

Intensifying Building Use

How the Cities of Amsterdam and Malmö Enable the Sharing of Spaces

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Abstract

In the building industry, circular economy has gained much attention in recent years, yet thus far, little research has been conducted on the topic of intensified building use, despite the great potential this strategy offers in terms of emission reduction. One way of intensifying building use can be through the sharing of spaces among different users at different times. This thesis explores how municipalities can enable such space sharing and identifies relevant barriers, taking the cities of Amsterdam and Malmö as case studies. It finds that the municipalities are enabling space sharing either as a third party by subsidising, mediating, and leveraging the land allocation process, or as a space owner. Further, the municipalities enable space sharing at two stages: through the provision of a space, or through the operation of the sharing. Two levels of barriers are identified: first level barriers, which render space sharing as such difficult, such as user compatibility, safety, and liability concerns, and resulting organisational and financial cost. Then, second level barriers, which render it difficult for the municipalities to enable space sharing, such as lack of appropriate instruments, concerns of preferential treatment, the municipal ownership structure of buildings, and lack of knowledge and experience. The following internal and external contextual factors are identified as relevant, albeit to varying degrees: the administrative structure of the municipality (centralised versus decentralised), the priority areas of the municipality, the budget of the municipality, space scarcity, the presence of a private and civil society sector engaging in space sharing, and cultural attitudes towards space sharing. Finally, the themes of reluctance to sharing, risk aversion, a lack of awareness of the environmental cost of space inefficiency, and inflexible understanding of space as a resource, as well as their implications for space sharing are discussed.

Keywords: Building industry; circular economy; intensifying loops; urban governance; sharing economy.

Executive Summary

Background, Literature, and Research Design

It is a widely accepted fact that the building industry has a large environmental impact. In 2020, it accounted for 37% of global energy-related CO₂ emissions. Here, 10% occurred specifically in the manufacturing and building phase and 27% in the use phase (United Nations Environmental Programme, 2021). At the same time, the material demand of the building industry is big and growing rapidly: Tripling from 6.7 billion tons in 2000, it reached 17.5 billion tons in 2017 (Huang et al., 2020). According to the Global Waste Management Outlook 2015, construction and demolition waste makes up of around 36% of global solid waste (United Nations Environmental Programme & International Solid Waste Association, 2015). Furthermore, the building industry has a crucial and oftentimes overlooked impact on biodiversity (World Economic Forum, 2020). This scale of impact indicates that a fundamental transformation of the building sector is urgently needed, whereby the linear model of “take, make, dispose” (Ellen MacArthur Foundation, 2015) that is currently predominant in the building industry has been scrutinised. Instead, shifting to a circular economy is necessary to reduce the demand for new materials and connected greenhouse gas emissions (Benachio et al., 2020). Therefore, the topic of circular construction has received much attention from various scholars in recent years (see e.g., Benachio et al., 2020; Ghisellini et al., 2018; Munaro et al., 2020; Norouzi et al., 2021) and been the focus of different policies.

However, most research and action on circular economy in the building industry has been centred on the circular economy strategies of *closing loops*, such as recycling and reuse, *narrowing loops* through more efficient resource use, as well as *slowing loops* by extending the lifetime of buildings through renovation, refurbishment, or retrofitting. Considerably less research has been conducted on slowing the loops specifically in the sense of *intensifying loops*, which refers to a more intense use phase of a product. A more intense use phase may provide a sustainability benefit if it leads to the same user demand being fulfilled with fewer products used more intensely (Geissdoerfer et al., 2018). As a consumption-based approach, intensifying the use of buildings has great potential to reduce emissions and other environmental impacts (Cabrera Serrenho et al., 2019; Hertwich et al., 2020; Zhong et al., 2021). By targeting consumption, a percentage of building production and all related material consumption can be avoided altogether, in contrast to other strategies such as recycling or reuse which only lead to incremental reductions. Further, intensified use is likely to also lead to a decrease of operational energy (Harris et al., 2021; Holmin et al., 2015; Zhong et al., 2021).

One way of intensifying use of buildings is by sharing spaces among different users at different times. Thus far, most literature on shared spaces has been focused on office spaces and short-term vacation rentals (e.g., Álvarez-Herranz & Macedo-Ruíz, 2021; Bouncken, 2018; Midgett et al., 2018; Vaddadi et al., 2020; Yang et al., 2019). While there has been growing interest in the topic of sharing spaces in a broader sense (e.g., Brinkø et al., 2015; Lundgren et al., 2022), further research is needed on different settings of space sharing and about how space sharing could be encouraged by different actors. Cities, with great importance in the context of the sharing economy, are one such actor.

This thesis aims to explore the enabling role of municipalities in the context of sharing spaces, focusing on Amsterdam and Malmö as two case studies. It addresses the following research questions:

RQ 1: *How do the municipalities of Amsterdam and Malmö enable space sharing?*

RQ 1a: *Which kinds of space sharing practices are the municipalities involved with?*

RQ 1b: *In which ways are the municipalities engaging with these practices?*

RQ 2: *What barriers prevent or render it difficult for the municipalities to enable space sharing?*

A qualitative exploratory case study approach with data collection through semi-structured interviews and document analysis was chosen to answer these research questions. The research is conceptually guided by 1) the circular economy terminology of slowing, closing, narrowing, intensifying and dematerialising the loops formulated by Bocken et al. (2016) and extended by Geissdoerfer et al. (2018); 2) Curtis and Lehner's (2019) definition of a sustainable sharing economy, and 3) an framework for urban governance of the sharing economy by Palgan et al. (2021). Twelve semi-structured qualitative interviews were conducted with four respondents from Malmö municipality, six respondents from Amsterdam municipality, and two experts: a researcher in access-based consumption of space from Lund University, and the founder of a space sharing platform based in Sweden. Documents and websites were used as complementary sources of information on the space sharing practices mentioned during the interviews. The data was analysed using thematic qualitative content analysis to identify recurring themes, using an iterative approach with a few broad pre-defined themes. Initial coding was conducted using NVivo, a qualitative data analysis software, whereby a second, adapted and more detailed analysis was conducted using analysis matrices.

Findings, Discussion and Recommendations

Enablers: The findings show that the municipalities are either involved in space sharing as a third party or involved as the space owner. Furthermore, another important distinction that can be made is at which stage the support of the municipalities comes in: providing the space or operating the sharing. Provision of a space refers to the making available of a space for sharing in the first place, that is, either providing a space owned by the municipalities or facilitating the construction or renting of a space for sharing. For an overview of the enabler types and stages, see Figure 0-1.

As an involved third party, the municipalities engage with and enable space sharing mainly in three ways: by providing subsidies, by acting as a mediator, and by leveraging land allocation competitions and negotiating in the planning process. First, the municipalities can subsidise the shared space itself, that is, the rent of the space, or the operation of the shared space, for instance by subsidising an organisation that is specialised in running shared spaces. Second, by mediating, the municipalities can facilitate an agreement between owners of a space and potential space users, thereby supporting space provision, or they can mediate between users to share a space amongst themselves, thereby supporting the sharing operation. Here, the municipalities are leveraging their position as trusted and reliable actor. Third, the municipalities can support provision of spaces for sharing by setting demands in land allocation tenders, and thus push for the inclusion of shared spaces in new development projects.

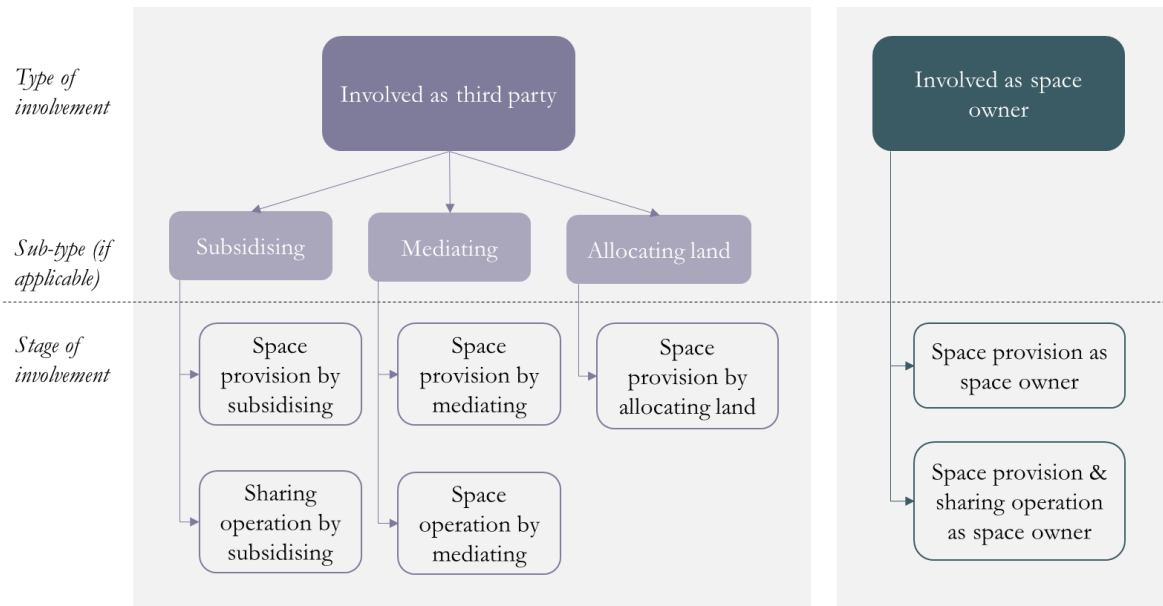


Figure 0-1: Types and Stages of Involvement of the Municipalities in Space Sharing.

As a space owner, the municipalities primarily enable shared spaces by providing the space. In this context, the municipalities might only provide the space and leave the operation of the shared space to a specialised organisation—there was no example identified in which the sharing was organised among the users, that is, there were no such examples of peer-to-peer sharing in spaces provided by the municipalities. Then, in some instances the municipalities also managed the operation of the shared space, and in the case of school buildings that are shared, they are also the main user of the building.

Barriers: Two levels of barriers render it difficult or prevent the municipalities from enabling space sharing: first level barriers directly affecting the actors involved in space sharing arrangements, and second level barriers affecting specifically the municipalities when trying to enable space sharing. The first level barriers are the following: first, compatibility issues between the users, their needs and behaviours, such as cleanliness, noise, availability of the space, and a general discontent about other users. Second, concerns regarding security and liability, which include on one hand a more tangible concern about physical damage and questions of liability, and on the other hand a feeling of discomfort of having to share a space with other users. Then, as a result of these issues of compatibility and risk of conflict between users, as well as questions of safety and liability, there was note of ensuing financial and organisational costs to arrange and operate a shared space, which in turn reduced the incentive to share space as a way of saving cost. Such barriers were brought up by respondents to explain as to why the municipalities might not even try to enable space sharing, as it was considered that these barriers make it complicated and unwanted by space users.

The second level barriers do not as such concern space sharing directly but affect the municipalities as actors that could enable space sharing. They relate mainly to a perceived lack of instruments and leverage available to the municipalities to enable space sharing, the risk of preferential treatment, and a lack of knowledge and uncertainty with regards to space sharing and its potential. These three are strongly related to each other: a lack of instruments is linked to the idea that as public actors, the municipalities are not allowed to facilitate space sharing for private companies fearing accusations of preferential treatment, but it also has to do with a lack of knowledge about which instruments would work, as well as a lack of knowledge about how the issue of preferential treatment could be approached.

Contextual Factors: The following factors internal and external to the municipalities have been identified as relevant, albeit to varying degrees. Factors internal to the municipalities are the administrative structure (centralised versus decentralised), priority areas of the municipality, and its budget. External factors are space scarcity, the presence of a private and civil society sector engaging in space sharing, and cultural attitudes towards space sharing. While financial motives are a strong initial driver for space sharing, there is uncertainty about how to implement space sharing in a way that the expected savings are in fact realised. Interestingly, sustainability considerations were not identified among the drivers for space sharing, which might point towards a limited understanding of the potential environmental benefits of space sharing. Cultural attitudes towards space sharing are difficult to capture yet crucial in understanding a reluctance towards space sharing. Further, it is important to consider that such attitudes would likely also influence the municipalities’ perspective on space sharing and combined with risk aversion prevent the municipalities from exploring novel ways of using space. This, in turn, also highlights the importance of private sector and civil society in providing proof of concept and creating knowledge on how space sharing can be operated. Finally, such novel ways of using space more efficiently require a more flexible understanding of space as a resource, moving away from the current understanding marked by long-term contracts with a single main tenant and static financing and planning.

Recommendations. Three levels of recommendations are provided: First, the thesis identifies and discusses specific existing and potential enablers for the municipalities, as summarised in Figure 0-2 below, with the lighter boxes representing potential enablers. Municipalities can profit from this knowledge by reflecting about ways of engagement to facilitate space sharing.

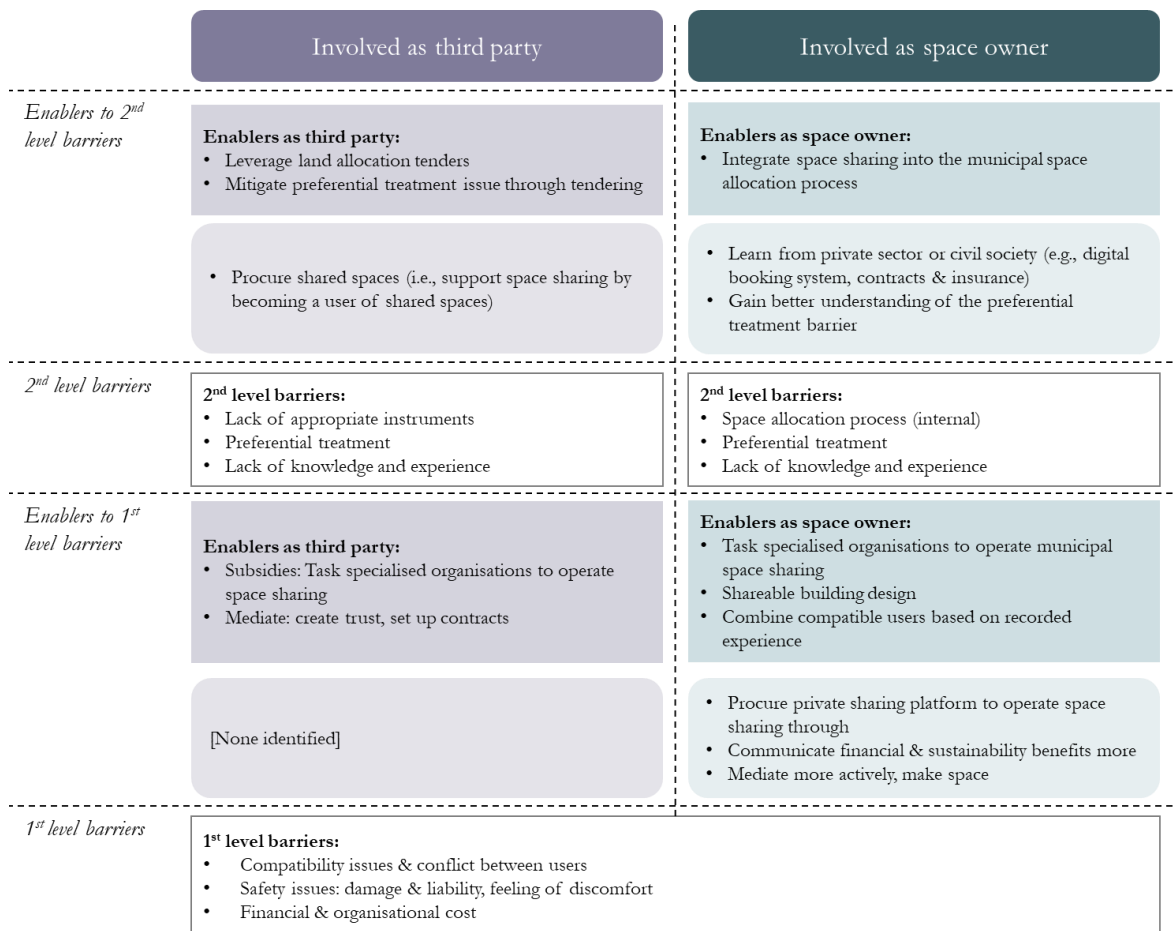


Figure 0-2: Summary Enablers and Barriers.

Second, on an organisational level of the municipalities, municipal actors need to create knowledge and processes that enable the municipalities to enable space sharing. Here, municipalities should:

- Transfer knowledge and derive best practices from other types of sharing: the first level barriers identified in this thesis largely correspond to barriers found commonly in the context of sharing (economy), meaning that knowledge generated on the facilitation of these types of sharing are to some extent transferable to the context of space sharing.
- Generate knowledge by interacting with private sector and civil society initiatives that are working with space sharing.
- Engage in pilot projects to provide proof-of-concept: this is necessary for the municipalities to mitigate risk aversion and gain experience and knowledge.
- Actively operate and moderate shared spaces: difficulties initially experienced with different types of shared spaces might not necessarily indicate that space sharing in these contexts is impossible, but rather that it requires active attention and effort, and a period of learning (e.g., about how these difficulties have been overcome in other types of sharing).
- Develop knowledge and experience on other governance tools than subsidies: There is the need for more awareness of the potential of instruments such as mediating, acting as a matchmaker or providing other non-financial support.
- Adapt and leverage the processes of space allocation within the municipalities, as well as land allocation to private developers to enable space sharing.
- Lead the way: As a large real estate owner and user, the municipalities should not only lead the way in showing how space sharing is possible with its own facilities, but also engage in space sharing as a user.

Finally, the topic of space efficiency must be better addressed in policymaking on an urban, as well as national and international level. Now that cities such as Amsterdam and Malmö are formulating policy ambitions and measurable objectives in terms of circularity and sustainability, it is crucial that they go beyond incremental improvements towards holistic approaches such as intensified building use. Measurable objectives are needed in order to create the policy incentive to shift the focus towards space efficiency and sufficiency and move away from an inflexible understanding of space as a resource that requires inefficiency and surplus capacity. The current policy focus on strategies such as recycling or reuse are not in line with the scientific findings that strongly underline the importance of consumption-based approaches. Policies promoting both sufficiency and efficiency in the built environment are therefore direly needed to achieve the necessary emissions reduction, decrease resource use and waste, and prevent further biodiversity loss.

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Abbreviations

CDW	Construction and demolition waste
CE	Circular economy
CEAP	Circular Economy Action Plan
EU	European Union
GHG	Greenhouse gas
ICT	Information and communications technology
IPCC	Intergovernmental Panel on Climate Change
PSS	Product service system
RQ	Research question
SE	Sharing economy
SEO	Sharing economy organisation
VAT	Value-added tax
WFD	Waste Framework Directive

1 Introduction

1.1 Background

It is a widely accepted fact that the building industry has a large environmental impact, both in terms of material as well as energy consumption. The scale of impact indicates that a fundamental transformation of the sector is urgently needed in order to meet the 1.5-degree climate target proposed by the Intergovernmental Panel on Climate Change (IPCC) and set by the Paris Agreement, as well as the United Nations' Sustainable Development Goals. At the same time, there is a growing demand for housing and infrastructure due to population growth and urbanisation on the industry, posing a challenge for policymakers and industry to reconcile these with the need to reduce the building sector's environmental footprint (United Nations Environmental Programme, 2021; Wang et al., 2018).

In this context, the linear model of “take, make, dispose” (Ellen MacArthur Foundation, 2015) that is currently predominant in the building industry has been scrutinised. Instead, shifting to a Circular Economy (CE) is considered necessary to reduce the demand for new materials and connected greenhouse gas (GHG) emissions (Benachio et al., 2020). Therefore, the topic of circular construction has received much attention from various scholars in recent years, and there is a growing body of literature on circular construction, as well as the challenges and drivers for its implementation (see e.g., Benachio et al., 2020; Ghisellini et al., 2018; Munaro et al., 2020; Norouzi et al., 2021). Parallel to this, there has been a growing interest from the policy side: the European Union (EU), for instance, has taken a leading role in CE in the building industry, making construction and buildings a priority sector in its Circular Economy Action Plan adopted in March 2020 (European Commission, n.d.-a).

However, so far little attention has been paid to CE strategies that address the consumption of buildings. As elaborated in Chapter 2, most research on CE in the building industry has focused on the CE strategies of *closing loops*, such as recycling and reuse, *narrowing loops* through more efficient resource use, as well as *slowing loops* by extending the lifetime of buildings through renovation, refurbishment, or retrofitting. Considerably less research has been conducted on slowing the loops specifically in the sense of *intensifying loops*, which refers to a more intense use phase of a product. A more intense use phase may provide a sustainability benefit if it leads to the same user demand being fulfilled with fewer products used more intensely (Geissdoerfer et al., 2018). In the context of the building industry, this would translate to a more intense usage of buildings, or, more specifically, of floor area. This could be achieved, e.g., through smaller dwellings (smaller floor area per person means it is being used more intensely) or sharing spaces which also reduces the floor area needed to fulfil the same space demands. In this context, thus, sharing can be considered a form of CE, which brings together two fields of sustainability research: the CE and the Sharing Economy (SE). With sharing spaces, one can distinguish between different users simultaneously using a space (e.g., shared flat) or different users using a space at different times (e.g., cultural event venue). This thesis focuses specifically on the latter, that is, space sharing in the sense of different users accessing a space at different times. There is currently limited research on this topic, with most existing research focusing specifically on co-working spaces or short-term vacation rentals like Airbnb (Harris et al., 2021).

Importantly, intensifying the use of buildings has indicated to be a promising approach in reducing emissions and other environmental impacts due to the fact that it is a consumption-based approach (Zhong et al., 2021). By targeting consumption, a percentage of building production and all related material use can be avoided altogether, in contrast to other strategies such as recycling or reuse which only lead to incremental reductions. Furthermore,

intensified use could thereby allow to bypass a trade-off that is commonly found between emission reductions in the use phase and in the production phase (Zhong et al., 2021). Around two-thirds of the emissions of the building sector are operational emissions, while one-third is embodied emissions from the production of the building materials (United Nations Environmental Programme, 2020). Therefore, while other CE strategies such as extending the lifetime of a building might be effective from a material perspective, they often lead to a negative impact in terms of energy use, as older buildings tend to be less energy efficient. Having an increased use of existing buildings, in contrast, might rather lead to a decrease of operational energy while at the same time reducing production-related emissions (Harris et al., 2021; Holmin et al., 2015; Zhong et al., 2021). Finally, seeing how space is becoming increasingly scarce and expensive, especially in urban settings, CE strategies in the built environment must extend their focus from optimising use of material to also optimising use of space (Brinkø et al., 2015). Recognising the value of space in the context of urbanisation and the environmental impacts of land use change underlines the importance of exploring strategies of intensifying use of buildings. Finally, it has been argued that even though intensifying loops is a consumption-based approach, it can be reconciled with population growth and wellbeing. As the focus is on optimising building usage, it should not require significant restrictions regarding space size and usage (Arup, 2016; Zhong et al., 2021).

While there has been growing interest in the topic of sharing space in very recent years (Arup, 2016; Brinkø et al., 2015; Lundgren et al., 2022), it is still marginal. Furthermore, existing research addresses shared spaces mainly from a SE perspective and does not draw the connection to CE. This is important, however, to contribute to a more holistic understanding of CE in the building industry, as it is currently often reduced to topics such as reuse, recycling, or alternative materials. Considering that other CE strategies might have much higher potential for environmental benefits, it is crucial that these are not being neglected now that CE in the built environment is receiving great attention from policy and academia. In order to achieve the emission reduction needed to stay in line with the 1.5-degree target, address waste reduction materials demand, and space constraints, it is thus essential to gain a better understanding of more radical and currently underexplored approaches such as intensifying loops in the built environment. This is especially true in an urban setting. Not only do cities have an even greater pressure to reconcile rapid population growth with spatial constraints and sustainability considerations, but they are also in a position to encourage such strategies using local policy. Especially in the Northern and Western European context, in which this thesis is set, the issue of space scarcity for urban development has become increasingly pressing.

1.1.1 Environmental impacts of the Building Industry

In 2020, the building sector accounted for 37% of global energy-related CO₂ emissions, which corresponds to 11.7 Gt CO₂. Here, 10% occurred specifically in the manufacturing and building phase and 27% in the use phase, which includes space heating and cooling, water heating, and lighting, among other (United Nations Environmental Programme, 2021). At the same time, the material demand of the building industry is significant and growing rapidly: tripling from 6.7 billion tons in 2000, it reached 17.5 billion tons in 2017 (Huang et al., 2020). Significant impacts also occur at the end-of-life stage, to some extent depending on waste management practices, and—unsurprisingly, given the vast material demand—the quantities of waste produced by the building industry are large. According to the Global Waste Management Outlook 2015, construction and demolition waste (CDW) makes up of around 36% of global solid waste (United Nations Environmental Programme & International Solid Waste Association, 2015). In Europe, this percentage is even higher: European CDW amounts to 850 million tons per year, which accounts for approximately 60% of total solid waste (Robinson et al., 2021).

Aside from GHG emissions occurring during production, other environmental impacts include human toxicity, fossil depletion, and metal depletion, among others (Huang et al., 2020). Furthermore, the building industry has a crucial and oftentimes overlooked impact on biodiversity. Overall, it is estimated that infrastructure and the built environment endanger around 29% of all threatened and near-threatened species as defined by the International Union for Conservation of Nature IUCN (World Economic Forum, 2020). The built environment sector reinforces the five direct drivers of biodiversity loss: land-use change, overexploitation, pollution, climate change and invasive alien species, due to urban expansion, intensive material extraction and transportation, waste management practices, and high GHG emissions (Ellen MacArthur Foundation, 2021; IPBES, 2019).

This large impact on the environment in different dimensions indicates the need for a radically more sustainable built environment. The impact of the building industry on sustainability dimensions other than GHG emissions, such as on biodiversity, also particularly highlights the need for solutions that are not merely low-energy, but also significantly reduce material consumption and land-use change. However, these changes have proven difficult to implement. This is due to the sheer scale and complexity of the supply chain, the industry being heavily regulated, the long lifespan of buildings, strong fragmentation and competition between actors, as well as a resistance to innovation (Høibye & Sand, 2018; McNamara & Sepasgozar, 2021; Nordby, 2019). These characteristics of the building industry, as well as the need to reduce environmental impacts all along the supply chain explain the effectiveness of consumption-based approaches over incremental solutions. Consumption-based approaches, such as intensified use, reduce the demand for buildings altogether, thereby reducing demands for all materials and energy, as well as reducing energy demand for heating or cooling during the use phase.

1.1.2 Policy Background

The realisation of the considerable environmental impacts of the building industry have led to political action of international and national, and urban level. Many countries have, for instance, included the building sector in their Nationally Determined Contributions as part of the Paris Agreement, mainly focusing on energy efficiency and zero-carbon fuels, as well as introducing policies on a national level, such as building codes that set standards for energy efficiency (United Nations Environmental Programme, 2021). On an EU level, legislation concerning the building sector focused mainly on energy efficiency has been around a few years, such as the Energy Performance of Buildings Directive of 2010 (Directive 2010/31/EU, n.d.) and the Energy Efficiency Directive of 2012 (Directive (EU) 2018/2002, n.d.). In 2015, the EU further adopted its first Circular Economy Action Plan (CEAP). In the CEAP, the construction industry has been identified as one of the main priority areas, due to its high environmental impact. The strategy for the building sector includes points such as promoting circular design or potentially setting targets for material recovery or recycled products.

The importance of reducing consumption in order to minimise waste is reflected in the European Waste Hierarchy: according to the Waste Framework Directive of the EU (WFD), political measures for waste management should prioritise waste prevention, then reuse, before recycling, recovery, and finally, disposal (Directive 2008/98/EC, n.d.). The aim of this regulation is environmental and health protection. CDW is considered a priority waste stream in the WFD. Resulting from the WFD are specific targets with regards to reuse and recycling of CDW, which in turn highlight the importance of encouraging more circular building practices from a political perspective (European Commission, n.d.-b). It also sets the highest priority to be waste prevention, which includes lower consumption—which in turn can be

achieved through sharing practices. Hence, the WFD sets a political framework that considers sharing practices to reduce overall consumption a highest priority.

On a national level, policies regarding lifecycle impacts of buildings and CE targets have been introduced in both the Netherlands and Sweden. For instance, a mandatory life-cycle analysis for buildings above 100 m² and an environmental impact cap have been introduced in the Netherlands in 2018, with a similar policy planned for Sweden in the coming years (United Nations Environmental Programme, 2021). The Dutch government has further set the objective to reach a CE by 2050, with the construction industry being the centre of one of their five transition plans in that context (Waterstaat, 2019). Their overall objective is to have reduced the consumption of primary abiotic materials by 50% in 2030, and a zero-waste economy by 2050. For the construction industry, they promote strategies such as more resource efficient construction (narrowing loops), extending lifetimes of buildings by maintenance and adaptable construction (slowing the loop), reuse and recycle (closing loops), and using alternative materials. While more effective use is not included in these strategies, more efficient use of apartments through co-living is mentioned as a sub-objective, and should be stimulated as such (Ministerie van Infrastructuur en Waterstaat, 2023).

Similarly, Sweden has adopted a Circular Economy Strategy in 2020, which aims to increase resource efficiency and reduce waste. This strategy also includes a focus on the building sector, with measures such as incentivising the use of recycled materials and improving waste management practices (Klimat- och näringslivsdepartementet, 2020). The Swedish government in 2022 has further mandated the Swedish National Board of Housing, Building and Planning to investigate the transition of the building sector in Sweden to a CE. This includes the analysis of the current circularity of the building sector, an assessment of potential measures to promote circular design and building, and the development of indicators to measure CE in the building industry. This should be completed by 2024 (Finansdepartementet, 2022).

Sustainable and particularly circular policies have also been introduced on an urban level. The city of Amsterdam has set the target to be circular by 2050 and makes construction one of its main three action areas (Gemeente Amsterdam, 2020). The city of Malmö includes CE and climate-neutral construction as two priority transition areas in its plan to reach its climate goals by 2030, and places strong focus on collaborative initiatives with different actors from the building industry (Malmö Stad, n.d.)

These policies and the inclusion of the building sector as special focus area into the CE programmes indicated that the importance of CE in the built environment has been recognised by policy makers on an international, national and urban level alike. However, the strong focus of these plans on CE strategies such as slowing or closing loops also points towards the fact that intensified use is not on the political agenda yet, despite its environmental importance.

1.2 Problem Definition

The problem that composes the starting point of this thesis is the pressing need to significantly reduce the environmental impact of the building sector, including all cycles of the life phase. Despite ongoing efforts to increase the sustainability of the sector, such as more energy efficient buildings, and various CE strategies, the sector is not on track to achieve the necessary reduction in GHG emission to stay in line with the 1.5-degree target (Wang et al., 2018; Zhong et al., 2021). It is therefore evident that strategies that better address the consumption side of the sector, and therefore might have stronger leverage need to be

investigated and implemented (Zhong et al., 2021). However, strategies that do this, such as sufficiency and sharing, have not been explored widely.

Exact data on the idling capacity of buildings, that is, the amount of time that buildings or parts of buildings are not occupied, is difficult to generate. Nonetheless, due to existing use patterns, it seems likely that a large idle capacity is to be expected. This suggests that there might be great potential to utilise the existing building stock more efficiently. By doing so, the same space function could be delivered with fewer buildings, thereby reducing the need for new buildings (Arup, 2016). One way to achieve this optimised building utilisation could be by sharing the building between different users during different times of the day or week, either for the same or different purposes (Brinkø et al., 2015). Next to environmental benefits, this sharing of space could also have economic benefits, due to shared cost of rent, heating and maintenance cost. Furthermore, social benefits due to arising synergies and social contacts between users could be created, while there is also potential for conflict and friction.

However, despite space sharing offering a compelling case from an environmental and perhaps financial perspective, there are currently few efforts to increase space sharing. Some forms of space sharing are widely spread, such as short-term apartment rentals, school gym halls being used by sports associations in the evenings, or cultural venues being used by different groups. Apart from these examples, it seems to be a rather sporadic practice considering the theoretical potential. This could be due to a number of factors, ranging from legal constraints, organisational difficulties, a mismatch between offer and demand, and cultural barriers, among others. Therefore, there is a need to better understand the barriers that prevent space sharing, and how they might be eliminated in some cases.

In this context, the role of city governments is crucial and requires further exploration. With a constantly growing share of the population living in cities resulting in significant environmental footprints, cities play an essential role in environmental protection. The pressure to comply with climate targets while at the same time providing housing and infrastructure for a growing population should push cities to investigate every option to reconcile these two objectives. Space sharing being among the ones with the greatest potential, it should be the focus of greater attention. Inversely, it has been found that city governments play an important role in governing the SE, and have a significant impact on what activities succeed or fail (Palgan et al., 2021; Sánchez-Vergara et al., 2021). However, little is known about how city governments are acting or could act as enablers for space sharing specifically. While city governments often publicise their engagement with sharing activities for other goods and services, as well as with CE activities, also specifically in the building industry, such engagement with space sharing remain rare at this point in time. More knowledge is therefore needed about the way in which municipalities are enabling space sharing.

1.3 Aim and Research Questions

In line with the research problem defined above, the aim of this thesis is to explore space sharing in the cities of Amsterdam and Malmö in the Netherlands and Sweden, respectively, from an urban governance perspective. That is, the thesis aims to contribute to a better understanding of the city governments' engagement with space sharing practices, more specifically, how they can enable space sharing, and the barriers that are faced in this context. As such, the aim of the research is also to create greater knowledge around the topic of municipalities as enablers of space sharing and potentially identify best practices.

In more detail, the aim can be divided in two main parts, which constitute the two research questions (RQs). The first part is to describe the current engagement of the two municipalities with space sharing: what kind of space sharing initiatives are they involved with, and in which

way(s) are they involved? This includes knowledge about the kinds of actors that are involved, which role the municipalities play in the sharing or the establishment of the sharing. It is important to note here, however, that the aim of this research is strongly focused on the municipalities and how they are interacting with space sharing, and less so on describing the functioning of the different types of space of space sharing. The second part is to identify the barriers and challenges the municipalities face when enabling space sharing. This can include organisational, legal, financial, social, or other types of challenges.

Based on this, the following RQs with two sub-questions have been formulated:

RQ 1: *How do the municipalities of Amsterdam and Malmö enable space sharing?*

RQ 1a: *Which kinds of space sharing practices are the municipalities involved with?*

RQ 1b: *In which ways are the municipalities engaging with these practices?*

RQ 2: *What barriers prevent or render it difficult for the municipalities to enable space sharing?*

Finally, since this thesis is taking a case study approach, as elaborated in later sections, a more implicit aim is also to discuss relevant contextual factors. However, since this is not a primary aim of the thesis, it is not included in the RQs. Correspondingly, contextual factors are included in Chapter 6 Discussion, instead of Chapter 5 Findings and Analysis, where findings answering the RQs are presented.

1.4 Scope and Delimitations

In order to answer the RQs outlined in the previous section, this thesis focuses on space sharing practices specifically in the municipalities of Amsterdam and Malmö, in the Netherlands and Sweden. It uses a working definition of space sharing, which is conceptually informed by Curtis and Lehner's (2019) definition of a sustainable SE, as is discussed in more detail in Section 3.3.1 of the Conceptual Framework. It defines space sharing as a setting in which a space is used by different users at different times, that is, users have temporary and serial access to a space. Furthermore, the goal of space sharing is to optimise space use.

To explain the meaning of 'serial' sharing: as already briefly touched upon, sharing can be distinguished by simultaneous sharing (i.e., co-using), and serial sharing (i.e., sharing between different users at different times). A shared flat is an example for simultaneous sharing, whereby a vacation rental is an example for serial sharing. A co-working space is almost always a case of simultaneous sharing, in that multiple people are sharing one office space, but can at the same time be serial sharing as well, if it is flexible workstations that are used by different people at different times of the week. While both forms of sharing are important and reduce floor area used per person, this thesis focuses on serial sharing. For simplicity and to avoid confusion, throughout this thesis the term 'co-using' is used to describe simultaneous sharing.

Furthermore, a space is defined as any indoor area within a building. This thesis does not set a focus on a specific type of building, that is, it is not only specifically office spaces, publicly owned buildings or commercial spaces that are being studied. Likewise, the thesis does not set a limitation in terms of which users are involved in the space sharing. The motivation behind this broad focus is to maintain an open perspective, allowing for the possibility to capture different kinds of sharing practices, including such that might cross multiple purposes and types of users and such that have found novel ways of using spaces. In this way, it also encourages thinking beyond the current ways to define and understand space usage. However, a clear delimitation is set in that the focus is on space sharing activities in which the

municipalities are directly involved, although not necessarily as space owner or user, but also as a third party.

Given that there is not a large amount of research on the topic of intensifying loops in the built environment, there are many highly relevant aspects requiring further research that are outside of the scope of this thesis. This thesis does not aim to quantify neither existing space sharing, nor future potential of idling capacity. It does not aim to measure environmental benefits of space sharing. Rather, the thesis takes a qualitative approach to explore the ways in which city governments are interacting and could interact with space sharing initiatives.

1.5 Ethical Considerations

Ethical considerations with regard to data collection were considered and no particular risk was identified. Participation in the research was entirely voluntarily; participants received information on the following before the interviews: a) what the purpose and context of the study is; b) that participation is voluntary and can be withdrawn at any point; c) that interviews will be recorded, transcribed, and analysed; d) that they will be referred to by the role, organisation and city case if applicable; e) how the data will be stored and handled. The full information is found in the Appendix A: Interview Consent Form. No risks that the outcomes of the research could harm the participants in any way were identified. No sensitive information was collected. At the beginning of each interview, interviewees were asked to confirm that they had received and read the information. Further, they were asked to confirm that they agreed to being recorded and transcribed, whether they agreed to being referred to by role, organisation and city case or preferred another way of being identified, and finally whether they would like to review the transcript. Due to technical reasons, recordings were made with video and sound, but the video recordings were deleted after the interviews, except for cases where the interviewee agreed to keep the video recording (due to relevant information being shared through screen sharing).

The research was conducted with support from the Swedish Environmental Research Institute (IVL). This includes feedback and suggestions as to what should be focused on in this research. Given that the IVL is a research institute and does not pursue any financial goals or specific agenda, the risk that this would influence the research or conclusions in an unduly manner has been estimated to be very low. No circumstance that would compromise academic honesty and personal integrity has been identified.

1.6 Audience

By addressing how cities can optimise building usage through encouraging and facilitating sharing spaces, this thesis is mainly of interest for an audience of policy makers and academia, working and researching, respectively, on topics related to urban planning, built environment and infrastructure, CE, and SE.

For policy makers, particularly on a city level, the thesis contributes to a better understanding of how space sharing develops in the context of cities, and how urban governments can encourage such practices. It thereby creates knowledge and draws attention to a CE strategy in the built environment that has not received much attention thus far, despite its great potential. Drawing insights from the cities of Amsterdam and Malmö, the thesis allows for knowledge transfer between these cities, as well as to other cities.

From an academic perspective, the thesis contributes to an area of research that is not very developed so far. The findings of the thesis open doors to further research in a range of disciplines on topics such as the quantification of environmental impacts of different space

sharing strategies or cases, business models for space sharing, policy options, or the social and economic impacts of space sharing.

1.7 Disposition

Chapter 1 (Introduction) provides an overview of important background information and the problem definition that constitutes the point of departure for this research, as well as research aim and questions. Chapter 2 (Literature Review) presents the current state of research around the topic around intensifying loops in the building industry. Starting with a broad overview of literature on different CE strategies, then narrowing down intensifying loops and more specifically sharing spaces, it ends with a discussion on the need for further research. Chapter 3 (Conceptual Framework) introduces the concepts of CE and SE, and how they are understood and applied in this thesis. It also presents the framework on urban governance for the SE. In Chapter 4 (Research Design, Materials and Methods), the qualitative explorative case study design employed for this thesis will be presented in more detail. Chapter 5 (Findings and Analysis) presents the findings of this thesis with regards to the enablement of the municipalities with regards to space sharing, and the barriers that have been identified. Chapter 6 (Discussion) reflects on the findings in relation to existing literature, discusses the significance of the finding from a methodological and theoretical point of view, before closing with critical reflections and limitations of the thesis research. Finally, Chapter 7 (Conclusions) answers the RQs, before reflecting on practical implications and recommendations for urban policy makers and other relevant stakeholders and closing with recommendations for further research.

2 Literature Review

This chapter reviews the existing literature pertaining to intensifying loops in the built environment and space sharing. Thereby, it aims to identify and describe in more detail the gap in the literature this thesis is addressing, following the structure illustrated in Figure 2-1. The first section places intensifying loops among other CE strategies of slowing loops, closing loops, narrowing loops, and dematerialising loops (Bocken et al., 2016; Geissdoerfer et al., 2018). Then, it summarises the findings of studies that compare the environmental benefits of these different strategies in the context of the built environment, indicating significant potential of intensified use approaches. The second section summarises literature on ways in which intensified use of buildings can be achieved, identifying sharing as one of them. The third section draws the connection from sharing as a CE strategy to space sharing in the SE literature. Previous research in this field has focused on the application in form of co-working spaces and short-term accommodation rentals, and two typologies on shared spaces were developed by Brinkø et al. (2015) and Lundgren et al. (2022). Finally, the fourth section discusses the need for further research as identified in this literature review.

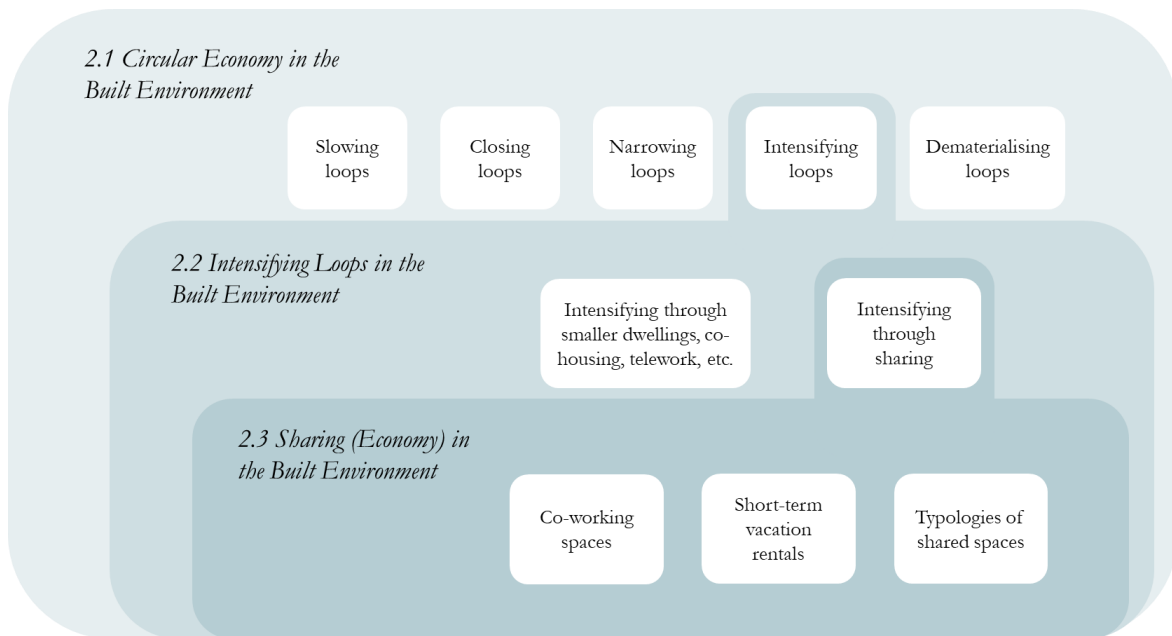


Figure 2-1: Structure of Literature Review Chapter.

2.1 Circular Economy in the Built Environment

CE in the building industry has received growing academic attention throughout recent years—this section presents a brief overview on important research topics. The research is grouped according to the main CE strategies as defined by Bocken et al. (2016) of narrowing, slowing, and closing the loops, and Geissdoerfer et al.’s (2018) addition of intensifying and dematerialising loops.

With regard to closing the loops, research had initially focused primarily on waste minimisation and recycling (Adams et al., 2017). Research on reuse, retaining higher material value, has followed mainly in the last five years. This ranges from studies on a very technical level on how to reuse certain types of materials (e.g., Nijgh & Veljkovic, 2019; Sanchez & Haas, 2018; Tallini & Cedola, 2018), to reuse in the context of whole buildings, instead of specific materials or components (e.g., Akanbi et al., 2019; Manelius et al., 2019). On the potential for the reuse of materials at industry level, researchers have investigated the potential

of materials savings and reduction of environmental impacts (e.g., Lederer et al., 2020; Nußholz et al., 2019), as well as the barriers and drivers for the implementation of reuse and similar strategies in the building sector (e.g., Adams et al., 2017; Frändberg & Nyqvist, 2021; Høiby & Sand, 2018, 2018; Nußholz et al., 2019; Salem, 2020; Selman & Gade, 2020).

With regards to narrowing the loops, which is about resource efficiency in the sense of using fewer resources per product, there is a range of literature on material efficiency, as well as energy efficiency. In the context of climate change mitigation, material efficiency can refer to using fewer materials, but also substituting for more environmentally friendly materials (Hertwich et al., 2019). On the topic of reducing through lightweight design, there are technical analyses on how much less material could be used without compromising on quality and safety (Carruth et al., 2011; Milford et al., 2013; Moynihan & Allwood, 2014). This is mostly with regard to high-impact materials such as steel, aluminium and concrete. Literature on substituting with less emission-intensive building materials is quite diverse and has focused on a wide range of different materials. This includes the utilisation of wood, where researchers have established its environmental benefits in comparison to steel and concrete (Heeren et al., 2015; Sandin et al., 2014). Others focus on alternative materials to replace aggregates or cement in concrete (Choudhary et al., 2020; Pranav et al., 2020; Singh & Middendorf, 2020), or alternative insulation materials (Bumanis et al., 2020; Crini et al., 2020). Energy efficiency, on the other side of narrowing the loops, has received great attention from research as well as policy makers. On this topic, there is wide range of literature on the specific energy efficiency technologies (Caird et al., 2012; Chenari et al., 2016; El-Darwish & Gomaa, 2017; Han et al., 2010) or more broadly of low-energy or zero-energy buildings (Belussi et al., 2019; de Wilde, 2014). Others have analysed the effectiveness of energy labels (Asensio & Delmas, 2017; Walls, 2017) or energy efficiency policy for buildings. Finally, scholars have also reviewed the barriers and drivers for labels (Mlecnik et al., 2010; Wong & Krüger, 2017), policy (Zhang & Wang, 2013), or energy efficient buildings overall (Cristino et al., 2021; Gupta et al., 2017).

Finally, slowing the loops has been explored mainly in the sense of extending the lifetime of buildings by means of renovation or retrofitting, also referred to as creative or adaptive reuse. Here, the main difference lies in whether the building will be used for the same purpose (renovation) or a different purpose than before (adaptive reuse). Adaptive reuse is similar to other forms of reuse, but buildings are first adapted to meet the needs of the new users through physical changes, e.g., expansion or conversion of spaces (Owojori et al., 2021). There is literature on the technical facilitation (Sanchez et al., 2019, 2020), its implications of revitalisation for urban spaces (Aigwi et al., 2019; Zecca & Laing, 2020), evaluations on adaptive reuse potential (Aigwi et al., 2019; Bullen, 2007; Laefer & Manke, 2008) and how policies can drive or inhibit adaptive reuse (Ikiz Kaya et al., 2021; Marika et al., 2021). Literature on renovation has covered similar fields: technical feasibility and potential (Göswein et al., 2021; Sesana & Salvalai, 2018), challenges and drivers for renovation (D'Oca et al., 2018; Jiménez-Pulido et al., 2021, 2022) and public policy (Artola et al., 2016; Y. Tan et al., 2021) have been identified among the most researched themes (He et al., 2021).

Complementing the framework of closing, slowing, and narrowing loops, Geissdoerfer et al. (2018), add the strategies of intensifying loops and dematerialising loops. Intensifying loops was already included in Bocken et al.'s (2016) understanding of narrowing the loops, since it is also a form of resource efficiency: instead of focusing on producing with fewer resources per products, this is about providing the same service with less product and thus fewer resources. In their framework, however, Geissdoerfer et al. (2018) choose to conceptualise intensifying loops independently to highlight the strategy's importance.

Aside featuring intensifying loops, Geissdoerfer et al. (2018) also add dematerialising loops, which refers to “the substitution of product utility by service and software solutions” (Geissdoerfer et al., 2018, p. 713). This includes product service system (PSS) business models or digital replacements of physical products. On the topic of PSSs in the building industry, there are case studies on buildings including operation that are being rented out instead of sold (FORA, 2010; Kurdve & de Goey, 2017; United Nations Environmental Programme, 2015), which creates incentive for a longer lifespan, reduced cost, and use of reused and recycled materials. On a smaller level, Ness et al. (2019) propose an ICT-enabled PSS for the reuse of building components, which might provide a solution to issues around warranty and quality assurance related to reuse products. Overall, however, it appears that dematerialising loops in the building industry has not been researched as extensively as the strategies of narrowing, closing, and slowing the loops.

Similarly, intensifying loops has not received as much attention from researchers or policy makers. Also referred to as ‘more intense use’, it aims at an overall reduction of floor area per capita achieved through, e.g., a reduction of residential space per person (i.e., smaller dwellings), larger household sizes, shared multi-purpose spaces, or shared office spaces. However, as shown in the next section, there is evidence in the literature that it is indeed an approach that merits more attention. The next section reviews a number of studies that have compared different CE strategies in the building sector, before moving on to the existing literature on intensifying loops.

2.1.1 Comparison of different strategies

There are a few studies comparing different scenarios for emission reduction in the building sector, which all highlight the importance of a reduction of floor area per capita in order to achieve significant emission reduction. This section provides an overview on these studies.

For instance, Zhong et al. (2021) find that among different scenarios, intensifying the use of buildings is the most effective strategy to reduce emissions from the building sector, as it reduces demands for all materials. The authors find that a 20% reduction of floor area per person could lead to a GHG emission reduction of 56.8 Gt CO₂eq between 2020 and 2060, compared to a ‘middle-of-the-road’ SSP2 pathway¹ baseline. This is almost four times as much as the 14.1 Gt CO₂eq reduction that would be achieved by the second-best strategy, lightweight design (see Figure 2-2). They consider the following scenarios, all by/compared to 2060: more intensive use (20% reduction in floor area per capita), lightweight design (10% reduction in concrete, 19% in steel and aluminium), lifetime extension (up to 90% longer use), material substitution (10% more buildings from wood), more recovery (reach maximum reuse and recycling rates), energy transition (according to the SSP2-RCP2.6 scenario), production efficiency increase (improvements in manufacturing and change in processes). It is important to note that their calculations are only based on embodied emissions, that is, the emissions resulting from the building materials production, and not from use-phase emissions. In fact, more intensive use is the only strategy that is expected to also reduce use-phase energy use, while the other scenarios are expected to have neither positive nor negative impact. In order to achieve a reduction of space used per person, the authors suggest sharing offices, lower vacancy rates of buildings, and telecommuting, for instance, and argue thus that the reduction does not have to be connected with a decrease in well-being.

¹ SSP2 is a “Shared Socioeconomic Pathway” as defined by the IPCC, whereby SSP2 refers to a “middle of the road” scenario where 21st century developments do not significantly deviate from historical patterns of development. For further reference, see for instance Riahi et al. (2017).

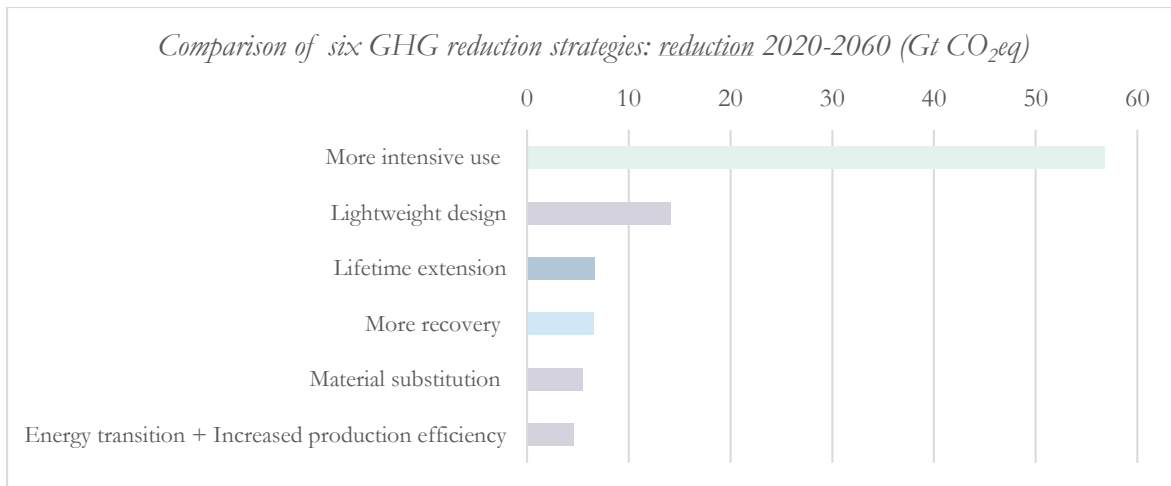


Figure 2-2: Global GHG emission reduction from commercial and residential building materials. Source: own illustration with data from Zhong et al. (2021).

In their analysis of the English housing stock, Cabrera Serrenho et al. (2019) come to a similar conclusion when comparing different strategies for reducing operational and embodied emissions and their respective costs. They claim that even a significant reduction of carbon emissions from building materials (low carbon materials) as well as a progressive transformation towards zero-carbon building standards would not be sufficient to deliver the necessary emission reduction due to the large share of operational emissions and the slow replacement rate of buildings. That is, strategies only geared towards reducing embodied emissions are insufficient because they do not address operational emissions, and more stringent building standards would take too long to take effect. To circumvent this issue would require replacement with new buildings or refurbishment of existing buildings at a large scale. However, the authors argue that the costs associated with these strategies are very high and strongly decrease the likelihood of them being implemented. Instead, the authors argue that a 10% reduction of floor area per capita by 2050, combined with improved building standards, would allow to decrease operational emissions by 30% at no additional cost compared to current practices. The fact that floor area per capita would be decreased *and* become more energy efficient allows for this strategy to be less costly and yet achieve significant reduction. The authors suggest that flexible designs that allow for multiple use of spaces, telecommuting, and house sharing are options to achieve such reduction in floor area, since dwellings are likely to be empty a few hours each day. Such change will have far-reaching impacts on social organisation and spatial planning and design.

In a report for the International Resource Panel, Hertwich et al. (2020) also find that more intensive use appears to be much more beneficial than more technical material-based approaches, such as higher recycling rates. In their model, they assume a 20% reduction of floor area per capita, which leads to a reduction of 9.2 Gt CO₂eq in comparison to a SSP2 baseline scenario. They identify the second highest emission reduction potential to be in end-of-life recovery rate improvements, which includes higher recycling rates of aluminium, copper, plastic, and timber. The authors calculate an emission reduction potential for this strategy of 0.8 Gt CO₂eq—over ten times smaller than that of more intense use. Similarly to Cabrera Serrenho et al. (2019) reviewed above, the authors highlight that the slow replacement rate of the building stock hamper the potential of material-based approaches (i.e., ones that target mainly the material-related emissions). From this, the authors derive the need to implement GHG-reducing measures as quickly as possible. A more intensive use scenario, according to Hertwich et al. (2020), would require the adoption of sufficiency as a norm

regarding living space, including changes in social acceptance, lifestyle and urban planning. Further, the existing building stock would have to be refurbished in order to adapt for more optimal use.

In a previous paper by a very similar constellation of authors based on a literature review of studies on different materials and industries, Hertwich et al. (2019) conclude that there is moderate support for intensified use of buildings as the strategy most able to reduce material demand and associated emissions. They also mention lightweight design as a second strategy with high potential. Hertwich et al. (2019) go a little deeper into the trade-offs between CE strategies that aim to reduce material use and energy consumption during the building's use phase. They find that refurbishment must have ambitious energy standards, otherwise a higher life cycle impact occurs (Grant & Ries, 2013; Itard & Klunder, 2007). They further argue that aside from more intensive use, lightweight design also does not increase energy consumption. Another interesting point that the authors make is that even though most scenarios included in their literature review assume that a reduction in floor area per person will be achieved through smaller dwellings, it could also include other strategies, such as a larger number of residents in a household, multi-purpose spaces and shared spaces, including for instance offices.

In the context of Norway, Pauliuk et al. (2013) conduct a material flow analysis and lifecycle assessment with a stronger focus on energy efficiency during the use phase. The authors conclude that in order to achieve a 50% reduction of the carbon footprint of the sector, which would be in line with the 2-degree target, transforming the stock would not be enough, but measures affecting the lifestyle, such as a reduced floor area per person, would be necessary. Grubler et al. (2018) also assume floor space limits at around 30m² per capita in their global 1.5-degree scenario.

The above summarised studies clearly demonstrate that the potential for intensified use of buildings in terms of material and emission reduction is considerably larger than most other CE strategies, such as recycling or lightweight design. Evidently, this does not mean that other efforts to better understand and implement other strategies should be neglected, since the most impact can be achieved through the combination of multiple strategies. It does speak to the importance of researching and achieving more intensive use. The existing literature on this topic is presented in the next section.

2.2 Intensifying Loops in the Built Environment

There is very limited research that is concerned specifically with strategies to intensify building use, which makes it difficult to obtain an overview of the available strategies. However, the studies reviewed in the previous section mention examples of ways to intensify building use, which have been compiled in this section. Individually, the strategies have been researched, just without the conceptual connection to intensifying loops. This section briefly presents the compilation of the strategies, before providing a quick overview on literature on sufficiency and optimisation for intensified building use.

The studies reviewed in the previous section that find intensifying loops to be an effective CE strategy each provide different examples of how this could be achieved. Compiling them, they all include either elements of optimisation (i.e., using space more efficiently in a way that does not reduce the space function) or sufficiency (i.e., effectively using less space), or a combination of both. For instance, lower vacancy rates (Zhong et al., 2021) could be considered as purely optimising whereas smaller dwelling sizes (Heeren & Hellweg, 2018; Hertwich et al., 2019, 2020; Pauliuk et al., 2013) fewer second homes (Hertwich et al., 2019), and co-housing (Cabrera Serrenho et al., 2019; Hertwich et al., 2020; Pauliuk et al., 2013) are

sufficiency strategies. Strategies that are mainly optimising but have some aspects of sufficiency include multi-purpose buildings and spaces (Cabrera Serrenho et al., 2019; Hertwich et al., 2019, 2020), which telecommuting is a form of (since the home serves as living and working space) (Cabrera Serrenho et al., 2019; Hertwich et al., 2020; Zhong et al., 2021), and shared spaces including offices and short-term rentals (Hertwich et al., 2019; Zhong et al., 2021). On the optimisation side, it can thus be differentiated between strategies that aim to increase use by the same user(s) (e.g., telecommuting) or between different users (e.g., co-working spaces), and whether they intend the same type of use (e.g., lower vacancy rates) or different types (e.g., telecommuting, multi-purpose buildings).

On the topic of sufficiency, studies have shown the decrease of use phase energy use related to heating and cooling with reduced floor area (Ala-Mantila et al., 2016; Güneralp et al., 2017; Stephan & Crawford, 2016; Wilson & Boehland, 2008, 2008). Stephan and Crawford (2016) demonstrate a sublinear correlation between life cycle energy use and house size, meaning that energy demand increases with house size, even though at a slower rate (e.g., the energy demand for a 300m² house with two inhabitants is only about twice as high as a 100m² house with two inhabitants). Further, while *total* energy demand increases with a higher number of inhabitants, the energy demand *per person* in a 100m² household of two is about 75% higher than a household of five with the same floor area. There is not abundant, but a range of literature on policy options to reduce floor area per capita: Thomas et al. (2019) investigate what policy support would be needed for people who consider their home as too big to move to a smaller dwelling, and Pagani et al. (2022) explore occupancy rules and factors that enable co-housing. Hertwich et al. (2020) comment that policies on dwelling size in the past have had the opposite aim—to ensure good living conditions by setting minimum standards for floor area. Future policies seeking to reduce floor space could include taxation, removing barriers for people seeking to relocate to a smaller dwelling for a new life stage, and incentivise and remove barriers for multi-unit and smaller housing (such as zoning requirements). Finally, studies have also researched the social attitudes towards sufficiency (Sandberg, 2021; Thomas et al., 2017).

Optimising space use is a broad theme and includes topics such as lower vacancy rates, building spaces with multiple purposes, telecommuting, and shared spaces, oftentimes offices or short-term rentals. Lower vacancy rates have mostly been investigated from an economic (e.g., Hagen & Hansen, 2010) and social perspective (e.g., Cohen, 2001), whereby the environmental sustainability aspect has recently become a tangential topic of interest (Gentili & Hoekstra, 2019). A range of studies have been conducted on the sustainability benefits of telecommuting (Kim, 2017; O'Brien & Aliabadi, 2020; Zhu & Mason, 2014) and what factors drive employees' decision to telecommute (Bagley & Mokhtarian, 1997; Walls, 2017). Other forms of optimising space mentioned in the literature above describe different kinds of sharing spaces among different users, such as multi-purpose buildings for multiple users, co-working spaces, and short-term rentals. While there is little literature on the topic of sharing spaces from a CE perspective, there is a growing, albeit still limited body of research on shared spaces from the perspective of the SE, as further discussed in the next section.

2.3 Sharing (Economy) in the Built Environment

As Brinkø et al. (2015) note, the inclusion of space in the SE is a relatively recent development, which is why there is currently only limited literature on the topic, of which this section provides a brief overview. First, much of the research is specifically about shared offices and short-term accommodation, which have been studied from different disciplinary perspectives. Then, there are a few studies that have looked at space sharing from a broader perspective, have investigated the potential benefits and pitfalls of space sharing, and have developed typologies to classify space sharing.

While there is a recent and growing research interest in space sharing, most research on specific types of space sharing has focused on short-term rentals such as Airbnb, or co-working spaces (Harris et al., 2021). On accommodation sharing by companies such as Airbnb, there is quite an array of research with different perspectives on whether it has a positive environmental impact due to its space sharing aspect (e.g., Midgett et al., 2018), or whether social impacts and the environmental impact due to increased travel outweigh that (Álvarez-Herranz & Macedo-Ruíz, 2021). Crommelin et al. (2018) distinguish between Airbnb listings that can be considered examples of the SE, and listings that rather work as conventional holiday rentals, and find that in the cities of Paris, London, New York, Sydney, and Hong Kong, up to half of the Airbnb listings belonged to the latter type. Regardless of its environmental impact, Airbnb can be an interesting example of a functioning business model based on sharing space, from which insights might be drawn, for instance on the topic of consumer trust, which is an important aspect in the SE (Yang et al., 2019). Also relevant for this thesis is literature on the policy response from national or local governments to the emergence of short term rental platforms (Aguilera et al., 2021; Ferreri & Sanyal, 2018).

Another researched form of SE in the context of spaces is co-working. There is literature on co-working from a management perspective, which also touches upon potential social value such as knowledge exchange, trust and community building, and economic values like higher productivity, thereby establishing what makes co-working spaces attractive (Bouncken & Reuschl, 2018; Rådman et al., 2022). Other studies focus specifically on the environmental impact of co-working spaces: Vaddadi et al. (2020) identify travel distances, transportation modes, and heated floor area as the main factors impacting energy usage. In their case study on a co-working space in Stockholm, they find that travel-related energy savings are usually balanced out by the energy requirements to operate a co-working space. Therefore, they argue that co-working per se does not lead to energy savings but has the potential to do so if it were accompanied by a reduction in office space on the employer side (through e.g., shared workplaces). Similarly, Harris et al. (2021) conclude that co-working can indeed have a positive environmental impact if it leads to a lower total heated floor area and reduces new construction. Policies that promote sharing, therefore, should mitigate rebound effects.

Moving towards a broader perspective on space sharing, Brinkø et al. (2015) investigate the question of how shared spaces and their value for communities and cities can be understood. The authors describe space sharing as “optimising building use by allowing different types of use and users at different times of the day or different times of the week” (Brinkø et al., 2015, p. 737) and identify the following potential benefits and pitfalls of the shared spaces (see Table 2-1). Brinkø et al. (2015) further develop a typology of shared spaces, focusing specifically on organisations with a larger building portfolio, such as municipalities and larger companies. It is based on five main questions: What is being shared, when is it being shared, why is it being shared, who is sharing, and how is it being shared.

Potential benefits	Potential pitfalls
<ul style="list-style-type: none"> - Environmental benefits due to fewer buildings being used - Synergies between building users - Financial benefits - Greater connection to outside world - Creating a lively atmosphere - In case of third-party ownership, the buildings are managed professionally 	<ul style="list-style-type: none"> - Potential complications with logistics - Mismatch between offer and demand - Unclear ownership leading to management difficulties - Availability of spaces difficult to control - Cultural/emotional barriers with regards to privacy and ownership

Table 2-1: Potential benefits and pitfalls of shared spaces, adapted from Brinkø et al. (2015).

Lundgren et al. (2022) propose another typology, which substantially advances the conceptual understanding of shared spaces by applying an existing framework on access-based consumption to case studies of shared spaces, which consists of the following nine elements.

- 1) Temporality (access): drop-in/one-off versus longer term usage (membership or lease).
- 2) Temporality (duration): short and flexible versus long usage.
- 3) Anonymity (interpersonal): anonymous versus pro-social.
- 4) Anonymity (spatial): intimate context versus less intimate context.
- 5) Market mediation: for profit versus not-for-profit.
- 6) Consumer involvement: self-service versus serviced.
- 7) Type of accessed object (material): physical versus virtual.
- 8) Type of accesses object (function): functional versus experiential.
- 9) Political consumerism: commercial/non-political versus sharing with anti-consumerist background.

The authors suggest the addition of a tenth dimension: temporality in terms of organisation, that is, whether the organisation of a shared space is rather fluid or static. They find that their cases are almost exclusively fluid in organisation and have an evolving and work-in-progress nature. Furthermore, the authors noted the creation of a sense of experience through an aesthetic space and a community feeling among the users—community facilitation was an important service provided in many of the case studies, although there was no evidence of there being less of a community sense in the cases where there was no such facilitation service. Finally, sharing was mainly considered as a way to realise organisational values, and the environmental benefits rather unintentional (Lundgren et al., 2022). Both this and Brinkø et al.'s (2015) typology are really helpful in that they propose a more structured understanding of the notion of shared space, providing important information on which dimensions and characteristics have been deemed relevant to distinguish space sharing initiatives.

Writing on the implementation of intensified use strategies, a report on Circular Economy in the built environment by Arup, a professional service firm with a focus on sustainability, underlines the benefit of using spaces and infrastructure more efficiently through sharing. They mention environmental benefits with the reasoning that “by occupying less space and minimising the time an asset is idle, fewer resources are needed to deliver the same function or service, and thus less waste is produced” (Arup, 2016, p. 22). The authors highlight that space sharing can provide financial benefits on top of that, citing the example of Lloyds Banking Group in the UK that managed to remove 1 000 desks from its offices and save around 11 million Euros by switching to flexible working for about one-fifth of its office space (Arup, 2016).

2.4 Discussion and Need for Further Research

While there is research that indicates the importance of strategies to intensify loops in the built environment, much research in the field of CE in the building industry has focused on strategies such as narrowing and closing the loops or slowing the loops in terms of lifetime extension. Research comparing these strategies demonstrates that intensified use has a considerable potential for the reduction of material consumption and GHG emissions. Intensifying use is mainly done through sufficiency and optimisation strategies, among them is the sharing of space.

Research on shared space has mainly been conducted in the context of SE literature and focused thus far on specific kinds of space sharing, such as short-term accommodation rental, or on co-working. There are, however, other forms of space sharing of private, public, and commercial spaces that are important to investigate. In these contexts, space sharing could

also be financially beneficial and might often be engaged in without explicit sustainability considerations, even though environmental benefits are likely to occur. Such occurrences of space sharing have not been studied extensively.

Lundgren et al. (2022) and Brinkø et al. (2015) significantly advance the theoretical understanding and conceptualisation of space sharing by proposing the use of typologies for shared spaces. Further knowledge is needed, however, on other examples of space sharing, especially occurring in a broader, more mainstream contexts. Moreover, the research has thus far focused on describing the types of space sharing only, and little is known about how space sharing could be encouraged by different actors. In this context, the importance of cities and municipalities in the context of other sharing activities suggests that they are relevant actors to investigate when trying to move towards more shared spaces.

3 Conceptual Framework

This thesis is to a large extent based on three conceptual frameworks, which are interconnected with each other. The first one is CE, of which the main value for this thesis lies in the theoretical understanding and contextualisation of intensifying use as a CE strategy. The second concept, or rather cluster of concepts, is the one of SE, what has been defined to be a sustainable SE, and how cities interact with the SE. These are deployed to guide the research design, data collection and analysis, as outlined in more detail in Section 4.1 on Research design.

3.1 Circular Economy

As the concept of CE has been quite much debated topic in the sustainability sphere in recent years, multiple definitions and frameworks for CE have been put forward in attempts to capture what type of strategies and solutions are part of CE. It is widely agreed upon that the fundamental idea behind CE is to use materials and products as much and long as possible by preserving their value and utility (Benachio et al., 2020). This is commonly understood to include strategies such as reuse and recycling, whereby strategies that preserve the most value of a product are preferred, meaning for instance that reuse is preferred over recycling (Ellen MacArthur Foundation, 2015). This is for instance depicted by the CE framework often referred to as ‘R-strategies’, which summarises CE as ten different strategies beginning with R: Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover. Here, the first strategy is the most prioritised, since it preserves the most value, and is considered the most circular (Potting et al., 2016). Bocken et al. (2016) introduce a terminology of slowing, closing, and narrowing loops. They distinguish by how the materials flow through the system in terms of speed, quantity, and circularity. In closed loops, materials flow at the same quantity and speed through the system, but in a circular flow, such as is the case for recycled materials. In narrowed loops, fewer materials flow through the system, but they are not necessarily cycled, nor are they used for longer time—this is achieved for instance through more efficient material usage in production. Finally, in slowed loops, materials will be flowing through the system for a prolonged time, for instance through repair or maintenance. The terminology of slowing, closing and narrowing loops by Bocken et al. (2016) was extended by Geissdoerfer et al. (2018) to explicitly include intensifying loops and dematerialising loops (see Figure 3-1: CE strategies based on Bocken et al. (2016) and Geissdoerfer et al. (2018)).

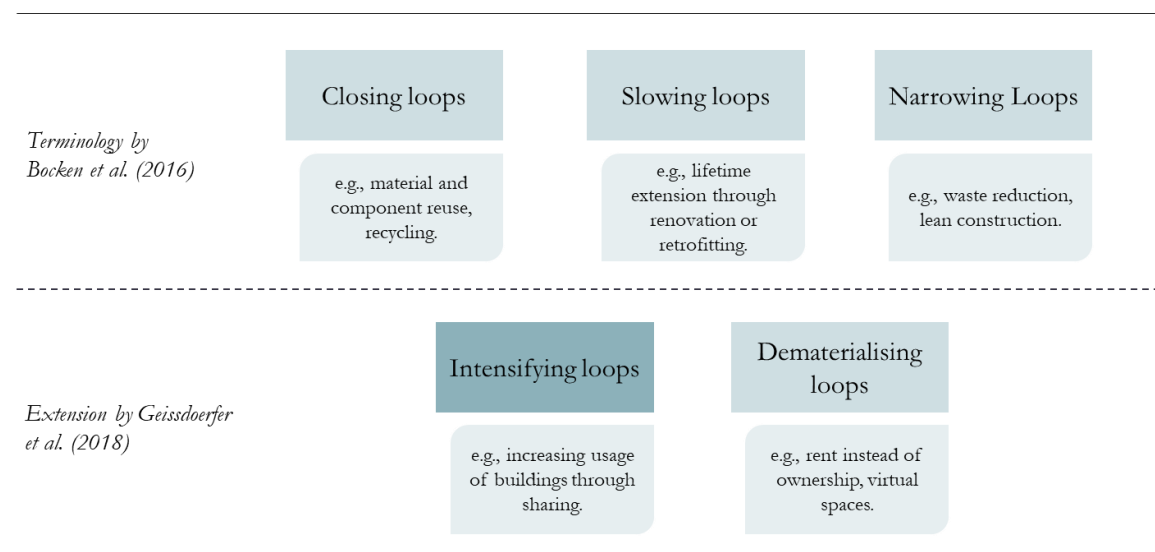


Figure 3-1: CE strategies based on Bocken et al. (2016) and Geissdoerfer et al. (2018).

While there are differences between different conceptualisations of the CE such as the R-strategies and the loop terminology, they all go beyond the reductive image of CE as recycling or reuse only and include other ways of reducing material demands. Furthermore, they each include intensified use in some form although it might not be called so: In the R-strategies, sharing products and designing multi-purpose products to make product use more intensive is the Rethink strategy.

Finally, it is worth mentioning that scholars have pointed out that CE strategies are not always more sustainable, and that trade-offs among different dimensions are crucial to take into account when making the decision to implement a new solution (Blum et al., 2020). In the specific context of the building industry, there are important trade-offs often between the use phase and the production phase, that is, many strategies that might reduce embodied emissions run the risk of increasing use phase emissions. It is therefore imperative to ensure that solutions in fact have a positive sustainability aspect.

3.2 Connecting Circular Economy and Sharing Economy

The CE and the SE, the latter of which is discussed in more detail in the next section, have several aspects in common, not least the fact that they are both sustainability buzzwords that have been lauded and fiercely criticised in the past few years. Indeed, both are considered to have a significant potential for sustainability, but also at risk not to realise said potential should they move away too far from their original principles and paradigms they were reputed for (Henry et al., 2021). This underlines the importance of always questioning whether CE or SE activities are actually more sustainable and considering potential trade-offs and rebound effects. Besides this, CE and SE are also connected on a conceptual level: as mentioned before, considering intensifying loops a type of CE strategy includes sharing as a CE strategy. In a literature review on CE and SE, Henry et al. (2021) find that most scholars that investigate both SE and CE business models consider SE to be a subset of CE. However, there are differences within the literature on CE and on SE, one important aspect being that SE literature has a stronger focus on the social aspect, whereas CE focuses more on the environmental and economic elements (Henry et al., 2021). Thus, it seems important to note that while SE might be considered a subset to CE, sharing might still have slightly different meanings in both contextual settings, as both the framework assigns different objectives and characteristics.

Nonetheless, concepts and frameworks from research on the SE can be very helpful in researching and analysing sharing from a CE perspective, particularly as there is currently not much conceptual work on sharing in the SE. Therefore, this thesis' research design and analysis are informed by a definition of a sustainable SE and a framework on urban governance of the SE, which are discussed in the next section.

3.3 Sharing Economy & Sharing Cities

The following section delves into the related topics of SE and the Sharing City, and how these concepts are used in this thesis as it focuses on sharing from a CE perspective, which is slightly different than sharing in the context of SE, as explained in this section. First, it presents a set of criteria aiming to delineate what characterises a 'sustainable' SE, as defined by Curtis & Lehner (2019), before discussing these criteria in the context of space sharing to further define what is meant by space sharing in this thesis. Then, it moves on to the question of how cities can govern the SE in order to uphold its environmental and social benefits—thereby becoming a 'Sharing City'—which has been captured in a comprehensive framework

by Palgan et al. (2021). This framework, consisting of different governance mechanisms and roles that a municipal government can take on to govern the SE, is then also discussed in the context of the thesis.

3.3.1 Sustainable Sharing Economy

The first concept presented here is a definition of what is part of a sustainable SE, as defined by Curtis and Lehner (2019). The first section briefly presents the criteria that the authors formulate, and the second section discusses these criteria in the context of this thesis and how they inform the definition of space sharing used in this thesis.

Definition from Literature

The SE, as an alternative model to consumption, has been subject to much research from environmental, social, policy, and management perspectives. Therefore unsurprisingly, there exist many different definitions of it, which do however largely agree on the following characteristics: SE promotes access over ownership, thereby increasing the utilisation of goods and services, in order to maximise resource efficiency (Curtis & Lehner, 2019; Mazzucotelli Salice & Pais, 2017). While SE is therefore often associated with environmental benefits, in practice, it has been called in question whether these are actually achieved (Mi & Coffman, 2019; Murillo et al., 2017; Vith et al., 2019). Delineating the characteristics of a sustainable SE, Curtis & Lehner (2019) identify the following aspects (see Figure 3-2): a) ICT-mediated (i.e., access to sharing through websites or apps); b) non-pecuniary motivation for ownership (i.e., while there might be monetary or other compensations involved, the goods should not be bought solely for the purpose of making money through sharing); c) temporary access (i.e., no transfer of ownership); d) rivalrous (i.e., shared good cannot at the same time be used by someone else); and e) tangible goods (i.e., space, durable and non-durable goods).

Criteria	Definition	Excluded elements
ICT mediation	Mediation through technology allows for two- or multi-sided markets.	E.g., more traditional forms of sharing.
Non-pecuniary motivation for ownership	The space is not acquired solely for the purpose of making financial gains through sharing.	E.g., business-to-consumer models.
Temporary access	There is no transfer of ownership; access is temporary (not over extended period of time)	E.g., second-hand, longer rentals.
Rivalrous access	Access to different users at different times, i.e., the spaces are not used by the users simultaneously.	E.g., streaming services, parks, Wikipedia.
Tangible space	Physical goods are being shared.	E.g., gig economy, streaming services.

Figure 3-2: Criteria for Sustainable Sharing Economy, own illustration based on Curtis and Lehner (2019, p. 14).

Application in this Thesis

As mentioned above, while SE might be considered a subset to CE, sharing might still have slightly different meanings in both contextual settings, as both the framework assigns different objectives and characteristics. The general description of the SE as promoting access of

ownership to increase the utilisation of goods and services, thereby maximising resource efficiency corresponds to the idea of sharing in the context of intensifying loops. However, the SE, although there exist many different definitions of it, is a recent phenomenon that proposes sharing as an alternative mode of consumption (Curtis & Lehner, 2019), and thus carries much broader socio-political implications with it. It could thus be said that while sharing is part of SE, SE goes beyond sharing. Conversely, the SE usually only captures specific types of sharing—considering Curtis and Lehner’s (2019) definition, for instance, it is only sharing activities that meet the criteria they have identified. In the context of CE, however, there seems to be not such a clear understanding of sharing, other than its purpose in reducing resource use through shared use of a good or service, thereby intensifying resource loops. The lack of a more defined definition might indicate a contextual gap that could be addressed in further research.

This thesis investigates sharing as a practice within CE, and therefore does not adapt a SE definition of sharing. However, considering the lack of a definition of sharing in the context of CE, Curtis and Lehner’s (2019) framework is helpful in creating a more tangible working definition, even though some features used to define sharing in the SE might not be that relevant in the CE. For instance, Curtis and Lehner’s (2019) principles of information and communications technology (ICT) mediation and non-pecuniary motivation for ownership might not be included in a definition of sharing for the SE. Regarding ICT mediation, the authors maintain that it is important since it marks the difference between sharing as a traditional practice and the SE that has newly emerged, and allows for two- or multi-sided sharing platforms that also involves strangers. This is not a distinction that is very relevant for sharing in the context of CE. Further, the criterion of non-pecuniary motivation for ownership is helpful to exclude many sharing activities that are not in fact sustainable, considering that this would in the first place stimulate consumption rather than reduce consumption by creating a financial incentive to buy. This excludes any business-to-consumer sharing activities. The authors argue that in the context of business-to-consumer models, the focus is not on reducing the idling capacity of goods. Instead, they see this as a form of product-service systems or access-based consumption (Curtis & Lehner, 2019), which might not be considered part of the SE, but are modes of sharing in a broader sense. Therefore, as long as business-to-consumer sharing ultimately intensifies the use of space, it can be considered sharing in the CE sense. It is helpful to note that Lundgren et al. (2022) also use the term access-based consumption of space to describe space sharing.

Therefore, for the purpose of this thesis, the criteria of temporary access, rivalrous use, and tangible goods (in this context, physical spaces) are used to further define sharing beyond the goal of reducing resource consumption through optimised use. However, the criterion of rivalrous use might be a bit difficult to apply in the context of space, which Curtis and Lehner’s (2019) consider to mean that it can only be one person at the time using the good. It might be easier to think of this idea in terms of simultaneous sharing (i.e., co-using) and serial sharing, as explained in Section 1.4 of this thesis. The thesis focuses on serial sharing. The following definition of space sharing is formulated: a setting in which a space is used by different users at different times, that is, users have temporary and serial access to a space, thereby optimising space use. The goal of optimising space use does not have to be explicit, that is, users do not have to be aware of it or motivated by that.

3.3.2 The Sharing City and Urban Governance of the Sharing Economy

This section briefly presents the framework for municipal governance of the SE as formulated by Palgan et al. (2021), before discussing the limitations regarding its application for this thesis.

Definition from Literature

The fact that cities play a special role in different sharing practices has led to the emergence of the concept of the Sharing City. Although the definition of Sharing City varies significantly, as is the case with the definition of SE, it is widely associated with a strong focus on community and the importance of locality associated with SE (Sánchez-Vergara et al., 2021). In this sense, mitigating the social and environmental risks of the SE, while harnessing its benefits, is crucial for a Sharing City, which in turn speaks for the importance of collaboration between different social actors. In this context, Palgan et al. (2021) underline the importance of municipalities in this process, and develop a comprehensive analytical framework for municipal governance of the SE and sharing economy organisations (SEOs), in which they outline five different governance mechanisms divided into 11 governance roles that a municipal government can take on when interacting with SEOs. They are the following (see Figure 3-3):

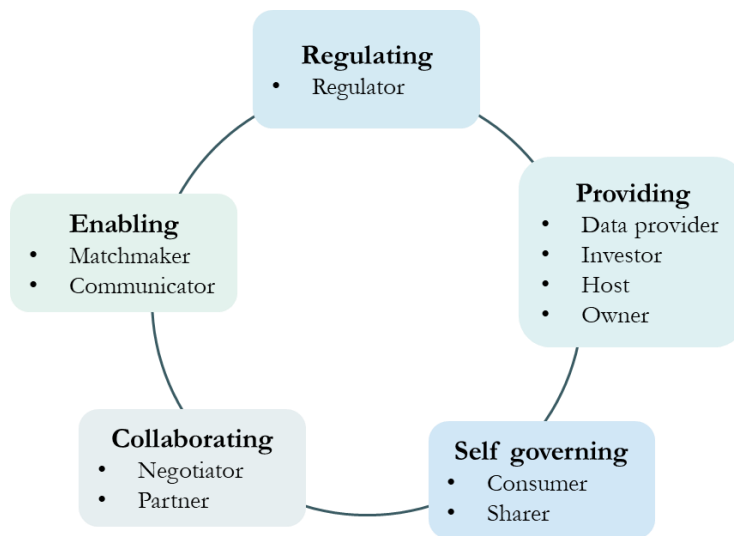


Figure 3-3: Framework for municipal governance of the SE by Palgan et al. (2021) with five governance mechanisms and 11 governance roles.

Application in this Thesis

This framework is helpful to have a structured and holistic understanding of what interactions between urban governments and actors involved in space sharing practices could consist of. It is important to note that this framework focuses specifically on the interactions between the municipalities with SEOs, that is, it focuses on formalised sharing activities where a SEO is facilitating the sharing. In this thesis, however, sharing is not always as formalised and facilitated by a SEO. That is, while an online platform for co-working spaces would be considered a SEO, that would not be the case for a school, which decides to rent out rooms in the evening, or cultural organisations that share repetition rooms. This means that there is a wider range of actors that the municipality could be interacting with. Therefore, this lack of an actor that is clearly assigned the task of leading and organising the sharing renders it difficult to apply the framework in the context of this thesis. The difference between governing a specific SEO and governing sharing more generally has also been reflected on by the corresponding author of the framework Yuliya Voytenko Palgan, who points out that the framework is indeed focused specifically on the former (Y. V. Palgan, personal communication, 4 May 2023).

To avoid confusion, the framework and its terminology were thus not applied in the description of the findings. Nonetheless, the framework provides a helpful and holistic

understanding of the types of engagement the municipalities can have with different actors in the context of sharing that are available to the municipality. It captures mechanisms that go beyond conventional tools of regulating or providing funding and highlights the importance of other modes of governance such as enabling and collaborating. Furthermore, it points out the possibility of the municipality participating in sharing as a sharer and consumer itself. This is very important in the context of this thesis, as municipalities are large owners of real estate and could therefore be influential participants in space sharing. Therefore, even though the framework and its terminology are not applied in the findings, it has crucially informed the understanding and analysis of the data collected.

4 Research Design, Materials and Methods

This chapter provides an overview of the research design, materials and methods employed in this thesis. The first section presents general information about the research design, with the following sections providing more details about data collection, materials collected, and data analysis.

4.1 Research design

To investigate space sharing practices in the cities of Amsterdam and Malmö, a qualitative exploratory case study approach with data collection through semi-structured interviews and document analysis has been chosen. As demonstrated in the literature review, there is little research about space sharing as a means to intensify building use, and no research has been found that specifically investigates the role of municipalities in this context. A qualitative exploratory approach is suitable as it allows to describe and develop a better understanding of a topic that has not been studied extensively before (Creswell & Creswell, 2018).

Typical for qualitative research is an inductive strategy, in which patterns in the findings are identified in order to formulate a general model (Creswell & Creswell, 2018). Strictly speaking, the outcome of inductive research should thus be theory (Bryman, 2001). However, as Bryman (2001, p. 27) notes, much qualitative research in fact does not follow a classical inductive approach: “not only does much qualitative research *not* generate theory, but also theory is often used the very least as a background to qualitative investigations.” Instead, much qualitative and induction-oriented research produces “insightful empirical generalizations,” rather than actually developing theory out of its data (Bryman, 2001, p. 27). The differentiation between inductive and deductive research is thus much less definitive as often suggested, but could rather be considered as “tendencies” (Bryman, 2001, p. 27). In line with this description, this thesis does follow an inductive approach, but not a strict inductive approach in the sense that it generates theory, but rather produces generalised findings based on the data collected. Furthermore, it uses theory to inform the data collection and analysis, but not with the aim of testing this theory as would be the case in deductive research. In line with this more flexible approach, it can be argued that the research paradigm most fitting for this thesis is pragmatism, as it is about finding a solution to a problem (that is, identifying existing solutions as well as enablers and barriers), rather than a societal condition (Creswell & Creswell, 2018).

Then, the research has been conducted as a qualitative case study, which is helpful in understanding a complex and multi-faceted circumstance in a more contextual and in-depth manner (Creswell & Creswell, 2018; Yin, 2018). Yin (2018) underlines the importance of including the context in the research, which differentiates case study research from other research designs that might seek to separate the phenomenon from the context. Case study research, by contrast, underlines the importance of understanding the context that is relevant to the phenomenon since it is crucial to understanding the case (Yin, 2018). The author further explains that the importance of real-life context when conducting a case study has the consequence that there tends to be a greater number of variables that could be interesting to investigate than is possible within the scope of the research. Thus, to help guide the research design, data collection, and data analysis, it is beneficial to develop a theoretical framework prior to the study. Furthermore, it is crucial to use triangulation, that is, verifying data through the convergence across multiple data sources (Yin, 2018). As shown in Chapter 3 Conceptual Framework, multiple theories and concepts have been employed to frame, inform, and guide the research (see *Figure 4-1*): a) the definition and understanding of CE to provide an understanding of the connection of more intensive use and sharing, and the environmental benefits thereof (Bocken et al., 2016; Geissdoerfer et al., 2018); b) the definition of a

sustainable SE by Curtis and Lehner (2019) to inform the working definition of space sharing used in this thesis; c) Palgan et al.'s (2021) framework of an urban governance of the SE to inform data collection and analysis. To ensure triangulation, data has been collected with both document analysis and semi-structured interviews and using different sources.

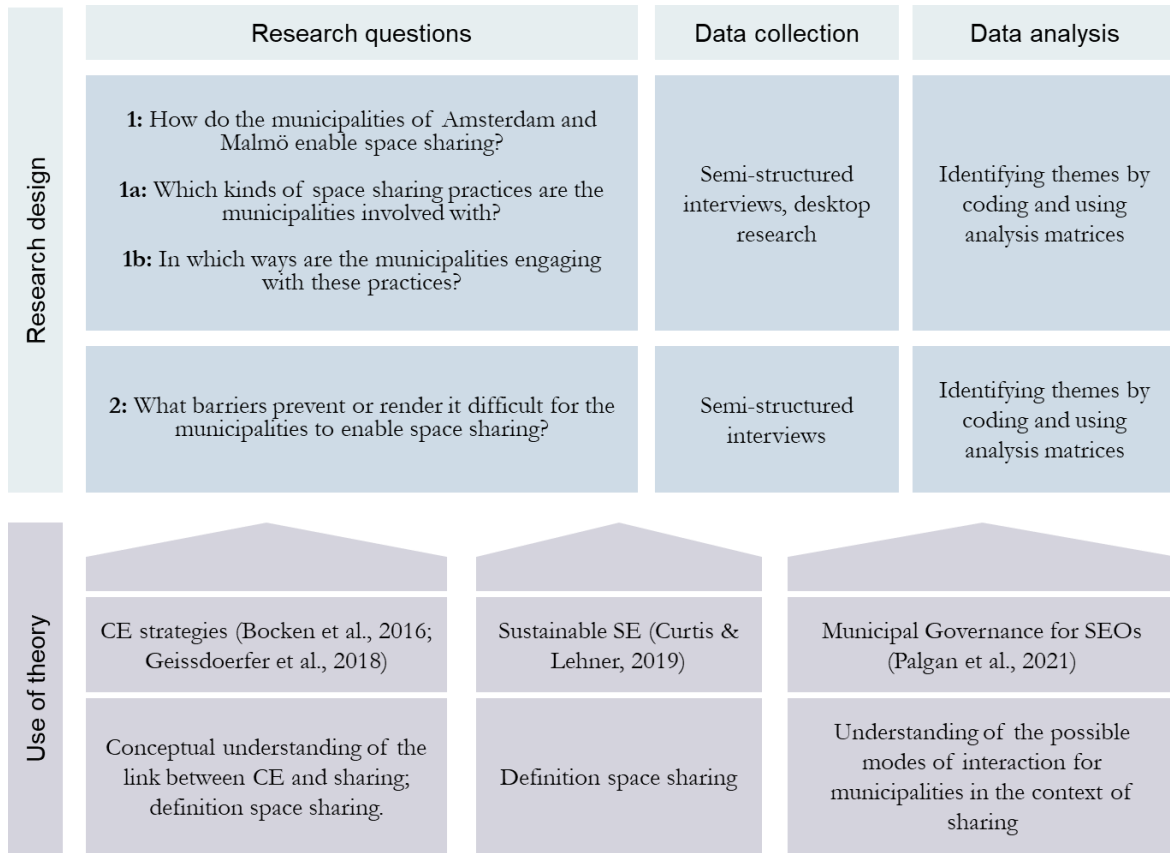


Figure 4-1: Research design and use of theory to inform research design.

4.2 Data collection

For the two case studies, data was collected by means of document analysis of relevant websites and reports, and semi-structured interviews. The following section first provides more information on the selection of case studies, before going into depth for the methods for data collection.

4.2.1 Selection of case studies

The type of case studies chosen for this thesis are cities, rather than specific space sharing practices, given the focus on urban governance, and how municipalities interact with space sharing. The two cases studied in this this thesis are the cities of Amsterdam and Malmö, which were chosen due to their active involvement with the CE in the building industry and the SE. Furthermore, the Netherlands and Sweden, two European high-income countries, have each been active in the context of circular economy in the building industry, and might therefore be considered more advanced in the topic than other countries. The cities' sizes are approximately 350 000 inhabitants for Malmö to 850 000 inhabitants for Amsterdam (Malmö Stad, 2022; StatLine, 2023).

The municipality of Amsterdam has set the target to be circular by 2050, with construction as one of its main three action areas. For the building sector, the municipality formulates three ambitions: first, taking a more holistic approach involving all stakeholders for CE and

integrating CE at all points of the value chain, second, integrating circularity into the municipality's own operations and taking a role model position, third, cooperating with external stakeholders. Targets under these three main ambitions include for instance the creation and implementation of circular criteria, and examining in advance the need for new buildings and how they can be replaced by extending the lifespan of existing buildings or by sharing municipal assets internally. Furthermore, they include revising municipal processes for more circularity, such as procurement and land allocation tender, and reorganising internal processes. Specifically in the context of tenders for buildings, it mentions the inclusion of clear and measurable circular performance (Gemeente Amsterdam, 2020). Malmö has the ambition to transition to climate neutrality by 2030 and has defined both CE and the building industry as two priority areas. As part of this, Malmö was the first Swedish city to formulate a Local Roadmap for a Climate Neutral Construction Sector 2030 (LMF30), which was developed by actors from the construction industry in collaboration with the city of Malmö to achieve its climate goals (LMF30, n.d.). The initiative has six working groups, including one on CE and resource efficiency.

Both cities are engaged in various CE and SE initiatives: the city of Malmö is a signatory of the European Circular Cities Declaration, with the building industry as one of its mentioned focus areas (Circular Cities Declaration, n.d.), Amsterdam was named Europe's first sharing city in 2015, as the city was aiming to harvest the benefits of the SE, while at the same time mitigating its social and economic pitfalls (ShareNL, n.d.), and the Sharing City Alliance is also based in Amsterdam (Sharing City Alliance, n.d.). Malmö was part of Sharing Cities Sweden, a national innovation programme which ran projects in different cities in the country (*Sharing Cities Sweden*, n.d.). Both cities are further part of the EU NetZeroCities project (Prieto, n.d.).

4.2.2 Methods for data collection

Two methods were chosen for data collection: qualitative semi-structured interviews and desktop research (see Figure 4-1 above). Qualitative interviews allow for a more targeted collection of information, due to the interviewer being able to control what questions are being asked and which topics are discussed (Creswell & Creswell, 2018). However, this also constitutes a certain risk in the sense that the interviewer's personal opinions and beliefs, as well as expected results might influence the data collected. In order to minimise this risk, an interview guide was prepared and reviewed with the thesis supervisors beforehand, to ensure that questions were formulated in a neutral way (the full interview guide can be found in Appendix B: Interview Guide Municipalities). Further, the interviews were conducted with the awareness that potential follow up questions should be posed in a way that does not lead the interviewee to a specific answer. Nonetheless, while this kind of bias and influence was attempted to be avoided as much as possible, it is still important to keep in mind for data analysis and discussion of findings. The interview guide for the respondents from the municipalities was different than for the experts interviewed. The interview guide is broadly following the logical structure of the RQs, that is, the first part was about the interviewee's knowledge about the existence of space sharing practices in their city, the second part about their perspective on challenges and drivers for such practices.

4.3 Materials collected

Twelve semi-structured qualitative interviews were conducted with four respondents from Malmö municipality, six respondents from Amsterdam municipality, and two experts: a researcher in access-based consumption of space from Lund University, and the founder of a space sharing platform based in Sweden, referred to as practitioner. Both experts were based in Sweden, and were thus more familiar with the Swedish context, although they also had knowledge about the broader European situation. Some of the interviewees from the

municipalities were chosen due to recommendations from colleagues or connections, which referred to them due to their knowledge about and/or experience with the topic of shared spaces, while others were selected with the specific aim to have a balanced representation between people from different departments. The departments contacted were mainly those that are directly involved with urban planning, building construction, and building management, whereby recommended interviewees also included employees from different departments, such as the environmental department, and the social provision department. For a list of interviewees with their roles and departments, see Appendix C: List of Interviewees.

The documents and websites consulted were mainly used as a source of information about the space sharing practices, and the involvement of the municipality, to complete the information about these provided during interviews. Therefore, examples of documents consulted are annual reports of organisations involved in space sharing, reports and planning documents by the municipality, organisations' websites, newspaper and blog articles, and various websites from the municipalities.

4.4 Data analysis

Thematic, qualitative content analysis was used to analyse the material collected in the interviews and document search, which is a common method in qualitative studies, and refers to a “searching-out of underlying themes in the materials being analysed” (Bryman, 2001, p. 557). Despite its common application for qualitative data analysis, Bryman (2001) notes that there have been few attempts to develop a standard approach for thematic analysis. According to Braun et al. (2019), there are different schools of thematic analysis and the approach chosen for this thesis can best be described as codebook thematic analysis. This school combines more structured elements such as pre-defined codes with a qualitative research philosophy. Themes, in this context, are usually understood as domain summaries, that is, a rather surface-level summary of what has been said or written about a certain topic in the data (Braun et al., 2019; Braun & Clarke, 2022).

Even though for a different school of thematic analysis, Braun et al. (2019) formulate a procedure, consisting of the following six steps: 1) familiarising oneself with the data (reading through, making marks/notes), 2) generating codes, 3) constructing themes; 4) revising themes; 5) defining themes; 6) producing report (Braun et al., 2019). Considering the lack of documentation of thematic analysis, as mentioned above, this is a helpful starting point, despite this thesis following more of a codebook approach. For this thesis, an iterative approach was used to structure the coding, which means that theory was used to approach the data and provide initial coding; however, the coding structure was adapted to the material. Another helpful resource to guide data analysis is Ryan and Bernard's (2003) indicators that help to identify a theme: 1) repetitions; 2) indigenous typologies or categories; 3) metaphors and analogies; 4) transitions; 5) similarities or differences; 6) linguistic connectors; 7) missing data; 8) theory-related material. Initial coding was conducted using NVivo, a qualitative data analysis software, whereby a second, adapted and more detailed analysis was conducted using analysis matrices.

5 Findings and Analysis

This chapter presents the findings of the thesis. First, Section 5.1 presents an overview of how the municipalities of Malmö and Amsterdam are currently engaging with and enabling space sharing. Thereby, the section answers RQ1 (How do the municipalities of Amsterdam and Malmö enable space sharing?), which consists of the two sub-questions RQ1a (Which kinds of space sharing practices are the municipalities involved with?) and RQ1b (In which ways are the municipalities involved with these practices?). The section answers these questions by briefly presenting the examples of space sharing that were discussed by the respondents, and then describing the way in which the municipality is involved with them. As explained in more detail at the beginning of Section 5.1, the examples are divided into two fundamental categories of involvement of the municipality: involved as a third party and involved as a space owner. Then, Section 5.2 presents the barriers that the municipality is facing in the context of space sharing, answering the RQ2 (What barriers prevent or render it difficult for the municipalities to enable space sharing?). This section is divided in two main parts, as two levels of barriers have been identified. Finally, Section 5.3 summarises and combines the findings of Sections 5.1 and 5.2, and relates and analyses ways to enable space sharing in relation to the barriers identified.

Throughout the remaining chapters, interviews are referenced according to the table in Appendix C: List of Interviewees. The abbreviation “A” refers to respondents from Amsterdam municipality, “M” to respondents from Malmö municipality, and “E” to expert interviews. Finally, as discussed in more detail in Section 6.1.4 Comparison between Amsterdam and Malmö, there was a great convergence between the enablers and barriers identified by respondents from cities, which is why the findings are not presented separately by city, but together.

5.1 Municipalities’ Enablement of Space Sharing

This section presents the findings of this thesis with regards to the municipalities’ involvement with space sharing. That is, it broadly describes which kinds of space sharing activities the municipalities of Amsterdam and Malmö are involved with, and how they are involved with it. The focus is on the involvement of the municipalities, and how they can enable space sharing. As discussed in Section 3.3, the framework by Palgan et al. (2021) is not applied directly to the findings of this thesis, but has significantly informed the understanding of different ways the municipality can interact with actors in the context of sharing. The categories that are used to describe the findings here have then emerged during data analysis (see Figure 5-1 for an overview). For a list of all space sharing initiatives that were identified in this thesis, see Appendix D: List of Space Sharing Initiatives.

First, the findings of this section are organised by the type of involvement of the municipality. During data analysis, it was observed that that one significant aspect that differentiates the involvement of the municipalities is whether the municipalities are the owner of the space in question, or whether they are involved as a third party. Whether the municipalities have ownership of the space significantly affects which kinds of levers or enabling instruments they have at their disposal, which barriers it is facing, and which interests it has. Therefore, this section is divided into two main parts: first, space sharing in which the municipalities are involved as third party, and second, those in which they are owner of the space. For the municipalities as a third party, their role is a bit more undefined than as a space owner, hence, three sub-types have been identified in that context: providing subsidies, mediating between different parties, and leveraging land allocation tenders and planning processes. For the municipalities as a space owner, no such sub-type has been identified since it is already a more narrowly defined role in itself (see Figure 5-1 for an overview).

Second, another important distinction that can be made is at which stage the support of the municipalities comes in: providing the space or operating the sharing. Provision of a space refers to the making available of a space for sharing in the first place, that is, either providing a space owned by the municipality or facilitating the construction or renting of a space for sharing. Support to operate the shared space can be provided either by the municipalities taking over the organisational effort, or by supporting another organisation in doing so. This distinction between provision or operation of a shared space is important in that it is different main actors that are involved in these processes, with which the municipalities interact to enable space sharing. In the provision of a shared space, the main actors are the owners and developers of the spaces, such as real estate companies, developer companies, and the municipalities as space owners. In operating a shared space, the focus lies on space users, such as companies and organisations, different departments of the municipalities, and in some cases a space operator, if the responsibility of operating a shared space is assigned specifically to one party. When involved as a third party, the municipalities can be involved in space provision and sharing operation separately. As a space owner, the municipalities are always involved in space provision, but it is distinguished between cases where it is only involved in space provision, and cases where it is involved in both space provision and sharing operation.

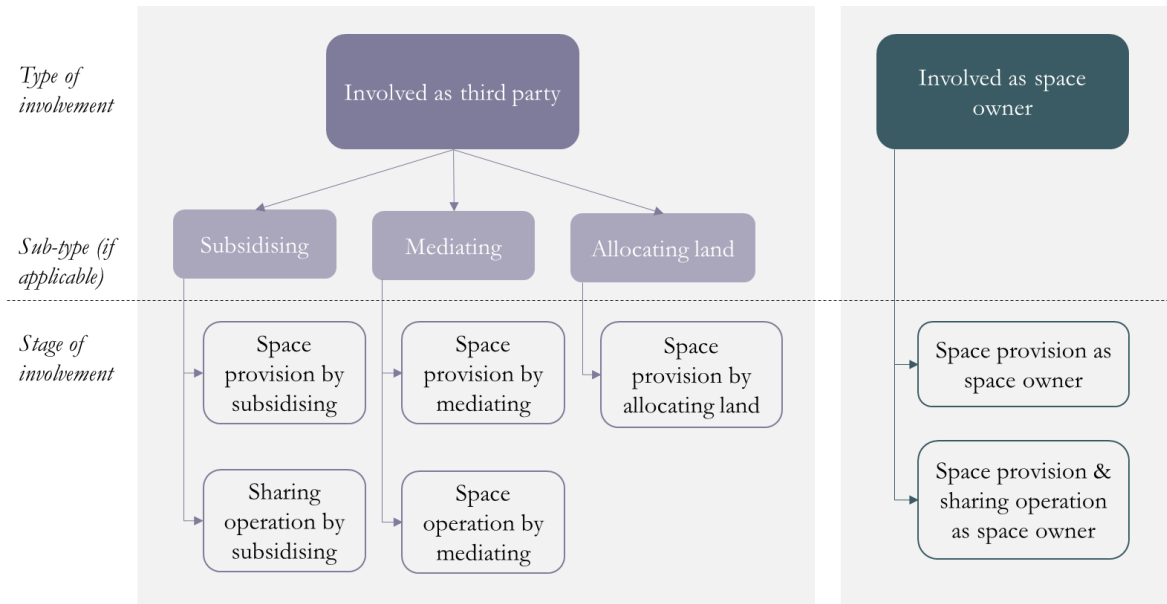


Figure 5-1: Types and Stages of Involvement of the Municipalities in Space Sharing.

Finally, it is important to note that the municipalities’ respondents also spoke about multiple space sharing initiatives that they were aware of, but that their municipality is not directly involved in. These provide helpful information on what kinds of space sharing exist, how it can work, and different motivations for space sharing, such as financial motivations, social interaction and knowledge exchange. However, these sharing initiatives are not further described here, as they are outside of the scope of this thesis which focuses on the role of municipalities in enabling space sharing.

The following sub-section describes how the municipalities of Amsterdam and Malmö are involved in space sharing as a third party by providing subsidies, mediating, or by leveraging land allocation tenders and planning processes. Then, Sub-section 5.1.2 describes the involvement of the municipality as a space owner. The third sub-section summarises the findings with regards to the involvement of the municipalities in space sharing.

5.1.1 Involved as Third Party

This type of involvement refers to a setting in which the municipalities are involved in space sharing, but not as a space owner, but by providing subsidies, through land allocation tenders and planning processes, and by mediating between different parties.

By Providing Subsidies

In order to support the facilitation of shared spaces, the municipalities might grant subsidies to an organisation that is running a shared space for social or cultural activities. Examples are some of the neighbourhood centres in Amsterdam, which are operated by NGOs that receive subsidies from the city for the activities and spaces that they offer (A1-5). They offer different kinds of activities for the neighbourhood, ranging from cooking classes or computer lessons to cultural events, targeting different ages and social groups, and also rent out spaces for low prices to local residents (A1-5). There might be larger social organisations that run multiple neighbourhood centres, or an NGO directly applying for a subsidy to run a specific neighbourhood centre (A4). Similar kinds of social organisations also act as a type of mediator or agency between a space owner and multiple smaller social or cultural organisations in Amsterdam. When a business, organisation or real estate owner might want to rent out a space or building that is not used, instead of getting in touch with these smaller organisations individually, they can contact the larger mediator organisation, which rents the space and takes charge of coordinating all the smaller user organisations. These mediator organisations receive secure subsidies from the city of Amsterdam in return for this work, creating an engagement with the neighbourhood (A4). Furthermore, as in an example of ‘Makers Spaces’ explained in more detail below, the municipalities can also use subsidies as a way to ensure the space provision for shared spaces by subsidising the rent of these places (A6).

Subsidising	<i>Involvement of the municipalities</i>	<i>Main actors</i>
Space provision by subsidising	Municipalities provide subsidies to developer to build and rent out a shared building	Space owners (developers, real estate owners)
Sharing operation by subsidising	Municipalities provide subsidies to operate shared spaces	Space sharing operators (specialised organisations)

Figure 5-2: Overview Involvement of Municipalities as a third party by subsidising.

By Mediating

As a mediator, the municipalities can mediate between different parties both for the provision and for the operation of a shared space. One example is that the Amsterdam municipality in some cases assists with setting up contracts between different arts and culture organisations that are interested in space sharing (A3). Here, the municipality mediates between different users to facilitate the operation of sharing. The respondent mentioned that this helps to reduce uncertainties and reservations regarding safety and liability issues.

To support the provision of a shared space, the municipalities might help space sharing organisations to rent a space by signing the contract on behalf of the organisation in order to mitigate reservations on behalf of the real estate owner (A5). One foundation in Amsterdam, for instance, rents buildings that are meant to be demolished at a low price, in which they then

offer spaces to young businesses, arts and culture practitioners, and social entrepreneurs either for low or no rent. In this context, the respondent recounts that the concerned real estate owners were hesitant at first due to uncertainties about safety and insurance, among others, and feared that the organisations might refuse to vacate the building again once the time for the demolition had arrived. The municipality offered to sign the contract on behalf of the social and cultural institutions, thereby offering a certain guarantee (A5). However, according to the interviewee, an important motivation for the real estate owners to agree to renting out the building in the interim period to social, arts and culture organisation was that they realised the beneficial impacts of the presence of artists on the long-term value of property in that area. Describing a process of gentrification, the respondent argued that the presence of artists attracts students, which in turn leads to restaurants and other services, which ultimately leads to an influx of mid- and high-income residents (A5).

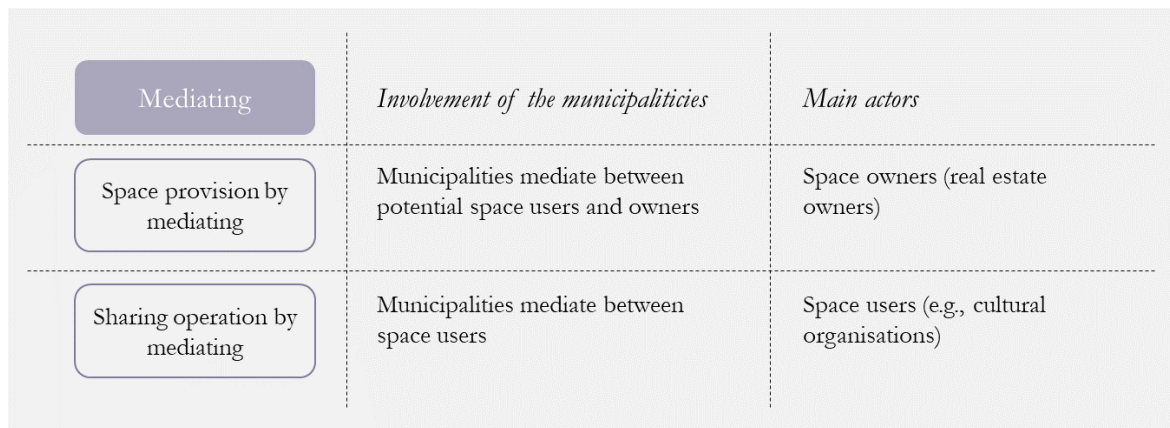


Figure 5-3: Overview Involvement of Municipalities as a third party by mediating.

Through Land Allocation Tenders

The city can encourage the provision of spaces for sharing to a certain degree using land allocation tenders and the zoning plans (A6, M1, M4, E2). Without going into detail, land allocation tenders refer to a process in which the municipality seeks to sell or lease land that the municipality owns to a developer and does so by putting it out to tender. Developers can submit their project proposals and based on a selection process with pre-defined criteria, the municipality chooses a developer. Then, the winning developer and the municipality enter a negotiation or collaboration on the realisation of the project (M4). This process allows the municipalities therefore to set certain criteria they would like to see realised in the project, and furthermore stay engaged in the implementation of the project (M4; Andersson, 2022). Zoning plans, on the other hand, refers to a detailed map that specify which area of land can be used for which function, such as housing, commercial area, offices, parking, etc. (A6, M1, M4). These must be adhered to by anyone.

In Malmö, an innovative neighbourhood development project is in the process of being built, which exemplifies how these urban planning tools can enable space sharing: In a first step, the competition that was held to determine which developer would be allowed to acquire and build on the land included certain requirements and suggestions regarding social and environmental sustainability (M1, M4, E2). The reason why the city had included these kinds of sustainability considerations in the competition was the fact that this was one of the few remaining undeveloped plots of land in that area of Malmö, and there was the need to develop social provisions in this area, as well as increase the liveability and friendliness of it (M4). The competition was then won by a proposal with different environmental and social aspects. In a second step, the planning phase involved a close collaboration between the real estate

developer of the area and the city planning office (M4). The planning architect involved in the creation of the area's zoning plan explains that it was their aim to enable the ideas that the developer had by including the right space functions in the zoning plan. One example here was that the developer sought to have walking bridges to connect the buildings, in order to have a more flexible space capacity, which could be used by and shared among different users.

However, the respondent conceded that aside from the example with the bridges, the enabling capacity of the zoning plan is not so great. First, it is not so unusual to include as many zones as possible in an area, and that if something is not included in the zoning plan, it is likely because that activity would not be conforming with the laws that the zoning plan is based on (e.g., environmental regulations, noise regulations, etc.) (M4). Second, the respondent emphasised that the municipality could not enforce space sharing through the zoning plan but could only enable it (M4). Third, the researcher respondent noted that it in this process it was indeed also the initiative and ideas by the developer that were decisive (E2). Nonetheless, both the expert and the planning architect argue that in particular the inclusion of sustainability requirements in the competition for land allocation instead of simply selling it to the highest bidding developer was an important step (M4, E2). A strong part is played by the developer, which is taking up these ideas and is going beyond them—it now also intends to create a phone application with which the people living and working in these buildings can share different things, including object but also spaces (E2). The developer is keen to try out new innovative ways of using space, anticipating a future need for more flexibility in that regard. In that sense, the developers' contribution was on one hand driven by a motivation to fulfil the municipality's demands and win the competition, and on the other hand by creating a first mover advantage, that is, gaining an advance on competitors regarding coming market developments (E2).

A similar example is a theatre complex in the Southeast district of Amsterdam, which is a building shared by different theatre groups, dancing schools, music bands, a brass band, circus, and other cultural groups (A5). The building has a flexible design so that it can be easily adapted for a different type of rehearsal or performance. It was commissioned by the municipality of Amsterdam, and during the design phase, multiple workshops were held in order to capture the needs of the different groups (Amsterdam Municipality, n.d.-a). The building is managed by one organisation, which sub-rents to four regular tenants, and also to other organisations on demand (Bijlmer Parktheater, n.d.). In this case, the municipality took the role of matchmaker and negotiator among the different organisations during the design process, and also subsidises the organisations that are running and using the building.

A second example from Amsterdam, which is currently still in the process of being developed, is a shared space for companies called 'Makers Spaces', for which the municipality actually employs both subsidies and the land allocation tenders (A6). These Makers Spaces are meant to be for companies that were forced to leave their buildings due to transformation projects, and then cannot afford the new, much increased rent. Therefore, the planning department is putting out tenders for shared buildings to be built, and also subsidising those spaces for a few years, so that they can be maintained as shared spaces with low rent. Due to rules around preferential treatment, the municipality cannot build these spaces itself and rent them out for lower prices, as the companies are private companies, so instead the municipality puts out a tender for a private developer to do it, and then this developer decides which companies can rent those spaces, which solves the issue of preferential treatment (A6). The respondent explained that the municipality would nonetheless aim to include certain descriptions of what kinds of companies they would like to have use those spaces, without being so specific it would breach preferential treatment regulations, in order to ensure that it is the companies that they are targeting with these spaces that actually get to benefit from the lower rents. The

municipality perceives these companies as essential to the city and does not want them to leave the city because they cannot pay their rent anymore. Therefore, the municipality seeks to provide them with more affordable spaces within the city (A6).

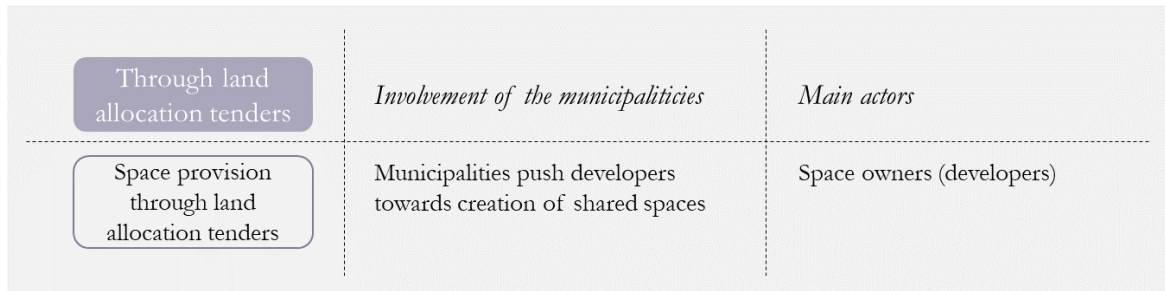


Figure 5-4: Overview Involvement of Municipalities as a third party through land allocation tenders.

Summary Involved as Third Party

To summarise, it seems that the involvement as a third party is quite complex and multi-faceted, as there are different instruments the municipalities can use, and interact with different actors, including space owners, operators, and users. The main kinds of involvement that have been identified are by subsidising, by taking a mediating role between different space users and owners, and by settings demands and by negotiating in the process of land allocation (see Figure 5-5 below). Subsidising and mediating can be used to support both provision of a space for sharing and operation of the shared space. By subsidising, the municipalities can support the creation of a shared space (space provision), and they can subsidise an organisation that is specialised in running shared spaces (sharing operation). By mediating, the municipalities can facilitate an agreement between owners of a space and potential space users to be able to use a space for sharing (space provision), or they can mediate between users that are interesting in sharing a space (sharing operation). By setting demands in land allocation tenders, the municipalities can push for the inclusion of shared spaces in those projects (space provision).

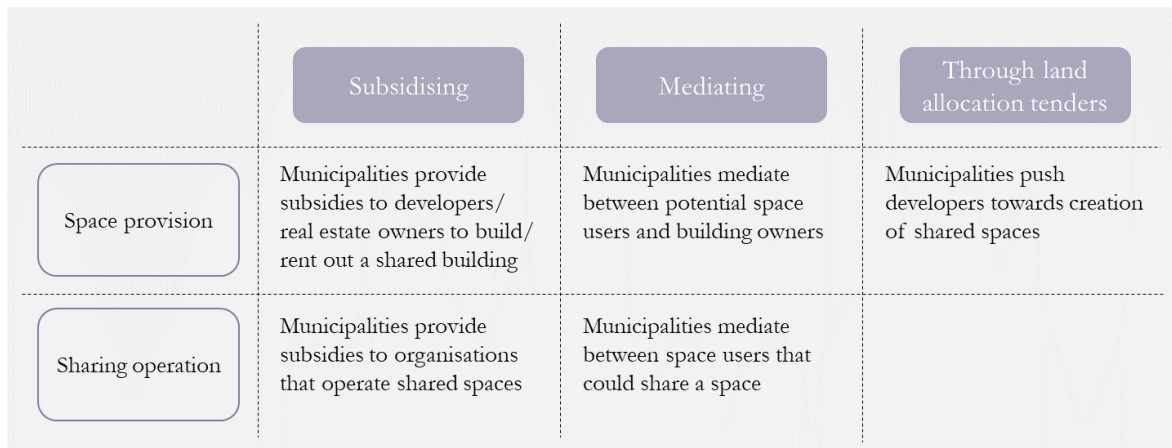


Figure 5-5: Overview Involvement of Municipalities as a third party.

5.1.2 Involved as Space Owner

This second type of involvement refers to a setting in which the municipalities participate in space sharing as a space owner. The fact that the municipality has ownership over the space provides it with different levers and opportunities, but also difficulties. Since this is a more clearly delineated kind of involvement in contrast to involved as a third party, there are no

sub-types for the involvement as a space owner. Furthermore, since the municipalities are always involved in the provision of space in this context, it is distinguished here between cases where the municipalities only provide space and cases where the municipalities provide space and are involved in the sharing operation.

By Providing Space

In some instances, the municipalities simply provide a building that can be shared between different users. This is the case for a certain number of the neighbourhood centres in Amsterdam mentioned above: some are buildings directly provided by the municipality (A1). Similarly, typical for Amsterdam are also incubator spaces mostly for starting artists and creatives (A1). Overall, there is a great diversity in what kinds of buildings these incubator spaces inhabit, and how they work—some might also offer affordable housing, or work as an exhibition space. The spaces they inhabit are typically either built by the municipality, old buildings of the municipality they no longer use for their intended purpose, or rented from developers, and then sub-rented to these groups who share the spaces, with a foundation or NGO tasked with operating the space (A1). The incubator spaces are listed and mapped on the website of the municipality of Amsterdam, which states that there are about 60 such locations across the city (Amsterdam Municipality, n.d.-b). While many of the facilities within such incubator spaces are rented out by regular tenants over a longer time (e.g., an artist renting a studio), they also include shared spaces for co-usage. One foundation running 19 incubator spaces in the city of Amsterdam writes that about 600 regular tenants rent spaces from them, and over a thousand co-users and visitors (Urban Resort, 2022).

A similar initiative is an Amsterdam foundation called LOLA that makes use of vacant buildings in a kind of temporary creative reuse (A1). Particular to this initiative is that it specifically rents vacant municipal real estate, such as schools or kindergartens—although they now have a number of locations, and it is not entirely clear if all of them are municipal property, or if they now also rent from private property owners. With the goal of this organisation being to benefit the local community as much as possible, it hosts affordable housing, spaces for artists and creatives, offices for social entrepreneurs, and in some cases e.g., a restaurant, gym hall or second-hand shop, and different kinds of meeting spaces or studios that can be rented out for specific times (LOLA, n.d.-b; Winter, 2022). They thus have a more open focus than the incubator spaces. Another significant difference to the incubators, which are orchestrated by the municipality, is that this was initiated by the organisation, which approached the municipality asking to use its vacant buildings. In order to be able to fill more vacant municipal spaces, the organisation later asked the municipality to guarantee that they could stay in them for at least a year, which for the municipality meant less flexibility in dealing with the buildings (Hans, 2015). After a few years of being financially self-sufficient, the organisation further started to receive a subsidy by the city for their work (Winter, 2022). Next to the immediate benefits for the local community, LOLA promises to preserve the building in good condition and preserve or restore the liveability of the area, which are benefits often associated with these kinds of creative reuse of buildings (Kyrö & Lundgren, 2022).

By Providing and Operating Space

On some occasions, the municipalities do not only provide a space, but also operate the shared space for other organisations. This is the case for some of Amsterdam's neighbourhood centres, of which parts are run by specialised organisations, and parts directly by a few employees of the municipality (A1). Furthermore, one respondent spoke about the conception of a shared space for arts and culture organisations, which the municipality will manage (A3). The driver for the municipality is, again, to provide value to the local community and arts and culture organisations with affordable facilities, while at the same time

having limited funds on the side of the municipality as well (A3). The respondent explained that this was also a way for the municipality to steer organisations towards space sharing, as they had more control over who would be allowed to rent the space and how it would be organised (A3).

Finally, the municipalities can also share a space that they also use themselves, in which case they also usually organise the sharing—this was mentioned by respondents from both cities to be mostly the case for schools, or parts of schools (A1, A4, M1-2, M4). The most common example was the gym halls being used in the evenings by sports associations, but also other rooms of the schools being used for activities from local organisations (A1, A4, M1-2, M4). In Amsterdam, a respondent mentioned that the schools were used by different neighbourhood associations (A1). A respondent in Malmö spoke about how schools would open up for activities outside of school hours as multipurpose facilities, offering activities such as cooking and dance classes, sports activities, and so forth—very similar to the neighbourhood centres in Amsterdam (M1). These activities are also organised by the municipality in collaboration with community organisations (M1). The respondent argued that the schools decided to open their buildings for such use in the evenings to help to offer such activities to the local community with very limited resources (M1).

Summary Involved as Space Owner

With the municipalities as a space owner, their involvement is clearer cut than when they are a third party. The municipalities can either be just the space provider, or they can be space provider and the operator of the sharing. Among the examples here in which the municipality only provided the space, it was always a specialised organisation that operated the shared space. There were no examples in which the users would just organise the sharing amongst themselves, that is, there was always an organisation that took the lead. Finally, in some cases the municipalities were both owner and operator, for instance neighbourhood centres or cultural centres that the municipalities were running, but also spaces that the municipalities were using for their own purposes, which were mainly schools.

5.1.3 Analysis Municipalities' Involvement with Space Sharing

Two main types of involvements of the municipalities in space sharing activities have been identified: involved as third party and involved as space owner. The municipalities have different tools at their disposal in these different contexts. As a third party, they can subsidise, they can act as a mediator between different parties, and they can set demands and negotiate during the land allocation process. As a space owner, the municipalities' main tool is the provision of space, although this can also be combined with subsidies or mediation.

The space users of most of the space sharing activities that the municipalities are involved in are organisations that generate value for the community, such as arts and culture organisations, social enterprises, and non-profits, which organise events or workshops for the local community. All the initiatives identified in this thesis for which the municipalities support the *operation* of the shared space, be it in form of subsidies or by operating themselves, targeted these kinds of organisations. Among the initiatives where the municipalities support the space *provision* for shared spaces, there are also examples where the municipalities supported the creation of shared spaces for users such as private companies.

Most of the examples of space sharing identified here could be considered examples of business-to-consumer or rather organisation-to-consumer sharing, and not peer-to-peer sharing. That is to say that most examples are spaces that are specifically meant to be shared

between different organisations or individuals, and which are run by organisations that have the clearly assigned responsibility of facilitating the sharing between different users, such as the neighbourhood centres or incubator spaces. Peer-to-peer sharing does occur, especially in the context of the municipalities being the owner and user, such as is the case for schools, but also for instance in the context of the municipality mediating between different organisations.

The drivers for the space users to participate in space sharing were mainly financial considerations, and the need to reduce space cost. As the municipalities are not in direct contact with the space users in the cases where they facilitate space provision, they could not provide information on what motivates private companies to share spaces. Aside from the municipalities and the space users, relevant actors are the operators of shared spaces. These organisations are specialised in doing so and have sometimes been created with the motivation to create social and environmental value by providing affordable space to different organisations and individuals. Space owners and builders aside from the municipalities, that is, real estate owners and developers, are driven by business considerations. These include immediate ones such as winning the tender by the municipalities, but also more long-term business considerations, such as first mover advantage in sustainability issues, and higher value in the surrounding area due to the presence of arts and culture organisations. In the examples mentioned here, higher revenue from rents was not a driver for owners and builders—either because there was no higher revenue from rent, considering how the user organisations in these examples are typically not able to pay much rent, or because it was not considered an incentive enough. Finally, a strong motivator for the municipalities in the initiatives outlined here was to support organisations that create social value for the inhabitants of the cities and improve the liveability of the city by creating more social provisions.

5.2 Barriers

This section presents the barriers to space sharing. The barriers mentioned by the respondents from the municipalities can be divided into barriers directly to space sharing, here referred to as ‘first level barriers,’ and barriers preventing or rendering it difficult for the municipalities to enable space sharing, referred to as ‘second level barriers.’ That is, first level barriers are barriers that affect mostly the users of a shared space, such as issues of compatibility between users, and act as a deterrent to the municipalities to want to engage with space sharing in the first place. Second level barriers hinder the municipalities when they try to enable space sharing, such as questions of preferential treatment or limited availability of instruments. First level barriers thus affect the users of space sharing, which includes the municipalities in cases where it is also one of the users, whereas second level barriers do not directly affect the users of the shared spaces, only the municipalities as an enabling actor.

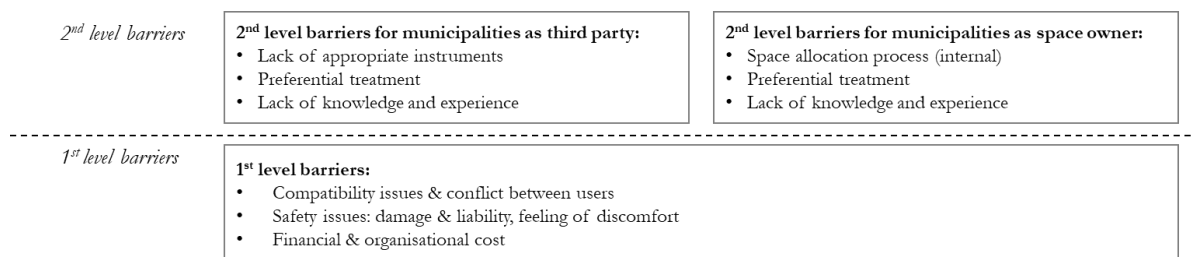


Figure 5-6: Overview of first and second level barriers.

5.2.1 First Level Barriers

The most prominent first level barriers were compatibility issues between the users and their needs and behaviours, including concerns regarding security and liability, and resulting

financial and organisational challenges. The compatibility issues between users were highlighted as a fundamental challenge, as there was this notion that it led to everyone involved being opposed to having to share a space (A1, A3-6, M1-2). Among the aspects cited in this context were conflicts between users' behaviours and needs with regards to noise level, smells and cleanliness, timeslots during which they would like to use the space, and location of the space (A1, A3-6, M1-2). In the context of shared facilities, one respondent from Amsterdam recalls that they "stopped building them because nobody was happy with this kind of construction. It was always a lot of tension between the contract partners, and so it didn't work out" (A3). Similarly, other respondents from Amsterdam spoke about a certain frustration with regards to shared facilities in general, also including simultaneous usage, in that it was at first considered a great solution with much space saving potential but then turned out to be very difficult to implement (A3-6). In Malmö, there does not seem to be as much practical experience with such shared spaces to make such conclusions, but one respondent working on a pilot study on the topic of sharing municipally owned spaces similarly found that "many of the things you perhaps think would be great are quite complicated and not entirely for the benefit of those who use it" (M2).

Closely linked to compatibility issues were questions of safety, which on one hand comprised very practical concerns about damage to the space and liability, and on the other hand a more emotional sense of loss of ownership and discomfort about vulnerability towards other users (A3-5, M1-2). Concerns about damage and liability ranged from unintentional damage (A4-5, M1-2) to vandalism or other illegal activities, such as the cultivation of illegal substances (A3-5). Here, respondents raised questions of liability and insurance, pointing out that it was either not clear which user was carrying the responsibility, or that based on standard rental contracts, it would always be the main renter who would bear the responsibility in such cases, regardless of whether they had fault in the situation. One respondent from Malmö recounted a situation in which a small organisation had left the water tap running over night, after evening use of a school. As a result, there was a conflict about who would be financially responsible for this mistake; whether it was the small organisation that had left the tap open, or the school as the space owner (M2). Another respondent spoke about intentional damages done to the space in cases of vandalism and explaining it by the lack of ownership that user groups felt when sharing a space, leading to careless or violent behaviour (A3). Finally, a related concern to safety was data protection issues, which was mentioned by a respondent from the municipality of Amsterdam as a reason why they could not open their own offices for sharing, as they have confidential information in their offices (A2).

Respondents also described a certain unease among users that were sharing a space connected to the lack of ownership and lack of control of who is entering the space (A3-5, M1-2). This was brought up for instance in the context of shared schools, where the respondent argued that it would be undesirable for the children to lose their "safe space," which would be the case if other people were to use the space in times that they were not around (M2). Lack of ownership was also mentioned to be an issue in the context of competing organisations: interviewees from Amsterdam mentioned that in the context of arts and culture organisation, there was a feeling from the organisations that sharing a space would weaken their position among competitors, and potentially threaten their subsidies (A3, A5). Summarising the compatibility issues and feeling of safety loss, one respondent says:

A4: And then you have, let's say, different groups in this building and one group is very proper and the other one is not so proper; the one likes silence, the other one wants to move. [...] and you share the same entrance, share the cleaning, so if someone walks in a building, is he going to that place, or that place, or that place? You

don't know. So, it also demands that all these organisations inside this building, that they want to cooperate. Sometimes it's like that. Far more often it's not like that.

Underlying to this seems the sense that sharing a space with others is complicated, as it is difficult to coordinate one's needs and behaviours, and uncomfortable, as it makes the users vulnerable to each other. Finally, respondents argued that ways to mitigate such issues and make a better space sharing arrangement were costly and required organisational effort (A3-4, M1-2). Mainly mentioned here was the need to hire someone to guard the premises, open and lock the doors, and make sure there would be no transgression of rules. This would increase the rent of the space significantly, reducing the affordability for non-profit organisations, for instance (A3, M1-2). Another respondent argued that there were also high transaction costs associated with finding the right associations to share the space with, setting up contracts, and settling questions of liability and insurance (A4).

To summarise, when asked which barriers prevented the municipalities from enabling space sharing, respondents importantly also mentioned barriers that directly affect actors engaging in space sharing, and thus deterring the municipalities from engaging with the topic, as it was perceived as complicated, costly, and unwanted by the users. These barriers also directly affect the municipalities in settings where they are owning and using the space themselves. Furthermore, it seems that these barriers specifically make peer-to-peer sharing more difficult and create the need for a facilitating organisation and could thus perhaps explain why there were much more examples of organisation-to-consumer or business-to-consumer initiatives among the examples mentioned by the municipalities.

It is important to note that, when speaking about first level barriers, respondents usually began to speak about sharing spaces in a very general way, and thus perhaps also included experiences from settings that they perceived as similar to serial space sharing, such as co-used facilities or multi-purpose buildings. This is also due to the fact that many examples mentioned during the interviews involved both serial and simultaneous space sharing, making it more difficult to distinguish which barriers were due to which kind of space sharing. This difficulty is also reflected on in Section 6.3.1 Reflections on Methodology.

5.2.2 Second Level Barriers

Not concerning space sharing directly but affecting the municipalities as an actor that could enable space sharing, the barriers identified as second level barriers mainly related to limited instruments and leverage available to the municipalities, the risk of preferential treatment, and a lack of knowledge or uncertainty regarding space sharing and its potential.

For space sharing outside of the municipalities' own buildings, respondents generally felt that it was not in the municipality's responsibility or power to support space sharing (A1-2, A6, M1, M4). In terms of it not being the municipality's responsibility, respondents argued that it should be up to the organisations themselves to decide if they wanted to share a space, and that the municipality did not have to interfere with that (A2, A6, M1). As one respondent from Malmö put it: "whoever wants to can share, but then it's up to the partners that want it. The city cannot force sharing" (M1). This was also linked to the idea that there are very few to no instruments available to the municipalities to enable space sharing, and that the ones that are available have only limited leverage (M1, M4, A1-2, A6). For instance, when asked about the possibility to enable space sharing outside municipally owned buildings, several respondents replied that they could not do this, due to risk of preferential treatment, as further elaborated in the next paragraph (A1-2, M1). Then, when asked whether this risk also applied to non-financial support, for instance matchmaking or mediating efforts, the respondents conceded that that could be an option, indicating that they had previously only thought of

financial support. Respondents from both municipalities working with zoning plans argued that they could indeed try to create those plans in such ways that they allow for sharing but could not ensure that this would then actually also take place, as this would ultimately be up to the owner and users of the buildings (A6, M2). Therefore, the municipalities' leverage in enabling space sharing is limited, as they do not have appropriate tools with stronger leverage.

In the case of Amsterdam, and in Malmö until recently, even the leverage for municipally owned buildings is limited due to the ownership of the building. In the case of Amsterdam, a respondent argued that a big challenge was that it was actually the school or the cultural organisation that owned specific buildings and not the municipality, which meant that the municipality could not decide on whether it should be shared or not (A3). Comparably, Malmö used to have a decentralised ownership structure of municipal buildings, which also meant that buildings were owned by the respective department that was using it, e.g., the school was owned by the school department. However, this process has recently been changed to become more centralised, and buildings to be owned by the city planning office (M3). Before this, it was difficult to have an overview of the spaces owned by the municipality, and up to the individual departments to decide whether they would like to share it (M3).

For any financial involvement in space sharing involving private sector actors, respondents were concerned that there was a risk of preferential treatment, as the municipalities should not provide any private company with a better treatment than other companies (A1-2, A6, M1). This was brought up as a reason why the municipalities could not provide financial support to private sector space sharing initiatives, provide matchmaking services for shared spaces, and why it might be difficult for the municipalities to share their own spaces with other actors than non-profit actors. This is important, since the financial cost linked to operating a shared space mentioned above leads to a higher rent than might be affordable for non-profit users, but respondents were not sure whether private companies would be allowed to rent those spaces if the rent would still be cheaper than regular rent. This means that shared spaces would often be too expensive for non-profit actors unless they were subsidised by the municipality, or too cheap to rent to private sector actors due to preferential treatment rules. However, it seems that the delineation of what constitutes preferential treatment is not entirely clear. One respondent from Malmö says the following about the possibility to open municipal spaces for sharing, indicating that the issue of preferential treatment might be circumvented:

M1: If you say that this association gets the space, so they pay 50 crowns a month, whereas that other organisation didn't get space, so they pay 500 crowns a month. So why does the city indirectly support organisation A and not B? I don't know how this has been dealt with. I think there should be possibilities to get around this and make it transparent, and to have criteria or so. I think it's not a prohibitive reservation. It's something that needs to be thought about.

Similarly, a respondent from Amsterdam shares that they are currently trying to find ways to open up shared spaces for private companies that are subsidised by the municipality, explaining that it might be possible to circumvent the issue (A6). This indicates that there might also simply be a lack of knowledge and experience with regards to this issue.

A lack of knowledge and experience seems to be a general issue. For instance, there was a certain hesitation among respondents regarding the potential of space sharing linked to the perceived risk of users' space needs changing over time bringing sudden halt to a space sharing agreement (A4, M1). One respondent from Amsterdam expresses his reservations on shared spaces saying that the policies and funding decisions by the municipality change

continuously, while the building and the rental contract are inflexible, which is why it is difficult to plan for shared spaces. Similarly, an interviewee from Malmö says:

M1: What is the space requirement? What do you win in space by co-locating? And the other thing is also that you never know what will happen in 30 years or so. If you co-locate different users that might work initially, but at some point, it might be that some kind of activity grows so much that they need to find different locations and so on. So, you can never guarantee how this saves space, how long it saves space or once the sharing is not possible anymore for whatever reasons. Because we can have a thought now and it might even work initially or for a certain time, but then you don't know if it will continue to work, or something will happen. Suddenly, you need to find another solution. Basically, we're back to the usage—what do you use? What do you share? What kinds of uses do you share?

This is interesting, considering that an important part of the idea behind space sharing (especially serial space sharing) is that it optimises building usage due to the fact that it is more flexible and aims to move away from the long-term contracts—a flexibility that naturally entails its own challenges, but it seems surprising that inability to adapt to different space needs is perceived as one. This is an indication that there is uncertainty about how space sharing would function, and thus about the potential and limitations to the potential of space sharing.

Then, there is a lack of experience in the administrative and legal processes that are involved in renting out to different groups, as one respondent from Malmö notes in the context of renting out to commercial parties:

M2: The department that builds and manages the city's buildings, they are not used to that kind of combinations or renting out small venues to others than the [local] communities. So, I think it's also a question of the city not knowing how to manage it, really.

Similarly, another respondent from Malmö explains out that the restructuring of the space allocation processes to an internal rent model requires a lot of new skills, roles and methods which first have to be developed, and that they also currently do not know how much space sharing would cost (M3). Another indication that the topic of space sharing might be quite novel and difficult to understand for the municipalities is that there seemed to be a certain difficulty differentiating among various types of optimising space use, for instance, building smaller, co-usage (simultaneous sharing) and serial sharing. On this topic, a respondent that had worked on an assessment of space sharing in Malmö noted:

M2: That's one of the difficulties with this 'simultaneously used', or whatever you call it, *sammyttjande* is very frequently used here, because everyone has their own view of what they mean by it. And sometimes they're very different. So, you sort of tend to speak past one another. [...] Is it a building where there's lots of different uses at the same time? A business and a preschool and some offices in the same building? Or is it at night when the preschool isn't there, something else is going on in the same rooms? That's another kind. Or is it just that you use some functions together, perhaps a big kitchen that can supply more than one function with dinner? So, I think it's a very confusing term [...].

This illustrates the difficulty to grasp the concept of space sharing, what kinds of possibilities it entails and how it might be implemented, as there are so many ways in which you could

share (parts of) spaces, and different combinations of users as well. The respondent thus underlines the importance of breaking down the concept of space sharing, and engage with practical issues of implementation, as it is currently mainly spoken about on a very broad and theoretical level (M2).

In addition to the first level barriers mentioned above, which already give the impression that space sharing can be very difficult to implement, these second level barriers then prevent or render it difficult for the municipalities to enable space sharing. These include first the perception that the municipalities are not equipped to support space sharing outside of municipally owned buildings, as they do not have the right instruments. Second, even for municipally owned buildings, the administrative processes and ownership structure can make it difficult for the municipalities to open their buildings up for sharing. Third, the issue of preferential treatment prevents the municipalities oftentimes to engage with space sharing that involves private sector actors, and fourth, there is a general lack of knowledge and much uncertainty around the topic as it involves unfamiliar processes and stakeholders.

5.3 Analysis of Barriers and Enablers

The following section discusses the enablers in connection to the specific first and second level barriers: The first sub-section briefly summarises the first level barriers and then discusses which enablers could help to overcome said barriers. This is from both the perspective of the municipalities as a space owner, and as an involved third party (corresponding to the type of involvement identified in Section 5.1). The enablers that are listed are both those that were identified from the existing practices, and potential enablers from all the respondents' answers, including the expert interviews. The second sub-section then goes through the same points but for the second level barriers. Figure 5-7 at the end of the section presents an overview of the barriers and enablers, with the potential barriers in a lighter colour.

5.3.1 Enablers to First Level Barriers

As outlined in Section 5.2, two levels of barriers were identified: the first one is barriers to space sharing, and the second one is barriers to the municipalities enabling space sharing, more specifically. On the first level, there are issues that generally discourages potential co-users of space, such as the incompatibility of their needs and activities, issues related with security and liability, which in turn often lead to extra cost relating to insurance, maintenance or supervision. Finally, there is transaction cost associated with arranging the sharing.

In general, enablers in this context are either of very practical nature such as designing the building in a way that facilitates sharing or finding space users that work well together, but also about learning from the experience of external organisations which have been working with space sharing for a while and developed important. From a user's perspective, it is largely about leveraging the benefits of space sharing while mitigating the negative aspects of it.

Enablers as Space Owner

When involved as a space owner, the municipalities are quite affected by first level barriers, and respondents mentioned difficulties to manage space sharing. In this context, existing enablers have been to engage external organisations that manage the municipality's spaces as shared spaces, which have the expertise and experience to do so and manage conflict and safety issues. This could be financed partially through the user organisations paying rent to that organisation, or through the subsidies from the city if the space is used by non-profit organisations. This might constitute an additional financial burden at first but would still likely deliver more social value at higher financial effectiveness than, for instance, subsidising

organisations directly which would then rent their own space somewhere for a higher rent. A potential enabler here could also be to contract a private company to manage renting out unused spaces from the municipality at market prices, if this is possible through some kind of procurement process. In this way, the municipality could outsource the organisation of sharing to a company that has the knowledge and experience to navigate the legal and organisational challenges.

A second existing enabler is to design municipal buildings in such way that they are more easily shared between users, such as sectioning buildings in a way that it is possible to access only parts of the building with a certain key or including equipment such as restrooms in different parts of the buildings so they can be used separately. Office infrastructure could be designed or refurbished in way that ensures that devices containing confidential data can be locked away so office space can be shared. Finally, while this might sound obvious, an enabler mentioned in Amsterdam was also to make sure to try and combine users in spaces that are known to be able to collaborate, whereby these matches were then recorded in a planning document.

A potential enabler could further be to put a stronger focus on leveraging the benefits of space sharing and making this explicit to the users. This could be done, for instance, by changing the communication and framing around space sharing, and attempt to focus on the financial and sustainability benefits of space sharing, as well as highlight some social benefits such as knowledge exchange and synergies. As mentioned by some interviewees, users oftentimes were unhappy about sharing a space despite the financial benefits, but perhaps this is also due to insufficient communication about such financial savings, especially in the context of subsidised organisations. Sustainability aspects could also be highlighted more explicitly, although this might be more of a driver for private organisations. Private and third sector organisations are showing how space sharing can be framed as a modern, flexible, and trendy way of using space rather than a nuisance, establishing trust between users and curiosity to meet, and highlighting financial and sustainability benefits. The municipalities could learn from private and third sector initiatives on how to manage shared spaces in a more positive way, and actively mediate between parties that are involved in it. This could for instance be done by organising common events or creating a digital community with contributions of different users.

Enablers as Third Party

As a third party, and thus not the owner of the space, the municipalities are less directly involved in space sharing and therefore also less affected by first level barriers. Rather, respondents cited first level barriers as a reason why the municipalities might not invest efforts in outside space sharing initiatives in the first place, because they do not think they will work. Nonetheless, two existing enablers were identified in this context: first, the municipalities can subsidise or fund organisations that offer shared spaces and which can facilitate the sharing between user organisations. Second, the municipalities can act as a mediator themselves, helping in setting up contracts between the parties, providing liability, or helping with setting up insurance, respectively. In this way, the municipalities can leverage their position as a trusted and reliable actor in contexts where space sharing is difficult due to lack of trust and reservations as to whether it will go well.

5.3.2 Enablers to Second Level Barriers

The following second level barriers were identified: in both settings (involved as a third party or as an owner), there were hesitations with engaging with space sharing arrangements that involved private sector actors, due to regulations regarding preferential treatment, and a general lack of knowledge and uncertainty about the potential and the functioning of space

sharing. As space owners, a barrier was also the space allocation process and ownership of buildings within the municipalities that made it difficult. Finally, as third party, there was the feeling that there were no appropriate instruments available to the municipalities to promote space sharing outside of the municipally owned buildings.

Enablers as Space Owner

As a space owner, an existing enabler, or at least an enabler in the making is the restructuring of the space allocation processes within the municipalities and the building ownership. A more centralised space ownership allows for a better understanding of the available space and where space needs could be combined. Furthermore, it provides for the department owning and managing the real estate with the competency to decide whether this space should be shared which otherwise would have to be decided individually. In Malmö, the respondent spoke about the restructuring of their space allocation and how it could allow for space use by external organisations:

M3: [...] until now, the takers of the spaces that we provide, they are responsible for any secondary lending of the space. But that will now go back to us. So, we will have a greater influence on the possibility of finding other groups of people, associations, could be like sports organisations, clubs, anything, you know, after school time and things like that. So, there is a great need for these kinds of spaces. And we can have contracts directly with them.

Potentially, such a centralised organisation could also help to gather expertise about space sharing at one point of the municipality, including knowledge on how to overcome first level barriers, and how to leverage the benefits of space sharing. While previously the transaction cost to arranging space sharing might often be considered too high for individual building owners of the municipality, e.g., school administrations, this could be different when it is one centralised department that is managing it, which has acquired experience and knowledge on how to do so.

Another potential enabler to mitigate lack of knowledge is to work with or learn from private sector or civil society initiatives, which have developed solutions to first level barriers and in the case of private sector platforms been able to make a business case out of it. These organisations act as mediators. The space sharing platform founded by the interviewed practitioner in Malmö is a great example of how some of these barriers could be overcome (E1). The interviewee explained that aside from providing the platform, the company helps with setting up contracts between parties, with different regulations, such as value-added tax (VAT) regulation, and with administrations and key handling systems (E1). The VAT regulation on buildings in Sweden is quite complex, which renders it difficult for organisations that do not pay VAT, such as associations, to rent a space. Furthermore, rental law prevents property owners from renting out to more than one tenant, which is hindering co-usage (E1). To provide a solution to this, the company offers to set up contracts so that the space is not rented out as facility, but as a service, which required legal experts and year-long investigation into different legal aspects, proving that solutions to such challenges might take time to develop, but do exist. This is thus a matter of developing knowledge and competences. Until recently, the company also offered insurance in collaboration with an insurance firm but stopped doing so because of the rising premiums. The respondent reported, however, that this did not stop people from using their platform, even though it would make the service a little easier (E1). The main challenge for the company currently was not to overcome barriers directly related to space sharing—proving that it is indeed possible to do so—but rather awareness raising and marketing about their platform, in order to be able to scale up:

E1: [The business] can be sustained if we get enough volume. We don't really have the volume that is needed for this to be sustainable economically. Right now, we're not making a lot of money I'd say, no. But we have a lot of proof of concept. We know that this is a possible way of meeting the needs for facilities, but we need to have a lot more volume.

The respondent further argues that while there are municipalities in Sweden that do have a booking system for some of their facilities, it could there are certain simple improvements that the municipality could make, for instance, while some municipalities in Sweden already have a system where rooms can be booked, these systems require potential users oftentimes to call or send emails rather than web-based platforms that allow one to see the available time slots and prices immediately (E1, E2).

An interesting case for a civil society actor in the Netherlands is LOLA, which provide an example not only in how a shared space can be managed and facilitated in a way that is beneficial for the local community, but also in how it is possible to highlight the benefits and communicate how they create value for different stakeholders, including developers and real estate owners. For instance, on their website, they speak about the value added in their work for real estate owners and developers, saying that they provide a low-cost and simple solution to vacancy management which prevents risks and deterioration, and create new life in the surrounding area which enhances the property's value for future developments (LOLA, n.d.-a). Since LOLA started out as an initiative renting out vacant municipal buildings, this is a fascinating example of how the municipality's support can be helpful in providing proof of concept, before moving into the private sector, as LOLA is doing now.

As highlighted by a respondent from Malmö, it is further crucial to take the discussion around space sharing in the municipalities to a more practical level in order to generate the relevant knowledge to facilitate space sharing in the cases where it is possible and useful:

M2: In order to move on with more space sharing in planning and management, I think it is absolutely necessary to go more in depth regarding which functions are suitable for sharing, and which are not. Unless we set up these definitions, we will continue to speak about it on a level that is theoretical, and lead to very little change. It is easy to agree on a theoretical level, but much more complex when we talk about what and where.

Therefore, generating specific and applied knowledge on space sharing through for instance test projects or experiments is crucial in gaining a better understanding of the potential application of space sharing and its limitations.

Finally, it seems that a lack of knowledge also seems to be strong issue with regards to the barrier of needing to avoid preferential treatment, which makes it difficult to offer the use of municipal spaces to private companies, if those spaces would then be rented out more cheaply. However, as mentioned in the barriers section already, there is some uncertainty around the degree to which this means that the municipalities cannot engage with private actors in this context at all, or whether it would just have to be in a certain way, for instance by establishing criteria or processes to decide who they will rent out to, or using procurement processes to determine who they will collaborate with.

Enablers as Third Party

The three main barriers that were identified here are strongly interrelated: perceived lack of available tools, need to avoid preferential treatment, and lack of knowledge and uncertainty.

Some respondents expressed that they did not feel they had the appropriate tools to enable space sharing outside of municipally owned buildings. However, other interviewees showed that they have found ways with which to engage with the topic to some extent. One way which was mentioned was to leverage land allocation tenders, as was done in the case of the Embassy of Sharing in Malmö and is planned to be done for the Makers Spaces in Amsterdam. In the Swedish context, the land allocation tenders can include broader requirements, such as to include social and environmental sustainability in the planning or make certain suggestions with regards to planning and explain what the city would like to achieve with this development. While this is a limited tool, as there are limitations as to what the city can include in these requirements (E2), it still has an impact in that it is likely to result in more progressive and sustainability minded developers winning the tender. The researcher respondent argued that there is unused potential of this tool as the municipalities could work with such tenders more often and also make more specific suggestions as to what they are looking for, even if they cannot demand specific things. More specifically, Andersson (2022) in his thesis on land allocations as a tool to promote CE and SE finds that municipalities cannot include specific requirements for the technical properties of buildings due to legal stipulations. The municipalities can, however, describe their objectives in the call for project proposals. Then, the author suggests that there is potential in using more specific selection criteria within CE and SE, proposing the degree of utilisation rate to promote shared spaces as an example (Andersson, 2022).

Similarly, the work in Amsterdam with the Makers Spaces shows that working with land allocation tenders might also be helpful with questions of preferential treatment, are investigating putting out a tender for a company to develop a shared space and then subsidising that space, even though it will be used by private companies. The issue of preferential treatment should be overcome here by organising a tender, and therefore a transparent process with disclosed selection criteria as to which project proposal wins. Furthermore, it is then the developer who decides which companies get to use these shared and cheaper spaces, while it would be an issue if it were the municipality hosting this shared space and making the decision as to who to rent it out to (A6). In order to get the target group of companies in these spaces, nonetheless, the municipality is investigating the possibility to include certain criteria of space users into the tenders. Both these experiences and the findings of Andersson (2022) indicate that the municipalities do indeed have some leverage with land allocation tenders, and could use these in a more targeted way to promote space sharing and other sustainability objectives.

The zoning plans were found to not play such a strong role in enabling space sharing. There is some importance in ensuring that the city zoning plans do not interfere with mixed use spaces, however, from the findings of this thesis, it appears that in Amsterdam and Malmö, this is not a great concern. Respondents explained that the zoning plans are usually created with as much flexibility as possible, meaning that if a space function is not included in the zoning plan, that is due to other existing policy (A6, M4). Nonetheless, there are still some instances where the zoning might make a difference in whether a building can be built in a way that is suitable for sharing, which should therefore be kept in mind.

Finally, a tool that could be used to promote shared spaces is municipal procurement, in the sense that municipalities could take on the role of a user of a shared space that is owned and run by another party. This could be done for office spaces or other kinds of space needs. This might have to go through some procurement process, and further requires the municipalities to shift from a more traditional form of facility management in which they own all the buildings they are using (E1-2).

	Involved as third party	Involved as space owner
<i>Enablers to 2nd level barriers</i>	<p>Enablers as third party:</p> <ul style="list-style-type: none"> • Leverage land allocation tenders • Mitigate preferential treatment issue through tendering <p>• Procure shared spaces (i.e., support space sharing by becoming a user of shared spaces)</p>	<p>Enablers as space owner:</p> <ul style="list-style-type: none"> • Integrate space sharing into the municipal space allocation process <p>• Learn from private sector or civil society (e.g., digital booking system, contracts & insurance)</p> <p>• Gain better understanding of the preferential treatment barrier</p>
<i>2nd level barriers</i>	<p>2nd level barriers:</p> <ul style="list-style-type: none"> • Lack of appropriate instruments • Preferential treatment • Lack of knowledge and experience 	<p>2nd level barriers:</p> <ul style="list-style-type: none"> • Space allocation process (internal) • Preferential treatment • Lack of knowledge and experience
<i>Enablers to 1st level barriers</i>	<p>Enablers as third party:</p> <ul style="list-style-type: none"> • Subsidies: Task specialised organisations to operate space sharing • Mediate: create trust, set up contracts <p>[None identified]</p>	<p>Enablers as space owner:</p> <ul style="list-style-type: none"> • Task specialised organisations to operate municipal space sharing • Shareable building design • Combine compatible users based on recorded experience <p>• Procure private sharing platform to operate space sharing through</p> <p>• Communicate financial & sustainability benefits more</p> <p>• Mediate more actively, make space</p>
<i>1st level barriers</i>	<p>1st level barriers:</p> <ul style="list-style-type: none"> • Compatibility issues & conflict between users • Safety issues: damage & liability, feeling of discomfort • Financial & organisational cost 	

Figure 5-7: Summary Enablers and Barriers.

6 Discussion

This chapter discusses the findings of this thesis. The first section presents contextual factors that are relevant to understand the findings of the case studies. As mentioned at the beginning of Chapter 5, there was a great overlap between the findings in Amsterdam and Malmö, and as the small number of respondents render it difficult to draw comparisons, the findings were presented together. This first section now discusses contextual factors that were recurring in the interviews and tentatively compares findings between Amsterdam and Malmö. The second of this chapter then discusses the significance of the findings of the thesis, and the third section provides critical reflections on the methodology and theory employed in this thesis, as well as on legitimacy and generalisability.

6.1 Contextual Factors and Discussion of Case Studies

This section presents the main contextual factors that potentially have an impact on space sharing. It is divided in two main parts: external and internal contextual factors, whereby external factors are outside of the direct control of the municipalities, that is, space scarcity, cultural aspects, and private and civil society sector, and internal factors refer to characteristics of the municipalities, their structure, and their work.

6.1.1 External Contextual Factors

In this section, contextual factors outside of the city administration are discussed, which are: the issue of space scarcity and implications for the price of rent, cultural aspects related to the willingness to share and to take responsibility for a shared space, and the engagement of the private sector and the civil society in sharing spaces.

Space Scarcity

One prominent contextual factor that was mentioned by multiple interviewees of both municipalities was space scarcity and connected increase of rents (M1-2, A1, A3-6). Space scarcity could be a potential driver for space sharing for different actors, although for different reasons. For municipalities, space scarcity poses significant challenges to urban planning and renders it difficult to ensure housing and social provisions for a growing population. To some extent, it is an environmental issue, as the failure to provide these buildings within the current city area leads to land use change, as undeveloped surfaces, such as agricultural lands or nature, might be built on. Both Amsterdam and Malmö are facing the challenge of providing space for more people without growing outside of the city boundaries; and both cities do not want to build on surrounding nature areas (M1, A6). In Amsterdam, there was mention of a housing shortage as the city is experiencing a significant growth in terms of inhabitants (A1, A6), and the difficulty for the city to build social provisions with the little space available (A1, A3). To illustrate the severity of this challenge, one respondent speaks about the fact that the city sometimes has to resort to creating new islands, which is very expensive, to make space for housing:

A6: There's not only a shortage of housing in the city, but also a shortage of industrial space and company space. And the main thing is, Amsterdam has its borders, and around these borders there are the green areas [...] and we don't want to develop those spaces [...], so there is only one way how we can make new spaces [...]: we make land. We make new islands and there we built a lot of housing and sometimes also some industrial space. But I think it's a very expensive way to expand your city. An easier way is to transform and intensify the ground, which is already used, but since we're not the owner of the land anymore, we need to do it together with the businesses and owners which are there.

The space scarcity and related issues has put the question of how to use space more efficiently on the agenda of the municipality (A1-3, A5-6). However, opinions on whether space sharing is an effective way to address this issue diverged: some seemed to perceive the potential of space sharing from the municipality's perspective as rather exhausted (A1-2, A4), one saw potential but under the condition that there is a significant change of mindset among the organisations that co-use the space, and different types of space ownership (A3), while others were quite positive that there are further possibilities for the municipality to exploit (A5-6).

On the side of Malmö municipality, space scarcity is certainly considered an issue (M1-3), and using space more efficiently is a priority of the municipality, although this might also be motivated by financial considerations (M4). Regardless, space scarcity has not seemed to reach the amplitude it has in Amsterdam: one respondent expressed that it there might be more space left available, and that the discussion of saving space is currently mainly focused on outdoor spaces (M2). Furthermore, interviewees explained why perhaps space scarcity was not enough of a driver for more space sharing from the perspective of the municipality: One interviewee expressed hesitation for whether space sharing would actually lead to space savings in the longer term (M1). Speaking about the possibility of schools as a shared space, another respondent argued that they did not think it was the right place to start making space savings, as school children could suffer from it, and the potential space savings compared to other solutions were not convincing (M2). On the other side, the respondent that spoke about the changed procedure of space allocation among the municipality branches seemed quite positive about what potential there still is (M3), while one other saw potential but limited impact by the municipality.

On the other hand, individuals and organisations are mainly affected by space scarcity in the form of increasing rents and difficulty finding available spaces. In Amsterdam, in particular arts and culture organisations are strongly affected by space scarcity and the high rents in combination with decreasing subsidies (A1, A3, A5), and has pushed arts and culture organisations towards sharing spaces to a certain extent (A3, A5). Only the project manager from the municipal real estate office strongly opposed the notion of space scarcity and high rents in Amsterdam, and claimed that that was rather a mediated issue, and that it was not difficult, for instance, to find housing at an affordable price in Amsterdam (A4). The respondent insisted that especially space rented from the municipality was very affordable, but without touching on the availability of such spaces (A4). The interviewee concluded thus that the issue of space scarcity or rent was not strong enough of an incentive to overcome barriers mentioned above such as the organisational to find a suitable space sharing partner, the transaction costs involved, risks, and liability issues (A4). Even though this respondent's perspective on the availability and price of space seems to be an outlier among the others' repeated emphasis on space scarcity, some other interviewees shared the hesitation to which extent it was a driver for space sharing (A3, A5). After speaking about the fact that most users are often reluctant to share their space, interviewees conceded that they were not sure why the space scarcity and high rents—that they previously described as very pressing—would not be pressure enough to find a way to overcome such hesitations (A3, A5). One interviewee attempted to explain this, saying that oftentimes organisations do have access to space, but it is not sufficient space. That is, while there is constant lack of space, the lack is not that severe (A5). Another said that organisations are willing to share a space as a respond to space scarcity when the municipality specifically encourages the organisations to do so, indicating that it might just require a little extra push and coordination (A3).

In Malmö, space scarcity was considered more of an issue for the municipality than for organisations. Hence, it is not surprising that respondents from Malmö did not perceive it as a strong driver for them engage in space sharing (M1-2). The parking garages shared between

residential and office users was believed to be the exception to this, as the financial incentives might have grown strong enough for the parking company to investigate into options for more efficient space use (M1). In contrast, in the cases of schools being used for neighbourhood activities in the afternoon, the driver is rather perceived to be the aim to create social value with very limited financial resources (M1).

Cultural Attitude towards Space Sharing

While the aspects of reluctance to share a space connected with a loss of ownership, and a lack of responsibility when using a shared space is discussed in more detail in Section 5.2, it is important to mention it here as well, since this is connected to some broad cultural characteristics. Cultural attitudes play a role on both the demand and offer side of space sharing: on the demand side, there was a lack of responsibility from parties that used shared spaces (A3-4, M2), which reinforces the reluctance towards sharing, and on the offer side, respondent noted a lack of willingness to share spaces (A3-5, M2, E1-2).

On the demand user side, one respondent from Amsterdam went into a little more detail, speaking about how multifunctional facilities often are not a success, because there is a lot of tensions between the parties involved (A3). The respondent recalls how surprised by the absence of such issue they were when they went for a work visit in Estonia:

A3: We were really surprised in Estonia when we were there, because there, they are just doing it. We saw a primary school and within the primary school they had this swimming pool, so the children, they had their swimming lessons at school during school times, but then in the weekends, all the inhabitants they could swim in the swimming pool, and we were like: ‘oh, how can this be?’. [...] And then we asked them: ‘don’t you have problems with this?’, and they said: ‘no, everybody respects the building and the different type of users, we never have problems, everybody who uses the spaces they leave it clean and on Monday morning all the pupils they come to school and they don’t see that the building is used during the weekend’ and well, we couldn’t believe it.

When asked about what could explain this difference between Estonia and Amsterdam, the respondent continued to say:

A3: I think here, we have a lack of the feeling of ownership. Lots of groups they don’t feel responsibility about buildings...it’s not their problem. That kind of mentality. And we think in Estonia, because of the Communism, there is the sense of common use and there’s a lot more respect for each other and respect for the properties. I think it is because of that.

Irresponsible behaviour mentioned by the respondents ranges from outright illegal activities (A4-5)—one respondent named the cultivation of illegal substances, fights, or “political things you don’t want to happen” (A4)—to gross negligence and vandalism (A3), to rather unfortunate events perhaps caused by carelessness, such as a tap left open or a broken door (M1-2). When asked why it is that in the context of other SE practices, such as bike sharing, people have learnt to treat the objects with care, but not in the context of space sharing, the respondent explains that there might be a difference between individual sharing and sharing as a group:

A3: I think [there are] the individual sharing concepts where most of the time your bank card leads directly to you as a person, so if something happens, they will go to

you and see what you've done, which is different from group accommodations or groups which are using spaces.

This suggests that there could be a group mentality, where spaces are shared with larger groups and organisations rather than with individuals, where perhaps nobody is the responsible in that group, that could lead to negligence and a lack of ownership.

However, it is not clear how often such things actually take place, or to which extent this might also be singular events. The practitioner respondent on the topic from company that provides a platform for individuals and organisations to put up their unused spaces for other people to rent over limited time argues that they have never experienced such issues (E1). It is thus difficult to know whether these are events that do often occur, or whether they in fact do not take place so often, but have a strong signalling effect, scaring off people who might otherwise be interested in space sharing. Here, the phrasing of a respondent from Amsterdam indicates that it might also be the fear of organisations of something being stolen or broken that constitutes an important barrier, as it then requires the organisation to install supervision over the place:

A3: There's also, well, you can call it vandalism, or that the users, they don't feel responsibility for using the space. So [the organisations renting out the space] are really afraid that things are stolen or that other groups are breaking things and if you want to prevent that, then you need somebody from your own organisation, who is in the building at the same time when the activity happens.

Likewise, another respondent expresses his doubts about the sustainability of a sharing arrangement where a university in Amsterdam lets an organisation host a neighbourhood cinema in one of their lecture halls, indicating that just a few negative experiences can halt the arrangement:

A4: The question is, is it a sustainable solution? Because then, the neighbourhood needs to enter this bigger [university] complex, you don't have any control over the people who come over there, what do you do with security, what do you do with insurance, or so and so. Eight out of ten times it will go good for one year, for two years or so, but usually then an accident appears and then that's it. Something goes wrong and then it stops.

This supports the idea that negative experiences might not be that common, or at least not the majority—as the respondent was saying that it might go well for a year or two—but even so, just the anticipation of them taking place is enough to prevent people and organisations to want to engage in space sharing.

A cultural aspect on the offer side, which is reinforced by the real and perceived lack of ownership among the space users, is the reluctance to share space (A3-6, M1-2). As mentioned in Section 5.2, this seems to be caused by a combination of very rational but perhaps surmountable issues, such as incompatible needs and behaviours (A4-5, M1-2), competition between different organisations (A3, A5), but to some extent also to an emotional connection and protectiveness of one's own space (A3, A5-6, M2). In this context, one respondent from Amsterdam explains why certain businesses rather not share their space:

A6: Some of the renters or companies who come there see the opportunity to share the spaces, but others are protective, and they'd rather see an empty office space than to share it with someone else.

Similarly, another respondent from Amsterdam points out: “I think there could be more sharing, but people really want their own dance school, they want their own gallery, they want their own little square meter in the world.” Another respondent compares it to the reluctance towards building and living in smaller houses when we need to “downsize our way of living”, saying that organisations are struggling to accept that they might not be able to have their own space in the future as “they are not ready for it” (A3). Speaking about the possibility to open preschools and schools in Malmö up for sharing, one respondent expresses her concerns about the emotional impact for the children to have other people enter their space:

M2: [...] from the children’s perspective, they have their things there, their personal belongings. They make their paintings and whatever they do, create things. And it’s not uncomplicated to have other people coming in and using and perhaps moving around their things. It’s a very important thing for many Swedish children, the preschool. And for some of them even a very safe place. So, from the children’s perspective, it’s not a good thing that other people go see or touch or use your stuff.

There is this notion, therefore, that sharing a space with other people is difficult also from the prospect of losing one’s “own square meter” (A4), “safe space” (M2) which might be indicative of a much more intimate connection with space than, for instance, with an object such as a bike or car, even when speaking about offices, cultural spaces, or schools, which one would assume to be far less personal than residential spaces. The need to be “protective” (A6) of one’s space, combined with a perceived or real lack of care towards shared spaces seems to create a strong aversion against sharing spaces in the first place. This seems to be linked to cultural attitudes towards sharing and ownership, as well as trust to other people.

Awareness and Interest of Private Sector and Third Sector

Another external factor is the private and third sector environment in the city, and their interest and availability in sharing. This involves actors that demand, offer, or facilitate sharing, such as businesses interested in sharing office spaces, real estate investors, owners, and developers, or civil society organisations. As this thesis and the interviews were focused on the municipalities as actors, this is by no means a comprehensive overview or comparison of private and third sector actors engaged in space sharing in Malmö and Amsterdam, but rather indicative of the role that the presence and absence of such actors can play.

Real estate actors, as spoken about by Amsterdam interviewees, were either mentioned as neutral market actors (A3-4), or more specifically as very profit driven actors that are not necessarily interested in creating any social or environmental value if they do not financially benefit from it (A5-6). One respondent describes that developers might be interested in social or cultural projects if it increases property values in the long run through gentrification, as “most developers will always have an economic perspective when it comes to developing areas and buildings—it is the capitalistic world we live in” (A5).

Similarly, an interviewee from the project management department working on area development comments that there is a strong risk aversion from investors, leading to them being reluctant to engage in novel kinds of development project with more flexible space use. Specifically on the topic of subsidised shared buildings, where there is “no interest from property investors because of the low rents and the intensive collaboration needed to make the businesses work together and share spaces” (A6).

On the side of Malmö, however, there was mention of a developer that plays a very active role in the creation of shared spaces in the context of the innovative neighbourhood development, where the respondent highlighted the high ambitions to work with shared spaces, going

beyond what was expected from them from the side of the municipality (M4). According to the interviewee, the developer consulted the local community in what kinds of spaces and functions they would like to see in this area before submitting their proposal to the city (M4). The researcher respondent agrees that the developers actively tried to implement different aspects of sharing, including an app that will facilitate space sharing (E2). When asked about the motivations for the developer to do so, the respondent describes that they perceive a kind of first-mover advantage in experimenting with these changes:

E2: [...] they see it as the future of real estate. It's not going to be static, as it has been for many years now, where one tenant leases x amount of space for x number of years. Now, a lot more flexibility will be demanded by tenants. So, [the developer] believes that any real estate owners that are stuck in the in the past way of doing things, they're going to get left behind eventually. So, they want to get ahead and test all these things out so that then, when it finally hits big, they're going to already be there. And welcoming all these tenants that want to be with them. Instead of struggling to find tenants for their long, inflexible contracts.

The respondent continues by saying that there are very few developers in Malmö that share this perspective and put a clear emphasis on environmental and social sustainability in their work. While acknowledging that they are still profit-driven companies, as they also clearly communicate, the expert suggests that they choose to have lower profits than they would have with lower ambitions regarding sustainability. Furthermore, the companies also perceive a business case in being sustainable, as indicated in the above quote, with a growing importance of sustainability for all kinds of businesses (E2).

Apart from real estate actors, other private sector actors that were brought up were mainly in the context of shared office spaces, where the businesses were either involved as customers or as space providers. In Amsterdam, a large range of office space sharing initiatives were observed by the respondents, which was linked to scarce availability of office spaces, a high number of self-employed people living in small dwellings and thus looking for a place to work, and rising digitisation (A1-2). The respondent explains:

A3: Because of the digitalisation and ICT, there's a lot of startups jumping on sharing office spaces, [...] like the ICT startups where you can easily share your spaces with each other. So, if you have one room available in your office, you can rent it out to somebody. And then they are the party in between, and they digitalised it. They made a platform that you can share easily. So, they make it easy for the payment and things like that.

These were initiatives that the municipality was not involved in, as they are independently running commercial initiatives (A1-2), but they are highly interesting cases of how obstacles commonly associated with space sharing could be overcome. Among Malmö respondents, there was no such mention of private office sharing initiatives, but they do exist. One of the experts interviewed operates a space sharing platform, which functions very much according to the description of the interviewee quoted above.

Like private sharing initiatives, civil society initiatives can be a good indicator for the demand and offer of space sharing, and also highly valuable in providing proof-of-concept and lessons on how space sharing arrangements can be successful. An interesting example here is the case of LOLA, which uses vacant buildings in a form of temporary creative reuse, and then shares the space (discussed in more detail in Section 5.1.2). The organisation started off without municipal subsidies and only applied for subsidies during Covid. It is an interesting example

for a self-sustaining financial model, since they rent the space at low cost and then ask for a small rent from the organisations staying with them, while at the same time providing much value to the local community and these organisations.

Initiatives and active actors from the private and civil society sector can thus be important drivers for space sharing. Municipalities can learn from them, leverage their potential, and also determine how they can support them best. Nevertheless, while the support from the municipality for these actors is in most cases mutually beneficial for both parties, the ways in which the municipalities (financially or non-financially) supports these initiatives must happen in a transparent way and following clear guidelines to avoid preferential treatment.

6.1.2 Internal Contextual Factors

This section presents the internal contextual factors within the municipalities (characteristics of the municipalities, their structure, and their work) and how they potentially drive or inhibit space sharing or the enabling of space sharing. The following factors have been identified: the financial status and decision-making of the municipalities, the values and objectives that determine the municipalities priorities in terms of work areas, and a centralised versus decentralised organisational structure.

Budget and Finances

As space sharing has the potential for economic savings, the financial status of the municipalities also plays a role. A respondent from Malmö municipality points out that a primary driver for the re-structuring of their space allocation process was strongly motivated by financial pressure to use space more effectively (M3), whereby sustainability effects would rather be a nice side effect:

M3: [...] one of the issues was definitely that we need to have a more strategic view on how we plan our spaces. It is also of course an economic issue. If we can provide the same services on lesser space, we have huge potentials of economic savings, and as you might note, the city of Malmö is not a rich municipality, so there is always a need to decrease spending. So, I think that economic motivation was one of the biggest issues, and it is always nice when you can see that economic and environmental sustainability actually go hand in hand.

Similarly, in Amsterdam, one respondent observes that there were fewer funds available for the building of arts and culture spaces, meaning that there are not enough spaces available for these organisations. This leads the municipality to want to use the ones they can provide more efficiently (A3).

Changes in municipal funding can also affect organisations that might engage in space sharing. Cuts in subsidies to these organisations reduce their financial capacity to rent their own space, which in turn pushes them to share spaces, since they cannot afford the rent by themselves (A3). On this, a project manager working on arts and culture describes that the Amsterdam municipality has started to build more share arts and culture venues:

A3: The [arts and culture] organisations, they do not have money to rent all these square meters if they have to do it on their own. [...] So, we stay the owner of the buildings and then we make the contracts with the organisations. We have to make sure that the organisations that rent are strong enough, that they can pay the rent. So, in that way, we are really active in making that new collaboration.

This makes sense considering the high share of social and cultural organisations among the co-users of the space sharing initiatives mentioned above—as they oftentimes have to operate on a very restricted budget, it follows that financial considerations are important for these organisations when space sharing. Of course, other benefits, such as exchanges with other organisations, etc., might also play a role, but considering all the difficulties associated with it mentioned above, it seems likely that financial drivers, which these kinds of organisations are more sensitive to, are very important. Hence, it does not surprise that a decline in subsidies might lead to an increase in space sharing.

However, this has to be weighed against what respondents said about the cost associated with space sharing, e.g., costs to provide access and guarantee security, rendering the financial benefit of space sharing more uncertain. One respondent from Amsterdam municipality argues that while financial considerations definitely constitute an incentive to share space, it does not outweigh the effort of making the arrangement and of having to tolerate the disadvantages of a shared space, outlining the example of a university that finds itself with unused space capacity and could consider going into a shared space:

A4: There is definitely an [economic] incentive. But I think the first step will be to try and get rid of all the spaces that they do not need anymore. And only the second would then be perhaps to [share space]. But then you also have transaction costs, you have to make a plan, you have to agree, you need the support of all the people around you to do that. You have to have a rental contract, you have to wait until it is terminated, then you have costs for moving. So, it is far more simple, more relaxed, to pay a little too much and stay at the same place.

In a similar line of reasoning, the researcher respondent at Lund University argues that while the costs associated with space sharing can be covered with the additional revenue, and that there would likely still be additional revenue left. However, this might just not be strong enough incentives for municipalities to make the adaptations necessary for space sharing, such as ensuring access and security, and behaviour changes. The researcher respondent summarises as following: “[...] if people just did it properly, the economic incentive would be there. But I think that it is just not enough to push it over the limit, to push them over to actually do it” (E2). This is in line with the respondent quoted above and shows that in order for space sharing to be interesting for different actors, they would have to derive more benefits from it.

Priority Work Areas

Aside from budget restraints and space scarcity, another contextual factor that might influence in which settings municipalities get more engaged in space sharing are the priorities of the municipalities in which societal challenges they are seeking to address, or societal objectives seeking to fulfil.

Amsterdam respondents cite a changing demography in districts (A1, A2) as a challenge for them to adapt the social provisions accordingly, that is, for instance, to create more elderly homes and close schools (A1). Similarly, a landscape architect working with schools at Malmö’s city planning department mentioned that an inquiry into more flexible school buildings was commissioned with the idea that the buildings should be adaptable to the changing future needs of the surrounding communities (M2). In both cases, this has led to attempts to combine different functions in one building, which in Amsterdam, they have bad experiences with and in Malmö the inquiry found that it would be difficult to combine different needs (A3, M2).

Another relevant objective by the municipalities is to improve the quality of life in city parts with more socioeconomic challenges. In Amsterdam, this was brought up by respondents active in the Southeast district (A1-2, A5). One part of their strategy to do this is to increase the offer of activities and services in these districts, in order to strengthen community spirit, create a feeling of belonging and responsibility for the neighbourhood (A2, A5). In Malmö, it was likewise noted that the schools hosting social neighbourhood activities in the evenings and weekends are located specifically in districts with more socioeconomic challenges (M1). Remarking that fulfilling these social demands was more of a driver for space sharing than space constraints, the interviewee noted:

M1: And so, we do have space constraints all the time already, but I think these kinds of activities are not initiated by space restraints. I think [using schools as shared spaces] originated out of a sort of social perspective of sustainability, involving people and supporting grassroots activities.

Increasing liveability in the neighbourhood was a strong motivation also for the innovative neighbourhood development in Malmö, which was the last area of undeveloped land next to a train station, and perceived as the last opportunity to realise certain changes to the appearance and ambiance of the neighbourhood:

M4: There were different demands. For example, we would like one of the buildings to be welcoming around the train station, so that people feel welcome to enter the building and maybe have a seat while they are waiting for the train or the bus. Because we don't have that kind of facility in [name of neighbourhood] as it is right now. So that was one of the requirements. [...] And then also, we would like it to feel like a very public spot [...], where all people could feel welcome and meet and, you know, to create the city life that we feel that [name of neighbourhood] maybe has been missing so far. Because the buildings are very... They're big and it's windy and it's, you know, the square there is very wide, and you don't really meet in the way that we would like to. You know, the human [aspect] and everything, it hasn't existed in that part of [neighbourhood] yet. So that's what we like to put in this last piece, for example.

To be able to realise these changes was a strong driver to include particular dimensions of environmental and social sustainability in the land allocation tender, to a higher degree than usually. While they could not prescribe that spaces would be shared, they could provide some ideas and enable space sharing. Furthermore, the fact that the tender included different sustainability requirements led to the land being allocated to a more sustainably minded developer, which then brought up their own ideas of space sharing (M4, E2).

Another type of priorities that have been discussed is the image or city culture that the city would like to convey. In Amsterdam, one interviewee emphasised that the municipality was putting so much effort into ensuring the availability of affordable spaces for arts and culture professionals and organisations because “arts and culture is really part of the identity Amsterdam and we do not want to lose it” (A3). With declining funding and increasing rents, the municipality tries to find solutions in order to help arts and culture organisations to survive, even if it means that organisations have to share spaces—at least, the municipality tries to facilitate that (A3).

While the need to reach these objectives might not be a driver for space sharing in itself, since these could be achieved with non-shared spaces as well, it could be that it creates a situation where the municipality perceives the opportunity to find a way of enabling these activities with limited financial capacities or no possibility to provide their own space, respectively, and more

than usually tries to overcome the barriers that otherwise stand in the way of space sharing. This might suggest that it is possible to work out these arrangements, if the will on both sides is strong enough, particularly if there is an awareness that this is the only available option. It might lead the municipality to make the extra effort and facilitate space sharing in different roles—in the examples mentioned here as space owner, mediator, or by leveraging land allocation tenders.

Centralised Versus Decentralised Structure

One significant difference between Amsterdam and Malmö is that Malmö has a centralised city administration (M1), whereas Amsterdam's administration is divided in different districts and a central organisation (A1-6). Malmö used to be separated into ten districts up until 2013, when it was merged into five city areas, which were then completely eliminated in 2017 and their responsibilities relegated to the central government (Astly, 2014; Malmö, 2017). Speaking about the schools opening up for neighbourhood activities, the respondent from the Environmental Department in Malmö remembered that they were initiated by the schools themselves and the local district administration, which existed at the time. The respondent believed that the fact that there was a local administration was beneficial to the creation of such a space sharing initiative, arguing that they were much more familiar and concerned with the local needs that led to the creation of it:

M1: Now, everything is centralised. And I think this makes these kinds of initiatives a little but harder because suddenly everything is central. [...] Because you don't necessarily have good knowledge about the local needs. [Name of neighbourhood] is an area with social problems, so the idea is that you need to have a lot of soft measures to build trust and get people off the street, you want to give them an attractive alternative. I think this is basically one of the reasons why they started this. And for this, you need to be on site. [...] At the end of the day, it's also a money question [...] and I think it might be easier when you have a local organisation make this need heard on the local level, rather than if you give it to the central level. The central level needs to distribute money all over the city. [...] There are advantages and disadvantages with both types of organisation, but for this case, I would say that being closer to the local needs I can imagine makes it easier for these kinds of activities.

The respondent continued, arguing that it made mostly a difference from the offer perspective, rather than from the demand perspective, since the difference between centralised or local administration was mainly in understanding what an unused space could be used for. That is, if someone were to look for a space and would like to use a school in the evening, they could approach a school and ask whether that is possible—here, whether it is a centralised organisation or district organisation does not make a big difference. However, from the space offer perspective, in this context the perspective of the school, if they were interested in opening up the school to provide the local community with added value, then a decentralised government can be helpful in understanding what the local community wants or needs, in order to provide that (M1).

Understanding the local needs and perceiving that space sharing could help in fulfilling them could thus be a factor that drives the municipality to enable space sharing. While none of the respondents in Amsterdam specifically pointed out that they thought a decentralised organisation would facilitate space sharing more than a centralised organisation, the examples of involvement in space sharing that they mentioned were to a large extent involvement from the district organisation and not the central organisation, especially for the culture and arts sector (A1-2, A3, A5). However, there are initiatives such as the neighbourhood centres,

which are organised all across the city, and the funding for such sharing activities also comes from the central level (A4).

An argument speaking in favour of a centralised government is that there is a better overview of what municipal buildings exist overall, and how different needs of the municipality as a space owner and user can be combined more efficiently, as was brought up by the interviewee from the Service Administration in Malmö (M3). While this was in the context of getting rid of thematic compartmentalisation within the municipality, not geographic division, a similar argument could be made for geographic centralisation: it is easier to have an overview over what kinds of buildings are owned and used by the municipality if that is managed by one central organisation. Indeed, there seemed to be more uncertainty and ambiguity among Amsterdam respondents with regards to space ownership and management, that is, whether a certain type of building was usually owned and managed by the municipality, and if so, by which department in the municipality (A4-6). Such knowledge could be important to determine whether the municipality could enable space sharing as a space owner in that case.

It is thus difficult to determine whether a centralised or decentralised city administration are better to drive space sharing, and the difference in size between Malmö in Amsterdam make it difficult to compare. There seems to be a trade-off between better understanding local space needs and offers and having an overview of all municipally owned buildings. Such an overview might be difficult to gain in a city the size of Amsterdam in any case, and Malmö, as a smaller city, might be able to have a better understanding of local needs even without a decentralised administration.

6.1.3 Summary Contextual Factors

To summarise the above-described aspects, it seems that some contextual factors might constitute a stronger, while others a less strong impact on space sharing. First, the administrative structure of the municipalities does not appear to have a strong impact, or the different advantages and disadvantages balance each other out. Second, the priority areas of the municipalities might not be a driver in themselves, but they can motivate the municipalities to try out new strategies to achieve them, which in some cases includes space sharing. Third, space scarcity does create a strong interest for space sharing, but ultimately does not seem to be as much of a driver as perhaps could be expected, as even though respondents highlighted space scarcity, they were hesitant to say that this leads to space sharing. A few were open, however, that it could be a helpful approach. Space scarcity is also closely linked to the fourth aspect, municipal budget and finances, in that space scarcity has led to increased rents. There is a strong initial interest in space sharing for its financial benefits, but also hesitation as to whether it would actually lead to such financial benefits, or rather, whether these benefits will be significant. Fifth, cultural aspects and the mentality around (space) sharing plays an interesting role: while only few respondents explicitly acknowledge the relevance of cultural aspects and the mindset of sharing, it was an underlying theme in the barriers mentioned, in that respondents claimed that people do not feel comfortable sharing space. Thus, there seems to be a certain difficulty with establishing trust in sharing as on one hand, people do not behave as well as they should in shared spaces, and on the other hand, people are hesitant to trust the others they are supposed to share spaces with. Finally, the presence of actors pushing for space sharing on the side of the private sector or civil society is a crucial driver for space sharing, even in the examples where the municipalities themselves also play an active role.

6.1.4 Comparison between Amsterdam and Malmö

This section reflects on some differences and similarities between Amsterdam and Malmö in the context of this thesis. However, the scope of this thesis did not allow for data collection

comprehensive enough to draw comparisons between both cities. Furthermore, it is difficult to determine what impact contextual factors not discussed by respondents, e.g., size of the population, could have. Therefore, these are rather tentative reflections.

In general, there seem to be quite some similarities between respondents from both cities in terms of the overall attitudes towards space sharing. That is, both sides perceived a theoretical potential in space sharing in terms of financial savings, and to a lesser extent space saving. At the same time, they were hesitant about its realisation, as they perceived different barriers and challenges. It could not be observed that either side would generally be more positive or more negative about the future potential of space sharing. Rather, there were great individual differences among respondents, as some were very critical and expressed that the barriers were much too significant, while others believed that while there were certainly barriers, these could be overcome, or other solutions attempted. It seems that Amsterdam's experiences with space sharing might be a bit more consolidated, as they describe more implemented examples of space sharing. Nonetheless, this could also be linked to individual respondents rather than the cities themselves. Furthermore, the barriers that were identified on both sides strongly overlap with each other. In terms of enablers, there again seemed to be a little more experience on the side of Amsterdam, especially with regards to having specialised organisations take over the operation of shared spaces.

6.2 Discussion and Significance of Findings

This section discusses the findings of this thesis. First, it discusses three recurring underlying themes in relation to existing literature. Then, it reflects on the academic relevance of this thesis' findings, both in terms of knowledge created and methodology employed.

6.2.1 Discussion of Findings in Relation to Existing Literature

This section discusses three broader themes that are recurring throughout the findings of this thesis in both case studies and connects it with literature findings on CE and SE. The three themes are the reluctance to participate in sharing, risk aversion, and the need to change the current understanding of space as a resource, which highlights the importance of becoming more aware of the environmental impacts of space inefficiency and shifting towards a more flexible understanding of space use.

Reluctance to Participate in Sharing

To a large extent, the first level barriers to space sharing identified in this thesis correspond to general barriers to the participation in the SE as described by Spindeldreher et al. (2019). These are the following nine: effort expectancy, exploitation, inflexibility, lack of trust, performance risk, physical risk, privacy risk, process risk, and undesired social interaction. All barriers except for performance risk, which was only identified as a barrier to participation as a consumer, are barriers to both participation as consumer and user. The authors emphasise the importance of being aware of these barriers in order to design sharing activities in such way to mitigate such barriers, and to improve communication to different actor groups by addressing those barriers. Interestingly, Spindeldreher et al.'s (2019) findings were generated from individuals that were aware of SE platforms, but had never used one. Therefore, the barriers are largely based on the participants' perceptions rather than their experiences, which highlights that in some cases, the mere anticipation of such barriers is sufficient to prevent people from participating in sharing.

The barriers of effort expectancy, inflexibility, and process risk, strongly resonate in the context of this thesis. First, effort expectancy, that is, the idea that participating in sharing activities requires much effort, has been identified in this thesis, as respondents spoke about

the high organisational efforts to facilitate space sharing. This was from the user perspective but mainly from the perspective of the municipalities as a space owner. This highlights the importance of easy-to-use shared spaces, for instance with regards to how to gain access to the buildings (i.e., necessity to pick up a key versus access codes), or booking interfaces (i.e., necessity to call or send email to receive information about availability and price versus information accessible online).

Second, process risk refers to fears about potential economic or legal risks associated with sharing, such as questions of liability or physical damage. This concern figures prominently among the first level barriers identified in this thesis. To mitigate this, it is helpful to have contracts and guidelines that set clear directions on this topic, whereby a mediating actor is helpful in setting these up and making sure that they are adhered to. This can be a specialised civil society or private sector actor, or the municipalities leveraging their position as a trusted authority.

Third, inflexibility describes a perceived loss of independence due to loss of permanent ownership. Spindeldreher et al. (2019) describe this to be mainly relevant in the time dimension, that is, for instance, having to book a timeslot in advance rather than being able to make use of the good at any time. However, in the context of this thesis, the concern about inflexibility might go beyond inflexibility in time to inflexibility in behaviour and expectations altogether. That is, the need to adapt and compromise one's behaviour and expectations when in a shared space is much stronger than when having an own space, meaning that the loss of ownership leads to inconvenience. In this context, the researcher respondent describes the unwillingness to make simple behaviour changes:

E2: Sharing requires people to change their behaviour a bit. You know, for me to be able to share, I need to turn off my computer every time I leave my desk [for data protection purposes]. But like, building new sustainable buildings to have more space requires no effort for me to change at all. So that's why we're stuck in this sort of sustainable construction thing instead of sharing spaces, which are more effective environmentally. It requires people to change, even though I would consider it not big changes, but people are very stuck in their ways.

Other changes in behaviour require more consideration towards other users in terms of cleanliness and noise. Resulting from an unwillingness of certain space users to make such changes in their behaviour or from other space users to make compromises on their expectations are the conflicts over these topics, which respondents spoke about. The inflexibility from loss in ownership might be difficult to mitigate, although there are certain strategies in designing the building and usage structures in such ways that they allow for more flexibility. At the same time, it might be helpful to drive the acceptance of certain behaviour changes with communicating the importance of such changes for the sake of environmental, social, and economic benefits. That is, it might be just as important to work on the concern about inflexibility, rather than on inflexibility itself.

Not as explicitly brought up by respondents but rather broadly expressed as an unease about sharing space with unknown people space were the barriers of lack of trust, privacy risk, physical risk, and undesired social interaction, as discussed in Section 6.1.1 External Contextual Factors under cultural attitudes towards space sharing. Respondents spoke about the loss of control of who is entering and leaving the building, some users' preference for a locked space, companies' protectiveness over their office space, or the need for privacy of school children. In the context of space sharing, these topics do appear to be crucial, considering how personal space is. On this topic, the researcher respondent argues that this

feeling of unease over lack of ownership and loss of control might go beyond more general concerns about safety or privacy:

E2: And space can feel very personal. I mean, we saw the whole flexi desk situation where people just had riots because they wanted *their* desk. It's *my* desk. It's very personal to me. And it looks the same as all the other desks [...]. I don't know, it gets very personal for people, even if it's commercial space. So, I think it's all about attitude again, from users as well as owners.

It is interesting to note how this respondent points to the fact that insisting on the need for one's own space in this context appears irrational, considering that any other desk would fulfil the same function. It could be speculated that this impression—that this need is not rational, even a little silly—might lead to this barrier not being discussed very explicitly, and other, more 'rational' causes for an aversion to space sharing being cited instead. The only times when respondents spoke about this aversion more explicitly, they slightly distanced themselves from this need, for instance by signalling that this behaviour seemed illogical: “[some companies] are really protective, they'd rather see an empty office space than to share it with something else.” One context where the respondent spoke very openly about it was when speaking about the need for “safe space” for pre-school children, a demographic group where such needs might be much more acceptable. This indicates that the aspects that were explicitly pointed out with regards to physical safety, privacy, trust, and social interactions might only be the tip of the iceberg, while much of the emotional aspect of space, which might make space sharing uncomfortable, was not discussed very openly. It is thus important to keep these aspects in mind when working with shared spaces, also especially with regards to vulnerable groups such as children. Clear guidelines on behaviour that are being enforced could be helpful in this context, design elements such as lockers that allow to store private belongings, or activities to familiarise space users with each other to strengthen trust.

Finally, not identified as such in this thesis were the barriers of exploitation and performance risk. Exploitation refers to a critical stance towards the SE as an exploitative consumption model, and threatens traditional values associated with sharing as a communal activity, and performance risk the idea that there is no guarantee about the quality of the shared good. The fact that these were not identified might be linked to the sharing settings that were spoken about, which were to a large extent non-commercial.

The fact that there is such a strong overlap between the first level barriers identified in this thesis, and the barriers identified by Spindeldreher et al. (2019) indicates that these barriers also exist in other forms of sharing, such as short-term vacation rentals or ride sharing. Some of these have become quite popular, which suggests that these are barriers that can be overcome. Knowledge gained in the context of established forms of sharing can be used to inform measure to mitigate those barriers. Finally, it is important to note that these barriers also exist on the level of the municipalities. It is thus crucial to ensure that there is a differentiation between the perception of challenges and the actual challenges—as discussed above, the anticipation of risks and inconveniences associated with sharing is in some cases sufficient to prevent actors from participating in sharing. This is closely linked to the following section about risk aversion and indicates the importance of being aware of such potential biases towards only employing familiar solutions.

Risk Aversion

Risk aversion is a commonly identified barrier to the implementation of CE, and while often discussed as a characteristics of private sector actors (e.g., J. Tan et al., 2022; Wuni et al., 2019), it has also been identified in municipalities (Wijayasundara et al., 2022). Wijayasundara

et al. (2022) in the context of procurement of CE products find that risk aversion was a crucial barrier to circular innovation in the studied local governments, as it meant that products had to prove at least the same or higher performance to be adopted.

Risk aversion might also play a role in the context of space sharing, as it requires very novel ways of thinking about space. Furthermore, as mentioned previously, there is a feeling that space is very personal, hence it might be considered even more risky by the municipalities to try and push people towards more space sharing. This would explain why, despite the fact that there is great potential for environmental benefits and, albeit smaller, financial benefits in space sharing, many respondents of the municipalities were very hesitant about the idea of trying it out, although there were a few exceptions. While respondents were able to justify these reservations with the first and second level barriers, it appeared as though those barriers were not high enough that it would explain why the municipalities would not investigate the topic further, especially considering the high potential effectiveness. Some municipalities also saw this perspective and argued that while it would be difficult and require the development of much new knowledge, it would be something that could have a great deal of impact. There was also great deal of variety in the depth of responses that interviewees were able to provide on the barriers they brought up: while in some cases, respondents showed a detailed and nuanced understanding as to why there was a certain difficulty with a topic, in other conversations, interviewees were struggling to provide such information. This suggests that in some cases, respondents were very willing to accept the finality of these barriers without having tried out different solutions, or without reflecting on why they perceive this barrier.

Of course, the risk aversion in this context is also met with a considerable amount of actual risk, as space sharing requires novel ways of thinking and is a culturally difficult topic, which might make it difficult to overcome such risk aversion. Nonetheless, there are certain ways in which it can be addressed: Wuni et al. (2019) for instance highlight the importance of proof of concept projects as it reduces perceived risks. This suggests the importance of looking towards private sector and civil society for lessons learnt on one hand, and the municipalities taking a leading position in demonstrating how space sharing can work. Furthermore, Wijayasundara et al. (2022) identify different factors that can encourage CE innovation from municipalities despite risk aversion such as knowledge creation and sharing, clear policy priorities to innovate, allocating of resources for experiments and transformation, organisational culture that encourages innovation, and using measurable objectives for CE performance. Such insights on how to mitigate risks and risk aversion in the context of CE could be important to overcome this underlying barrier in the municipalities.

Current Understanding of Space as a Resource

Finally, the topic of space sharing is marked by the way in which space in itself is currently understood and characterised as a resource. First, there seems to be a lack of understanding and recognition of the environmental implications of wasted space, and second, space is perceived as an inflexible resource.

As discussed in the introduction of this thesis, the potential environmental benefits of using floor space more efficiently are considerable, and yet, this is not very present in the sustainability discourse or in CE policy and projects in the building industry. This suggests that the environmental importance of sufficiency or optimisation strategies in the context of indoor space might not be very well recognised by many actors. This also shows in the fact that when discussing reasons for the municipalities to investigate space sharing, respondents highlighted mainly economic reasons, even though the financial benefit was ultimately not perceived as so large. In line with this, the researcher respondent finds that even though the strongest argument for space sharing is environmental, and not financial, it is not so present:

“The economic incentives are not as pressing as the environmental savings, which are very pressing, but are further away from people’s minds than the economic incentives” (E2). The researcher respondent continues to argue that the topic would receive more attention if space efficiency were included in sustainability reporting. Indeed, it currently seems very common for companies or public actors to simply accept inefficient space use, which, in the context of other wasteful behaviour with similar environmental impact would certainly receive much more negative attention. Thus, to include space efficiency in sustainability reporting or in public policy environmental objectives would create stronger incentives and shift the awareness towards this issue.

Second, the framework in which buildings and spaces are currently understood is very inflexible and long-term, which is strongly contributing to inefficient space use. When respondents expressed their uncertainty about the potential of shared spaces actually saving space, they argued that the needs of the users might change over the years, making the space sharing arrangement no longer working, meaning that another solution would have to be found. In saying this, the interviewees assumed exactly this traditional understanding of static space use and long-term contracts, which is exactly what is intended to change with shared spaces. The reason why static and long-term contracts currently work well despite changing needs of users is because there is a great surplus of space compared to actual space use. Space sharing is one way to attempt to reduce this inefficiency by making space use more flexible and by combining needs in a more optimal way. As the researcher respondent mentioned, some developers in Malmö have already adopted this mindset and are willing to try out more flexible contracts, for instance (E2). While in the long term, perhaps a completely different understanding of renting space is needed overall, in the meantime, solutions to start and try to combine different space can pave the way for more flexibility.

It is thus important to recognise the importance of space efficiency from an environmental perspective, on one hand, and shift towards a more flexible understanding of space use in order to enable this efficiency.

6.2.2 Significance of the Content

This thesis addresses the research problem described in Section 1.2 by exploring the ways in which municipalities can enable space sharing, looking at the case studies of Amsterdam and Malmö. The research problem was identified as relevant in that it addresses an academic and a practical knowledge gap. From the academic perspective, there is a lack of research on intensifying loops in the built environment and access-based consumption of space in particular. While there is growing academic interest in the topic in recent years, much of it has been centred around office spaces and short-term accommodation rentals, or individual case studies of shared spaces. This thesis approaches the topic also from the perspective of how space sharing can be mainstreamed. Furthermore, this thesis contributes knowledge about the specific actor of municipalities, and how they can enable space sharing. Thereby, it also adds to a body of literature on the role of municipalities in the context of sharing activities.

This thesis also addresses a practical knowledge gap, which is that there is little available knowledge about the potential roles for municipalities in the context of space sharing. Taking an explorative approach, the thesis demonstrates in which areas further practical knowledge has to be generated in order to overcome the barriers faced by municipalities when engaging in space sharing. It further provides some insights on how municipalities can interact with sharing activities in the absence of sharing organisations.

6.2.3 Significance of Methodological and Conceptual Approach

This thesis shows that a qualitative approach using semi-structured interviews is useful in understanding complex and multi-layered topics such as space sharing, which combines environmental, financial, legal, social, and political topics. In particular, the use of qualitative research has been useful in identifying underlying themes, such as risk aversion or reluctance to share, which were expressed in the formulation and conveying of respondents' replies, rather than their explicit statements. This allowed for a more in-depth understanding of respondents' perspective and understanding of the topic.

From a conceptual approach, the thesis contributes to a better understanding of the relationship between the concepts of SE and CE by demonstrating how sharing is a strategy of intensifying loops and overlaps with but does not exactly correspond to sharing as defined by SE literature. Many of the sharing activities identified in this thesis would not be considered part of the SE according to the criteria defined by Curtis and Lehner (2019), which are features commonly used to describe SE. Yet, such sharing activities can be important in reducing resource consumption by intensifying use and should thus be included in CE research, as they are likely not covered by SE research. Similarly, the difficulty to apply the Palgan et al.'s (2021) framework on governing the SE illustrates how sharing that is closer to the traditional forms of sharing in that it is not mediated by a SEO is more difficult to capture due to the multitude of actors and lack of clearly defined roles in facilitating the sharing. Therefore, it might also not be as easy to enable, since it is not as clear which actor to target. This thesis illustrates how such a framework can nonetheless be used to inform the understanding of role distribution and which types of actions municipalities can take to enable space sharing. Thereby, the thesis shows how SE concepts can be adapted to facilitate research on sharing as a CE strategy, and how findings from SE research might be applied to other sharing contexts. In this way, the thesis provides an example of a combined application of CE and SE concepts, and points towards a conceptual gap between SE and CE that requires better understanding.

On a more general level, the thesis thus shows how drawing insights from different concepts and frameworks can be helpful in understanding a complex topic and illuminate different aspects of a topic. This might also—perhaps rightly so—be criticised as a “pick and mix” approach, which makes selective use of elements of frameworks or concepts as seen fit, without committing to a specific theory or concept. However, it could be argued that it is a means of triangulating the findings, in that it draws from different theories and topics to see if similar patterns were identified there. It is also a pragmatic approach helpful in identifying solutions and transferring knowledge from one discipline to another. Finally, it also helps to detect larger patterns between different bodies of knowledge, and by using frameworks in a slightly different context than intended refines the understandings of such frameworks.

6.3 Critical Reflections and Limitations

6.3.1 Reflections on Methodology

The first reflection concerns the use of semi-structured interviews as a mean of data collection. Due to the relative novelty of space sharing as a topic and the lack of clear vocabulary or well-established concepts, it was difficult to describe the topic of research to the respondent in a way that was easy to understand and not lead them on. This often led to misunderstandings with the respondents and led them to also include different types of shared spaces. This was the case especially with regards to the difference between serial sharing and simultaneous sharing, which was oftentimes spoken about by respondents. They also brought up multi-purpose buildings without or adaptative reuse buildings without any serial sharing

element. Even though this was then always followed up by asking specifically about serial sharing, it was difficult to stay on that topic only. This is also difficult since many examples involve both simultaneous and serial sharing. This is also difficult since many examples involve both simultaneous and serial sharing at the same time, making it difficult to differentiate in some instances whether a barrier they were talking about really related to serial sharing, or in fact to simultaneous sharing. For example, the barrier of noise disturbance that was brought up a few times seems more likely to be an issue with simultaneous sharing but could also be an issue with serial sharing in that a range of different groups using the space for different purposes might be noisier and more difficult to reprimand.

Another limitation is the limited number of interviewees, as well as the difficulty to reach relevant interviewees. This increases the risk that important information was missed during the data collection of this thesis, and that there is a bias towards a specific perspective. For instance, while it was aimed to select interviewees from different branches of the municipalities that work with buildings and space provision, this was not always possible due to availability of interviewees. However, a fairly good representation on both sides was achieved. There was an asymmetry regarding additional interviews with one being held with an employee of the environmental department for Malmö, and for Amsterdam two interviewees working for social provisions and arts and culture, representing more the space user side. In most regards, however, there seemed to be strong congruence between the respondents' answers, although there were of course respondents that had more specific knowledge in certain topics than others. Nonetheless, it could be that respondents from Amsterdam were able to name more space sharing activities than those in Malmö because of the selection of interviewees. Naturally, there is also a difference in that there were six interviewees from the municipality of Amsterdam, and only four from the municipality of Malmö. Both experts interviewed were Swedish, which was due to the availability of respondents, which might lead to an overrepresentation of the Swedish context in the expert statements. However, they rarely included specific statements and usually described broader trends.

Finally, reflecting on data analysis, it appears difficult to take a structured approach in thematic analysis. As there is no singular procedure for thematic analysis, there are different understandings of the methodology emerging, and even different definitions of what represents a theme. In an attempt to classify the approaches, Braun et al. (2019) delineate two principal understandings of the "theme", and three main schools of thematic analysis. The two understandings of theme they identify are either as a "domain summary" or as "meaning-based patterns" (Braun et al., 2019, p. 845). The first one is a common understanding of theme as a rather surface-level summary of what has been said or written about a certain topic in the data. This is in contrast to the second understanding of themes as "reflecting a *pattern* of shared meaning, organized around a core concept or idea, a central organizing concept" (Braun et al., 2019, p. 845, emphasis in original). Here, a theme is understood to go beyond the direct and explicit meaning of the data and capture broader ideas. The authors further differentiate between three schools of thematic analysis, the first one being coding reliability. Coding reliability is rooted in (post-)positivism and aims to code in way that is understandable and replicable by other researchers, in the sense that they aim to increase the objectivity of codes, and rather using domain summary-type themes. For this purpose, the coding is usually guided by a set of predefined codes. Thereby moving a bit towards quantitative data analysis, this school has been criticised for lacking some critical aspects of qualitative research, such as reflexivity and profoundness of analysis. In contrast, the second school of thematic analysis, called reflexive thematic analysis, underlines the importance of the researchers in the process of finding meaning in the data. In this approach, themes are considered meaning-based patterns, and the coding emerging from the analysis is a result of an in-depth engagement with and interpretation of the meaning in the data by the researcher. This means that the researcher

views the data through their own subjective lens. The codes are not predefined; rather, it is an iterative process. The third school identified by Braun et al. (2019) named codebook thematic analysis, is in between the first two schools by combining elements of the more structured approach of coding reliability thematic analysis, with the qualitative research philosophy found in reflexive thematic analysis. Themes usually take the form of domain summaries. They are often to some extent defined in advance, but not necessarily to ensure standardisation, but rather out of pragmatic reasons, for instance, to be receive pre-defined types of information (Braun et al., 2019; Braun & Clarke, 2022). Codebook approaches are often found in applied research, and can be considered a compromise between qualitative research and pragmatic considerations, although thereby also losing some qualitative qualities (Braun & Clarke, 2022). A codebook thematic analysis approach was chosen for this thesis, as there were some pre-defined codes which were determined by the RQs. This might have impacted the qualitative depth of this thesis. Nonetheless, this was on one hand difficult to avoid while at the same time answering the RQs, and on the other hand, there was in-depth engagement with the material, and the pre-defined codes were very broad.

6.3.2 Reflections on Theory

The relative novelty of space sharing as a topic also impacted the application of theory, as there was no framework fully applicable to the findings of this thesis. Therefore, with the approach of combining different concepts and theoretical frameworks without fully employing one theoretical framework, nor producing a fully-fledged new framework, this thesis could be criticised as having a weak relation to theory. The thesis follows neither a classic deductive nor inductive approach, as it did not test a pre-defined theory, and did not generate a new theory either. Too little use of theory could lead to what according to Bryman is often called “naïve empiricism”: research that is based on the “belief that the accumulation of facts is a legitimate goal in its own right” (Bryman, 2001, p. 23). This is criticised for not being preoccupied with theory enough. However, as Bryman argues, much research that is accused of this is in fact very much informed by literature, and oftentimes deals with RQs that are based on existing literature, whereby “literature acts as a proxy for theory” (Bryman, 2001, p. 22). Thus, even though there might not be a strict application of theory, he argues that it would be harsh to consider such research naïve empiricism. In the case of the thesis, there was indeed great familiarisation with different theories and frameworks existing in the literature that pertain to the topic of research (CE, SE, Sharing Cities, Governance modes for the Sharing Economy, typologies of shared spaces). While there was not one single theoretical that was applied, or a theoretical framework generated, this does not mean that this thesis was not preoccupied with theory. Furthermore, this was also due to a difficulty to find theory that is applicable, as has been explained in Chapter 3 Conceptual Framework. The exploratory character of the thesis further makes it difficult to generate theory, but rather can lay groundwork for theory to be developed from further research.

6.3.3 Legitimacy and Generalisability

The RQs that guided this thesis were clear and researchable, although relatively broadly formulated. This has rendered answering the RQs fully more difficult, since they are formulated in a very explorative way. While the RQs are answered, there is certainly more information that could be provided on the topic. There are certainly many RQs that have emerged, which are discussed in the Section 7.3 Recommendations for Further Research.

While the findings of case study approaches have been said to lack generalisability, they provide in-depth insights and a better understanding of the relations within such cases (Yin, 2018). Flyvbjerg (2006) goes as far as to argue it is indeed context-specific knowledge that distinguishes experts from beginners. Similarly, the method of qualitative research is

sometimes criticised for not being very generalisable but instead ensuring great qualitative validity, meaning that the outcomes are accurate from the perspective of the different participants and the researcher (Creswell & Creswell, 2018). Furthermore, since in this research the focus really lies on the interaction between different actors and barriers, an in-depth understanding of the perspectives of the participants can be prioritised over generalisability.

7 Conclusions

This chapter presents the conclusions of this thesis, summarising the main findings and thereby answering the RQs, discussing practical implications and recommendations, and finally, making recommendations for further research.

7.1 Conclusion and Answers to the Research Questions

The aim of this thesis was to explore space sharing in the cities of Amsterdam and Malmö from an urban governance perspective and contribute to a better understanding of the city governments' engagement with space sharing practices, how they can enable space sharing, and what barriers they face in this context.

Although intensifying loops has been identified as a CE strategy with great environmental benefits, ways to achieve this such as the sharing of spaces have not been studied much. Therefore, there is a lack of knowledge as to how space sharing works and how it could be facilitated. The importance of cities in sharing activities and the SE has been highlighted, therefore, it is important to study the role of cities in the context of space sharing. In order to also address a practical knowledge gap, the aim of the thesis was also to identify best practices and areas that require further exploration for the municipalities. As case studies, the cities of Amsterdam and Malmö were chosen, due to their and their respective countries' strong engagement in CE in the built environment and SE topics.

First, answering RQ1, RQ1a and RQ1b, the thesis describes different types of space sharing activities that the municipalities are either involved in as a third party, or involved in as a space owner, and is interacting with and supporting these practices in different ways.

RQ 1: *How do the municipalities of Amsterdam and Malmö enable space sharing?*

RQ 1a: *Which kinds of space sharing practices are the municipalities involved with?*

RQ 1b: *In which ways are the municipalities engaging with these practices?*

The kinds of space sharing practices that the municipalities are engaging with identified in this thesis are mainly spaces that are used by organisations such as arts and culture organisations, not-for-profit organisations, and social enterprises. By encouraging and supporting these organisations in sharing spaces, the municipality supports them in finding an affordable space. There are some cases that involve other actors as users as well, such as companies and event facilities. The initiatives identified in this thesis are mainly cases of organisation-to-consumer space sharing, with few exceptions of peer-to-peer sharing. That is, there was the presence of a central organisation that managed the space and its users, that is, operating the shared space.

The findings show that the municipalities are either involved as a third party or involved as the space owners. Furthermore, another important distinction that can be made is at which stage the support of the municipalities comes in: providing the space or operating the sharing. Provision of a space refers to the making available of a space for sharing in the first place, that is, either providing a space owned by the municipality or facilitating the construction or renting of a space for sharing. Operation of the sharing refers to the process of arranging and facilitating the sharing among different users.

As an involved third party, the municipalities engage with and enable space sharing mainly in three ways: by providing subsidies, by acting as a mediator, and by leveraging land allocation competitions and negotiating in the planning process. First, the municipalities can subsidise

the shared space itself, that is, the rent of the space, or an organisation that is specialised in running shared spaces, thereby supporting the operation of the shared space. By mediating, the municipalities can facilitate an agreement between owners of a space and potential space users to be able to use a space for sharing, or it can mediate between users to share a space. Here, the municipalities are leveraging their position as trusted and reliable actor. By setting demands in land allocation tenders, the municipalities can push for the inclusion of shared spaces in development projects.

	Subsidising	Mediating	Through land allocation tenders
Space provision	Municipalities provide subsidies to developer to build and rent out a shared building	Municipalities mediate between potential space users and owners	Municipalities push developers towards creation of shared spaces
Sharing operation	Municipalities provide subsidies to operate shared spaces	Municipalities mediate between space users	

Figure 7-1: Figure 5 5: Overview Involvement of Municipalities as a third party (copy of Figure 5-5)

As a space owner, which offers space for sharing, the municipalities primarily take care of making spaces available for sharing. In this context, the municipalities might only provide the space and leave the operation of the shared space to a specialised organisation—there was no example identified in which the sharing was organised among the users, that is, there were no such examples of peer-to-peer sharing in spaces provided by the municipalities. Then, in some instances the municipalities also managed the operation of the shared space, and in the case of school buildings that are shared, they are also the main user of the building.

Second, answering RQ2, two levels of barriers that render it difficult or prevent the municipalities from enabling space sharing: first level barriers directly affecting the actors involved in space sharing arrangements, and second level barriers affecting specifically the municipalities when trying to enable space sharing.

RQ 2: What barriers prevent or render it difficult for the municipalities to enable space sharing?

The first level barriers are the following: first, compatibility issues between the users, their needs and behaviours, such as cleanliness, noise, availability of the space, and a general discontent about other users. Second, concerns regarding security and liability, which include on one hand a more tangible concern about physical damage and questions of liability, and on the other hand a more emotional discomfort of having to share a space with other users. Then, as a result of these issues of compatibility and risk of conflict between users, as well as questions of safety and liability, there was note of ensuing financial and organisational costs to arrange and operate a shared space, which reduced the desirability to share space as a way of saving cost. Such barriers were brought up by respondents to explain as to why the municipalities might not even try to enable space sharing, as it was thought that these barriers make it complicated and unwanted by space users.

The second level barriers do not as such concern space sharing directly but affect the municipalities as an actor that could enable space sharing. They relate mainly to related to a

perceived lack of instruments and leverage available to the municipalities to enable space sharing, the risk of preferential treatment, and a lack of knowledge and uncertainty with regards to space sharing and its potential. These three are strongly related to each other: a lack of instruments is linked to the idea that they are not allowed to facilitate space sharing for private companies due to preferential treatment, but it also has to do with a lack of knowledge about which instruments would work, as well as a lack of knowledge about how the issue of preferential treatment could be approached. Figure 7-2 presents a summary of the enablers and barriers.

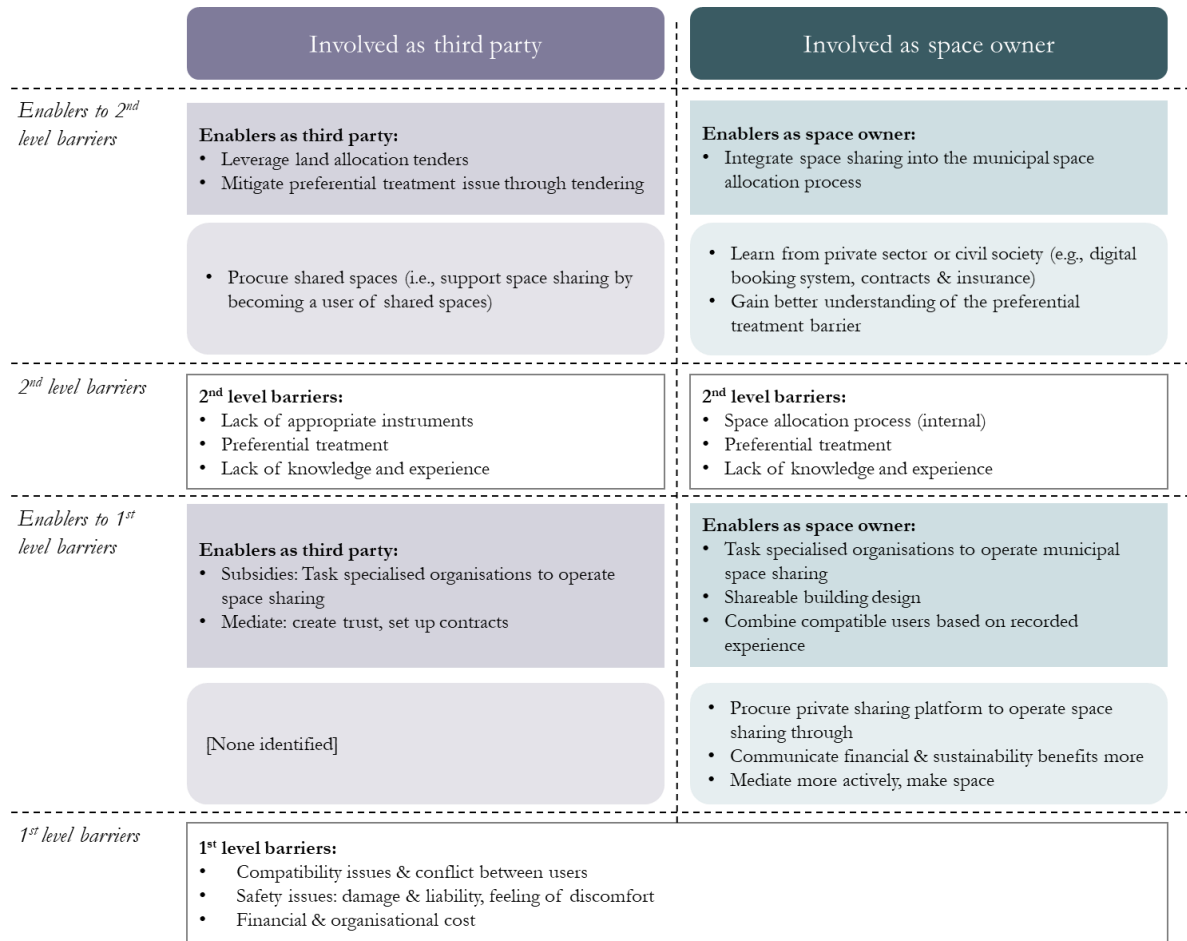


Figure 7-2: Summary Enablers and Barriers (copy of Figure 5-2).

Finally, contextual factors were discussed, as they are crucial to better understand the case studies examined. The following factors were identified: factors internal to the municipalities are the administrative structure of the municipalities (centralised versus decentralised), priority areas of the municipalities, and the budget of the municipalities. External factors were space scarcity, the presence of a private and civil society sector engaging in space sharing, and cultural attitudes towards space sharing. While financial motivations are a strong initial driver for space sharing, there is uncertainty about how to implement space sharing in a way that the expected savings are actually realised. Interestingly, sustainability considerations could not be identified among the drivers for space sharing, which suggests that there might be a lack of awareness of the environmental cost of space inefficiency. Cultural attitudes towards space sharing appear to be difficult to capture yet crucial in understanding the reluctance towards space sharing among different users. Further, it is important to consider that such attitudes would likely also influence the municipalities’ perspective on space sharing and combined with risk aversion prevent the municipality from exploring novel ways of using space. This, in turn,

also highlights the importance of private sector and civil society in providing proof of concept and creating knowledge on how space sharing can be operated.

7.2 Practical Implications and Recommendations

A few practical implications and recommendations can be inferred from this thesis, which are mainly directed towards municipalities and policy makers, but can also be relevant to practitioners. For municipalities, the following recommendations can be made.

First, on a more specific level, this thesis has identified and discussed existing and potential enablers for the municipalities, as discussed in Section 5.3 and summarised in Figure 7-2 above. Municipalities can profit from this knowledge by reflecting about ways of engagement to facilitate space sharing. Second, on an organisational level of the municipalities, there is need for the creation of knowledge and processes that enable the municipalities to enable space sharing. Here, municipalities could engage in pilot projects to provide proof-of-concept, which is necessary in order for the municipalities to mitigate risk aversion which is strongly present in the context of space sharing. Furthermore, municipalities can create knowledge through learning from other contexts of sharing and deriving best practices, for instance, on how to overcome first level barriers, since they largely correspond to barriers found commonly in the context of sharing. Here, considering the strong focus on the provision of space for sharing and less on the operation of shared spaces in the municipalities' work thus far, the importance of actively operating and moderating such a shared space might have been underestimated. Therefore, the difficulties initially experienced with different types of shared spaces might not indicate that space sharing in these contexts is impossible, but rather that it requires active attention and effort, and a period of learning. By looking at private sector and civil society initiatives and sharing of other goods and services, the municipalities can generate such learning. Furthermore, more knowledge and experience need to be developed on other governance tools than subsidies, as there appears to be a lack of awareness of tools such as mediating, acting as a matchmaker or providing non-financial kinds of support. Similarly, the processes of space allocation within the municipalities, as well as land allocation to private developers should be adapted and leveraged to facilitate space sharing. As large real estate owners and users, the municipalities should not only the lead the way in showing how space sharing is possible with their own facilities, but also engage in space sharing as users.

Finally, it cannot be stressed enough that the topic of space efficiency must be better addressed in policymaking on an urban, as well as national and international level. It is crucial now that cities such as Amsterdam and Malmö which are formulating policy ambitions and measurable objectives in terms of circularity and sustainability go beyond incremental improvements towards holistic changes. Such metrics are needed in order to create the policy incentive to shift the focus towards space efficiency and sufficiency and move away from an inflexible perspective on space as a resource based on inefficiency and surplus capacity. The current policy focus on strategies such as recycling or reuse does not align well with the scientific findings that strongly underline the importance of consumption-based approaches. Policies promoting both sufficiency and efficiency in the built environment are therefore urgently needed to achieve necessary emissions reduction and prevent further biodiversity loss.

7.3 Recommendations for Further Research

The following recommendations based on this thesis can be made. First, a better fundamental understanding of space sharing is necessary, in order to describe and quantify its benefits and how it can be implemented. This could, for instance, include research on the potential space savings through space sharing, either for specific actors (such as municipalities) or cities.

Important knowledge would be generated by mapping space needs and demand, for instance on a city level, to detect where the greatest potential for space sharing lies. Furthermore, it is also crucial to better understand the financial and social benefits of space sharing.

Then, in order to gain a better understanding of how space sharing can be facilitated, further research on first level barriers could include the following research topics. First, as this thesis could mainly include the perspective of first level barriers, it would be interesting to study whether the occurrence of these barriers corresponds to the respondents of this thesis. Second, a better understanding of the less tangible barriers, that is, lack of trust, discomfort of having to share space with other users, etc., would help to understand how these barriers can be overcome. In a similar line of thought, a better understanding of how space sharing can be communicated to users in a way that it seems attractive to them could be helpful. Third, compiling knowledge generated in other SE contexts and investigating whether it can be applied to the context of space sharing could generate helpful and practical knowledge on how to facilitate space sharing. Such knowledge could be drawn from academic sources, but also practitioners. Fourth, it would be interesting to conduct a similar study to this in a different cultural context. As one respondent mentioned that the experience of space sharing was completely different in Estonia, an investigation into which difference really exists with regards to culture and mentality. For second level barriers, knowledge more specific to urban policy and planning would be required, such as an investigation into applications of preferential treatment regulation and how it could be handled when engaging with private companies in the context of space sharing.

From a higher-level perspective, it would be interesting to analyse questions such as the understanding of space as an inflexible resource from a perspective of transition management or futurism, in order to determine which relevant changes are needed to have a broader shift to more flexible and efficient space use.

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Appendix A: Interview Consent Form

Interviews Master Thesis: Information on Participation and Data Handling

The following document provides information concerning the participation and handling of data collected as part of the master's thesis research by Sonja Leyvraz on the topic of optimised building utilisation in the cities of Amsterdam, Malmö and Zurich.

Purpose of the study: The aim of this master's thesis is to explore the topic of optimising building utilisation by sharing spaces; that is, how the idling capacity of buildings (the time they are empty/unused) could be reduced by sharing it between different users. Taking an urban governance approach, the thesis focuses on three case studies, Amsterdam, Malmö and Zurich, and how these cities perceive and engage with such initiatives.

Participation and data handling: Your participation is voluntary, and you have the right to withdraw your participation at any time and without stating any reason. During the interview, you may ask for clarification on the questions, and choose not to answer at any time or request to keep certain materials confidential. There are no anticipated risks to individuals taking part in this study. Interviews will be recorded and subsequently transcribed. You may review the transcribed interview if you wish to do so. The data collected will be analysed as part of the research project. Participants will be referred to by their role, organisation and the city case they relate to, if applicable (e.g., 'Sustainability Expert, Real Estate Department, City of Zurich' or 'Researcher, Lund University'). You may request to be referred to differently (e.g., without the role). All data will be handled in accordance with Lund University guidelines. Interview data will be stored and analysed using a participant number which will be recorded in a separate document. All research materials, including participant data, are stored password protected and are only accessible to the researcher. The data will not be shared with third parties. At any stage of the research until April 30, 2023, you have the right to access your own personal data, request its rectification or erasure, or request that data processing be restricted. Interview data will be saved for a limited time after the research is completed to validate the research findings. The findings of this study will be written up as an M.Sc. thesis and presented in an internal thesis defence. A final version of the thesis will be published in the university's open-access database in autumn 2023 (online accessible here: <https://www.iiee.lu.se/education/mastersprogramme-environmental-management-and-policy-emp/msc-theses-iiee>).

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Appendix B: Interview Guide Municipalities

Optimising Building Utilisation – How the Cities of Amsterdam, Malmö and Zurich Encourage the Sharing of Spaces

Semi-structured interview, main points:

- A) Introduction
- B) RQ 1: Current status/knowledge of space-sharing initiatives
- C) RQ 2: Challenges and opportunities/solutions for municipalities

A) Introduction:

- 1) *Introduce myself; brief explanation of the topic: Idle capacity of buildings is very high, i.e., spaces are empty for a large amount of time. How can this be changed; how can existing buildings be used more efficiently (over time) and idle capacity shortened?*
- 2) *Participation and data handling: any questions? Consent (most important: recording & transcript, can review if they want, what would you like to be referred to).*
- 3) *What is your role/what is your place in the administration (brief)? What topics do you work with?*

B) RQ1:

- 1) *Explain what is meant by “Space Sharing”: More space demands are fulfilled with fewer buildings as they are shared, thereby reducing the time a building/space is empty. Provide 1-2 examples but clarify that it could be public, commercial, or private spaces – open scope.*
- 2) *Do you know of any examples of this happening in Amsterdam/Malmö/Zurich?*
 - a. *No: maybe broaden the thinking a little bit, can happen very inadvertently on a small scale (and then maybe the municipality doesn't have much to do with it).*
 - i. *Could also ask whether they have thought of it. If they have thought of it but are not doing anything, why not? (Basically, moving on to C). If they have not thought of it, why not?*
 - ii. *Have thought of it/tried but didn't work? Why?*
 - b. *Yes: how does it work? Who is involved? Is the municipality involved in this? What do you do (versus what could you do in the next RQ)?*
 - i. *If they cannot think of anything, could ask specifically according to the categories? (I.e., regulation, provision, enabling, partner, self-governing)?*

C) RQ2:

- 3) *From your perspective, what do you think are the main challenges for such space-sharing initiatives?*
 - a. *Follow up*
- 4) *From your perspective, what are the main opportunities/solutions/things that the municipality could do (more) to support space sharing?*

- a. *If they cannot think of anything, could ask specifically according to the categories? (I.e., regulation, provision, enabling, partner, self-governing)?*

Close: option to review the transcript if they wish to do so. Timeline of the thesis: Interviews mostly Jan/Feb, thesis due in May. Questions?

Appendix C: List of Interviewees

Ref.	Type	Organisation	Department	Role/title
A1	Municipality	City of Amsterdam	Project management office (Projectmanagementbureau), Amsterdam Southeast	Project manager urban development
A2	Municipality	City of Amsterdam	Built environment Amsterdam Southeast	Programme manager sustainability and innovation
A3	Municipality	City of Amsterdam	Arts & Culture	Process manager
A4	Municipality	City of Amsterdam	Municipal Real Estate (Gementelijk Vastgoed)	Project manager
A5	Municipality	City of Amsterdam	Arts and culture Amsterdam Southeast	Department manager
A6	Municipality	City of Amsterdam	Project management office (projectmanagementbureau), Ground and Development (Grond en Ontwikkeling)	Project manager urban planning
M1	Municipality	City of Malmö	Environmental Department (Miljöförvaltning)	Researcher & Sustainability Strategist
M2	Municipality	City of Malmö	Planning Department, part of City Planning Office (Planavdelning, Stadsbyggnadskontoret)	Landscape Architect
M3	Municipality	City of Malmö	City Real Estate Office, part of Service Administration (Stadsfastigheter, Serviceförvaltning)	Sustainability Strategist
M4	Municipality	City of Malmö	City Planning Office (Stadsbyggnadskontoret)	Spatial Planner
E1	Expert	Vakansa	n/a	Founder
E2	Expert	Lund University	Lunds Tekniska Högskola LTH	Researcher

Table 0-1: List of Interviewees.

Appendix D: List of Space Sharing Initiatives

Space sharing initiatives in Amsterdam and Malmö, as identified by the interviewees.

Ref.	Type of space (principal)	How is it being shared?	Users	Involvement municipality	Provision or operation
<i>Municipality not involved</i>					
M1; M2	Parking houses	Local residents use at night, people who work in the area.	Local residents; people who work in the area	n/a	n/a
A2	Office spaces	"Spaces": companies or freelancers can rent office spaces.	Companies; freelancers	n/a	n/a
A1	Parking spots	Shared through app where you can add parking buildings from different offices.	Anyone looking for a parking spot	n/a	n/a
A2	Office spaces	"Seats to meet": Self-employed people can have a spot for free, in return, they can share knowledge and be social.	Companies; freelancers	n/a	n/a
A2	Office spaces	"Extra mile": building that is to be demolished, but in the meantime is turned into a co-working space that rents out office space. Also offers workshops.	Companies; freelancers	n/a	n/a
A4	Sports facilities, club houses	Used by childcare to watch children before and after school hours.	Sports associations; childcare service providers	n/a	n/a
A4	University hall	Lecture hall is used as a neighbourhood cinema.	University; local community	n/a	n/a
A5	Library	Library (OBA Bijlmerplein) is also used by an NGO (Imagine IC) and dance school during and outside opening hours	Library; NGO; dance school	n/a	n/a
A5	Arts and culture space	Organisations rent out their space for extra income.	Arts and culture organisations (e.g., dance schools, artists)	n/a	n/a
A5	Arts and culture space	Arts centre (Centrum Beeldende Kunst) has been lending a small space to arts institute (Dutch Gospel Arts Institute).	Arts and culture organisations	n/a	n/a
A5	Shopping	Shopping centre (Amsterdamse Poort) is	Shopping centre; dance school	n/a	n/a

	centre	allowing dancing school to use space after opening hours and only pay utilities.			
A1	Churches	Sometimes used by/rented out to local organisations	Local community; NGOs	n/a	n/a
Municipality involved as third party					
M1	Multi-purpose building	Compartmentalised use (different spaces for concerts, gym, etc.) but still shared reception, gathering facilities, and toilets, etc.	Different visitors (conference, concert, sports)	Aimed for a multi-purpose building (process not clear).	Provision
M1	Multi-purpose building complex	(In construction) Different types of functions in one building: housing, library, potentially shared offices. Buildings are connected with bridges across an open (public) space, more flexibility for sharing.	Residents; companies; local community	Set requirements for social and environmental sustainability in the land allocation tender. Supports ideas of space sharing in the development process.	Provision
A2; A5	Office/atelier spaces	"Prospect 11": building that is to be demolished is used as a shared space in the meantime.	Young businesses; arts and culture organisations	Mediated between building owner and organisation(s).	Provision
A1; A2; A4; A5	Neighbourhood centres	"Buurthuizen": Offer all kinds of activities (workshops, cooking classes, sports, etc.) to local community and also rents out space for low rent to local community.	Local community; arts and culture organisations; dance schools, etc.	Subsidises organisations which manage the centres, or an NGO can apply for subsidies to run such a centre.	Operation, Provision
A4	Multi-purpose community spaces	Spaces managed by mediator organisations (subsidised by the municipality) that offer to rent them to organisations that provide social value for low rent.	NGOs; arts and culture; other	Subsidises the mediator organisations (they receive secure financing for structural engagement with the local community).	Operation
A5	Theatre	Theatre (Bijlmer Parktheater) has repetition rooms for dancing schools and music bands, offices, theatre, cultural group, brass band.	Arts and culture organisations	Initiated the construction of the building and planned it to be shared among different organisations. Was planned and built to accommodate different needs.	Provision
A6	Business spaces	(In development/construction) Local businesses that cannot afford new higher rents are offered cheaper subsidised facilities that they will share with other businesses.	Local businesses	Made a tender for the development of shared business spaces and will subsidise the rent of the spaces. Is aiming to include certain requirements as to which businesses will be allowed to rent those spaces. By having a tender and a development company executing it, they are mitigating issues of preferential treatment.	Provision
Municipality is the owner of the space					

M1; M2	Schools	Used by local organisations outside of school hours.	Schools; local community; NGOs; sports association	Was mainly initiated by the specific school or the local district administration in order to provide activities in the neighbourhood at affordable price.	Provision, Operation
A1; A4	Schools	Used by local organisations outside of school hours.	Schools; local community; NGOs; sports association	Unclear, depends on the local department and school.	Provision, Operation
A3	Cultural centres	Building shared by multiple cultural organisations, owned and managed by the municipality.	Arts and culture organisations	Built these spaces and rent them out to arts and culture organisations at low rent to provide affordable space.	Provision, Operation
A1	Incubation spaces	Talent centres for people to develop their start-ups and social initiatives.	Social enterprises; NGOs; start-ups; local community	Sometimes in old buildings of the municipality, or in other unused buildings. For some, the municipality manages them, or subsidises organisations that manage them.	Provision
A1	Multi-purpose community spaces	"LOLA": temporary creative reuse of a.o. unused municipal buildings. Offers affordable housing, spaces for artists and organisations, but also hosts events and rents out e.g. meeting spaces.	Residents; local community; arts and culture organisations	Rents out unused municipal buildings to LOLA at low price; was asked to guarantee rental period of at least one year.	Provision

Table 0-1: List of Space Sharing Initiatives