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URBAN COMMONS AS A DRIVER OF SOCIAL INCLUSION:
**A Socio-Spatial Analysis of
the Accessibility to Urban
Commons in Amsterdam**

Master's Thesis Report

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Science & Policy 

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URBAN COMMONS AS A DRIVER OF INCLUSION:

A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam

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by

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WELKOM!



Foreword

Cities are fountains of innovation and leadership. Places abundant in opportunities where different people meet and new ideas flow. So, they are attractive people. However, many cities are not being able to cope with the recent surge in urban population. The resulting pressure on urban space and skyrocketing real estate value create an increasingly segregated urban environment. This thesis focuses on the accessibility of Urban Commons, a potential alternative to address these grand challenges. Despite the highly politicized connotation of the term, I have attempted to study Urban Commons' accessibility and their ability to include the excluded from a scientifically neutral perspective.

This thesis owes its point of departure to Trivik and Juliana, who assisted with this work's topic selection. I'm indebted to Trivik for his Socratic guidance in shaping this research's objectives, and to Juliana for her ever-present and invaluable guidance throughout the supervision process. I'd also like to express my deepest gratitude to the other members of my committee, without whom I could not have undertaken this journey: this research project would not have turned out as successfully as it has without Amineh's immensely insightful and incisive comments, and Igor's reminders that behind the words and numbers that pop up in the analyses, there are people and stories to be uncovered.

In addition to my thesis committee, I would like to express my sincere gratitude to those who supported me during and prior to my pursuit of a master's degree at TU Delft – which included moving across an ocean during a pandemic. Primarily, I would like to effusively thank my wife Luiza – who was still my girlfriend when this thesis journey started – for her unwavering support and companionship. I am also profoundly grateful for my family, particularly my parents, who have always been a major source of inspiration for me. A special mention goes to Kita and Thor, the most loving Akitas ever. In addition, I am thankful to the EPA community, the CUSP lab folks, and all my friends around the world.

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The study and its findings are described in this report in such a way that researchers, practitioners, and policy-makers of diverse backgrounds will find it accessible and useful. When reading it, please keep this quote in mind: *“Knowledge is your freedom; imagination your wings. Once you are free – fly!”* (FRC Team 383)

I hope this report can be of value to you. Enjoy the read!



Ettore Arpini

The Hague, The Netherlands | August 2022

Executive Summary

As the urban population grows worldwide, cities are becoming increasingly unequal and segregated. In this context, Urban Commons emerge as a potential driver of inclusion and resilience for city dwellers that local governments can leverage for policy-making. However, it is still unclear whether the benefits of Urban Commons are distributed fairly among social groups, or they ultimately remain inaccessible to the culturally and socioeconomically vulnerable. Via a case study in Amsterdam, this report summarizes an exploration of how socio-spatial and policy factors affect the accessibility to Urban Commons. This report proposes a new research framework to study the accessibility to Urban Commons and contributes to the academic debate about the power of commons to drive inclusion. Furthermore, it serves as a reference for government officials interested in commoning as a policy alternative.

Highlights

- Socio-economically vulnerable people in Amsterdam do not seem to face significant material or immaterial barriers to accessing the commons. Instead, the main factors inhibiting access for them might be systemic, such as lack of supporting services – constituting an ecosystem wall of access.
- As such, a new framework for studying Urban Commons' material, immaterial, and ecosystem accessibility is presented.
- Most studied Urban Commons are located in neighborhoods with a high population of Non-Western descent where households earn, on average, less than the Dutch average national income.
- Nine in ten residents of Amsterdam can reach a commons initiative by bike within 15 minutes.
- Immaterial factors do not seem to hinder access to the studied commons. On the contrary, material aspects, such as travel time and cost, discourage participation in commons more often than immaterial ones.
- In the case study, Urban Commons' most significant impact on participants' lives was the sense of community.
- Most participants of the case study Urban Commons also seem to feel included in society via their commons.
- Amsterdam's underprivileged population might face more barriers of access due to systemic factors such as time, money, knowledge, and legal expertise.
- An Urban Commons Ecosystem is a policy option that mitigates systemic barriers of access and creates synergy between commoners' and local governments' goals.
- From a policy perspective, the main barrier to cooperating with commons in Amsterdam is the lack of a legal framework for interacting with the initiatives.

CONTEXT

As the urban population grows worldwide and cities are becoming increasingly unequal and segregated, Urban Commons emerge as a potential driver of inclusion and resilience for city dwellers. According to Feinberg et al. (2021), Urban Commons can promote social, environmental, and economic resilience, and Park et al. (2020) suggest they can act as a haven for the excluded. Commons could, therefore, become a policy alternative to address the grand urban challenges of the 21st Century.

However, it is still unclear whether the benefits of Urban Commons are ultimately accessible to the culturally and socioeconomically vulnerable. For instance, in a literature review study, Huron (2017) found significant uncertainties in how Urban Commons relate to feminism, race, gender, and ethnicity – factors that could constitute immaterial barriers of access, following Vrasti & Dayal's (2017) terminology. In fact, while several studies have investigated the commons' role in promoting urban justice, explorations of whether access to the commons itself is just have been neglected.

ABOUT THIS REPORT

This master's thesis explores what constitutes material and immaterial barriers to accessing Urban Commons to understand whether these initiatives can work, policy-wise, as a driver of social inclusion. 29 Urban Commons in Amsterdam were selected as a case study. A quantitative geo-spatial analysis was conducted to evaluate the material accessibility to each initiative. In parallel, commoners were surveyed about their perception of immaterial barriers and benefits of commoning. Finally, a representative of the municipality of Amsterdam was interviewed to assess the potential challenges and benefits of policies involving Urban Commons.

CONCLUSIONS AND RELEVANCE

Concurring with Park et al. (2020), the case study findings suggest commons could indeed promote social inclusion. Moreover, it was also found that the excluded could face, in addition to the initially proposed material and immaterial walls, an ecosystem barrier to access commons. Yet this could be addressed from a policy standpoint with the development of a commons ecosystem that is capable of scaling the benefits of commoning across an entire city.

The results have academic and societal relevance. This study provides a new theoretical framework to research the factors influencing access to commons and also contributes to literature with a unique city-wide case study. It can also function as a reference for policy-makers who wish to learn about the commons landscape in Amsterdam and who interested in understanding the factors that contribute to participation in a commons.

INGANG

EETCAFE

STRANDZAAL

STRAND TERRAS

01.

Introduction

Urban Commons are emerging as an alternative strategy for addressing urban inequalities and securing the right to the city. However, it is unclear whether vulnerable social groups can access them. This section introduces the problem and highlights its scientific and societal relevance, describes the existing academic literature, and presents the research questions addressed in this research.

1.1 Context and Motivation

For the first time in history, most of the world's population lives in cities (UN-Desa, 2018), an environment that is becoming increasingly unequal and segregated both socially and spatially (Divided Cities, 2018; Soja In Soja, 2009; van Ham et al., 2021a). This growing pressure on urban spaces creates ever-competitive markets for real estate and private property in urban settings (Beard et al., 2016; David Harvey, 2012), raising the question of "who owns the city" (Kern, 2010; Lizieri et al., 2011; Sadowski, 2020).

In this context, several authors argue that Urban Commons emerge as an alternative to address urban inequalities and obtain the right to the city initiatives by allowing citizens to manage urban space and resources themselves (Harvey, 2012; Parker et al., 2012; Dellenbaugh et al., 2015; Tonucci Filho, 2017). Additionally, Urban Commons' many benefits can contribute to United Nations' Sustainable Development Goal 11 (United Nations, 2021): they can improve urban resilience, people's health, and the environment (Feinberg et al., 2020, 2021) and can function as a policy option for local governments to build more inclusive and sustainable cities (Bianchi, 2018, 2022; Eidelman & Safransky, 2021; Shah & Garg, 2017).

However, because commons have set boundaries and are community-based (Ostrom, 1990), they are also inherently exclusive. Therefore, urban Commons can only drive social inclusion if the socially excluded are capable of accessing them. Indeed, recent studies have indicated that the ownership regime of a commons may not be as relevant as what groups of people have access to and can benefit from them (Feinberg et al., 2021; Williams, 2018). Yet while authors tend to agree that Urban Commons can contribute to a more just city (Fainstein, 2014a; Kazimowicz, 2020), it remains unclear whether the access to Urban Commons themselves is just and equitable.

The starting point of this research was the scarce and contradictory studies investigating whether the commons can drive inclusion. Authors such as Graham (2017), Nightingale (2019), and Eidelman et al. (2021) have theorized about how commons can promote social inclusion, and case studies by Gillespie (2016), Parker et al. (2017), Park et al. (2020), and Johnson et al. (2022) have provided empirical evidence for such theories in specific contexts. However, Shah and Garg (2017) found, conversely, that the distributional equity of Urban Commons' benefits remains a crucial issue. Furthermore, Huron observed in her literature review (2017) that there are still significant gaps in the Urban Commons literature regarding how commons relate to vulnerable socio-demographic groups.

Based on these debates, this study seeks to contribute to the discussion by examining the power of Urban Commons to drive inclusion from a novel perspective: material and immaterial accessibility. Inspired by Vrasti and Dayal's (2016) work, immaterial accessibility is understood as socio-demographic factors that act as potential drivers or barriers of access, while material accessibility refers to the spatial component of accessibility (Pereira et al., 2017). Understanding how Urban Commons relate to socio-spatial accessibility segregation and who benefits from them can help policymakers to design policies that leverage Urban Commons to reduce inequalities on a local level.

Therefore, this thesis explores how geospatial, social, and policy factors relate to Urban Commons' potential to drive social inclusion from an accessibility standpoint. To do so, a case study mixed-method approach was chosen. Within the context of Amsterdam's De Meent platform, quantitative methods were employed to assess the case study initiative's material accessibility,

and surveys were deployed to assess commoners' perspectives on immaterial access and the impacts of commoning. Finally, a semi-structured interview was conducted with an expert on commons-oriented governance and policy innovations from the Municipality of Amsterdam. Due to TU Delft's Engineering and Policy Analysis (EPA) master's program's multidisciplinary and multi-actor perspectives, the objectives and approach of this study are unique to the commons literature.

This innovative research approach provides researchers with a novel framework to study the accessibility of the commons from a geospatial, social, and policy perspective. The research outcomes contribute to the academic debate on whether Urban Commons can act as a driver for inclusion and offer a better understanding of the socio-spatial and policy factors that influence access to commons. Furthermore, its insights can support policy-makers in designing policies that leverage public-collective partnerships to address the grand urban challenges of the 21 Century and contribute to more inclusive and sustainable cities.

1.2 Literature Review and Core Definitions

As Derek Wall explains in his book *The Commons in History: Culture, Conflict, and Ecology*, the concept of Commons historically referred to natural resources shared by a rural community, such as pastures, cattle, and fishing waters. As communities expanded and managing these resources became increasingly more complex, the expression Commons grew broader and started to also encompass the practice of collective governance (Kip et al., 2015). The term has evolved to also denote, among others, scientific knowledge, community gardens, and collectives (Hess, 2008). However, although the idea of *commons* is recently getting increasingly more attention in the political imaginary and academia, there is still no consensus on what it means.

From a political point of view, the concept represents an action-word against subordination to a capitalist logic of merchandise, competition, and property (Caffentzis & Federici, 2014; Dardot et al., 2019). Furthermore, it represents an alternative to the dichotomies of *state* versus *market* and *public* versus *private* via collective management, production, and social reproduction (de Angelis, 2017; Hardt & Negri, 2009; Schlager & Ostrom, 1992). From the academic perspective, the Commons is a complex and multifaceted topic, drawing interest from researchers from various fields, such as anthropology, ecology, law, geography, history, economics, and urban studies (Wall, 2014).

Nobel Prize winner economist Elinor Ostrom started the modern discussion on Commons in her groundbreaking book *Governing the Commons* (Ostrom, 1990), in which she introduces the concept of the Common Pool of Resources (CPR). The CPR is an ensemble of natural and artificial *public goods*, universally accessible and finite, whose property-rights regime transcends traditional economic thinking of public versus private regimes (Schlager & Ostrom, 1992). This alternative property rule offers an alternative to the mainstream idea of the *Tragedy of the Commons* (Hardin, 1968). Since then, the literature corpus on the topic has grown vastly, and there was no standard definition for the term Commons. The currently accepted understanding of the commons is that they are governed by complex institutional aspects, as laid out by Ostrom (Ostrom, 1990), and have four critical characteristics proposed by Bollier and Helfrich (2014),

namely that they are finite, exclusive, cause rivalrous use, and require regulation. Another relevant concept is *communing*, understood by Foster and Iaione (2015) as the practice of connecting a resource to a nearby community of users.

In this study, nevertheless, the terminology around the commons is based on a depoliticized socio-technical view, which, as Bianchi illustrates (2018), has been shown to facilitate policy changes favoring the commons (in this case, the Urban Commons) in Bologna. Therefore, in this study, **common** is understood as a perspective of social transformation based on the principle of sharing and collaborating (Feinberg et al., 2021; Hardt & Negri, 2009). The verb **commoning** refers to connecting resources to a community of users with access to them (Feinberg et al., 2021; Foster & Iaione, 2019). Moreover, **commons**, based on Feinberg et al.'s work (2021), is defined as a socio-technical system comprised of *i*) material, immaterial or digital resources; *ii*) their users, who have input in the resources' management; *iii*) the institutions binding them; *iv*) and the associated processes. This broader and more complex understanding of the term relates to the *new commons*, a term coined by Charlotte Hess. In her work called *Mapping the New Commons* (2008), she expands on her work with Ostrom (2006) and recognizes eight types of commons: Cultural Commons, Knowledge Commons, Markets as Commons, Global Commons, Traditional Commons, Infrastructure Commons, Neighborhood Commons, and Medical and Health Commons. Many of these are inherently urban or are relevant in an urban context – in that case, they are referred to in this study as **Urban Commons** (UC).

1.2.1 URBAN COMMONS, JUSTICE, AND INCLUSION

Prominent urbanists and philosophers such as Henri Lefebvre (2003; 2009) have foreseen the growing global urbanization trend experienced today (UN-Desa, 2018) as early as the mid-20th century. Nevertheless, few researchers have historically investigated the commons in an urban context (Tonucci Filho, 2017). While the idea of Commons is behind many initiatives and movements in cities since the 2010s, such as in Bologna (Comune di Bologna, 2014), Barcelona, and Napoli (Bianchi, 2022), it was as late as 2009 that Hardt and Negri (2009) theorized for the first time about the city as a catalyzer of the Commons, a concept David Harvey expands upon in his book *Rebel Cities* (2012).

In fact, the literature is so incipient that a multi-lingual literature review by Kip (2015) found only 43 publications addressing the Urban Commons, 37 of which date after 2011. Enright and Rossi (2018) suggest that this recent interest in the Urban Commons stems from the intense pressure put on urban space combined with the growth of the sharing economy due to the fallout of the 2008 economic crisis. The results of a literature review study focusing on English language publications only by Feinberg and colleagues (2021) are evidence for the spike in publications after 2008: from the 167 articles found, 161 (96%) were published after 2008.

Despite the interest in the field, the fact that the Urban Commons corpus is still in its nascent phase means there is no cohesive understanding or definition of the term (Foster & Iaione, 2015; Huron, 2017). As Tonucci Filho (2017) elucidates, while some consider Urban Commons as regular Commons located within a city, other authors have a broader understanding of them. Researchers such as Parker and Johansson (2012) or Dellenbaugh et al. (2015), consider the urban environment and its collective life as a Commons.

The predominant understanding of Urban Commons, though, inherently associates the commons with an alternative use and management of urban resources to address urban socio-spatial inequalities. This view aligns with Soja's (2009) idea of distributional equity of benefits within spatial justice, and Fainstein's (2014b) Just City, both of which focus on how spaces are used and,

in particular, by whom (Chatterton, 2010). These authors' ideas are a development of Rawls's (1991) well-known understanding of justice as fairness, nowadays synonymous with **equity**, which is a form of justice that recognizes people's distinct cultural, economic, and social backgrounds. Instead of treating everyone equally, equity prioritizes those people who are in unfavorable circumstances or have been historically disadvantaged (Menezes, 2015). The lack of equity is, therefore, inherently linked to **social exclusion**, which, as Lucas (2012) explains, is generally understood as a multilayered and dynamic concept of deprivation, or, as Levitas et al. (2007) put it, as the denial of resources, rights, goods, and services available to the majority of the people in a society. The opposite of social exclusion is **social inclusion**, which can, therefore, be defined as providing the excluded with access to the resources, rights, goods, and services that were not available to them.

In fact, much of the literature seems to approach the Urban Commons from the perspective of *rights* through Lefebvre's idea of the *Right to the City* (2009). Through this lens, Urban Commons are a means to combat socio-spatial inequities and grant the right to the city via the appropriation or occupation and management of urban space (Tonucci Filho, 2020). However, considering the inherently social and ever-changing characteristics of urban spaces, instead of asking who *owns* the Urban Commons, it might be more relevant to ask who has *access* to the Commons in an urban context (David Harvey, 2012; Feinberg et al., 2021; Foster & Iaione, 2015; Huron, 2017; Kip, 2015; Vrasti & Dayal, 2016; Williams, 2018).

The underlying idea that permeates literature on the Urban Commons is, therefore, that all urbanites have the right to reap the benefits of living in a city, not just a few privileged. They are a means to promote social equity by changing the relationship of who owns, manages, and accesses urban spaces. If those who have access to Urban Commons are socially excluded, then Urban Commons can improve the equity of the distribution of benefits of urban living and can ultimately function as a driver for inclusion. Literature, however, is divided.

On the hand, there are case studies agreeing with the theoretical work by Runge et al. (2006), Graham (2017), Nightingale (2019), and Eidelman et al. (2021) proposing that commons can promote social inclusion. For example, Johnson (2022) argues that commons can foster the inclusion of low-income women by offering entrepreneurship opportunities; Based on a study in Accra, Gillespie (2016) argues that commons can promote the inclusion of low-income people in the housing market if supported financially by the state; Parker (2020) found that partnerships between local governments and parks commons can increase citizen participation and promote inclusiveness; more adamantly, in a case study in Seoul, Park (2017) argues that Urban Commons can function as a haven for the socially excluded by offering a sanctuary for people left behind by the state and market.

On the other hand, Shah & Garg's found that if power relationships and access are not considered from a commons' onset, the benefits of commoning might not be equitably distributed. For instance, Sundaresan (2011) and Unnikrishnan et al. (2017) found that lakes in Bangalore managed as commons have governance structures that benefit the privileged and exacerbate inequalities. Moreover, in a literature review, Huron (2017) found that there are issues of exclusion in the commons literature, and points to a knowledge gap in terms of the relationship between commons and gender, race, and class or income.

The issue boils down to who has access to the commons – a perspective often neglected, and perhaps new, in the Urban Commons literature, as illustrated in the next section.

1.2.2 MATERIAL AND IMMATERIAL ACCESS TO URBAN COMMONS

While the literature agrees that Urban Commons can promote more equitable access to the opportunities arising from living in a city, there is still debate on whether the access to Urban Commons themselves is fair. However, before investigating the literature on access to Urban Commons, it is fitting to define what is meant by accessibility and how it can be understood in the context of Urban Commons.

Accessibility is a concept present in several academic fields, such as transport planning, urban planning, geography, and land-use (Geurs & van Wee, 2004), which naturally means there are multiple meanings for the term. In this study, accessibility is understood broadly, following Levinson and King's (2020) definition of **accessibility** as the ability of (a group of people) to reach certain goods, services, and activities (commonly called opportunities in accessibility literature). As the authors explain, this broader understanding of access refers not only to physical movement or mobility, but also to other factors affecting people's capability to access opportunities. In this study, a clear distinction is made between material accessibility and immaterial accessibility to Urban Commons.

In terms of factors that affect access to Urban Commons beyond mobility, Vradi & Dayal (2016) argue that people's socio-cultural traits can hinder access to Urban Commons. Referring to them as 'immaterial walls' of access, the authors explain, based on affect theory (Ahmed, 2013; Massumi, 2020), that specific initiatives have an atmosphere or culture that affects people with certain socio-demographic traits in such a way that they feel unwelcome. Examples include, they continue, atmospheres that emanate whiteness, masculinity, and wealth. In this study, therefore, socio-demographic factors that affect people's ability to reach or their willingness to participate in an Urban Commons are called **immaterial barriers** of access. These immaterial walls (barriers are used interchangeably in this work) contribute to understanding the **immaterial accessibility** of Urban Commons. Examples are gender, age, ethnicity, and income.

However, as van Ham et al. (2021) aptly show, urban segregation of socio-economic groups has an increasingly important spatial component – an often overlooked aspect in Urban Commons studies, as Tonucci Filho explains (2017) and resulting paper (2019). As such, accessibility related to geospatial components (Geurs & van Wee, 2004; Levinson & King, 2020; Lucas, 2012) is understood in this work as **material accessibility**. Therefore, urban mobility aspects such as public transport service, travel time, and costs are considered **material barriers** of access.

This definition of material accessibility adds a final criterion to the characterization of the Urban Commons to be analyzed in this study: the Commons must have a physical location in space where its members can reap its benefits. The Urban Commons considered in this study are a socio-technical system that meets the following requirements:

- It is comprised of material, immaterial, or digital resources.
- It has a community of users, who have input in the resources' management.
- It has an associated binding institution.
- It has associated managerial processes.
- It is relevant in an urban context.
- It can be physically reached in space in a unique location.

Despite the wealth of research on accessibility in general and the clear understanding of Urban Commons' potential benefits in literature, few studies have examined access to Urban Commons. Although Harvey (2012) and Williams (2018) point to the social issue of access to Urban Commons, few case studies relate commons to their spatial environment and users. Fewer still

explicitly investigate who benefits from Urban Commons in practice. Only 12 case studies were found to mention the access to Urban Commons or the equity of their benefits, as seen in Table 1. Only recent studies by Milan (2021), Shelby (2021), Charitonidou (2021), Tartari (2021), as well as Shah and Garg (2017), and Nascimento (2016) address the demographics of the users of the Urban Commons they studied. Yet none of the authors explored accessibility in relation to space.

Table 1 | Analysis of studies investigating the distribution of benefits or access of Urban Commons

Paper	Does the study recognize as a key issue:		Does the study investigate who has access from a:		Finds barriers of access	UC Type
	UC's Location	Access to UC	Social Perspective	Spatial Perspective		
(Slavuj Borčić, 2022)	No	Yes, indirectly	No	No	No	urban agriculture
(Milan, 2021)	No	Yes, indirectly	Yes, via census data	No	No	multiple
(Aernouts & Ryckewaert, 2018)	Yes	Yes, as a key property of UC	No	No	No	housing
(Shelby, 2021)	No	Yes, indirectly	Yes, via census data	No	No	housing
(Morado Nascimento, 2016)	Yes	Yes, as a key property of Urban Commons	Yes, census data and ways to join	No	Legislation and policies	housing
(Cruz & Paulino, 2020)	Yes	Yes, as a benefit of the UC	No	No	No	urban mobility
(Charitonidou, 2021)	Yes	Yes, indirectly	Yes, census data and ways to join	No	No	housing
(Noterman, 2016)	Yes	Yes, indirectly	No	No	Legislation and policies	land use
(Tartari et al., 2021)	Yes	Yes, indirectly	Yes, via surveys	No	Feeling as an 'outsider'	cultural, knowledge, neighborhood
(Shah & Garg, 2017)	Yes	Yes, inequity of benefits is a key issue	Yes, via census data	No	No	multiple
(Sharp, 2018)	No	Yes, as equity	No	No	Feeling as an 'outsider'	housing
(Tsavdaroglou, 2020)	Yes, spatial analysis	Yes, as a benefit of the UC	No	No	Legislation and policies	Multiple related to refugees

The literature review highlighted a debate in the literature over the commons' power to drive inclusion. Additionally, it revealed that, although inclusion and accessibility are inexorably connected, there are scarcely any studies investigating who has access to the Urban Commons from a geospatial, social, or policy perspective.

1.3 Research Questions

The literature review has highlighted a debate surrounding the ability of commons to promote social inclusion, following a Lefebvrian outlook of the Urban Commons as providers of the Right to the City (2009) and catalysts of Fainstein's Just City (2014a). This study adopts a novel problem framing and examines the inclusiveness of commons from the perspective of geospatial and social accessibility. In that sense, few case studies in the literature look into how accessible Urban Commons are from a socio-spatial perspective and which groups of society benefit from them.

In addition, who has access to the Urban Commons becomes even more prominent from a societal and policy-making perspective. Urban Commons can be a driver of urban resilience to socio-economic and environmental disruption (Feinberg et al., 2020) and promote more equitable and sustainable cities (Bianchi, 2018, 2022; Eidelman & Safransky, 2021). Specifically, Amsterdam's city government is seeking public-collective partnerships as a policy option to address local issues and promote participation (*Omgevingsvisie Amsterdam 2050: Een Menselijke Metropool*, 2021).

Thus, this study aims to contribute to the academic debate by examining Urban Commons from a geospatial, social, and policy perspective. Via an Amsterdam case study, it aimed to explore how access to Urban Commons and their benefits vary based on social-demographic and spatial factors. The following main research question (MRQ) and sub-questions (SQ) are addressed:

- **[MRQ] How do geospatial, social, and policy factors relate to Urban Commons' potential to drive social inclusion from an accessibility perspective?**
 - **[SQ1]** How are the locations of Urban Commons related to social and spatial factors in Amsterdam?
 - **[SQ2]** How is the material access to Urban Commons in Amsterdam related to social and spatial factors?
 - **[SQ3]** How do immaterial factors influence the accessibility to Urban Commons in Amsterdam?
 - **[SQ4]** What impact do Urban Commons have in the lives of users, and how does that differ by initiative type and social group?
 - **[SQ5]** How does the Municipality of Amsterdam perceive the commons, and what barriers and opportunities are there to implement policies that take advantage of the benefits of Urban Commons, including promoting inclusion?

1.4 Report Outline

This report is divided into seven main sections and an appendix. Section 1 motivated this work, introduced the key terminology and presented the research questions. Section 2 explains the research design, while Section 3 introduces the case study. Subsequently, Section 4 describes and discusses the main findings. It is divided according to the research approach into a Material Access Stream, an Immaterial Access Stream, and a Policy Confluence, in addition to a section dedicated to introducing a new framework for studying commons accessibility. Section 5 concludes this report by reflecting on the implications and limitations of this study and outlining future research directions.



02.

Research Design

Accessibility to Urban Commons is a topic at the intersection of several academic fields, ranging from the humanities to public policies and engineering. From TU Delft's Engineering and Policy Analysis program's perspective, this section introduces a research framework new to the commons' state-of-the-art, explains the methodology used, and justifies a mixed-method approach.

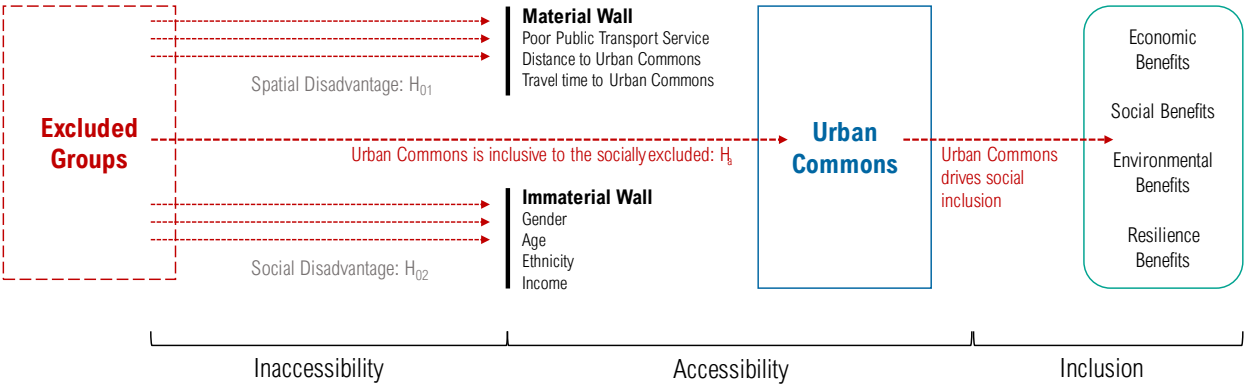
2.1 Research Approach

Research on the commons is typically conducted from a political and economic standpoint, only recently focusing on the benefits of commoning in an urban context. Whether Urban Commons are widely accessible and can drive inclusion, however, remains an open question. To address this knowledge gap, this study has taken a research approach novel to the state-of-the-art by studying inclusion from a holistic accessibility lens through a city-wide multi-initiative case study. Moreover, a policy component was also included in the study because of the societal implications and benefits of more accessible and inclusive commons.

Firstly, in this work, it is assumed that if the Urban Commons are accessible to the social groups that are excluded in a society, then it can drive social inclusion. By accessing a commons, the socially excluded have the opportunity to access the social, economic, environmental, and resilience-wise benefits of Urban Commons identified by Feinberg et al. (2020, 2021).

In terms of accessibility, this approach innovatively contemplates both material and immaterial factors that, according to literature, can act as barriers for the excluded to access an Urban Commons. Inspired by Vratsa & Dayal's (2016) identification of immaterial walls that can prevent the socially excluded from accessing the commons, this study investigates how socio-demographic factors can function as an immaterial wall for accessing the commons. Complementarily, factors constituting a material wall of access were also considered, based on a traditional mobility-oriented perspective on accessibility. The approach can be visually represented by the research framework displayed in Figure 1.

Figure 1 | Framework to study the accessibility to Urban Commons, its impacts, and potential to drive inclusion. Arrows represent the access of excluded groups to Urban Commons and their benefits.



The framework presented in Figure 1 can be rewritten as a null (H_0) and alternative (H_a) hypothesis, which can be further broken down into two hypotheses, one for material accessibility and another for immaterial access:

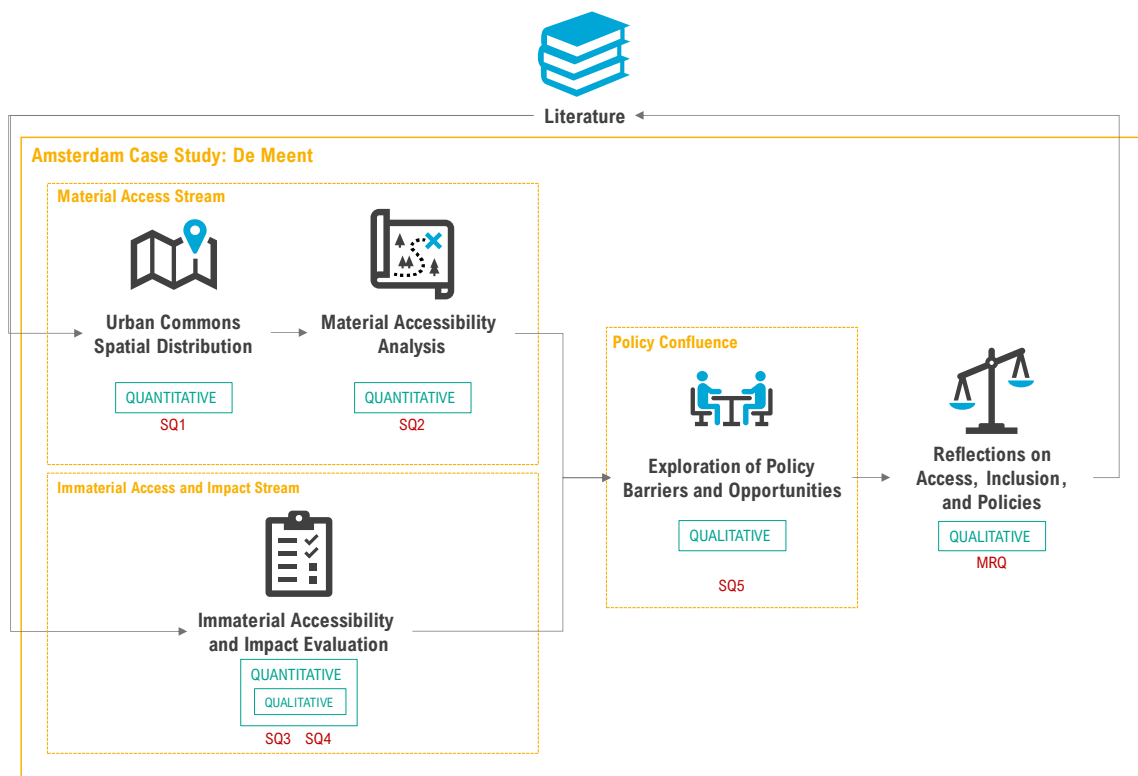
- **H₀:** The most vulnerable social groups are at a spatial and social disadvantage to access Urban Commons in Amsterdam.
 - **H₀₁:** The most vulnerable social groups are at a spatial disadvantage to reach Urban Commons because of material walls.
 - **H₀₂:** The most vulnerable social groups are at a social disadvantage to reach Urban Commons because of immaterial walls.

- **H_a**: The most vulnerable social groups are not at a spatial and social disadvantage to access Urban Commons in Amsterdam.
 - **H_{a1}**: The most vulnerable social groups are not at a spatial disadvantage to reach Urban Commons because of material walls.
 - **H_{a2}**: The most vulnerable social groups are not at a social disadvantage to reach Urban Commons because of immaterial walls.

A critical reflection on the research questions and hypotheses H_a and H_o indicates that quantitative methods are fitting for studying material accessibility. In contrast, qualitative ones are more appropriate to address immaterial accessibility. Moreover, the importance of historical and local context regarding the commons makes the boundaries between access to Urban Commons and the local social, spatial, and policy context not clearly distinguishable. As Yin (2009) explains, in such cases, when context and other complex phenomena are integral to answering the research questions, a case study approach is recommended to the study.

Therefore, a Case Study-Mixed Method Design (Guetterman & Fetters, 2018) was adopted, in which a mixed-method approach is embedded in an overarching case study. As depicted in Figure 2, the study was designed as Material Access Research Stream and an Immaterial Access Research Stream that converged into a complementary Policy Confluence centered around Commons policies. Section 2.2 describes the methods utilized, and Section 3 introduces De Meent, the case study where they are embedded.

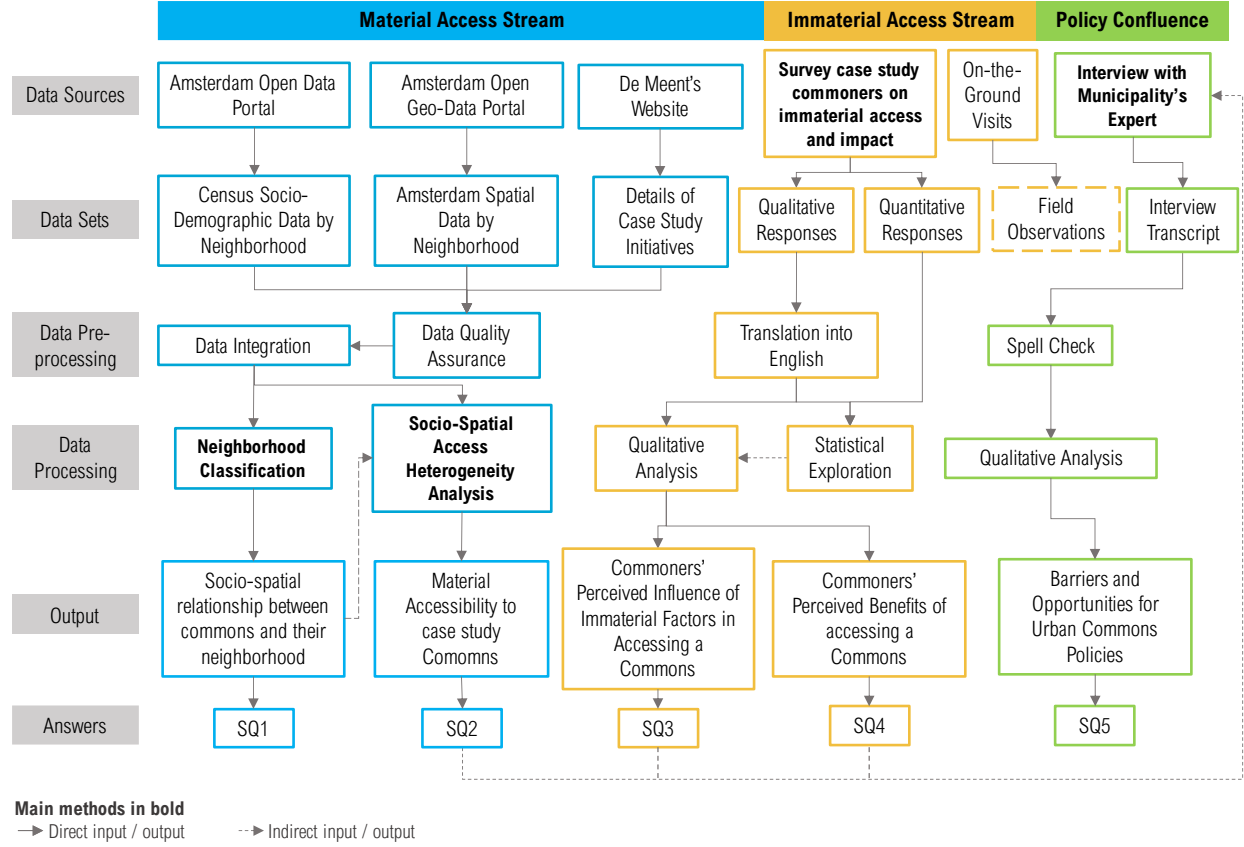
Figure 2 | Research flow diagram representing a Case Study-Mixed Method Design (Guetterman & Fetters, 2018) comprised of multiple mixed-methods strategies, as elucidated by J. W. L. Creswell & Clark (2010)



2.2 Methodology

This study adopted an original research approach, which holistically studies the Commons' accessibility and inclusivity from the perspective of material, immaterial, and policy factors. Similarly, the research methodology, schematically shown in Figure 3, attempted to go beyond the state-of-the-art by deploying mixed methods and embracing a multi-actor perspective to explore how geospatial, social, and policy factors relate to Urban Commons' potential to drive social inclusion from an accessibility perspective. In Figure 3, dashed lines represent indirect inputs/output relationships. Field Observations are represented as a dashed box because its results feed into the entire research.

Figure 3 | Research's Methodology overview. The Material Access Stream adopted quantitative methods, while the Immaterial Access Stream and Policy Confluence used primarily qualitative ones.



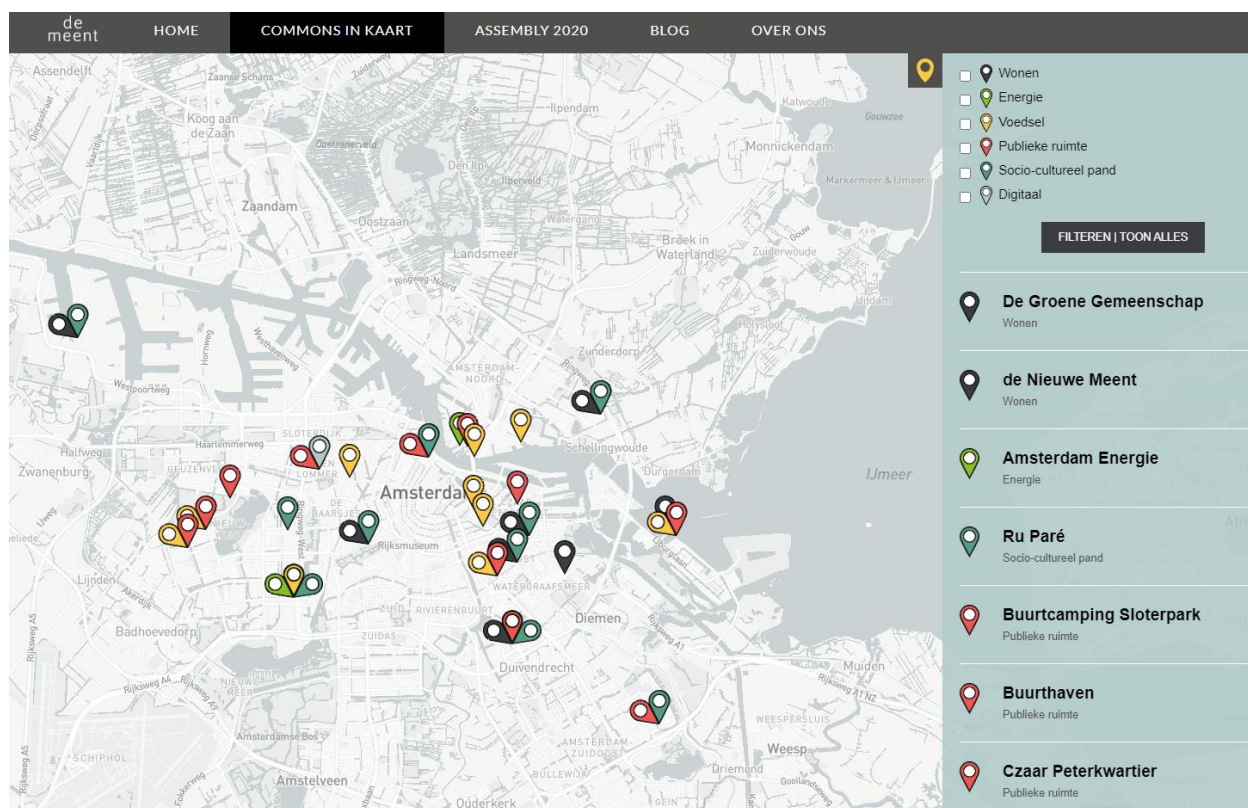
Machine learning algorithms were deployed on publicly available data in the Material Access Research Stream. At the same time, in an Immaterial Access Research Stream, members of Urban Commons in the case study were surveyed about their perceptions of immaterial barriers to accessing the commons and the benefits of doing so. Finally, the policy-making perspective was taken into account through a semi-structured interview with an expert in commons innovation from the Municipality of Amsterdam. The following sections outline the data and methods employed in the Material and Immaterial Access Streams and in the Policy Confluence research components.

2.2.1 DATA

Various data points from different data sources were required to conduct this research. Unlike the qualitative data inputs for the Immaterial Access Stream and the Policy Confluence, which were obtained directly from the qualitative methods, the data for the methods in the Material Access Stream consisted of publicly available quantitative data. This section details the quality assurance process and modeling of the data used in the Material Access Stream. Three types of information were used in the Material Access Stream: the location of the case study Urban Commons in Amsterdam, geospatial data on Amsterdam, and socio-demographic data by Amsterdam neighborhood.

Information on the Urban Commons participating in the case study DeMeent, including their location, was primarily obtained from the platform's website (seen in Figure 4) and supplemented by information gathered from each initiative's website. In addition, the geodata comprised a shapefile obtained directly from Amsterdam's geodata portal. Unfortunately, the most recent data on the city's neighborhood boundaries was published in 2016, meaning that the recently added neighborhood of Weesp is not included in the analysis. Finally, the census data consisted of socio-demographic factors broken down by Amsterdam's most granular available category of spatial demarcation, namely, demographic information by neighborhood (*Wijk*, in Dutch).

Figure 4 | DeMeent is the only platform listing commons initiatives in Amsterdam and displaying its members on a map (de Meent, 2019a)



The list of census variables included in the analyses was chosen based on the socio-demographic factors that often correlate with social vulnerability, according to a report by the United Nations Development Programme (Katic et al., 2017). These are age group, ethnicity (or migration background), gender, and household income, collected from eight data sources. The complete list of variables and data sources can be seen in Appendix 7.2.1.

In order to create a workable data model that connects the multiple datasets so that they can be analyzed together and processed by other data analysis algorithms, the raw data went through a data quality assurance process. This process increases the reliability and performance of the subsequent analyses by reducing the risk of errors and biases (García et al., 2015a).

The data quality was assessed and improved following Huang's (2013) framework. As she explains, data quality can refer to a syntactic category (whether the data complies with the data model's rules), a semantic category (whether the data truly reflects the real-life information it is representing), or a pragmatic one (whether the data is suitable for the purpose it is being used for). All the data quality assurance work was performed in Microsoft's Power BI software due to its built-in data checking capabilities.

Regarding syntactic data quality, the datasets pulled from the Municipality of Amsterdam's official data portal were thoroughly clean, accurate, and consistent. All data values correspond to the field's data type, and all fields representing the same information are standardized across the published datasets. For example, in each of these datasets, a row represents a neighborhood (*Wijk*, in Dutch), and they are all identified by the same key field, "WijkID".

Concerning semantics and timeliness, the primary data quality identified pertains to the semantic completeness of Amsterdam's neighborhoods. As of March 2022, the municipality of Weesp merged with that of Amsterdam (Gemeente Amsterdam-Weesp, n.d.). As such, while Amsterdam's officially published geodata was updated in April 2022 to reflect the addition of Weesp to the city map, the most recent municipal census data predates the addition of the new region. As a result, while Weesp still appears in this study's geospatial visualizations as part of Amsterdam, that region was disregarded when analyzing the results, as per the data treatment best practices found in the literature (García et al., 2015b).

Pragmatically, higher precision of the census data, such as demographic data by street rather than neighborhood, would allow for more granular intra-neighborhood analyses. This limitation was addressed by assuming the census data was evenly distributed within a neighborhood.

Finally, the different datasets were integrated so information from the various sources could be analyzed and cross-referenced. As such, in Python (van Rossum, 1995), the datasets containing census information by neighborhood were merged on the column "WijkID", resulting in a single database containing all relevant census variables by neighborhood. Then, a spatial join was performed between the points where Urban Commons are located and Amsterdam neighborhoods using Geopandas (Kelsey Jordahl et al., 2020). Another spatial join was applied to connect the two resulting datasets to obtain a single integrated dataset containing spatial, demographic, and Urban Commons related information by neighborhood of Amsterdam.

2.2.2 MATERIAL ACCESS STREAM

This section describes the quantitative methods deployed to answer SQ1 and SQ2 within the Material Access Stream. SQ1 was answered by investigating the spatial distribution of the case study Urban Commons in Amsterdam, and SQ2 by analyzing their material accessibility.

2.2.2.1 Urban Commons Spatial Distribution

In order to answer SQ1, Amsterdam neighborhoods were firstly classified according to the socio-demographic profile of their residents. Then, the location of Urban Commons in the case study was assessed based on the type of neighborhood they are located in.

Lloyd's (1982) K-Means unsupervised machine learning algorithm was deployed to classify the neighborhoods using Python's Scikit-Learn package (Pedregosa et al., 2012). This algorithm was chosen because it allows for multivariate comparison, it is relatively straightforward, vastly researched and documented, and it strikes a balance between accuracy and computational power, particularly for smaller datasets (Kanungo et al., 2002; Ostrovsky et al., 2006; Wilkin & Huang, 2008). The code used can be seen in the complementary materials at 4TU.ResearchData Repository under DOI 10.4121/c.6081006.

The algorithm clusters data points by attempting to group data points in k groups of equal variances while minimizing parameter called inertia, or within-cluster-sum-of-squares iteratively, representing how coherent clusters are. The inertia was calculated as the Euclidian distance between an observation and the cluster's centroid, as expressed in Equation 1:

$$Inertia = \sum_{i=0}^n \min_{\mu \in C_k} (\|x_i - \mu_C\|^2) \quad (1)$$

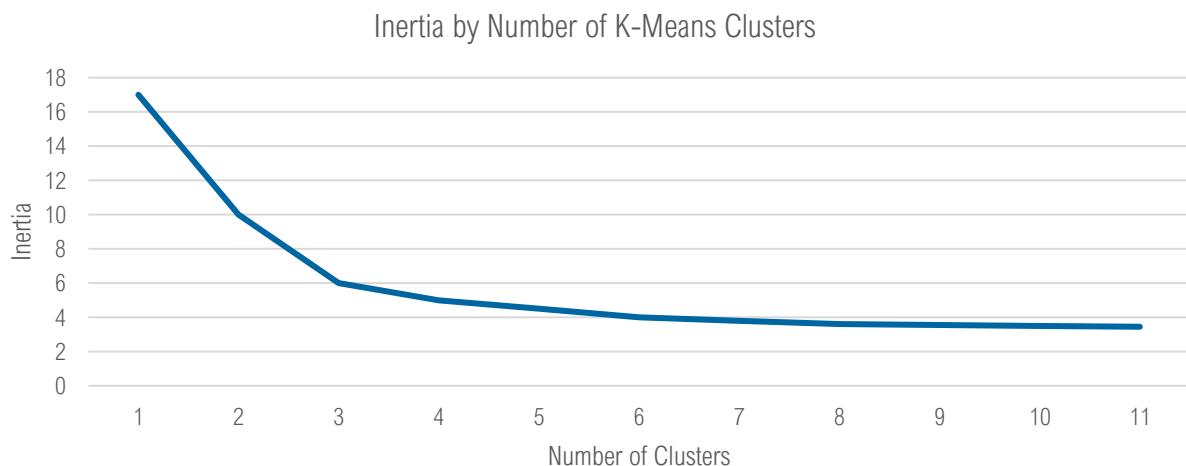
Where:

- *Inertia*: the within-cluster sum-of-squares parameter, which assesses the variance of a variable within a cluster.
- C_k : Cluster C out of k total clusters.
- x_i : Value of datapoint i , out of n total datapoints.
- μ_j : Mean value of the samples in the cluster C .

One of the critical drawbacks of Lloyd's K-Means is the possibility of it converging to local rather than global minima - which is expected, as clustering is considered an NP-Hard computational problem. However, this issue is deemed unlikely in a relatively small dataset such as the one used in this study (Wilkin & Huang, 2008). Nonetheless, the algorithm was run multiple times until the results were identical three times in a row to avoid this issue. A random seed (based on the number 1234) was used for reproducibility purposes.

Moreover, the performance of the algorithm can be affected by a priori the specified number of clusters k (Pham et al., 2005). The optimal number of clusters k was selected using the Elbow Method, shown in Figure 5. This visual method seeks to balance the additional gain of information provided by a larger number of clusters versus the effort taken to generate and interpret these clusters (Bholowalia & Kumar, 2014).

Figure 5 | The Elbow Method yielded four as the optimal number of clusters in the K-Means analysis



Applying the method to a dataset containing census data by neighborhood, it becomes clear that there is an “elbow” at three clusters: from the number of clusters $k = 4$ on, the gain (i.e., reduced inertia) by adding another cluster is considerably reduced, and the curve becomes much flatter. Therefore, the selected number of clusters for the analysis was $k = 4$.

2.2.2.2 Material Accessibility Analysis

The material accessibility analysis conducted to answer SQ2 identified the shortest travel time to reach a commons. The spatial heterogeneity analysis found the shortest travel time to a commons for each neighborhood, while the socio-spatial heterogeneity analysis estimated the shortest mean travel time to a commons by socio-demographic factor.

SPATIAL HETEROGENEITY OF MATERIAL ACCESS TO URBAN COMMONS

Neighborhoods’ demarcations are arbitrary administrative boundaries, which take shape for several historical and political reasons. As a result, their shapes and sizes are often irregular. Consequently, the time it takes to go from one neighborhood to another point in a city can vary drastically depending on the size of the neighborhood that one is analyzing and the location of the trip’s starting point within the neighborhood. Furthermore, when comparing irregular and arbitrary spatial units (neighborhoods, in this case), several problems arise, as analyses’ results are susceptible to bias as a reconfiguration of the neighborhoods, for example, could significantly change the results.

To mitigate that problem, known in literature as the Modifiable Areal Unit Problem (Openshaw, 1981; Wong, 2004) and ensure consistency, instead of assessing each neighborhood’s accessibility to Urban Commons, Amsterdam was split into smaller hexagonal spatial units of the same area. Analyzing a hexagonal grid also reduces sampling bias and improves the efficiency of the operations deployed to calculate the travel times (Birch et al., 2007).

The operation was conducted in Python using a hierarchical geospatial indexing algorithm developed by Uber called H3 (Uber Engineering, 2022). The algorithm’s input is a geodata frame with existing zones (in this study’s case, Amsterdam and its neighborhoods), and the only parameter is the resulting hexagons’ area size. To strike a balance between statistical significance and computational cost, a resolution level of 9 was chosen because that corresponds to hexagonal cells with an area of 0.1053325 km^2 - just smaller than Amsterdam’s smallest neighborhood, Tuindorp Buiksloot, whose surface area covers 0.17 km^2 . This operation resulted in a grid with 2241 cells, which can still be aggregated to their neighborhoods.

After which, each hexagonal cell’s centroid was calculated using H3’s built-in function to generate an origin point for the travel time calculations. Finally, the accessibility of each centroid to an Urban Commons was calculated as the minimum time it takes to travel from the centroid c to any Urban Commons by walking, cycling, and public transport. This approach, mathematically described in Equation 2, is based on graph theory and spatial separation. Despite being a generalized accessibility method, it is fitting to the case study as there is no information on the attraction level or land use of Urban Commons (Bhat et al., 2000). Furthermore, because Urban Commons tend to be local initiatives, the measure was calculated as the shortest time to reach any initiative instead of considering accessibility as a centroid’s average travel time to all Urban Commons. This indicator can, therefore, be understood as a proxy for how easy it is for people living in the centroid c to reach a commoning initiative.

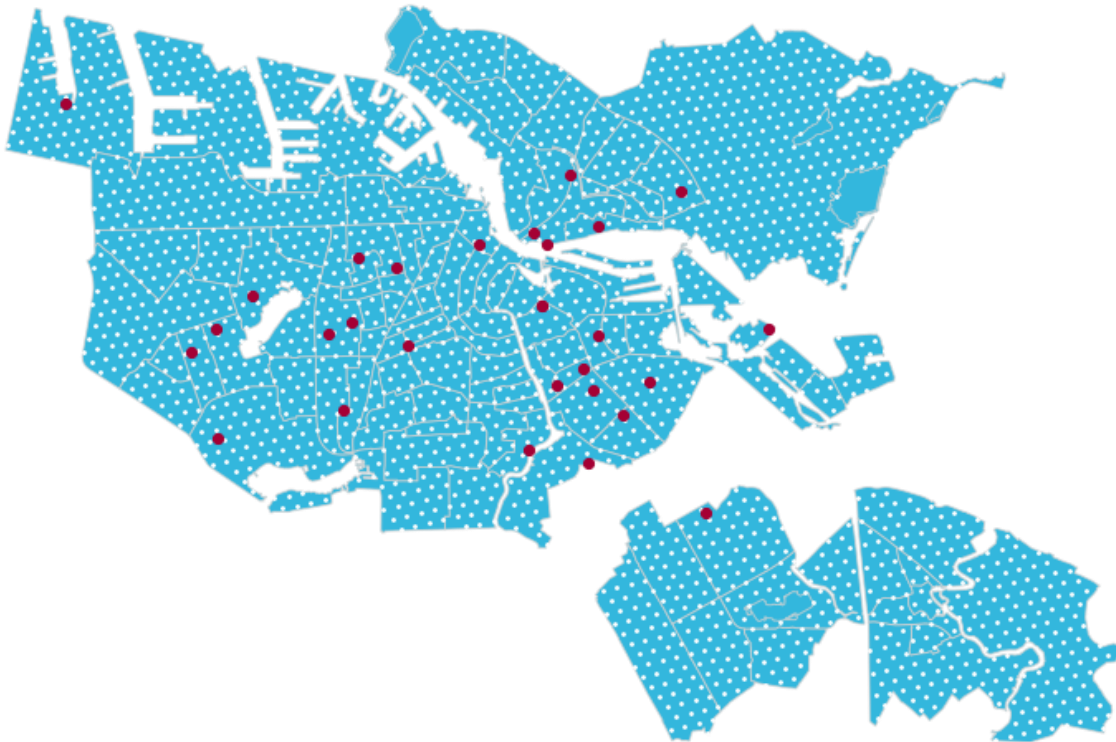
$$\begin{aligned}
A_{c,m} &= t_{cu,m} \mid t_{cu,m} \in T_{c,m} \wedge t_{cu,m} \leq y, \forall y \in T_{c,m} \\
&= \min_{t_{cu,m} \in T_{c,m}} (t_{cu,m}) \mid c \in C \text{ and } u \in U \text{ and } m \in M
\end{aligned} \tag{2}$$

Where:

- $A_{c,m}$: Accessibility of centroid c to Urban Commons using mode of transport m , which is also extrapolated to represent the accessibility of the hexagon cell it is in.
- M : Set $M = \{m: m \text{ is a mode of transport}\}$ containing the four studied m modes of transport, namely walking, cycling, public transport (which is called “transit” interchangeably in this work) and driving.
- U : Set $U = \{u: u \text{ is an Urban Commons}\}$ containing the 29 u Urban Commons analyzed in this case study.
- C : Set $C = \{c: c \text{ is a centroid of a hexagon cell in Amsterdam}\}$ containing the hexagons of equal
- $t_{cu,m}$: Estimated travel time from centroid c to Urban Commons u using mode of transport m .
- $T_{c,m}$: Set $T_{c,m} = \{t_{cu,m} \mid \forall u \in U\}$ containing the travel times using mode of transport m from centroid c to each Urban Commons u .

The travel time $t_{cu,m}$ was calculated using Google Map’s Distance Matrix API (Google, 2022) for Python. Providing the coordinates of all 2241 centroids and 29 Urban Commons as inputs (represented in Figure 6), the API ran Google Map’s algorithm to find the shortest pair-wise route on a specified mode of transport from each centroid to each Urban Commons

Figure 6 | In the material accessibility analysis, the centroids of each cell, in white, were considered origin points, while Urban Commons, in red, were the destination locations.



As Wang and Xu (2011) found, the Distance Matrix API yields similar travel time estimates to other methods while offering advantages such as using more updated road and network data, consideration for road congestion, and peak hours. For this study, however, the algorithm was set to find the fastest routes based on road network only, disregarding traffic conditions. This choice is justified because the visiting pattern to Urban Commons is unknown (unlike when assessing the accessibility to schools or jobs, for example, when it is possible to estimate when most trips take place during the day). The analysis yielded 64,989 shortest-time trips per mode of transport. Finally, Equation 2 was operationalized by finding the fastest mode of transport and the associated time, and then finding the fastest-to-reach Urban Commons u for each centroid c .

The accessibility of a hexagonal cell was considered the same as that of its centroid. The results were then plotted on a map and visually inspected to identify regions in Amsterdam with better or poorer access to a commoning initiative.

SOCIO-SPATIAL HETEROGENEITY OF MATERIAL ACCESS

This section describes the methods used to estimate the accessibility to case study commons by socio-demographic group. It was, a priori, not possible to compare social and spatial information because of data level incompatibility. While the spatial heterogeneity analysis was calculated by centroid to provide more nuance, the highest level of granularity of census data available is information by neighborhood. To address this issue, the population was assumed to be evenly and homogeneously distributed within a neighborhood's area.

The average accessibility for each socio-demographic group g was estimated as the weighted mean of the group's population in a hexagon cell and that cell's accessibility score, as described algebraically in Equation 3.

$$A_{g,m} = \frac{\sum_{c \in C} (A_{c,m} \times p_{c,g})}{\sum_c p_c} \mid \forall g \in G \quad (3)$$

Where:

- $A_{g,m}$: Weighted mean accessibility of socio-demographic group g using mode of transport m .
- $p_{c,g}$: Population belonging to socio-demographic group g living in the hexagonal cell with centroid c .
- p_c : Total population living in the hexagonal cell with centroid c .
- G : Set $G = \{g: g \text{ is a socio - demographic group}\}$ containing the socio-demographic groups g obtained from census data, which can also fall under the broader d categories. The g groups are namely: Male, Female, Younger than 17 years old, 18 to 24 years old, 25 to 49 years old, 50 to 64 years old, Older than 65 years old, Non-Western migration background, Western-migration background, Native Dutch.

Moreover, an analysis of the variance (one-way ANOVA statistical test) was performed with a confidence interval of 95% ($\alpha=0.5$) to explore how much of the total variance can be attributed to each socio-demographic category. The test essentially compares the variance of a variable (in this case, the weighted mean accessibility to Urban Commons A_d) within a group g with that across the groups through the F -score, which is the ratio of the mean sum of squares between groups over the mean sum of squares within groups. The statistical significance is given by the P -value: if a group's $P < \alpha$, then there are statistically significant differences among the groups. Equations to calculate the F -score and the P -value can be found in Anderson's (2001) work.

Additionally, a populational analysis was conducted to estimate how material accessibility is distributed across the population of different socio-demographic groups. Firstly, each hexagonal cell was categorized according to its accessibility as *a*) less than 5 minutes, *b*) 5 to 10 minutes, *c*) 10 to 15 minutes, *d*) 15 to 20 minutes, *e*) 20 to 25 minutes, *f*) 25 to 30 minutes, and *g*) more than 30 minutes. Then, to capture the distribution of material access across different ethnic backgrounds, the same analysis was conducted for each ethnicity-background variable *e*, as shown in Equation 4.

$$P_{e,a} = \sum_{c \in C} p_{c,e,a} \mid a \in A \text{ and } e \in E \subseteq G \quad (4)$$

Where:

- $P_{e,a}$: Total population in Amsterdam of people of ethnicity *e* living in a hexagon cell from whose centroid *c* it is possible to reach an Urban Commons within a timeframe *a*.
- *A*: Set $A = \{a: a \text{ is an accessibility category}\}$ containing the seven *a* accessibility categories based on travel time, going from “less than five minutes” to “more than 30 minutes” to reach an Urban Commons, at five minutes increments.
- *E*: Set $E = \{e: e \text{ is an ethnicity group}\}$ containing the three ethnicity groups *e*, namely “native Dutch”, “Non-Western migration background”, and “Western migration background”.
- $p_{c,e,a}$: Population of ethnicity *e* living in the hexagonal cell of centroid *c* belonging to the accessibility category *a*.

The methods employed so far are centered around exploring the difference in access to commoning initiatives from a broad city-wide perspective. So finally, the population of each hexagon cell was broken down by socio-demographic group, summed, and categorized according to the Urban Commons with the fastest access from its centroid. This metric can also be interpreted as the *catchment population* of an initiative *u* in the case study, i.e., the population number of people of socio-demographic group *g* for whom an Urban Commons *u* is the easiest (i.e., fastest) commoning initiative to reach from where they live.

2.2.3 IMMATERIAL STREAM

The immaterial access stream of this research aims to answer SQ3 and SQ4. To answer both questions, an exploratory digital survey was designed to be shared with members or participants of the Urban Commons initiatives listed in the case study. This method was chosen because it allowed for a systematic approach encompassing several initiatives in Amsterdam, which could then be compared to the results from the Material Access Stream. Additionally, on-the-ground observations from field visits to the initiatives were used as input for the qualitative analysis of the results. The following sections describe the survey design and distribution approach.

2.2.3.1 Survey Design

The survey was created using Qualtrics (2020), and the responses were stored in the platform. Because the survey involves sensitive socio-demographic factors, it was designed to be fully anonymous and comply with the European General Data Protection Regulation (2016). Moreover, a data management plan (DMP) was developed, and TU Delft’s checklist for human research (HREC) was completed for the research to be approved by the University’s ethics committee and privacy team. The DMP, HREC, and informed consent text can be found in Appendix 7.3.

The survey was comprised of 18 bilingual questions available in English and Dutch, formulated with familiar terms to respondents to facilitate comprehension (Taylor et al., 2015). The survey

was designed and analyzed based on principles of community narrative and ethnography (Harper et al., 2005; Olson et al., 2016), aiming to elicit commoners' perspectives on immaterial access to and benefits of commoning and the heterogeneity of answers depending on respondents' socio-demographics. The survey questions were split into three sections (see Appendix 7.3.5 for the complete list of questions)

SURVEY SECTION 1: YOU AND YOUR URBAN COMMONS

Section 1 of the survey positions the respondent's socio-demographic profile according to the variables g taken from the census and the respondent's native language and neighborhood of residence. Furthermore, it also captures the Urban Commons the respondent participates in, and the participation profile.

SURVEY SECTION 2: YOUR URBAN COMMONS AND THE IMPACT ON YOUR LIFE

The second section of the survey is dedicated to capturing the impact participating in the initiative has had on the respondent's life. Respondents were asked how much they agree that participating in the Urban Commons has made them feel more included. They were also asked to rate the benefits of their participation quantitatively on a scale from 0 (no value) to 10 (very high value). This indicator was represented with the letter B . Additionally, Davies's (2003) Most Significant Change (MSC) technique was deployed in an open-ended question to capture narratives and extract meaning.

SURVEY SECTION 3: ACCESS BARRIERS

Section 3 covers the immaterial aspect of accessibility to Urban Commons. First, respondents are asked in open-ended questions what factors make them wish to continue participating in the initiative and which would make them stop. These questions were devised to capture the respondent's unprimed reaction to what constitutes immaterial drivers and barriers of participation (and thus access) to the initiative. In addition to the open-ended questions, respondents were also asked whether they feel welcome in the initiative for belonging to a particular socio-demographic group g (from those studied in Section 4) shared by the majority of other initiative members. Finally, respondents were asked how often they feel discouraged to participate in the initiative because of their socio-demographic status and other variables, such as gender, age, ethnicity, income, native language, political inclination, and worldview.

2.2.3.2 Survey Distribution

In order to distribute the survey to participants of initiatives listed in the DeMeent platform, initial contact was made, in Dutch, with every initiative and DeMeent itself via email, asking for them to share the link to the survey with their members. The authors also attempted to reach commoners directly by posting an invitation to participate in the survey in each initiative's Facebook pages and groups, when available.

Moreover, to mitigate the typical low response rate from digital surveys (Stern et al., 2014), the author visited each initiative and attempted to talk to a manager or participant to introduce the present study and distribute customized flyers with a QR code to the survey link. Some initiatives, such as Foodcoop Noord, Het Koffiehuis, VOKOMOKUM, Taste Before You Waste, and NieuwLand were highly receptive, not only promising to share the survey with other participants, but also offering very insightful conversations about the history of the initiative and the commons in Amsterdam.

Nonetheless, the general tone of comments in the online posts about the survey was negative and skeptical of academic research on the commons. Furthermore, it was not possible to reach other initiatives directly either because no one was found on site, or because the person met refused to talk or share the survey. In total, there were 64 responses, 49 of which were complete.

2.2.3.3 Data Analysis

The open-ended responses were translated into English using DeepL (n.d.) and analyzed qualitatively through organic Thematic Analysis (Clarke & Braun, 2017). Statistical techniques were also deployed to complement the analysis of open-ended questions through keyword frequency via word clouds (Heimerl et al., 2014). Socio-demographic and Urban Commons initiative heterogeneity, as well as data collected from scoring and multiple-choice questions, were explored following principles of Exploratory Data Analysis (Tukey, 1977).

2.2.4 POLICY CONFLUENCE

In order to answer SQ5, expert knowledge from policy-makers working with Urban Commons in Amsterdam was required. Therefore, the semi-structured interview method was chosen because it is suited to extract perceptions, attitudes, and background information from an interviewee and their domain of expertise (RAND, 2009), in addition to allowing for clarifications and detailed understanding of complex phenomena (Denzin, 2017).

An expert from Amsterdam's Municipality, who specializes in social and governance innovation policies through the commons, participated in the interview. The contact of the person interviewed was suggested after asking commoners during field visits to the case study initiatives for points of contact in the Municipality of Amsterdam. Although time constraints limited the search for further stakeholders to be included in the sample, the interviewee's knowledge and experience fit with the needs of this work - someone working at the Municipality of Amsterdam on policies leveraging the commons).

After obtaining a written consent form, an audio-recorded interview was conducted via Zoom, lasted circa 40 minutes, and was pilot-tested internally. The interview was approached using Kallio et al.'s framework (2016). Drawing from the literature review, the field observations, five questions were crafted as a loose guideline for the interview and shared beforehand with the interviewee:

- What is the Municipality's relationship with the commons in Amsterdam?
- How could or do commons help the Municipality of Amsterdam achieve its goals?
- (How) Do you think commons can promote inclusion and bring benefits to the most vulnerable population?
- What are some success stories and lessons learned from the perspective of the Municipality of Amsterdam concerning commons in Amsterdam?
- What are some opportunities and barriers to designing policies involving the commons or leveraging them to help the Municipality of Amsterdam?

In addition to the guiding questions, follow-up questions were made, and the insights from the field observations and Material Access and Immaterial Access Streams were brought up during the interview to provide more context to the interviewee. This permitted for immediate reflexive iteration (Anselin et al., 2006) and allowed the interviewee to validate the results from the perspective of a policy practitioner involved in multiple commons projects across Amsterdam.

The data obtained from the interview was analyzed qualitatively using the principles of thematic analysis (Braun & Clarke, 2006). Adopting an organic thematic analysis approach (Clarke &

Braun, 2017), overarching themes were identified (Aronson, 1995) and topics organized into a Strengths, Weaknesses, Opportunities, and Threats (SWOT) matrix (Gürl, 2017) concerning the role of commons as partners and a viable governance model for urban planners. Because of the interactive and semi-structured character of the interview, content was prioritized rather than frequency.



OLYMPIESTAD
SCHEVENINGEN
O.S.F.

AMSTER
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NIETTE
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WAAR IS ONZE

NieuwLand

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CS20 Hamburg

WELCOME TO HELL

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3 MAX

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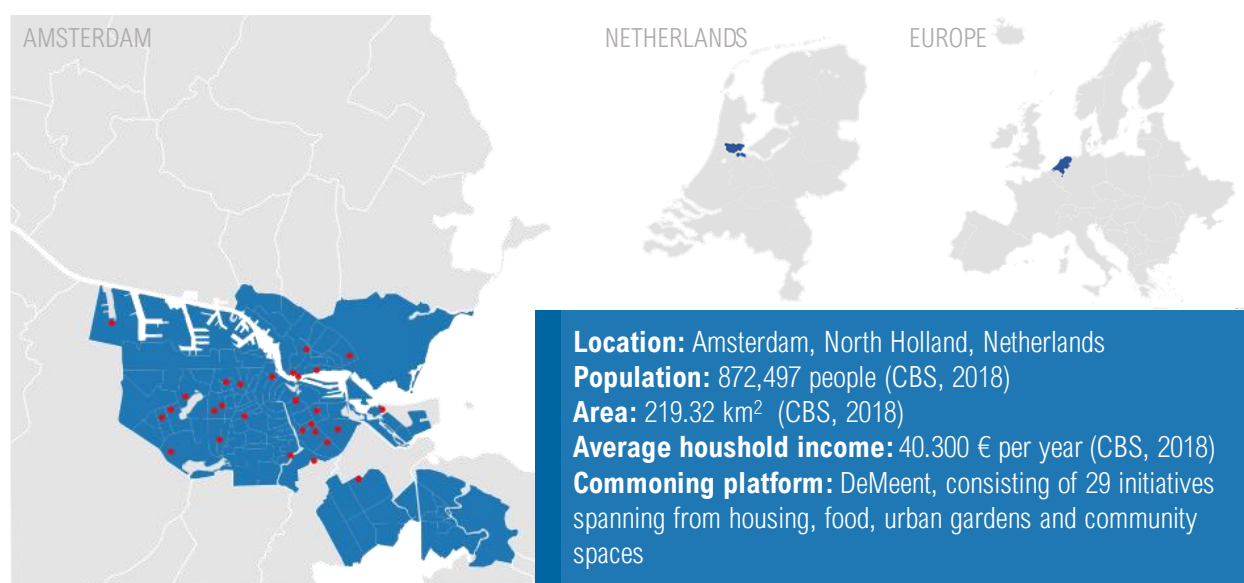
Case Study

The research was embedded in a case study in Amsterdam, focusing on the De Meent platform for Urban Commons. This section contextualizes Amsterdam's relation to commons and introduces De Meent and the initiatives analyzed in the study.

De Meent, an Amsterdam-based collective platform to connect the Urban Commons of Amsterdam, was selected as this thesis's objective of study. This section justifies such a choice and briefly introduces DeMeent and the urban context it is inserted into. Figure 7 positions DeMeent geographically and provides an overview of Amsterdam.

Amsterdam is of particular interest when studying the relationship between accessibility, social inclusion, and the Urban Commons due to its rich history of Commons initiatives and its renown for being a just city. In *An in memoriam for the just city of Amsterdam*, Uirtermark (2010) shows that between the 1960s and the 1990s, key authors in the field of urban justice, including Henri Lefebvre, Susan Fainstein, Ed Soja, and John Gilderbloom, have portrayed Amsterdam as the just city by definition. Fainstein, author of *The Just City*, writes that Amsterdam “offers the best available model of a relatively egalitarian, diverse, democratic city, with a strong commitment to environmental preservation” (1999, p. 19).

Figure 7 | Case Study: DeMeent platform for and by Urban Commons, in Amsterdam



According to Uirtermark (2010), Amsterdam's reputation grew out of a combination of strong government involvement in urban planning, the development of national policies, and the spread of urban movements ideologically seeking inclusion. Case in point, Pruijt (2020) shows that in the late 1970s and early 1980s, there were hundreds of squats (now considered a form of Urban Commons) in Amsterdam, which developed an organized movement of city-level communing seeking to participate in urban development planning. Uirtermark (2004) argues that these grassroots movements reverberated and created consensus around a vision of the city, leading to the legalization of those squats and ultimately prompting the government to invest in social housing, strengthening tenants' rights, and finance tenants' organizations.

Novy & Mayer (2010) contend, however, that idealizing Amsterdam as the desirable model for a just and progressive city could distract policymakers from recognizing the growing inequalities and injustices happening in the Amstel metropolis. In that sense, Dadusc (2019) argues that political and policy changes in the 1990s led by the neo-liberalization of the economy shifted the urban paradigm significantly in favor of projects with high returns on investment. In the same work, he maintains that the privatization of the housing market, the dispossession of local communities, the revitalization and gentrification of central areas for investment purposes, the growing population, and the formation of new neighborhoods at the city's edge, led to an intense restructuring of the socio-spatial characteristics of Amsterdam. As Van Gent (2013a) finds, the

urban space went from a resource serving social needs to a resource serving as investment opportunities.

Notwithstanding, in her thesis, Kazimowicz (2020) argues that Amsterdam is trying to shift back to focus on justice and equity. They find that policymakers are becoming aware of past flaws and are working on promoting justice, inclusion, and equity in a neoliberal context. This is reflected in Amsterdam's response to the *Omgevingswet* (van Veldhoven, 2019), a new Dutch law (to be enforced in 2022) that aims to simplify and improve legislation regarding the development and management of the living environment. Taking advantage of the opportunity, the Dutch capital developed its *Omgevingsvisie Amsterdam 2050: een menselijke metropool* (2021) ("Living Environment Amsterdam 2050: a people's metropolis", in a free translation), a document that functions as a strategic and binding commitment in terms of planning the urban development of the city for the coming decades. It is centered around five strategic pillars (author's free translations): pluricentric development, growth within city limits, sustainably and healthy mobility, rigorous greening, and participation.

The Urban Commons are a vital part of Amsterdam's strategy to reach its *Omgevingsvisie* (2021, p. 41), particularly under the *participation* pillar (2021, p. 243). In fact, the cooperation between the municipality and collectives, cooperatives, and commons is listed as a short-term action item (2021, p. 257). Additionally, it gives citizens and entrepreneurs the space to determine what happens in their environment and supports municipal decision-makers via alternative forms of urban and housing developments, such as Commons. The question of how the Urban Commons and the Municipality of Amsterdam can cooperate in a *Co-City* has also sparked discussions among academics, as in the Hogeschool van Amsterdam (2020), and Urban Commons organizations, as shown in a report by the Commons Network (2020).

One such Urban Commons organization is the object of this thesis's case study: DeMeent, a collective platform "for and by the Commons" to connect the Urban Commons in Amsterdam, as well as to represent the interests of the Commons movement with meetings, campaigns, expertise, and lobbying (de Meent, 2019b). One of the quintessential tenets of De Meent is to literally "put the Commons" on the map: By visualizing the initiatives together, we can lift them above the individual value of one initiative and put the commons on the map of politics and society (de Meent, 2019a).

It is, therefore, a fitting case for this thesis, as it represents a collection of Urban Commons in Amsterdam, categorized by type, and plotted on a map. De Meent currently counts with 26 member Urban Commons. The individual Urban Commons themselves enlist in De Meent, provided they comply with the following requirements, taken from the platform's website (2019a):

- There is some community.
- There is a shared resource such as a piece of land, solar panels, or knowledge.
- There are clear agreements about how and by whom the resource is used.
- Those agreements are made in common.
- The group itself arranges (part of) the management and maintenance of the resource.

It becomes clear that the requirements to join De Meent match the definition and criteria for the Urban Commons to be analyzed in this study. Each Urban Commons listed under De Meent represents an institution relevant in an urban context with a community of members who commonly agree on the management process of said resource. Moreover, the location where the Commons' members reap the initiatives' benefits can be plotted on a map as a single point in space. The following section describes the initiatives analyzed in this research.

3.1 Studied Urban Commons

In addition to the original 26 members of De Meent, an additional six *buurtcamping* initiatives were added because only one of seven such initiatives were included in the platform - totalizing 32 Urban Commons to be analyzed. Of the 32 Commons analyzed, 29 initiatives met the criteria and were included in the case study. An overview of initiatives considered in the case study broken down by type can be found in tabular form in Appendix 7.1.1. Supported by online materials and field observations, the initiatives were also categorized by the author according to Feinberg et al.'s (2021) revisiting of Hess's (2008) type and sub-type of New Commons, as described in the following sections.

3.1.1 NEIGHBORHOOD COMMONS

According to Hess (2008, p. 16), "*Neighborhood commons incorporate both urban and rural commons where people living in close proximity come together to strengthen, manage, preserve, or protect a local resource. This sector is closely related to cultural commons.*". They comprise 26 of the 19 initiatives in the case study and can be further categorized, according to Feinberg et al. (2021) and Hess (2008), into Community Gardens, Homeless Habitats, Housing Initiatives, and Parks & Greenery. Furthermore, the author proposed an additional sub-type of Neighborhood commons, Community Spaces initiatives, to more fittingly encapsulate the Ru Paré initiative.

3.1.1.1 Community Garden Initiatives

While some such initiatives may also function as public spaces or even sell their produce, the key characteristic of Community Gardens is the coming together of people to maintain a commonly used garden. Six initiatives in the case study were classified as Community Gardens: Buurttuinen Transvaal, de Kaskantine, I can change the World with my two Hands, Moestuinvereniging, Stadsboerderij, and Voedseltuin IJplein.

Buurttuinen Transvaal (2022) is a community garden that opened in 2011 and self-declares as a food and public space initiative. Much like other urban gardening initiatives, it receives a subsidy from the national government to maintain a vegetable garden in the Afrikanerplein. In addition to a public vegetable garden for educational purposes, locals can become a member and receive a piece of land to start a garden for 10 euros a year (though the garden has been at full capacity since its inception, and new members are put on a waiting list).

De Kaskantine (2022) is an off-grid green area that runs a food surplus-based restaurant, a *voedselkringloop* (a food surplus market), and organizes talks on philosophy and climate change. It is an off-grid community that started as a single restaurant using self-produced produce. It now consists of several initiatives around sustainable urban farming, reducing food waste, and sustainable catering. Members work with gardening and composting; the generated produce is used in local restaurants and cafés.

I can change the World with my two Hands (2022) is a commons that manages a garden in the Landlust neighborhood and explores questions of sustainability, collaboration, and alternative economy. Local volunteers run it, and a small café is organized on Saturdays in the Summer. Members can grow their own vegetable garden in the space and use the communal compost.

The Moestuinvereniging Proefeiland (2022), in IJburg, is taken care of by about 30 gardeners. For a few years now, the garden has received municipal funds to allow the residents to enter the garden and pick up fruits and vegetables.

Stadsboerderij Osdorp (2022) is a large community garden kept by volunteers with a restaurant and a food cooperative that sells local groceries. It is not only a place for locals to meet and do gardening, but the initiative also offers trainings on healthy eating, sustainability, and urban gardening, among others. Compared to this case study's other urban gardens, which rent out gardening spaces to members, Stadsboerderij Osdorp is unique because it consists of an urban garden and small farm open for free to the public every day that also offers gardening classes.

Finally, Voedseltuin IJplein (2022), located in the Noord district. Members, who are volunteers, help maintain the garden and get a share of the production. Most of the production is sold in another initiative called Resto van Harte. Locals can also visit the garden, and there is a playground for young children.

3.1.1.2 Parks & Greenery Initiatives

In addition to Community Gardens, Parks & Greenery initiatives represent another type of Neighborhood Commons related to vegetation. Unlike the former, however, the resource managed refers to trees, parks, and other urban foliage. There are nine such Commons in the case study, seven of which are social camping initiatives, called *Buurtcamping*.

These are free camping organized by volunteers, mainly local to the neighborhood. They typically last three days and two nights a year at a local park to strengthen local ties and create a sense of belonging. Includes workshops and activities. The initiatives in the study are: Buurtcamping Frankendael (2022a), Buurtcamping Betondorp (2022a), Buurtcamping Park Egeldonk (2022d), Buurtcamping Martin Luther Kingpark (2022b), Buurtcamping Noorderpark (2022c), Buurtcamping Sloterpark (2022f), and Buurtcamping Rembrandtpark (2022e). The other two initiatives are the Buurthaven and the Lucas Community.

Buurthaven (2022) comprises a terrain by the Willemsluis in IJplein/Vogelbuurt, which was recently awarded a new environmental permit through 2026. It is maintained and managed by local volunteers, which also host socio-cultural events and workshops in the area. In addition, the organizers are collaborating with the Municipality of Amsterdam for a temporary space redevelopment.

Lastly, Lucas Community (2020) is a community organization founded in Osdorp-Oost to maintain the urban greenery in the neighborhood, offering residents the opportunity to develop their sustainable entrepreneurship. During field visits, the author learned that the initiative started from a demand from residents to solve a rat infestation in the neighborhood. The initiative shifted the focus to taking better care of the local greenery after assessing that was the best solution to the original problem.

3.1.1.3 Homeless Habitat Initiatives

Homeless Habitat commons were understood as those neighborhood initiatives managed to support people in a homeless situation. A single initiative, Stichting Het Koffiehuis (2022), fell under that umbrella. It entails a non-for-profit café where homeless and other vulnerable people can be welcomed and offered the opportunity to do voluntary work in exchange for food, clothing, and shelter. The organization lies on the Haarlemmerstraat, a high-end shopping area (NL Streets, 2014). Its services are hired by multiple clients, such as Amsterdam's municipality, which

then employs homeless volunteers to do local maintenance and improvements, such as pruning trees, watering public gardens and flowers, or cleaning the street.

3.1.1.4 Housing Initiatives

Urban Commons directly or indirectly related to the living arrangement of its members were classified as Housing Commons. However, following the New Commons framework, they can be broken down further into Apartment Communities and Homeowners Associations.

APARTMENT COMMUNITIES

The critical characteristic of Apartment Community commons is that they serve as residence for (part) of their members. They are often comprised of legalized former squats that occupied vacant buildings. During field visits, the author noted that Apartment Communities seemed to be the most political type of initiative, often promoting social action, organizing events, and creating a network of similarly minded organizations. There were eight initiatives in the case study fitting that description: Bajesdorp, De Groene Gemeenschap, De Nieuwe Meent, De Kerk, Joe's Garage, NieuwLand, OT301, and Ruigoord.

Located in the former penitentiary complex Bijlmerbajes, Bajesdorp (2022) consists of a small village containing about 20 houses. As the prison was slowly deactivated in the 1980s and 1990s (Geheugen van Oost, 2018), guard houses became vacant. In 2003, four of the 19 houses were squatted after being empty for two years, which formed the basis of what is now a village with 20 houses, shops, cultural centers, and gardens (Bajesdorp, 2022b). The village is open to all but aims to offer a temporary residence for artists and entrepreneurs new to Amsterdam. Currently, some of the houses are being demolished to develop a new high-end neighborhood called Bajeskwartier (Gemeente Amsterdam, 2021a). As a response, the residents are now developing a new project, VrijKoop, to be a free space for artists and residents. It involves buying the former villa of the prison's director, which is to be financed by selling bonds to the public. It is worth noting that during a field visit, the author was struck by the contrast between the small community of houses and the massive construction site surrounding it where – literally – a new neighborhood is being built.

Near the Windkammerdijk, at the Barkasstraat, lies another housing cooperative: De Groene Gemeenschap (2022). Residents are chosen based on their engagement with the neighborhood's community, sustainability, and solidarity. De Groene Gemeenschap is home to six residents who rent the building from Woningstichting Rochdale (de Groene Gemeenschap, 2022). In addition to offering an alternative form of housing, the initiative also opens the building's communal area to the public through activities such as crochet classes, Arabic lessons, and math tutoring for children. Institutionally, De Groene Gemeenschap is co-financing another housing commons: De Nieuwe Meent.

De Nieuwe Meent (2022) is a housing cooperative based on the principles of commoning, which was idealized by one of the original squatters of yet another commons in the case study: NieuwLand. Having won a municipal call via the municipality's Action Plan Wooncooperatie, which aims to generate 7000 such living spaces in five years (Gemeente Amsterdam, 2020b), De Nieuwe Meent's building is still under construction and is planned to be delivered in 2023. While a loan and social subsidies cover 88% of the project's cost, the cooperative members are paying 3% of the costs, while the rest is being raised via crowdfunding (de Nieuwe Meent, 2020). While this means that the community members are also owners of the building, it also implies that only those who can afford the charges can effectively buy their share of the building.

De Kerk (Stichting Bildung, 2022) was a housing commons and socio-cultural space in Waterlandpleinbuurt but is looking for a new place to operate. It was managed by Stichting Bildung through a housing corporation. The contract expired in 2020 before the pandemic, and the commons' original location will be redeveloped privately. The initiative aims to offer an accessible cultural program to the local neighborhood. In addition to offering open space and cultural events for the local community, De Kerk offered affordable housing to its members, who in turn had to engage with the community and help organize local open events.

Located in the Transvaal neighborhood, Joe's Garage (2022) is a "squatted political social center" with a deep-seated political vein that aims to provide a platform to support social, environmental, spatial, and economic justice. It is a collective where members from diverse backgrounds live and run a vegan kitchen. In addition, the resident members and volunteers organize cultural events and run a vegan kitchen. Joe's Garage is also acutely aware of the principles of the commons and openly enforces them in the management of the community. Perhaps due to its highly political characteristic, Joe's Garage was one of the initiatives where the author perceived the most distrust regarding academia and research about the commons during a field visit.

NieuwLand (2022) is a community project combining a living collective, workplaces, and a social-political neighborhood center. Located in a neighborhood with strong social ties and engagement since at least the 1970s (Huijbers, 2013), NieuwLand is a community located in an original building from the late 19th Century where a primary school used to operate. After a period left abandoned, the building was acquired in 2015 by SOWETO, a social housing activist organization rooted in Amsterdam's squatting movement. SOWETO is a housing association based on the German *Miethäuser Syndikat*, whereby the organization buys buildings and allows the residents to self-manage them. Moreover, the residents become part of SOWETO, meaning they effectively co-own the building (SOWETO, 2022). NieuwLand currently has 11 housing tenants and five workspaces, whose rents are used to repay the loan taken to purchase the building. There is also a communal public area where volunteers and neighbors organize public events.

OT301 (2022) is a space managed by a collective that combines housing, workspaces, and public spaces to contribute to the arts, politics, and subculture. With a clear political and ideological element, OT301 is an initiative seeking to contribute to the fields of art, politics, and subculture by offering public events, workspaces, and housing. Its residents run it through a self-managing association called EHBK (Eerste Hulp Bij Kunst or "First Aid in Case of Art"). It was formed in the 1990s with the objective of breaking into a socially relevant building in the city center and establishing a permanent breeding ground for subculture and autonomy as a form of political activism against the government's crackdown on squatting in the 1990s (Jansen, 2013). In 1999, EHBK broke into the building of the former Film Academy after it had been vacant for only three months. Due to the extensive political and media support, the society bought the building from the municipality in 2006. In that same year, OT301 was awarded the Amsterdam Prize from the *Amsterdamse Fonds voor de Kunst* (Amsterdam Art Fund) for their contributions to the arts in the city. Today, in addition to a housing community, OT301 maintains public spaces, offers workshops and art galleries, and hosts artists in residence. Unlike most initiatives in the case study, OT301 is not a Commons that emerged organically in its location. Instead, it is a political and ideological initiative with a city-wide impact that chose its location purposefully.

Finally, in Westpoort, there is another multi-building Commons, Ruigoord (2022). It consists of a self-denominated cultural haven located in a large area to the westernmost part of Amsterdam's port. It used to be a small village set to be demolished for the expansion of the port in the 1970s. However, due to the inhabitants' resistance, the village has become a fully legalized squatting zone. The social organization of the entire village (now a neighborhood) follows the commoning

principles, where an overarching local organization officially rents the land from the harbor and manages all buildings and ateliers inside it through a series of committees. Regarding the New Commons classification, one could even argue Ruigoord (and Bajesdorp) could be considered a “villages and social organization” type of commons, a category defined initially by Hess (2008) but whose examples were not in the corpus studied by Feinberg et al. (2021). Nevertheless, both are considered Apartment Community commons in this work to facilitate quantitative analysis and explicitly highlight that it exists in an urban context.

HOMEOWNER ASSOCIATIONS

In the Bos en Lommer neighborhood in Amsterdam West, locals organized a residents’ association that acts as a connecting, informing, and decision-making platform: BoLoBoost (2018). It boasts roughly 50 members and works toward improving the quality of life in the neighborhood, supporting local initiatives, and organizing socio-cultural events. It is the only initiative in the case study that falls under the Homeowner Association commons.

3.1.1.5 Community Space Initiatives

There is, finally, one initiative in the case study classified as a Neighborhood Commons: Ru Paré (2022), a building run by an organization called *SamenWonen-SamenLeven*, which follows Commons principles. It runs the former building of a school that consistently ranked as the single worst school in the Netherlands according to Cito scores. The building was renovated and designed to be the hub of the neighborhood, offering community-aiding and public services, leading it even to be awarded the *Amsterdam Architectuur Prijs* (Minkjan, 2018).

The multi-purpose nature of Ru Paré posed a problem when attempting to categorize the initiative in terms of the New Commons. While it performs similar functions to a Nonprofit Organization, Ru Paré is a physical space intimately related to its neighborhood, unlike New Commons of the Cultural type where Nonprofit Organization commons fall under, according to Hess (2008). Indeed, Hess’s (2008, p. 16) definition of a neighborhood commons fits like a glove in Ru Paré’s case: a local community that comes together to preserve and protect the building of a former school. The caveat is that the building is now managed as a community center, hosting other local initiatives and local events. Therefore, none of the sub-types of New Commons listed in Feinberg et al. (2021) and Hess (2008) (homeless habitats, housing commons, community gardens, parks & greenery, security commons, sidewalks, streets, and silence/noise) are appropriate to describe it. Therefore, by analogy to Community Gardens, the author proposes a new sub-type of neighborhood commons that would fit Ru Paré’s characteristics: Community Spaces.

3.1.2 MARKET COMMONS

Hess (2008) identified markets as a potential source of commons, categorized as locally or peer-produced goods that are sold, exchanged or gifted (Feinberg et al., 2021). Among the case study initiatives, two were classified as market commons because they facilitate transactions between members without producing the goods in the market.

3.1.2.1 Exchange Commons

Both market commons in the case study, namely FoodCoop Noord and VOKOMOKUM, fall under the Exchange Commons category. They are organizations that connect local producers of organic produce to consumers, offering its members organic fruits and vegetables at an affordable price. Note that unlike some Community Gardens, such as de Kaskantine and Voedseltuin IJplein, the

initiatives listed under Exchange Commons do not produce the goods sold in the markets – the resource managed as a commons is the market itself. They were classified as exchange commons because members typically have to volunteer a certain number of hours a month in order to be able to buy the produce, therefore effectively exchanging their time and work for the right to access the market.

FoodCoop Noord (2022) lies in Amsterdam Noord, an affordable groceries initiative. Located in Noordelijk IJ, Foodcoop Noord connects local organic farmers to local consumers, offering Amsterdam Noord residents high-quality produce at a more affordable price. Members also must help prepare the orders at least four times a year and help with other tasks. It is part of a larger initiative, De Verbroederij, a not-for-profit association that won an open call to use an empty land and transformed it into a public vegetable garden, opened a café, and started the Foodcoop initiative.

VOKOMOKUM (Food) (2022), on the other hand, is situated in the Plantage neighborhood, a lush green area with boulevards and a lively international cultural offer. Inspired by Park Slope Food Coop's model, VOKOMOKUM members pay an annual fee and must contribute a set number of hours of volunteer work every other month in order to be able to buy any products. It happens in the same squatted building where Taste Before You Waste takes place (although they are managed and run by different people). Both initiatives are the only initiatives in the case study whose working language is English rather than Dutch.

3.1.3 CULTURAL COMMONS

Hess (2008) highlighted that cultural and neighborhood commons are often similar and sometimes challenging to distinguish. In her work, Hess (2008) relates cultural commons to concepts such as the public sphere and the common good. In this study, they are considered as volunteer-run initiatives that do not fit into the market commons or neighborhood commons definition.

3.1.3.1 Non-Profit Organizations

By elimination, only one initiative was classified as a cultural commons of sub-type Non-Profit Organization in the case study: Taste Before You Waste (Food) (2022). It is an organization that defines itself as an “international community of foodies with the mission to reduce consumer food waste” (Taste Before You Waste, 2017). The organization seeks to reduce food waste and raise social justice and sustainability awareness by hosting dinners cooked by volunteer cooks with food surplus collected from local restaurants, grocery stores, and other donation forms. The resource managed, in this case, is the surplus food and produce, as well as the culture and knowledge disseminated around food waste.



Welkom bij Johan
WELKOM BIJ JOHAN
WELKOM BIJ JOHAN

04.

Results and Discussion

This section describes the study's findings and discusses them based on the author's observations on the field and other literature. It is divided into a Material Access Stream, an Immaterial Access Stream, and a Policy Confluence. Additionally, a closing section proposes a new research framework to investigate the accessibility of Urban Commons based on the previous sections' results.

4.1 Material Access Stream

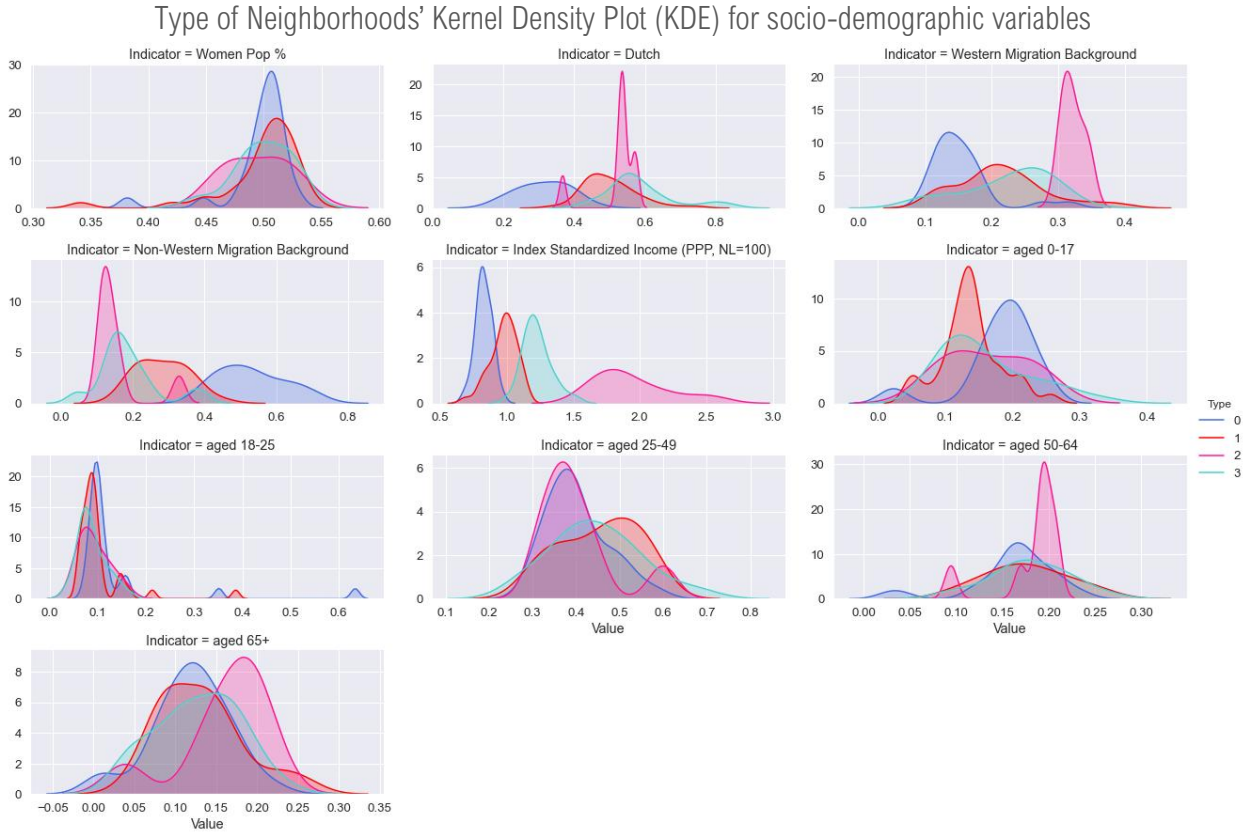
The material access stream of this research aims to explore how the social and spatial aspects of segregation in Amsterdam relate to the location of Urban Commons in the city and how accessible they are. Based on the findings from quantitative methods deployed on publicly available data, section 4.1.1 addresses SQ1, and section 4.1.2 focuses on SQ2. The results support H_{ao} by indicating that material aspects do not seem to constitute a barrier to access to Urban Commons for most of the Amsterdam population.

4.1.1 SPATIAL DISTRIBUTION OF URBAN COMMONS

This section aims to answer SQ1, “how are the locations of Urban Commons related to social and spatial factors in Amsterdam?”. The findings paint a complex yet elucidating picture. While every initiative emerges from a specific context, it is possible to identify some socio-spatial patterns regarding the emergence of Urban Commons. The results from the K-Means classification algorithm indicate that most Urban Commons in the case study are located in neighborhoods with a high population of Non-Western descent where households earn, on average, less than the Dutch average national income.

The algorithm classified Amsterdam neighborhoods into four categories: Type 0, color-coded in blue; Type 1, color-coded in red; Type 2, color-coded in pink; And Type 3, color-coded in cyan. The distribution of values for each variable across the neighborhood types can be seen through Kernel Density Estimates (KDE) in Figure 8 and used to discern key characteristics of each type.

Figure 8 | Type 0 ones stand out the most for their meager income and higher share of ethnically Non-Western population. Type 2, however, have a comparatively much higher household income.



Neighborhoods of Type 0, in blue, are primarily impoverished and Non-Western. They are distinguishable by their significantly low income and high Non-Western migration background population. In fact, looking at the distributions in Figure 8, one can observe that all neighborhoods in this category have an average household income below the national average, as the entire distribution of Index Standardized Income (ISI) sits left of the 1.0 mark. Moreover, the distribution of the Non-Western migration background population also reveals that most Type 0 neighborhoods comprise a population with at least 50% of people with a Non-Western migration background – significantly more than others. Additionally, a distinct peak of the women population distribution at 50% and a larger share of people aged 0 to 17 could indicate a sizable presence of different-sex couples with small children.

Type 1 neighborhoods, in red, are average earning and multiethnic. They are marked by an annual household income close to the national average (Index Standardized Income peaks at 1) and have a wide distribution for all ethnicity variables. They also tend to have a higher population with Non-Western migration background (though not predominantly Non-Western, as Type 0).

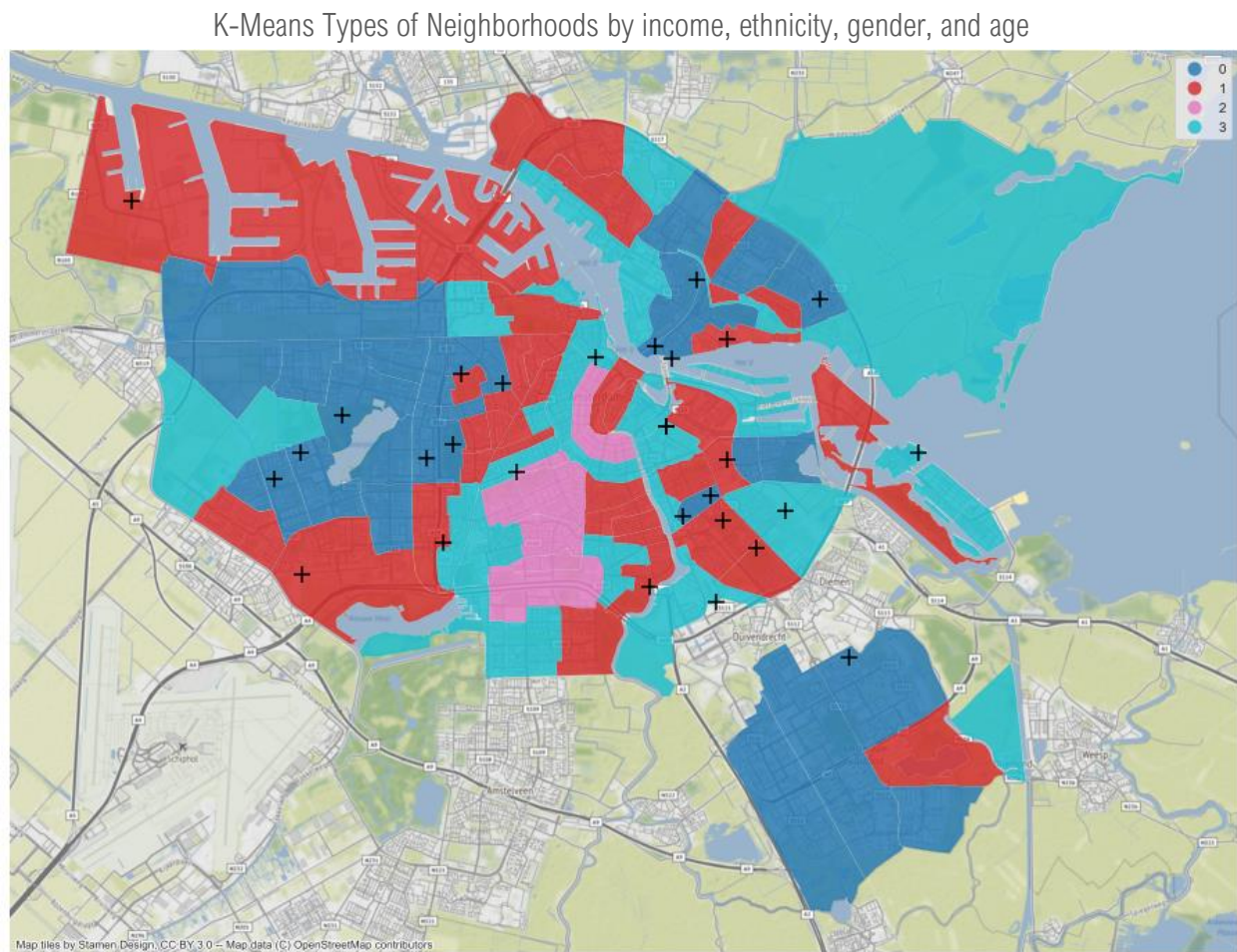
Neighborhoods classified as Type 2, in pink, are very affluent, older, and typically Dutch or Western. These neighborhoods have a remarkably high average annual household income, from 120% to 300% of the national average. Another critical characteristic of Type 2 neighborhoods is the significantly low Non-Western background population: only about 10% of the population of most of these neighborhoods falls under that ethnic category. These neighborhoods also tend to have a higher share of their population above 50 years old.

Finally, Type 3 neighborhoods, in cyan, are wealthy and barely Non-Western. Much like Type 1, Type 3 neighborhoods have a widespread distribution in terms of ethnicity except for Non-Western migration background, which is still relatively low compared to Types 0 and 1.

When plotting a map of Amsterdam and color-coding the neighborhoods by type according to the K-Means results (Figure 9), it becomes apparent that there are spatially segregated clusters of Type 0 neighborhoods in Amsterdam Nieuw-West, Noord, and Zuidoost. In particular, Type 0 neighborhoods to the West of Amsterdam are surrounded by a ring of Type 1 neighborhoods, which seem to act like a buffer between that cluster of low-income and Non-Western neighborhoods and the rest of the city.

Indeed, there seems to be a socioeconomic spatial gradient in Amsterdam. Neighborhood Types 0, 1, 3, and 2 form an income and ethnicity gradient when looking at the census attributes– but they also do so spatially: In general, from higher-income and more Dutch or Western neighborhoods in the city center to poorer and more Non-Western to the urban periphery.

Figure 9 | Type 0 neighborhoods, where most Urban Commons (represented as crosses) are located, are concentrated on the West, North, and South-East periphery of Amsterdam and are surrounded by Type 1 neighborhoods to the West.

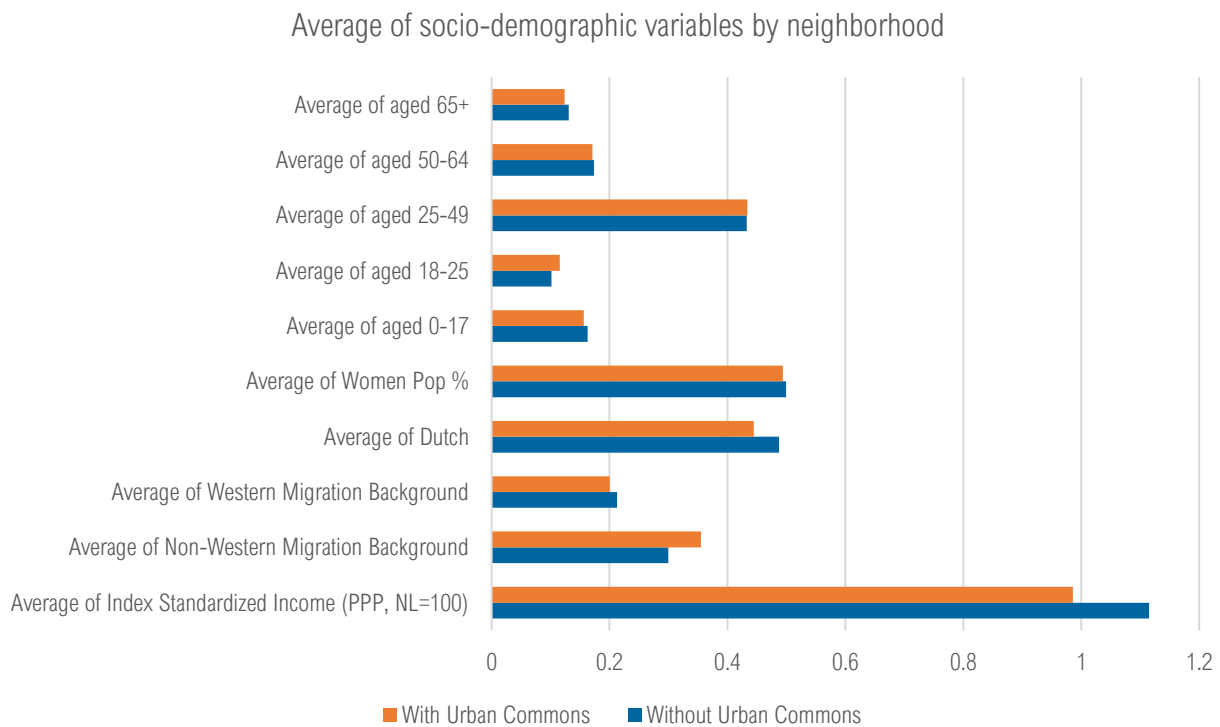


The results are in line with literature. As Van Gent explains, the inner city within the ring area was renewed and has been under a gentrification process since the 1980s, slowly expanding outward since the 2000s (2013b). Moreover, social housing programs in the city’s outskirts (Savini et al., 2016) and increased demographic growth driven by international immigrants with low educational levels (Musterd, 2016; Nancy Foner et al., 2014), which led to an increasing income and ethnicity gap between the city center and its fringes (Musterd et al., 2013).

What is interesting, however, is the location of the Urban Commons in relation to the diverse types of neighborhoods. In total, there are 14 Urban Commons in Type 0 neighborhoods, eight in Type 1, a single one in Type 2 neighborhoods, and six initiatives in regions of Type 3. As represented in the map in Figure 9, the case study initiatives are concentrated in blue and red neighborhoods, and there is only one initiative in the highest-income neighborhoods of Type 2. In fact, three in every four initiatives are in Type 0 and Type 1 neighborhoods. In other words, 75% of the studied Urban Commons are established in lower-income and higher Non-Western migration background neighborhoods. It would seem that the case study commons emerge from adversity.

In fact, by comparing the average values of the income, gender, ethnicity, and age variables of the neighborhoods with at least an Urban Commons versus the average of Amsterdam (Figure 10), a pattern emerges. Urban Commons seem to appear, on average, in lower-income neighborhoods with a larger share of men, children under the age of 17, and Non-Western migration background residents in their population.

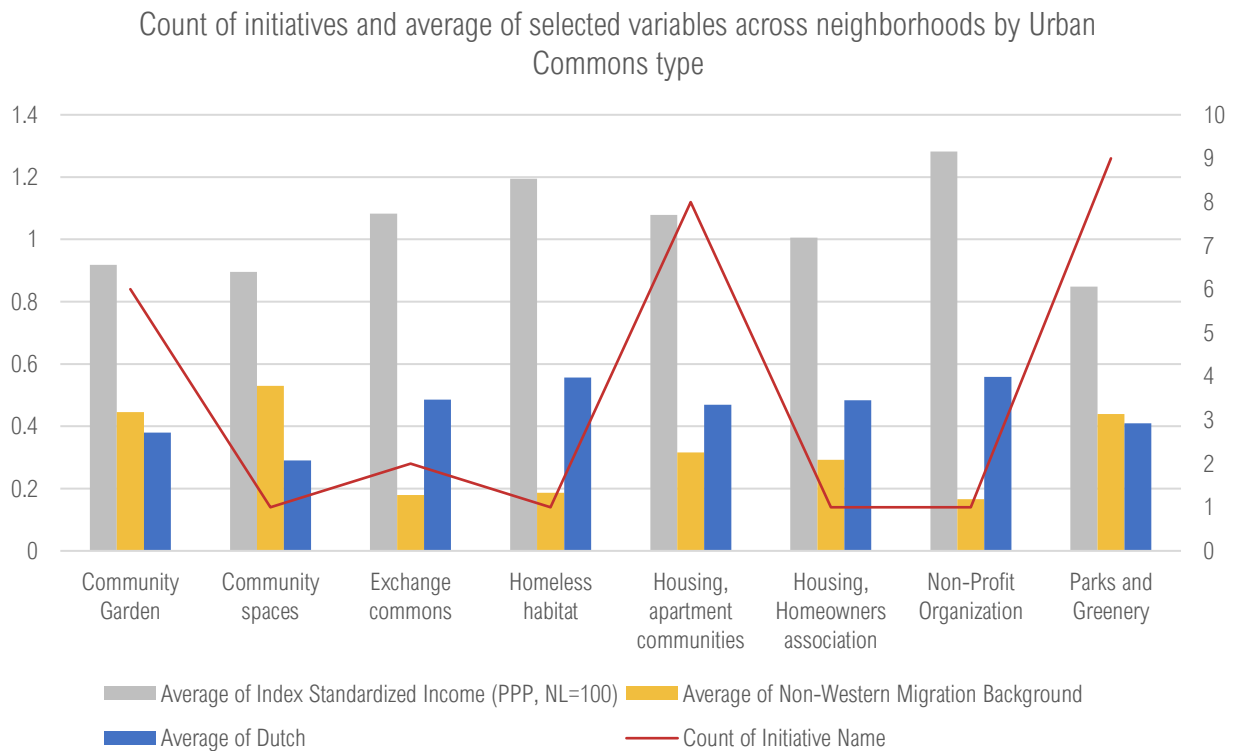
Figure 10 | Neighborhoods with commoning initiatives have, on average, lower household income and more people with Non-Western migration backgrounds than Amsterdam's average.



With these results, one can infer that the Urban Commons arise in socially and sometimes spatially segregated areas of Amsterdam, bringing benefits to vulnerable population segments. Moreover, agreeing with Feinberg et al.'s (2021) findings, all initiatives in the case study originated as a bottom-up solution to address the scarcity of a resource such as a livelihood, affordable produce, housing, meeting spaces, or social connections (except for De Nieuwe Meent, which serves the same purpose but originated in government action). The findings seem to support the alternative hypothesis H_a that the most vulnerable groups are those with better access.

However, Urban Commons are context-driven and neighborhood-specific. So a more thought-provoking picture appears when looking at the different types of initiatives. For example, lower-income neighborhoods with a large population with migration backgrounds form more community-oriented and on-the-ground-improvement commons, such as Parks & Greenery, gardening, and public spaces. Indeed, of the 14 Urban Commons in Type 0 neighborhoods, 12 can be classified as Community Gardens or Parks & Greenery commons. On the other hand, higher-income neighborhoods, typically of Type 2 and 3, tend to have more politically inclined Urban Commons, based on squats or offering not-for-profit services, such as connecting producers to consumers. While they offer cultural activities, the residents of the neighborhoods are likely to earn higher incomes - the initiative might be thus tending to an already included public rather than fostering inclusion. This trend can be seen in Figure 11, which shows the number of initiatives by New Commons type (in red), the mean Index Standardized Income (ISI), and selected ethnicity variables.

Figure 11 | Community gardens and spaces, as well as Parks & Greenery initiatives, are located in lower-income neighborhoods with a larger ethnically Non-Western population, whereas housing and exchange commons are situated in more ethnically Dutch and higher-income neighborhoods



Housing and exchange commons are, on average, located in neighborhoods with higher income (ISI > 1) where the native Dutch population is larger than the one with non-western migration background. Conversely, Community gardens, community spaces and parks, and greenery commons tend to be situated in neighborhoods with lower income (ISI < 1) and higher non-western migration background population than native Dutch.

Therefore, the findings reveal that there are two distinct categories of Urban Commons when it comes to their relationship to socio-spatial inclusion. First, there are those located in more privileged neighborhoods, where the population earns a higher income, is more Dutch, and is closer to the city center. These tend to be either politically oriented squats that took the opportunity to occupy a vacant building in a prime location or initiatives providing a service benefitting individual members, such as a market for organic groceries. On the other hand, there are those initiatives arising in socially and spatially vulnerable neighborhoods, which lie on the outskirts of the city and have a large population of low-income ethnic minorities.

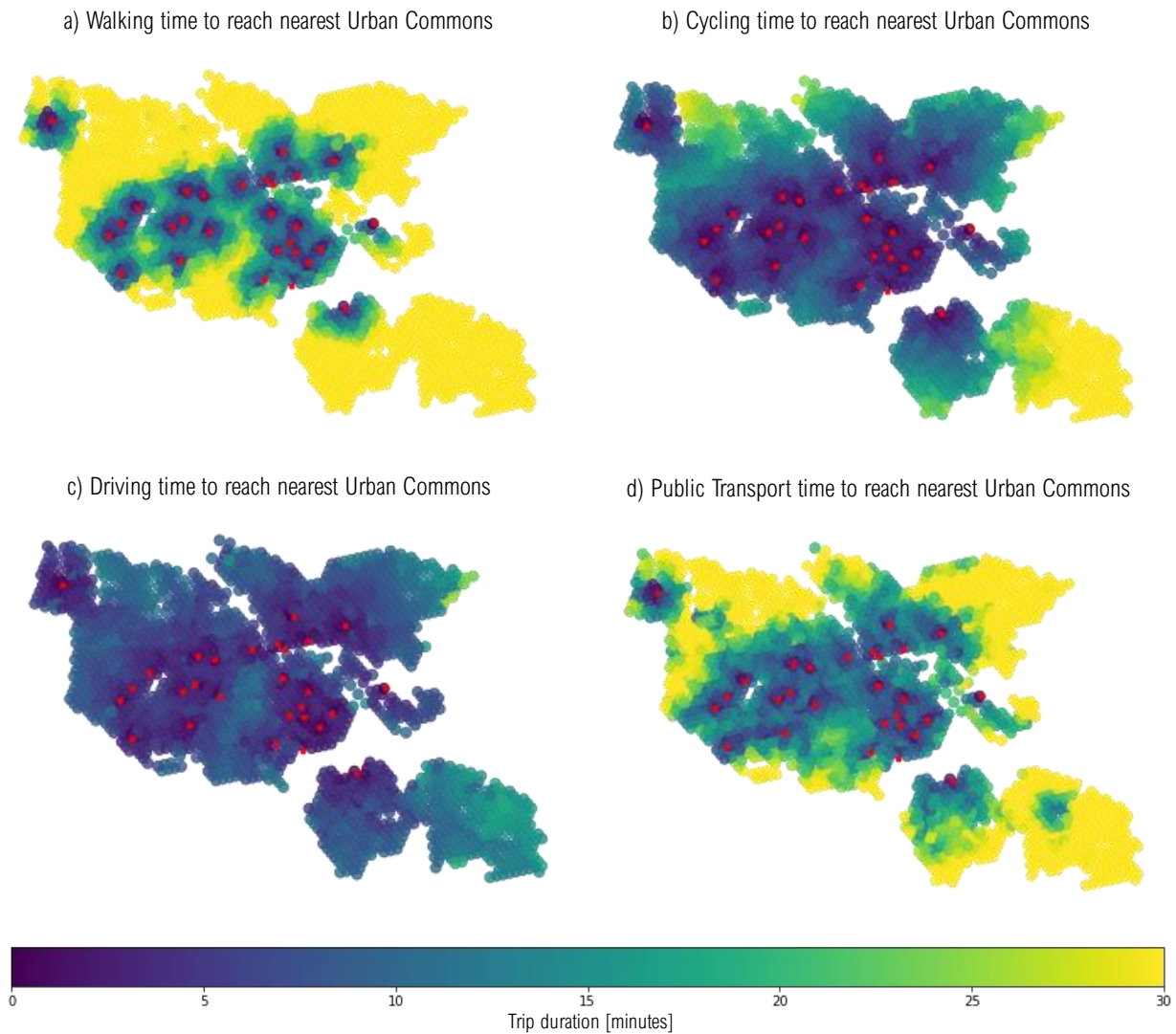
4.1.2 MATERIAL ACCESSIBILITY TO URBAN COMMONS

Building on section 4.1.1, which explored the relationship between an Urban Commons location and socio-spatial segregation, this section explores the material access to Urban Commons. This sub-section aims, therefore, to answer SQ2, “How is the material access to Urban Commons in Amsterdam related to social and spatial factors?”. The findings suggest with a 95% confidence interval that the material accessibility of the studied Urban Commons in Amsterdam is higher for socially vulnerable groups, which supports the alternative H_{a1} , that most vulnerable social groups are not at a spatial disadvantage to reach Urban Commons because of material walls.

From a purely spatial perspective, Oost and Centrum are the districts with the highest access to commoning initiatives for all modes of transport. On average, it is possible to find an Urban

Commons from there in about 13 and 21 minutes on foot. On the other hand, Noord's north, Westpoort, and Nieuw West's northeast, as well as Weesp are the regions with the poorest material accessibility to Urban Commons in Amsterdam. The spatial heterogeneity of material accessibility to the commons across different modes of transport can be seen in Figure 12 (for the raw travel time data, see the accompanying material in the 4TU.ResearchData Repository under DOI 10.4121/c.6081006.)

Figure 12 | Amsterdam's periphery has comparatively much poorer access to Urban Commons by walking, but it is possible to reach an Urban Commons in less than 30 minutes from almost everywhere in the city except for Weesp.



Material access to the studied commons is, however, excellent. As Figure 13 illustrates, 95% of Amsterdammers can reach at least one commoning initiative from the case study by bike in less than 15 minutes, and 99.5% of the Non-Western population can do so in less than 30 minutes. This staggering result implies that the Urban Commons are indeed highly accessible in the Dutch capital, and material accessibility is not an issue for such a cyclable city.

Figure 13 | Fastest travel times to Urban Commons vary greatly by mode. Yet, 95% of the population can reach a commoning initiative within 15 minutes by bike in Amsterdam



However, one of the most relevant results from the material access analysis is the significantly shorter time the population with Non-Western migration takes to reach an Urban Commons across all means of transport, as Table 2 denotes. The mean travel time for Non-Westerners to reach an Urban Commons is estimated to be 6% to 12% shorter than the average of other ethnicities, depending on for all modes of transportation.

Table 2 | Average accessibility by socio-spatial factor and mode of transport. Shortest travel time by category in bold.

Category	Group	Frequency [%]	Walking [min]	Cycling [min]	Driving [min]	Transit [min]
Gender	Male	49.5%	39.06	10.72	6.87	25.00
	Female	50.4%	39.05	10.72	6.86	24.92
Age	<17 years old	16.4%	39.81	10.96	6.86	25.52
	18 – 24 years old	9.9%	39.98	10.83	6.74	24.70
	25 – 49 years old	42.6%	36.95	10.23	6.73	23.78
	50 – 64 years old	15.5%	40.11	10.94	7.02	25.75
	> 65 years old	13.0%	41.99	11.41	7.21	26.75
Ethnicity background	Non-Western	36.5%	36.59	10.20	6.32	22.91
	Western	19.7%	37.73	10.36	7.02	24.19
	Native Dutch	38.2%	41.88	11.34	7.30	27.16
Neighborhood Type	Type 0	27.55%	31.10	9.11	5.72	19.15
	Type 1	36.73%	45.14	11.15	6.53	24.27
	Type 2	8.16%	27.21	8.48	8.23	16.26
	Type 3	27.55%	41.38	11.77	7.89	30.98

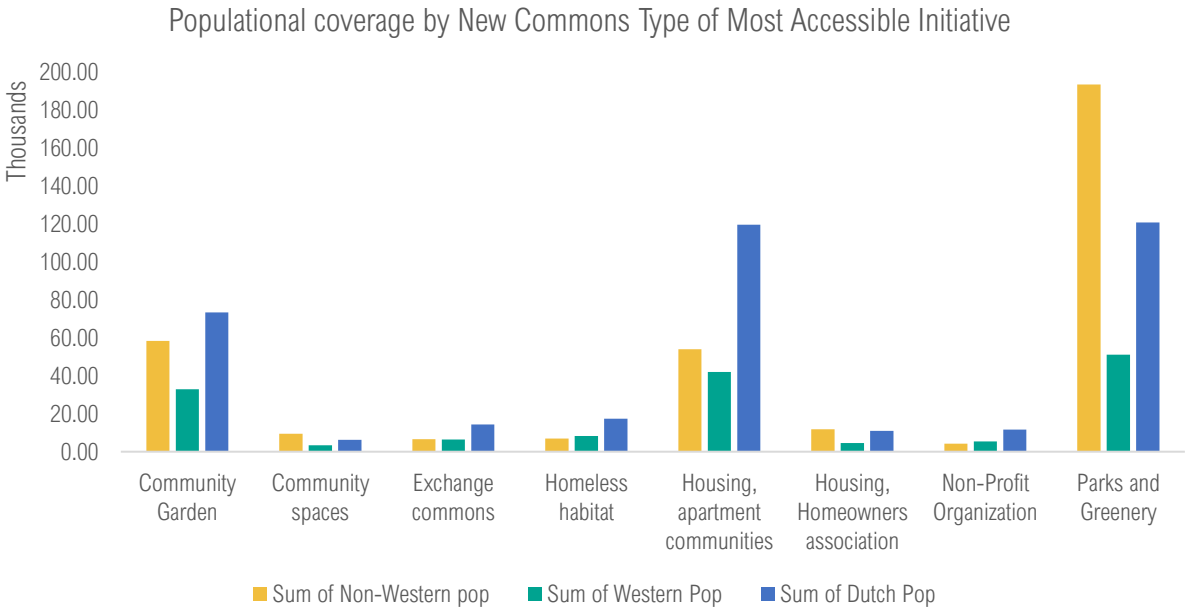
Regarding other socio-demographic factors, the results illustrate that gender does not seem to play a role in material accessibility since the average time to reach an Urban Commons is virtually the same for all modes of transport, varying only milliseconds between genders. Conversely, age and ethnic background are the socio-spatial categories that most explain the differences in mean travel time to a commons initiative (see Appendix 7.2.2 for the ANOVA indicators).

In terms of spatial factors, the results indicate that Type 2 neighborhoods (very high-income and barely Non-Western) have the best accessibility across all modes of transport except for driving. Although Type 2 neighborhoods are in a privileged position to reach any other point in the city, it could be surprising that Type 0 neighborhoods are not those with the best average accessibility. For instance, despite being populated chiefly by residents with Non-Western migration backgrounds and hosting most Urban Commons, the average time to reach an initiative is increased because of the Type 0 neighborhoods in Amsterdam Zuidoost.

Indeed, there is a stark divide regarding the accessibility to commoning of the low-income and mainly Non-Western population: those living in Nieuw-West and Noord, where there are many Urban Commons, have remarkably high material access to commoning, whereas those residing in Zuidoost, where there is only one initiative can take more than two hours on foot to reach an Urban Commons. What is more, a large share of that group has better access

Finally, an interesting relationship between the New Commons type of initiative and the number of people, by ethnicity, from whom an Urban Commons is the nearest initiative. As reflected in Figure 14, a much larger share of the Non-Western ethnic population lives closer to a Parks & Greenery commons (40%) than the Western (25%) and native Dutch (28%) populations (for details on accessibility by case study initiative and their populational coverage, see Appendix 7.2.3).

Figure 14 | Apartment communities are the most accessible commons for primarily people of native Dutch ethnicity, whereas Parks & Greenery initiatives are the fastest to reach for ethnic Non-Westerners.



This relationship can be attributed to the large population of Non-Western ethnicity living in Zuidoost, the entirety of which falls under the Buurtcamping Egeldonk initiative’s catchment area. Proportionally to their populations, though, more than twice as many people with native Dutch

and Western ethnicities live within the catchment area of a food-related initiative compared non-Westerners.

The findings illustrate an almost paradoxical commons accessibility landscape in Amsterdam: while most of the more vulnerable groups have better than average material access to Urban Commons, at least one in four sees themselves in a situation of exceptionally low accessibility. Once again, however, the situation is mitigated by the fact that Amsterdam is extraordinarily cyclable, resulting in Urban Commons being readily accessible by a significant share of the population.

4.2 Immaterial Access Stream

The immaterial access stream of this research aims to explore to what degree immaterial factors can be an immaterial barrier for people to access Urban Commons, and how members of such initiatives perceive the benefits and inclusion power of Urban Commons. In order to answer SQ3, related to immaterial access, and SQ4, regarding impact and inclusion, a single survey addressing the two issues was sent out to participants of the case study's Urban Commons. Section 4.2.1 answers SQ3, and section 4.2.2 addresses SQ4. The findings underscore Urban Commons' potential to drive inclusion and a sense of community, and suggest commoners perceive material aspects more often as a barrier of access than immaterial ones.

Before delving into the results, however, it is essential to contextualize the profile of the respondents (for details, see Appendix 7.3.6, for a complete summary of the responses, see the complementary materials at 4TU.ResearchData Repository under DOI 10.4121/c.6081006). There were 49 complete survey responses. The average respondent is a woman of native Dutch ethnicity between 25 and 45 years old and earns between 15,000.- € and 30,000.- €. Regarding gender and ethnic background, 68% of the respondents identified as women, 27% as men, and 5% as other. While no statistically significant claims can be made due to the survey's small sample size, the respondents' socio-demographic profile suggests that, indeed, commons are well accessible to a lower-income population.

Ethnicity-wise, just over four in ten respondents were native Dutch, while 32% have migration backgrounds from Western countries and 7% from Non-Western ones. Out of the 49 responses regarding native language, 14 (32%) people claimed to speak a native language other than Dutch, and 12 of those declared to be of Western migration background. The dwindling number of Non-Western respondents was unexpected since that ethnic group has the best material access to Urban Commons in Amsterdam, according to the findings from section 4.1. Be that as it may, during field visits to the commons initiatives in the case study, the author was mainly received by and talked to people who, when casually asked, declared to have native Dutch or Western ethnicity. They were, however, generally taking on managerial roles in the commons, therefore not necessarily representative of the initiatives' participants.

Regarding the initiatives in the sample, it was expected that few to no responses would be obtained from the Lucas Community, De Kerk, and all buurtcamping initiatives, as these commons are currently on hold or had no meetings planned for the duration of this study. However, there were also no responses from participants of De Groene Gemeenschap, De Kaskantine, I Can Change the World with my Two Hands, Moestuinvereniging Proefeiland, Ruigoord, and Stadsboerderij Osdorp, as well as from any of the buurtcamping initiatives except for Buurtcamping Sloterdijk. The initiatives with highest uptake are VOKOMOKUM, Buurttuinen Transvaal, and Stichting Het Koffiehuis, with 19, 8, and 7 responses each. Intriguingly, the commons with the highest responses are all located in Transvaalbuurt, Harlemmerbuurt, and Plantage - neighborhoods that are either gentrifying or already too wealthy to be gentrified, according to Meppelink's (2021) study on the gentrifying neighborhoods of Amsterdam. It seems, therefore, that the survey distribution and the author's visits to the initiatives were not successful in generating survey responses from commons from very low-income neighborhoods or commoners with non-Western migration backgrounds.

In terms of the pattern of participation in Urban Commons, all survey respondents who participate in a neighborhood commons live in the same neighborhood as the initiative, and most

reach it on foot in less than 10 minutes. On the contrary, most respondents who join a market commons live in a neighborhood other than where the initiative is located, travel by bike, and take more than 10 minutes to reach it. Moreover, all respondents from Non-Western ethnicity take part in neighborhood commons, while more than half of respondents who joined a market commons are of native Dutch ethnicity.

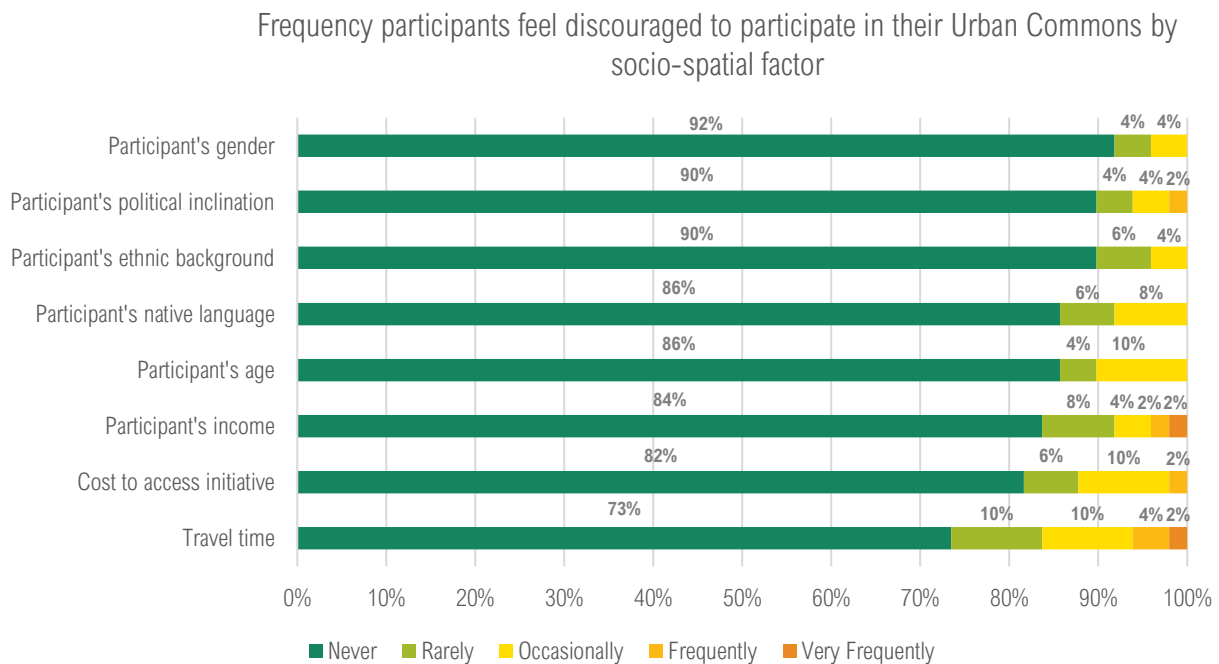
This pattern is reflected in field observations made by the author. Neighborhood commons, such as Buurttuinen Transvaal, Buurthaven, and Stadsboerderij Osdorp, seemed to function as meeting places for local communities to socialize. Furthermore, these initiatives' general atmosphere, care, and maintenance state left the author with the impression that locals are proud of these urban oases within their neighborhoods. Conversely, participants of market commons seemed more interested in the process and service offered by the initiative (such as connecting consumers to local farmers or reducing waste) rather than in the physical structure of the marketplace and its impact on local space.

4.2.1 IMMATERIAL ACCESS TO URBAN COMMONS

In addition to material barriers to access an Urban Commons, such as distance, cost, or travel time, there could also be intangible and personal reasons deterring people from joining a commoning initiative, called immaterial barriers of access. Among them are socio-demographic factors such as gender, age and ethnicity, and income. Additionally, specific environments can make people uncomfortable or unwelcome because of their socio-demographic profile. As a complement to section 4.1, which studies the material aspects of accessibility to Urban Commons in the Dutch capital, this section sought to answer SQ3: "How do immaterial factors influence the accessibility to Urban Commons in Amsterdam?". The results indicate that immaterial factors might not discourage commoners from participating as much as immaterial aspects.

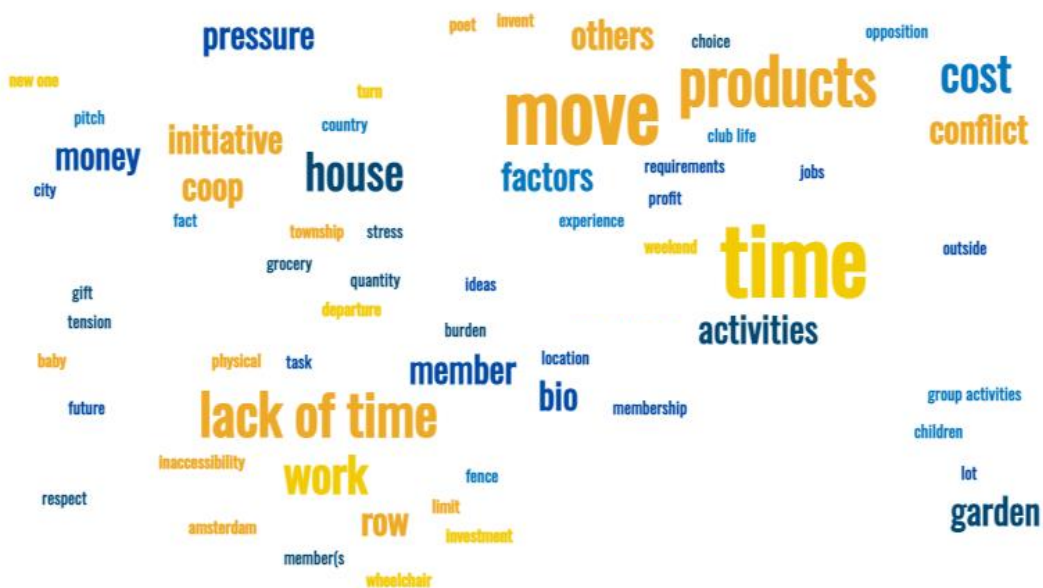
Primarily, it was clear from the survey responses that most respondents did not spontaneously report immaterial factors as barriers to accessing the Urban Commons they participate in. As shown in Figure 15, for all, more than 80% of respondents claimed never to perceive immaterial factors as a hindrance. Gender was the least frequently immaterial to be perceived as a barrier, which is an interesting result since almost 70% of the respondents identify as women.

Figure 15 | Most respondents never feel discouraged to access Urban Commons because of any material or immaterial barriers. However, material factors such as accessibility cost and travel time hinder participation more often than immaterial ones



Conversely, twice as many respondents (21%) perceived material factors as occasional, frequent, or very frequent barriers of access, compared to immaterial ones (10%). In that sense, the overarching theme of the open-ended responses about impediments to participation referred to material barriers of access, such as time and distance-related issues. When asked about factors that would lead respondents to quit participating in their Urban Commons, most responses converged on three key topics: time, distance, and work constraints, as the translated word cloud in Figure 16 elucidates. The most frequently mentioned factor is time and the lack thereof (9 times), which was present in all responses. Moving away from the commons (4 responses) and not being able to participate because of work-related obligations (4 responses) were also brought up by several respondents.

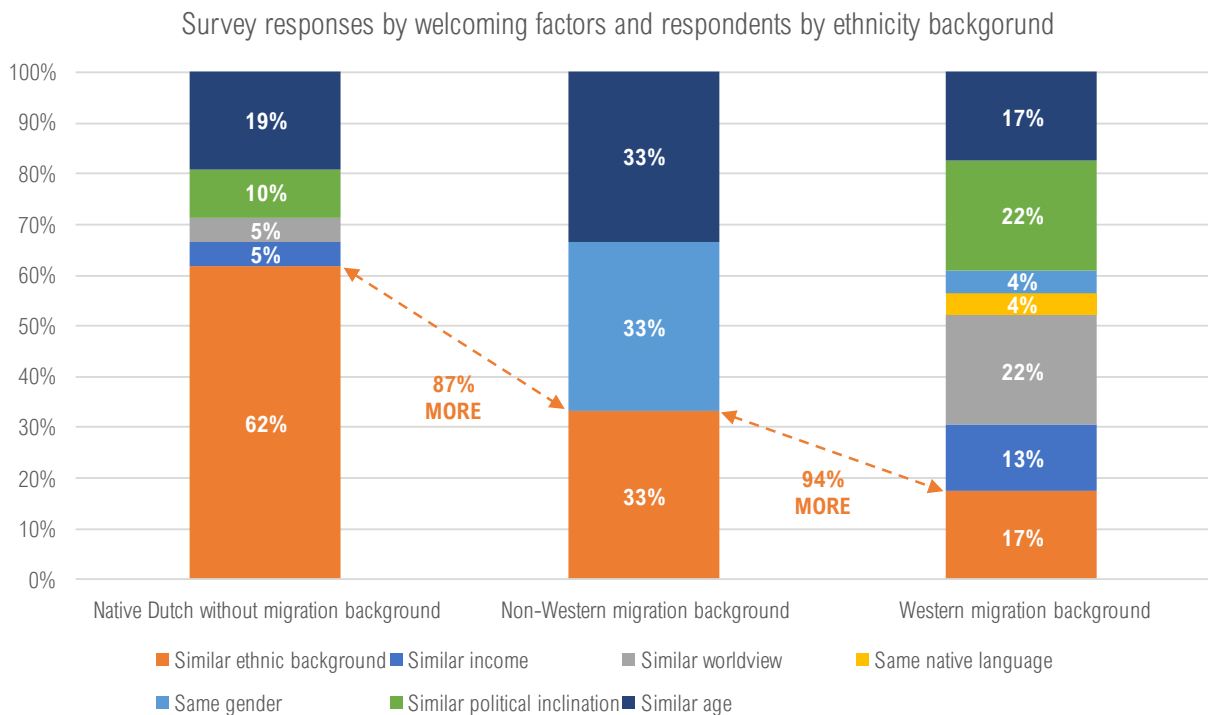
Figure 16 | Respondents indicate that time, distance, and work-related issues are the key potential barriers to Urban Commons



It is evident, therefore, that when asked about access barriers, respondents instinctively responded pragmatically with material, rather than immaterial walls of access. This result emphasizes the importance of the findings from Section 4.1, which suggest the case study commons dispose of excellent material accessibility. Moreover, the results indicate that, for the sample of commoners surveyed, comprised chiefly of adult women of native Dutch ethnicity earning between 15,000.- € and 30,000.- € a year, their socio-demographic profile is *not* perceived as a barrier to accessing the Urban Commons they participate in.

Nevertheless, respondents' ethnic background did seem to positively influence immaterial access - but only for the native Dutch. Six in ten respondents without a recent migration background reported feeling welcome at the commoning initiative they participate in because most other participants have the same ethnicity as they do. Figure 17 also shows that contrary to native Dutch respondents, who seem to perceive shared ethnicity as the predominant socio-demographic welcoming factor, responses from people with a Western migration background indicate that this group feels welcome when there are multiple shared characteristics between them and other participants of the Urban Commons. In particular, Non-Westerners seem more attuned to the political inclination and worldview of their commoning colleagues when compared to other ethnicities.

Figure 17 | Participating in an initiative where most members have a similar ethnic background is the most welcoming factor for native Dutch respondents. This group of respondents is almost twice as likely to feel welcome because of that factor as ethnic Non-Westerners, and almost three times more likely to do so than Westerners.



Similar ethnicity is not, however, the first welcoming aspect of a commons that comes to respondents' minds. Most answers to the open-ended question about immaterial drivers of access refer to intangible benefits, such as social ties in a local context, but also concrete advantages participating offers, such as affordable groceries. A selection of the responses (freely translated when originally written by a respondent in Dutch) include:

- *“Casually connecting with new neighbors and making for a fun and friendly atmosphere in the neighborhood”* (Buurttuinen Transvaal)
- *“Cheaper organic food and meet like-minded people”* (VOKOMOKUM)

experienced barrier to participating in a case-study commons is the travel time to reach a commons, not an immaterial aspect.

Due to the small sample size and underrepresentation of vulnerable ethnicities, it is not possible to reject the null hypothesis H_{02} , which proposes that the most vulnerable social groups are at a social disadvantage in reaching Urban Commons because of immaterial walls. However, extrapolating from the case study, the survey results could suggest that immaterial factors could potentially function as a *driver* of accessibility for certain social groups by forming a cohesive community in terms of socio-demographic and interests, while material ones could act as a *barrier* of access in general.

The results have shed light, at least partially, on how material and immaterial aspects of accessibility are perceived by participants of Urban Commons in Amsterdam. However, to better understand the commons' power to improve people's lives and drive inclusion, it is still necessary to explore how commoners are impacted and benefit from joining such initiatives.

4.2.2 IMPACT AND INCLUSIVITY OF URBAN COMMONS

Beyond anecdotal accounts, academic research has pointed out that Urban Commons can provide multiple benefits to their participants. From providing income and recreation, to creating a sense of community and offering services, the commons are a powerful form of social organization that can change people's lives and build various forms of local resilience. Some even argue they can be a haven for the excluded and drive social inclusion. So far, this study has explored *who* accesses the commons. But what about *how* are people impacted, and how do the benefits of commoning vary across social groups? This section explores that very issue by addressing SQ4, "What impact do Urban Commons have in the lives of users, and how does that differ by initiative type and social group?". The survey responses indicate that the sense of belonging to a community and strong social ties are among the most significant impacts of commoning. In general, the more local an initiative is and the closer the relationship between the commons and its commoners, the higher the perception of value provided by joining such initiative. The findings also indicate that commons could drive social inclusion, but more commoners from more privileged social groups seem to value the benefits of commoning more.

From a qualitative point of view, the Most Significant Change respondents experienced after joining an Urban Commons was the feeling of belonging to a community and creating a strong local social network. For the majority of respondents, the most meaningful change in their lives after joining an Urban Common was getting to know the people who live in the same neighborhood as the respondent. This benefit is observed directly in responses such as "*I got to know my neighborhood much better*", from a Buurttuin Transvaal response, and "*A friendly place in the neighborhood for real contact with your neighbors*", from a Voedseltuin IJplein participant.

A related impact commons had in respondents' lives is the feeling of belonging to a community that joining an Urban Commons offers. This impact is reflected in responses such as "*it gave me a sense of community*" and "*joining a new community*", both from VOKOMOKUM participants. These answers are similar to the responses obtained in the survey question about the drivers of participation. It is possible to infer, therefore, that the strong social connections and feeling of community offered to participants of commoning initiatives is not only a benefit, but one of the most impactful ones, being also the reason people continue to participate in the commons.

Moreover, respondents from grocery market and urban garden commons also mentioned eating and acting more healthily and sustainably as the most significant impact in their lives of

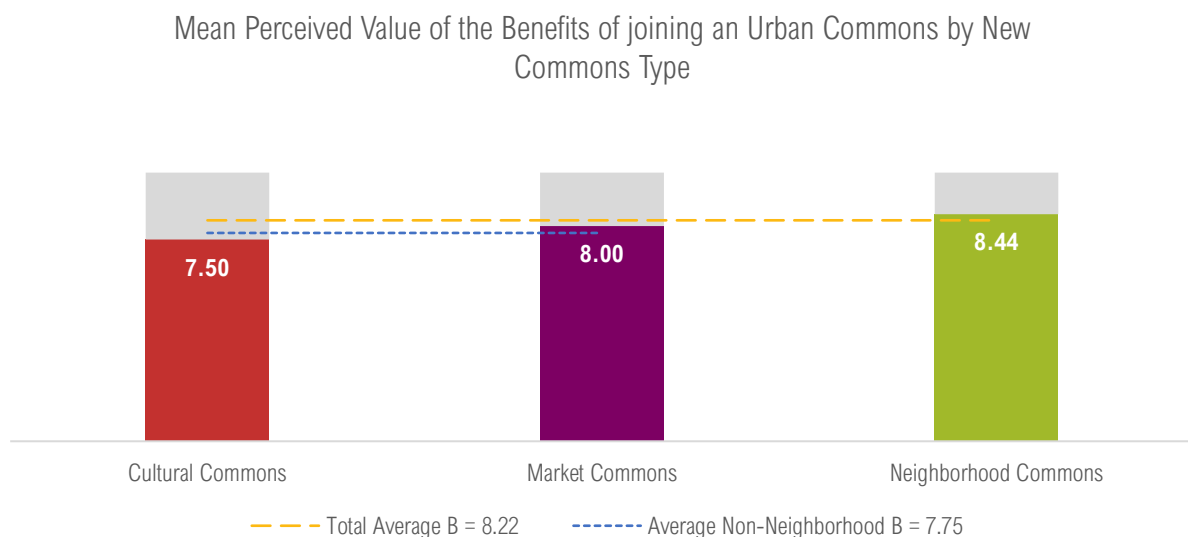
honest language reminds one that commoning refers to more than managing a resource collectively: Commoning is also about people. In addition to its social, economic, and environmental impacts, its benefits are also, and perhaps especially, present in the human dimension. These results agree with Feinberg et al. (2021), who found multiple studies indicating that commons offer recreation opportunities, create a sense of shared identity, empower a sense of community, and represent place-making opportunities.

From a quantitative perspective, the results indicate that people joining the case study initiatives highly appreciate the benefits of doing so: The mean perceived benefits value of joining a commons initiative B , as perceived by the survey respondents, was $B = 8.22$ out of 10. However, because commons are so diverse, more nuanced results appear when studying the results by type of New Commons.

The benefits generated by neighborhood commons were scored higher than those of other types of New Commons. As can be seen in Figure 20.a), the respondents who participate in neighborhood commons are those who rated the benefits of commoning the highest. The driver of such a high score is the average perceived value of participating in Community Garden initiatives, which have the highest benefit rating $B = 8.75$ across all sub-types of New Commons. Urban gardens are among the best-ranked initiatives in terms of benefit values: Buurttuinen Transvaal, Voedseltuin IJplein, and Stadsboordereij Osdorp have mean benefit scores $B = 8.86$, $B = 9.00$, and $B = 10.00$.

The Most Significant Change in the lives of all respondents from these high-scoring initiatives refers to getting to know their neighbors and creating local solid social ties. Interestingly, during field observations, the author noted a relatively high number of families with small children using these commons as a gathering space. In addition, a relaxed, friendly, and talkative atmosphere gave the impression that the people knew each other and used the space to socialize and spend quality time with their families, whether by lounging or gardening.

Figure 20 | Respondents who participate in a Neighborhood commons, and Community Gardens in particular, perceive more value in the benefits of joining the initiative than those of other types of commons



On the contrary, food-related commons, which in this case study fall under the Exchange and Non-Profit Organization sub-types of New Commons, rank among the lowest in terms of perceived benefits value. For example, on average, VOKOMOKUM's perceived benefits were valued as $B = 8.11$, while FoodCoop Noord and Taste Before You Waste scored $B = 7.00$ and $B = 7.50$, respectively. For more than half of these respondents, the Most Significant Change in their

lives after joining the initiative was the access to affordable produce. These results imply, therefore, that the perceived benefits of local, neighborhood-specific commoning initiatives are valued higher by their participants, which tend to be local residents, than those of market commons, which are attended by a larger group of people, including from other neighborhoods.

Compared to market ones, the higher value of benefits from neighborhood commons could stem from their inherently local and physical characteristics, which allow them to offer participants a more varied array of benefits. Furthermore, considering the different benefits of Urban Commons, as identified by Feinberg et al. (2021), neighborhood commons can more easily promote a sense of identity, recreation, and livelihood support benefits than market ones.

Indeed, the very definitions and characteristics of neighborhood and market commons could explain such a difference. Neighborhood commons consist of initiatives organized by locals who go the extra mile to take care of and manage a resource in *their* neighborhood. The resource is, in a way, *theirs*, and the improvements and sense of community are all connected to *their* neighborhood. For instance, as observed during field visits, initiatives such as Buurttuinen Transvaal and Stadsboerderij Osdorp seemed to create a direct identity connection between citizens and their neighborhoods, offer public spaces catered to local needs, and improve local air quality through increased urban greenery.

Conversely, market and not-for-profit commons inherently offer more ephemeral and transactional benefits. The sense of community generated by neighborhood commons is related to the *place*, whereas market and non-profit commons create a community centered around the *initiative*. Perhaps it is this more personal relationship that commoners seem to have with neighborhood commons that causes them to rate the benefits of commoning higher than participants of market and non-profit commons, whose relationship could be purely transactional.

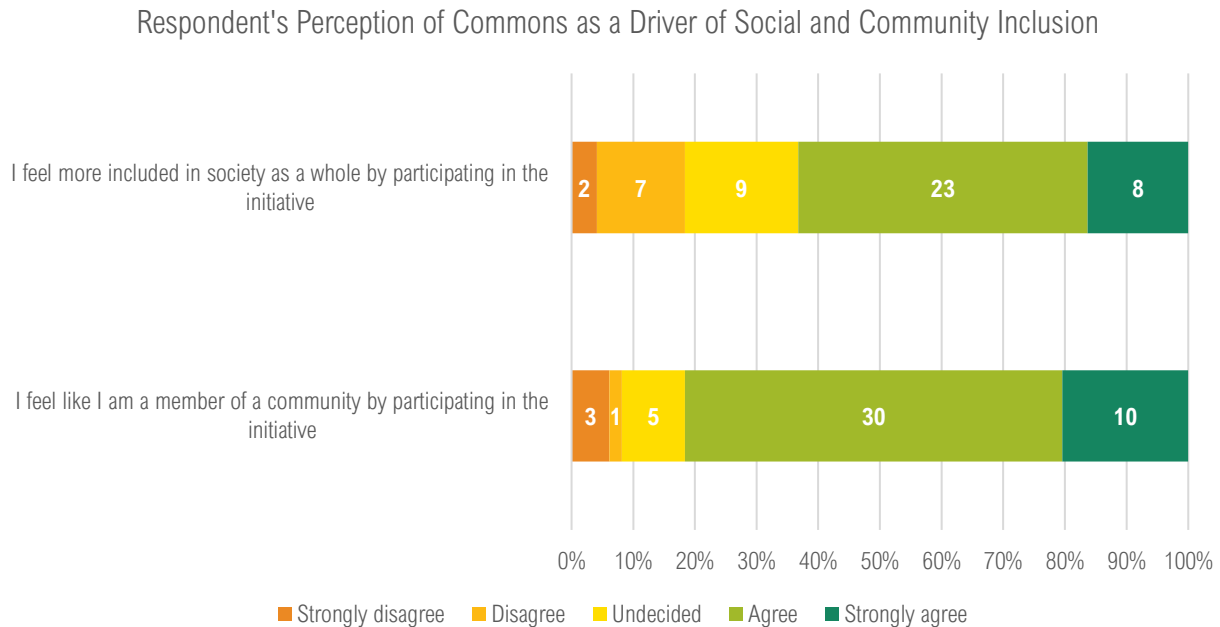
On an interesting note, a comparison with the results of section 4.1 reveals that commoners from initiatives with a longer average shortest travel time to reach assign, on average, the highest values to the benefits of commoning. They also feel discouraged to participate because of material or immaterial barriers the least often. For example, the more isolated initiatives (which tend to be neighborhood commons) such as Bajesdorp, Stadsboerdereij Osdorp, and Voedseltuin IJplein are among Amsterdam's top 4 least accessible initiatives. Based on field observations, the author theorizes that the inaccessibility of these initiatives could work in their favor by attracting participants who live in the vicinities of the commons, thereby intensifying the social ties between commoners and a sense of identity with the initiative's location.

Shifting to a socio-demographic perspective, respondents belonging to more privileged social groups indicated a higher perception of the value of the benefits reaped from commoning. Respondents who identify as male or female perceived more benefits than non-binary ones ($B = 8.30$ and $B = 8.33$ versus $B = 7.00$), and those earning more than 50,000.- € a year also attach more value to the benefits of commoning than those who earn less than 15,000.- € ($B = 8.60$ against $B = 8.00$). Similarly, surveyed commoners of native Dutch ($B = 8.21$) or Western ethnic backgrounds ($B = 8.41$) rated the benefits of participating in a commons higher than Non-Westerners ($B = 8.00$). However, the sample is too small to infer with high confidence that there is a statistical difference in perceived impact among groups or that these findings are representative of the population of commoners in Amsterdam.

Still, the case study commons were found to be capable of driving inclusion. As depicted in Figure 21, eight in ten surveyed commoners agree that participating in an Urban Commons has made them feel like a part of a community. Furthermore, six in ten agree that doing so has made them

feel more included in society. These findings are particularly pertinent since most of the respondents earn less than the Dutch national average income – which suggests commons could indeed drive inclusion, at least for the economically vulnerable.

Figure 21 | Six in ten respondents feel like they are more included in society because they participate in an Urban Commons and four in five feel like they are part of a community



Notably, half of the respondents who disagreed or strongly disagreed with that statement were participants of Het Koffiehuis initiative. They are among the most vulnerable social groups surveyed, consisting majoritively of people with a Non-Western migration background in a situation of homelessness. When evaluating only the responses from other initiatives, 70% of respondents agree that commoning makes them feel more included. One interpretation of the results is that while Urban Commons could drive inclusion by integrating vulnerable people into a community, that might not be enough to promote a feeling of inclusion among people belonging to stigmatized social groups whose exclusion stems from deep-rooted or systemic factors. For example, based on Lamont et al.'s (2014) and Clair et al. (2016) research on the underlying cultural causes of exclusion, even if Urban Commons can extend benefits previously unavailable to the socially excluded, people from the most vulnerable groups might still feel stigmatized.

The high percentage of respondents who agree that participating in a commons makes them feel like a member of a community comes as no surprise, given that is precisely the most significant benefit from commoning they perceive. It might be an essential factor contributing to the fact that most respondents agree that joining a case study Urban Commons makes them feel more socially included. Indeed, the feeling of belonging is considered a keystone of social inclusion by several authors from various fields, such as Secker et al.(2009), Koster et al. (2018), and Goodall (2018). In particular, Urban Commons can directly promote the three dimensions of social inclusion via livable urban space that Sauter and Huettenmoser (2008) proposed: from a structural standpoint, Urban Commons create space for social integration; from an interactive dimension, they foster neighborhood relations; finally, by giving members a say in their management, they contribute to the subjective dimension of social inclusion by potentially increasing the personal satisfaction of people with the neighborhoods living arrangement.

In a nutshell, the section has offered more insight into the benefits of commoning and its power of inclusion. The findings indicate that Urban Commons are a catalyst for community building and that the more local and relatable the initiative, the higher its perceived benefits. Moreover,

since most survey respondents earn less than the national average salary, the results suggest that, assuming the sample is representative, commons can work as a driver of inclusion, at least for the more economically vulnerable. There is a caveat, though: the respondents who do not feel part of a community and do not experience better social inclusion because of their commoning initiative are those who belong to the most vulnerable social groups. Nevertheless, both commoning and social inclusion in Amsterdam are a complex and multi-stakeholder problem, with a shared key actor: the municipality. It is, therefore, crucial to understand the *Gemeente's* perspective on the commons and how policy-makers could leverage them.

4.3 Policy Confluence

The preceding sections of this study have delved into how access to Urban Commons in Amsterdam varies depending on spatial and social conditions. The findings so far suggest that the Urban Commons are highly accessible and do not indicate that urban excluded are at a social or spatial disadvantage to reap the benefits of Urban Commons. Commons could, therefore, be a policy alternative for urban planners. So, it is high time to bring in the policy component and answer SQ5, “How does the Municipality of Amsterdam perceive the commons, and what barriers and opportunities are there to implement policies that take advantage of the benefits of Urban Commons, including promoting inclusion?”. The interview indicates that the Amsterdam government is looking at commons as a policy and governance alternative via public-collective partnerships and is developing a commons ecosystem to improve commons initiatives' accessibility, growth, and management. The main barrier to cooperating with commons is a lack of trust and a legal framework. The energy transition presents itself as an opportunity to pilot such an ecosystem since there is legislation, political will, and investment around it.

This section reports the main findings from the interview with an expert from the Municipality of Amsterdam (referred to as Jip, a pseudonym). It is divided into three key topics: the relationship between the local government and the commons, the expert's perception of the commons as a driver of inclusion, and the potential barriers and opportunities for cooperation.

4.3.1 THE MUNICIPALITY OF AMSTERDAM AND THE COMMONS

The current government ruling Amsterdam is interested in the commons. Indeed, the very fact that it was possible to interview Jip, a dedicated expert in the Municipality of Amsterdam's innovation team working towards collaborating with the commons, is evidence of that. Jip explained that this interest, reflected in action and personnel, started with the left-wing coalition that took power after the 2018 municipal elections and remains after the 2022 elections. Commons are explicitly mentioned in the coalition agreements of 2018 and 2022 and are also an essential part of the city's Omgevingsvisie (2021), which functions as a binding urban planning strategy.

The municipality sees commons as a movement of initiatives following Ostrom's (1990) commons governance model that can foster participation and drive a new era of public governance. As Jip elucidates, “*we [the Municipality's innovation team] want to look at them [the commons] as a governance model. Of course, we have a lot of resources in the city, and our Commons agenda or Commons perspective would be to look at how people can manage them as a Commons. So that's commonly owned and managed resources, basically*”.

Amsterdam's commons agenda has at least two different fronts: recognizing and enabling the commons movement and leveraging it for public-collective partnerships. Regarding the former, the municipality is working on recognizing the commons as a movement to support its growth and self-management: “*if you look at commons from the perspective of a movement, you could strengthen the movement [...] and properly recognize it, for instance by introducing a register [...] that allows you to also start to organize facilities and support initiatives*”. The latter refers to collaborating with commons to drive social and governance innovation in the city and offer urban planners policy alternatives to reach their goals. Indeed, Jip pointed out that the growing Urban Commons movement represents an innovation opportunity in terms of policy-making:

“You know, in the 1980s it [public policy and projects] was all public, in the 2000s it was all public-private, and now it’s a new time to move on to public-collective [partnerships]”. Jip’s team is currently working on an official description of the commons, a list of initiatives, and how the local government relates to them.

Currently, however, the interactions between local government and the commons happen on a project basis, arising primarily as bottom-up citizen-led initiatives: *“it usually starts with people wanting something and trying to organize something [to meet their demand] and then the municipality thinks ‘oh, that’s interesting! How could I help?’”. Nonetheless, the Municipality has taken the lead and opened calls for public-collective shared mobility and social housing projects, which are pressing issues with legal tools available to collaborate with commons. Jip explains: “Specifically in housing, it’s also in the law, so [...] it’s easier to open a call. I think wooncooperaties are in national law, and it is a priority to organize social housing [...]. So that’s why we open the call. But it’s easier if the law works along with that.”*

During the conversation, it became clear that the Municipality and commons often have shared goals. Cooperation is, however, sometimes troublesome. The government lacks the legal recognition and framework to act, while the initiatives lack access to operational and organizational capacities, such as funding, management methodologies, and legal expertise. For instance, banks are often hesitant to fund commons initiatives, and the local government has had to intervene: *“As a city, we want these households to organize housing themselves, but then they struggle with financing. So, there’s one private [...] bank that finances [commons housing initiatives], but they were hesitant about loaning money to several commoners. So, the city of Amsterdam said ‘OK, so we’re we’re gonna make a fund for that first 20% [for the initial deposit]’, so that banks don’t feel that hesitant anymore to finance these cooperative housing initiatives”. The Municipality recognizes the complexity and multi-actor characteristic of this grand challenge: “So, there you see the wickedness. You need to organize more things and then just tackle the same problem from different perspectives. You need to see it from a broader perspective and think: ‘OK, so we want those projects, but then they need financing, they need legal structures, they need incubating, they need help.”*

4.3.2 URBAN COMMONS ECOSYSTEMS AS A POLICY

Amsterdam’s strategy to address this gap is to develop a commons ecosystem that supports commons’ creation, growth, and maintenance. In Jip’s words: *“We need to look at an ecosystem for working together. In housing, for instance, if we want to organize social housing, well, what you need there is legal tools, financial tools, organization tools [...] As a government, we are totally into entrepreneurial ecosystems, but there’s nothing when it comes to Commons ecosystems, [...] there are not even companies only doing the administration to start with, that’s something you’d have to do in Excel. There is no support anywhere, not even in the law. So, I think it is really important to develop an ecosystem. I hope that is a sort of innovation I can bring to the city”. According to Jip, the idea shares similarities with the *Incubadoras de Economia Cooperativa* in Brazil, incubators of social startups hosted in universities.*

Several studies examine commons as part of larger ecological systems (Kahui & Cullinane, A, 2019; Mundoli et al., 2017) or socio-technical systems (Bauwens & Pantazis, 2018; Feinberg et al., 2021; Shah & Garg, 2017), but Jin’s concept of an Urban Commons Ecosystem seems unique to the commons literature. It could, however, be considered as a type of social innovation ecosystem, an emerging and still fuzzy concept (Domanski et al., 2019) referring to the collaborative interface of different societal actors and their related issues, problem-solving capabilities, and regulations (Howaldt et al., 2015).

Such a commons ecosystem could extend the benefits of Urban Commons to more neighborhoods and people. For example, suppose a group of people have an idea (or a need) to develop a business or a commons. If they do not have the know-how to start the operation, scale it, get access to funds, get permits, or manage it, they are unlikely to succeed unless there is a network of platforms, tools, and actors which can provide help and guide them along the way. From access to funding to management training and legal advice, the benefits initiatives of belonging to one such ecosystem are vital for the success of initiatives, particularly those started by the underprivileged.

Additionally, complementing a gap in literature pointed out by Feinberg et al. (2021) about institutional benefits of Urban Commons, an Urban Commons Ecosystem could also bring such benefits to local governments. For example, it could offer public-collective partnerships as policy and governance options for projects involving the management of city resources. Furthermore, a commons ecosystem could also increase the trust in local government by approximating it to the citizens and free up capacity used by transferring the management of specific resources to citizens.

A well-developed commons ecosystem also provides an incentive for continuous growth and improvement since all parties benefit from it. This characteristic can make the commons movement less reliant on governmental support and more resilient to political changes, which is essential for its long-term sustainability. Policywise, these resilient public-collective partnerships would be potentially viable options to address wicked problems.

For example, the coalition currently in power in Amsterdam favors commoning from an ideological point of view, so there is a political will to catalyze their spawning and growth. But what happens when a new (and opposing) government takes place? With a sound ecosystem in place, bottom-up commoning is facilitated regardless of the government's political ideology: citizens would still be able to start commoning with the help of other organizations within the ecosystem without necessarily needing direct support from the local government.

Complementing Moreno Pessôa's (2021) findings, this would be crucial for the longevity of the commons movement in developing countries or in contexts where governments are elected and ruled by the majority, and commoning is reliant on top-down policies. For instance, Porto Alegre, Brazil, is often cited in commons literature as a success story in commoning and its relationship with government action because of its pioneering role in starting participatory budgeting in 1989. The policy remained in action for several years but was slowly suffocated when a new and opposing party won the elections in 2004. It only saw a comeback in recent years, as it is being used almost as a referendum on large-scale incorporation projects financed by the private sector, rather than listening to the needs of small, vulnerable communities when devising plans (Paz, 2022). An ecosystem with a legal framework and a host of interdependencies actors from multiple areas of society co-involved in a project could increase the odds of initiatives such as that being long-lasting.

4.3.3 COMMONS AS A DRIVER OF INCLUSION

Jip's work concerns commons innovation systems from a policy and governance standpoint, with no particular focus on social inclusion. This stance is reflected in the expert's answer to a question about how commons can promote inclusion and bring benefits to the most vulnerable: *"Yes, I think they can, but not necessarily. I think that if the government enables them, they should [promote inclusion]. If you look at Barcelona, for instance, they organized community balance [referring to the "Citizen's Agreement for an Inclusive City" (Vilà et al., 2016)] where inclusion is one of their pillars. [...] I think it [inclusion] should be part of the deal. But it is not per se that*

Commons do that". In alignment with this thesis's assumptions, Jip believes the crucial point to promoting inclusion is that the commons are open and accessible: "You want it to be open. So I think they should organize something so that it stays open and it can always be open, accessible at least."

As a segue, the author introduced the results of the material and immaterial research stream to the conversation. That includes the low number of Non-Westerner respondents and the suggestion that neighborhood commons tend to arise in lower-income and more Non-Westerner neighborhoods, as opposed to market commons. Jip did not seem surprised by the findings and implied that the demographic profile of survey respondents could reflect that of commoners in Amsterdam. Indeed, the expert offered a hypothesis to explain that phenomenon: the lack of support systems and a commons ecosystem makes it so that only the privileged population can start or join a commons. In Jip's words: "I think that's also got to do with the ecosystem. It's bloody difficult to get a housing cooperative together, you need, like, four or five years before you have it together. You need to manage the community, you need to organize financing, [...] you need to have a vision and have the time to do that. So. I think now it's the privileged people doing it because they have the time to do it in that sense. But if you would make it easier, then other people could have access to it as well. So I think there's that again; it just shows that it's an ecosystem thing and not a Commons problem." Jip's point coincides with what a commoner told the author during a field visit to NieuwLand: the residents are currently in the process of buying the building, but that was only possible because one of the commoners took a master's degree in law and did her thesis precisely on legislation surround that.

From this governance standpoint, at the moment, there is no ecosystem of partners from various parts of society who can provide or foster capacities needed for commons to start, grow, and thrive. Jip provided an anecdotal account to support this point: "For example, a friend of mine started a windmill cooperative, and she says is 10 years further down the road, and she is the last woman standing [because it is so challenging to start a commons]. So, 10 years ago, she started building a community, gathering people, so there she needed campaigning capacities. Then after five years, maybe you get to the permit, do the legal stuff like tendering and stuff like that. And you might also need legal advice, you need legal expertise and capacity. And then, after eight years, you get to the financial stage, you need to give loads of information and data to bankers, and after an opaque process, something comes out, and nobody understands anything anymore. So, after 10 years there, she says 'I'm the last one standing' – so, you need to be privileged to be able to do that. So, you don't blame it on the Commons [if they are not inclusive], blame it on the system, please!". The issues highlighted in this anecdote correspond with socio-economic and institutional challenges found by Feinberg et al. (2021), such as values, knowledge, financial viability and governance.

Alternatively, a commons ecosystem could provide the underprivileged with the capacities and tools to start or join a commons: "You have to have those talents within your community. You need to have organizational capacity. You need to have, organisatie [the Dutch term used within the Municipality]. You need to have all sorts of talents in your community. When you look at a business, they have organizational capacity. They organize a financial department, hire somebody with communications, or hire a lawyer. But if you're community, you don't have communications, legal, or financial departments. But you do need to have it. So maybe if you find these capacities in the ecosystem, that's easier."

As a result, only the privileged people who already possess such capacities and can afford to dedicate time to an initiative start or join a commons. Therefore, beyond material and immaterial walls, a lack of systemic support for commoning represents an ecosystem barrier for the urban

excluded to access the commons. Furthermore, it is a barrier to starting commons and a hindrance to accessing them since initiatives started by privileged citizens might address issues or resources more relevant to other demographics. This novel perspective brought up by Jip has important implications for the study of the accessibility and inclusivity of the commons, and is further discussed in Section 4.4.

4.3.4 FACTORS INHIBITING AND ENABLING POLICIES AND COOPERATION

Finally, the interview moved to the opportunities and barriers to designing policies involving the commons or leveraging their characteristics to help the Municipality achieve its goals. When asked about possible barriers to cooperating with the commons in terms of local policies, Jip listed the absence of a legal framework and a generalized lack of trust in society as the main barrier to commons policies.

The lack of legal instruments allowing for the Municipality to interact with the commons was brought up as an issue by Jip throughout the conversation. As mentioned earlier, the commons-related initiatives started by the Municipality regard social housing, shared mobility, and sustainable energy – but only because there is already legislation about those topics, not because of a lack of political will. For example, according to Jip, *“energy cooperatives are easy to handle because they're recognized in European law. But food cooperatives are not that far yet. If the initiative is described in legislation, if they are “something” legal [for the municipality to interact with], then that's better and easier for the government.”* Interestingly, Bianchi (2022) found echoes of this barrier in other cities, such as Barcelona and Naples. In consonance with Feinberg et al. (2021), recognizing commons and defining legal instruments to engage them seems to be the foundation upon which public-collective partnerships can be built.

However, even if legislation is crafted, there is still the issue of trust: *“I think the legal system is definitely way too complicated, but [...] I think trust is more of a threat. And it's a threat to society and transitions in general. [...] So I think that's the biggest barrier.”* Jip believes this too can be addressed by developing a flourishing commons ecosystem. In the expert's view, *“there's a lot of distrust. Distrust anyway in society. But there's also distrust between Commons amongst themselves, because it is just such a fragile ecosystem still, and there's a feeling of scarcity. I think we should go to a feeling of abundance and then there will be more trust.”*

Conversely, several factors internal to the municipality ready mentioned enablers of commons policies and public-collective cooperation

Conversely, Jip deems the energy transition to represent the foremost opportunity to further develop the commons in Amsterdam and foster collaboration with the Municipality. There is political will across the political spectrum, investments are coming in, and legislation is in place that allows governments to interact with energy cooperatives. In particular, it is an opportunity to pilot a commons ecosystem within that framework, which can then be scaled to other types of commons. *“I think one of keys [to build a commons ecosystem] is energy cooperatives. There is legislation for it, and if we get their ecosystem right, they can also start financing other Commons initiatives. I think that that's key to further transitions. [...] The energy transition is great opportunity for transitioning to more local sustainable and commons-based economy.”*

Finally, the insights obtained from the interview with Jip can be organized in terms of Strengths, Opportunities, Weaknesses, and Threats (SWOT) regarding the role of commons as partners and a governance model available for urban planners. They are presented in the SWOT matrix shown in Figure 22.

Figure 22 | Strengths, Weaknesses, Opportunities, and Threats for the Municipality of Amsterdam to collaborate with Urban Commons and implement policies that leverage the benefits of commoning

<p>Strengths</p> <ul style="list-style-type: none"> ■ Favorable government in power for another three years; ■ Binding commitment in the coalition agreement and in the Omgevingsvisie; ■ Dedicated staff working on social and governance innovation via commons and public-collective partnerships. 	<p>Weaknesses</p> <ul style="list-style-type: none"> ■ Lack of legal framework to engage with the commons; ■ Recognition of commons initiatives and definition of interactions with the government still in the early stages; ■ Lack of supporting services and capacity building for commons.
<p>Opportunities</p> <ul style="list-style-type: none"> ■ Pilot Energy Cooperatives Commons Ecosystem because of political will, investments, and legislation on the Energy Transition; ■ Scale pilot Commons Ecosystem to Other types of commons. 	<p>Threats</p> <ul style="list-style-type: none"> ■ Lack of trust among commoners and towards the Municipality; ■ Frail commons ecosystem that favors access to the privileged few; ■ Changes in government composition to parties opposing Commons.

Internal strengths, such as binding documents focusing on commons, dedicated staff, and time in government, increase the chances of the Municipality successfully pursuing external opportunities such as taking advantage of the energy transition’s favorable conditions to pilot a commons ecosystem. That could address external threats such as the lack of trust among commons and between them and the Municipality and mitigate ecosystem barriers of access for the urban excluded. Moreover, it would also offer the local government to work on internal weaknesses like the lack of a legal framework, the lack of a definition and registry of the commons, and the lack of supporting services for commoning.

4.4 A New Framework for studying the Access to Urban Commons

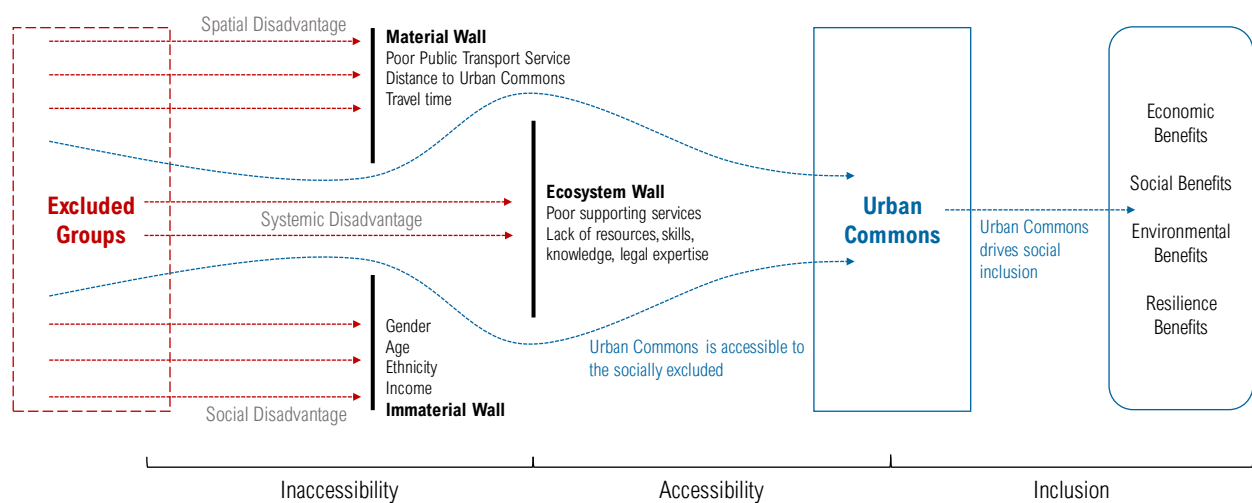
Based on the research findings, this section highlights the existence of ecosystem walls of access, and revisits this research’s original framework in Figure 1. Therefore, the study proposes a new and comprehensive framework for studying the accessibility to Urban Commons, their impacts, and their potential to promote inclusion.

The case study results indicate that commons could indeed drive social inclusion. However, as much as the material and immaterial barriers to accessing the case study Urban Commons appear low, commoning might only be possible for privileged socio-demographic groups. Indeed, the expert from the Municipality of Amsterdam who was interviewed expressed that the few survey responses from commoners of Non-Western Migration background could be representative of the entire Amsterdam commoner population. Furthermore, during the interview with the expert, it emerged that ecosystem factors might be responsible for this phenomenon.

In fact, the lack of an ecosystem that supports people in joining or starting a commons makes it so that only those who are privileged enough to already have the necessary resources, knowledge, or skills do so – effectively creating an ecosystem wall of access. Therefore, in addition to the initially proposed immaterial and material barriers that can hinder the socially excluded from accessing the commons, the author proposes a third wall of access: an ecosystem one.

The result, depicted in Figure 23, is a novel framework to study Urban Commons' power to drive inclusion and accessibility from a geospatial, social, and policy perspective. The framework can be explained as follows. Urban Commons can promote social inclusion and offer resilience, socio-economic, and environmental benefits to the socially excluded only they can access the commons. There are, however, barriers that can prevent the excluded from participating in Urban Commons.

Figure 23 | In addition to material and immaterial barriers, systemic factors could constitute an ecosystem wall preventing the excluded to access the Urban Commons



Drawing from classic urban mobility literature (Geurs & van Wee, 2004), geospatial factors such as poor public transport service, travel costs, and travel time represent a material wall for the excluded to access an Urban Commons, putting them at a spatial disadvantage.

Additionally, Vrasti & Dayal (2016) argue that socio-demographic characteristics can discourage people from participating in an Urban Commons. This happens when the initiative's atmosphere affects commoners because of their socio-demographic traits to such an extent that they feel compelled to leave, quit, or not join the commons at all. This phenomenon is represented in the framework as immaterial barriers of access, constituting traits such as gender, ethnicity, income, age, native language, and worldview, which can put the socially excluded at a social disadvantage in accessing the commons.

Finally, the findings from this study suggest that even if there are no material or immaterial walls present, the socially excluded might still be at a systemic disadvantage to access Urban Commons because of an ecosystem wall that increases the entry barrier to the commoning world. Citizens who are not privileged to have the resources, knowledge, and skills to establish, grow, and manage a commons face greater risks of never being able to do so because there are no commons incubators, no commons legal consultants, and no organizational management and operations trainings.

The other side of the coin: Urban Commons Ecosystems could also offer public-collective partnerships as policy options for urban planners and promote social inclusion. While not studying Urban Commons Ecosystems in particular, Steele & Derven (2015) found a symbiotic relationship between diversity & inclusion (D&I), and innovation ecosystems. Case in point, recent studies by Cukier et al. (2022), Senyo et al. (2021), and Eckhardt et al. (2017) have found that innovation ecosystems have been found to promote the inclusion of underprivileged groups.

Therefore, poor or lacking capacity-building services that support citizens to start or join a commons are considered ecosystem walls for the socially excluded to access Urban Commons. While nothing more than empirical observation, most people in managing or coordinating roles the author talked to during field visits to the case study commons spoke Dutch natively, were white, and seemed highly educated.



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Concluding Remarks

As a final note, this section summarizes the findings and highlights the academic and social implications of the study. Furthermore, it reflects on the research process and its limitations, and suggests future research directions.

5.1 Conclusions

This section revisits the motivation for this study and the research approach. Finally, it connects the research results to the main research question, "How do geospatial, social, and policy factors relate to Urban Commons' potential to drive social inclusion from an accessibility perspective?".

Urban Commons' many benefits (Feinberg et al., 2021, 2020) have been suggested as an alternative to achieving the Sustainable Development Goal 11 of more inclusive and sustainable cities (Eidelman & Safransky, 2021). However, these initiatives can only drive inclusion and equity if vulnerable social groups can access them. However, few studies have investigated the accessibility of Urban Commons explicitly, and there is no consensus in the literature on whether commons drive social inclusion.

This research deployed a mix-method approach to a case study in Amsterdam's De Meent platform, aiming to contribute to the academic debate. In a Material Access Stream, quantitative methods were used to explore the material (i.e., mobility-related) accessibility to Urban Commons and answer SQ1 and SQ2. In a parallel Immaterial Access Stream, SQ3 and SQ4 were answered by surveying participants of the case study initiatives about their perceptions of immaterial (i.e., socio-demographic) factors influencing access and the benefits of commoning. Finally, in a Policy Confluence, an expert in commons-oriented policies from the Municipality of Amsterdam was interviewed to understand the barriers and opportunities to design policies that leverage the benefits of Urban Commons, thus answering SQ5.

Starting the Material Access Stream, machine learning classification algorithms were applied to geospatial, census, and case study data to answer SQ1, "How are the locations of Urban Commons related to social and spatial factors in Amsterdam?". The findings reveal that three out of four commons in the case study are located in newly (re)developed neighborhoods where Non-Western migrants comprise a higher share of the population than the city average and where average household income is lower than the national average.

SQ2, "How are social and spatial factors related to material access to Urban Commons in Amsterdam?" was answered by looking at the travel time to an Urban Commons on foot, by bike, by car, and by public transport. It was estimated that over 90% of Amsterdam residents could reach a case study Urban Commons within 15 minutes. Additionally, people with non-Western migration backgrounds took significantly less time to access a commons compared to other ethnicities across all studied modes of transport.

In the Immaterial Access Stream, a survey was deployed to participants of the case study initiatives to answer SQ3, "How do immaterial factors influence the accessibility to Urban Commons in Amsterdam?". Over 80% of the respondents claimed never to consider immaterial factors as barriers to access. Furthermore, twice as many respondents (21%) perceive material factors, such as travel time and costs, as occasional, frequent, or very frequent barriers of access than immaterial factors (10%).

The same survey was used to address SQ4, "What impact do Urban Commons have in the lives of users, and how does that differ by initiative type and social group?". A thematic analysis revealed that the most significant change in participants' lives after joining Urban Commons was the sense of community it provides. In addition, Neighborhood Commons participants' average rating of the benefits of commoning was higher (8.44 out of 10.00) than those of other types of initiatives

(7.75 out of 10.00). Furthermore, over 60% of respondents reported feeling more included in society due to participating in a commons. The results indicate, therefore, Urban Commons could, indeed, facilitate inclusion, especially for economically vulnerable people, since most survey respondents have incomes below the national average.

A semi-structured interview was conducted with an expert on innovation via commons from the Municipality of Amsterdam to answer SQ5, namely “How does the Municipality of Amsterdam perceive the commons, and what barriers and opportunities are there to implement policies that take advantage of the benefits of Urban Commons, including promoting inclusion?”. The interview revealed that Amsterdam's local government actively promotes commons as a means of social innovation and aims to engage in more public-collective partnerships. However, according to the interviewee, the key challenges the local government faces in implementing policies promoting and partnering with Urban Commons revolve around the lack of a legal framework to interact with them and generalized distrust among commoning initiatives and between them and the Municipality. Conversely, the Energy Transition offers the opportunity to pilot and scale such an Urban Commons Ecosystem since there is political will, investments, and a legal framework in place.

Furthermore, an additional result from the interview was the concept of an Urban Commons Ecosystem, which seems novel to the literature. The interviewee explained that the Municipality of Amsterdam envisions establishing an Urban Commons Ecosystem to assist commons in starting, growing, and managing themselves. Policy-wise, Urban Commons Ecosystems directly address systemic issues preventing the excluded from commoning. Thus, they could represent a viable policy option for urban planners by making commons more abundant and resilient.

Results complement each other. The Material Access Stream indicates that there are few material access barriers in Amsterdam, and both SQ1 and SQ2 indicate that low-income and ethnic Non-Westerners have the best material access. Furthermore, the Immaterial Access Stream indicated that commoners do not perceive socio-demographic factors as hindrances to participation in the case study. The SQ3 results also add nuance to the Material Access Stream: even if material barriers are low, they are more often perceived by commoners than immaterial ones. Yet the profile of survey respondents in the Immaterial Access Stream and remarks by the interviewee in the Policy Confluence suggest that perhaps the socially excluded could face another barrier to access the commons. One that is not inherently associated with material or immaterial barriers: an ecosystem wall. Because SQ4 demonstrated that Urban Commons could promote social inclusion along with their socio-economic and environmental benefits, and SQ5 has highlighted the public sector's role in supporting the commons, it is essential to integrate the three accessibility perspectives from an academic and societal standpoint. This understanding led to the development of a new framework to study the potential of Urban Commons to drive inclusion from a material, immaterial, and ecosystem accessibility perspective, which was presented as a final result.

Finally, the main research question can be addressed by building on the answers to the research sub-questions. Overall, the spatial and social accessibility components relate to Urban Commons' potential to drive inclusion by acting as drivers (or barriers) for the socially excluded to reap the benefits of commoning, including the feeling of social inclusion. Policy-wise, local governments can actively leverage Urban Commons' benefits and power to drive inclusion by understanding material, immaterial, and ecosystem walls of access in their context and designing policies that mitigate these barriers. In that sense, Amsterdam seems well equipped to lead the way in employing public-collective projects to address the grand challenges of the 21st Century and become the model city regarding sustainability, collectiveness, and inclusion.

5.2 Academic and Societal Relevance

This research is tied to TU Delft's Engineering and Policy Analysis master's program. The program's cross-cut perspective is reflected in the fact that analytical data science analyses were combined with qualitative socially-oriented methods to assess the accessibility of the commons. Moreover, the multi-actor characteristic is perceived in the study's consideration of different actors, such as commoners and the local government. Lastly, the program's societal outlook can be appreciated by the fact that Urban Commons can contribute to more sustainable and inclusive cities, thereby addressing a grand challenge (UN SDG 11) at the intersection of public, private, and collective spheres. As discussed in the following sections, the added value of this study lies in its contribution both to science and society.

5.2.1 ACADEMIC REFLECTIONS AND SCIENTIFIC RELEVANCE

The study provides the first city-wide multi-initiative case study on the accessibility and inclusiveness of Urban Commons in the commons literature. It contributes to the academic debate about the Commons' power to drive inclusion uniquely by demonstrating that commoners from different social groups participating in different types of commons could feel more included because of an Urban Commons. The findings, therefore, support conclusions by authors like Park (2017), Graham (2017), Nightingale (2019), and Eidelman et al. (2021). Additionally, this research also complements consonant case studies by Gillespie (2016), Parker et al. (2017), Park et al. (2020), and Johnson et al. (2022), by demonstrating that different types of commoning initiatives can promote inclusion.

This study also found empirical evidence in agreement with Feinberg et al. (2021), Vradi & Dayal (2016), and Williams (2018), who contend that Urban Commons' accessibility is more relevant than their ownership regime in an urban context. For example, most of the initiatives studied in this study were not owned by the commoners, but were managed by them through rent, lease, or government-sponsored open calls.

This research also contributes to the commons literature by introducing Community Spaces, a new type of neighborhood commons that supplements the list of New Commons proposed by Hess (2008) and revisited by Feinberg et al. (2021). Additionally, further investigation could narrow a gap in literature found by Feinberg et al. (2021) regarding the institutional benefits of Urban Commons.

A further scientific contribution of this study is to introduce to academia the concept of Urban Commons Ecosystems as a policy based on the interview with a policy-maker. Despite the recent and growing interest in social innovation ecosystems in Latin America (Alcaide Lozano et al., 2019; Andion et al., 2022) and Europe (Audretsch et al., 2022; Domanski et al., 2020), an ecosystem of and for commons represents uncharted academic waters.

Finally, this study proposes a new framework to study Urban Commons' inclusivity from the perspective of access. Theoretically, the framework integrates accessibility concepts from the urban planning and social sciences fields, connecting them to the social commons' inclusion

debate. Methodologically, it offers researchers a comprehensive approach to investigating spatial, social, and policy factors influencing Urban Commons' accessibility and inclusivity using both quantitative and qualitative methods. Both theoretically and methodologically, the framework contributes to the state-of-the-art.

5.2.2 SOCIETAL RELEVANCE

In addition to its scientific contributions, this study is also of societal relevance. The document highlights how policy-makers can unleash and leverage Urban Commons' social, economic, and environmental benefits. Furthermore, analyzing several often interconnected initiatives instead of focusing on just one initiative further highlighted Urban Commons' role in society as an active social movement.

As for the findings, they indicate that Urban Commons can indeed promote a sense of social inclusion. Commoning initiatives can, therefore, provide policy-makers with an alternative method of addressing socio-spatial disparities. What is more, the results corroborate with the Municipality of Amsterdam's focus on ecosystem-oriented policies to promote Urban Commons, since the material and immaterial barriers of access seem low.

Indeed, the interview with a representative of the Municipality of Amsterdam shed light on how city administration can go beyond public-private partnerships and collaborate with citizens to address large and complex issues. Public-collective projects can be used to address local issues and, as a positive side-effect, promote social inclusion, strengthen local resilience, and enhance trust in local government.

Additionally, this study investigated the barriers and opportunities the local government faces in implementing policies that promote Urban Commons in Amsterdam and reap their societal benefits. In particular, an Urban Commons Ecosystem emerged as an innovative governmental policy that benefits both the commons and local governments. These insights can be helpful for urban planners around the world who are interested in integrating public-collective partnerships into projects in their contexts.

Finally, the proposed framework, which defines material, immaterial, and ecosystem barriers of access, can function as a conceptual tool for urban planners interested in Urban Commons. Considering these accessibility factors can help them develop projects that are accessible and inclusive when devising public-collective partnerships or promoting the commons in general. For example, they can assess whether the key barriers preventing access to commons refer to material, immaterial, or ecosystem barriers, and prioritize policies accordingly. Similarly, Urban Commons could also use this framework to assess the main accessibility barriers they face and mitigate them. For example, initiatives could ensure that the atmosphere of the commons does not act as an immaterial barrier for some socio-demographic groups, or, if they are aware that they lack specific organizational capacity, they might seek workshops and training. Alternatively, the framework could also enable initiatives to realize they possess organizational strengths that other commons lack and to share their knowledge and skills.

5.3 Looking Back: Limitations

This study attempted to gain a birds-eye view of Amsterdam's commons, particularly their accessibility, inclusiveness, and how the local government interacts with them – all within 25

weeks. This is, naturally, a challenging endeavor. Time and resource constraints, as well as the sheer complexity of actors and perspectives, meant some challenges were inevitable. Being aware of the drawbacks allows the findings to be more confidently and discerningly interpreted. As a result, this section highlights some of the limitations of this study regarding its methodology and data inputs.

5.3.1 METHODOLOGICAL AND OPERATIONAL LIMITATIONS

- **Focus on people who are already members of Urban Commons.** The survey was designed to capture perceptions of barriers to accessing commons by those who already participate in Urban Commons. Thus, the input data and results may be biased since they might not encounter significant barriers. For example, the fact that immaterial factors were not generally perceived as barriers could be an example of survivor bias, meaning that only people who do not face them participated in the study. However, surveying local residents who are not involved in the commons would be too resource-intensive, especially with 29 initiatives included in the case study.
- **Balance between quantitative and qualitative methods.** The panoramic analysis treated 29 unique initiatives as similar objects of study, representing a trade-off. As a result, while it offered a city-wide perspective ideal for municipal policy analysis, it was bound to miss on detail and nuance of each initiative. The context and type of each initiative were explored whenever possible to provide more context to the analysis and mitigate that problem.
- **Assuming commoners only participate in the nearest available commons.** Urban Commons' innately local nature was factored in the model by assuming people would participate in the nearest commons available to them. However, people may decide to go to a faraway initiative instead of the nearest commons. An alternative method to calculating accessibility, where the mean time to reach a commons is assessed, would have been suitable if that were the general case.
- **Resistance and distrust by commoners.** In the case study, the author encountered a certain resistance to academia. Most people the author met during field visits seemed uneasy and distrustful at first, sometimes even disdainful of the research project. However, the commoners were much more receptive to the survey after the author displayed interest in their initiative. Perhaps spending more time on-the-ground with the initiatives and commoners could bridge the distancing between commoners and researchers and reduce resistance.
- **Author's limited fluency in Dutch.** While all written interactions with Dutch-speaking commons and initiatives were made in Dutch, in-person conversations with commoners were held in English. Speaking the native language of the people interviewed or met during field visits could have facilitated conversations and generated trust from commoners more easily.

5.3.2 DATA LIMITATIONS

- **Modest sample of survey responses.** This phenomenon could be explained by a distancing between the commons and academia combined with the fact that the survey was delivered in digital form, not in person. On several occasions, the author attempted to communicate digitally with the commons and their members (e-mail, Facebook, LinkedIn), but rarely received a response or was met with hostility. For example, a Facebook user commented on a post in a commons group "*studenten zijn aso*", possibly implying that academia is interested in studying, not participating, in the commons. Perhaps more time engaging with the initiatives in person and participating in their activities would have yielded more participation.

- **Arbitrary choice of initiatives within the case study.** De Meent provided a well-defined scope for this study but also introduced bias since membership is voluntary - and arbitrary. Having a comprehensive list of Amsterdam's commons would allow a more thorough material accessibility analysis - but would also make it more challenging to assess immaterial accessibility perceived by their participants.
- **Limited sample of policy-makers interviewed.** Due to time constraints, only one expert in commons policies from the Municipality of Amsterdam was interviewed. While the interviewee's perceptions might influence the data obtained, it does represent information from an expert who has the knowledge to answer the research questions.
- **Low granularity of census data available.** The lowest resolution data census available was broken down by neighborhood. It was assumed that the population is evenly distributed within a neighborhood to address this drawback and allow for census data to be merged with more detailed spatial data.

This section highlighted some of the drawbacks and trade-offs faced in this research. Nonetheless, such limitations are intrinsic to analyzing complex or wicked problems. Thus, the results should not be interpreted as absolute truths, but as an exploration of a particular context. In light of this, the following section concludes this report by proposing future works.

5.4 Looking Ahead: Future Work

Although this research has contributed to the academic debate about Urban Commons' accessibility and inclusiveness, the reflections from Sections 5.1 to 5.4 reveal that there are still new research avenues yet to be explored. As such, five recommendations for further research are provided:

- **Replicate the study with an extended scope.** An analysis with enough resources to conduct extensive on-the-ground research and investigate a broader case study in Amsterdam would address many limitations mentioned in Section 5.3. For example, a larger sample of people surveyed (including commoners and other citizens) and policy-makers interviewed could yield more robust results, mainly referring to the Immaterial Access Stream. It is particularly important to consider both the perceptions of commoners and non-participants in the Immaterial Access Stream in order to reduce bias and improve robustness.
- **Conduct additional case studies using the proposed research framework.** By following the proposed research framework, this study could be replicated in various contexts, with the addition of a method to investigate ecosystem barriers. It would be possible to compare social, spatial directly, and policy components of accessibility in cities with a flourishing or scarce commons movement, both in similar socio-economic contexts (such as European cities) and in dissimilar ones (such as Latin American cities).
- **Perform a systems analysis of the case study.** This work highlighted a complex network of actors with different power and interests related to Urban Commons in Amsterdam. A systems analysis could further clarify the complexities of commons-oriented policies in Amsterdam, especially as they relate to a Commons Ecosystem and the interconnections between public, private, and collective actors. A systems analysis could also provide a first glimpse into the current ecosystem barriers present in this case study, which could then be fleshed out using a framework to study Urban Commons Ecosystems.
- **Develop a framework to study Urban Commons Ecosystems.** This research has uncovered an overarching ecosystem policy in the makings in Amsterdam, aimed at fostering new

commoning initiatives and promoting public-collective projects. This represents a unique opportunity for researchers to study commons ecosystems as they are being piloted in practice. A first step could be developing a framework for future research, possibly based on Sgaragli's (2014) model to describe social innovation ecosystems, which encompasses not only relevant actors (originally government, industry, academia, and civil society, with the obvious addition of commons), but also systemic complexity and system resilience.

- **Further investigate how unique characteristics of each type of New Commons relate to social, spatial, and ecosystem accessibility factors.** While this research has focused on the general social and spatial heterogeneity of access to Urban Commons, differences depending on the type of Urban Commons were noted and briefly discussed. A dedicated study could uncover the underlying characteristics of different types of commons that explain the differences in socio-spatial accessibility and perceived benefits.

These recommendations aim to advance the study of Urban Commons from a practical and policy-oriented perspective. A better understanding of Urban Commons' characteristics, benefits, accessibility, inclusiveness, and relationship with the private and public spheres can aid policy makers in promoting more inclusive and sustainable cities.



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07.

Appendices

7.1 Case Study

7.1.1 TABULAR VIEW OF ANALYZED URBAN COMMONS

Table 3 | Urban Commons considered in this research's case study by New Commons type and sub-type

New Commons Type	New Commons Subtype	Initiative Name	District	Resource	Self-Declared Type
Neighborhood Commons	Community Garden Commons	Buurttuinen Transvaal	Oost	Garden	Food, Public Space
		De Kaskantine	Nieuw-West	Garden	Food, Energy, Socio-Cultural Space
		I can change the world with my two hands	West	Garden	Food
		Moestuinvereniging Proefeiland	Nieuw-West	Garden	Food, Public Space
		Stadsboerderij Osdorp	Nieuw-West	Garden	Food, Public Space
		Voedseltuin IJplein	Noord	Garden	Food
	Community Spaces Commons*	Ru Paré	Nieuw-West	Building	Socio-Cultural Space
	Homeless Habitat Commons	Stichting Het Koffiehuis Amsterdam	Centrum	Building	Public Space, Socio-Cultural Space
	Housing Commons: Apartment Communities	Bajesdorp	Oost	Area	Housing, Public Space
		De Groene Gemeenschap	Oost	Building	Housing
		de Nieuwe Meent	Oost	Building	Housing
		DeKerk	Noord	Building	Housing, Socio-Cultural Space
		Joe's Garage	Oost	Building	Housing, Socio-Cultural Space
		NieuLand	Oost	Building	Housing, Socio-Cultural Space
		OT301	West	Building	Housing, Socio-Cultural Space
		Ruigoord	Westpoort	Area	Housing, Socio-Cultural Space
Housing Commons: Homeowners Association		Boloboost	West	Neighborhood's atmosphere	Public Space, Digital
Parks & Greenery Commons		Buurtcamping Betondorp	Oost	Park	Public Space
	Buurtcamping Frankendael	Oost	Park	Public Space	

		Buurtcamping Martin Luther Kingpark	Zuid	Park	Public Space
		Buurtcamping Noorderpark	Noord	Park	Public Space
		Buurtcamping Park Egeldonk	Zuidoost	Park	Public Space
		Buurtcamping Rembrandtpark	Nieuw-West	Park	Public Space
		Buurtcamping Sloterpark	Nieuw-West	Park	Public Space
		Buurthaven	Noord	Area	Public Space
		Lucas Community	Nieuw-West	Urban Greenery	Food, Public Space
Market Commons	Exchange Commons	Foodcoop Noord	Noord	Local Groceries Market	Food
		VOKOMOKUM	Centrum	Local Groceries Market	Food
Cultural Commons	Non-Profit Organization	Taste Before You Waste	Centrum	Local Surplus Groceries	Food

*Note**: Community Spaces is a New Commons category proposed in this work which is not traditionally used in the commons literature.

7.2 Material Access Stream

Materials

7.2.1 DATA SOURCES

The census variables used were chosen to identify socially and spatially segregated neighborhood, which often relate to income, ethnicity or migration background, gender and age. These also relate to “immaterial barriers of access”. Populational data was also included in the analysis for more nuance, such as neighborhood population size, expected growth and average time of residence. Table 4 displays the variables used, their dataset publication date and their data source.

Table 4 | Summary of data and data sources used in the Material Access Stream of research

Column name	Data type	Information represented	Original Data Set
Wijknaam	String	Name of the neighborhood	GEBIED_BUURTEN_EXWATER (Gemeente Amsterdam, 2022a)
Oppervlakte_m2	Float	Area of the neighborhood in square meters	GEBIED_BUURTEN_EXWATER (Gemeente Amsterdam, 2022a)
WijkID	Integer	Unique identifying code of the neighborhood	GEBIED_BUURTEN_EXWATER (Gemeente Amsterdam, 2022a)
Average Income by Household (2018)	Float	Average household yearly income of the neighborhood	3.15a Kerncijfers inkomen, 2018 1) (Gemeente Amsterdam, 2018)
Index Standardized Income (PPP, NL=100)	Float	Ratio between neighborhood average household income and the Dutch national average yearly income	3.15a Kerncijfers inkomen, 2018 1) (Gemeente Amsterdam, 2018)
Non-Western Migration Background	Float	Percentage of the neighborhood's population declaring to have a non-western migration background	1.6a Bevolking wijken en stadsdelen naar migratieachtergrond, 1 januari 2021 (Gemeente Amsterdam, 2021b)
Western Migration Background	Float	Percentage of the neighborhood's population declaring to have a western migration background	1.6a Bevolking wijken en stadsdelen naar migratieachtergrond, 1 januari 2021 (Gemeente Amsterdam, 2021b)
Dutch	Float	Percentage of the neighborhood's population declaring to have no migration background	1.6a Bevolking wijken en stadsdelen naar migratieachtergrond, 1 januari 2021 (Gemeente Amsterdam, 2021b)
Population 2021	Integer	Number of people living in the neighborhood	1.6a Bevolking wijken en stadsdelen naar migratieachtergrond, 1 januari 2021 (Gemeente Amsterdam, 2021b)
Pop Growth 2021-2050	Float	Expected percentage population growth of the neighborhood between 2021 and 2050	Prognose wijk 2022, aantal personen per 1 januari (Gemeente Amsterdam, 2022b)
Women Pop [%]	Float	Percentage of the neighborhood's population who identifies as a woman	1.1a Bevolking wijken en stadsdelen, 1 januari 2016-2021 (Gemeente Amsterdam, 2020)

Aged 0-17	Float	Percentage of the neighborhood's population aged between 0 and 17 years old	1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 (Gemeente Amsterdam, 2021a)
Aged 18-24	Float	Percentage of the neighborhood's population aged between 18 and 24 years old	1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 (Gemeente Amsterdam, 2021a)
Aged 25-49	Float	Percentage of the neighborhood's population aged between 25 and 49 years old	1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 (Gemeente Amsterdam, 2021a)
Aged 50-64	Float	Percentage of the neighborhood's population aged between 50 and 64 years old	1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 (Gemeente Amsterdam, 2021a)
Aged 65+	Float	Percentage of the neighborhood's population aged above 65 years old	1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 (Gemeente Amsterdam, 2021a)
Average residence at address (2020)	Float	Average time people live at the same address in the neighborhood	1.7a Bevolking wijken en stadsdelen en (gemiddelde) woontuur op het adres, 1 januari 2016-2020 (Gemeente Amsterdam, 2020)
Count_UC	Integer	Number of Urban Commons located in the neighborhood	Author's own collection

7.2.2 ANOVA ANALYSIS OF ACCESSIBILITY BY SOCIO-SPATIAL FACTOR

The ANOVA's F -scores, F -critical, and P -values can be seen in Table 5. If the F -score is larger than the F -critical, then the confidence interval of 95% is met, and the larger the F -score, the more that category explains differences in the accessibility across the population. The statistical significance of the test can also be confirmed by checking that P -value is smaller than α . How much the average accessibility of a socio-spatial group deviates from the global average for each mode of transport is shown in Table 5.

Table 5 | ANOVA outputs. Highest F -score by mode of transport in bold.

Mode of Transport	Category	F -score	P -value	F -critical
Walking	Gender	14.08	<0.001	3.84
	Age	326.00	<0.001	2.37
	Ethnicity background	388.98	<0.001	3.00
	Neighborhood Type	20.96	<0.001	2.61
Cycling	Gender	13.68	<0.001	3.84
	Age	447.39	<0.001	2.37
	Ethnicity background	462.06	<0.001	3.00
	Neighborhood Type	14.38	<0.001	2.61
Driving	Gender	23.26	<0.001	3.00
	Age	933.77	<0.001	2.37
	Ethnicity background	850.59	<0.001	3.84
	Neighborhood Type	55.25	<0.001	2.61
Public Transport	Gender	17.71	<0.001	3.84
	Age	487.05	<0.001	2.37
	Ethnicity background	583.35	<0.001	3.00
	Neighborhood Type	60.00	<0.001	2.61

Age and ethnic background are the categories that most explain the differences in accessibility to Urban Commons across all modes, as shown by their comparatively high F -scores. Regarding age, the people between 25 and 49 years old have significantly better access than the other age groups across all modes of transport. Indeed, this age category is the only one to have a negative deviation in relation to the global average for all means of transportation. The average travel time until a commons is the longest for people aged over 65 years.

7.2.3 ACCESSIBILITY AND POPULATIONAL COVERAGE BY TYPE OF URBAN COMMONS

This sub-section describes the results found during the analysis of material accessibility by Urban Commons initiative and New Commons type. The first step in this analysis was categorizing each hexagon cell in Amsterdam according to the Urban Commons u which represents the fastest commoning initiative to reach. Drawing from the transport accessibility literature, these areas were called the catchment area of an Urban Commons u . In other words, an Urban Common's catchment area is the region or regions where it is the most accessible commoning initiative available.

Once each initiative's catchment area was defined, the mean accessibility of each Urban Commons was calculated by averaging the accessibility scores of its catchment area, and its populational coverage was considered as the sum of the population of its catchment area. This consisted of iterating over all Urban Commons u initiatives in the case study and averaging the accessibility of all hexagons cells from which given Urban Commons u is the fastest to reach. Additionally, each catchment area's average Index Standardized Income (ISI) was also calculated. The results, which can be seen in Table 6, are highly localized, as they provide insight into the accessibility, population size and income pertinent to potential members or participants of each initiative.

Table 6 | Average accessibility by Urban Commons, and share of total population and average ISI by initiative's catchment area

Initiative by New Commons type	Catchment area's average accessibility				Catchment area indicators	
	Walking	Cycling	Transit	Driving	Population	ISI
Community Garden	26.74	7.72	17.98	5.58	18.84%	1.11
Buurttuinen Transvaal	18.89	5.97	13.84	6.21	0.97%	1.09
De Kaskantine	30.17	8.57	18.82	5.80	7.83%	1.20
I can change the world with my two hands	19.40	6.54	13.50	4.51	2.20%	1.02
Moestuinvereniging Proefeiland	29.47	8.13	22.13	4.98	5.22%	1.09
Stadsboerdereij Osdorp	20.77	6.06	13.53	6.43	2.56%	0.99
Voedseltuin IJplein	45.49	12.07	29.11	8.15	0.07%	1.03
Community spaces	18.28	5.26	12.67	4.99	2.21%	0.91
Ru Paré	18.28	5.26	12.67	4.99	2.21%	0.91
Exchange commons	16.59	5.46	12.98	6.61	3.13%	1.16
Foodcoop Noord	17.22	5.14	13.92	3.98	0.70%	0.96
VOKOMOKUM	16.26	5.63	12.49	7.99	2.43%	1.26
Homeless habitat	18.91	6.29	13.87	6.96	3.74%	1.13
Stichting Het Koffiehuis Amsterdam	18.91	6.29	13.87	6.96	3.74%	1.13
Housing, apartment communities	45.76	12.14	30.98	7.44	24.70%	1.15
Bajesdorp	58.04	16.60	28.68	7.25	2.99%	1.11
De Groene Gemeenschap	32.45	9.95	23.42	6.51	2.35%	1.12
de Nieuwe Meent	14.88	4.43	11.70	4.84	2.60%	1.16
DeKerk	47.22	12.66	38.46	8.25	8.59%	1.32
Joe's Garage	25.44	7.21	16.26	5.58	0.37%	1.05
NieuwLand	17.50	5.48	13.11	5.36	3.66%	1.04
OT301	18.89	5.88	12.43	8.11	3.69%	1.67
Ruigoord	61.10	14.58	32.88	6.97	0.45%	0.71
Housing, Homeowners association	75.06	16.12	34.13	7.44	3.13%	0.80
BoLoBoost	75.06	16.12	34.13	7.44	3.13%	0.80

Non-Profit Organization	16.26	5.63	12.49	7.99	2.43%	1.26
Taste before you waste	16.26	5.63	12.49	7.99	2.43%	1.26
Parks & Greenery	32.75	10.26	21.24	6.54	41.83%	0.95
Buurtcamping Betondorp	16.70	5.25	11.42	3.44	1.24%	0.98
Buurtcamping Frankendael	20.00	6.50	15.12	4.27	1.19%	1.03
Buurtcamping Martin Luther Kingpark	24.75	7.02	20.70	7.40	3.17%	1.25
Buurtcamping Noorderpark	30.09	9.67	19.82	6.78	5.80%	0.99
Buurtcamping Park Egeldonk	42.90	12.57	23.83	7.08	20.72%	0.84
Buurtcamping Rembrandtpark	18.64	6.32	11.81	4.45	1.23%	0.97
Buurtcamping Sloterpark	29.12	11.45	22.49	5.95	5.33%	0.80
Buurthaven	16.91	5.16	11.24	5.52	0.60%	0.98
Lucas Community	31.41	9.75	23.13	6.81	2.55%	1.10
Grand Total	39.06	10.72	24.96	6.86	100.00%	1.05

The initiatives with the best accessibility within its catchment areas include De Nieuwe Meent, VOKOMOKUM and Taste Before You Waste, Buurtcamping Betondorp, and Buurthaven, all with a walking accessibility of under 17 minutes. Interestingly, among this group there are initiatives located in Type 0, 1 and 3 neighborhoods.

While Ruigoord is the spatially segregated initiative on the map, when considering the catchment areas, it has only the second worst multi-modal accessibility. It is BoLoBoost the initiative with poorest accessibility in its vicinity. Considering it is a neighborhood's residents association located in a socio-economically vulnerable area, the accessibility of the people residing in BoLoBoost's catchment area but who live in a different neighborhood is in reality even poorer, as they are likely not participating in BoLoBoost.

Not only do Ruigoord and BoLoBoost have the poorest accessibility, but their catchment areas also have the lowest ISI among all studied initiatives. These datapoints are, however, outliers, and do not represent the entire population. A correlation analysis shows there are a slight negative correlation between an Urban Common's catchment area's household income and the travel time by means of walking (-0.34), cycling (-0.33) and public transport (-0.21). Conversely, a region's driving time until the nearest Urban Commons has a mild positive correlation with that region's household income (0.38).

Another outlier is the Buurtcamping Park Egeldonk, which is the nearest Urban Commons for roughly 21% of Amsterdam's population, whose average ISI is 0.84. It is the only initiative located in Zuidoost, a large and physically separated district of Amsterdam with a large low-income population with a migration background. It explains the outlier second peak observed in Figure 13.a), which highlighted that a substantial portion of Amsterdam's population has an unusually poor walking accessibility to Urban Commons. Indeed, given the Buurtcamping events only happen a few times a year, most of the time Zuidoost citizens simply can't find a commoning initiative in their own district and would fall under Bajesdorp's catchment area. Nonetheless, despite the poor comparative accessibility, in absolute terms, the travel times by cycling and public transport still fall under 16 and 35 minutes.

An interesting picture is also painted when accounting for the initiative's types according to the New Commons. Regarding accessibility scores, Housing commons, which include Apartment Communities and Homeowners Associations, are the types of commons with the worst average access for their catchment areas, with average travel times larger than 45 minutes on foot and 15 minutes on a bike. Conversely, the types of New Commons with the best accessibility across

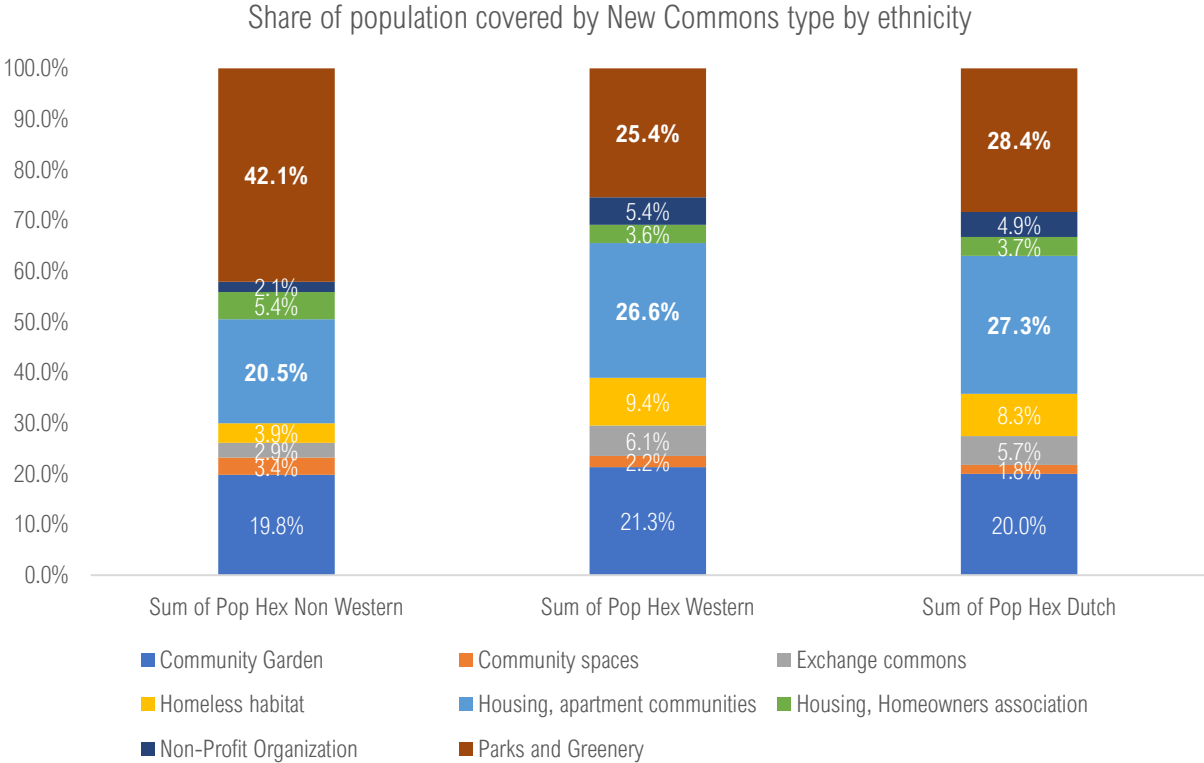
modes are the Exchange Commons and the Non-Profit Organizations, which in reality account for only three initiatives, Foodcoop Noord, VOKOMOKUM and Taste Before You Waste - all of which are food-related and cover the population with the highest household income.

Concerning population by type of commons' catchment area, for more than 60% of the population, the most accessible types commoning initiative are Community Garden, and Parks & Greenery, both of which have median accessibility scores when compared to other types of commons. Another type of commons covering a large portion of the population is Apartment Communities, which is the fastest type of commons to reach for 25% of Amsterdam's residents.

In terms of ethnic group, a breakdown of the population by ethnicity for each type of New Commons reveals that Apartment Communities have a disproportionate larger population of native Dutch ethnicity, while Parks & Greenery face an analogous situation for those with a Non-Western migration background. Indeed, Parks & Greenery seem to be the type of neighborhood most accessible to more vulnerable socio-demographics, as it is only type of commons whose catchment area has an average household income lower than the national average is Parks & Greenery.

Moreover, people of Non-Western ethnicity also represent a particularly small share of the population in the catchment area of Exchange Commons, Non-Profit Organizations and Homeless Habitat. The former two consist mainly of food-related commons, while the latter refers to Het Koffiehuis, a unique initiative in the shopping district of Haarlemmerbuurt. Indeed, a much larger share of the Non-Western ethnic Population lives in the catchment area of a Parks & Greenery (40%) than the Western (25%) and native Dutch (28%), as reflected in Figure 24. This can be attributed to the large population of Non-Western ethnicity living in Zuidoost, the entirety of which falls under the Buurtcamping Egeldonk's catchment area. Proportionally to their populations, though, more than twice as many people with native Dutch and Western ethnicities live within the catchment area of a food-related initiative compared non-Westerners.

Figure 24 | A disproportionately large share of the ethnically Non-Western population lives closer to Parks & Greenery commons than to other types of more frequently occurring initiatives



The findings of this subsection provide more insight and nuance to the results found thus far in this study. They indicate that Parks & Greenery, Apartment Communities and Community Garden are the types of commons most accessible in terms of material accessibility for almost 80% of the population. They also underscore the fact that not all socio-demographic groups have equal material access to all types of New Commons in this case study. In particular, food-related initiatives, either in the form of organic cooperative markets or anti-food waste organizations, are the more accessible to more socially privileged ethnicities, and also count with the lowest average travel time across modes. Conversely, apartment communities’ catchment population must travel the longest to reach an initiative and is predominantly of native Dutch ethnicity. Finally, it was also uncovered that the Zuidoost district of Amsterdam, whose population account for over 20% of Amsterdam’s total, falls entirely within the catchment area of Buurtcamping Egeldonk, an initiative located in its very northeast corner, indicating a lack of commoning opportunities in the district.

7.3 Immaterial Access Stream Materials

7.3.1 DATA MANAGEMENT PLAN

TPM Msc Thesis: A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam

0. Administrative questions

1. Name of data management support staff consulted during the preparation of this plan.

My faculty data steward, Nicolas Dintzner, has reviewed this DMP on the 22nd of March 2022. Moreover, the privacy team has also been consulted on March 29, 2022.

2. Date of consultation with support staff.

2022-03-22

I. Data description and collection or re-use of existing data

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

Type of data	File format(s)	How will data be collected (for re-used data: source and terms of use)?	Purpose of processing	Storage location	Who will have access to the data
Amsterdam GIS data	.csv files	Re-use of open data from the Municipality of Amsterdam's open geodata portal (GEBIED_BUURTEN_EXWATER , CC BY)	To understand the spatial properties of Amsterdam and visually correlate them with other variables	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)

Amsterdam income data by neighborhood	.csv files	Re-use of open data from the Municipality of Amsterdam's open data portal (3.15a Kerncijfers inkomen, 2018 1 , CC BY)	To understand the spatial distribution of income in Amsterdam and correlate it with other variables	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Amsterdam population migration background by neighborhood	.csv files	Re-use of open data from the Municipality of Amsterdam's open data portal (1.6a Bevolking wijken en stadsdelen naar migratieachtergrond, 1 januari 2021 , CC BY)	To understand the spatial distribution of varying migration backgrounds in Amsterdam and correlate it with other variables	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Amsterdam population age groups by neighborhood	.csv files	Re-use of open data from the Municipality of Amsterdam's open data portal (1.2a Bevolking wijken en stadsdelen naar leeftijdsgroepen, 1 januari 2021 , CC BY)	To understand the spatial distribution of varying population age groups in Amsterdam and correlate it with other variables	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)

List and contact of Urban Commons members of the DeMeent organization	.doc	Collected from publicly available data on DeMeent's website and the member Urban Commons' publicly available information	To define a list of initiatives to investigate geospatially and to identify the Urban Commons in which to conduct a survey with their members	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Type and Location of Urban Commons members of the DeMeent organization	.csv files	Collected from publicly available data on DeMeent's website	To understand the spatial distribution of Urban Commons in Amsterdam and correlate it with other variables	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Survey questions to Urban Commons members on income, ethnicity, gender, religion, residence neighborhood, perceived access to, and perceived impact of Urban Commons	.csv files	Developed based on literature to capture data on the accessibility and impact of Urban Commons and the demographic profile of its members in a single survey	To collect the demographic profile of Urban Commons users in Amsterdam, which barriers of access do they perceive to the Urban Commons they participate in, and how the Urban Commons impact their lives	Qualtrics and OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)

Anonymized data on income, ethnicity, gender, religion, and residential neighborhood of Urban Commons members	.csv files	online survey	To understand the relationship between Urban Commons' geospatial location, their members' demographic profile, and how that correlates with other variables	Qualtrics and OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Anonymized data on perceived access and impact of Urban Commons	.csv files	online survey	To understand the relationship between Urban Commons' geospatial location, how accessible they are, and how impactful they are, and how that correlates with other variables	Qualtrics and OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
List of interview participants	.doc	professional and academic network	To identify a point of contact at the municipality of Amsterdam to interview	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)

interview recording data	.mp3	Recording from a live or virtual interview with a representative from the Municipality of Amsterdam	To collect the challenges and opportunities to leverage Urban Commons to drive social inclusion from a policy-making standpoint	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Anonymized interview summary	.doc files	Transcribed from the interview recording	To summarize key findings from the interview	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)
Master thesis	.pdf	record of the process, documentation, and reporting results	To provide long term documentation	OneDrive	The project team (the MSc. student and the Graduation Committee: Trivik Verma, Juliana Gonçalves, Amineh Ghorbani. and Igor Pessoa.)

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

- < 250 GB

II. Documentation and data quality

5. What documentation will accompany data?

- README file or other documentation explaining how data is organised
- Methodology of data collection

The methodology will be detailed in the body of the thesis's text. Only high-level data aggregated data analysis will be shared with the thesis (for example, statistical data, or found relationships between an Urban Commons location, its user's demographic profile, and its accessibility) and potentially also in an Excel file with graphics pulling from highly aggregated data. In addition, anonymized summary notes and key quotes from the interview will also be made available.

The individual survey responses (which won't capture the respondents' names or personal information) will not be shared.

The full interview transcript will also not be made available.

III. Storage and backup during research process

6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

- Another storage system - please explain below, including provided security measures
- OneDrive

All the data and subsequent analysis will be stored in OneDrive (via my TU Delft student Microsoft account). This includes the geospatial and .CSV re-use files obtained from the municipality of Amsterdam's open data portal, the results of the surveys with members of the Urban Commons initiatives, and the recording and transcript of the interview with a representative from the municipality of Amsterdam.

During the period of time when the survey will be open for responses, the answers will also be hosted in Qualtrics.

This decision has been made after consulting with the data steward and the privacy team: my student's personal OneDrive offers the right balance between functionality, shareability among the team, and privacy. Moreover, Qualtrics has also been approved because of its highly customizable anonymization features. While Qualtrics is a US-based software, no personal data will be captured or stored in the survey, so its use complies with GDPR.

IV. Legal and ethical requirements, codes of conduct

7. Does your research involve human subjects or 3rd party datasets collected from human participants?

- Yes

8A. Will you work with personal data? (information about an identified or identifiable natural person)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice. You can also check with the [privacy website](#) or contact the privacy team: privacy-tud@tudelft.nl

- Yes

Data coming from interactions with other people will be collected in a survey with members of Urban Commons initiatives pertaining to the DeMeent organization, and in an interview with a representative from the municipality of Amsterdam.

Survey part

The survey will be conducted virtually and voluntarily with members of each Urban Commons initiative identified within the DeMeent Organization. The only personal information captured is the e-mail address of the participants, which it will not be a mandatory field but rather an optional one, as a way to reach out to the winner of a draw for a gift card. Note that the e-mail address will not be captured during the survey in Qualtrics, but is rather a piece of information that will be collected if a respondent sends the corresponding researcher an email asking to join the draw for a gift card.

To avoid respondents being identified based on their answers, the survey will be anonymized and analyzed on an aggregated level (by Urban Commons initiative and by neighborhood). The row-to-row data will be deleted after use.

Interview

For the interview with the representative of the municipality, personal information such as name and contact will be collected (also for the purposes of informed consent), but it will be deleted after use. An anonymized summary of the interview will be made available as an appendix to the MSc. thesis.

8B. Will you work with any types of confidential or classified data or code as listed below? (tick all that apply)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice.

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

9. 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. If this is not the case, you can use the example below.

The datasets underlying the published papers will be publicly released following the TU Delft Research Data Framework Policy under CCBY license. Only high-level, aggregated data summaries will be made available to avoid publishing any information that could make survey or interview respondents identifiable.

During the active phase of research, the project leader from TU Delft will oversee the access rights to data (and other outputs), as well as any requests for access from external parties. They will be released publicly no later than at the time of publication of the corresponding master thesis.

10. Which personal data will you process? Tick all that apply

- Photographs, video materials, performance appraisals or student results
- Names and addresses
- Data collected in Informed Consent form (names and email addresses)
- Signed consent forms
- Special categories of personal data (specify which): race, ethnicity, criminal offence data, political beliefs, union membership, religion, sex life, health data, biometric or genetic data
- Gender, date of birth and/or age
- Email addresses and/or other addresses for digital communication

Survey part

For the volunteer online survey with members of Urban Commons initiatives who are members of the DeMeent organization, information related to their demographics will be asked, including:

- Gender (Male, Female, Other, prefer not to answer)
- Age group (0-17, 18-24, 25-44, 45-65, 65+, prefer not to answer)
- Income range (for example, 0-1500 EUR/month, 1500-3000 EUR/month, etc., prefer not to answer)
- Ethnicity (Native Dutch, Western-background, Non-Western-Background, prefer not to answer)

In addition to asking respondents about the personal data above, the survey will ask them to express quantitatively how do they perceive those socio-cultural traits to affect their access to the Urban Commons they are a member of (for example, in a scale from 1 to 7), and will also be asked what was the most significant change in their lives after joining the initiative.

Moreover, respondents will have the opportunity to voluntarily inform an e-mail address to have a chance to win a gift card, which will be randomly drawn to one of the participants. Please note that they will be shown the corresponding researchers's email address and will have the opportunity to send an email informing they'd like to join the draw. This means that the personal information collected (the email address) will not be linked to survey responses.

The raw data will be analyzed, processed, and aggregated to the Urban Common initiative and Neighborhood level. The granular data containing potentially personally identifiable information will be deleted after use.

Only statistical summaries will be made publicly available and the raw data will be deleted after use.

Interview part

Regarding the interview with a representative from the municipality of Amsterdam, the results will be anonymized and steps will be taken to avoid identifying the respondent. Only a summary of the interview will be published, and the personal data will be deleted after use.

11. Please list the categories of data subjects

Survey part

Users of Urban Commons initiatives that are members of the [DeMeent organization](#). First, DeMeent will be contacted so the umbrella organization can share the survey with its members, then each member initiative will be contacted to reinforce the ask to roll out the survey to its users.

Interview part:

Staff working at the municipality of Amsterdam.

12. Will you be sharing personal data with individuals/organisations outside of the EEA (European Economic Area)?

- No

15. What is the legal ground for personal data processing?

- Informed consent

Survey part

All survey respondents will have to read the opening statement and are assumed to take the survey voluntarily.

Interview part

When it comes to the interview, the interviewee will be asked for their written consent for taking part in the study and for data processing before the start of the interview

16. Please describe the informed consent procedure you will follow:

All study participants will be asked for their written consent for taking part in the study and for data processing before the start of the interview.

Survey

For the survey, informed consent will be obtained by clicking OK on a question asking if respondents read the opening statement, and by respondents completing the survey.

Interview

Proof of consent will be obtained by signing the consent form, via confirmation in email, and in the beginning of the interview

17. Where will you store the signed consent forms?

- Same storage solutions as explained in question 6

18. Does the processing of the personal data result in a high risk to the data subjects?

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 during your research (check all that apply).

If two or more of the options listed below apply, you will have to [complete the DPIA](#). Please get in touch with the privacy team: privacy-tud@tudelft.nl to receive support with DPIA.

If only one of the options listed below applies, 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.

If you have any additional comments, please add them in the box below.

- Matching or combining datasets

The responses of the survey will be aggregated to the Urban Commons initiative level and analyzed to understand how socio-cultural traits correlate with their perception of access to and impact of Urban Commons. These results will be then compared with the results from the geospatial analysis of the location and mobility options in the vicinity of each Urban Commons initiative.

The results of the geospatial analysis will include classifications and clusters of neighborhoods in Amsterdam according to census data on socio-cultural factors such as residents' average income, ethnicity, and age profile. Moreover, it will show in which

neighborhood type (or cluster) each Urban Commons initiative is located.

The results of the survey will be aggregated to paint a picture of the socio-cultural profile of the users of the Urban Commons, how do they perceive their socio-cultural traits affect their access to the Urban Commons they are a member of, and how impactful has this membership been to their lives.

The results from the survey (for example, average income, dominant ethnic profile, perceived accessibility and impact) will be aggregated by Urban Commons initiative and will be compared to the aggregated results from the neighborhood the initiative is located in, which was obtained in the geospatial analysis. For example, comparing the average income range of neighborhood X with the average income range of an initiative Y located in neighborhood X, or comparing the mobility access to initiative Y versus the perceived access to it.

In that sense, no personal data or granular data which can lead to personal identification will be compared with any other dataset. The granular row data from the survey will be aggregated before analysis, and will be deleted after use.

19. Did the privacy team advise you to perform a DPIA?

- No

Quoting the privacy team:

"My conclusion based on the documentation and information you've sent to the Privacy team is that it is not necessary to perform a DPIA, because the processing of personal data in your project is not likely to create a high risk to the rights and freedoms of the participants. I therefore took in consideration that there are no vulnerable subjects involved in the project and that the sensitive data is collected anonymously."

22. What will happen with personal research data after the end of the research project?

- Anonymised or aggregated data will be shared with others

Anonymized and aggregated data will be shared in the form of statistical summaries and interview summaries, but granular and personal data will be destroyed, including:

- row answers from survey results
- email addresses for the gift card draw
- consent forms
- interview recordings
- list of participants

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

- Yes, in consent form - please explain below what you will do with data from

participants who did not consent to data sharing

The data will be anonymized but the data from participants who don't wish to share their data will be disregarded.

V. Data sharing and long-term preservation

27. Apart from personal data mentioned in question 22, will any other data be publicly shared?

- All other non-personal data (and code) underlying published articles / reports / theses

The master thesis containing aggregated results will be shared. Additional aggregated and high-level data statistical summaries will also be made available, in such a way that the average results of the survey questions related to personal information are correlated to different Urban Commons initiatives or Amsterdam neighborhoods. An anonymized summary of the interview will also be made available.

29. How will you share research data (and code), including the one mentioned in question 22?

- All anonymised or aggregated data, and/or all other non-personal data will be uploaded to 4TU.ResearchData with public access

30. How much of your data will be shared in a research data repository?

- < 100 GB

31. When will the data (or code) be shared?

- As soon as corresponding results (papers, theses, reports) are published

Published together with the MSc. thesis.

32. Under what licence will be the data/code released?

- CC BY

VI. Data management responsibilities and resources

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

- Yes, the only institution involved

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

The thesis's advisor and head of the Center for Urban Science and Policy, Trivik Verma (t.verma@tudelft.nl).

35. 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)?

4TU.ResearchData is able to archive 1TB of data per researcher per year free of charge for all TU Delft researchers. We do not expect to exceed this and therefore there are no additional costs of long-term preservation.

At least 5% of the time allocation of the corresponding researcher will be dedicated to proper documentation and management of the data and related processes.

7.3.2 CHECKLIST FOR HUMAN RESEARCH

Delft University of Technology
HUMAN RESEARCH ETHICS
CHECKLIST FOR HUMAN RESEARCH
(Version January 2022)

IMPORTANT NOTES ON PREPARING THIS CHECKLIST

1. An HREC application should be submitted for every research study that involves human participants (as Research Subjects) carried out by TU Delft researchers
2. Your HREC application should be submitted and approved **before** potential participants are approached to take part in your study
3. All submissions from Master's Students for their research thesis need approval from the relevant Responsible Researcher
4. The Responsible Researcher must indicate their approval of the completeness and quality of the submission by signing and dating this form OR by providing approval to the corresponding researcher via email (included as a PDF with the full HREC submission)
5. There are various aspects of human research compliance which fall outside of the remit of the HREC, but which must be in place to obtain HREC approval. These often require input from internal or external experts such as [Faculty Data Stewards](#), [Faculty HSE advisors](#), the [TU Delft Privacy Team](#) or external [Medical research partners](#).
6. You can find detailed guidance on completing your HREC application [here](#)
7. Please note that incomplete submissions (whether in terms of documentation or the information provided therein) will be returned for completion **prior to any assessment**
8. If you have any feedback on any aspect of the HREC approval tools and/or process you can leave your comments [here](#)

I. Applicant Information

PROJECT TITLE:	A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam
Research period: <i>Over what period of time will this specific part of the research take place</i>	February 2022 – August 2022
Faculty:	TPM
Department:	EPA
Type of the research project: <i>(Bachelor's, Master's, DreamTeam, PhD, PostDoc, Senior Researcher, Organisational etc.)</i>	Master's thesis
Funder of research: <i>(EU, NWO, TUD, other – in which case please elaborate)</i>	-
Name of Corresponding Researcher: <i>(If different from the Responsible Researcher)</i>	Ettore de Lacerda Arpini
E-mail Corresponding Researcher: <i>(If different from the Responsible Researcher)</i>	E.deLacerdaArpini@student.tudelft.nl
Position of Corresponding Researcher: <i>(Masters, DreamTeam, PhD, PostDoc, Assistant/ Associate/ Full Professor)</i>	Master's student
Name of Responsible Researcher: <i>Note: all student work must have a named Responsible Researcher to approve, sign and submit this application</i>	Trivik Verma
E-mail of Responsible Researcher: <i>Please ensure that an institutional email address (no Gmail, Yahoo, etc.) is used for all project documentation/ communications including Informed Consent materials</i>	T.Verma@tudelft.nl
Position of Responsible Researcher : <i>(PhD, PostDoc, Associate/ Assistant/ Full Professor)</i>	Assistant professor

II. Research Overview

NOTE: You can find more guidance on completing this checklist [here](#)

a) Please summarise your research very briefly (100-200 words)

What are you looking into, who is involved, how many participants there will be, how they will be recruited and what are they expected to do?

Add your text here – (please avoid jargon and abbreviations)

As the urban population grows worldwide, cities are becoming increasingly unequal and segregated. In this context, Urban Commons emerge as a potential driver of inclusion and resilience for urbanites. However, it is still unclear whether the benefits of Urban Commons are distributed fairly among demographics, or whether they ultimately remain inaccessible to the culturally and socioeconomically vulnerable. Therefore, the goal of this study is to analyze the relationship between space, demographics, and urban commons to identify the material and immaterial barriers to access them and ultimately understand whether urban commons can work, policy-wise, as a driver for social inclusion of vulnerable groups.

The thesis will consist of a case study of an umbrella organization in Amsterdam, called DeMeent. It currently counts with about 30 Urban Commons member initiatives.

The methods consist of three different streams of research:

1. A quantitative analysis of the mobility access to these Urban Commons in Amsterdam, using census, transport, and other open data sources.
2. A qualitative analysis of the perceived barriers of access and impact to Urban Commons in Amsterdam, using digital surveys with the members of the 30 Urban Commons that are part of the DeMeent. The objective here is to capture the "immaterial barriers" of access, which include socio-demographic factors, such as ethnicity, age, and income.
3. An exploratory interview with a contact from the Municipality of Amsterdam to understand what are the potential opportunities and challenges in designing policies that leverage Urban Commons as a means to drive social inclusion.

- b) **If your application is an additional project** related to an existing approved HREC submission, please provide a brief explanation including the existing relevant HREC submission number/s.

Add your text here – (please avoid jargon and abbreviations)

- c) **If your application is a simple extension of, or amendment to,** an existing approved HREC submission, you can simply submit an [HREC Amendment Form](#) as a submission through LabServant.

III. Risk Assessment and Mitigation Plan

NOTE: You can find more guidance on completing this checklist [here](#)

Please complete the following table in full for all points to which your answer is “yes”. Bear in mind that the vast majority of projects involving human participants as Research Subjects also involve the collection of **Personally Identifiable Information (PII)** and/or **Personally Identifiable Research Data (PIRD)** which may pose potential risks to participants as detailed in Section G: Data Processing and Privacy below.

To ensure alignment between your risk assessment, data management and what you agree with your Research Subjects you can use the last two columns in the table below to refer to specific points in your Data Management Plan (DMP) and Informed Consent Form (ICF) – **but this is not compulsory**.

It’s worth noting that **you’re much more likely to need to resubmit your application if you neglect to identify potential risks**, than if you identify a potential risk and demonstrate how you will mitigate it. If necessary, the HREC will always work with you and colleagues in the Privacy Team and Data Management Services to see how, if at all possible, your research can be conducted.

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
A: Partners and collaboration						
1. Will the research be carried out in collaboration with additional organisational partners such as: <ul style="list-style-type: none"> One or more collaborating research and/or commercial organisations Either a research, or a work experience internship provider¹ <i>¹if yes, please include the graduation agreement in this application</i>		X				
2. Is this research dependent on a Data Transfer or Processing Agreement with a collaborating partner or third party supplier? <i>If yes please provide a copy of the signed DTA/DPA</i>		X				
3. Has this research been approved by another (external) research ethics committee (e.g.: HREC and/or MREC/METC)? <i>If yes, please provide a copy of the approval (if possible) and summarise any key points in your Risk Management section below</i>		X		Already reviewed by the privacy team and currently being reviewed by the Ethics Committee		
B: Location						

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
4. Will the research take place in a country or countries, other than the Netherlands, within the EU?		X				
5. Will the research take place in a country or countries outside the EU?		X				
6. Will the research take place in a place/region or of higher risk – including known dangerous locations (in any country) or locations with non-democratic regimes?		X				
C: Participants						
7. Will the study involve participants who may be vulnerable and possibly (legally) unable to give informed consent? (e.g., children below the legal age for giving consent, people with learning difficulties, people living in care or nursing homes.)		X				
8. Will the study involve participants who may be vulnerable under specific circumstances and in specific contexts, such as victims and witnesses of violence, including domestic violence; sex workers; members of minority groups, refugees, irregular migrants or dissidents?	X		The surveys will be conducted voluntarily with members of the Urban Commons initiatives within the DeMeent organization. Because members are not selected but rather decide to participate themselves, there is the possibility that people vulnerable under specific circumstances participate and feel emotional or mental discomfort during the process.	No personal data will be collected and no question in the survey will specifically collect data about the vulnerabilities of the respondents. The participants can quit the study at any point in time and can request the data to be deleted immediately.	6, 8a, 10	
9. Are the participants, outside the context of the research, in a dependent or subordinate position to the investigator (such as own children, own students or employees of either TU Delft and/or a collaborating partner organisation)? <i>It is essential that you safeguard against possible adverse consequences of this situation (such as allowing a student's failure to participate to your satisfaction to affect your evaluation of their coursework).</i>		X				
10. Is there a high possibility of re-identification for your participants? (e.g., do they have a very specialist job of which there are only a small number in a given country, are they members of a small community, or employees from a partner company collaborating in the research? Or are they one of only a handful of (expert) participants in the study?	X		There is a possibility of re-identification by inference if there is a small number of participants in the survey and there are outlier answers for specific demographic questions (ethnicity, income, etc.)	<ul style="list-style-type: none"> No personal data will be collected in the surveys Personal data will be destroyed after use in the interview In the survey, high risk information will be asked in the form of broad groups (e.g.: 'dutch ethnicity', 'western background' and 'non-western background' as options to 'ethnicity'). The privacy team has judged this to result in no high risk information being collected. 	10, 11,18,22	

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
				<ul style="list-style-type: none"> Row data from the surveys will be aggregated to the Urban Commons initiative or neighborhood level and analyzed with that level of granularity. Individual survey responses will be deleted. 		
D: Recruiting Participants						
11. Will your participants be recruited through your own, professional, channels such as conference attendance lists, or through specific network/s such as self-help groups	X		The interviewee will be invited based on a selection of potential participants coming from an analysis of knowledgeable professionals working at the Municipality of Amsterdam. There is the possibility that the selection is biased to people in the network. Moreover, there is the risk of identification of the participant by connecting them to TU Delft.	<ul style="list-style-type: none"> In order to select the interviewee, an analysis will be conducted to identify employees at the Municipality of Amsterdam with the most knowledge and insight into the research questions, going beyond those staff members who already have a connection to TU Delft. The analysis will take into consideration public information on the Municipality's staff, in addition to specific network connections with TU Delft. To mitigate reidentification, personal data will only be collected in the Informed Consent Form, and will be deleted after use. The recording will be move to a safe cloud storage and will be deleted from the local device. Only a summarized anonymized summary of the interview will be made public, and the original interview and transcripts will be deleted before the Master's thesis is published. 	8a, 11, 16,	
12. Will the participants be recruited or accessed in the longer term by a (legal or customary) gatekeeper? (e.g., an adult professional working with children; a community leader or family member who has this customary role – within or outside the EU; the data producer of a long-term cohort study)		X				
13. Will you be recruiting your participants through a crowd-sourcing service and/or involve a third party data-gathering service, such as a survey platform?	X		Qualtrics will be used as the survey platform. It is an US-based company and therefore there is the risk of personal data breach.	<ul style="list-style-type: none"> Complying with GDPR, no personal information will be collected or stored in Qualtrics. This will be done by not asking any personal information in the survey, not even the email address to participate in the draw for the gift card. 	8a, 11, 16,	
14. Will you be offering any financial, or other, remuneration to participants, and might this induce or bias participation?	X		A bol.com gift card will be drawn randomly and given to participants who wish to join the draw. To contact	<ul style="list-style-type: none"> To curb both risks, both risks, participation in the draw is voluntary and made external to the 	8a, 10, 22,	

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
			the participant, an email address will be collected. This could lead to the risk of re-identification and to respondents bias based on the money incentive.	survey. At the end of the survey, participants will be informed of the draw and told that if they want to participate, they can send an email to the corresponding researcher requesting participation. <ul style="list-style-type: none"> Therefore, the email addresses will not be connected to survey responses, thus keeping the answers anonymous. Moreover, by asking participants to send an email and only informing about the survey at the end, this also disincentivizes double participating and participating for the potential prize only 		
E: Subject Matter <i>Research related to medical questions/health may require special attention. See also the website of the CCMO before contacting the HREC.</i>						
15. Will your research involve any of the following: <ul style="list-style-type: none"> Medical research and/or clinical trials Invasive sampling and/or medical imaging Medical and <i>In Vitro Diagnostic Medical Devices</i> Research 		X				
16. Will drugs, placebos, or other substances (e.g., drinks, foods, food or drink constituents, dietary supplements) be administered to the study participants? <i>If yes see here to determine whether medical ethical approval is required</i>		X				
17. Will blood or tissue samples be obtained from participants? <i>If yes see here to determine whether medical ethical approval is required</i>		X				
18. Does the study risk causing psychological stress or anxiety beyond that normally encountered by the participants in their life outside research?		X				
19. Will the study involve discussion of personal sensitive data which could put participants at increased legal, financial, reputational, security or other risk? (e.g., financial data, location data, data relating to children or other vulnerable groups) <i>Definitions of sensitive personal data, and special cases are provided on the TUD Privacy Team website.</i>		X				
20. Will the study involve disclosing commercially or professionally sensitive, or confidential information? (e.g., relating to decision-making processes or business strategies which might, for example, be of interest to competitors)		X				

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
21. Has your study been identified by the TU Delft Privacy Team as requiring a Data Processing Impact Assessment (DPIA)? <i>If yes please attach the advice/ approval from the Privacy Team to this application</i>		X				
22. Does your research investigate causes or areas of conflict? <i>If yes please confirm that your fieldwork has been discussed with the appropriate safety/security advisors and approved by your Department/Faculty.</i>		X				
23. Does your research involve observing illegal activities or data processed or provided by authorities responsible for preventing, investigating, detecting or prosecuting criminal offences <i>If so please confirm that your work has been discussed with the appropriate legal advisors and approved by your Department/Faculty.</i>		X				
F: Research Methods						
24. Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g., covert observation of people in non-public places).		X				
25. Will the study involve actively deceiving the participants? (For example, will participants be deliberately falsely informed, will information be withheld from them or will they be misled in such a way that they are likely to object or show unease when debriefed about the study).		X				
26. Is pain or more than mild discomfort likely to result from the study? And/or could your research activity cause an accident involving (non-) participants?		X				
27. Will the experiment involve the use of devices that are not 'CE' certified? <i>Only, if 'yes': continue with the following questions:</i>		X				
<ul style="list-style-type: none"> • Was the device built in-house? • Was it inspected by a safety expert at TU Delft? <i>If yes, please provide a signed device report</i>						
<ul style="list-style-type: none"> • If it was not built in-house and not CE-certified, was it inspected by some other, qualified authority in safety and approved? <i>If yes, please provide records of the inspection</i>						
28. Will your research involve face-to-face encounters with your participants and if so how will you assess and address Covid considerations?		X				
29. Will your research involve either : a) "big data", combined datasets, new data-gathering or new data-merging techniques which might lead to re-identification of your participants and/or		X				

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
b) artificial intelligence or algorithm training where, for example biased datasets could lead to biased outcomes?						
G: Data Processing and Privacy						
30. Will the research involve collecting, processing and/or storing any directly identifiable PII (Personally Identifiable Information) including name or email address that will be used for administrative purposes only? (eg: obtaining Informed Consent or disbursing remuneration)	X		<ul style="list-style-type: none"> The collection of personal data for administrative purposes for the interview generates re-identification risk. Email addresses from survey respondents can generate the risk of re-identification. 	<ul style="list-style-type: none"> For the interview, personal data will only be collected in the Informed Consent Form, which will be stored securely in TU Delft's OneDrive for the duration of the study and will be wiped after publication. Moreover, the risk of linking the personal information from the consent forms with the answers in the interview will be mitigated by not asking personal questions during the interview, moving the interview recording and transcript to a secure cloud storage as soon as possible, and deleting them after use. The only material published from the interview will be an anonymized summary. Regarding the survey's risk of re-identification, respondent's email addresses will only be collected for those who wish to participate in a draw for a gift card. They will not provide their email address as part of the form, but rather are going to be invited to send an email to the corresponding researcher stating their wish to join the draw. As a consequence, the survey is fully anonymized and the personal information collected cannot be linked to survey responses. 	8a, 10, 18, 19, 22	
31. Will the research involve collecting, processing and/or storing any directly or indirectly identifiable PIRD (Personally Identifiable Research Data) including videos, pictures, IP address, gender, age etc and what other Personal Research Data (including personal or professional views) will you be collecting?	X		<ul style="list-style-type: none"> In the interview, professional opinion concerning opportunities and challenges for designing and implementing policies on Urban Commons to drive accessibility will be asked. 	<ul style="list-style-type: none"> For the interview, personal data will only be collected in the Informed Consent Form, which will be stored securely in TU Delft's OneDrive for the duration of the study and will be wiped after publication. Moreover, the risk of linking the personal information from the consent forms with the answers in 	8a, 10, 18, 19, 22	

			<i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>		<i>Please provide the relevant reference #</i>	
ISSUE	Yes	No	RISK ASSESSMENT – what risks could arise? <i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>	MITIGATION PLAN – what mitigating steps will you take? <i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>	DMP	ICF
				<p>the interview will be mitigated by not asking personal questions during the interview, moving the interview recording and transcript to a secure cloud storage as soon as possible, and deleting them after use. The only material published from the interview will be an anonymized summary.</p> <ul style="list-style-type: none"> Regarding the survey's risk of re-identification, respondent's email addresses will only be collected for those who wish to participate in a draw for a gift card. They will not provide their email address as part of the form, but rather are going to be invited to send an email to the corresponding researcher stating their wish to join the draw. As a consequence, the survey is fully anonymized and the personal information collected cannot be linked to survey responses. 		
32. Will this research involve collecting data from the internet, social media and/or publicly available datasets which have been originally contributed by human participants		X				
33. Will your research findings be published in one or more forms in the public domain, as e.g., Masters thesis, journal publication, conference presentation or wider public dissemination?	X		Publishing personal information carries the risk of identification of respondents, which can lead to other risks such as reputational issues	No personal information will be published. The personal data from the interviewee, captured in the Informed Consent Form, will be deleted before the study's publication, and until there will be hosted securely. In terms of the email addresses of survey respondents who wish to participate in an draw for a gift card, the data will be deleted after the draw, and it will be stores securely until then. Moreover, the email addresses cannot be link directly to specific survey answers.	8a, 10, 18, 19, 22	
34. Will your research data be archived for re-use and/or teaching in an open, private or semi-open archive?		X				

H: More on Informed Consent and Data Management

NOTE: You can find guidance and templates for preparing your Informed Consent materials) [here](#)

Your research involves human participants as Research Subjects if you are recruiting them or actively involving or influencing, manipulating or directing them in any way in your research activities. This means you must seek informed consent and agree/ implement appropriate safeguards regardless of whether you are collecting any PIRD.

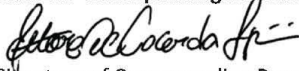
Where you are also collecting PIRD, and using Informed Consent as the legal basis for your research, you need to also make sure that your IC materials are clear on any related risks and the mitigating measures you will take – including through responsible data management.

Got a comment on this checklist or the HREC process? You can leave your comments [here](#)

IV. Signature/s

Please note that by signing this checklist list as the sole, or Responsible, researcher you are providing approval of the completeness and quality of the submission, as well as confirming alignment between GDPR, Data Management and Informed Consent requirements.

Name of Corresponding Researcher (if different from the Responsible Researcher) (print)



Signature of Corresponding Researcher: Ettore de Lacerda Arpini

Date: April 1, 2022

Name of Responsible Researcher (print)



Signature (or upload consent by mail) Responsible Researcher: Trivik Verma

Date: April 1, 2022

V. Completing your HREC application

Please use the following list to check that you have provided all relevant documentation

Required:

- **Always:** This completed HREC checklist
- **Always:** A data management plan (reviewed, where necessary, by a data-steward)
- **Usually:** A complete Informed Consent form (including Participant Information) and/or Opening Statement (for online consent)

Please also attach any of the following, if relevant to your research:

Document or approval	Contact/s
Full Research Ethics Application	After the assessment of your initial application HREC will let you know if and when you need to submit additional information
Signed, valid Device Report	Your Faculty HSE advisor
Ethics approval from an external Medical Committee	TU Delft Policy Advisor, Medical (Devices) Research
Ethics approval from an external Research Ethics Committee	Please append, if possible, with your submission
Approved Data Transfer or Data Processing Agreement	Your Faculty Data Steward and/or TU Delft Privacy Team
Approved Graduation Agreement	Your Master's thesis supervisor
Data Processing Impact Assessment (DPIA)	TU Delft Privacy Team
Other specific requirement	Please reference/explain in your checklist and append with your submission

7.3.3 INFORMED CONSENT TEXT

English version

You are being invited to participate in a research study titled *A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam*. This study is being done as part of a master thesis by Ettore Arpini from the TU Delft.

Some practical information about this survey:

- Completing the survey takes on average 10 to 15 minutes.
- This survey is completely anonymous and your participation in this study is entirely voluntary. **You can withdraw at any time.**
- After completing the survey, you'll have the chance to participate in a draw to win a 50€ Bol.com voucher.

The purpose of this study is to investigate how a certain type of citizen-led initiative, which we call Urban Commons, can promote more social inclusion. This survey is being sent to members of the [DeMeent](#) platform for Urban Commons Amsterdam to explore how different groups of society benefit and access these initiatives.

To capture that information, you will be asked about your perceptions about how easy it is for you to reach the initiative you participate in and how you benefit from it, as well as some questions about which social groups you belong to.

As with any online activity, the risk of a breach is always possible. To minimize that risk, your answers in this study will remain confidential and no personal information or individual survey responses will be published or made publicly available. All survey responses will be deleted after the study is complete.

You can research the research team through the following contact details:

- Ettore Arpini (corresponding researcher): E.deLacerdaArpini@student.tudelft.nl
- Trivik Verma (responsible researcher): T.Verma@tudelft.nl
- Amineh Ghorbani (advisor): A.Ghorbani@tudelft.nl
- Juliana Gonçalves (advisor): j.e.goncalves@tudelft.nl
- Igor Pessoa (advisor): i.tempelsmorenopessoa@uva.nl

By clicking through to the online survey and completing all mandatory questions in the survey, you are agreeing to this Opening Statement and providing informed consent to your participation.

Dutch version

U bent uitgenodigd om deel te nemen aan het onderzoek: *A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam*. Dit onderzoek wordt uitgevoerd door Ettore Arpini van de TU Delft.

Wat praktische informatie over deze enquête:

- De enquête is volledig anoniem end uw deelname aan dit onderzoek is geheel vrijwillig. **U kunt zich op elk moment terugtrekken.**
- Het volledig invullen van de enquête kost u ongeveer 10 - 15 minuten.
- Na het invullen van de enquête maak je kans op een Bol.com waardebon van 50€.

Het doel van dit onderzoek is om te onderzoeken hoe een bepaalde type gemeenschapsinitiatieven, Urban Commons, sociale inclusie kunnen bevorderen. Deze enquête wordt verstuurd naar leden van het [DeMeent](#) platform voor Urban Commons in Amsterdam om te onderzoeken hoe verschillende groepen in de samenleving profiteren van en toegang hebben tot deze initiatieven.

Om deze informatie te verzamelen zal u gevraagd worden naar uw perceptie over het gemak waarmee u het initiatief waaraan u deelneemt kan bereiken en hoe u er voordeel uit haalt, evenals enkele vragen over tot welke sociale groepen u behoort.

Zoals bij elke online activiteit is het risico van een databreuk aanwezig. Om dat risico tot een minimum te beperken, blijven uw antwoorden in deze studie vertrouwelijk en worden geen persoonlijke gegevens of individuele antwoorden op de enquête gepubliceerd of publiekelijk beschikbaar gesteld. Alle antwoorden op de enquête worden na afloop van het onderzoek gewist.

U kunt contact opnemen met het onderzoeksteam via de volgende contactgegevens:

- Ettore Arpini (corresponderende onderzoeker): E.deLacerdaArpini@student.tudelft.nl
- Trivik Verma (verantwoordelijke onderzoeker): T.Verma@tudelft.nl
- Amineh Ghorbani (advisor): A.Ghorbani@tudelft.nl
- Juliana Gonçalves (advisor): j.e.goncalves@tudelft.nl
- Igor Pessoa (advisor): i.tempelsmorenopessoa@uva.nl

Door door te klikken naar de online-enquête en alle verplichte vragen in de enquête in te vullen, gaat u akkoord met deze openingsverklaring en geeft u op geïnformeerde wijze toestemming voor uw deelname.

7.3.4 LETTER OF APPROVAL

Date 13-Apr-2022
Contact person Dr. Cath Cotton, Policy Advisor Academic Integrity
E-mail c.m.cotton@tudelft.nl



Human Research Ethics Committee
TU Delft
(<http://hrec.tudelft.nl/>)

Visiting address
Jaffalaan 5 (building 31)
2628 BX Delft

Postal address
P.O. Box 5015 2600 GA Delft
The Netherlands

Ethics Approval Application: A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam
Applicant: Lacerda Arpini, Ettore De

Dear Ettore De Lacerda Arpini,

It is a pleasure to inform you that your application mentioned above has been approved.

Please note that this approval is subject to your ensuring that the following conditions are fulfilled: 1) Please clarify in the IC what DeMeent's role is, incl. whether they have access to data; 2) Please clarify whether IP addresses are collected for the online survey; 3) Please consider whether it is necessary to publish summaries and whether it is possible to give participants the opportunity to assess them before publication. Please make sure this is clear in the IC.

Good luck with your research!

Sincerely,

Dr. Ir. U. Pesch
Chair HREC
Faculty of Technology, Policy and Management

7.3.5 FULL SURVEY QUESTIONS

Section 1: You and your Urban Commons <i>These first few questions aim to understand which groups of people are participating in the initiatives we're studying and how they are doing so</i>		Sectie 1: U en uw Urban Commons (UC) <i>Deze eerste paar vragen hebben als doel te begrijpen welke groepen mensen deelnemen aan de initiatieven die we bestuderen en hoe ze dat doen</i>		
Question	Answer options	Enquêtevraag	Antwoordoptie	
1	<p>Which of the following initiatives do you participate in or are a member of?</p> <p>The rest of the survey will be referring to the initiative you select.</p>	List of DeMeent Urban Commons	<p>Aan welk van de volgende initiatieven neemt u deel of bent u onderdeel van?</p> <p>De rest van de enquête zal verwijzen naar het initiatief dat u selecteert.</p>	[List of DeMeent Urban Commons]
2	How often do you visit or participate in the initiative?	<ul style="list-style-type: none"> • Less often than once every three months • Once every 2 - 3 months • Once a month • Once every 2 – 3 weeks • Once a week • Multiple times in a week • Everyday 	Hoe vaak bezoekt u of neemt u deel aan het initiatief?	<ul style="list-style-type: none"> • Minder dan eens in de drie maanden • Eens per 2 - 3 maanden • Eens per maand • Eens per 2 – 3 weken • Een keer per week • Meerdere keren per week • Elke dag
3	At what times do you usually visit the initiative?	<ul style="list-style-type: none"> • Before work hours • During work hours • After work hours • Multiple times a day • Every weekend • Sometimes in the weekend 	Op welke tijden bezoekt u het initiatief meestal?	<ul style="list-style-type: none"> • Voor werktijd • Tijdens werkuren • Na werktijd • Meerdere keren per dag • Elk weekend • Soms in het weekend
4	On an average day, how do you usually go to this initiative?	<ul style="list-style-type: none"> • On foot • By bike • By car 	Hoe ga je op een gemiddelde	<ul style="list-style-type: none"> • Te voet • Met de fiets • Met de auto

		<ul style="list-style-type: none"> • By public transport • Combination of the above 	dag naar dit initiatief?	<ul style="list-style-type: none"> • Met het openbaar vervoer • Combinatie van bovenstaande
5	On an average day, how long do you usually take to arrive at this UC?	<ul style="list-style-type: none"> • Less than 5 minutes • 5-10 minutes • 10-15 minutes • 15-25 minutes • More than 25 minutes 	Hoelang doet u er meestal over om bij deze UC aan te komen op een gemiddelde dag?	<ul style="list-style-type: none"> • Minder dan 5 minuten • 5-10 minuten • 10-15 minuten • 15-25 minuten • Meer dan 25 minuten
6	In which Neighborhood of Amsterdam do you live?	• List of Wijken in Amsterdam + “Outside of Amsterdam”	In welke wijk van Amsterdam woon je?	[List of Wijken in Amsterdam + “Outside of Amsterdam”]
7	What is your age group?	<ul style="list-style-type: none"> • 18 or under • 19-25 • 25-45 • 45-65 • 65 or over 	In welke leeftijdsgroep valt u?	<ul style="list-style-type: none"> • 18 jaar of jonger • 19-25 jaar • 25-45 jaar • 45-65 jaar • 65 jaar of ouder
8	What gender do you identify with?	<ul style="list-style-type: none"> • Female • Male • Other 	Met welk geslacht identificeert u zich?	<ul style="list-style-type: none"> • Vrouwelijk • Mannelijk • Ander
9	What is your estimated annual income range?	<ul style="list-style-type: none"> • Less than 15000€ • 15000€ to 30000€ • 30000€ to 40000€ • 40000€ to 50000€ • More than 50000€ 	Wat is uw geschatte jaarinkomen?	<ul style="list-style-type: none"> • Minder dan 15000€ • 15000€ tot 30000€ • 30000€ tot 40000€ • 40000€ tot 50000€ • Meer dan 50000€
10	What is your ethnic background?	<ul style="list-style-type: none"> • Native Dutch • Western • Non-Western 	Wat is uw etnische achtergrond?	<ul style="list-style-type: none"> • Autochtone Nederlander • Westerse migratieachtergrond • Niet-westersre migratieachtergrond

11	What is your native language?	<ul style="list-style-type: none"> • Dutch • Other: specify which 	Wat is uw moedertaal?	<ul style="list-style-type: none"> • Nederlands • Anders: specificieer welke
Section 2: Your Urban Commons and its impact on your life <i>These questions aim to understand the impact the initiative has on your life</i>		Sectie 2: Uw Urban Commons en de impact ervan op uw leven <i>Deze vragen zijn bedoeld om inzicht te krijgen in de impact die het initiatief op uw leven heeft</i>		
	Question	Answer options	Enquêtevraag	Antwoordoptie
12	What was the most significant change in your life triggered by joining or participating in the initiative?	Free write	Wat was de belangrijkste verandering in je leven door je aan te sluiten bij of deel te nemen aan dit initiatief?	[free write]
13	<i>How do you rate the value of the benefits of participating in the initiative?</i>	<ul style="list-style-type: none"> • Very high • High • Moderate • Low • Very Low • None 	Hoe beoordeelt u de waarde van de voordelen van deelname aan dit initiatief op een schaal van 0 (geen waarde) tot 10 (zeer hoge waarde)?	<ul style="list-style-type: none"> - Zeer hoog - Hoog - Gemiddeld - Laag - Zeer laag - Geen <p>0 - 10 = 0 geen waarde 5 = gematigd 10 - zeer hoge waarde</p>
14	To which extent do you agree or disagree with the following statements:		In hoeverre bent u het eens of oneens met de volgende stellingen:	
14 ^a	<i>I feel like I am a member of a community by participating in the initiative</i>	<ul style="list-style-type: none"> • Strongly disagree • Disagree • Undecided • Agree • Strongly agree 	Ik heb het gevoel dat ik lid ben van een gemeenschap door deel te nemen aan dit initiatief	<ul style="list-style-type: none"> • Zeer mee oneens • Oneens • Onbeslist • Mee eens • Zeer mee eens
14 ^b	<i>I feel more included in society as a whole by participating in the initiative</i>	<ul style="list-style-type: none"> • Strongly disagree • Disagree • Undecided • Agree • Strongly disagree 	Ik voel me meer onderdeel van de samenleving door deel te nemen aan dit initiatief	<ul style="list-style-type: none"> • Zeer mee oneens • Oneens • Onbeslist • Mee eens • Zeer mee eens
Section 3: Barriers of access			Sectie 3: Toegangsbelemmeringen	

The following questions aim to capture understand how what are the potential barriers of access to the initiatives we're studying		De volgende vragen zijn bedoeld om inzicht te krijgen in de mogelijke belemmeringen voor de toegang tot de initiatieven die we bestuderen		
	Question	Answer options	Enquêtevraag	Antwoordoptie
15	What factors make you wish to continue to participate in <i>the initiative</i> ?	Free text	Welke factoren maken dat u wilt blijven deelnemen aan dit initiatief?	[free write]
16	What factors would make you stop participating in <i>the initiative</i> ?	Free text	Welke factoren zouden ervoor zorgen dat u stopt met deelnemen aan dit initiatief?	[free write]
17	Which of the following factors make you feel welcome at <i>the initiative</i> ?	<ul style="list-style-type: none"> • Most of the other members of this initiative are of the same gender as me. • Most of the other members of this initiative have a similar political leaning as I do. • Most of the other members of the initiative have a similar income as I do. • Most of the other members of the initiative have the same native language as me. • The age of most of the other members of the initiative is similar to mine. • Most of the other members of the initiative have a similar worldview to me. • Most of the other members of the initiative have a 	Welke van de volgende factoren maken dat u zich welkom voelt bij dit initiatief?.	<ul style="list-style-type: none"> • De meeste andere leden van dit initiatief hebben hetzelfde geslacht als ik. • De meeste andere leden van dit initiatief hebben een vergelijkbare politieke voorkeurs als ik. • De meeste andere leden van het initiatief hebben een vergelijkbaar inkomen als ik. • De meeste andere leden van het initiatief hebben dezelfde moedertaal als ik. • De meeste andere leden van het initiatief hebben een vergelijkbare leeftijd als ik. • De meeste andere leden van het initiatief hebben een vergelijkbaar wereldbeeld als ik. • De meeste

		<p>similar ethnic background to me.</p> <ul style="list-style-type: none"> • Other factors affect how welcome I feel. Please specify which: 		<p>andere leden van het initiatief hebben een vergelijkbare etnische achtergrond als ik.</p> <ul style="list-style-type: none"> • Andere factoren hebben invloed op hoe welkom ik me voel. Gelieve te specificeren welke:
18	To which extent do you agree or disagree with the following statements:		In hoeverre bent u het eens of oneens met de volgende stellingen:	
18 ^a	I feel discouraged to participate in <i>the initiative</i> because of my income	<ul style="list-style-type: none"> • Very Frequently • Frequently • Occasionally • Rarely • Very Rarely • Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn inkomen	<ul style="list-style-type: none"> • Zeer vaak • Vaak • Af en toe • Zelden • Zeer zelden • Nooit
18 ^b	I feel discouraged to participate in <i>the</i> $\{q://QID8/ChoiceGroup/SelectedChoices\}$ initiative because of my age	<ul style="list-style-type: none"> • Very Frequently • Frequently • Occasionally • Rarely • Very Rarely • Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn leeftijd	<ul style="list-style-type: none"> • Zeer vaak • Vaak • Af en toe • Zelden • Zeer zelden • Nooit
18 ^c	I feel discouraged to participate in <i>the initiative</i> because of my ethnic background	<ul style="list-style-type: none"> • Very Frequently • Frequently • Occasionally • Rarely • Very Rarely • Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn etnische achtergrond	<ul style="list-style-type: none"> • Zeer vaak • Vaak • Af en toe • Zelden • Zeer zelden • Nooit
18 ^d	I feel discouraged to participate in <i>the initiative</i> because of my political inclination	<ul style="list-style-type: none"> • Very Frequently • Frequently • Occasionally • Rarely • Very Rarely • Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn politieke voorkeur	<ul style="list-style-type: none"> • Zeer vaak • Vaak • Af en toe • Zelden • Zeer zelden • Nooit
18 ^e	I feel discouraged to participate in <i>the initiative</i> because of my native language	<ul style="list-style-type: none"> • Very Frequently • Frequently • Occasionally • Rarely • Very Rarely • Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn moedertaal	<ul style="list-style-type: none"> • Zeer vaak • Vaak • Af en toe • Zelden • Zeer zelden • Nooit
18 ^f	I feel discouraged to participate in <i>the initiative</i> because of time it takes to get there	<ul style="list-style-type: none"> • Very Frequently • Frequently 	Ik voel me ontmoedigd om deel te	<ul style="list-style-type: none"> • Zeer vaak • Vaak

		<ul style="list-style-type: none"> ● Occasionally ● Rarely ● Very Rarely ● Never 	nemen aan dit initiatief vanwege de reistijd	<ul style="list-style-type: none"> ● Af en toe ● Zelden ● Zeer zelden ● Nooit
¹⁸ _g	I feel discouraged to participate in <i>the initiative</i> because of the cost to do it	<ul style="list-style-type: none"> ● Very Frequently ● Frequently ● Occasionally ● Rarely ● Very Rarely ● Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege kosten	<ul style="list-style-type: none"> ● Zeer vaak ● Vaak ● Af en toe ● Zelden ● Zeer zelden ● Nooit
¹⁸ _h	I feel discouraged to participate in <i>the initiative</i> because of my gender	<ul style="list-style-type: none"> ● Very Frequently ● Frequently ● Occasionally ● Rarely ● Very Rarely ● Never 	Ik voel me ontmoedigd om deel te nemen aan dit initiatief vanwege mijn geslacht	<ul style="list-style-type: none"> ● Zeer vaak ● Vaak ● Af en toe ● Zelden ● Zeer zelden ● Nooit

7.3.6 RESPONDENT'S PROFILE

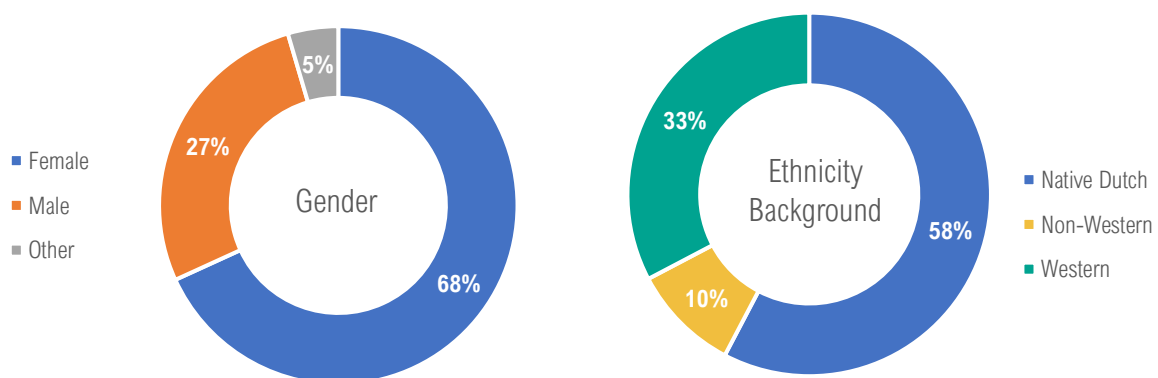
This section reports the responses obtained in Section 1 of the survey, describing the socio-demographic profile of the respondents and their pattern of participation in the Urban Commons. During a period of one month, 64 responses were obtained, 49 of which completed the entire survey.

7.3.6.1 Socio-Demographics

The average respondent is a woman of native Dutch ethnicity, who is between 25 and 45 years and earns between 15,000.- € and 30,000.- €. As seen in Figure 25, which breaks down survey respondents by gender and ethnicity background, 68% of the respondents identified as women, 27% as man, and 5% as other. Ethnicity-wise, just over four in ten respondents were native Dutch, while 32% migration background from Western countries and 7% from Non-Western ones. Out of the 44 responses regarding native language, 14 (32%) people claimed to speak a native language other than Dutch and 12 of those declared to be of Western-migration background.

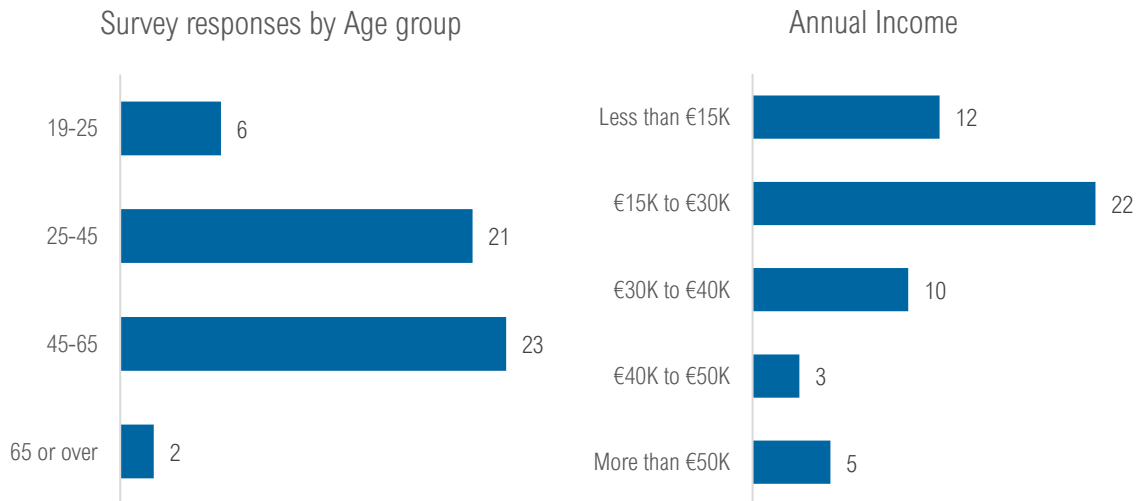
Concerning the age of the respondents, the bulk of the responses come from people aged 25-44 (45%) and 45 to 64 (41%). There were six responses from people aged 19 to 25 (9%) and two from respondents older than 65 (3%). The distribution of responses by income range and age group can be inspected in Figure 26.

Figure 25 | The vast majority of survey respondents identify as women and have no recent migration background



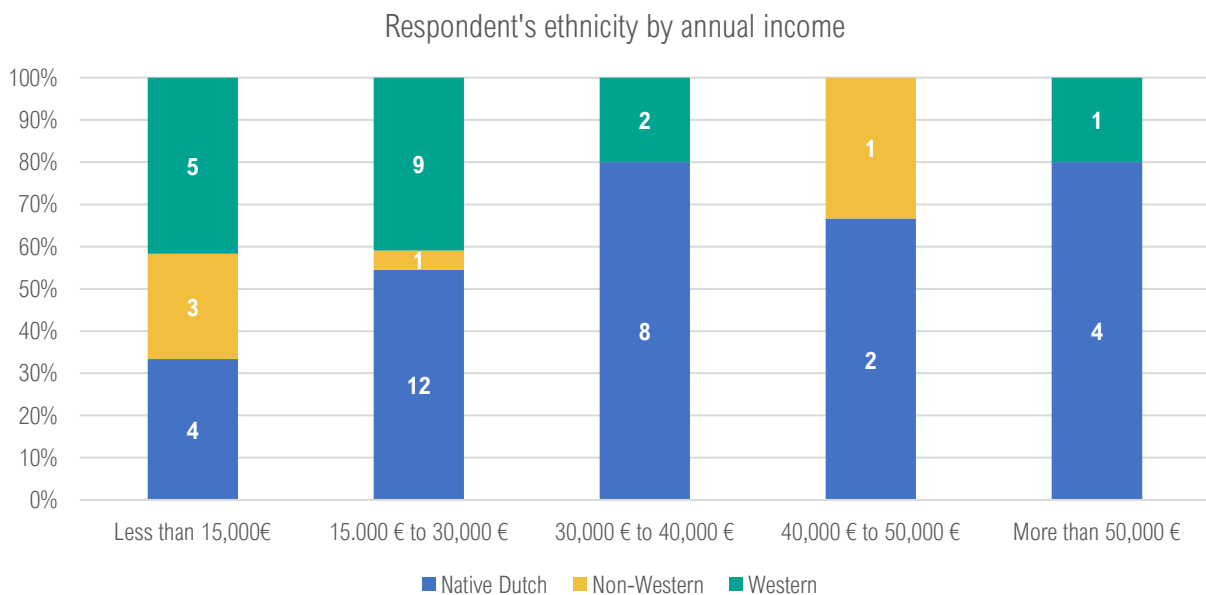
The mode answer for the respondent's yearly income was between 15.000,- € and 30.000.- €. An inspection of the income distribution reveals that 62% of the respondents earn less than Amsterdam's individual income average of 39.000,- € (Gemeente Amsterdam, 2018). Yet, at least 5 commoners who responded the survey (7%) are at the other end of the spectrum and have an annual income higher than 50,000,- €.

Figure 26 | Most survey respondents are adults earning between 15,000.- € and 30,000.- €



As can be seen in the column chart of Figure 27, most of the respondents earning less than 15,000.- € are of Western ethnicity. Compared with the responses from people with a native Dutch background, which are spread across all income ranges, the responses from people with a migration background fall predominantly within the lower income categories. In particular, most respondents in the lowest income bracket reported a Western migration background, and all the respondents declaring that ethnicity also reported to speak a different native language than Dutch. Although the sample size hinders the statistical significance of the findings, these results suggest that the commons are indeed accessible to the more vulnerable population, at least economically.

Figure 27 | Most survey respondents with a migration background earn less than 30,000.- € a year



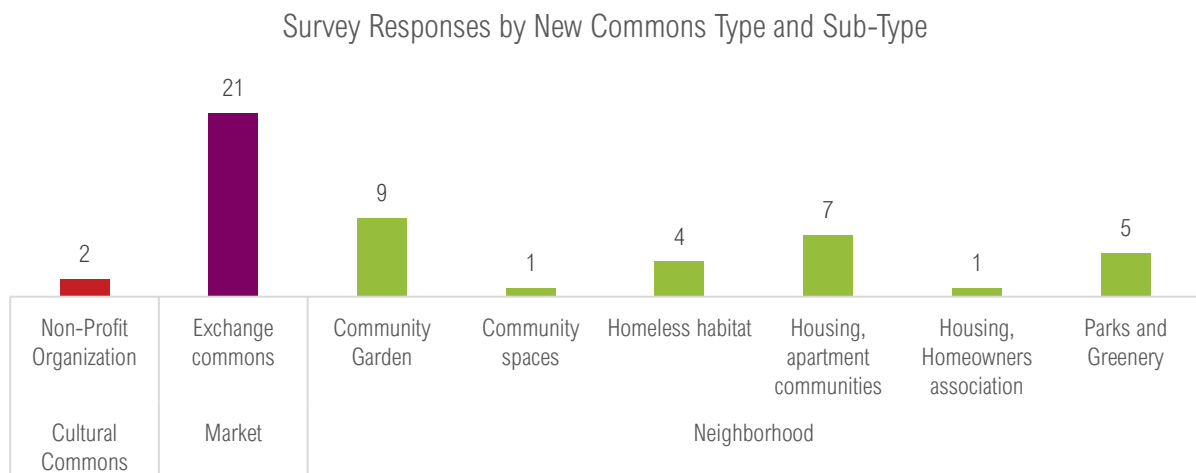
In order to better explore the survey results within their context, it is important to understand which Urban Commons from the case study are represented in the responses.

7.3.6.2 Urban Commons Participation

While it was expected that few to no responses would be obtained from the Lucas Community, De Kerk, and all buurtcamping initiatives, as these commons are currently on hold or had no meetings planned for the duration of this study, there were no responses from participants of De Groene Gemeenschap, De Kaskantine, I Can Change the World with my Two Hands, Lucas Community, De Kerk, Moestuinvereniging Proefeiland, Ruigoord, and Stadsboerderij Osdorp, as well as from any of the buurtcamping initiatives except for Buurtcamping Sloterdijk. The initiatives with highest uptake are VOKOMOKUM, Buurttuinen Transvaal, and Stichting Het Koffiehuis, with 19, 8, and 7 responses each.

Both VOKOMOKUM and Buurttuinen Transvaal are categorized as primarily food commons on DeMeent. Following that categorization, therefore, initiatives related to food represent 64% of the sample (32 responses), followed by those self-labeled as public spaces (10 responses, or 20%), housing (7 or 14%) and only one response from a socio-cultural space (2%). Following Feinberg et al.'s (2021) reviewed categories of New Commons, these two initiatives fall under the exchange commons sub-type, which means that although there were many more neighborhood commons in the case study, market and neighborhood commons are similarly represented in the survey's sample (42% and 54%, respectively), as can be observed in Figure 28 | Despite the low number of initiatives, market commons account for two in every five survey response, which depicts the number of responses by New Commons type and sub-type.

Figure 28 | Despite the low number of initiatives, market commons account for two in every five survey responses



The underrepresentation of neighborhood commons is due not only to the high VOKOMOKUM and Buurttuinen Transvaal's high response rate, but also due to the low uptake of community gardens, apartment communities, and Parks & Greenery, as seen in Table 7. Moreover, half of the responses (27 or 54%) refer to Urban Commons located in Type 3 neighborhoods, whereas there are 16 (32%) and 6 (12%) responses from Type 0 and 1 neighborhoods, respectively. The number of responses from initiatives in Type 0 neighborhoods was expected to be higher, since that is where most of the studied commons are located. Interestingly, all responses from people with a Non-Western migration background refer to neighborhood commons. It is possible to infer, therefore, that survey uptake of people with a Non-Western migration background, and by extension those participating in commons in Type 0 neighborhoods, was low compared to other ethnicities.

Table 7 | Survey uptake type of New Commons outputs. Highest F-score by mode of transport in bold.

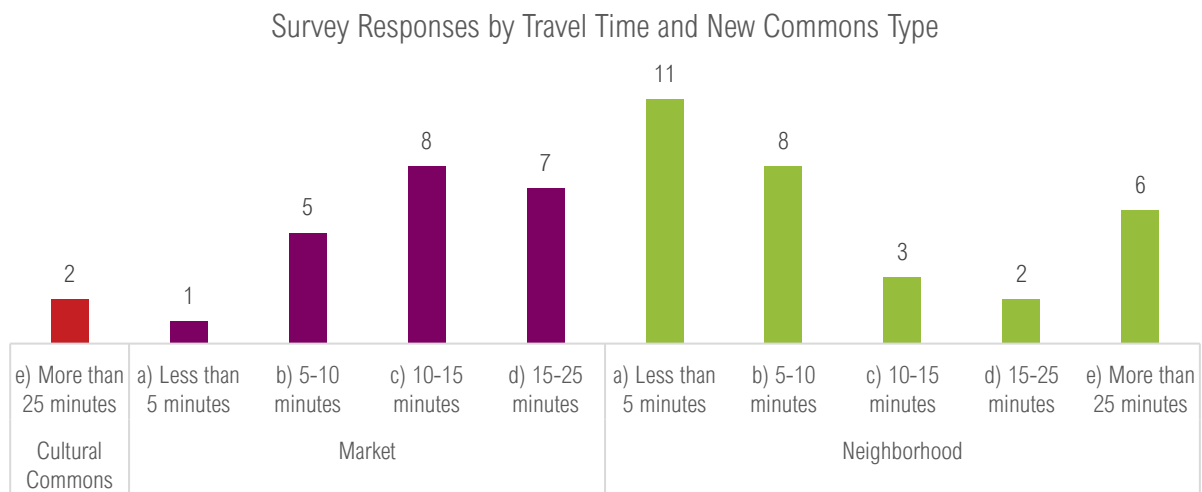
New Commons Type and Sub-Type	Commons in the Case Study	Commons represented in the survey sample	Commons uptake
Cultural Commons	1	1	100%
Non-Profit Organization	1	1	100%
Market	2	2	100%
Exchange commons	2	2	100%
Neighborhood	26	12	46%
Community Garden	6	2	33%
Community spaces	1	1	100%
Homeless habitat	1	1	100%
Housing, apartment communities	8	5	63%
Housing, homeowners' association	1	1	100%
Parks & Greenery	9	2	22%
Grand Total	29	15	52%

In terms of the participation pattern, because VOKOMOKUM's grocery market happens once a month at 18:00, "once a month" and "after work hours" were the most frequent response for the questions about participation frequency and times. Both questions observe a wide distribution of answers across types of commons once a month after working hours, such as frequency responses ranging from "multiple times a week" to "less often than once every three months". This result clearly suggests that there are various levels of participation engagement with these commoning initiatives. In an interesting note, no respondent answered "I live here" to the participation frequency question, suggesting that no resident of housing commons answered the survey despite the many outreach attempts.

If the frequency of participation varies greatly, the same cannot be said about the mode of transport. Six in every 10 respondents claimed to go to the initiative they participate in by bike, compared to 24% by walking, 11% by public transport and only one response with a car. Indeed, Bike is preferred (i.e., most common) travel mode to reach all New Common Sub-Types and is particularly predominant among respondents participating in an exchange commons (79% of the responses). Conversely, the only kind of commoning initiative where walking was predominant is community gardens: in fact, all the nine respondents claimed to go on foot.

More light is shed into the participation pattern is when the travel times are analyzed. As expected, the travel times on foot are concentrated within the less than five minutes bracket (81%), while a third of respondents that go to their initiative with a bike take more than 15 minutes to reach it. The time respondents taking public transport take to reach their Urban Commons vary considerably, from 10-15 minutes up to more than 25 minutes. Two respondents answered they drive to their initiative and both take between 10 and 15 minutes to get there. However, when drilling down the travel times reported by respondents by type of New Commons, a pattern emerges, as seen in Figure 29.

Figure 29 | Respondents travel time to neighborhood commons are shorter than those to market commons



The distribution of travel times to reach a market commons is skewed to the left, while that to reach a neighborhood one is skewed to the right: most respondents (72%) that go to exchange or non-profit commons initiatives such as Taste Before You Waste, Foodcoop Noord and VOKOMOKUM take more than 10 minutes to get there, while most participants (71%) of housing, gardens, or greenery commons, such as NieuwLand Buurttuinen Transvaal, take less than 10 minutes to reach it. Indeed, a comparison between each respondent's residence neighborhood and the location of the initiative they participate in manifests such discrepancy even further. All respondents who join in community gardens live in the initiative's neighborhood, as do half of the people surveyed who participate in parks and commons initiatives. All the other participants, which account for 82% of the total, live in a different neighborhood than that where their Urban Commons is located. While not much can be inferred from this result, as administrative regions are arbitrary, this finding corroborates with the supposition that no resident of a housing commons answered the survey, only people who participate or contribute to housing commons' other functions as a social space.

The findings in this section suggest a rather distinct participation pattern between market and neighborhood commons. Indeed, all respondents who participate in neighborhood commons and, in particular those related to community gardens and Parks & Greenery, live in the same neighborhood as the commons they participate in and thus take shorter to reach that initiative. Respondents who participate in market commons, on the other hand, tend to live in other neighborhoods and tend to bike for more than 15 minutes to get there.

Exploring the answers obtained in the Section 1 of the survey provides key insight into the socio-demographic profile of the case study commoners – or at least those willing to fill out the survey. How they perceive the immaterial accessibility to and impact of the commoning initiative they participate in, however, is what offers key information to answer this study's SQ3 and SQ4. These aspects are analyzed in the following two sections. These also include a deep dive section on the responses from VOKOMOKUM and Buurttuinen Transvaal, as they represent over 50% of the sample and the results are likely to be significant in an initiative-specific context.

7.4 Policy Confluence Materials

7.4.1 INTERVIEW CONSENT FORM

Delft University of Technology
HUMAN RESEARCH ETHICS
INTERVIEW INFORMED CONSENT
(English Version: January 2022)

You are being invited to participate in a research study titled *A socio-spatial analysis of the accessibility to Urban Commons in Amsterdam*. This study is being done by Ettore Arpini from the TU Delft.

The purpose of this research study is to investigate the barriers of access to Commons initiatives in Amsterdam to ultimately explore how they can promote social inclusion. At the time of this interview, the study has already explored the accessibility to the Urban Commons who are members of the [DeMeent](#) association of Commons initiatives in Amsterdam, focusing on the mobility and socio-cultural aspects of access. With the understanding of which groups of citizens have access to Urban Commons and how do they benefit from them, this study aims to explore how Urban Commons can be used as a driver of social inclusion in terms of public policy

This interview is expected to last not more than one hour, and the data generated will be used for research purposes as part of a Master's thesis whose goal is to explore how Urban Commons can function as a driver of inclusivity in Amsterdam. We will be asking you for certain information such as your understanding of Urban Commons in Amsterdam and how they can drive social inclusion, as well as theoretical and practical challenges and opportunities to designing and launching policies that leverage access to Urban Commons as a driver of social inclusion.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by deleting the audio recording and transcript after it has been used for the research purposes, and only publishing an anonymized summary of the interview's transcript. No personal information or individual survey responses will be published or made publicly available.

Your participation in this study is entirely voluntary **and you can withdraw at any time**. By clicking through to the online survey and completing all mandatory questions in the survey, you are agreeing to this Opening Statement.

You can also reach out to the researchers asking for data to be removed up to a month after the interview has been conducted. You can research the research team through the following contact details:

- Ettore Arpini (corresponding researcher): E.deLacerdaArpini@student.tudelft.nl
- Trivik Verma (responsible researcher): T.Verma@tudelft.nl

By checking yes to the questions below and signing the form, you are agreeing to this Opening Statement and providing informed consent to participate in the study.

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated 28/06/2022, 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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. I understand that taking part in the study involves participating in an audio-recorded interview, from which written notes and a transcript will be generated. The audio file and transcription will be deleted after the study, and only an anonymized summary of the transcript contents will be made available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. I understand that I will not be compensated financially for my participation in the study.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. I understand that the study is expected to end and be published in August 2022.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
6. I understand that taking part in the study involves the risk of emotional or mental discomfort. I understand that these will be mitigated by my ability to ask for the interview to stop at any point and ask for the data or information collected thus far to be deleted.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) such as name, email address, and job title, as well as associated personally identifiable research data (PIRD) such as my insights on challenges and opportunities regarding policies leveraging the Urban Commons to deliver social inclusion. I understand that in case of data breach, there could be potential re-identification and reputational risks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. 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: <ul style="list-style-type: none"> • Bare minimum collection of personal data (collected only in this Informed Consent form) • Deletion of recording from local device and move it to secure data storage with limited access. • Instead of publishing the audio file and full transcript, only an anonymized summary of the transcript will be made publicly available, excluding the interviewee's name, job title and contact information. • Deletion of the audio recording and transcript after use. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. I understand that personal information collected about me that can identify me, such as my name, my job title and contact information, will not be shared beyond the study team.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. I understand that the (identifiable) personal data I provide will be destroyed after use, when the study is complete, and the findings are deemed satisfactory for publication. The publication is expected to happen in August 2022.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
11. I understand that after the research study the de-identified information I provide will be used for a master's thesis and could feed policy recommendations within that publication.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12. I agree that my responses, views or other input can be quoted anonymously in research outputs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE		
13. I give permission for the de-identified anonymized summary of the interview's transcript that I provide to be archived in the 4TU.ResearchData repository so it can be used for future research and learning.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. I understand that access to this repository is open.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Signatures

_____	_____	_____
	Signature	Date

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

Ettore de Lacerda Arpini



24/06/2022

Signature

Date

Study contact details for further information:

Ettore de Lacerda Arpini

+31 06 _____

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