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Planning for sharing neighbourhoods – Negotiating sustainable transition with adaptive governance models

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Abstract. Thorough sharing is discussed as a promise concept to reduce emissions and enable sustainable development, little is known how the diverse approaches of sharing ranging from Collective Commons to the Sharing Economy can be incorporated in the development of the built environment. In this study, we set the spotlight on sharing and how it could be implemented as a guiding principle in neighbourhood development. We build our study on an empirical case study within the new planned zero emission neighbourhood development of Ydalir within the city of Elverum, Norway. Building on document analysis, accompanying research and a one-day workshop with diverse stakeholders, we identified respective sharing solutions to create social value for future Ydalir residents. The findings let us draw the picture of an adaptive governance model to initiate and facilitate sharing within a multi-stakeholder setting of a new planned neighbourhood development.

Keywords. sustainable neighbourhood development, case study, sharing, adaptive governance, design thinking

1. Introduction

The recent IPCC report states unequivocally that human influence has warmed the atmosphere, ocean and land, and observed warming is driven by emissions from human activities [1]. The outlook of both Horizon Europe and the EU Green Deal highlight the urgency of addressing climate targets through engagement of diverse stakeholders. The European Union (EU) aims to set a target for reducing greenhouse gas emissions by at least 50% by 2030 compared with 1990 levels [2]. As the built environment is one of the main sources of greenhouse gas emissions, it is a prioritized area for policy interventions [3]. Better maintained buildings, neighbourhoods and public spaces will not only contribute to reducing carbon emissions, but simultaneously improving the well-being of citizens. Aiming to fulfil internationally agreed reduction goals of the Paris Agreement and guaranteeing future development within planetary boundaries, new approaches to improve sustainability are needed for the built environment. In the light of planetary boundaries, the reduction of emission through sharing resources is promising [4,5,6].

Sharing is used as a buzz word and there are many definitions out there depending on the research field and practical context. Hyeonju et al. (2019) have adapted the concept sharing paradigm as an umbrella, where they use commercialisation and ownership to identify 4 areas of sharing from Peer-to Peer Sharing, Collective Commons, Sharing Economy and Collective Economy [7]. All of these areas incorporate different sharing practices, reaching from peer-to peer sharing between persons building on

trust to commercial business models represented in the Sharing economy, where digitalization has led to the development of platforms that enable sharing in a bigger scale. Different actors are involved in sharing, as it can happen between persons and institutions [8]. While sharing can take place direct and simultaneously between persons or institutions, a lot of sharing is facilitated through tools as platforms or applications and do not require a direct interaction between giver and taker. Another aspect to differentiate sharing is the resource to be shared, that can be intangible resources as time or tangible ones as goods, but also include services within Product Service Systems as car sharing [7]. There are benefits to sharing for participants – both giver and taker – and third parties of wider society within social, environmental and economical areas of sustainable development [4,5,6]. In this paper we define sharing as co-use of resources to incorporate all areas of sharing that can be implemented in the built environment.

The built environment plays a prominent role in sustainable transition as a potential enabler to foster sharing by its design [9]. The neighbourhood level is highlighted for enabling sustainable transition as it opens up for the realization of cross-sectoral solutions [10]. The neighbourhood level concept consists of proximity as it covers a group of buildings within a geographical boundary as well as community by the group of its inhabitants and users [11]. Neighbourhoods do not have just one characteristic but many due to the diverse stakeholder interest that make up the public and private spaces. Therefore, it is difficult to define a community, which is important when discussing the sharing of services. The physical presence of buildings is fluid due to behavioural patterns of the people occupying public and private spaces within and between buildings. Sustainability of a neighbourhood is impacted by these behavioural patterns, and it is therefore necessary for planners to work with the United Nations Sustainable Development Goals (SDGs) when planning an area.

Urban Facilities Management (Urban FM) acts as an intermediator between what is planned in an area, and identifying a community within a neighbourhood in terms of needs and services, which can then be linked to meeting a number of SDGs such as SDG 11 – sustainable cities and communities. In this way, Urban FM can link diverse interests of a neighbourhood to create social value embedded to economic and environmental perspectives [12]. FM facilitates the resilience and sustainability of buildings through management of both hard services such as maintenance, safety, heating and lighting, and soft services aimed to make life easier for building users. Taking this approach to the evolving discipline of Urban FM results on a larger scale going from one organization to urban areas. It requires understanding diverse community needs and their social values. Urban FM aims to facilitate a new type of interactive governance which is collaborative and effective in the improvement of citizen's sense of attachment to public spaces by creating processes for commitment, trust, inclusion and integration in neighbourhood development [13]. These processes cover the multi-sector of stakeholders influential in shaping a community's social value in neighbourhood through service orientation that is currently lacking in city planning authorities [14].

Social values cannot just be viewed in light of an identity in one single community or neighbourhood, but requires connectivity to the wider environment in line with a larger focus on planning [14]. In this there is a need to examine cooperation and collaboration as part of the approach for sustainable neighbourhoods. This is no easy feat as it requires understanding and negotiating between the intricate interplay of individual actors, social networks, organisations and institutions that enables or hinders societies for gaining collectively within their own eco-system of needs and values. Within this context, there is a need to consider governance. Specifically, governance underpinned by structures and processes enabled through coordination, negotiation and collaboration across communities, neighbourhoods and districts in cities, which in addition consider different sectors and institutional levels for holistic planning [15].

Adaptive governance for ecosystem management employs a social–ecological systems approach and moves away from the economic focus of value chains. "Governance" is here understood as structures and processes to facilitate shared power and shared decision-making amongst people in society creating the conditions for organisation and collective action, or institutions of social coordination [15]. While co-creation has become a popular term, little is known how planning authorities work with developers to integrate local community values and local understandings of sustainability [16]. The absence of governance on how the self-organization of neighbourhood residents work with planners and developers

is an oversight that can lead to tensions among citizens, but also between citizens and government or citizens and other institutions [17]. The level of local governance is central to climate mitigation and adaptation and could potentially include a plurality of understandings of resilience thinking, including modes that are transformative [18]. Municipalities have agency by agenda setting such as through master planning and being the negotiator between citizen, politicians and private sector interests [19].

In the context of sharing, Hult and Bradley stress that sharing solutions can be exclusive and thereby stress the role of public authorities, in specific municipalities, to establish accessible sharing solutions to enable social value creation for the wider society [20]. The governance of service approaches, particularly sharing services, opens up new territory to establish models of planning as part of developing an area. The sharing of services does not necessary fall under municipality territory, but neither are they traditionally under the developer's protocol. Urban FM is an approach which can deliver services with municipality and private sector working in partnership, but when considered alongside adaptive governance and sharing services, it is a game changer for the sustainable transition of developing areas as part of a broader eco-system.

Building on the two strands of scientific background presented on sharing and Urban FM, we ask how sharing can be implemented as a guiding principle in a neighbourhood development. In specific we ask what kind of sharing is appropriate from a citizen perspective and thereby foster social value creation? Additionally, we put the spotlight on how sharing can be implemented and facilitated in the neighbourhood development?

2.   Methodology

We built our research approach on an empirical case study, conducted in 2021. We have chosen the neighbourhood of Ydalir in Norway to investigate how sharing solutions can be identified, implemented and facilitated within the development of a new planned residential area. Our empirical approach is twofold. Building on document analysis and accompanying research we have identified preconditions and structures to enable the integration of sharing solutions and the establishment of an organizational steering model for sharing. Secondly, we facilitated a one-day workshop and identified with help of design thinking sharing solutions for Ydalir in line with value creation for future inhabitants. In the design thinking methodology, it must be ensured that an initiative from above is met with a bottom-up process to ensure value creation for those who will use the new solutions, product or service [21]. In urban development projects that are to promote an inclusive and sustainable city or neighbourhood, it is important to include the inhabitants and users, and those who are to develop and maintain the district in order to create social value and sustainable solutions.

The Ydalir workshop consisted of 5 elements and respective methodologies to elaborate for co-creation of sharing solutions for Ydalir and its practical implementation: 1. Building a future version of Ydalir in 2035 with the help of DUPLO blocks to generate understanding of stepwise development of Ydalir and its 12 construction sub-fields, 2. Knowledge input on experiences with sharing solutions in the built environment through presentations of extern actors, 3. Story telling of future inhabitants needs (personas) as starting point to ideate appropriate sharing solutions, 4. Co-creation of organisational models to implement and operate identified sharing solution and 5. Identification of drivers and barriers to implement sharing solutions in the specific contextual settings. Relevant stakeholder groups were identified in collaboration with the project owner, and they attended the workshop in different numbers: landowners/developers (2), (municipal) administration and project development (6), voluntary organisations (1), school employees (1), mobility sharing company (1), citizen representative (1). In total 12 participants attended the workshop in addition to five researchers.

3.   Results

In this chapter we present the results of our studies in three parts. Firstly, we describe the case study of Ydalir and the development until 2021. Secondly, we present the identified areas for sharing in Ydalir as the results of the workshop. Thirdly, we introduce the organizational model developed for implementation and facilitation of sharing solutions in Ydalir.

3.1. Ydalir - Case study description

The Ydalir neighbourhood is a new planned development on approx. 430 000 m^2 in the city of Elverum, Norway. Around 900 residential units, both as detached houses and apartment buildings, (approx. 100 000 m^2) are planned to be completed within 2035. The municipality owns the holding of 'Elverum Vekst' and established a land development agency 'Elverum Tomteselskap' (ETS). ETS bought around 80% of the land of the former sandpit with the ambition to develop it as a zero emission neighbourhood (ZEN). The ZEN approach reaches for the compensation of all direct and embodied emissions during planning, construction and operation of the buildings and infrastructures of the neighbourhood with on-site renewable energy production [22].

The residential units are planned as a combination of detached houses and apartment buildings and will be built around a school and a kindergarten, which were already opened in autumn 2019. The first residential buildings were completed as detached houses in 2019 and with several zoning plans adapted, new construction of building blocks is planned for 2022. In total Ydalir consists of 12 construction sub-fields. The development of Ydalir takes place in a multi-stakeholder setting with different stakeholders in place at different times of development (for example planning/design, construction and operation phase). Table 1 lists the main actors relevant for establishing sharing solutions.

Table 1. Relevant stakeholders and their role within Ydalir development

Stakeholders	Description and Role
Elverum Municipality (EM)	- Owner of Elverum Vekst and ETS. - Owner and developer of school and kindergarten in Ydalir; in the future a second sub-field will developed as nursing home for disabled people by the municipality.
Land development agency (ETS)	- Provider of technical infrastructure for Ydalir. - Sale of sites of Ydalir. - Commitment and follow-up on ZEN ambition for Ydalir.
Developers obliged to Masterplan	- 80% of land (9 sub-fields) is or will be owned by developers that have a sale contract with ETS and are obliged to follow the Ydalir masterplan. - While some of the developers are positive towards the ZEN ambition, others are more reluctant. - By late 2021, 6 developers are in place, while 2 sub-fields are still for sale.
Developers not obliged to the Masterplan or sales contracts	- 20% of land (3 sub-fields) is owned by 2 developers who are not obliged to the masterplan. - One of them follows the masterplan on voluntary basis for two sub-fields and the other does not.
Sharing companies	- ETS has signed intention agreements with two providers for sharing solutions. - They offer sharing solutions as for example car sharing or a web-based community application.
Building owners	- Five alternatives of future building owners are foreseen for Ydalir: 1. EM as owner of the school and kindergarten and the planned nursing home, 2. Developers, who keep the ownership of the buildings after completion and rent the appartements out, 3. Housing cooperatives [borettslag], 4. Housing association [sameie], 5. Private owners, often organized in a welfare association.

Regarding the implementation of sharing solutions in Ydalir several relevant steps have been undertaken in the last years. Table 2 gives an overview over relevant occasions in a chronically matter.

Table 2. Milestones to establish sharing solution in Ydalir development.

Time	Milestones	Description
2016-2018	Anchoring sharing as vision for Ydalir	Ydalir Masterplan was developed in a collaborative approach with involvement of relevant stakeholders and facilitated by ETS. The plan contains several relevant areas as urban design, energy and materials use, blue-green infrastructure and sharing solutions to reach for the ZEN ambition and to guarantee qualities of the built environment for its future residents.
2017-ongoing	Sale contracts	Establishing contracts on the sale of construction sites, where the developers are obliged to follow the masterplan and its ambition of sharing as a guiding principle for Ydalir.
2019	Establishing first sharing	The Ydalir school offer room and facilities to share with organizations and inhabitants after school time. ETS has signed an agreement with EM that allows them and

	solution in Ydalir	developers to use this in marketing activities for sale of sites and apartments. In addition, ETS made an intention agreement with a car sharing provider to foster dialogue and planning for mobility sharing in Ydalir.
08.2021	Sharing ideation ws.	One day workshop (ws) in August 2021 with relevant stakeholders to identify appropriate sharing solutions, their implementation and facilitation in the neighbourhood of Ydalir.
2021-ongoing	Definition of operational entity for sharing	ETS works on an agreement to set up the organizational structure and contract for the Ydalir welfare association as steering organization and operational entity for the establishment and facilitation of sharing solutions on neighbourhood level.

The results of the workshop on sharing solutions to establish in Ydalir will be further presented in chapter 3.2 and the facilitation and steering model in chapter 3.3.

3.2. *Sharing solutions for Ydalir*

Four areas of sharing were identified in the one-day workshop by relevant stakeholders: Space and room, mobility, equipment and community activities. Table 3 presents the four areas at a glance before they are described in greater detail for each domain.

Table 3. Sharing solutions identified for Ydalir neighbourhood.

Sharing domain	Examples	Level	Operator
Space and room	School (kitchen, workshop room, etc.)	City and neighbourhood	Elverum Municipality
	Guest apartments, shared kitchen	Apartment block	Building owner
Mobility	Car sharing	Neighbourhood and apartment block	Company
	Bicycle sharing	Apartment block	Company
Equipment	Sports equipment (seldom used)	City and neighbourhood	Elverum Municipality
	Tools, technical equipment	Apartment block	Individual, company and/or building owner
Community	For example arrangements, voluntary work [dugnad]	Neighbourhood and city	Neighbourhood manager and company

Space and room: The participants of the workshop identified different examples of space sharing for Ydalir. These examples ranged from indoor spaces and room as apartments for guests, co-working spaces, gaming room to shared outdoor spaces such as gardens, greenhouses, shelter [gapahuk] and barbeque areas. The school at the centre of Ydalir was completed in 2019 and offers shared indoor spaces such as a kitchen, workshops, sports hall and room for flexible use. Residents of Ydalir will have privileged access to these. The participants discussed the possibility of adding shared outdoor spaces on the schoolground such as greenhouses or gardens. These spaces are and should be accessible to all inhabitants of Elverum. Regarding greenhouses and gardens on the school ground, the participants expressed the necessity of cooperation with voluntary organisations or future residents of Ydalir to operate these areas.

Many of the other identified shared spaces such as shared apartments or co-working spaces were discussed initially to be provided for each apartment building or block. Each developer should provide these shared spaces on an individual basis, while the owner of the buildings will be responsible for the operation of the spaces for its residents. There is a need for a profound design of shared spaces with regard to the flexibility, and accessibility through its location. The accessibility of the spaces is especially important, as the participants discussed that some of the shared indoor spaces could be later made accessible for the whole neighbourhood of Ydalir. The participants discussed the necessity of a booking system, mostly related to the indoor shared spaces. A web-based application was identified as a preferred system, both for the shared spaces of the school and the residential buildings. These two systems should be aligned with each other or preferable be the same.

Mobility: Establishing a car sharing service was already anchored in the Ydalir masterplan and the sale contracts between ETS and the developers. But little was decided so far on how car sharing facilities

as parking spaces will be implemented in the built environment and how the service will be facilitated. The workshop helped to provide more insights in favourable shared mobility solutions and its implementation and operation. The participants identified both car and bicycle sharing as preferred sharing solutions. Car sharing should be provided on neighbourhood level and being available for all residents of Ydalir. That implies that each developer has to provide indoor and/or outdoor parking facilities for shared cars, that are easily accessible for all residents of Ydalir. To gain for the ZEN ambition of Ydalir a respective part of these parking facilities requires charging equipment for electric vehicles. Sharing of electric bikes and "cargobikes" was identified as another shared mobility solution. Bike sharing should be provided on an individual basis per apartment block. Car and bike sharing shall be provided by a private mobility sharing provider and the costs for it will be integrated in rental costs for the apartments or joint expanses for the housing association or cooperative.

Equipment: Regarding the sharing of equipment and goods, the participants discussed mainly tools and sports equipment as favourable goods to share within Ydalir, but saw the possibility that also other goods could be attractive to share between residents as for example washing machines or freezers. Therefore, it was proposed that each developer provide space or shelter to store shared goods. These shared goods could be either owned individually by the residents or the owner of the building. In addition, a web-based app should be implemented to allow direct sharing between residents of Ydalir as well as a booking system for joined owned goods and equipment. A cooperation with a nearby tool-shop was discussed, that could provide a rental service for Ydalir residents. ETS has started to negotiate with the shop owner on this sharing service.

Regarding the sharing of sports equipment, the participants recognized that sports equipment has a specific frequency in usage, as for example ski is a common activity among Norwegians in winter, while canoeing is less familiar and limited to summertime due to weather conditions. Therefore, the participants favoured a collaboration with EM that offer a service called "Fritt Fram" to borrow sports equipment for free for residents of Elverum. One idea discussed is the establishment of a local branch in Ydalir and an intensified collaboration with EM.

Community building: The establishment of a living community in Ydalir was identified as a fourth strand of sharing. That incorporates, for example, peer-to-peer sharing between neighbours, voluntary work but also the facilitation of activities or events that do foster and maintain community building and well-being of Ydalir residents and users. Many of the named sharing solutions here are interrelated to physical established sharing solutions, such as a community garden would need volunteers to maintain it. The participants especially expressed the need of a coordination and facilitation authority to initiate and maintain sharing facilities and activities to build up a well-functioning community in Ydalir. The specific role of a coordinating person, an "ambassador for Ydalir" with an onsite office in Ydalir, was highlighted and indicated in addition to technical solutions as for example neighbourhood applications.

3.3.   Facilitation and steering for sharing solutions – the Ydalir welfare association (YWA)

In the aftermath of the workshop, ETS signed a preliminary intention contract with a sharing provider for mobility services (cars and bikes) and community building (web-based application) to anchor sharing and to provide services for existing and future residents. Additionally, ETS developed a draft for an organizational steering entity to establish and facilitate sharing in Ydalir in collaboration with the developers and EM: the Ydalir welfare association (YWA). This association is planned as an overarching institution in charge to follow up the ambitions for Ydalir in an inclusive way for its residents. The YWA has a steering committee that consists of members from the respective associations or cooperatives for each construction sub-field or apartment block (figure 1).
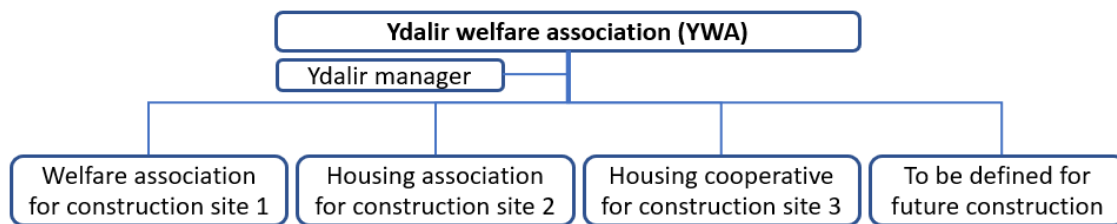
Figure 1. The Ydalir Welfare Association

A main outcome of the workshop is the expressed need for a coordination and facilitation authority and a specific person who will foster the realization of sharing solutions in Ydalir. The property sale contracts between ETS and developers do include already the establishment of a welfare association for Ydalir. So far, the organizational model and tasks for this association were not specified. During the workshop a clearer picture for the YWA and the designation of a person as coordinator for sharing solutions was drawn.

A specific innovation is the establishment of a coordinating position, the Ydalir neighbourhood manager [Ydalirtjener] as a 10% job position under the YWA. The main role of that person is to initiate and facilitate sharing solutions in Ydalir in alignment with the steering committee of the YWA.

The YWA and its Ydalir manager shall provide the following services to the members of the YWA:

- Access to the Community application for community building through for example activities, concerts.
- Access to car sharing services at a cheaper price, as the YWA is covering most of the monthly rent. Car sharing parking spaces will be provided all over Ydalir and be accessible for all residents, as YWA is renting parking spaces from the apartment block owners.
- Facilitation and maintenance of established sharing solutions.
- Organization of events for the residents of Ydalir as for example Christmas tree lightning, summer party.
- Investments in common installations at common areas as for example play structures, outdoor shelter.
- Maintenance of common outdoor areas in Ydalir.

The costs for the membership in the YWA will be covered by the future residents and be a part of the rent or the joint expenses for their respective apartment block association or cooperative.

At the time writing, ETS is negotiating the establishment of the YWA and its specific areas of responsibility with the developers. Some of the developers have already expressed the risk of rising costs for future residents due to the costs for joint sharing solutions. Contradictory, other developers see the chance to offer the apartments at a lower price due to the proposed sharing solutions. For instance, car sharing solutions limit the need for indoor parking space, which is extremely costly for developers. This saving for developers can be transferred to the market price of the residential housing.

3.4. Summary

We sum up the results of the case study in the neighbourhood of Ydalir following the three research questions, presented below.

(1) Firstly, we ask what kind of sharing is appropriate from a citizen perspective?

The findings show that the workshop based on design thinking as methodological approach enabled the participants to ideate and evaluate optional sharing solutions and its facilitation from a citizen-centred perspective. The broad diversity of the participants enabled for a controversial discussion on what should be shared in which way and how that will benefit future residents and the society. Therefore, the workshop results demonstrate a variety of possibilities for sharing as named by [7]: Traditional product service systems as car sharing offered by a company are identified as an appropriate way to offer a broad service to a reasonable price to all residents of Ydalir. On the opposite, for sharing of equipment and tools different solutions from peer-to-peer directly sharing between residents, product

service systems and commonly owned equipment were identified to benefit the residents in the best way.

We therefore see the main contribution of the workshop to make possibilities for sharing from a citizen perspective in Ydalir visible and thereby lay the foundation for stakeholders to make a profound choice to design for sharing.

(2) Secondly, we asked how sharing can be implemented and facilitated in the neighbourhood development?

To implement and facilitate the identified diverse sharing solutions in Ydalir, there is a need for a flexible and adaptive governance model that both orchestrate the diverse stakeholders over time and facilitate sharing solutions on its own. An adaptive governance structure consisting of the YWA and the Ydalir manager was identified as appropriate model to serve the neighbourhood as a whole. While the YWA and the Ydalir manager are permanent structure, they do generate flexible processes with regard to communication, collaboration and agreements between the members of the YWA and other relevant stakeholders.

(3) How can sharing be implemented as a guiding principle in neighbourhood development.

The findings show that the municipality of Elverum has through ETS created a stepwise development of a number of permanent structures such as contracts or agreements that are facilitated and fostered through several processes as workshop and bilateral communication channels (see figure 2). This 'ladder of adaptation' enables for the collective identification, implementation and operation of sharing solutions in Ydalir in the past. The adaptive governance approach has resulted in the establishment of the YWA that will take the lead in planning, designing and partially the operation of sharing solution in Ydalir.
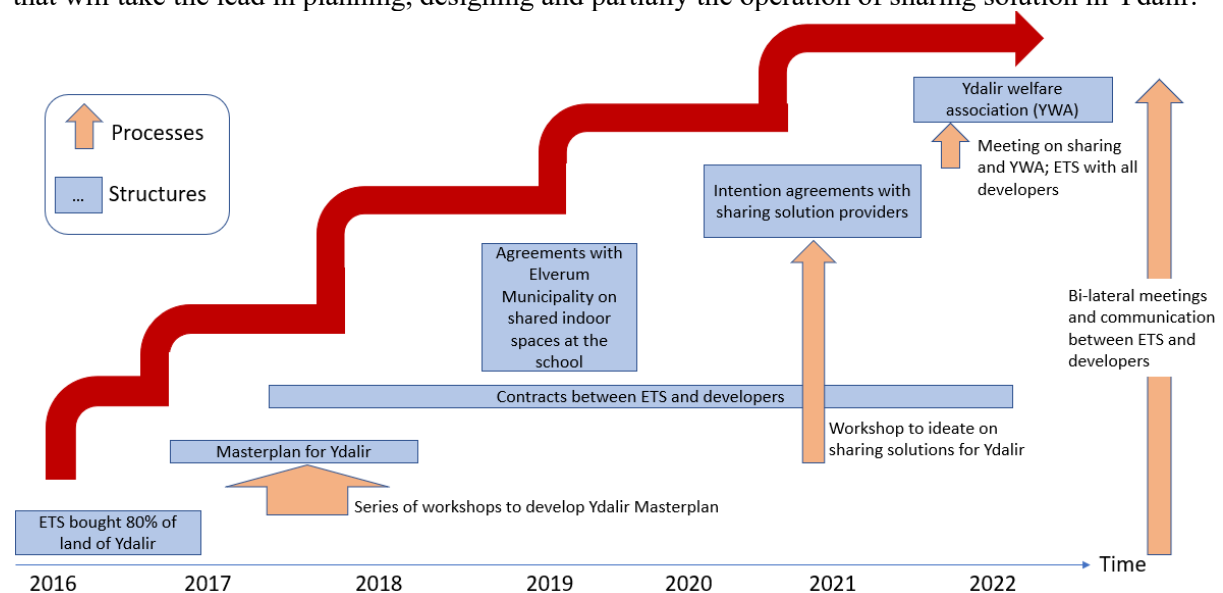

Figure 2. The adaptation ladder as adaptive governance model to establish the sharing neighbourhood of Ydalir

The process can be described as a stepwise ladder, where the establishment of structures which foster sharing as for example the Masterplan or the YWA is based on participative processes, where a broad number of stakeholders are included to co-create and agree on the way forward. As the mindset of developers towards the ambitions of Ydalir is varying, as is their attendance and contribution. ETS played a crucial role in establishing processes as bi-lateral communication and joint workshops to guarantee an alignment among the diverse developers.

4.   Discussion: Sharing in the light of Urban Facility Management

Additionally, the findings show that the neighbourhood of Ydalir is acting to create a living space that will benefit the community but also benefit those outside its community through its cooperation with the municipality. In this way it is viewing itself as part of a wider structure. This is seen when they talk of sharing services not for those within the neighbourhood but also outside and negotiating with the

municipality for sharing of equipment. Mainly all of the identified sharing activities implies Urban FM as this is a role that works between public and private sector to meet community needs and ensures that they are managed properly and actively, the person fulfilling this role was identified as Ydalir manager.

There is no doubt that Ydalir is a complex neighbourhood but by focusing on an approach as service sharing enables an identity for the neighbourhood to evolve, but also importantly consider the wider implication of the neighbourhood with the municipality. The development reflects collaborative and interactive governance underpinned by Urban FM through a multisector response to social value linking to the wider environment beyond one single community [13,14]. The active nature of inclusivity is closing the gap to ensure community values are being integrated into planning. The governance in this neighbourhood is evolving as the services are defined so are the decision makers and the relationship to the neighbourhood and wider area, thus creating the conditions for ordered rule and collective action, or institutions of social coordination [17]. The role of Ydalir manager ensures there is an intermediator present for organization as opposed to tensions emerging between societal groups [17]. This type of local governance between Ydalir manager, neighbourhood, developer, and EM is ensuring a plurality of understanding included in planning and opens up the scope for transformative sustainable neighbourhoods [18]. Within this work, we focus on service but there is more of a contextualized social ecological issue that is not considered [15] ecosystem management for adaptive governance. If we were to develop further, could we consider carbon emissions in the neighbourhood in terms of which services aid in reducing emission comparable to neighbourhoods that do not have these services. Other considerations are profit margins, as the Ydalir manager implies an additional body which implies increased costs for the residents but how are these costs balanced with other influential factors such as market and profit margins for developers and required services from the municipality.

5.   Conclusion

This study analyses how sharing can become a guiding principle for the new planned neighbourhood of Ydalir in Norway. We presented an adaptive governance model (figure 2) that facilitated the collaboration and co-creation between stakeholders and the establishment of permanent structures to enable sharing over the lifetime of the neighbourhood.

As the Ydalir development is still in progress, we cannot evaluate if the proposed ambitions for Ydalir and the impact on sustainability will be reached in the end, but we could identify and analyse an adaptive governance model in a multi-stakeholder setting that enables the establishment of a sharing neighbourhood. The bottom-up process and the focus on social value creation for its citizens opened up for the stakeholders to identify different sharing domains, their implementation and maintenance by the body of the Ydalir Welfare Association. We see this as a fruitful counter approach to top-down approaches of sharing solutions that mainly focus on economic cash back. From our study we draw three specific learnings:

- A bottom-up approach to define sharing domains for neighbourhood development and its facilitation enables to identify a broad multitude of sharing solutions that primarily serve the residents and foster social value creation.
- The land development agency ETS, that is obliged to social value creation and at the same time equipped with private-law tools, has proven to be an effective intermediator to plan and mediate for a sharing neighbourhood.
- The planning for sharing through a 'ladder of adaptation' approach enables for a stepwise anchoring of sharing ambitions and at the same time giving enough room for discussion and co-creation of the involved stakeholders.

We conclude that the 'ladder of adaption' governance approach is applicable to other new planned development, but may come to limitations in existing neighbourhoods as the existing buildings and infrastructures might create limitations. We assume that the structures might be different, but the process might be adaptable. There is a research need for further studies on planning for sharing and beneficiary governance models in existing neighbourhoods.

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