it reduced the ability to generalise conclusions to other urban contexts or municipalities. Although the Groene Loper served as a rich example due to its scale and status, further (comparative) research across multiple projects and/or municipalities would strengthen the broader applicability of the findings. In addition, recent municipal (policy) documents also influence how people experience the Groene Loper currently. These new documents were excluded from the scope to avoid overcomplicating the study.

The municipal coding analysis

The coding analysis employed for this research is novel, and was created to identify dimensions of spatial justice in sustainability-oriented documents. While this method helped recognise patterns, it remained inherently subjective. The interpretation of textual data was influenced by the researcher's perspective, which may have introduced bias. However, the researcher had thoroughly familiarised herself with the technique and material, and had conducted multiple iterative rounds of coding. Thereby the researcher aimed to minimise this bias as much as possible. Furthermore, the analysis focussed exclusively on the municipal – and residential perspective, whereas the project was also inevitably shaped by other stakeholders, including the role of developers and contractors. Their impact on choices of influence on the experience of spatial justice was beyond the scope of this study, but could be considered in future research.

The survey design

Several limitations arose due to the design of the survey. The socioeconomic status (SES) of the respondents' was only partially captured. Due to the sensitivity of asking about income directly, an alternative variable was created using a combination of demographic indicators. While informed by relevant literature, this remained an arbitrary way to measure SES and may not have fully captured the nuance of respondents' socioeconomic positions. Also, questions involving complex terminology were simplified to enhance understandability for the respondents. While this allowed for broader participation, it also reduced the level of detail in some aspects. Additionally, several questions had a high non-response rate. Future studies should consider refining the formulations for these questions to minimise the non-response rate as much as possible.

The survey sample

The demographic profile of the survey respondents did not perfectly mirror the composition of the residents in Wittevrouwenveld. This limited the representativeness of the data and weakened the ability to generalise conclusions across all residents of the neighbourhood. Furthermore, challenges with comprehension of the posed survey questions may have influenced response accuracy. Variations in background knowledge or literacy levels could have led to misinterpretations of certain questions. Also, the use of self-reported data introduced risks of recall bias or social desirability bias. Participants may have unintentionally misrepresented their experiences or reported on other areas of Maastricht rather than on the Groene Loper itself. By using accessible language and clearly explaining what the Groene Loper was, an attempt was done to minimise this potential issue. While both Dutch and English survey templates and additional clarifications were used to increase inclusivity, language barriers may still have affected the responses. Lastly, it should also be considered that possibly the more critical individuals have voiced their opinions, which may have caused a skewed representation in the results regardless of the minimum required sample size.

External factors

External conditions, such as seasonal variation or allergies, may have influenced how residents experienced and evaluated the Groene Loper at the time the survey was spread and filled in. For example, weather conditions could have affected the usage of the green space and its perceptions of comfort, potentially influencing responses either more positively or negatively.

The data analysis

In analysing the dimensions of spatial justice, this study was able to determine statistical significances in relationships between the variables, but not in the relative strength or weighting of each dimension. There currently exists no established framework or methodology to quantify or compare the importance of each dimension in relation to spatial justice outcomes. This limited the ability to determine which dimensions contributed most strongly to the experienced spatial justice in general. This limitation was partly due to the conceptual foundations of spatial justice in this study, which relied heavily on a limited number of key literature sources (Rocco and Lopéz et al.). The scarcity of academic literature on spatial justice, its dimensions and indicators presented a broader constraint. As a relatively emerging concept in urban studies, measuring spatial justice remained under-theorised and under-explored, leaving aspects such as the relative strength of the dimensions still undefined and open to interpretation. Therefore, it was decided to weigh them equally.

Additionally, while missing responses were limited overall, they were disproportionately high in the questions regarding recognitional justice. For that reason, averages were calculated for the missing responses based on the available responses. Further reflection is needed on how this could have influenced the interpretation of the results and how a higher response rate on these questions can be achieved in future studies.

Furthermore, despite statistically significant correlations found in the data analysis, this study faced the known limitation of establishing causality. As Bertani et al. (2018) argued, no perfect statistical methodology exists to definitively determine the true direction of causality in observational studies. Therefore, the researcher applied both her theoretical knowledge and practical insights to support the analysis with regards to this limitation.

10.4 Validity of the study

The validity of this research was ensured through a well-structured approach that incorporated various research instruments and techniques to enhance the consistency and reliability of the findings. The study benefitted from clear and well-defined research questions, ensuring that each aspect of the research was focussed and purposeful. The key concepts were effectively operationalised through a thorough literature review, contributing to the clarity and accuracy of the research design. Additionally, there was a logical connection between the sub research questions and the main research question, providing coherence and direction to the study.

One of the key strengths of this research lied in the application of *triangulation*, involving a range of both quantitative and qualitative research instruments across the various sub research questions. Triangulation is a recognised strategy for enhancing a study's validity, as it combines findings from multiple methods and data sources, leading to a more comprehensive and nuanced understanding of the research topic (Carter, 2014). By integrating these diverse instruments, the research tried to mitigate potential bias and limitations as much as possible, ensuring more reliable results.

Furthermore, the representativeness of the participants in the survey was carefully elaborated upon to ensure that the findings reflected the experiences and perspectives of the target population as accurately as possible. The study also demonstrated transparency in its data collection and analysis processes, which allowed for a clear understanding of how the results were derived. Reflexivity was incorporated by acknowledging and addressing the limitations of the research, thus providing a more balanced and honest evaluation of the findings.

In addition to the conventional research instruments, this study explored methodological innovation through the application of the VSOA-technique, a newly structured analysis tool for documents. Applying the VSOA-technique within the context of spatial justice added analytical depth to the research and helped generate new insights relevant for urban professionals. Although its use in this context was exploratory, it demonstrated the potential of such methods to support future applications in policy and planning practices.

Overall, the use of multiple data sources, the transparency in its methodology, and the reflexivity in addressing limitations all contributed to the high validity of this research, providing a solid foundation for the conclusions drawn in this study.

10.5 Recommendations to the municipality

Achieving spatial justice starts long before the first design sketch. Too often, participation is reduced to informing residents of decisions already made, which leads to distrust and disengagement. Instead, municipalities should actively invest time in neighbourhoods to observe, listen, and learn how residents use and value their surroundings starting in the planning phase. While early involvement might seem inefficient, it often prevents delays later on and leads to more inclusive, better-supported outcomes. Taking more time at the beginning, paradoxically, helps speed up progress in the long term.

When managing urban green spaces, spatial justice should be considered across the entire lifecycle of planning, design, construction, and maintenance. Participation must not be a one-time event, but a consistent practice. This means creating clear feedback loops and continuing engagement after implementation. As an urban green space is never truly finished due to its evolvement with the neighbourhood, it should remain responsive to the people who use it. These spaces should reflect the unique identity of their surroundings, including its people, the existing greenery, and the urban structure. Aligning all phases of green space planning and management with the lived experiences of residents strengthens spatial justice and contributes to socially sustainable urban development.

When the green spaces are publicly owned, municipalities hold greater power to embed spatial justice meaningfully. They should fully use this to their advantage, as it is often harder to enforce spatial justice in semi-public or private developments, where competing interests and limited oversight can complicate matters.

But for whom are municipalities making urban green space just exactly? Understanding this requires stepping beyond policies and office desks and into daily neighbourhood life. Meaningful engagement means showing up on different days, at different times. It means observing with openness, listening with attention, and participating in everyday activities. This perspective offers insights that data alone cannot provide.

When residents share ideas, it is essential to respond genuinely. Not every suggestion can, or should, be implemented, but what matters is transparency. People deserve to know what has been done with their input, what has not, and why. Managing expectations and keeping communication clear and realistic helps build and maintain trust. If people feel ignored, participation drops, and rebuilding that trust is much harder than maintaining it. Residents' knowledge of their environment should be embedded where and when possible. This involves recognising their voices (*recognitional justice*), involving them meaningfully (*procedural justice*), and reflecting their input in the physical space (*distributive justice*). Maastricht's 2040 vision already expressed this philosophy with the phrase '*Koester de Balans*' (Cherish the balance) in the Environmental Vision of 2040, a message that could serve as a guiding principle across the three dimensions of spatial justice.

The Groene Loper is already a promising example. It is being treated as dynamic and evolving. Still, participation must go beyond information-sharing. People must feel empowered to contribute and receive honest, respectful feedback. A simple "*no*" is not enough. Even when co-decision-making is not possible, clarity about what is and is not feasible helps maintain trust and collaboration of residents. The Groene Loper has a strong foundation for improving procedural and recognitional justice, as it has scored very well on distributive justice, with high local usage patterns. Research shows that satisfaction with one's environment, influenced by these spatial justice dimensions, positively influences well-being. Deeper, more varied engagement with green spaces also builds enjoyment and place attachment. If these aspects are nurtured, the Groene Loper could become a truly inclusive and social space for all. Naturally, this does take time.

That said, not all projects in Maastricht may align as closely with the municipal vision as the Groene Loper did. Differences are natural. However, a strong policy foundation grounded in spatial justice provides a solid base. Departments within the spatial domain should stay alert to how perceptions of spatial justice shape how people interact with the urban green spaces, and how they feel about their city.

It should be noted that, in recent years, municipalities have largely withdrawn from active land policies, reducing their ability to steer spatial development through land ownership. As a result, social goals are harder to achieve or require buying land at high cost. Yet land sales and changing environmental plans remain two of the municipality's few tools for both raising income and shaping space. This should be more central in discussions about the just city.

With urban designers today working in a shifting landscape, they should constantly re-evaluate how spatial justice is realised. With greater freedom in planning methods, they can shape more tailored processes and engage citizens as a third party alongside governments and markets. A strong urban framework that is clear in structure, yet flexible for future change, will offer the best chance of achieving spatially just outcomes. This means occasionally setting aside short-term financial returns, recognising that affordable land for social uses ultimately brings long-term value for an open and just city.

10.6 Contribution and generalisability

This research has contributed to the growing body of literature on spatial justice by offering an integrated perspective that connects spatial justice theory with models of urban green space usage. The originality of the study lied in its multi-dimensional approach, in which conceptual frameworks from both spatial justice and urban green space management were combined. It could thereby move beyond the policy level to explore how spatial justice was experienced in practice, and translated abstract academic language into more accessible terms to engage directly with residents. In doing so, it bridged the gap between the academic debate and the lived realities of residents.

While the findings came from the specific context of the Groene Loper in Maastricht, the core insights have a broader relevance. For instance, the relationships that have/have not been found between socio-economic status, satisfaction, usage, and the experience of spatial justices provided valuable lessons for other urban developments, particularly within the Dutch context. However, generalising these results requires caution as each city has its own policy frameworks, stakeholder dynamics, and socio-spatial characteristics that influence how spatial justice is realised and perceived.

Nevertheless, the methodological framework itself can be adapted to suit other public space contexts, especially concerning the coding of spatial justice dimensions and the focus on lived experiences. This includes not only urban green spaces, but potentially other shared urban environments accessible to the public. For municipalities aiming to address spatial inequalities more effectively, this approach offers a replicable starting point for critically evaluating existing practices and identifying opportunities for more inclusive design and management processes.

Finally, as discussed in Section 10.4, triangulation and careful methodological design were applied to ensure internal validity. Yet, further application of the method in other cities is necessary to strengthen its external validity. What remains universally relevant, however, is the central argument that *public spaces should be shaped by and responsive to the diverse communities they serve*. By focussing on lived experiences and embedding justice into spatial practice, this study contributed to showing municipalities that they can move closer to achieving truly sustainable and socially just urban environments.

10.7 Recommendations for future research

This study offered an initial exploration of how principles of spatial justice are embedded in policy and how they are manifested in the experience of urban green spaces. To build on these findings, future research could take several directions.

Expanding the scope

Rather than focussing solely on one neighbourhood, including multiple neighbourhoods within Maastricht would allow for a comparative analysis of spatial justice across more diverse urban contexts. Selecting areas that vary in demographics, urban form, and green space availability could help determine whether observed trends are context-specific or generalisable across the municipality. Such comparisons may offer valuable insights into the underlying causes of spatial justice disparities and identify key factors that contribute to more satisfaction with and usage of urban green spaces. It would be particularly relevant to examine more recent projects that are guided by the *Omgevingsvisie Maastricht 2040*, assessing whether the vision's ambitions related to spatial justice are effectively reflected in practice. This would allow researchers to evaluate continuity or change in patterns compared to earlier projects like the Groene Loper, influenced by, among others, the *Structuurvisie Maastricht 2030*.

Expanding beyond the municipality of Maastricht and including other municipalities would offer valuable comparative perspectives as well. Differences in planning culture, local governance, and participatory mechanisms could reveal new best practices or structural barriers across municipalities.

Future research could further benefit from expanding the scope of stakeholder involvement by including not only the municipality and local residents, but also the private sector. This sector namely also plays a significant role in shaping the design, development, and execution of urban green spaces next to the municipalities. As highlighted by Hafni (2009), the management of green spaces is a multi-actor process involving the government, society, and the private sector, where each contributes to both the opportunities and the challenges of effective green space management. While this study focussed primarily on the interaction between the municipality and local residents, the role of private stakeholders was not examined in depth. Including these perspectives in future case studies could offer a more comprehensive understanding of how power dynamics and ownership structures influence spatial justice in green space development, especially due to the increasing influence of developers in urban planning under New Public Management principles, where development became more market-driven and private actors took a more central role (Jansson et al., 2020).

Moreover, future research could consider different types of urban green spaces, such as smaller versus larger parks, spaces designed with specific functions (e.g., sports versus relaxation), and areas with varying levels of access (public, semi-public, or private). Such a comparison could help evaluate how the different characteristics of urban green spaces, as highlighted by Schipperijn (2010) in Figure 6, influence residents' experience, usage, and satisfaction. In this same model, user characteristics were mentioned as another influence on the usage of an urban green space, besides the characteristics of the urban green space. This decision was consciously made, as the focus was based on the understanding that urban green space characteristics are more directly influenced through planning and design, whereas user characteristics are less controllable by policymakers. Nevertheless, different user characteristics can significantly affect how spatial justice is experienced and the impact it has on people's interactions with green spaces. While this aspect was beyond the scope of the current research, applying Schipperijn's (2010) conceptual model more comprehensively in future studies could provide a broader understanding of this influences on usage.

Refining the survey and statistical methods

The survey allowed for a basic understanding of resident experiences. However, future studies could benefit from more advanced statistical analysis techniques. While the bivariate analyses provided a useful starting point, deeper regression models and multivariate analysis would help explore relationships between variables with greater nuance (Bertani et al., 2018). For example, it could explore whether the different dimensions of spatial justice should have different weights. That is, if one dimension should be considered more important than another.

Furthermore, future research could explore more detailed usage patterns by examining how spatial justice influences different types of green space usage, such as relaxation, physical activity, or commuting. Gaining insights into how these factors shape people's interactions with urban green spaces could offer a deeper understanding of how to optimise their use and ensure they better meet the diverse community needs.

Improving the dimensions of spatial justice

While this research identified where improvements are needed across the dimensions of spatial justice, future research could explore how such improvements can actually be achieved in practice. Policy revision could be an important starting point, but not sufficient on its own. Further investigation is needed into who should take the lead or facilitate these changes, and what forms of action are most impactful. This could involve municipal action, co-creation with residents, or other forms of collaboration. It could then also include examining how different scales of intervention and the regulatory system enable or limit efforts to improve spatial justice.

11. Conclusion

This chapter presents the conclusions to this research, summarising the key findings based on the findings and discussions in the preceding chapters. Each research question is addressed individually, providing a clear synthesis of the insights gained throughout the study.

Sub research question 1

"How is spatial justice currently integrated into municipal management of urban green spaces as a means to support socially sustainable urban development?"

In the city of Maastricht, where space is limited and densification is ongoing, working towards sustainability means more than just creating efficient systems or adding greenery where there is room. It is about shaping pleasant, accessible, and inclusive urban environments where people genuinely enjoy to be and thereby contribute to social sustainability. However, challenges with limited available space, uneven distribution of green areas, and a mismatch between what residents need and what is actually provided make this a complex task.

This is where spatial justice becomes an essential objective. Without clear principles that guide fair and just green space development, there is a real risk of losing these spaces altogether, especially during redevelopment or densification processes. As the city becomes more compact, it becomes increasingly important that the green spaces that do exist are well-adapted to the needs, wishes, and lifestyles of the people who live nearby. If this does not happen, the benefits these spaces could offer will not reach everyone equally, or worse, may not be realised at all.

Looking at the case of Maastricht, it is clear that attention to spatial justice is increasing over time. In earlier planning documents, some aspects of spatial justice were already present, even if they were not explicitly called that. Most of the focus then was on who gets what and where, touching upon the distributive side of spatial justice. Each municipal document had its own emphasis, but when viewed together, a more balanced picture already emerged.

The real shift became visible in the most recent environmental vision of the municipality. Today, spatial justice is much more deliberately embedded as a planning goal, and there is increasing awareness of its different dimensions. Still, distributive justice remains the dominant focus, while procedural and recognitional justice receive less attention. These aspects are recognised as important, but are not yet fully integrated into policy and practice. However, achieving a precise balance at the policy level is difficult, and perhaps not even necessary. As long as there is awareness of the different dimensions. This awareness is already evident in conversations with municipal staff and in the more balanced approach of the current Environmental Vision.

Sub research question 2

"How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces?"

At the neighbourhood level, spatial justice plays a crucial role in shaping how residents feel about their surroundings. A key insight was that feeling at home in one's neighbourhood is not just about having access to green space, it is about being seen, heard, and acknowledged as well. This feeling of belonging is essential for people to participate actively in their neighbourhoods, but also to be taken seriously as 'partners' by the municipality.

People evaluated the experience of spatial justice in different ways. Of the three dimensions, distributive justice was rated the highest, followed by procedural and recognitional justice. This distribution matters, because residents' satisfaction with their local green spaces appears to be strongly influenced by how they experience spatial justice. When people feel that access is fair, that their voices are heard, and that their identities are recognised, they are more likely to express satisfaction with these spaces. If these experiences fall short, satisfaction tends to drop as well. Interestingly, this connection is much stronger when it comes to satisfaction than to actual frequency of usage. There is no direct relationship between how satisfied someone is with a green space and how often they use it. Instead, the influence of spatial justice on usage seems more complex and indirect. What does appear to matter is the interaction between distributive and procedural justice. When people feel that not only the space is fairly distributed, but also that they had a say in its development or management, their frequency of use increases. Moreover, only the experience of distributive justice is shaped by a person's socio-economic status; the lower the status, the less distributive justice they tend to perceive.

The significantly lower scores for procedural and recognitional justice highlighted a critical gap in urban development processes: the lived experiences of residents are still often missing from the conversation. While planning and sustainability policies increasingly mention inclusion and participation, without understanding how people actually experience these spaces and what its effect is on their satisfaction and usage levels, there is a real risk that well-meaning initiatives will not translate into meaningful improvements. Worse, existing injustices may even deepen as urbanisation continues.

Altogether, it became clear that the way spatial justice is experienced in daily life has a clear and measurable effect on both the satisfaction with green spaces, and the usage thereof. If municipalities aim to create socially sustainable environments, they must take these experiences seriously and explore how improvements can be made. Not just in municipal (policy) documents related to planning, but in the actual design, execution and maintenance of it as well.

Sub research question 3

"How do the policy levels of spatial justice align with the experienced level of spatial justice in the neighbourhood, and what lessons can be drawn from this comparison?"

When comparing the policy level of spatial justice with how residents actually experienced it in their neighbourhood, an interesting alignment became visible. Residents seemed to generally perceive spatial justice in the same way as how it is presented in the original municipal (policy) documents: distributive justice scores the highest, followed by procedural and recognitional justice. This parallel indicated that policy is not just a background framework, but it actively shapes the way people experience their environment.

This is a promising finding, especially when looking at the current policy vision of Maastricht, which showed a noticeable shift towards better balance across the three spatial justice dimensions. While distributive justice remained dominant, the efforts to strengthen procedural and recognitional elements are clearly visible. This potentially indicates that adjusting policies with a more balanced spatial justice lens can have a positive influence on residents' experiences, and consequently their trust in and engagement with the municipality.

Still, there is more to be done. While the direction is right, procedural and recognitional justice are in need of improvement in practice, not necessarily so much in policy. An important general lesson is that policy alone is not enough. As emphasised in the case of the Groene Loper, mutual trust between stakeholders, whether between the municipality and residents, or between market and public actors, is essential for turning policy intentions into inclusive and optimal public spaces. No matter how well-designed a policy may be, it cannot substitute the lived and experiential knowledge of local people, which plays a crucial role in shaping spaces that truly meet community needs and realities. Recognising and valuing this knowledge is therefore not optional, but essential.

Main research question

"To what extent can urban green spaces be managed at the municipal level to ensure spatial justice within the built environment, thereby stimulating socially sustainable urban development?"

The research has demonstrated that public urban green spaces can be effectively managed at the municipal level to meaningfully ensure spatial justice, which in turn enhances individuals' use and satisfaction of the space, and thereby contributes to improved well-being and a higher quality of life. This validated the main hypothesis of this research (Figure 11), confirming the moderating role of policy integration in the relationship between spatial justice and user experience. The municipality plays a vital role in shaping how these spaces are distributed, governed, and experienced by residents. Yet achieving full spatial justice is difficult due to its complex nature and the practical challenges of city governance.

From a *distributive justice* perspective, municipalities are well-positioned to ensure the fair allocation of green spaces. Through spatial planning and targeted policies, they can identify underserved areas and reduce inequalities. This is an urgent need in cities like Maastricht, where densification and spatial pressures complicate just distribution. Ensuring that all residents, regardless of their background, have access to green areas is a vital step toward well-being, inclusion, and quality of life.

Procedural justice can also be actively improved when municipalities involve citizens as genuine partners in shaping their environments. While harder to institutionalise, early and meaningful participation through, for example, co-creation, transparency, and continued dialogue, can clearly enhance residents' sense of ownership and satisfaction with the urban green space.

Recognitional justice remains more challenging to fully guarantee at the municipal level. Municipalities tend to serve the majority, often overlooking more specific needs of individuals and minority groups. While meeting every individual's preferences may be unrealistic, municipalities can still strive for inclusivity through more inclusive design and community engagement. Recognising differences between people and designing with care can already go a long way in creating a sense of belonging for most people.

The case of the Groene Loper showed that the extent to which principles of spatial justice are embedded into local policy directly shapes how residents perceive and experience the urban green space. A growing awareness of the need to balance all three dimensions of justice marks an important shift. However, ambition must be followed by action, especially in strengthening the procedural and recognitional dimensions. This is especially urgent in a context where economic value increasingly dominates spatial development, often dismissing social needs that are harder to quantify. While this trend benefits private interests, it offers little insight into how people actually live in and experience the city. Urban development should be centred more on public value, and residents must have a real say in shaping the city they inhabit.

Management of urban green spaces itself has, most of the times, been a public task, where private and public interests are connected and social goals are aimed to be translated into space. However, in recent years, this role has been overshadowed by the pressure to deliver housing at speed, particularly in large-scale expansions and urban renewal projects. While housing is critical, urban design must move beyond numbers to shape a complete city. One that balances spatial and economic growth with cultural and social goals. This broader, more just approach is long overdue and urgently needed. This is especially true for urban green spaces, which are becoming scarcer due to increasing urban populations and densification of cities. These spaces are essential not only for environmental resilience, but also for public health and social cohesion, especially for vulnerable residents. Every square metre must now meet more needs, requiring flexible, inclusive, and careful management.

In conclusion, while spatial justice cannot be perfectly managed, municipalities can and must take active responsibility in shaping urban green spaces through more distributive –, procedural –, and recognitional justice. Doing so will not only enhance the quality and usability of these spaces, but will also strengthen the foundation for socially sustainable urban environments where all residents are provided with more optimal urban green spaces, enhancing their well-being and quality of life. Which is, in the end, the ultimate goal of the municipality.

Part V Reflection, references, and appendices

Part V concludes this report with a personal reflection, responding to a set of guiding questions provided by Delft University of Technology, supplemented by two additional questions formulated by the researcher herself. It ends with the list of references and the appendices.

12. Reflection

This chapter offers a concise reflection on the thesis process, addressing its relation to the MBE programme, the interaction between research and design, the value of the chosen approach, and the broader academic and societal impact of the research. It concludes with two self-formulated questions to critically assess the learning experience.

What is the relation between my graduation project topic, my master track (MBE), and my master programme?

My graduation project aligned with the *graduation project topic* Inclusive Communities theme as it focussed on addressing spatial justice in the management of urban green spaces, ensuring a just experience for all people of the community. It connected to the *master track* Management in the Built Environment by having explored the optimisation of policy and management strategies for socially sustainable urban green space management. Within the broader *master programme* MSc Architecture, Urbanism, and Building Sciences, my research contributed to urban planning and policy by integrating the new perspective of spatial justice to create more just and socially sustainable cities. By analysing spatial justice in urban green space management and proposing actionable policy improvements, my study bridged inclusivity, strategic urban management, and socially sustainable urban development.

How did my research influence my design/recommendations and how did the design/recommendations influence my research?

My research and design process ended up being more of a two-way street than I initially expected. On the one hand, the theoretical background I dug into gave me a clear idea of which methods to apply and how to structure my approach to actually get useful answers. It grounded my thinking and helped me frame the problem in a more analytical way.

But once I started designing the survey and getting feedback, especially from people outside the academic bubble, I realised just how much I had been stuck in the academic bubble of thinking and speaking. It made me step back and see how much of a gap there can be between wanting to make a change and actually communicating it in a way that it is accessible. This really tied into the broader theme of participation: you can have the best intentions or ideas, but if there is a language barrier, literally or conceptually, it is going to be hard to get people on board and really know that they want and need.

That realisation pushed me to make a lot of changes to the survey along the way. It was not just about tweaking words, it was a shift in mind-set about who I was really 'designing' for, and how to make the whole research more inclusive and understandable.

How do I assess the value of my way of working (my approach, my used methods, my used methodology)?

Looking back at my *way of working*, I will be the first to admit it was not perfect. Concerning time management, I took on a bit too much during the first half year of my research, which ended up causing some delays that had a snowball-effect throughout the rest of the research process. On top of that, quite a few things went wrong with arranging the internship, which was honestly really frustrating.

That being said, I still stand behind the *used methods* I chose. They have worked out the way I wanted them to, even though they were not exactly the easiest ones to apply. The municipal coding analysis using the VSOA-technique is quite a new method, which made it challenging at times, but in a good way. The applied methods opened up proper conversations with experts involved in the concept, who were eager to support the process and helped translate things into something more practical and less academic. That step, from coding in an academic way to actually testing things out through the surveys in an accessible way, was a big one. As far as I know, I was the first one to try and do this, so having that close collaboration with experts was a key aspect.

In terms of *methodology*, I think the structure made sense. I made a conscious decision in sub research question 1 and 2 to keep them separate, so they would not be dependent on each other. Sub research question 3 was dependent on the first two sub research questions, but that was intentional too. I saw it as a real opportunity to compare policy to lived experience and to use that comparison as the basis for making recommendations to the municipality. It was exactly the sort of link that highlights what is working (or not), and where adjustments might be needed.

How do I assess the academic and societal value, scope, and implications of my graduation project, including ethical aspects?

In terms of *academic and societal value*, I believe my graduation project brought something meaningful to the table. Academically, it contributed to the growing body of work on spatial justice, especially in the context of the residents who are the ones experiencing it (something that is still underexplored). It was an attempt to connect theory with practice in a very grounded, real-world way.

From a *societal angle*, the value lied in bridging the gap between how spatial justice is written into policy and how it is actually experienced by people on the ground. By having explored whether there was alignment, or not, between the municipal level and lived experiences, it shed light on where it might be falling short. Also, by looking at how spatial justice connected with satisfaction and usage, it gave insights into what matters for social sustainability in urban development.

The *scope* was naturally a bit limited due to the single case study approach, but that was a conscious choice. It allowed for depth, even if it meant the findings were not easily generalisable straight away. That being said, there is potential for wider conversations with the municipality, especially as I have shared this report with them through a presentation and as a report.

As for the *implications*, one of the more direct outcomes was to encourage the municipality to think more consciously about integrating spatial justice in the municipality as a concept in its own right. That alone could have a long-term impact if it starts shifting how planning and development are approached.

Ethically, I have tried to stay very aware of how I framed the voices of participants, where I made sure their input was not just used to prove a point, but was actually valued and reflected in the analysis. Especially when dealing with a specific concept of justice, that kind of attention felt essential.

How do I assess the value of the transferability of my project results?

Reflecting on my research, I feel it offered valuable insights into how policy, related to spatial justice, can shape residents' satisfaction with and their usage of urban green spaces. Even though my findings are very much grounded in Maastricht's unique context, I believe the approach I used (coding spatial justice and linking it directly to how residents experience their environment) holds potential for other municipalities as well. This method could be adapted not just for urban green spaces, but also for public spaces more broadly, helping cities better understand and improve spatial justice in the city.

I am also aware that transferring the results to other cities is not straightforward. Differences in local policies, socio-economic conditions, and the ways stakeholders interact can all influence how spatial justice is perceived and put into practice. So, while the framework and focus on lived experience provided a strong starting point, I do recognise that the findings were specific to Maastricht's particular circumstances and should be applied elsewhere with care.

Still, I keep coming back to the core idea that public green spaces should genuinely serve and reflect the needs of all residents to a certain extent. That is something I believe is universally relevant. If anything, my research underlined for me the crucial role municipalities play in fostering inclusive and just urban environments. That sense of responsibility feels essential in working toward truly socially sustainable city development.

Own developed reflection question: what would I have done differently in the process?

If I could go back and do things differently, there are definitely a few things I would like to change. First of all, I would make clearer and firmer agreements from the start, especially around expectations, timelines, and responsibilities. A lot of the setbacks I faced could possibly have been avoided, or at least have been less frustrating, if things had been more solid and clear from the beginning.

Nevertheless, some things were just out of my control. There were quite a few unexpected hurdles along the way, and at some point, you just have to accept that and find a way to keep going. It has been tough at times, but I have learnt a lot about perseverance.

Another thing I would definitely change, is bringing in someone with expertise on spatial justice earlier in the process. I think having had that input from the start onwards would have helped me sharpen my research and saved me some back-and-forth down the line.

Own developed reflection question: what has surprised me most during the process?

One of the more unexpected aspects of the process was the level of independence it required. While I anticipated more regular check-ins, I often found myself navigating the process largely on my own. This challenged me to take full ownership of my work and pushed me to develop a greater sense of autonomy than I had initially expected. Although it sometimes felt like being thrown in at the deep end, this experience ultimately proved to be both demanding and empowering, helping me grow significantly in confidence and self-direction.

What also surprised me was how incredible it actually was to try and build something from scratch. Even with all the uncertainty and the different kinds of pressure, it was quite a good feeling to see an idea slowly take shape and realise you are the one making it happen. That being said, the emotional rollercoaster was real. There were times where I went from feeling completely stuck to having a breakthrough within the same day. The ups and downs were intense, but I believe that is just part of the process. In the end, despite the challenges, it was incredibly rewarding to witness the journey of transformation, where each setback and breakthrough contributed to bringing the idea to life.

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14. Appendices

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Appendix A: Alignment of the selected case with the case criteria

The municipality: Maastricht

Criterion 1: Dutch municipality with an emerging interest in spatial justice

The municipality of Maastricht is increasingly recognising the importance of spatial justice. While it has not yet become a top priority, the municipality is keen on integrating it into its policies, particularly in the new '*Omgevingsvisie*' (Environmental Vision), which is scheduled for completion by the end of 2025. This emerging interest signals that Maastricht is ready to engage with the concept of spatial justice in future urban development, making it a relevant municipality to study for this research (De Ronde & Hendricks, personal communication, January 21, 2025).

Criterion 2: policy engagement in inclusive urban development and green accessibility

The municipality of Maastricht is committed to inclusivity and accessibility in urban development. The city envisions itself as a social and welcoming place where diversity is respected and no one is left behind. The municipality prioritises creating a space where residents feel at home, which aligns with the goals of spatial justice by ensuring that everyone benefits from urban spaces, including the green areas. Furthermore, health and well-being have become more central in the city's policies, with a focus on walking, cycling, and increasing green spaces for everyone. This makes Maastricht a fitting example of a city where inclusive urban development and green accessibility are becoming key priorities (Gemeente Maastricht, n.d. b).

Criterion 3: experience in citizen participation

The municipality of Maastricht has significant experience in citizen participation, especially since the implementation of the '*Omgevingswet' (Environmental Act)*, which has been applied in 2024 on national scale. The law emphasises the importance of involving citizens in the decision-making processes. Maastricht has committed to collaboration with residents, businesses, and other stakeholders to ensure that urban development is aligned with the community's needs. This commitment to participatory processes, linking to the spatial justice dimension of procedural justice, makes Maastricht an appropriate municipality for studying how citizen engagement can influence the development of just urban green spaces (Gemeente Maastricht, n.d. a).

The urban green space: Groene Loper

Criterion 1: multifunctional public space

The Groene Loper serves as a multifunctional urban green space by offering opportunities for economic, social, and environmental benefits (Innovatieve aanpak A2 Maastricht, n.d.). It includes areas for leisure activities, community events, and temporary initiatives, such as a community garden and small-scale businesses (Green Cities Europe, 2022). The space not only improves air quality and reduces noise pollution, but it also provides a welcoming environment for biodiversity and the people visiting and living there (ZonMw, 2019).

Criterion 2: open space with greenery

The Groene Loper is primarily a green corridor, featuring landscaping with trees designed to provide greenery, public health benefits, and environmental quality. The project was envisioned to enhance connectivity, thereby improving the urban experience of Maastricht and access to green spaces (ZonMw, 2019). It also aimed to offer large, open spaces for recreational use, fostering communal interaction and social engagement (Green Cities Europe, 2022).

Criterion 3: unpaved/paved trail(s), walking/cycling routes

The Groene Loper is designed as a pedestrian-friendly axis that spans 2.3 kilometres. It includes a six-metre wide path for slow traffic, such as pedestrians, cyclists, and runners, promoting active mobility and sustainable transportation (Green Cities Europe, 2022). The space is designed with the idea to encourage walking, cycling, and other outdoor activities, creating a vital green corridor for residents and visitors to connect with nature (Innovatieve aanpak A2 Maastricht, n.d.).

The neighbourhood: Wittevrouwenveld

Criterion 1: lower socio-economically status than average in the municipality

The socio-economic position of Wittevrouwenveld can be understood through the individual-based indicators of income, education, occupation, wealth, and housing (Conway et al., 2019). A detailed analysis of these indicators comparing the numbers of Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2022) with those of the Municipality of Maastricht in general (Statistieken gemeente Maastricht, 2022) is presented in Appendix A. Based on this analysis, it can be stated that the residents of Wittevrouwenveld, when compared to the general figures for the Municipality of Maastricht, fall below the average in all socio-economic indicators set-up by Conway et al. (2019). This suggests that the neighbourhood is characterised by a low socio-economic status.

Criterion 2: proximity to the urban green space

Wittevrouwenveld is situated parallel to The Groene Loper (Figure 14). This proximity is a vital factor in assessing the impact of the urban green space on the community, as the Groene Loper is positioned to offer enhanced access to green space and a better connection with the centre of Maastricht for residents of Wittevrouwenveld. However, the question remains whether the proximity alone translates into meaningful access and usage for the residents of Wittevrouwenveld, particularly those from lower socio-economic backgrounds (Gemeente Maastricht, 2010; Janssen, 2021).

Criterion 3: known challenges with the spatial justice of the urban green space

Despite the intention behind the Groene Loper to enhance access to urban green spaces and improve the connectivity to the centre of Maastricht, there are known challenges in its usage and accessibility. Studies indicate that urban renewal projects often lead to unintended consequences such as green gentrification, where improvements in public space result in rising housing prices that displace lower-income residents (Gevers et al., 2023; ZonMw, 2022). It has already been found that the Groene Loper has so far been experienced more as a new neighbourhood, than as a connection between Wittevrouwenveld and the west-part of Maastricht. Therefore, the question arises whether the residents of Wittevrouwenveld genuinely experience improvement with the development of the Groene Loper (Janssen, 2021).

Appendix B: Socio-economic status analysis of Wittevrouwenveld

The socio-economic status analysis of Wittevrouwenveld, in comparison to the overall municipality of Maastricht, is based on the individual-based indicators outlined by Conway et al. (2019). Only available data could be used for this analysis. While the available data was limited, it still provides a reasonably clear overview of the socio-economic status in Wittevrouwenveld, in relation to the general municipality of Maastricht (Table 18).

	Neighbourhood of Wittevrouwenveld	Municipality of Maastricht
Income		
Average income per inhabitant	€26.200	€31.100
Government or state welfare benefit support	15%	9,4%
Households below/around the social minimum	15%	9,1%
Education		
Educational attainment		
- Low	46,1%	24,8%
- Middle	31,9%	39,7%
- High	22%	35,5%
Occupation		
Net labour force participation	52%	54%
Percentage of employees	89%	86%
Percentage of self-employed	11%	14%
Wealth		
Average property value	€261.000	€297.000
Housing tenure		
- Owner-occupied	28%	38%
- Rental homes	71%	61%
- Unknown	1%	1%
Rental homes		
- Owned by housing corporation	65%	56%
- Owned by other landlords	35%	44%
Passenger cars per household	0,55	0,64
Housing		
Housing type		
- Apartment	50,7%	51,8%
- Semi-detached or terraced house	37,2%	29,4%
- Corner house	11,2%	11,4%
- Duplex house	0,8%	4,7%
- Detached house	0,1%	2,7%

Table 18: The individual-based indicators to understand the socio-economic position of Wittevrouwenveld. Table by author, inspired by Conway et al. (2019). Data for Wittevrouwenveld is retrieved from Statistieken buurt Wittevrouwenveld (2022). Data for the municipality of Maastricht is retrieved from Statistieken gemeente Maastrtticht (2022).

Appendix C: Data Management Plan

Plan Overview

A Data Management Plan created using DMPonline

Title: MBE MSc Graduation Project - The path to just urban green spaces

Creator: Anne Erven

Principal Investigator: Anne Erven

Data Manager: Anne Erven

Project Administrator: Anne Erven

Contributor: Yawei Chen

Affiliation: Delft University of Technology

Template: TU Delft Data Management Plan template (2025)

Project abstract:

This thesis aims to investigate how spatial justice is tackled at the policy level in the municipality of Maastricht, how it is experienced by the residents in the neighbourhood of Wittevrouwenveld, if and how this influences their usage of, and satisfaction with the urban green space *De Groene Loper*, and whether improving spatial justice at the policy level can improve this. The central research question is: *To what extent can urban green spaces be managed at the municipal level to ensure spatial justice within the built environment, thereby stimulating social sustainable urban development?* To answer this complex question, the study poses three sub-research questions:

1. *How is spatial justice currently a critical component in achieving social sustainable urban development in the management of urban green spaces in the context of the municipality of Maastricht?*
2. *How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces?*
3. *How do the policy levels of spatial justice align with the experienced level of spatial justice at the neighbourhood level, and what lessons can be drawn from this comparison?*

To get an answer to these questions, literature/document reviews, observations, interviews, municipal document analysis, surveys, and a focus group will be executed. In the quantitative surveys, local residents from Wittevrouwenveld (a neighbourhood in Maastricht) are approached both physically and online. This target group is part of a neighbourhood that is known for having a lower socio-economic status than average in the municipality. The focus group will be of qualitative nature, following the data analysis of the surveys. This group will include representatives of the municipality to reflect on the research findings and to explore the practical relevance of incorporating the concept of spatial justice within the municipality.

ID: 170859

Start date: 02-09-2024

End date: 27-06-2025

Last modified: 04-06-2025

MBE MSc Graduation Project - The path to just urban green spaces

0. Adminstrative questions

1. Provide the name of the data management support staff consulted during the preparation of this plan and the date of consultation. Please also mention if you consulted any other support staff.

This DMP has been shared with my thesis supervisor (the Responsible Researcher) Yawei Chen via DMPonline, and reviewed by her on 25/02/2025.
Janine Strandberg, Data Steward at the Faculty of Architecture and the Built Environment, has reviewed this DMP on 26/02/2025.
Rinus van Delden-Cost, Privacy Officer of the Privacy Team of the TU Delft, has reviewed this DMP on 10/03/2025.

2. Is TU Delft the lead institution for this project?

- Yes, leading the collaboration – please provide details of the type of collaboration and the involved parties below

In this project, TU Delft is the lead institution for this project. As the graduation is part of a graduation internship at the Municipality of Maastricht, they will be members of the collaboration as well.

I. Data/code description and collection or re-use

3. Provide a general description of the types of data/code you will be working with, including any re-used data/code.

Row	Type of data/code	File format(s)	How will data/code be collected/generated? *For re-used data/code: what are the sources and terms of use?*	Purpose of processing	Storage location	Who will have access to the data/code?
1	Literature related to the concepts of spatial justice, social sustainable urban development, and urban green spaces	.pdf	Internet, TU Delft library	To understand the different concepts tackled within this research, and how they relate to one another	Own computer / TU Delft OneDrive	Anne Erven, MSc student Yawei Chen, supervisor
2	Municipal (policy) documents of Maastricht on the management of urban green spaces	.pdf	Internet, archive of the Municipality of Maastricht	To analyse and review how spatial justice is currently being tackled in urban green spaces	Own computer / TU Delft OneDrive	Anne Erven, MSc student Yawei Chen, supervisor Municipality of Maastricht

3	Observations of space (no participants included)	.png / .pdf	Notes taken on a notepad and photographs taken of De Groene Loper, Maastricht	To better understand the current situation of De Groene Loper for the researchers' own understanding	Own mobile phone for photographs (temporary storage) / Own computer / TU Delft OneDrive	Anne Erven, MSc student Yawei Chen, supervisor
4	Interviews	.pdf	Short interviews will be conducted with municipal staff members and residents of Wittevrouwenveld without noting down any PII or PIRD data	To better understand the current situation of De Groene Loper and the municipality of Maastricht in general for the researchers' own understanding	Own computer / TU Delft OneDrive	Anne Erven, MSc student Yawei Chen, supervisor
5	Report/thesis	.pdf	Serves as record of the process as well as documentation	Long-term documentation	Own computer / TU Delft OneDrive	Anne Erven, MSc student Yawei Chen, supervisor
The survey						
6	Personally Identifiable Information (PII) of participants: address	.xlsx	Contact information for distributing the survey across Wittevrouwenveld. This is data that belongs to the municipality. The Department of 'Onderzoek en Statistiek' will handle the distribution, I will not have access to the PII that is being used	For distribution of the survey only; not processed further or connected to the answers given in the survey	Storage system of Municipality of Maastricht	Municipality of Maastricht
7	Opening statement	.pdf	Digital/physical opening statement stating that by clicking/signing the box, the participant consents to participating in the survey and agrees to the terms outlined in the opening statement	To obtain and document consent	TU Delft Project Data Storage (U:) drive / hard copy checked opening statements are stored in a locked cabinet functioning as a secure location	Anne Erven, MSc student Municipality of Maastricht Yawei Chen, supervisor

8	Personally Identifiable Research Data (PIRD) of participants: gender, age, socio-economic status	.xlsx	Online and physical survey using Enalyzer. Instructions for TU Delft research will be adhered to. Multiple-choice questions are prioritised and long open questions are avoided. This is because people may accidentally reveal personal information about themselves, and the ways in which people speak could potentially also be used to re-identify participants.	To determine whether the participants represent a diverse range of residents of Wittevrouwenveld / to explore the usage of, and satisfaction with De Groene Loper, and the experienced level of spatial justice by the inhabitants of Wittevrouwenveld	*Online survey*: Enalyzer server (temporary storage) *Physical survey*: Stored in a locked cabinet functioning as a secure location after which it will be digitalised and shredded (temporary storage) TU Delft Project Data Storage (U:) drive (primary storage)	Anne Erven, MSc student Municipality of Maastricht Yawei Chen, supervisor
9	Anonymous survey on the experienced level of spatial justice, and the usage of, and satisfaction with urban green spaces	.csv	Online and physical survey using Enalyzer. Instructions for TU Delft research will be adhered to. Multiple-choice questions are prioritised and long open questions are avoided. This is because people may accidentally reveal personal information about themselves, and the ways in which people speak could potentially also be used to re-identify participants. *Online survey in Enalyzer:* An anonymous link will be used and IP-address tracking will be turned off. The survey is distributed via a physical invitation letter, providing a digital link to the survey. *Physical survey:* The survey is distributed via a physical invitation letter, providing the opportunity to request a physical survey sent to the participants' home address, which can be returned for free when filled in.	To explore the usage of and satisfaction with De Groene Loper and the experienced level of spatial justice by the inhabitants of Wittevrouwenveld	*Online survey*: Enalyzer server (temporary storage) *Physical survey*: Stored in a locked cabinet functioning as a secure location after which it will be digitalised and shredded (temporary storage) TU Delft Project Data Storage (U:) drive (primary storage)	Anne Erven, MSc student Municipality of Maastricht Yawei Chen, supervisor
10	Personally Identifiable Information (PII) of participants: e-mail address	.xlsx	Contact information needed for contacting the winners of the lottery	For distribution of the vouchers only; not processed further or connected to the answers given in the survey	Storage system of Municipality of Maastricht	Anne Erven, MSc student Municipality of Maastricht
The focus group						

11	Informed consent forms including explicit consent points	.pdf	Informed consent forms signed physically	To obtain and document informed consent	Hard copy consent forms are stored in a locked cabinet functioning as a secure location	Anne Erven, MSc student Yawei Chen, supervisor
12	Audio-recording(s) of representatives of the Municipality of Maastricht in a focus group discussing spatial justice in relation to De Groene Loper	.mp3	The focus group is conducted in-person, preferably in the municipality itself. The audio-recordings are made on an external device, before being moved to the Project Data Storage. Recordings are deleted after transcription	To reflect on the research findings and to explore the practical relevance of incorporating the concept of spatial justice within the municipality	MP3 player (temporary storage) / TU Delft Project Data Storage (U:) drive (primary storage)	Anne Erven, MSc student Yawei Chen, supervisor
13	Anonymous transcriptions of focus group	.txt	Anonymous transcriptions created manually based on audio-recordings. Participants will be asked to review the transcriptions of their focus group discussion before the transcript is finalised	Privacy-preserving data on spatial justice of De Groene Loper from participants	TU Delft Project Data Storage (U:) drive	Anne Erven, MSc student Yawei Chen, supervisor
14	Anonymised data on the opinions of spatial justice in De Groene Loper	.csv	Data obtained from coding anonymised transcriptions using Atlas Software. TU Delft has a campus licence for students	Privacy-preserving data on spatial justice of De Groene Loper from participants	Atlas.ti (temporary storage) / TU Delft Project Data Storage (U:) drive (primary storage)	Anne Erven, MSc student Yawei Chen, supervisor

II. Storage and backup during the research process

4. How much data/code storage will you require during the project lifetime?

- 250 GB – 5 TB

5. Where will the data/code be stored and backed-up during the project lifetime? (Select all that apply.)

- TU Delft OneDrive
- Project Data Storage (U:) drive at TU Delft
- Another storage system – please explain below, including provided security measures

- **Mp3**: external device, storing the audios on site temporarily. Will be removed as soon as possible.
- **Enalyzer server**: external device, storing the anonymous responses to the survey temporarily. Will be removed as soon as possible.
- **Atlas.ti**: software used to temporarily store coded materials. Will be removed as soon as possible.
- **Storage system of Municipality of Maastricht**: the department of 'Onderzoek en Statistiek' of the Municipality of Maastricht will aid in spreading the distribution via the PII data they have on the residents of Wittevrouwenveld. I

will not work with this storage system including the PII data, therefore it will also not be shared with the TUD. The data collected from the anonymous surveys will not be connected to the PII data used to distribute the survey.
- **Locked cabinet**: storage of hard copy consent forms in a secure location and storage of physical responses to the survey (including PIRD data).
- **Own mobile phone**: photographs taken from De Groene Loper to be used in the thesis report, not including participants.
- **Notepad**: notes taken during visits to De Groene Loper, not including participants.
- **Own computer**: storing of found literature, municipal (policy) documents found on the Internet, and observations taken (notes and photographs) of De Groene Loper without including participants.

III. Data/code documentation

6. What documentation will accompany data/code? (Select all that apply.)

- Metadata – I will adhere to the metadata standards used by the data repository where the data will be shared (see section V)
- Data – Methodology of data collection

IV. Legal and ethical requirements, code of conducts

7. Does your research involve human subjects or third-party datasets collected from human participants?

If you are working with a human subject(s), you will need to obtain the HREC approval for your research project.

- Yes – please provide details in the additional information box below

I have applied for (and received) ethical approval from the Human Research Ethics Committee on April 2nd, 2025, with HREC application number 5347.

8. Will you work with personal data? (This is information about an identified or identifiable natural person, either for research or project administration purposes.)

- Yes

The personal data collected in the project will be anonymised, but processing of personal data is required for conducting the research project.

9. Will you work with any other types of confidential or classified data or code as listed below? (Select all that apply and provide additional details below.)

If you are not sure which option to select, ask your Faculty Data Steward for advice.

- No, I will not work with any other types of confidential or classified data/code

10. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your Faculty Contract Manager when answering this question.

The intellectual property rights are framed by a graduation agreement between Delft University of Technology, myself, and the Municipality of Maastricht.

11. Which personal data or data from human participants do you work with? (Select all that apply.)

- Proof of consent (such as signed consent materials which contain name and signature)
- Other types of personal data or other data from human participants – please provide details below
- Photographs
- Audio recordings
- Telephone number, email addresses and/or other addresses as contact details for administrative purposes
- Date of birth and/or age
- Gender
- Names as contact details for administrative purposes
- Sensitive personal information: socio-economic status

12. Please list the categories of data subjects and their geographical location.

Survey participants are residents in the neighbourhood of Wittevrouwenveld, Maastricht.
Focus group participants are representatives from the municipality. They will be recruited with the help of my internship supervisor at the Municipality of Maastricht.

13. Will you be receiving personal data from or transferring personal data to third parties (groups of individuals or organisations)?

- No

16. What are the legal grounds for personal data processing?

- Informed consent

17. Please describe the informed consent procedure you will follow below.

Survey:
For the anonymous surveys, an Opening Statement will be used at the start of the survey to inform participants about the goals and procedures of the research project, as well as the type of information that is requested in the survey. Participants' agreement with the terms and conditions of the research are signified by clicking through to the survey in case of the online survey, or signing a box in case of the physical survey.

Focus group:
The researcher will inform the participants about the goals and procedures of the research project. The researcher will also inform them about the personal data that are being processed and for what purpose. A digital copy of the information will be emailed to the participants before the focus group take place, and all participants will be asked for their consent for taking part in the study and for data processing by signing a physical informed consent form before the start of the focus group.

18. Where will you store the physical/digital signed consent forms or other types of proof of consent (such as recording of verbal consent)?

The physical signed consent forms will be stored in a locked cabinet functioning as a secure location.

19. Does the processing of the personal data result in a high risk to the data subjects? (Select all that apply.)

If the processing of the personal data results in a high risk to the data subjects, it is required to perform a Data Protection Impact Assessment (DPIA). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data in your research project.

If any category applies, please provide additional information in the box below. Likewise, if you collect other type of potentially sensitive data, or if you have any additional comments, include these in the box below.

If one or more options listed below apply, your project might need a DPIA. Please get in touch with the Privacy team (privacy-tud@tudelft.nl) to get advice as to whether DPIA is necessary.

- Data concerning vulnerable data subjects
- Sensitive personal data

Sensitive personal data: socio-economic status.
Data concerning vulnerable data subjects: people with lower socio-economic status.

20. Did the Privacy team advise you to perform a DPIA?

- No – please provide details in the additional information box below

Rinus van Delden-Cost, Privacy Officer of the Privacy Team of the TU Delft, has reviewed this DMP on 10/03/2025 and concluded that this research does not need the performance of a DPIA.
According to Rinus, this is because the amount of personal data is very limited and even though the participant could be part of a vulnerable group (lower social-economic status), their PII cannot be related to them individually and is not connected to the data collected in the surveys.
Data that is shared between the different organisations is anonymised, and therefore data agreements are also not necessary.

23. What will happen with the personal data used in the research after the end of the research project?

- Anonymised or aggregated data will be shared with others

24. For how long will personal research data (including pseudonymised data) be stored?

- Personal data will be deleted at the end of the research project

Audio-recordings of the focus group are destroyed after completion of anonymised focus group transcriptions. All other personal research data will be destroyed at the latest 1 month after the end of the project.

25. How will your study participants be asked for their consent for data sharing?

- In the informed consent form: participants are informed that their personal data will be anonymised and that the anonymised dataset is shared publicly

All participants will be asked for their consent for data to be shared anonymously in the body of the MSc thesis, which is made publicly accessible in the TU Delft Repository. Participants who do not consent to their data being included publicly in the thesis will not be included in the research project.

V. Data sharing and long term preservation

27. Apart from personal data mentioned in question 23, will any other data be publicly shared?

Please provide a list of data/code you are going to share under 'Additional Information'.

- All other non-personal data/code produced in the project

- The MSc thesis itself.
- The literature used for the research.
- The photographs taken from De Groene Loper (not including participants).

29. How will you share research data/code, including those mentioned in question 23?

- I am a Bachelor's/Master's student at TU Delft and I will share the data/code in the body and/or appendices of my thesis/report in the Education Repository

31. When will the data/code be shared?

- At the end of the research project

VI. Data management responsibilities and resources

33. If you leave TU Delft (or are unavailable), who is going to be responsible for the data/code resulting from this project?

My supervisor, Yawei Chen, Urban Development Management, withy.chen@tudelft.nl.

34. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?

The TU Delft Repository is able to archive 1TB of data/code per researcher per year free of charge for all TU Delft researchers. I do not expect to exceed this and therefore there are no additional costs of long term preservation.

35. Which faculty do you belong to?

- Faculty of Architecture and the Built Environment (ABE)

Appendix D: Graduation Plan

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Anne Erven
Student number	5912229

Studio		
Name / Theme	Inclusive Communities Thematic Lab 3	
Main mentor	Yawei Chen	Urban Development Management
Second mentor	Ellen Geurts	Real Estate Management
Argumentation of choice of the studio	I chose this lab, as I believe that fostering inclusivity is essential for creating more just societies. This lab offers the opportunity to explore how inclusive practices can be created and managed, not just to benefit marginalised groups, but to enrich society as a whole. By working within this theme, I hope to potentially contribute to meaningful change, using research and collaboration to create spaces where everyone feels valued.	

Graduation project	
Title of the graduation project	The path to just urban green spaces
Goal	
Location:	Municipality of Maastricht
The posed problem,	Despite the recognised importance of urban green spaces for well-being and quality of life, their spatial justice in the Dutch context remains insufficiently explored. In highly urbanised municipalities, urban green spaces are under a lot of pressure. The existing policies emphasise social inclusion, but they seem to lack integration of residents' lived experiences and perspectives on urban green space management. Without their views, these injustices may worsen as cities continue to densify further.
research questions and	**MRQ** To what extent can urban green spaces be managed at the municipal level to ensure spatial justice within the built environment, stimulating social sustainable urban development?

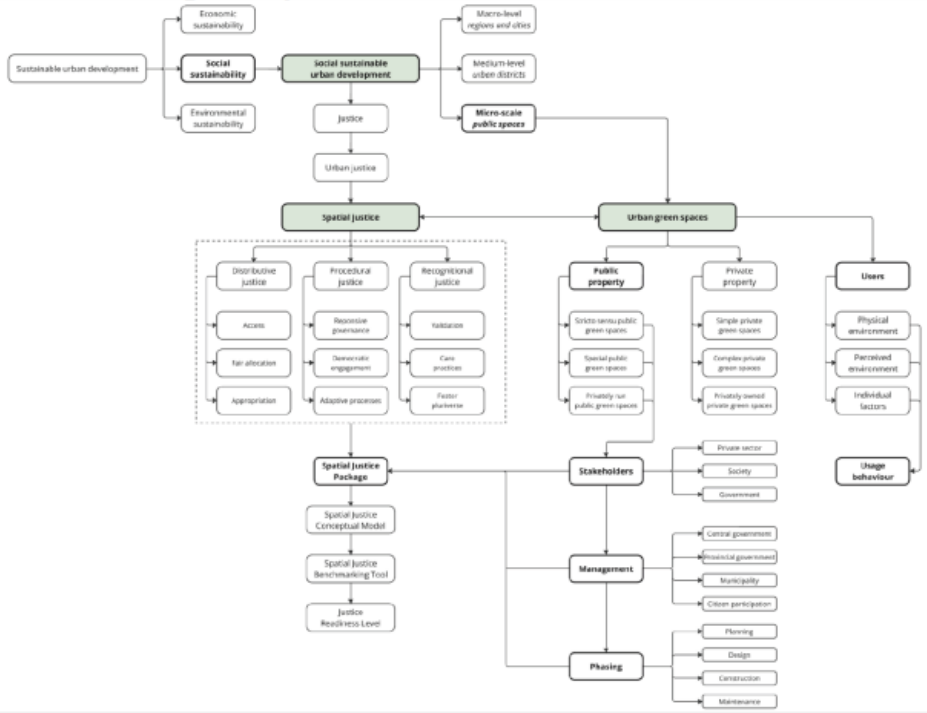
	SRQ 1 How is spatial justice currently a critical component in achieving social sustainable urban development in the management of urban green spaces in the context of the municipality of Maastricht? **SRQ 2** How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces? **SRQ 3** How do the policy levels of spatial justice align with the experienced level of spatial justice at the neighbourhood level, and what lessons can be drawn from this comparison?
assignment in which these result.	This research aims to analyse whether the level of spatial justice in neighbourhoods affects the use of, and satisfaction with urban green spaces, and whether improving spatial justice at the policy level can improve this. By evaluating the spatial justice of urban green spaces and incorporating local perspectives, the study seeks to develop actionable recommendations for more just urban green space management, contributing to social sustainable urban development.

Process

Method description

Research method	Data collection instrument	Data analysis	Type of data	Source
Sub research question 1 *How is spatial justice currently a critical component in achieving social sustainable urban development in the management of urban green spaces in the context of the municipality of Maastricht?*				
Qualitative	Literature/document review	Thematic review	Secondary data	Internet, TU Delft library
Quantitative	Municipal document analysis	Thematic document analysis	Secondary data	Internet, archive of the municipality of Maastricht
Qualitative	Interviews	Thematic analysis	Primary data	Employees of the municipality of Maastricht
Sub research question 2 *How do people experience spatial justice at the neighbourhood level, and how does this affect their satisfaction with, and usage of urban green spaces?*				
Qualitative	Observations	Non-participant, naturalistic	Primary data	The Groene Loper
Quantitative and qualitative	Survey	Bivariate analysis	Primary data	Inhabitants of Wittevrouwenveld
Qualitative	Interviews	Thematic analysis	Primary data	Employees of the municipality of Maastricht, and inhabitants of Wittevrouwenveld
Sub research question 3 *How do the policy levels of spatial justice align with the experienced level of spatial justice at the neighbourhood level, and what lessons can be drawn from this comparison?*				
Qualitative	Comparative analysis	Thematic analysis	Primary data	Findings from sub research question 1 and 2
Qualitative	Focus group	Thematic analysis	Primary data	Pre-selected employees of the municipality of Maastricht

Literature and general practical references



Reflection

What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

My graduation project aligns with the *graduation project topic* Inclusive Communities theme as it focusses on addressing spatial justice in the management of urban green spaces, ensuring a just experience for all people of the community. It connects to the *master track* Management in the Built Environment by exploring the optimisation of policy frameworks and management strategies for social sustainable urban green space management. Within the broader *master programme* MSc Architecture, Urbanism, and Building Sciences, my research contributes to urban planning and policy by integrating the new perspective of spatial justice to create more just and sustainable cities. By analysing spatial justice in urban green space management and proposing actionable policy improvements, my study bridges inclusivity, strategic urban management, and sustainable urban development.

What is the relevance of your graduation work in the larger social and scientific framework.

The relevancy of (social) sustainable urban development, spatial justice, and urban green spaces has become increasingly prominent in current urban discussions, as these concepts together highlight how the benefits and challenges of urban environments are distributed across different communities. Examining urban green spaces through the lens of spatial justice provides a deeper understanding of the

systems that shape access to these fundamental resources. This perspective not only looks critically at social injustices, but also underscores the importance of integrating spatial justice into academic research to drive meaningful improvements in urban management.

Societal relevance

In the context of sustainable urban development, the focus lies in meeting the present societal needs without compromising the ability of future generations to meet theirs (Mehan and Soflaei, 2017). By incorporating social sustainable urban development into this research, key issues such as governance, social justice, and community well-being are addressed specifically.

Urban green spaces specifically play a fundamental role in enhancing the quality of urban life by providing essential ecosystem services. They offer a range of benefits, including environmental, economic, social, and psychological well-being, as well as physical health improvements (Schipperijn, 2010). Beyond their immediate benefits, urban green spaces are crucial for climate change adaptation. However, these resources often do not receive the attention they deserve in urban management discussions (Derkzen et al., 2015). Rapid urbanisation has further intensified pressure on green areas, threatening their availability and the benefits they provide (Zhou and Wang, 2011). As urban green space scarcity increases, it becomes more crucial that the existing spaces are well-suited to the needs and preferences of the local population, ensuring they align with their requirements and desires as well as possible. Without proactive strategies, cities, particularly those experiencing significant population growth, face the risk of losing the benefits of these crucial spaces for its residents (Derkzen et al., 2017).

The challenges posed by urbanisation highlight the urgent need for research into the spatial justice of urban green spaces. Understanding how spatial justice functions in urban settings and how it can be applied to create more inclusive cities will ultimately contribute to a more just and sustainable society, and a potential higher quality of life for its individuals.

Scientific relevance

Beyond its societal implications, exploring spatial justice in relation to urban green spaces also carries substantial scientific relevance. A critical gap remains in understanding to what extent urban green spaces can be effectively managed within a municipal context to advance spatial justice. This shortcoming is evident in both academic literature and urban planning practice, particularly in relation to the development of strategies. Moreover, the literature currently lacks sufficient insight into how the dimensions of spatial justice are experienced by residents in their everyday lives, as the studies tend to emphasise policy frameworks or spatial analysis rather than residents' perspectives.

By addressing these gaps, this thesis seeks to contribute meaningful knowledge to the academic field. In doing so, it seeks to expand discussions on spatial justice and urban green space management, deepening the understanding of how these elements can be integrated to foster more just and social sustainable urban environments.

Appendix E: Opening statement survey in Dutch

Beste deelnemer,

U wordt uitgenodigd om deel te nemen aan een onderzoek getiteld *De weg naar eerlijke stedelijke groene ruimtes*. Dit onderzoek wordt uitgevoerd door Anne Erven, masterstudent aan de Technische Universiteit Delft, in samenwerking met de Gemeente Maastricht.

Doel van het onderzoek

Het onderwerp van deze studie is ruimtelijke rechtvaardigheid. Het doel is om te evalueren hoe u de Groene Loper ervaart als inwoner van Wittevrouwenveld, en hoe dit uw gebruik van deze groene plek beïnvloedt. Uw deelname zal helpen om het huidige niveau van ruimtelijke rechtvaardigheid te verkennen en te beschrijven, en inzichten te verkrijgen over hoe dit in de toekomst wellicht verbeterd kan worden. De enquête zal ongeveer 5 minuten duren om in te vullen.

Inhoud van de enquête

De enquête bevat vragen over uw persoonlijke ervaringen met de Groene Loper en hoe u deze groene ruimte gebruikt (of niet gebruikt).

Vertrouwelijkheid en gegevensbescherming

Uw deelname is volledig anoniem en er worden geen IP-adressen verzameld. Persoonsgegevens zoals uw geslacht, leeftijd, en achtergrond worden verzameld, maar u bent vrij om vragen over te slaan die u liever niet beantwoordt. Alle antwoorden worden vertrouwelijk behandeld en veilig opgeslagen in de TU Delft Project Data Storage (U:).

Vrijwillige deelname

Uw deelname aan dit onderzoek is geheel vrijwillig en u kunt op elk moment stoppen. U bent ook vrij om vragen over te slaan als u deze niet wilt beantwoorden.

Contactinformatie

Als u vragen heeft, kunt u contact met mij opnemen via de volgende opties:
Telefoon: 14 043
Mail: onderzoekenstatistiek@maastricht.nl

Door het vakje hieronder aan te vinken, gaat u akkoord met deelname aan het onderzoek en met de bovengenoemde voorwaarden.

☐

Bedankt voor uw tijd en bijdrage aan dit onderzoek, het wordt zeer gewaardeerd!

Met vriendelijke groet,
Anne Erven

Appendix F: Opening statement survey in English

Dear participant,

You are invited to participate in a research study titled *The path to just urban green spaces*. This study is conducted by Anne Erven, a Master's student at the Delft University of Technology, in collaboration with the Municipality of Maastricht.

The purpose of the study

The topic of this study is spatial justice. The purpose is to evaluate how you experience **the Groene Loper** as a resident of **Wittevrouwenveld**, and how this influences your usage of this green space. Your participation will help explore and describe the current level of spatial justice and provide insights into how it could be improved in the future. The survey will take you approximately **5-10 minutes** to complete.

The content of the survey

The survey will include questions on your personal experiences with the Groene Loper and how you use (or do not use) this green space.

Confidentiality and data protection

Your participation is **completely anonymous**, and no IP addresses will be collected. Personal data such as your gender, age, and background will be gathered, but you are free to skip any questions you are uncomfortable answering. All responses will be kept confidential and stored securely in the TU Delft Project Data Storage (U:).

Voluntary participation

Your participation in this study is entirely voluntary, and you can withdraw at any time. You are also free to skip any questions if you prefer not to answer them.

Contact information

If you have any questions or concerns, please feel free to reach out to me via the following options:
Phone: 14 043
Mail: onderzoekenstatistiek@maastricht.nl

By clicking the box below, you consent to participate in the study and agree to the terms outlined above.

☐

Thank you for your time and contribution to this research, it is greatly appreciated!

Kind regards,
Anne Erven

Appendix G: Formal consent form with explicit consent points focus group in Dutch

Deelnemer informatie

Beste deelnemer,

U wordt uitgenodigd om deel te nemen aan een onderzoek getiteld *De weg naar eerlijke stedelijke groene ruimtes*. Dit onderzoek wordt uitgevoerd door Anne Erven, masterstudent aan de Technische Universiteit Delft, in samenwerking met de Gemeente Maastricht.

Doel van het onderzoek

Het onderwerp van deze studie is ruimtelijke rechtvaardigheid. Het doel is om de onderzoeksresultaten met betrekking tot de ruimtelijke rechtvaardigheid van de Groene Loper, zoals ervaren door inwoners van **Wittevrouwenveld**, te bespreken. Daarbij wordt specifiek gekeken naar hoe ruimtelijke rechtvaardigheid is vormgegeven op beleidsniveau in relatie tot deze resultaten. Uw deelname aan deze focusgroep draagt bij aan het valideren van deze resultaten. Samen verkennen we waar kansen liggen, waar meer nuance gewenst is, en welke belemmeringen in de praktijk mogelijk moeten worden aangepakt. De sessie zal **maximaal 60 minuten** duren.

Inhoud van de focus groep

De focusgroep richt zich op het bespreken van de bevindingen uit het onderzoek, met bijzondere aandacht voor het identificeren van de belangrijkste uitdagingen rond de ervaringen en het gebruik van de Groene Loper. Tijdens de sessie staat het begrijpen van de prioriteiten van bewoners centraal, evenals het verkennen van manieren waarop de gemeente deze inzichten effectief kan vertalen naar toekomstig beleid.

Vertrouwelijkheid en gegevensbescherming

Er wordt een audio-opname gemaakt op een extern apparaat, die vervolgens wordt overgezet naar een veilige opslag. De opname wordt na transcriptie verwijderd. De transcripties worden geanonimiseerd en handmatig opgesteld. U wordt gevraagd om de transcripties van de focus groep te controleren voordat het definitieve transcript wordt afgerond. De transcripties worden vertrouwelijk behandeld en veilig opgeslagen in de TU Delft Project Data Storage (U:).

Vrijwillige deelname

Uw deelname aan dit onderzoek is **geheel vrijwillig** en u kunt op elk moment stoppen. U bent ook vrij om vragen over te slaan als u deze niet wilt beantwoorden.

Contactinformatie

Als u na deze focusgroep-sessie vragen of opmerkingen heeft, kunt u contact met mij opnemen

Door hieronder de punten van expliciete toestemming te beantwoorden met ‘ja’, gaat u akkoord met deelname aan het onderzoek en met de bovengenoemde voorwaarden.

Bedankt voor uw tijd en bijdrage aan dit onderzoek, het wordt zeer gewaardeerd!

Met vriendelijke groet,
Anne Erven

Punten van expliciete toestemming

Vink de juiste vakjes aan	Ja	Nee
A: Algemeen akkoord – onderzoeksdoelen, deelnemers taken, en vrijwillige deelname		
1. Ik heb de studie-informatie van .. / .. / …. gelezen en begrepen, of deze is voorgelezen aan mij. Ik heb vragen kunnen stellen over het onderzoek en mijn vragen zijn naar tevredenheid beantwoord.	☐	☐
2. Ik geef vrijwillig mijn toestemming om deel te nemen aan dit onderzoek en begrijp dat ik vragen kan weigeren te beantwoorden en op elk moment zonder opgave van reden kan stoppen met deelname.	☐	☐
3. Ik begrijp dat deelname aan het onderzoek inhoudt dat er een audio-opname van de focus groep wordt gemaakt. De opname zal worden getranscribeerd naar tekst, waarna de opname zal worden vernietigd.	☐	☐
4. Ik begrijp dat het onderzoek eindigt zodra de masterthesis door de onderzoeker is gepresenteerd. Dit staat gepland voor 27 juni 2025.	☐	☐
B: Potentiële risico's van deelname (inclusief gegevensbescherming)		
5. Ik begrijp dat deelname aan het onderzoek de risico's van mentaal ongemak met zich meebrengt. Ik begrijp dat deze risico's worden gemitigeerd doordat ik op elk moment kan vragen om de focus groep te stoppen.	☐	☐
6. Ik begrijp dat de (identificeerbare) persoonlijke gegevens die ik verstrek, zullen worden vernietigd nadat de gegevens uit de opnames anoniem zijn getranscribeerd.	☐	☐
7. Ik begrijp dat de volgende stappen zullen worden genomen om de dreiging van een data-lek te minimaliseren en mijn identiteit te beschermen in het geval van een dergelijk lek. Gegevens zullen geanonimiseerd worden tijdens het transcriberen, waarna ze veilig worden opgeslagen met beperkte toegang.	☐	☐
8. Ik begrijp dat persoonlijke informatie over mij die mij kan identificeren, zoals mijn naam en mijn email adres, niet buiten de focus groep zal worden gedeeld.	☐	☐
9. Ik begrijp dat deelname aan het onderzoek ook inhoudt dat er specifieke Persoonlijk Identificeerbare Research Data (PIRD) ['beroep': medewerker van gemeente Maastricht] wordt verzameld. Er wordt gegarandeerd dat er geen risico op her-identificatie zal zijn.	☐	☐
C: Onderzoek publicatie, verspreiding en toepassing		
10. Ik begrijp dat na het onderzoek, de informatie die ik verstrek exclusief persoonlijke details zal worden gebruikt voor de publicatie van de masterthesis. Ook kunnen de resultaten dienen als aanbeveling voor beleidswijzigingen in de gemeente Maastricht.	☐	☐
11. Ik ga ermee akkoord dat mijn antwoorden, opvattingen, of andere bijdragen anoniem geciteerd mogen worden in onderzoeksresultaten.	☐	☐

Handtekeningen

_____	_____	_____
Naam deelnemer	Handtekening	Datum

Ik, de onderzoeker, verklaar dat ik de informatie en het instemmingsformulier correct aan de potentiële deelnemer heb gegeven en, naar het beste van mijn vermogen, heb verzekerd dat de deelnemer begrijpt waar hij/zij vrijwillig mee instemt.

_____	_____	_____
Naam onderzoeker	Handtekening	Datum

Contactgegevens van de onderzoeker voor verdere informatie:

Anne Erven
Telefoon: +31 6 14677643
Mail: anne.erven@maastricht.nl

Appendix H: Formal consent form with explicit consent points focus group in English

Participant information

Dear participant,

You are invited to participate in a research study titled *The path to just urban green spaces*. This study is conducted by Anne Erven, a Master's student at the Delft University of Technology, in collaboration with the Municipality of Maastricht.

The purpose of the study

The subject of this study is spatial justice. The aim is to discuss the research findings related to the spatial justice of the **Groene Loper**, as experienced by residents of **Wittevrouwenveld**. The focus will be specifically on how spatial justice has been shaped at the policy level in comparison to these results. Your participation in this focus group will contribute to validating these findings. Together, we will explore where opportunities exist, where further nuance is needed, and which barriers may need to be addressed in practice. The session will last a **maximum of 60 minutes**.

The content of the focus group

The focus group is aimed at discussing the findings of the study, with particular attention to identifying the main challenges related to the experiences and use of the Groene Loper. The session will centre on understanding residents' priorities and exploring how the municipality can effectively translate these insights into future policy.

Confidentiality and data protection

An audio-recording is made on an external device, before being moved to a safe project data storage. The recording is deleted after transcription. The transcriptions will be made anonymous and created manually. You are asked to review the transcriptions of the focus group before the transcript is finalised. The transcriptions will be kept confidential and stored securely in the TU Delft Project Data Storage (U:).

Voluntary participation

Your participation in this study is entirely voluntary, and you can withdraw at any time. You are also free to omit any questions if you prefer not to answer them.

Contact information

If you have any questions or concerns after this focus group session, please feel free to reach out to me via the following options:
Phone: +31 6 14677643
Mail: anne.erven@maastricht.nl

By answering the points of explicit consent below with 'yes', you agree to participate in the research and to the terms and conditions mentioned above.

Thank you for your time and contribution to this research, it is greatly appreciated!

Kind regards,
Anne Erven

Please tick the appropriate boxes	Yes	No
A: General agreement – research goals, participant tasks, and voluntary participation		
1. I have read and understood the informed consent dated 17/03/2025, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves an audio-recorded focus group. The audio recording will be transcribed as text, after which the recording will be destroyed.	☐	☐
4. I understand that the study will end once the master's thesis has been presented by the researcher. This is planned for the 27th of June, 2025.	☐	☐
B: Potential risks of participating (including data protection)		
5. I understand that taking part in the study involves the risks of mental discomfort. I understand that these will be mitigated by having the ability to ask for the focus group to stop at any point.	☐	☐
6. I understand that the (identifiable) personal data I provide will be destroyed after the data from the recordings has been transcribed anonymously.	☐	☐
7. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach. Data will be anonymised in the process of transcribing, after which it will be securely stored with limited access.	☐	☐
8. I understand that personal information collected about me that can identify me, such as my name and my email address, will not be shared beyond the focus group.	☐	☐
9. I understand that taking part in the study also involves collecting specific Personally Identifiable Research Data (PIRD) ['occupation': employee of the Municipality of Maastricht]. It will be ensured that there will be no risk of re-identification.	☐	☐
C: Research publication, dissemination, and application		
10. I understand that after the study, the information I provide excluding personal details will be used for the publication of the master thesis. Also, the results might serve as a recommendation for policy changes in the Municipality of Maastricht.	☐	☐
11. I agree that my responses, views, or other input can be quoted anonymously in research outputs.	☐	☐

Signatures

_____	_____	_____
Name of participant	Signature	Date

I, as researcher, have handed out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands what they are freely consenting to.

_____	_____	_____
Researcher name	Signature	Date

Study contact details for further information:

Anne Erven
Phone: +31 6 14677643
Mail: anne.erven@maastricht.nl

Appendix I: Formula for calculating the socio-economic status

Due to limitations on what could be asked within the survey sent out by the municipality, the following variables were used to calculate a respondents' socio-economic status: *housing tenure*, *housing type*, *language(s) spoken at home*, and *income*. Each group contains indicators with their own weight (Table 19).

Group	Indicator	Weight
Housing tenure	Social housing	1
	Private rental	2
	Owner-occupied	3
Housing type	Apartment without garden	1
	Apartment with garden	2
	House	3
Language spoken at home	One (non-Western language)	1
	Dutch (and/or other Western language)	2
Income	Not enough at all / just not enough	1
	Sufficient	2
	Comfortable	3

Table 19: Indicators and their weights used in the formula for calculating the respondents' socio-economic status. Table by author.

The higher the weight, the higher the socio-economic status. The calculation was based on general knowledge and adjusted in consultation with municipal staff. The following formula was used:

Socio-economic status =
(housing tenure x 2) + (housing type x 1) + (language spoken at home x 1) + (income x 2)

Based on the resulting values of the formula above, a minimum score of 6 and a maximum score of 17 could be reached. These were then categorised into a low (6–9), a medium (10–13), and a high (14–17) socio-economic status.

Appendix J: Survey questions in Dutch

Welkom

Deze vragenlijst gaat over de Groene Loper. Het invullen van de vragenlijst duurt maximaal 5 minuten.

1. Ken je de Groene Loper?
   - ☐ Ja
   - ☐ Nee

De Groene Loper

De Groene Loper is een groene strook in Maastricht-Oost, waar vroeger de A2 snelweg liep. Sinds 2016 gaat het verkeer door tunnels onder de grond, waardoor er bovenop de tunnels een lange groene ruimte is ontstaan. Deze ruimte is bedoeld voor wandelen, fietsen, sporten en ontspannen. Auto's mogen er nog rijden, maar alleen met lage snelheid.

2. In hoeverre ben je het eens of oneens met de volgende stellingen?

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens	Weet ik niet/geen mening
Stelling 1: De Groene Loper is voor mij goed te bereiken.	☐	☐	☐	☐	☐	☐
Stelling 2: Iedereen in mijn buurt kan de Groene Loper even goed bereiken.	☐	☐	☐	☐	☐	☐
Stelling 3: Ik voel me fijn op de Groene Loper.	☐	☐	☐	☐	☐	☐
Stelling 4: Ik heb invloed op hoe de Groene Loper eruitziet.	☐	☐	☐	☐	☐	☐
Stelling 5: De gemeente wil mijn mening over de Groene Loper horen.	☐	☐	☐	☐	☐	☐

3. In hoeverre ben je het eens of oneens met de volgende stellingen?

	Helemaal oneens	Oneens	Neutraal	Eens	Helemaal eens	Weet ik niet/geen mening
Stelling 6: De gemeente geeft duidelijk uitleg over de manier waarop ze de Groene Loper inricht.	☐	☐	☐	☐	☐	☐
Stelling 7: De gemeente luistert naar lokale groepen voordat ze beslissingen neemt over de Groene Loper.	☐	☐	☐	☐	☐	☐
Stelling 8: De gemeente neemt de wensen van buurtbewoners mee bij het inrichten van de Groene Loper.	☐	☐	☐	☐	☐	☐
Stelling 9: De gemeente neemt mijn wensen mee bij het inrichten van de Groene Loper.	☐	☐	☐	☐	☐	☐

4. Waarvoor gebruik je de Groene Loper? Meerdere antwoorden mogelijk.

☐ Ik maak geen gebruik van de Groene Loper

☐ Ontspannende activiteiten
Bijvoorbeeld lezen, zonnen, eten, of het gebruiken van de speeltuin

☐ Sporten
Bijvoorbeeld wandelen, hardlopen, of fietsen

☐ Reizen
Bijvoorbeeld naar werk of boodschappen doen

☐ Anders, namelijk:

5. Hoe vaak maak je gebruik van de Groene Loper?
   - ☐ Dagelijks
   - ☐ Wekelijks
   - ☐ Maandelijks
   - ☐ Jaarlijks
   - ☐ Ik maak geen gebruik van de Groene Loper

     Zo ja, waarom maak je geen gebruik van de Groene Loper?

6. Hoe tevreden ben je met de Groene Loper?
   - ☐ Zeer tevreden
   - ☐ Tevreden
   - ☐ Neutraal
   - ☐ Ontevreden
   - ☐ Zeer ontevreden

7. Licht je antwoord toe:

Achtergrond

Nu volgen een paar vragen over je achtergrond.

8. Wat is je geslacht?
   - ☐ Man
   - ☐ Vrouw
   - ☐ Zeg ik liever niet
   - ☐ Anders, namelijk:

9. In welk jaar ben je geboren?

10. In wat voor soort woning woon je?
    - ☐ Koopwoning
    - ☐ Huurwoning van particuliere verhuurder
    - ☐ Huurwoning van een woningcorporatie
    - ☐ Anders, namelijk:

11. In wat voor type woning woon je?
    - ☐ Appartement zonder tuin
    - ☐ Appartement met (gedeelde) tuin
    - ☐ Huis met tuin
    - ☐ Huis zonder tuin

12. In welk jaar ben je op het huidige adres komen wonen?

13. Wat is de voertaal in jullie huishouden?
    - ☐ Nederlands
    - ☐ Engels
    - ☐ Anders, namelijk:

14. In hoeverre kun je rondkomen met het inkomen van het huishouden?
    - ☐ Goed
    - ☐ Ruim
    - ☐ Net niet
    - ☐ Helemaal niet
    - ☐ Zeg ik liever niet

Afsluiting

15. Heeft u nog opmerkingen over deze vragenlijst of de Groene Loper, dan kun je die hieronder opschrijven.

Bedankt voor het invullen van de vragenlijst.

Onder de deelnemers van deze vragenlijst verloten we 10 cadeaubonnen. Stuur hiervoor een mail naar onderzoekenstatistiek@maastricht.nl met je email adres en/of je telefoonnummer onder vermelding van ‘De Groene Loper', of bel naar 14 043.

Appendix K: Survey questions in English

Welcome

This questionnaire is about the 'Groene Loper'. Completing the questionnaire will take a maximum of 5 minutes.

1. Do you know the 'Groene Loper'?
   - ☐ Yes
   - ☐ No

The 'Groene Loper'

The 'Groene Loper' is a street in Maastricht East, where the A2 highway used to run. Since 2016, traffic has been going through tunnels underground creating a long green space on top of the tunnels. This space is meant for walking, cycling, sports and relaxing. Cars are still allowed to drive there, but only at low speeds.

2. To what extent do you agree or disagree with the following statements?

	Totally disagree	Disagree	Neutral	Agree	Totally agree	Do not know/no opinion
Statement 1: The 'Groene Loper' is easy for me to reach.	☐	☐	☐	☐	☐	☐
Statement 2: Everyone in my neighbourhood can reach the 'Groene Loper' just as easily.	☐	☐	☐	☐	☐	☐
Statement 3: I feel comfortable on the 'Groene Loper'.	☐	☐	☐	☐	☐	☐
Statement 4: I have a say in what the 'Groene Loper' looks like.	☐	☐	☐	☐	☐	☐
Statement 5: The municipality wants to hear my opinion on the 'Groene Loper'.	☐	☐	☐	☐	☐	☐

3. To what extent do you agree or disagree with the following statements?

	Totally disagree	Disagree	Neutral	Agree	Totally agree	Do not know / no opinion
Statement 6: The municipality clearly explains how it is working on the 'Groene Loper'.	☐	☐	☐	☐	☐	☐
Statement 7: The municipality listens to local groups before making decisions about the 'Groene Loper'.	☐	☐	☐	☐	☐	☐
Statement 8: The municipality considers the wishes of neighbourhood residents when working on the 'Groene Loper'.	☐	☐	☐	☐	☐	☐
Statement 9: The municipality takes my wishes into account when working on the 'Groene Loper'.	☐	☐	☐	☐	☐	☐

4. What do you use the 'Groene Loper' for? Multiple answers possible.

☐ I do not use the 'Groene Loper'.

☐ Relaxing activities
For example, reading, sunbathing, eating, or using the playground

☐ Exercising
For example, walking, running, or biking

☐ Travelling
for example, going to work or doing groceries

☐ Other, namely:

5. How often do you use the 'Groene Loper'?
   - ☐ Daily
   - ☐ Weekly
   - ☐ Monthly
   - ☐ Yearly
   - ☐ I do not make use of the 'Groene Loper'

   If so, why do you not make use of the 'Groene Loper'?

6. How satisfied are you with the 'Groene Loper'?
   - ☐ Very satisfied
   - ☐ Satisfied
   - ☐ Neutral
   - ☐ Dissatisfied
   - ☐ Very dissatisfied

7. Please explain your answer:

Background

Now follow a few questions about your background

8. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Prefer not to say
   - ☐ Other, namely:

9. In what year were you born?

10. What kind of home do you live in?

- ☐ Owner-occupied house
- ☐ Rental house from private landlord
- ☐ Rental house from a housing association
- ☐ Other, namely:

11. What type of home do you live in?

- ☐ Apartment without garden
- ☐ Apartment with (shared) garden
- ☐ House with garden
- ☐ House without garden

12. In which year did you move to the current address?

13. What is the working language in your household?

- ☐ Dutch
- ☐ English
- ☐ Other, namely:

14. To what extent is the household income sufficient to meet your needs?

- ☐ More than enough
- ☐ Sufficient
- ☐ Not enough
- ☐ Far from enough
- ☐ I would rather not say

Closure

15. If you have any comments about this questionnaire or the ‘Groene Loper’, write them below:

Thank you for completing the survey.

Among the participants of this questionnaire, we will raffle off 10 gift vouchers. To do so, send an email to onderzoekenstatistiek@maastricht.nl with your email address and/or your phone number stating ‘The Groene Loper’, or call to 14 043.

Appendix L: Invitation letter from the municipality of Maastricht in Dutch

Gemeente Maastricht

> RETOURADRES Postbus 1992, 6201 BZ Maastricht

Aan de bewoners van
<Straat en huisnummer>
<Postcode en plaats>

BEZOEKADRES
Mosae Forum 10
6211 DW Maastricht

POSTADRES
Postbus 1992
6201 BZ Maastricht
WWW.GEMEENTEMAASTRICHT.NL

ONDERWERP
Onderzoek Groene Loper

DATUM
22 april 2025

Beste bewoner,

De gemeente Maastricht is benieuwd wat je vindt van de Groene Loper. We willen graag weten óf en waarvoor je de Groene Loper gebruikt. Maar we zijn ook benieuwd of je vindt dat je zelf invloed hebt op de manier waarop de Groene Loper wordt vorm gegeven. Hiervoor voeren we in samenwerking met de Technische Universiteit Delft een onderzoek uit, als onderdeel van een afstudeeronderzoek.

We vragen daarom 5 minuten van je tijd voor het invullen van een online vragenlijst. Iedereen binnen je huishouden mag de vragenlijst invullen. De uitkomsten gebruikt de gemeente Maastricht om te kijken hoe we de besluitvorming en het betrekken van inwoners in de toekomst kunnen verbeteren.

Je vindt de link naar de vragenlijst op www.gemeentemaastricht.nl/stad/meedoen-aan-onderzoek.
Je kunt ook de QR-code op deze brief met uw telefoon scannen, om naar de vragenlijst gaan.

Vul je de vragenlijst liever op papier in? Bel dan met 14 043.

Je kunt de vragenlijst invullen tot en met 9 mei 2025.

Onder de invullers verloten we 10 cadeaubonnen ter waarde van €10. Heb je een vraag over het onderzoek dan kun je mailen met onderzoekenstatistiek@maastricht.nl of bellen naar 14 043.

Met vriendelijke groet,

Saskia Hendricks
Beleidsadviseurs groen, natuur en landschap

Anne Erven
Student Management in the Built Environment

Appendix M: Invitation letter from the municipality of Maastricht in English

Gemeente Maastricht

> RETURN ADDRESS Postbus 1992, 6201 BZ Maastricht

To the residents
<Straat en huisnummer>
<Postcode en plaats>

VISITING ADDRESS
Mosae Forum 10
6211 DW Maastricht

MAILING ADDRESS
Postbus 1992
6201 BZ Maastricht
WWW.GEMEENTEMAASTRICHT.NL

SUBJECT
Exercise participation survey

DATE
April 22, 2025

Dear resident,

The Maastricht municipality is curious to know what you think of the 'Groene Loper' (Green Carpet). We would like to know if and what you use the 'Groen Loper' for. But we would also like to know whether you feel you can influence the way in which the 'Groene Loper' is designed. Therefore we conduct a research in collaboration with Delft University of Technology as part of a graduation project.

We therefore ask for 5 minutes of your time to complete an online questionnaire. Everyone in your household is welcome to complete the questionnaire. The municipality of Maastricht will use the results to see how we can improve decision-making and the involvement of residents in the future.

You can find the link to the questionnaire at www.gemeentemaastricht.nl/stad/meedoen-aan-onderzoek.
You can also scan the QR code on this letter with your phone to go to the questionnaire.

You can complete the questionnaire until May 9, 2025.

Among those who complete the questionnaire, we will raffle off 10 gift vouchers worth €10.
If you have a question about the survey, please e-mail onderzoekenstatistiek@maastricht.nl or call 14 043.

Kind regards,

Saskia Hendricks
Policy advisor green, nature and landscape

Anne Erven
Student Management in the Built Environment

Appendix N: Detailed Spatial Justice Benchmarking results per document

Document 1: Ruimte rond de A2

Ruimte voor de A2 was a guiding document that set out the scope of the project and outlined the key conditions and principles that had to shape its development. Rather than presenting a fixed plan, it offered a starting framework with the intention to steer future decision-making and encourage further dialogue between involved stakeholders. It sketched the ambitions for the area surrounding the A2 motorway, reflecting on spatial opportunities, environmental considerations, and social impacts, while leaving room for elaboration and refinement as the project evolves.

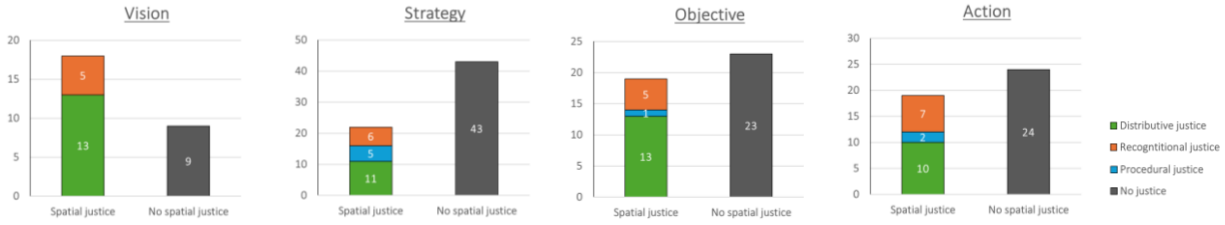


Figure 42: Results of coding the Vision, Strategy, Objective, and Action in document 1. Image by author.

Vision

In the vision section (Figure 42), spatial justice was addressed to some extent. Most references related to distributive justice (13 instances), indicating a focus on how resources or benefits might be spread across space. There were also a few mentions of recognitional justice (5), suggesting some awareness of differing needs or identities. However, procedural justice was not present at all, and 9 parts of the text were coded as reflecting no spatial justice. This suggests that inclusive or participatory processes were not considered yet at this stage of the project.

Strategy

Spatial justice played a very minor role in the strategy section (Figure 42). There were a few instances of distributive (11), procedural (5), and recognitional justice (6), but these were outweighed by 43 instances coded as no spatial justice. This points to a clear lack of spatial justice considerations when it comes to outlining how the project aimed to move forward strategically.

Objective

The objectives showed a similar pattern (Figure 42). Distributive justice was again present (13 instances), and there were a few references to recognitional (5) and procedural justice (1). However, 23 instances showed no link to spatial justice at all. This suggests that while some objectives may have supported fair outcomes, the majority did not explicitly reflect spatial justice principles.

Action

In the action section (Figure 42), there was a bit more variation: 10 instances related to distributive justice, 7 to recognitional, and 2 to procedural. Still, no spatial justice was the largest category here (24 instances). This suggests that although some of the proposed actions considered spatial justice to a degree, it was not consistent or clearly embedded throughout.

Overall results VSOA-coding

Looking at the overall results (Figure 43), it becomes clear that spatial justice was not yet a strong guiding principle in the *Ruimte rond de A2* document. Out of all coded instances, a large majority (99 in total) were categorised as showing no spatial justice. This is a significant contrast to the 78 instances where some form of spatial justice was present. Of those, distributive justice made up the largest share (47), suggesting that the document did pay some attention to how resources, benefits, or burdens are distributed. Recognitional justice was also present (23), indicating that there is some awareness of social or cultural differences and the importance of acknowledging diverse needs. However, procedural justice, which refers to inclusive, participatory decision-making, was far less represented, with only 8 instances.

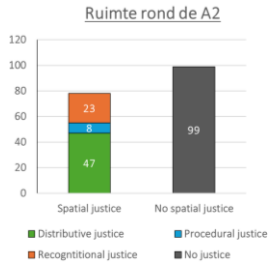


Figure 43: Accumulated results of coding the Vision, Strategy, Objective, and Action in document 1. Image by author.

Altogether, while there are signs that spatial justice-related ideas have found their way into the document, particularly around distribution and recognition, the overall balance leaned heavily towards a lack of explicit mentioning of spatial justice. This shows that although the document may have opened the door for future discussions on spatial justice, the set-up did not yet reflect a strong commitment to embedding spatial justice in the project's direction.

Breakdown of spatial justice dimensions

Zooming in on the codes that did reflect spatial justice within the VSOA coded material (Figure 44), the majority of references related to distributive justice, which makes up 61% of all spatial justice-related content. Within this dimension, access (28%) and fair allocation (19%) stood out as the most frequently addressed themes, suggesting a strong focus on how evenly resources and opportunities were spread across the area. Appropriation (14%) was also mentioned, though to a lesser extent, indicating some recognition of how people were enabled to make spaces their own.

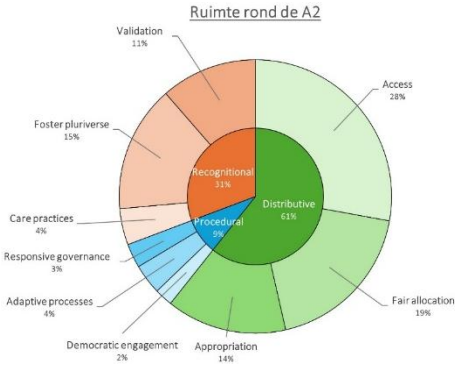


Figure 44: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the Vision, Strategy, Objective, and Action in document 1. Image by author.

Recognitional justice accounted for 31%, showing that the document also created space for acknowledging different perspectives and social realities. Most prominent here was the idea of fostering a pluriverse (15%), suggesting that the document did touch upon the importance of accommodating a diversity of perspectives. Other aspects such as validation (11%) and care practices (4%) also appeared, although less frequently.

In contrast, procedural justice only made up 9% of the total. Within this category, the indicators of adaptive processes (4%), responsive governance (3%), and democratic engagement (2%) appeared, but these were very limited. This indicates that while the document recognised the importance of what was being done and for whom, there was far less attention to how decisions were made and who got to participate in shaping them. This can be explained because in 2004, there was not as much focus on participation as there is now.

Benchmarking tool

Overall, this breakdown suggests that while spatial justice was present in the *Ruimte rond de A2* document, it was largely shaped around what was being distributed, rather than around inclusive or participatory processes. The relative limited awareness of procedural aspects may point to a more top-down or technical approach to planning, rather than one grounded in participatory approaches or community-driven input. Based on these findings, the document can be classified as Basic (0), demonstrating clear but limited attention to spatial justice, focussing on one dimension with vague details on what is being addressed, how, or who is involved.

Document 2: Ambitiedocument

The *Ambitiedocument*, also referred to as '*De vraag aan de markt*' (The question to the market), has been a key guiding document within the tendering process. It outlined the ambitions, expectations, and requirements that the commissioning party had set for potential market partners. The document meant to communicate both the hard demands and the softer wishes of the project, offering direction while still leaving room for innovation and interpretation by market actors. As such, it played a crucial role in shaping not only the technical and functional scope of a project, but also the normative and value-driven aspects, such as, for example, spatial justice. This made it a valuable document to examine how principles of justice were (or were not) embedded early on in the decision-making process.

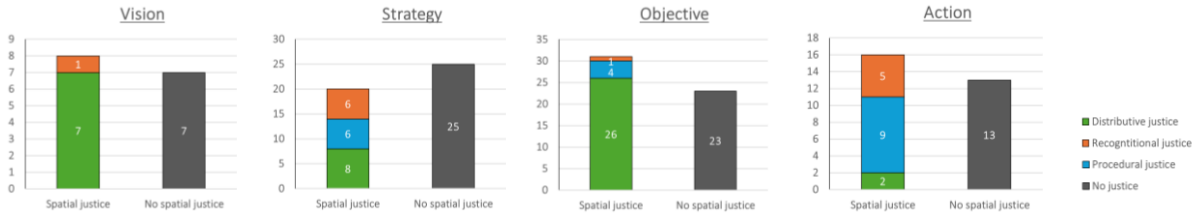


Figure 45: Results of coding the Vision, Strategy, Objective, and Action in document 2. Image by author.

Vision

In the vision category of the *Ambitiedocument*, spatial justice was present, but only to a limited extent (Figure 45). There were seven instances where distributive justice was mentioned, and just one for recognitional justice. Notably, there were no examples of procedural justice in this phase. Interestingly, there were also seven instances where no form of justice was considered at all. This suggests that while spatial justice was acknowledged to some degree in the vision, it was not consistently embedded and was often absent altogether.

Strategy

Looking at the strategy phase (Figure 45), spatial justice considerations were a bit more developed. The concept appeared in 20 instances across all three justice dimensions: eight distributive, six procedural, and six recognitional. However, the majority of the coded segments (25) fell under the category of no spatial justice. This shows that although there was some effort to incorporate justice in strategic thinking, it was still not dominant. The concept tended to be the exception rather than the rule here.

Objective

The objectives section was where spatial justice showed up most strongly (Figure 45). Out of the total coding, 31 instances were related to spatial justice, and the majority of these (26) were focussed on distributive justice. There were a few mentions of procedural (4) and recognitional justice (1), but they were clearly less of a focus. Even though 23 segments were still coded as having no justice, the strong emphasis on distributive justice suggests that fairness in outcomes was seen as important when setting objectives.

Action

Finally, in the action category, there was a bit more of a balance between the different dimensions of spatial justice (Figure 45). The concept was coded 16 times: nine for procedural, five for recognitional, and two for distributive. Despite this, there were still 13 instances where no spatial justice was identified. So while action seemed to be the phase where procedural justice started to play a more visible role, spatial justice overall remained inconsistently addressed.

Overall results VSOA-coding

When combining the results from the vision, strategy, objective, and action phases, it became clear that spatial justice was present but not predominant throughout the *Ambitiedocument* (Figure 46). A total of 75 segments reflected some form of spatial justice: the majority related to distributive justice (43), followed by procedural justice (19) and recognitional justice (13). However, 68 segments were coded as involving no spatial justice at all, which was nearly as many as the total number of spatial justice-related segments. This suggests that while elements of justice are embedded, particularly in terms of distribution, they were not consistently applied across the document.

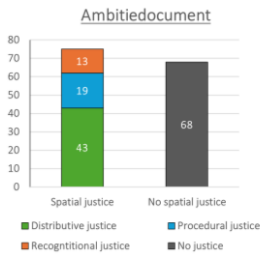


Figure 46: Accumulated results of coding the Vision, Strategy, Objective, and Action in document 2. Image by author.

Next to this analysis, the distinction between demands and wishes in the *Ambitiedocument* revealed some interesting differences in how spatial justice was addressed (Figure 47). In the case of demands, there was a relatively strong presence of spatial justice, particularly distributive justice (15 instances), with just a single mention of procedural justice. However, 17 segments were coded as no justice, indicating that although justice was considered in demands, it was still not applied consistently.

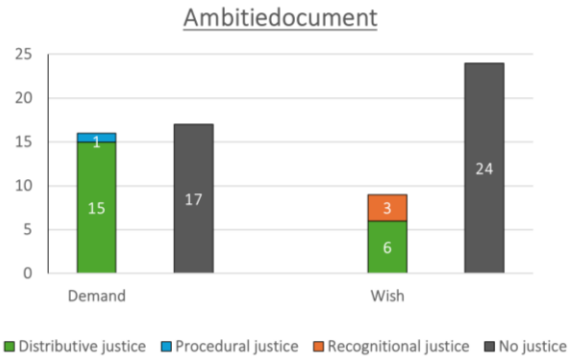


Figure 47: Coding the dimensions of spatial justice in groups of demands and wishes. Image by author.

When it comes to the documents' wishes, the presence of spatial justice was notably weaker. Only 6 segments were coded as distributive justice and 3 as recognitional justice, with no procedural justice at all. Meanwhile, 24 segments reflected no spatial justice, showing that the concepts' principles were even less integrated in this more aspirational part of the document.

Overall, spatial justice seemed more embedded in the parts of the document that framed firm requirements (demands), while wishes, although potentially important as well, were less spatial justice-oriented. This suggests that spatial justice considerations were treated more seriously when they were tied to obligations rather than to optional elements.

Breakdown of spatial justice dimensions

Distributive justice made up the largest portion of the spatial justice coding, accounting for 53% of all justice-related segments (Figure 48). Within this category, the emphasis lied mainly on access (25%), followed by appropriation (15%) and fair allocation (13%). This shows that most spatial justice considerations were focussed on how benefits or resources were distributed and whether people were able to access and make use of them.

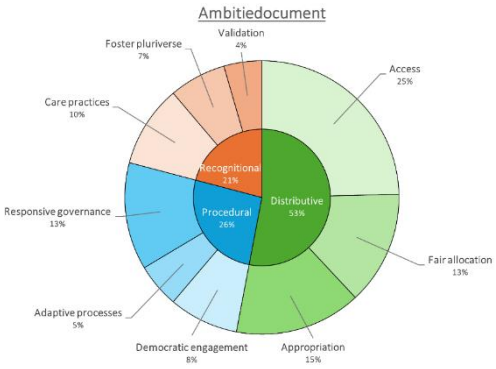


Figure 48: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the Vision, Strategy, Objective, and Action in document 2. Image by author.

Procedural justice represented 26% of the total, with attention given to how decisions were made and by whom. Sub indicators included responsive governance (13%), democratic engagement (8%), and adaptive processes (5%), revealing that while process-based fairness was considered, it was less prioritised than distributional concerns.

Recognitional justice made up 21%, covering how different identities, experiences, and ways of knowing were acknowledged. The largest subcategory here was care practices (10%), followed by fostering a pluriverse (7%) and validation (4%). Although this type of spatial justice was the least represented of the three, its presence suggests some effort to include more diverse perspectives and relational approaches in the document.

Benchmarking tool

Altogether, the findings highlighted that while all three dimensions of spatial justice were present in the *Ambitiedocument*, there was a strong tendency towards distributive aspects, with procedural and recognitional justice playing more of a supporting role. This can be classified as Growing (1), demonstrating a more in-depth engagement by connecting at least two aspects of spatial justice and clearly outlining what is being tackled, in what way, and which actors are involved in the process.

Document 3: Structuurvisie Maastricht 2030

The *Structuurvisie Maastricht 2030* was a long-term planning document that set out the city's overarching vision for future spatial and urban development. Rather than focussing on concrete projects or short-term interventions, the document outlined where and how the municipality intended to steer growth and transformation, offering a strategic spatial framework to guide decision-making. As such, it played a key role in shaping the city's ambitions for liveability, accessibility, and sustainability, making it a relevant source for analysing how spatial justice was, or was not, incorporated into high-level urban planning.

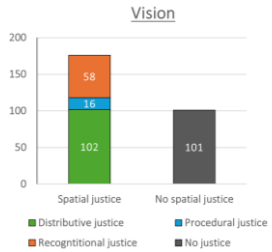


Figure 49: Results of coding the Vision in document 3. Image by author.

Vision

The vision outlined in the *Structuurvisie Maastricht 2030* shows a relatively strong presence of spatial justice (Figure 49). Out of the total coded segments, 176 were linked to spatial justice, compared to 101 that reflected no spatial justice. Within the spatial justice-related content, distributive justice was by far the most prominent dimension, with 102 instances, indicating a focus on the fair distribution of resources, opportunities, and/or spatial benefits.

Recognitional justice followed with 58 segments, suggesting that the document did not pay considerable attention to acknowledging different groups, needs, and identities within the city. Procedural justice, on the other hand, was far less represented, with only 16 segments, pointing to a limited emphasis on inclusive or participatory processes in the development of the city's future vision.

Overall, while the vision did incorporate spatial justice to a notable extent, especially in terms of distribution and recognition, there remained a significant portion of the document where spatial justice was not considered, and procedural aspects were particularly underdeveloped. This indicates room for improvement in embedding spatial justice more consistently and deeply into long-term urban planning visions.

Overall results VSOA-coding

As the *Structuurvisie Maastricht 2030* was primarily a vision document, the VSOA-coding was limited to the Vision category as described above.

Breakdown of spatial justice dimensions

The circular diagram offers a more detailed look into the spatial justice-related elements presented in the *Structuurvisie Maastricht 2030* (Figure 50). It shows that the majority of spatial justice references fell under distributive justice (67%), meaning the vision mostly focussed on how urban resources, opportunities, and benefits were allocated across the city. Within this category, access (26%), fair allocation (22%), and appropriation (19%) stood out as the most frequently addressed themes, indicating a strong emphasis on making urban spaces accessible, fairly distributed, and usable by different groups.

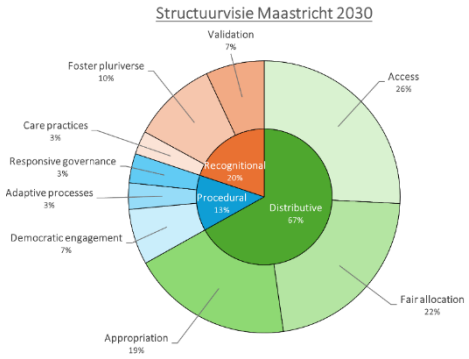


Figure 50: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the Vision, Strategy, Objective, and Action in document 3. Image by author.

In contrast, procedural justice only accounted for 13% of the spatial justice coding, pointing to a limited focus on inclusive planning processes or participatory governance. Most procedural codes related to democratic engagement (7%), with smaller shares for adaptive processes and responsive governance (both 3%).

Lastly, recognitional justice contained 20% of the codes. Within this category, the most prominent aspects were fostering pluriverse (10%) and validation (7%). The variable of care practices (3%) remained marginal.

Benchmarking tool

Overall, while the document did reflect a strong awareness of fairness in the distribution of urban resources, it paid far less attention to who was involved in shaping the vision and how different lived experiences were acknowledged within it. This can be classified as Basic (0), demonstrating clear but limited attention to spatial justice, focussing on one dimension with vague details on what is being addressed, how, or who is involved.

Document 4: Stadsnatuurvisie Maastricht

The *Stadsnatuurvisie Maastricht* set out the city's ambitions for integrating nature more meaningfully into the urban environment. It was not a detailed policy document, but rather a guiding framework that laid out a vision, broad objectives, and general directions for action. The emphasis was on creating a greener, more liveable city where nature was seen not just as decoration, but as something essential to everyday urban life. Whether it was about boosting biodiversity, improving access to green space, or encouraging residents to take part in shaping their local environment, the document set the tone for how nature and city-making can go hand in hand.

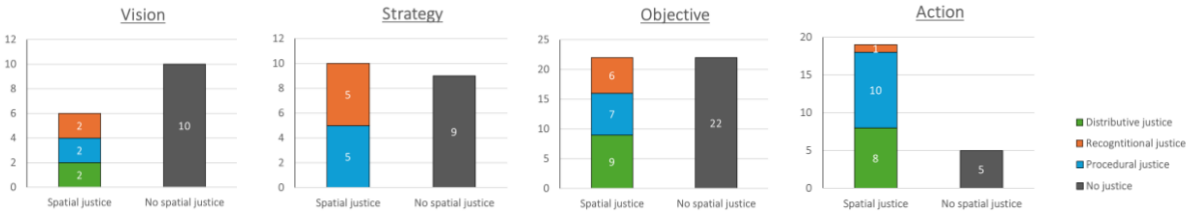


Figure 51: Results of coding the Vision, Strategy, Objective, and Action in document 4. Image by author.

Vision

In the vision section of the *Stadsnatuurvisie Maastricht*, spatial justice was barely present (Figure 51). The majority of references (10) were coded as "no spatial justice", with only two codes each for distributive, procedural, and recognitional justice. This suggests that while the document outlined a long-term ambition, it did not explicitly link this vision to questions of fairness or spatial distribution.

Strategy

The strategy section showed a bit more engagement with spatial justice aspects, although it still leant heavily towards "no spatial justice" (9) (Figure 51). Five procedural and five recognitional justice codes appeared, indicating some attention to inclusivity and process fairness, but without a strong distributive component. It seemed the strategy was more concerned with how things were done than who got what, and where.

Objective

When it comes to the objectives, a clearer presence of all three types of spatial justice was recognised (Figure 51). Distributive justice (9) and procedural justice (7) were the most visible, followed by recognitional justice (6). Even though "no spatial justice" still dominated (22), the presence of these spatial justice-related elements suggests a growing awareness of the need to frame concrete goals in terms of fairness, especially around who benefits and whose voices were heard.

Action

The action part of the document contained the most pronounced focus on spatial justice (Figure 51). Procedural justice (10) and distributive justice (8) were especially dominant here, indicating that when it came to implementation, there was a stronger effort to ensure fairness in both process and distribution. Although recognitional justice was still marginal (1), the drop in "no spatial justice" codes (only 5) was notable. This shift implies that the envisioned practical steps were being developed with more attention to spatially just outcomes.

Overall results VSOA-coding

The VSOA-coding produced 103 segments in total, of which 57 made some reference to spatial justice, leaving 46 with no spatial justice orientation (Figure 52). Within those 57 justice-focussed references, procedural justice appeared most often (24 instances), followed by distributive justice (19) and recognitional justice (14). In other words, the document tended to emphasise fair decision-making processes, while explicit commitments to "who gets what" and to recognising the full diversity of urban communities occurred rather less frequently. At the same time, almost half of all segments remained silent on spatial justice altogether, implying that fairness and inclusivity were not yet woven consistently through every vision, strategy, objective or action.

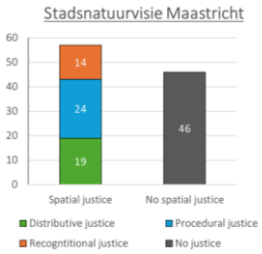


Figure 52: Accumulated results of coding the Vision, Strategy, Objective, and Action in document 4. Image by author.

Breakdown of spatial justice dimensions

The circular diagram offers a detailed breakdown of the 57 spatial-justice segments identified in the plan (Figure 53). Procedural justice formed the largest part at 40 %, showing a clear emphasis on the "how" of decision-making. Distributive justice followed at 33 %, and recognitional justice at 27 %

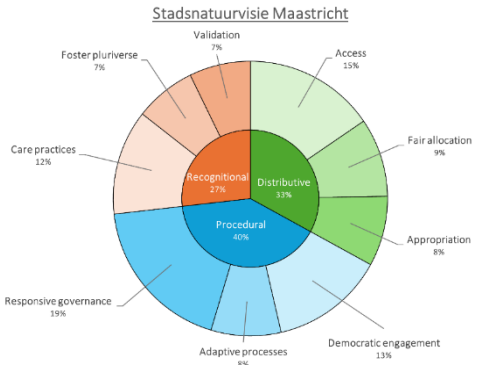


Figure 53: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the Vision, Strategy, Objective, and Action in document 4. Image by author.

Within the procedural category, nearly half of those references (19 % of all segments) concerned responsive governance. This illustrated the city's readiness to adjust rules or policies in response to community needs. Democratic engagement came next at 13 %, while adaptive processes accounted for just 8 %, suggesting that participatory methods and flexible planning remained underdeveloped.

Turning to distributive justice, the diagram revealed an emphasis on access (15 %), indicating a strong focus on opening up urban spaces and resources to all. Fair allocation (9 %) and appropriation (8 %) appeared less often, which pointed to fewer explicit commitments around balancing benefits or defining rightful use.

Finally, recognitional justice was split between care practices (12 %), foster pluriverse (7 %) and validation (7 %). This shows that there was some consideration for empathy, different types of knowledge, and acknowledging marginalised voices, but it also made clear that truly recognising the diverse experiences of urban life still played only a small role.

Benchmarking tool

Overall, the document demonstrated a strong concern for fair procedures, yet placed less weight on the fair distribution of resources and the full acknowledgment of diverse community perspectives. A more balanced approach, strengthening distributive and recognitional elements, would have ensured that spatial justice was woven through both the means and ends of urban development. This can be classified as Embedded (3), representing a thorough integration of spatial justice aspects, where all dimensions are interconnected with clear details about the involved locations, processes, and groups.

Document 5: Evaluatie participatiemodel

The *Evaluatie Participatiemodel* document looked back at how (public) participation was organised and implemented throughout the development of the project. Rather than focussing on outcomes alone, it reflected on the processes behind decision-making: how people were involved, whose voices were heard, and to what extent spatial justice and inclusivity were embedded in each phase. Using a spatial justice lens, it highlighted not just whether participation happened, but how fair, accessible, and representative it truly was. In doing so, the document offered a basis for learning on what worked, where gaps remained, and how future participatory processes could be strengthened.

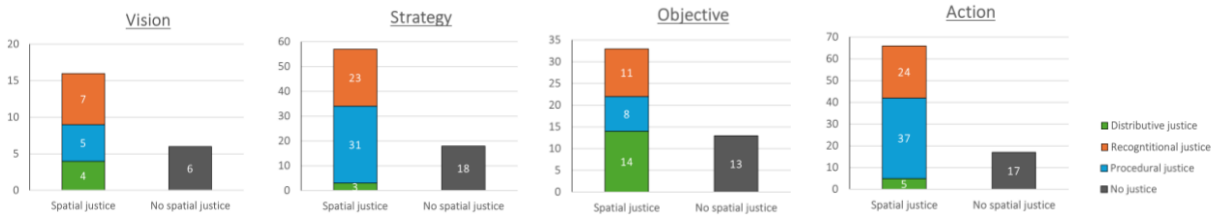


Figure 54: Results of coding the Vision, Strategy, Objective, and Action in document 5. Image by author.

Vision

The vision section included a relatively small number of coded segments overall, with only 16 linked to spatial justice and 6 showing no spatial justice orientation (Figure 54). Of those 16, recognitional justice (7) was the most prominent, followed by procedural (5) and distributive (4). This suggests that the vision behind the *Evaluatie Participatiemodel* document did make space for acknowledging different voices and perspectives, and even less for structural issues around access or fairness in outcomes. Given its role in setting the tone for the rest of the document, the vision's limited emphasis on spatial justice, especially the distributive dimension, was noticeable.

Strategy

The strategy section stood out in terms of volume, with 57 segments coded for spatial justice and 18 without (Figure 54). Most strikingly, procedural justice dominated here (31), making it the section with the highest emphasis on fair and inclusive processes. Recognitional justice was also strongly represented (23), while distributive justice was barely present (3). This pointed to a strategy that leans heavily on process and representation, but says little about the actual distribution of resources or benefits.

Objective

In contrast to the strategy section, the objective section offered a more balanced justice profile (Figure 54). Of the 33 segments coded for spatial justice, distributive justice lead (14), followed by recognitional (11) and procedural (8). This section showed more attention to outcomes (who benefits, and how), and also acknowledged the need to recognise different actors and ensure inclusive processes. Still, 13 segments were coded as having no spatial justice orientation, indicating that not all objectives were equally tied to fairness.

Action

The action section contained the largest number of coded segments overall, with 66 reflecting spatial justice and 17 not (Figure 54). Procedural justice was again the strongest theme (37), followed by recognitional (24), while distributive justice appeared in only 5 instances. This continues the pattern seen in Strategy: a strong emphasis on process, but limited engagement with questions of access or distribution. For a section focussed on implementation, this suggests a need for clearer commitments to spatial justice not just in how things were done, but also what was delivered and for whom.

Overall results VSOA-coding

The VSOA coding resulted in a total of 226 coded segments (Figure 55). Of these, 172 engaged with some form of spatial justice, while 54 carried no spatial justice orientation at all. Among the spatial justice-related segments, procedural justice clearly dominated (81 instances), followed by recognitional justice (65) and a comparatively small presence of distributive justice (26). This suggests the document put most emphasis on fair and inclusive decision-making processes, and made a considerable effort to acknowledge a diversity of voices. However, the limited attention given to distributive concerns revealed a gap in the model's spatial justice framing.

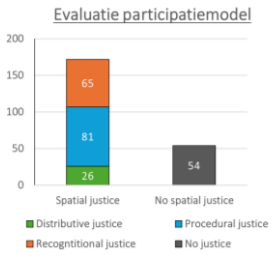


Figure 55: Accumulated results of coding the Vision, Strategy, Objective, and Action in document 5. Image by author.

The breakdown of spatial justice-related coding across the five project phases offered some additional nuance to the overall picture (Figure 56). It became clear that spatial justice was not distributed evenly throughout the process.

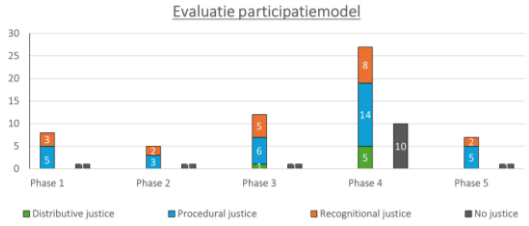


Figure 56: Coding the dimensions of spatial justice across the five project phases. Image by author.

In phase 1 (*Ambitiedocument; Ambition document*), one can already recognise a presence of procedural justice (5) and recognitional justice (3), hinting at an early effort to engage stakeholders and acknowledge diverse perspectives. Phase 2 (Aanbesteding en gunning; procurement and awarding), however, contained relatively few codings, which made it difficult to draw any conclusions about this phase.

Spatial justice considerations began to pick up in phase 3 (*Verankering in Tracébesluit en Bestemmingsplannen; embedding in route decision and zoning plans*), especially in procedural terms, but it was only in phase 4 (*Uitvoering; execution*) that the spatial justice agenda really took shape. This phase accounted for the highest number of coded segments, with a strong showing of procedural justice (14), recognitional justice (8), and even some distributive elements (5). It was also where the highest number of "no justice" segments (10) appeared, which suggests a moment of both opportunity and tension. While much was happening in terms of inclusion and acknowledgement, there was also a real risk of losing sight of spatial justice altogether in the actual delivery.

By phase 5 (*Gebiedsontwikkeling; area development*), engagement with spatial justice appeared to decline, despite a small continuation of procedural and recognitional references. This might reflect a shift in focus toward technical or spatial development concerns, but it also signalled the importance of not letting spatial justice fade from view in the final stages.

All in all, the diagram shows that spatial justice was not consistently prioritised across the entire lifecycle of the project. Instead, it tended to cluster around key moments (especially execution), while being more muted at the start and end.

Breakdown of spatial justice dimensions

The circular diagram gives a more detailed look into how spatial justice themes played out within the *Evaluatie Participatiemodel* (Figure 57). What stands out most was the clear emphasis on procedural justice, which made up nearly half of all coded instances (47%). Within this, responsive governance (19%), democratic engagement (14%), and adaptive processes (14%) were particularly prominent indicating that the *Evaluatie Participatiemodel* put considerable weight on fair processes, flexibility, and ongoing responsiveness throughout planning and execution.

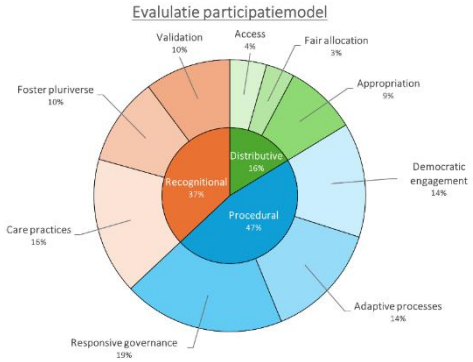


Figure 57: Pie-chart of the spatial justice dimensions. Based on the accumulated results of coding the Vision, Strategy, Objective, and Action in document 5. Image by author.

Following this, recognitional justice took up 37%, with notable attention given to care practices (16%), as well as efforts to foster pluriverse and provide validation (both 10%). This suggests an encouraging degree of sensitivity toward diverse urban groups and community values, important markers of inclusivity beyond procedural checks.

Distributive justice, however, was far less central, making up just 16% of the total. The sub-themes indicated that questions of who gets what, and how benefits and burdens were shared, have not received the same level of attention. This could point to a gap in how the *Evaluatie Participatiemodel* considered spatial justice in outcomes, despite being quite strong on process and recognition dimensions.

Benchmarking tool

All in all, while the document performed strongly in terms of process and recognition, there was clearly more work to be done in making sure that fairness also extended to the distribution of resources, access, and spatial benefits. A more balanced engagement with all three dimensions of spatial justice could have enhanced the overall validity and effectiveness of spatial justice efforts moving forward. This can be classified as Growing (+1), demonstrating a more in-depth engagement by connecting at least two aspects of spatial justice and clearly outlining what is being tackled, in what way, and which actors are involved in the process.

Appendix O: Calculation of the Spatial Justice Readiness Level

A chi-squared test was conducted to assess the balance across the three dimensions of spatial justice and their associated indicators across the analysed documents. This statistical test determined whether the different dimensions of justice were equally represented. The results are shown in Table 20 and Table 21.

A minimum score of 0 was chosen, as each document reflected spatial justice to a degree that would make negative scoring (-3 or-1) inappropriate. If a document showed a strong significant deviation, it received a score of 0; a slight deviation resulted in a score of 1; and if there was no significant deviation, a score of 3 was given.

	Distributive justice	Procedural justice	Recognitional justice	P-value	Justice Readiness Score
Ruimte rond de A2	61	31	9	1,06E-09	0
Ambitiedocument	53	26	21	1,25E-04	1
Structuurvisie Maastricht 2030	67	12	20	2,40E-12	0
Stadsnatuurvisie Maastricht	33	40	27	2,76E-01	3
Evaluatie Participatiemodel	16	47	37	5,05E-04	1
Total					1

Table 20: The spatial justice readiness level calculated for the documents relating to the case study, using 33% as the expected value. Table by author.

	Distributive justice	Procedural justice	Recognitional justice	P-value	Justice Readiness Score
Omgevingsvisie Maastricht 2040	42	29	29	1,80E-01	3

Table 21: The spatial justice readiness level calculated for the documents relating to the municipality's broader vision, using 33% as the expected value. Table by author.

Appendix P: Representativeness of survey respondents in relation to neighbourhood demographics

General

The survey was filled-in 455 times, resulting in 377 fully completed responses. This represents 6.23% of the 6,055 residents in the study area. It should be noted that not all residents were able to participate in the survey due to limiting factors such as age, illiteracy, absence during the survey period, or a lack of understanding of the Dutch/English language, and possibly other factors. Nonetheless, the number of completed responses exceeds the minimum required sample size of 362, as calculated and explained in Table 15.

The survey was distributed via post to 2,717 addresses, leading to a response rate of 13.91% per address. However, given the anonymous nature of the data collection and the fact that addresses were not recorded, it is possible that more than one person per household completed the survey.

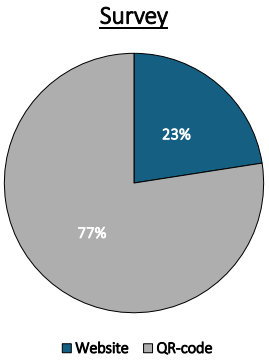


Figure 58: Pie-chart of the survey response method ratio in the survey (Own data, image by author).

As shown in Figure 58, the majority of respondents completed the survey via the QR code. The QR code was included in the invitation letter, which was distributed specifically to the residents in Wittevrouwenveld. Therefore, it can be assumed with relative certainty that responses via the QR code originated from residents of this specific neighbourhood. In contrast, responses via the website cannot be definitively linked to residents of Wittevrouwenveld, as the online version of the survey did not explicitly state that it was intended for residents of this neighbourhood. This decision was made in consultation with the municipality, recognising that residents may not be aware of the exact boundaries or name of their neighbourhood. Moreover, no public promotion of the online survey was undertaken. Awareness of the survey was limited to the invitation letters distributed in Wittevrouwenveld only. While it remains possible that individuals from other neighbourhoods completed the survey during the weeks it was online, this is not considered problematic, as the broader context of the Groene Loper project extends beyond the boundaries of Wittevrouwenveld.

In addition to the digital distribution, a limited number of physical (paper-based) surveys were spread. Unfortunately, these were not returned before the submission deadline and have therefore been excluded from the dataset.

Gender

As illustrated in Figure 59, the gender distribution of survey respondents aligns closely with the most recent demographic data provided by CBS (Figure 60). This suggests that the sample is reasonably representative in terms of gender composition.

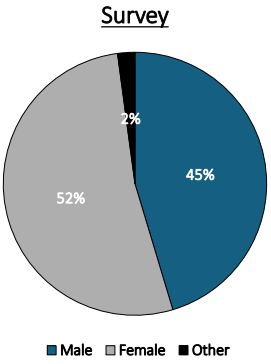


Figure 59: Pie-chart of the gender ratio in the survey (Own data, image by author).

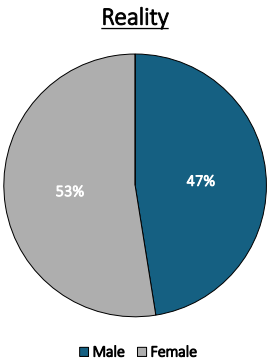


Figure 60: Pie-chart of the gender ratio in Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2024). Image by author.

Age

As shown in Figure 61, the age distribution of survey respondents does not fully correspond with the most recent age data from CBS (Figure 62). Younger residents, broadly defined as those aged 0 to 25, are significantly underrepresented in the survey results, while individuals aged 45 and above, particularly those over 65, are notably overrepresented. No responses were recorded from individuals under the age of 15. As a result, the dataset offers no insight into how children perceive spatial justice within the area. While this age group may not engage consciously with this concept, their lived experiences and perceptions of the built environment remain relevant and may still be shaped by underlying spatial justice dynamics.

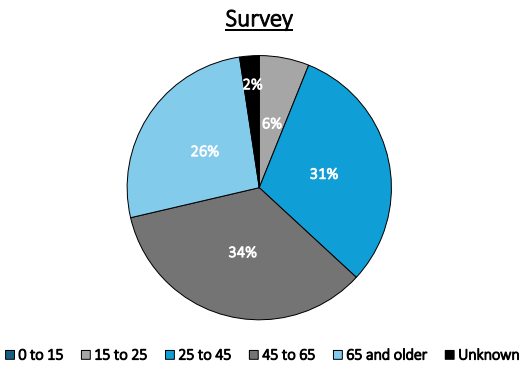


Figure 61: Pie-chart of the age ratio in the survey in ages (Own data, image by author).

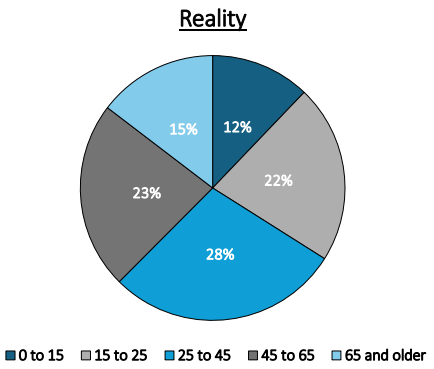


Figure 62: Pie-chart of the age ratio in Wittevrouwenveld in ages (Statistieken buurt Wittevrouwenveld, 2024). Image by author.

Housing tenure

As presented in Figure 64, the distribution of housing tenure among the survey respondents differs significantly from the most recent data provided by CBS for Wittevrouwenveld (Figure 63). A notable higher proportion of respondents reported living in owner-occupied dwellings (47%) compared to the CBS figure of 26%. This discrepancy may, in part, be attributed to recent shifts in the housing stock, where a substantial number of private rental properties may have been converted into owner-occupied homes. These are developments which may not yet be reflected in the official CBS data. However, this remains uncertain.

Social rental housing is also underrepresented in the survey, though not to the same extent as private rental housing. This imbalance in tenure representation should be kept in mind in the calculation of respondents' socio-economic status, as housing tenure contributes with a weighting factor of 2 in this formula. Consequently, the socio-economic status reflected in the results may be slightly higher than what would be expected based on the actual composition of the neighbourhood.

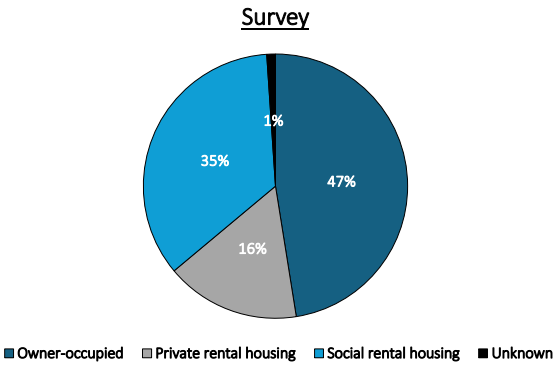


Figure 64: Pie-chart of the housing tenure ratio in the survey (Own data, image by author).

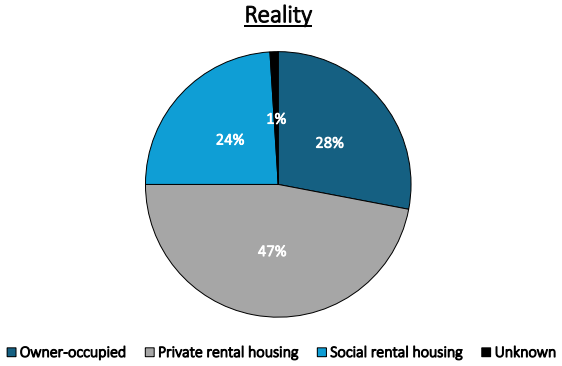


Figure 63: Pie-chart of the housing tenure ratio in Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2024). Image by author.

Housing type

As shown in Figure 65, the distribution of housing types among survey respondents differs slightly from the most recent CBS data for Wittevrouwenveld (Figure 66). While the actual distribution in the neighbourhood is approximately evenly split between houses and apartments, the survey sample includes a greater number of respondents living in houses. This deviation suggests a modest overrepresentation of residents in houses.

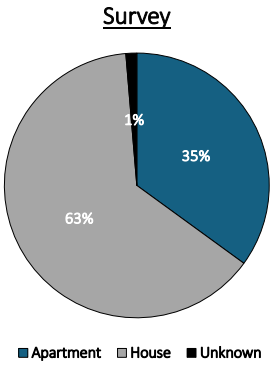


Figure 65: Pie-chart of the housing type ratio in the survey (Own data, image by author).

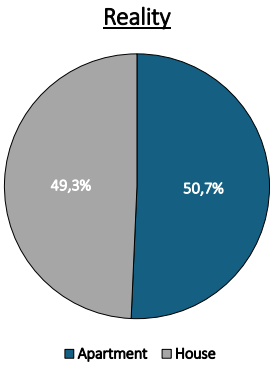


Figure 66: Pie-chart of the housing type ratio in Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2024). Image by author.

Income

As shown in Figure 68, the reported income levels of survey respondents differ notably from the most recent income data available for Wittevrouwenveld from CBS (Figure 67). In addition to this discrepancy, it is important to note that the income-related question in the survey was framed in more subjective terms, in contrast to the objective, quantified approach used by CBS. As previously discussed, income could not be asked in precise numerical terms within this survey due to the sensitivity of the topic.

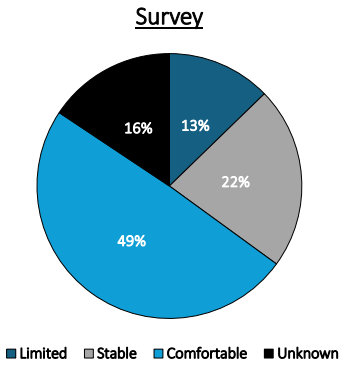


Figure 68: Pie-chart of the income ratio in the survey (Own data, image by author).

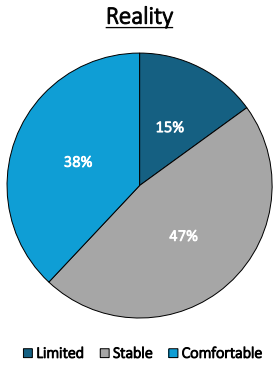


Figure 67: Pie-chart of the income ratio in Wittevrouwenveld (Statistieken buurt Wittevrouwenveld, 2024). Image by author.

The proportion of respondents indicating they live with a 'limited' income corresponds to the CBS data. However, there is a noticeable deviation in the categories of 'stable' and 'comfortable' incomes. Moreover, 16% of respondents chose not to answer this question, with several explicitly stating that they considered it 'too private' or 'unnecessary' in relation to the survey's overall aim.

As the survey question relied on self-assessment, the interpretation of income categories remains inherently subjective. For instance, a respondent with a relatively low income may still describe their situation as 'comfortable', while another with a higher income may report it as 'limited'. These nuances were kept in mind when calculating respondents' socio-economic status, as income is weighted with a factor of two in the applied formula. Consequently, the average socio-economic status derived from the survey may be somewhat higher than might be expected based on the actual income distribution within the neighbourhood.

Appendix Q: Data analysis results of RStudio

For all calculations relating to the survey data, the skewness was less than 2, indicating no significant deviation from normality that would affect the results of the conducted (M)ANOVAs.

Hypothesis 1: satisfaction with, and usage of the Groene Loper

The results indicated that there is no significant relationship between usage and satisfaction. This is evident from the p-value, which suggests that the result is not statistically significant *(*Figure 69*).*

```
> aov.use <- aov(Usage ~ Satisfaction , data = data_GL)
> summary(aov.use)
              Df Sum Sq Mean Sq F value Pr(>F)
Satisfaction   1   2.46  2.4591   3.245 0.0725 .
Residuals    375 284.20  0.7579
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> aov.use2 <- aov(Satisfaction ~ Usage , data = data_GL)
> summary(aov.use2)
             Df Sum Sq Mean Sq F value Pr(>F)
Usage         1    4.2   4.160   3.245 0.0725 .
Residuals   375  480.8   1.282
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> summary(data_GL$Usage)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   1.00    4.00    5.00    4.46    5.00    5.00
```

Figure 69: Outcomes of RStudio for hypothesis 1. One-way Anova between usage and satisfaction shows no significant correlation between the variables. Image by author..

Hypothesis 2: spatial justice of the Groene Loper

Each dimension had an individual effect on spatial justice, with no significant interactions observed between the different dimensions (Figure 70). This meant that they contribute independently to spatial justice and therefore can, and should, be considered separately in the analysis.

```
> skewness_SJ <- skewness(data_GL$SJ)
> print(skewness_SJ)
[1] -0.2390426
> ##########################################################################
> ### spatcial justice opbouw
> spatjus <- aov(SJ ~ DJ * PJ * RJ , data = data_GL)
> summary(spatjus)
             Df Sum Sq Mean Sq   F value Pr(>F)
DJ            1   4237    4237 1.265e+32 <2e-16 ***
PJ            1   4710    4710 1.407e+32 <2e-16 ***
RJ            1    958     958 2.861e+31 <2e-16 ***
DJ:PJ         1      0       0 6.740e-01  0.412
DJ:RJ         1      0       0 1.750e-01  0.676
PJ:RJ         1      0       0 4.800e-02  0.826
DJ:PJ:RJ      1      0       0 2.280e-01  0.633
Residuals   369      0       0
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
>
```

Figure 70: Outcomes of RStudio for hypothesis 2. Three-way Anova between spatial justice and its three dimensions shows no significant interactions between the factors themselves. Image by author.

Figure 71 shows that spatial justice as a whole correlates with satisfaction, but not with usage.

```
> SATSJ <-aov(Satisfaction ~ SJ , data = data_GL)
> USESJ <- aov(Usage ~ SJ , data = data_GL)
> summary(SATSJ)
             Df Sum Sq Mean Sq F value Pr(>F)
SJ            1  162.1  162.15   188.4 <2e-16 ***
Residuals   375  322.8    0.86
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> summary(USESJ)
             Df Sum Sq Mean Sq F value Pr(>F)
SJ            1   2.38  2.3775   3.136 0.0774 .
Residuals   375 284.28  0.7581
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
>
```

Figure 71: Outcomes of RStudio for hypothesis 2. One-way Anova between satisfaction and spatial justice, and usage and spatial justice. Spatial justice shows a significant correlation with satisfaction, but not with usage. Image by author.

A significant interaction could be found between distributive justice (DJ) and procedural justice (PJ) in relation to usage (Figure 72).

```
> linkuse2 <- aov(Usage ~ DJ * PJ * RJ , data = data_GL)
> summary(linkuse2)
             Df Sum Sq Mean Sq F value Pr(>F)
DJ            1   4.11   4.107   5.468 0.0199 *
PJ            1   0.02   0.016   0.021 0.8852
RJ            1   0.18   0.175   0.233 0.6295
DJ:PJ         1   4.23   4.225   5.625 0.0182 *
DJ:RJ         1   0.02   0.025   0.033 0.8561
PJ:RJ         1   0.15   0.152   0.202 0.6533
DJ:PJ:RJ      1   0.77   0.771   1.027 0.3116
Residuals   369 277.18   0.751
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
>
```

Figure 72: Outcomes of RStudio for hypothesis 2. Three-way Anova between the three dimensions of spatial justice and usage. The interaction of distributive justice and procedural justice shows a significant correlation with usage. Image by author.

All dimensions of spatial justice did have a significant correlation with satisfaction (Figure 73).

```
> summary(linktev2)
             Df Sum Sq Mean Sq F value   Pr(>F)
DJ            1 142.96  142.96 179.510  < 2e-16 ***
PJ            1  24.63   24.63  30.930 5.14e-08 ***
RJ            1  23.00   23.00  28.881 1.37e-07 ***
DJ:PJ         1   0.22    0.22   0.280    0.597
DJ:RJ         1   0.00    0.00   0.000    0.990
PJ:RJ         1   0.19    0.19   0.235    0.628
DJ:PJ:RJ      1   0.07    0.07   0.087    0.768
Residuals   369 293.86    0.80
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 73: Outcomes of RStudio for hypothesis 2. Three-way Anova between the three dimensions of spatial justice and satisfaction shows significant correlations between the variables. Image by author.

The results of the 4-way ANOVA show that all individual factors have a significant correlation with satisfaction, while no correlation effect was found between the dimensions of spatial justice and the moment of measurement (Figure 74). Additionally, the analysis indicated that the moment itself had a significant correlation with satisfaction.

```
> SJmomtev <- aov(Satisfaction ~ DJ * PJ * RJ * Moment , data = data_GL)
> summary(SJmomtev)
                Df Sum Sq Mean Sq F value   Pr(>F)
DJ               1 142.96  142.96 183.243  < 2e-16 ***
PJ               1  24.63   24.63  31.573 3.84e-08 ***
RJ               1  23.00   23.00  29.481 1.04e-07 ***
Moment           1   5.68    5.68   7.284  0.00728 **
DJ:PJ            1   0.23    0.23   0.295  0.58736
DJ:RJ            1   0.01    0.01   0.017  0.89627
PJ:RJ            1   0.04    0.04   0.052  0.81912
DJ:Moment        1   0.01    0.01   0.016  0.89868
PJ:Moment        1   0.03    0.03   0.040  0.84130
RJ:Moment        1   0.81    0.81   1.035  0.30965
DJ:PJ:RJ         1   0.10    0.10   0.129  0.71981
DJ:PJ:Moment     1   0.43    0.43   0.555  0.45658
DJ:RJ:Moment     1   2.89    2.89   3.709  0.05490 .
PJ:RJ:Moment     1   1.87    1.87   2.403  0.12201
DJ:PJ:RJ:Moment  1   0.59    0.59   0.752  0.38653
Residuals      361 281.64    0.78
---
```

Figure 74: Outcomes of RStudio for hypothesis 2. Four-way Anova between the three dimensions of spatial justice and the moment someone started living in Wittevrouwenveld, and satisfaction. It shows no significant interactions between the variables themselves, but each variable does correlate significantly with satisfaction. Image by author.

When examining the average satisfaction of residents, it becomes clear that those who lived in the neighbourhood before 2018 report lower satisfaction levels than those who moved in after 2018. This difference between the two groups is statistically significant (Figure 75) and has been tested through Fishers Least Significant Difference (LSD) test.

```
$groups
      Satisfaction groups
Na        3.633721      a
Voor      3.301951      b
```

Figure 75: Outcomes of RStudio for hypothesis 2. Fishers LSD shows a statistic difference of satisfaction between residents who lived in Wittevrouwenveld ≤ 2018 and > 2018. Image by author.

Socio-economic status for H3/4/5

These results in Figure 76 show that each variable used to calculate the socio-economic status (SES) has an independent effect on SES, and that no significant interactions exists between the variables.

```
> Socecstat <- aov(SES_formule ~ `SES-typewoning` * `SES-soortwoning` * `SES-inkomen` * `SES-voertaal`, data = data_GL)
> summary(Socecstat)
                                                        Df Sum Sq Mean Sq   F value Pr(>F)
`SES-typewoning`                                         1 1111.5  1111.5 2.296e+05 <2e-16 ***
`SES-soortwoning`                                        1 1543.1  1543.1 3.187e+05 <2e-16 ***
`SES-inkomen`                                            1  659.5   659.5 1.362e+05 <2e-16 ***
`SES-voertaal`                                           1   15.9    15.9 3.290e+03 <2e-16 ***
`SES-typewoning`:`SES-soortwoning`                       1    0.0     0.0 2.460e-01  0.620
`SES-typewoning`:`SES-inkomen`                           1    0.0     0.0 3.190e-01  0.572
`SES-soortwoning`:`SES-inkomen`                          1    0.0     0.0 1.701e+00  0.193
`SES-typewoning`:`SES-voertaal`                          1    0.0     0.0 1.760e-01  0.675
`SES-soortwoning`:`SES-voertaal`                         1    0.0     0.0 1.264e+00  0.262
`SES-inkomen`:`SES-voertaal`                             1    0.0     0.0 8.800e-02  0.767
`SES-typewoning`:`SES-soortwoning`:`SES-inkomen`         1    0.0     0.0 2.000e-02  0.887
`SES-typewoning`:`SES-soortwoning`:`SES-voertaal`        1    0.0     0.0 3.600e-02  0.851
`SES-typewoning`:`SES-inkomen`:`SES-voertaal`            1    0.0     0.0 5.800e-02  0.809
`SES-soortwoning`:`SES-inkomen`:`SES-voertaal`           1    0.0     0.0 9.300e-02  0.760
`SES-typewoning`:`SES-soortwoning`:`SES-inkomen`:`SES-voertaal` 1    0.0     0.0 7.160e-01  0.398
Residuals                                              361    1.7     0.0
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 76: Outcomes of RStudio for the socio-economic status. Four-way Anova between the individual indicators of socio-economic status shows no significant interaction between the factors themselves. Image by author.

Hypothesis 3: influence of socio-economic status on experience of spatial justice

A MANOVA test was conducted, using one independent variable (SES) to assess its effect on three dependent variables (DJ, RJ, PJ). The results show that SES has a significant effect only on distributive justice (Figure 77). Recognitional justice appears to move towards significance, but this result might become clearer with a larger sample size.

```
> tewsttt <- manova(cbind(DJ, PJ, RJ)  ~  SES_formule, data = data_GL)
> summary.aov(tewsttt)
 Response DJ :
             Df  Sum Sq Mean Sq F value  Pr(>F)
SES_formule   1   19.03 19.0323  6.2665 0.01273 *
Residuals   375 1138.93  3.0371
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

 Response PJ :
             Df  Sum Sq Mean Sq F value Pr(>F)
SES_formule   1    0.08  0.0784  0.0146 0.9038
Residuals   375 2009.54  5.3588

 Response RJ :
             Df  Sum Sq Mean Sq F value  Pr(>F)
SES_formule   1   18.22 18.2182   3.617 0.05796 .
Residuals   375 1888.79  5.0368
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 77: Outcomes of RStudio for hypothesis 3. MANOVA between SES and the dimensions of spatial justice shows that SES only has a significant correlation with distributive justice. Image by author.

Hypothesis 4: influence of socio-economic status on usage

No significant correlation was found between SES and usage (Figure 78).

```
> USE_SES <- aov(Usage ~ SES_formule, data = data_GL)
> summary(USE_SES)
             Df Sum Sq Mean Sq F value Pr(>F)
SES_formule   1   0.73  0.7305   0.958  0.328
Residuals   375 285.92  0.7625
> skewness_SES <- skewness(data_GL$SES_formule)
> print(skewness_SES)
[1] -0.4043054
>
```

Figure 78: Outcomes of RStudio for hypothesis 4. One-way Anova between the SES and the usage shows no significant correlation between the variables. Image by author.

Hypothesis 5: influence of socio-economic status on satisfaction

No significant correlation was found between SES and satisfaction (Figure 79).

```
> SES_Sati <- aov(Satisfaction ~ SES_formule, data = data_GL)
> summary(SES_Sati)
             Df Sum Sq Mean Sq F value Pr(>F)
SES_formule   1    0.1  0.0524   0.041  0.841
Residuals   375  484.9  1.2930
>
```

Figure 79: Outcomes of RStudio for hypothesis 5. One-way Anova between the SES and the satisfaction shows no significant correlation between the variables. Image by author.

Appendix R: Translation of quotes

1. “Our aim: access to urban nature, always close by.”

   “Ons doel: stadsnatuur altijd dichtbij.”

2. “Optimise the path towards it through open, generous communication.”

   “Optimaliseer de weg er naar toe via communicatie, open en ruimhartig.”

3. “This acquisition aims to minimise uncertainty and, in doing so, limit the negative effects for residents and property owners as much as possible.”

   “Deze verwerving heeft tot doel de onzekerheid en daarmee voor bewoners/eigena- ren nadelige effecten zoveel mogelijk te beperken.”

4. “In a co-design session, the area around the Scharnerweg roundabout was explored and given shape.”

   “In een co-design sessie werd het gebeid rond de rotonde Scharnerweg verkend en ingevuld.”

5. “There are other priorities the municipality must focus on, which are seen as more important. That means this ends up lower on the agenda.”

   “Er zijn andere prioriteiten waar de gemeente zich op moet richten, die als belangrijker worden gezien. Dat betekent dat dit lager op de agenda komt te staan”.

6. “'Legally, it is the responsibility of the initiative taker to ensure adequate participation, but in practice, this approach often falls short.”

   “Wettelijk gezien ligt de verantwoordelijkheid voor voldoende participatie bij de initiatiefnemer, maar in de praktijk schiet deze aanpak vaak tekort.”

7. “Even when another party is leading the development, we as a municipality must still take responsibility for our role.”

   “Ook als een andere partij de ontwikkeling leidt, moeten wij als gemeente onze verantwoordelijkheid nemen voor onze rol.”

8. “I want to be an additional point of contact for residents. Someone who can help when people feel lost in the municipal system. Ideally, I would become a kind of trusted figure in the neighbourhoods. For the municipality, I want to bring forward what is felt and said in these areas. Everyone at the municipality should know what is happening outside. As long as we are in conversation, there is progress.”

   “Voor de mensen in de buurten wil ik een extra aanspreekpunt zijn. Dat ik kan helpen als je je weg niet vindt binnen de gemeente. Het zou fijn zijn als ik een soort vertrouwenspersoon kan worden voor de wijken. Voor de gemeente wil ik het gevoel in de buurten goed naar voren kunnen brengen. Iedereen bij de gemeente moet weten wat er buiten speelt. En dat kan ik ophalen zolang ik in gesprek ben met de mensen in de buurten, ook met de mensen die kritisch zijn. Zolang we in gesprek zijn, heb je winst. In ieder geval willen wij als gemeente een goede verstandhouding en onderling vertrouwen opbouwen met de bewoners van de wijken. Van daaruit willen we vooral vooruit.”

9. “As a neighbourhood, we’ve really progressed with the Grey Loper – from four asphalt roads to two asphalt roads’.

   “Als buurt zijn we aardig op geschoten met de grijze loper, van 4 asfalt wegen naar 3 asfalt wegen.”

10. “The original residents of Maastricht are being pushed out of the neighbourhood, and eventually out of the city altogether.”

    “De oorspronkelijke Maastrichtenaren worden verdreven naar buiten de wijk en uiteindelijk naar buiten de stad.”

11. “Please talk to residents. Everything has now been decided and arranged without anyone ever asking me, as a resident, for my opinion.”

    “Ga alsjeblieft met bewoners in gesprek. Er is nu van alles bepaald en geregeld zonder dat mij als bewoner ooit iets gevraagd is.”

12. “Make people feel that they are being heard.”

    “Laat mensen voelen dat ze worden gehoord.”

13. “It was a beautiful plan, and at first it seemed to turn out beautifully. Now I avoid the Groene Loper if I can, and I avoid the central path completely. We thought we were gaining a lovely walking route, but it’s been a real let-down. A shame. That said, the Groene Loper is of course a thousand times better than the old motorway, and in that sense we’re very happy with it.”

“Het was een prachtig plan en in het begin leek het ook prachtig uit te pakken. Nu vermijd ik the Groene Loper als dat even kan, en het middenpad vermijd ik helemaal. Wij dachten een mooie wandelroute erbij te hebben gekregen maar dat valt vies tegen. Jammer. Dat neemt niet weg dat the Groene Loper natuurlijk 1000x beter is dan de oude autoweg en wij er op die manier erg blij mee zijn.”

14. “We were invited to view a design. The drawing was covered in sticky notes with complaints and ideas, all for nothing. The final design was exactly as initially presented!"

    “We werden uitgenodigd om een ontwerp te bekijken. De tekening hing vol met post-its vol klachten en ideeën: allemaal voor niets. Het uiteindelijke ontwerp was precies zoals het in het begin gepresenteerd was!”

15. “Fountains. Benches. If only the municipality had listened to the surrounding community instead of doing what it always does: inviting people only to proceed with its own plans!”

    “Fonteinen. Bankjes. Als de gemeente nou eens had geluisterd naar de omwonenden in plaats van, zoals altijd, mensen uit te nodigen en vervolgens toch gewoon haar eigen plan te volgen!”

16. “In short, there is a lot of potential, but it now remains untapped."

    “Kortom, er zit veel potentie in, maar die blijft nu onbenut.”