

THESIS FOR THE DEGREE OF LICENTIATE OF ARCHITECTURE

**RESIDENTIAL USABILITY
AND SOCIAL SUSTAINABILITY**

Towards a paradigm shift
within housing design?

Anna Braide Eriksson

Department of Architecture
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 2016

RESIDENTIAL USABILITY AND SOCIAL SUSTAINABILITY

Towards a paradigm shift within housing design?

Anna Braide Eriksson

©Ann Braide Eriksson 2016

Department of Architecture
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone + 46 (0) 31-772 1000

Form Helene Johansson

Chalmers Reproservice
Gothenburg 2016

ABSTRACT

The ongoing demographic transformation poses challenges for the field of residential design. Meanwhile rules and regulations maintain a conventional approach to the subject. The housing market is considering the home as a commercialized lifestyle question, not focusing on the long-term residential resilience of the housing stock. These preconditions imply a misfit between accelerating diversity in articulated consumer preferences and appropriate offers in the housing market. This situation impacts the quality of life in housing, in particular regarding issues of social sustainability.

In order to obtain a sustainable housing stock we need to develop a new focus and new perspectives for the design professions. This study constitutes a part of a larger research and development experimental project, the Positive Footprint Housing project. This licentiate thesis concentrates on the notion of residential usability and how it relates to aspects of social sustainability. It also focuses on how these issues can be incorporated into the practice of residential design.

The mixed methodological approach is based on the combination of studies of residential life situations with non-directed interviews and research by design in master studios. The work adopts a theoretical perspective presented by Schneider and Till and tests the hypothesis of residential usability as a critical precondition for socially sustainable residential processes. Findings from the research show that enhanced usability in residential design represents an important factor in the realisation of a sustainable society. A main result is the elaboration of a model for implementing social sustainability aspects in the design work in order to promote future housing design innovations. Further research intends to address the complexity of residential user participation and accompanying social consequences.

KEYWORDS: residential design, residential usability, flexibility, adaptability, alterability, social sustainability, residential process, user participation, demographic transformation

ACKNOWLEDGEMENTS

This thesis work is a part of the research project Positive Footprint Housing, which focuses on developing long-term sustainable solutions for housing design. Riksbyggen, a large cooperative developer, is the main stakeholder in the project. The others are Johanneberg Science Park, Chalmers University of Technology and Gothenburg University. I wish to thank Riksbyggen for the opportunity to take part in the research project and for funding this thesis. I also wish to thank the Positive Footprint Housing research group for generative and interesting discussions.

For the completion of this thesis, a big thank you to my supervisor, Sten Gromark, my co-supervisor, Björn Andersson, and also to my examiner, Catharina Dyrssen. My colleague Ola Nylander has been a great inspirer for the direction of this work. Colleagues and fellow Phd students in the Department of Architecture at Chalmers University of Technology have also provided support and interesting discussions. Thanks to my former classmate, John Krause, for a substantial language review. Also, last but not least, a big thanks to my family and my sister.

CONTENT

ABSTRACT ... page III

ACKNOWLEDGEMENTS ... page V

1. INTRODUCTION page I

- I. 1 **POSITIVE FOOTPRINT HOUSING** page 2
- I. 2 **RESIDENTIAL DESIGN AND THE MARKET** page 3
- I. 3 **PERSONAL EXPERIENCES** page 4
- I. 4 **AIM AND RESEARCH QUESTIONS** page 5
- I. 5 **FOCUS AND LIMITATIONS** page 6
- I. 6 **STRUCTURE OF THESIS** page 7

2. TWO CORNERSTONES page 9

- 2. 1 **RESIDENTIAL USABILITY AND FLEXIBLE HOUSING** page 9
 - 2. 1. 1 Residential usability – a definition page 10
 - 2. 1. 2 An historical overview page 11
 - 2. 1. 3 User participation page 12
 - 2. 1. 4 Sustainability aspects on micro and macro levels page 13
 - 2. 1. 5 Flexible housing today page 14
 - 2. 1. 6 Literature, research and positioning this thesis page 15
- 2. 2 **DEMOGRAPHIC TRANSFORMATION** page 18
 - 2. 2. 1 Urbanization page 18
 - 2. 2. 2 Household constellations page 19
 - 2. 2. 3 Residential situations – social aspects page 22

3. SOCIAL SUSTAINABILITY page 25

- 3. 1 **THE SOCIAL PILLAR – NOT A TOTAL SUSTAINABILITY PERSPECTIVE** page 25
- 3. 2 **SOCIAL SUSTAINABILITY – A COMPARATIVE NOTION** page 26
- 3. 3 **FOUR DIMENSIONS OF SOCIAL SUSTAINABILITY** page 27

4. METHODOLOGY page 31

- 4. 1 **EMPIRICAL STUDY OF RESIDENTIAL LIFE** page 32
- 4. 2 **EMPIRICAL STUDY OF SOCIAL DIMENSIONS OF RESIDENTIAL SPACE** page 33
 - 4. 2. 1 The Grounded theory method and applications for this work page 33
 - 4. 2. 2 The selection of residential situations page 34
 - 4. 2. 3 The analysis of residential situations page 35
 - 4. 2. 4 Limitations and remarks on the study page 36

4. 3	RESEARCH BY DESIGN, A DESIGN STRATEGY	page 37
4. 4	ETHICAL QUESTIONS	page 38
5.	PLURALISTIC HOUSEHOLDS – A STUDY	page 39
5. 1	RESIDENTIAL SITUATIONS: 1, 2 AND 3	page 39
5. 2	THE PLURALISTIC HOUSEHOLD, SPATIAL REQUESTS AND DIMENSIONS OF SOCIAL SUSTAINABILITY	page 48
5. 2. 1	Residential usability - reflecting feasibility	page 51
6.	RESIDENTIAL DESIGN ENGAGING SPACE AND TIME	page 53
6. 1	THE RESIDENTIAL PROCESS	page 53
6. 2	THE TIME-SPACE MODEL	page 54
6. 2. 1	A model involving residential life	page 55
6. 2. 2	The Time-Space model – Reflections	page 64
7.	THE VIVA PROJECT: REALIZING RESIDENTIAL USABILITY	page 65
7. 1	THE VIVA PROJECT – RESIDENTIAL USABILITY DIMENSIONS	page 66
7. 1. 1	Some strategic goals	page 66
7. 1. 2	The floor plans reflected through the Time-Space model	page 67
7. 2	THE VIVA PROJECT – PRECONDITIONS FOR RESIDENTIAL USABILITY	page 71
7. 3	REFLECTING THE FEASIBILITY OF RESIDENTIAL USABILITY	page 77
8.	RESULTS	page 79
8. 1	KEY RESULTS	page 79
8. 1. 1	Residential usability: reflecting the 4 social sustainability dimensions	page 79
8. 1. 2	The Time-Space model: contemplating a paradigm shift within housing design	page 81
8. 1. 3	The demographic transformation: a precondition for residential design	page 81
8. 2	FUTURE RESEARCH	page 82
9.	REFERENCES	page 85
10.	APPENDIX	page 91
10. 1	INTERVIEW CODING AND ANALYZING SOCIAL DIMENSIONS	page 91
10. 2	THE FLOOR PLANS AND THE CAPACITY OF SPATIAL USE	page 102
10. 2. 1	Analyzing residential usability in the three apartments	page 102

INTRODUCTION

A QUESTION ABOUT USABILITY...

Almost no buildings adapt well. They're designed not to adapt; also budgeted and financed not to, constructed not to, administered not to, maintained not to, regulated and taxed not to, even remodeled not to. But all buildings (except monuments) adapt anyway, however poorly, because the usages in and around them are changing constantly. (Brand 1994: 2)

This licentiate thesis began with two surveys I conducted of residential practice in 2008 and 2009. These resulted in my extended interest in the residential quality of the home and the usability of residential space. My own experiences from years as a practicing architect have also meant an increasing interest in housing design and spatial qualities. This thesis assembles some of the questions raised during the surveys with reflections from my practicing years.

This thesis work is a part of the research project *Positive Footprint Housing*, which focuses on developing long-term sustainable solutions for housing design. The project will enable some theories from this thesis work to be tested in a full-scale environment through the realisation of a housing block, the Viva condominium. My involvement in the Positive Footprint Housing project has provided an opportunity for me to further explore and develop my questions about residential usability and the residential qualities of the home, and to apply the theories in practice. I see this exchange between research and practice as a substantial process for the field of architecture.

The ongoing demographic transformation, the preconditions of the housing market, and the standardised and set presumptions for residential design together form the background for this work. The outcomes from these conditions raise the question of how sustainable the current residential design is in terms of some vital social aspects. From a micro perspective, how does the residential design affect the everyday life in the home for different types of households during different times in life, when considering social aspects such as life quality, recreation, safety and self-realization? And from a macro perspective, how can the housing stock respond to social sustainability aspects for diverse households for the unknown future? Does the

current view of the residential design embrace a sustainable approach when reflecting these micro and macro perspectives? The answer to this question may imply the need for a new focus for the design task.

1.1 POSITIVE FOOTPRINT HOUSING

The Positive Footprint Housing project started in 2012 and is a collaboration between academia and industry. Riksbyggen, a large cooperative developer, is the main stakeholder in the project. The others are Johanneberg Science Park, Chalmers University of Technology and Gothenburg University. The intention behind the project is to generate usable knowledge of sustainable housing design at the international leading edge of innovation, supporting a joint transdisciplinary knowledge project between academia and industry. In this research work the realization of a housing block, the Viva condominium development, constitutes a full-scale laboratory for implementing sustainable housing ideas developed during the research.

The mission for this thesis as part of the Positive Footprint Housing project has been to develop questions related to residential usability and aspects of social sustainability. This work has been performed through research by design in master studios, where the studio work has constituted a hub for the research questions. The result from the studio work submits relevant designs on questions dealing with aspects of social sustainability. These design qualities have been discussed in the Positive Footprint Housing research group and will potentially also be implemented in the design work with the Viva housing block. Results from the studio work have been assembled in two reports (Braide Eriksson 2012; 2013) The implementation of the studio results in the Viva development has enabled the discussion of residential design and aspects of social sustainability and the validity these issues can have in a real housing development situation. This has opened up for a reflection on how the ideas that have emerged from work on this thesis might be implemented in practice.¹

This licentiate thesis has been developed as part of the comprehensive Positive Footprint Housing research project, but also as a freestanding work, in order to frame my research questions within the larger project and delve deeper into how residential design relates to aspects of social sustainability.

¹ See Chapter 6, p 53.

1.2 RESIDENTIAL DESIGN AND THE MARKET

According to Schneider and Till, the ongoing demographic changes constitute a substantial precondition for the design of residential space as it reflects the structure of households (2007: 37). This calls into question current residential design practice. In Sweden, housing design was oriented towards the nuclear family from the Second World War until the 1980s (Eriksson 2007: 1–2). This orientation is still to some extent present in the current housing standards, and affects residential design today. The discrepancies between the household sizes and constellations and increasing cultural diversity on one hand and the unchanged principles underlying housing design on the other implies a mismatch between households' preferences and housing designs. How well are the housing stock and our contemporary homes adapted to the ongoing demographic transformation?

Residential design is also affected and defined by the Swedish housing market. The market is ruled by the belief that housing forms are a commercialized lifestyle question. Schneider and Till describe that housing is seen as a part of a commodified lifestyle in which developers provide residents with equipment elements as kitchens and bathrooms (2007: 37). This means that long-term considerations such as future adaptability are almost completely lost.

Duelund, Mortensen and Welling (2004: 4) describes the residence on the housing market as a product that is to be marketed – like automobile design. They also stress that a small group wealthy of households define the supply of housing since they represent the demands. They claim that social aspects are not taken into proper consideration as an effect of this market situation.

According to a thesis by Bendik Manum, the typical recently produced apartment is suited primarily for young couples, singles, and older couples downsizing from single-family homes (2006: 183). Manum describes a Norwegian context, but in Sweden new apartments are also oriented towards a smaller group of specific households. This situation means that the housing market dictates many of the fundamental decisions that go into residential design, while leaving out a large portion of our households.

This in turn implies that households that lack the means to own their own homes are relegated to the remaining rental housing stock. For them the established housing shortage can make it difficult to find somewhere to live. It is not common to have much choice of neighbourhood, size, room configuration or standard. Social networks, safety, schools and day care constitute a preferred every day continuity and can be regarded as crucial to

many people. These issues, related to qualitative social dimensions, can be difficult to maintain under the circumstances.

To conclude, the effects of the market's orientation results in a narrow focus on what qualitative residential design can be and on providing housing for a limited group, while excluding a large number of households from the market. These households can have difficulties finding an apartment that provides a proper residential space to meet their needs. This in turn can also mean that social aspects of residing such as safety, life quality, continuity and belonging can be questioned.

1.3 PERSONAL EXPERIENCES

My own practice as an architect also constitutes a major condition for this thesis work. I worked as an architect for fourteen years (1997–2011). That work included a variety of project building types but focused on housing. This has provided insight into major factors that influence contemporary residential design work. Some of these factors, from my perspective, result in diminishing possibilities for developing a qualitative design. For example, Swedish housing standards and regulations have a large impact on the design of floor plans. The standards do deliver the requested qualities, but unpredicted outcomes also occur. The standards affect the sizes of rooms and presuppose the nuclear family as the standardized household (for apartments larger than one-bedroom units). In most floor plans, all of the available space has been clearly defined by the architect for one functional use or another. This means that other aspects on usability are not addressed. The focus on the nuclear family also preconceives a standardized use of the dwelling, where room sizes and room configurations are fixed (a large master bedroom, a smaller children's bedroom, and a living room). Together with the economic conditions, that strive to cut costs and minimize the size of the dwelling, designing anything other than the types and sizes framed in the housing standards becomes difficult.

During 2008 and 2010 I performed two surveys of residential practice together with my colleague, Ola Nylander (Nylander and Braide Eriksson 2009; 2011). These surveys sparked my interest in the connections between residential space, living situations and household types. One of these residential situations in many ways provided the point of departure for this thesis. The household had chosen a rare residential solution: by using space in a flexible way they could solve their preferred way of living. The case initiated a series

of interesting questions concerning the relevance of residential usability and correlations to social aspects involved. This eventually formed the questions about residential usability and social sustainability for this work. The case described constitutes one of the living situations in the survey, and is presented in Chapter 5.²

1.4 AIM AND RESEARCH QUESTIONS

When considering the presented background for this work, the belief is that the perspective on social sustainability issues as a precondition for the design of residential floor plans today is hugely delimited. The objective is therefore to emphasise the social sustainability dimension as a critical aspect for design practice, and to introduce possible entries into the subject of residential design and social sustainability for stakeholders within the housing development field. The work is aimed at people who work with planning, construction and design in the housing sector, and more specifically at developers, architects and other stakeholders within the housing field.

The aim for this thesis is to develop knowledge on how residential design relates to social sustainability and to find a working model for promoting social sustainability aspects within design practice. In the thesis work the usability of residential space, *residential usability*, is discussed as a critical factor promoting qualitative social aspects. The work relates to viewpoints presented by Schneider and Till, arguing that spatial flexibility and adaptability in the home provides solutions for shifting residential needs, which can promote social sustainability aspects involved in the residential process (2007, 41). The notion of residential process concerns the shifting phases of life a household goes through, its members growing in number or contracting. The notion of residential usability constitutes a central concept in this thesis, and the proposed definition is found in Chapter 2.³

The main research question is: *How can the design of apartments contribute to improved social sustainability in housing conditions?* To investigate this, both a theoretical and a practice-based perspective are used. From the theoretical perspective, the issues of correlations between residential usability and social dimensions need to be penetrated. A starting point is to understand how the layout of conventional residential floor plans corresponds with requests and needs for residential space today, and how this can effect

² See Chapter 5, p 39.

³ See Chapter 2, p 10.

social aspects. This leads to a second question: *How does the practiced layout of residential floor plan correspond with today's residential requests and needs?* The residential usability of a home is evaluated as a factor promoting social sustainability aspects for the household in a residential situation. And that leads to a third question: *How can residential usability correspond to residential requests and needs, and affect social sustainability dimensions?*

The practice-based perspective studies the prospects for involving the social sustainability dimension as a quality in the design work with residential floor plans, leading to the fourth question for the thesis: *How can social sustainability aspects become a salient component in the work with residential floor plan design?*

1.5 FOCUS AND LIMITATIONS

This thesis relates to the situation of ongoing urbanization⁴, concentrating on units in multi-family housing in an urban environment in a Swedish context. The terms *residence*, *home* and *dwelling* represents apartments in multi-family housing.

Traditional residential patterns in Sweden constitute the point of departure for this work. Focus is on the conventional use of space as rooms, and the function of rooms in the home. In this context, furniture and pre-conditions for the furnishing constitute a decisive factor for the usability of space. This approach can be seen as a generalization of space in the residence but also as relating to our residential heritage and past experiences of space. Thus space defined in other ways, as well as individual preferences concerning space in the home, is not addressed.

The study relates to Swedish housing conditions and current standards for housing. This means that the performed study departs from these requirements when evaluating the possible spatial solutions for the residential situation.

4 See Chapter 2, p 19, Figure 2.1.

1.6 STRUCTURE OF THESIS

The structure of this thesis is conventional. Chapter 1 explains the background for the study and presents issues of departure for the work, the frames, the objective and the research questions. Chapter 2 presents the two cornerstones for the research, residential usability and the demographic transformation. Chapter 3 presents the point of departure for aspects of social sustainability. Chapter 4 presents the methodology. Chapter 5 presents the empirical study of social dimensions of residential space. Chapter 6 presents work with research by design in master studios. Chapter 7 reflects upon factors for realization of residential usability within the Viva housing development. Chapter 8 compiles the results and reflects upon further research work. An appendix provides the working material with analyses drawn from the empirical study of the social dimensions of residential space.

2. TWO CORNERSTONES

Demographic transformation and the residential usability are considered as two cornerstones for the discussion in this work. The second demographic transformation now taking place worldwide implies urbanization, changed household structures, an elderly population and a mix of more diverse household constellations and diverse cultures.⁵ The transformation constitutes a substantial precondition for the design of residential space as it reflects the structure of households according to Schneider and Till (2007: 37). They assert that residential usability (flexible housing) can provide a better frame for the shifting residential needs, and thus encounter social aspects involved in the residential process (2007, 35–37). The notion of residential usability in this work relates to an apartment's room sizes and spatial usability and transformability, and therefore also to the field of flexible housing, a wide knowledge field within architecture.

2.1 RESIDENTIAL USABILITY AND FLEXIBLE HOUSING

One cornerstone for this work is residential usability. The notion relates to flexible housing, a subject that deals with the usability of physical space in dwellings. The term flexible housing distinguishes a broad knowledge field with a strong relation to the architecture field from the 1920s to the present. The knowledge field is currently developing, and the flexibility-facility is constantly applied in architectural design to a varying extent, though this can't be seen as belonging to the average conventional design. The book *Flexible Housing* by Schneider and Till (2007) presents a comprehensive view of the subject and constitutes a starting point for this work. Critical objectives from the book are presented below and the social and sustainability aspects of

5 The demographic transformation is happening now and is a global phenomenon, but is not happening uniformly around the world. Main factor of this transformation is a process of declining mortality and fertility, which means that the population is growing. The process implies two fundamental changes in the population composition: from rural to urban and from younger to older. These demographic processes are related to each other and always appear in the same order: mortality decline-population growth-fertility decline-urbanization-aging population. These five processes usually develop over a long time, which means that their wider effects are not always detected (Dyson 2012: 3–4).

flexible housing are examined together with an historical overview of the flexible housing field and a summation of the literature and research field.

2. 1. 1 *Residential usability – a definition*

My experience in working on this thesis has been that the term *flexibility* is burdened with preconceptions. Many times the term appears to be understood as expensive extra equipment, or a technically complicated and expensive solution, or an experiment not really embraced by the resident. This preconception can occasionally mean that the discussion of the subject becomes undeservedly polarised, which can lead to difficulties in understanding. Therefore, for this work, the notion of usability has been regarded as a more neutral notion, and the work focuses on usability as it applies to residential space.

The notion of residential usability in this work relates to Schneider and Till's (2007) approach to the subject of flexible housing. They consider the dwelling's capacity to deal with volatility, with changing needs in an ongoing residential process, as crucial to the residential design task. They assert that:

Housing has to be flexible enough to deal with two conditions. The first is the need to adapt to the changing needs for individuals as they grow old or less physically able. The second is housing that can respond to the changing constitution of a family as it grows and then contracts. (Flexible Housing, 2007: 41)

In this thesis, the residential usability of rooms and room configurations in the dwelling are regarded as the critical design variables enhancing the volatility of dwelling. This relates to Schneider and Till's explication of the subject and how they describe flexible housing as "... /housing that can respond to the volatility of dwelling. It does this by being *adaptable* or *flexible* or both" (Flexible Housing, 2007: 5). Adaptability can, according to Schneider and Till, be achieved through rooms or units that can be used in a variety of ways; flexibility can be achieved by altering the physical fabric of the building (2007: 5).

To summarize, residential usability means residential space that can enhance the volatility of dwelling, meaning its ability to adapt to changing residential needs over the course of the resident's lives. The incentives for the changed residential needs in this definition are the residential process and the demographic transformation. The degree of residential usability is determined by the flexibility and adaptability of rooms and room configura-

rations in the dwelling. This means that the residential usability and flexible housing can be regarded as similar in their definitions.

2. 1. 2 *An historical overview*

In the history of flexible housing there are three key drivers that have influenced the development of housing. The first one came in the 1920s as a response to the needs for mass housing and provided small, efficient apartments as a part of European social housing programs. The second started in the 1930s and was a belief that prefabrication and technical solutions were the answer to mass housing production. This direction of flexible solutions is still a part of today's housing market. The third key driver was a user involvement movement in the 1960s. The renewed interest in flexible housing was due to its capacity of providing user participation (see 2.1.4), with the ideal that homeowners should be afforded freedom in ways of residing (Schneider and Till 2007: 15). The user participation movement embraced a social perspective on the housing issue, focusing on the resident's needs and comfort.

In Sweden, both the second and third drivers for flexible housing have left marks on the housing stock. Västra Orminge in Stockholm, by Curman Architects (1970), is a flexible housing development of the prefabrication era. In Gothenburg, Däckshuset in Kallebäck by architect Erik Friberger (1960) and Experimenthuset in Järnbrott by architects William-Olsson (father and son) (1953) represent both the prefabrication movement and the belief in user participation.

In more recent times, flexible housing is rare, but there are some interesting examples. Many of these have the user participation idea as a focus. The Dutch tradition of flexible housing is evident. For example they have had a number of flexible housing projects in the Java and Borneo neighbourhoods of Amsterdam during the 1990s where the traditional canal house constituted one idea for the urban design. The canal house is considered as a flexible unit that can house either a family, a company or a community. There are also contemporary projects focusing on social aspects and flexible housing, using the user participation idea as an agent for identification and engagement in one's own home and for providing adaptable space. The French architects Lacaton and Vassal work with raw space in housing projects, combining large living areas with rational materials and construction methods to cut costs. The flexible factor they claim is the large space for living (Gromark 2007: 26–27). In Iquique, Chile, Elemental Architects have worked with social sustainability, designing a new housing area for a whole neighbour-

hood in the Quinta Monroy development (2004). Here they have worked with user participation as a precondition. The Tila housing development by Talli Oy Architects in Helsinki, Finland (2011) is another recently produced flexible housing project providing raw space⁶ with user participation.

2. 1. 3 *User participation*

The Netherlands has a designated position in the history of flexible housing and user participation in particular. As early as the 1930s many architects in the Netherlands studied residential habits and involved the living process as a precondition for residential design. They targeted housing for the poor and the aim was to minimise the amount of residential space needed. The idea of user participation was tied to the idea of providing the user with changeable space to achieve as small apartments as possible (Eldonk and Fassbinder 1990: 31–33).

In the 1960s the focus of user participation took a new direction. The new turn was a reaction to the era of mass-produced social housing (known in Sweden as the Million Program). Architects in the Netherlands protested against ‘mass-housing’. In their opinion such housing could not supply possibilities for adaptation to the users’ needs. As a result the user participation issue also became focused on the social qualities and not only on the practical use of physical space. Habraken, a Dutch architect, claimed that the resident had to be re-introduced as an actor into the building process to restore the natural relation between the user and the dwelling (Eldonk and Fassbinder 1990: 53). In his famous book *Supports* (2011(1961)(1972)), Habraken stresses the issues of both user participation and how to solve a flexible housing design.

Schneider and Till (2007) describe how flexible housing makes user participation possible in three ways. The first is to let the resident customise the dwelling before completion, providing a degree of choice over the future home. The second is the possibility to adapt designs prior to occupation. This can mean involving future tenants in determining the spatial capacity of the units and can also impact the mix of units types. The third way is post-completion, when the resident can make adjustments on their own terms (2007: 47).

6 Raw space: Shell space in a building that has not yet been developed.

2. 1. 4 Sustainability aspects on micro and macro levels

Schneider and Till (2007) offer a perspective on the sustainability aspects of flexible housing that spans between a macro and micro level. They consider the overall sustainability issue the provision of adaptable space for uncertainty, the response to demographics and social needs, and the enabling of technical progress. The housing stock needs to be seen as a vital asset, and demands a long-term perspective on sustainability (2007: 35–37).

For social sustainability issues, the focus is on responding to demographic changes and residents' changing needs. On a macro level, regarded from a societal viewpoint, flexible housing can offer a response to demographic changes. It provides a long-term quality by providing changeability for the uncertainty of future demands. This turns the housing stock into an enduring usable asset for future generations. On a micro level it can respond to changed living conditions for the resident. In Schneider and Till's (2007) view the dwelling should be able to respond to the changing spatial needs encountered by a household over time. They claim that the capacity to adapt to cyclical changes implies that flexible housing not will become obsolete, while a fixed design will demand more resources to adapt to future needs. Thus they consider the living process to be a substantial precondition for the residential design. They see the ability to stay in the same dwelling and not have to move as a precondition for stable communities. This in turn sustains many qualitative social aspects within the community. Economic and environmental sustainability is supported in the minor needs for refurbishment for future unknown demands (2007: 35–50).

A recent example of a refurbished housing project in the Tensta neighbourhood of Stockholm provides an example of Schneider and Till's long-term sustainability perspective on flexible housing. A Stockholm municipal housing company owns and manages the development, which consists of leasehold flats. The reconstruction has been performed by the architect Erik Stenberg. Tensta was constructed between 1966 and 1972, during the Million Program era. The development represents a type of flexible housing built in the second era of the flexible housing progress, constructed to allow alterations. Over the years that flexibility has not been exploited, the knowledge of this amenity has been lost.

In the housing area there has been a shift from small households to large, and today there are many large, low-income migrant households that live in overcrowded conditions. The growing diversity of cultures also means a greater variety of residential needs (Stenberg 2012b: 90). In the refurbishment the adaptable building system has made it possible to shift the sizes and the configuration of the apartments. The apartments have been altered to adjust to changed residential requests fifty years after completion. The small apartments have grown through incorporating space from adjacent apartments, and room sizes and configurations have been altered. The originally intended flexibility has been exploited and residential space has been adapted to the residents' needs. To refurbish these apartments is a less expensive project than building new apartments. This results in dwellings that are affordable for more households. The scope of the targeted refurbishment was limited to households already established in the area, so that these households can afford to stay here in a larger dwelling, and social aspects as continuity, safety and social cohesion can be maintained.

2. 1. 5 Flexible housing today

To the question of why flexible floor plans are not more widespread in housing design today there is no simple answer. Schneider and Till (2007) highlight many of the advantages with flexible housing, and also mention a few that can speak for why it has not been employed to a larger extent. They suggest that the housing market and the developer deliberately build inflexible housing to sustain the need for moving to another residence. This would then provide the market with a permanent state of demand. Another important factor for flexible housing they contend, is the complexity of spatial customisation. If the systems employed for changing space are too complex and not user-friendly, the space will not be altered and gradually the flexibility will be left unemployed.

There have been studies of realised flexible housing projects to know more about in what way and how frequently the flexibility is used. Many of these show that the use of flexibility decreases over time after the first residents has become established. In this context the complexity of the flexible facility has a large impact together with the residential demands for space.

The report *Experimenthuset i Järnbrott, Erfarenheter från ett hus med flyttbara väggar* (Andersson, Jonasson and Olsson, 1988), is a study conducted thirty years after the completion of a flexible experimental housing development in the Järnbrott neighbourhood of Gothenburg to explore how

the implemented flexibility is utilized after a longer time span. The development was the result of an architecture competition in the 1950s won by the architects William-Olsson (father and son). The design idea is a free-span floor structure, with bathroom and kitchen permanently positioned and flexible wall panels that can be arranged in multiple but specific positions. In the report the authors claim that the usage of flexibility has decreased during the years after completion. The flexible wall panels are complicated to use. They are heavy to lift and they also result in a special and characteristic appearance as mounted walls. Together with the fact that the households with children have decreased over the years, so the changing needs of growing families play a lesser role, leading to less utilization of the potential flexibility (1988: 50–52, 62). In all, the authors identify three critical issues affecting the usage of the flexible wall panels: the residents' spatial needs and knowledge of the flexible system, how easy (or difficult) it is to handle the wall panels, and also how well the property manager informs about and supports the wall panel system.

The two spatial qualities used in this work, adaptable space and flexible space, can be regarded as representing in turn an easier and one more complex form of residential usability. The adaptable dwelling (one that can be used in a variety of ways without making physical alterations) is more obvious and easy to use. The flexible dwelling (one that can be achieved by altering the physical fabric of the dwelling) can require several different operations to modify. This can mean that the flexibility is rarely used and eventually abandoned. Still, both qualities are regarded as possible strategies to gain residential usability.

2. 1. 6 Literature, research and positioning this thesis

In literature, flexible housing is often presented as a solution to both technical issues and social aspects, and also highlighted as a design factor that provides sustainability. The technical perspective often involves a strategic separation of technical equipment from the space for living, along with the possibility of changing or adapting the built structure to provide a suitable residential space or to minimise the size of a dwelling with 'smart' flexible solutions. The social aspects from literature embrace the empowerment of the resident. Their ability to make adjustments to suit their own needs and preferences can provide a sense of control over their residential situation and consequently become a force for identification with the home. Social inclusion, safety and community attachment are regarded as social aspects constituting a possible outcome of the user empowerment.

One example of literature that emphasizes the technical issues is the book *Frame and Generic Space* by Bernard Leupen (2006). He presents a method for working with flexible space separating the frame from the content, thus making the content flexible. Another example focusing on the technical issues but also on the demographic transformation is *Fundamentals of sustainable Dwelling* by Avi Friedman (2002). He examines 'flexible and growing homes' in which flexibility is a response to the changing constitution of a family as it grows and then contracts.

Among the literature focusing on the social aspects, a central book is the earlier mentioned *Supports* (Habraken 2011(1961)(1972)). Another example is *Housing Without Houses* (Hamdi 1990), a book presenting different methods for housing design and focusing on poor countries. Flexible housing and user participation constitute central concepts in this book. User participation is seen as an enabling factor focusing on participatory planning in communities. Here the design is not regarded as the result of the process but as the means to it.

Overall, conventional research on the subject of flexible housing is not common. Instead there is literature covering different aspects of the subject as presented above. Some of these works, however, can be regarded as a research on spatial design or configuration, aiming towards a method for working with flexible space (Brand 1994; Leupen 2006).

Some of the realised flexible housing projects can also be considered full-scale research laboratories for testing ideas of technical solutions, spatial use and user participation. For example, the previously mentioned Quinta Monroy development in Iquique, Chile, by the Elemental Architects. They have been working with social sustainability and user participation as a precondition for the project.⁷

Research projects with a similar focus as this thesis work are rare. Existing research project that come closest is Duelund Mortensen, Welling, Livö and Wiell Nordberg (2006).

7 The social housing project manages the needs for new residences for an existing village of 100 families. The whole village, Quinta Monroy, is to be moved to Iquique and still remain a coherent community. The importance of the dwelling as an asset increasing in value and thus stabilizing an economy for the resident is a stressed quality in the project. If subsidies can add value over time, it could mean the key turning point to leave poverty. Accompanying outcomes are the user participation and the community cohesiveness. The user participation can be seen as the factor increasing the dwellings economical value over time, encountering poverty and promoting economic security. The user participation also becomes a factor that can affect social values as identity and social cohesion (Andersson 2011).

They are researchers who focus on housing. They have in published articles debated housing qualities in an urban context (Duelund Mortensen and Welling 2004; Duelund Mortensen, Welling and Livö 2005). They also emphasize the flexibility and changeability of the dwelling as a major quality for residential design. In the article ‘Situations of Dwelling – Dwelling Suiting Situations’, they present a research project in which they study how dwellings with open floor plan design can respond to changing family patterns. They analyse real living situations and the household’s spatial usage through floor plan layouts. Their aim is to develop concepts and models that are applicable in new projects. They identify time as an important factor for dwelling. The outcome of their study is three conditions for spatial use, each connected to different measurements of time in the dwelling.⁸ They claim that these can be applicable to both the home and the urban fabric to understand meaning and value in architecture. Correlating factors from their work to this thesis work include the emphasis on residential flexibility, the relation to aspects of time, and the methods for analysing residential use through real living situations and residential floor plan layouts. A missing factor in relation to this work is a strong focus on social aspects.

To summarize my review of existing research, I found no research with the same specific focus as my thesis. The question of how residential design relates to aspects of social sustainability must therefore be regarded as an identified gap in the research field. This work’s connection to the research project Positive Footprint Housing and the realization of the Viva development also provides a unique future profile for this work, as Viva constitutes a challenging and unique opportunity to follow up on how residential design relates to social sustainability. Once the housing is occupied and the residents have settled, the qualities of the spatial design can be evaluated from a social sustainability perspective and the actual outcome can be compared to the original intentions of the design. This can make it possible to build a more comprehensive knowledge base for the subject.

8 The levels for time are correlated to the use of the dwelling. The levels are, static condition: permanence, suitable condition: shorter life time, and situational condition: momentary (2006: 55).

2.2 DEMOGRAPHIC TRANSFORMATION

The ongoing demographic transformation constitutes the other cornerstone for this work. In parts of Europe that transformation has led to a shift from uniform to *pluralistic households* and the increasing importance of childless households. These pluralistic households include, for example, singles, childless couples, unrelated others sharing a flat, single-parent households, and parents with shared custody.⁹ These household forms cannot be seen as new, but they differ from earlier periods in terms of quantity, societal significance and social acceptance (Haase, Kabisch and Grossmann 2011: 53–54). These are sometimes described as non-traditional households; the term pluralistic households will be used in this work. This group of households is large and continually increasing in Sweden today, and therefore constitutes a focus for this thesis.

In Sweden, as in other parts of Europe, these demographic changes also include increasing urbanisation. There is a shift towards a larger group of small households, and the nuclear family has taken on new formations, with cohabitation and single households becoming more common (Figure 2.2, 2.3, 2.4). Today single and two-person households constitute 70% of all households. Other effects of the demographic transformation are an increasingly elderly population and an increase in migration (Figures 2.8). Reflecting the changes in residential need and residential use in Sweden through the emerging household configurations, cultural identity and the age of the population presents a map of diverse residential needs. The changes are presented below in diagrams and text. These emphasize the potential social aspects for the households, such as lack of living space, affordability/limited economy, and consequences of the housing shortage. The data presented here provides a background for the discussion that follows.

2.2.1 Urbanization

The increasing urbanisation can mean that the apartment as dwelling type will become more common, and become the standard for city dwelling. In Sweden today 60,3% of the households in metropolitan regions and their surrounding suburbs already live in multi-family apartment buildings. Urbanisation calls for the production of city dwellings (apartments) that can meet the increasingly diverse housing needs generated by the demographic transformation. This emerging need is the reason for this thesis's focus on apartments.

9 Unrelated others sharing a flat can also be described as a housing cooperative.

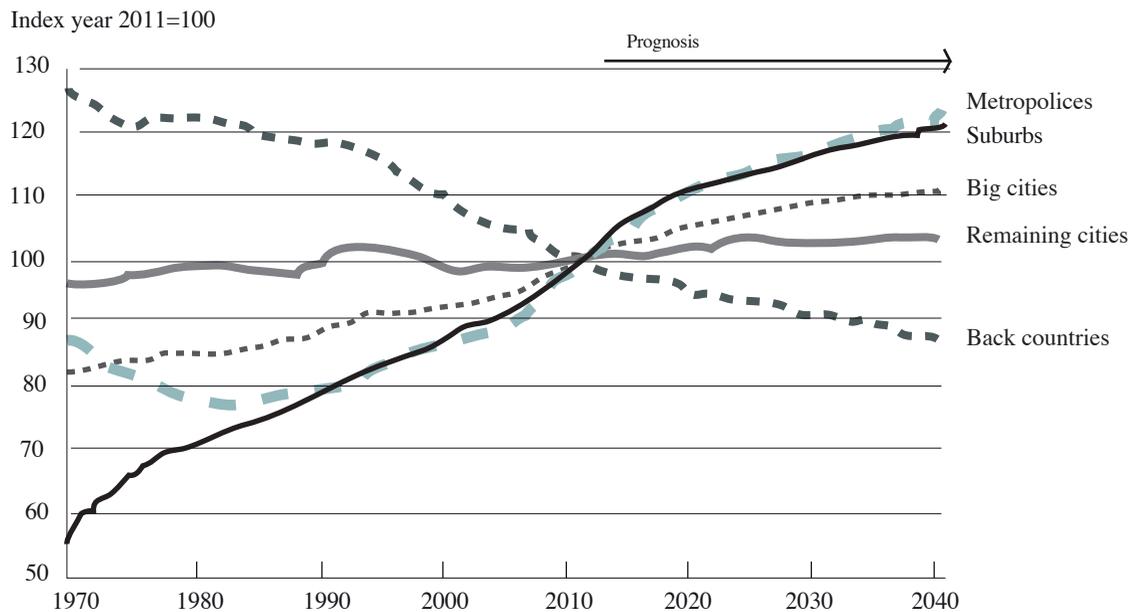


FIGURE 2.1: Development of population 1970-2011 and prognosis until 2040 for different municipality types. Statistics from article SCB (Karlsson 2012)

2. 2. 2 Household constellations

The sizes of the households in Sweden have been decreasing for many years (Figure 2.2). The nuclear family household represents 22,2% of all households today, and the group is decreasing (Figure 2.3). Still, the housing standards used today prescribe this household type as the model for the residential floor plan design. Meanwhile the number of pluralistic households is increasing (single, collective, single parent, cohabiting without children, and remaining households). This large group is heterogeneous, including for example elderly, young people, and single-parent households. Some examples are discussed to illuminate the diverse residential needs and requests.

YEAR	1991	1995	2000	2005	2010	2013
People/household	2,05	2,02	2,01	2,00	1,96	1,97

FIGURE 2.2: People/Household 1991–2013. Statistics from SCB (SCB 2015-b)

Small households constitute the main group among the pluralistic households. Among these there are households that can be economically vulnerable, such as the single-parent household or the migrant household, but the small household can also consist of one or two full-time workers with good incomes who desire a larger and more expensive dwelling. The small households thereby represent a huge range of different life situations.

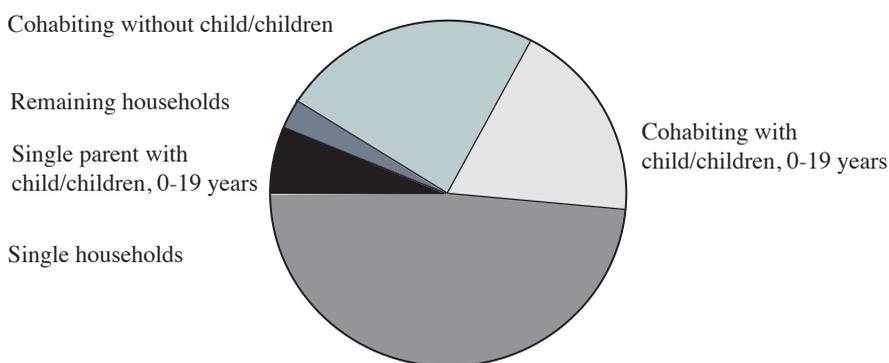


FIGURE 2.3: Quantum of households related to household construction 2014
 Statistics from SCB (SCB 2015-b)

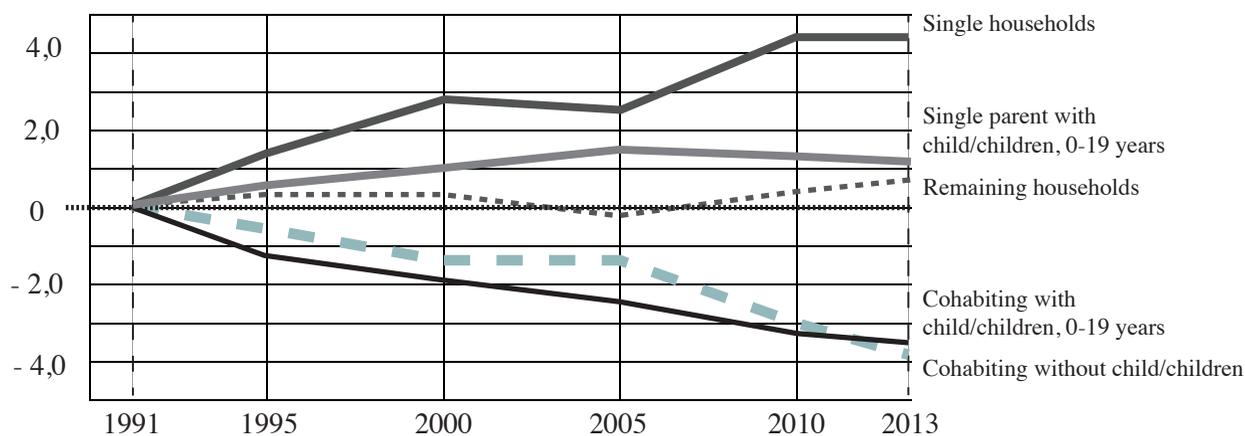


FIGURE 2.4: Changes in household configuration (%), 1991-2013
 Statistics from SCB (SCB 2015-b)

Among the small households the single household is the most common and the fastest growing type (Figures 2.3 and 2.4). A large portion of single households are elderly (Figure 2.5). This group can mean new requirements for housing, as the potential need for home healthcare is considered a present and future reality (Malmqvist 2012: 107–119). In this context, spatial usability and availability can constitute important factors in the dwelling situation. Young people also represent a large portion of the single household group. Among these the housing shortage results in a larger state of flux concerning residing patterns. Young people tend to rely on temporary solutions to resolve their residential situation, and reside in household constellations that change periodically. This can mean a variety of different needs and uses for residential space.

Today there is also a trend towards looking for other alternatives to living alone, both among elderly households and young people. As a result the cooperative, another form of pluralistic household, is becoming more common as a residential alternative. This household can, for example, comprise young people sharing a flat or older people seeking social interaction and community (Bynert 2008; Hindersson 2014; Lund 2013; Nandorf 2013). Cooperative living can also mean spatial requirements other than what is provided in many apartments, such as requests for a larger quality of spatial integrity and a more generalized floor plan layout.¹⁰

To summarise, the majority of pluralistic households is heterogeneous, and have many diverse requests, needs and preferences for residential space. A residential usability countering these diverse requests would need to provide a broad spectrum of ways of residing.

10 Spatial integrity in the home can for example be provided by ‘the neutral hall’ (Nylander 2007: 93). Generalized floor plan layout means a configuration of general rooms that offers diverse residential usability (Nylander 2007: 85–90).

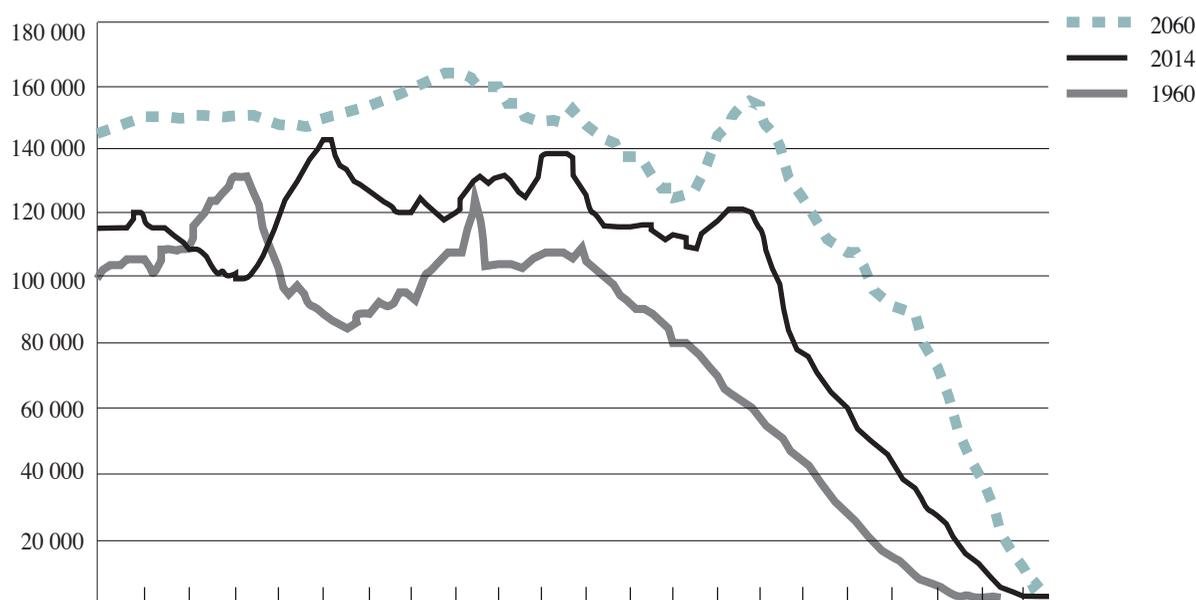


FIGURE 2.5: Age structure of population 1960 and 1914, and prognosis 2060 (number of people). Statistics from SCB (SCB 2015-c)

2. 2. 3 Residential situations – social aspects

Some groups are more vulnerable to the present situation with a housing shortage, high housing costs, and a narrow spectrum of design in the supply of apartments. One example is migrant households, a group that is growing with the ongoing demographic transformation (Figure 2.8). The increasing cultural diversity that comes with migration can place a broader variety of demands on residential space. One example of this is generational living and larger families (Stenberg 2012-a, 2012-b). Lack of living space is also more common in these households (Figure 2.7). In 2013, 36% of migrant households had overcrowded living conditions.

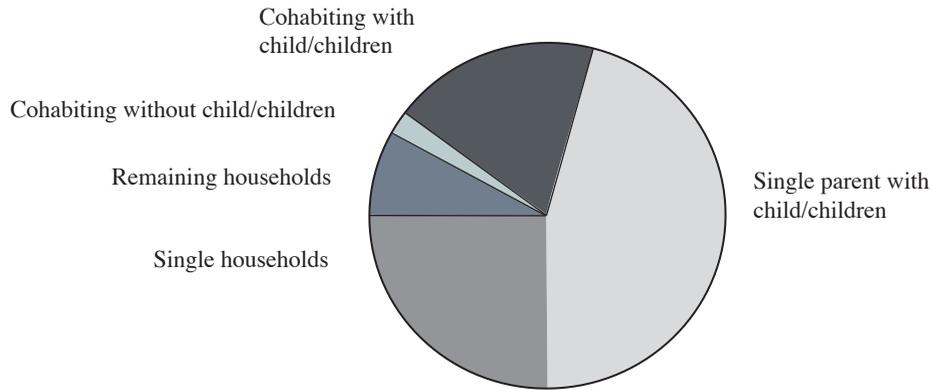


FIGURE 2.6: Proportion of households living in overcrowded conditions by household type, 2014. Statistics from SCB (SCB 2015-e)

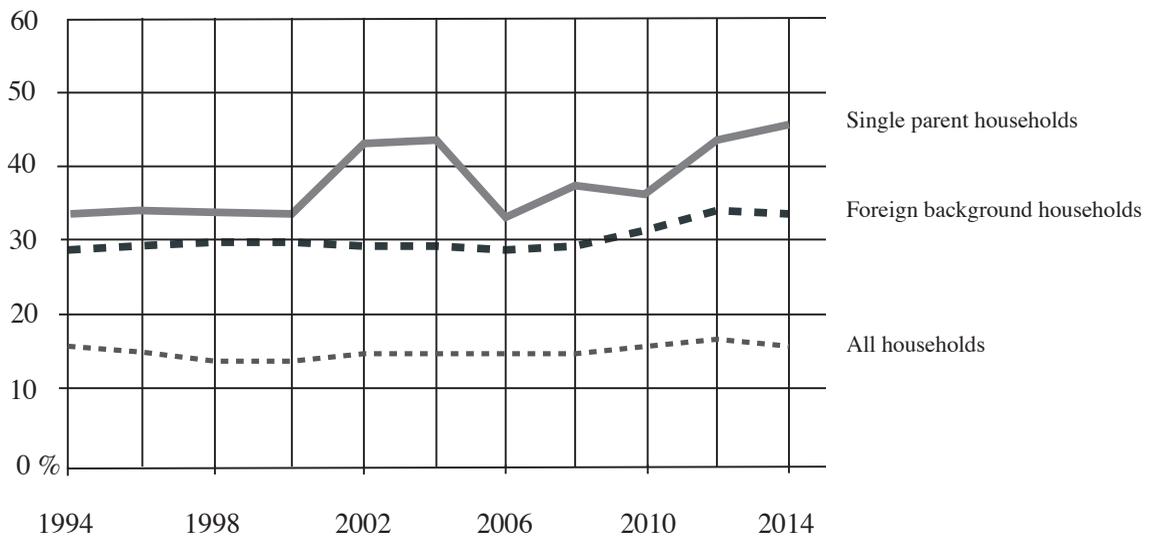


FIGURE 2.7: Proportion of households living in overcrowded conditions: single parent households, foreign background households, and all households, 1994-2014. Statistics from SCB (SCB 2015-f)

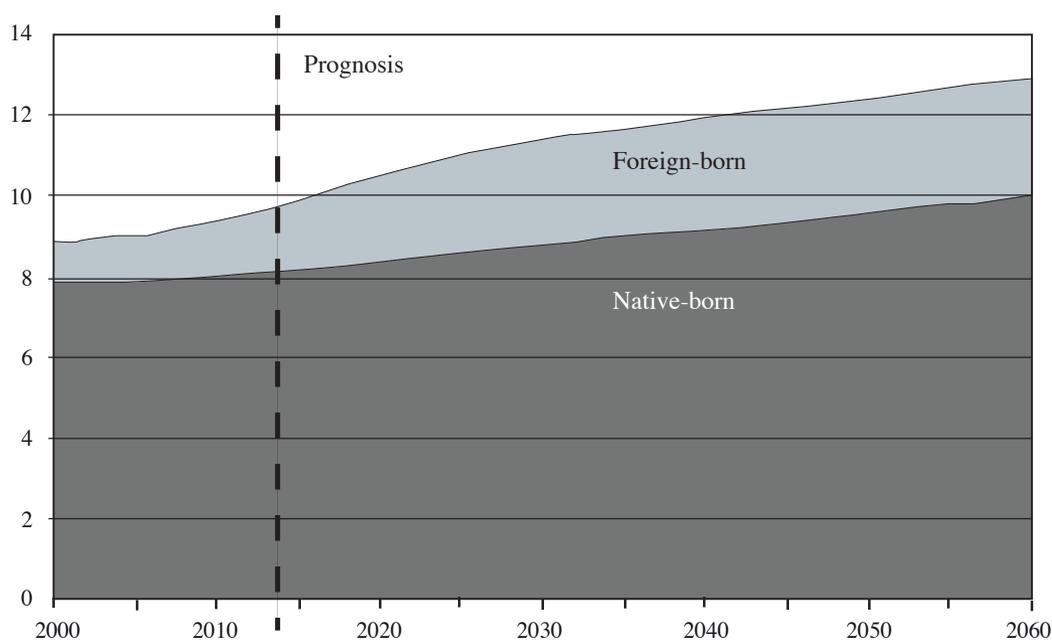


FIGURE 2.8: Proportion of population native- and foreign-born in 2015-2060 (million people), and prognosis for 2015-2060. Statistics from SCB (SCB 2015-a)

Another group that is vulnerable to the present market conditions is the single parent household. The lack of living space is also more common in this group, a trend that tends to be permanent (Figure 2.7; Andö 2014). In addition, these households tend to have a more limited economic situation. To move is not always an option for these households, as a consequence of the housing shortage and the household's weak economy. In this situation, adaptable and flexible residences enabling diverse and usable spatial solutions can promote a functioning everyday life. To solve the economic issue by renting out a room or sharing a cooperative can also be a solution. These residential requests and needs are seldom the subject of contemporary housing design. Nevertheless, the statistics presented here clearly show the diversity of household constellations that lead to widely varied residential requests and the vulnerability of some household groups.

3. SOCIAL SUSTAINABILITY

Our Common Future (the UN's so-called 'Brundtland Report' from 1987), states that sustainable development shall meet the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). This formulation embraces a perspective in which long-term conditions are central. These long-term conditions emerge as a relevant issue for the questions explored in this work, and I will return to this perspective further on.

It is customary today to characterize sustainable development in a typology with three pillars representing the environmental, economic and social dimensions. The three pillars differ in character. The economic and environmental pillars can be analysed, described, defined and measured in ways that the social pillar cannot. Today there is no commonly accepted definition of social sustainability. Definitions of the 'social' are difficult to agree upon. One reason could be the temporality associated with the notion: it is described as context dependent, a comparative notion, which can make it difficult to define and measure (Boström 2012: 3; Dempsey et al.: 289; Lehtonen 2004: 199; Murphy: 15). This may be one reason why the social sustainability dimension has been left behind. A few examples will be presented, reflecting the complexity of our understanding of social sustainability, but also showing that different contexts require different frameworks.

In the thesis, a framework for social sustainability aspects is used. This is related to social dimensions that have been found relevant to residential usability. Some of these are aspects derived from the demographic preconditions, while others are described by Schneider and Till (2007: 46–50).

3. 1 THE SOCIAL PILLAR – NOT A TOTAL SUSTAINABILITY PERSPECTIVE

The three-pillar perspective has been criticized, claiming that the divided sustainability notion lacks a comprehensive perspective and therefore does not deliver a complete understanding of the situation. It is a challenge to bring these pillars together, but the insight that a more comprehensive perspective is needed has brought about several models for linking the pillars (Boström 2012; Lehtonen 2004; Murphy 2012). This thesis relies on only one of the three aspects, the social sustainability pillar, and does not deliver a

complete picture of sustainability. Instead, focus is considered essential, since the social aspects of residential design are seen as an issue left behind by the contemporary housing debate. When considering a more full perspective of sustainability and flexible housing, Schneider and Till, as mentioned earlier, emphasize flexible housing's capacity to address uncertainty, demographic transformation, and social needs and to enable technical progress – factors belonging to all three pillars (2007: 50) The economic and environmental pillar, they claim, is served by the capacity flexible housing has to avoid obsolescence, which in turn means the reduced need for reconstruction, limiting the use of resources (2007: 50).

3.2 SOCIAL SUSTAINABILITY – A COMPARATIVE NOTION

Boström (2012), Lehtonen (2004), and Dempsey et al. (2011) exemplify different ways of reflecting and framing the notion of social sustainability. However, most emphasize, in different ways, the temporality and contextuality of the notion.

Lehtonen (2004) emphasizes that the key challenges of sustainable development lie in the synergies and trade-offs among its various dimensions (environmental, economic and social). He discusses ideas about frameworks for analysing the environmental-social interface. He concludes that a single framework for studying this interface is neither feasible nor desirable, and emphasises the need to contextualize the analysis. This can also be reflected in how he describes the social dimension. He characterizes it as bipolar, as it refers to both individual and collective levels. He claims it is reflective: perceptions and interpretations of the objective social conditions change the behaviour of individuals and social collectives. Social phenomena themselves are essentially immaterial which makes them difficult to grasp. Also, the different geographical and temporal scales and situational contexts demand their own frameworks. This in turn does not necessarily render a consistent picture, but rather a multiple of partly contradicting views of reality. (2004: 199–200, 202, 211).

Boström (2012) describes challenges in the theorizing and practicing of the notion of social sustainability. He presents a framework that describes social sustainability as two facets: substantive aspects and procedural aspects. To reach a socially sustainable solution both these aspects have to be employed. Substantive aspects refer to goals to achieve, while procedural aspects refer to how a goal is attained. Examples of these goals are social

recognition, security (economic, environmental) and social cohesion. The procedural aspects include access to information about risks and information about the sustainability project, and empowerment for taking part in the process. Boström also claims that procedures cannot be static. They should always include a temporal dimension, and it is not always easy to distinguish between the substantive and procedural issues (2012: 3, 6, 7).

Dempsey et al. (2011) seek a definition of urban social sustainability and describe the disparity of the notion. They present *equitable access* and *sustainability of the community* as two dimensions that allow us to frame social sustainability in an urban context. They stress sustainability and social sustainability as dynamic concepts – they are neither absolute nor constant, which means that the definition will change over time. This is exemplified by the fact that social cohesion and interaction may increase due to changes in local authority service delivery or the threat of airport expansion. They also emphasize the contextuality in the social sustainability notion in stating that contributory factors of urban social sustainability can relate to multiple scales from national to local (2011: 289, 292).

Lehtonen (2004), Boström (2012), and Dempsey et al. (2011) reflect the social sustainability notion as contextual, a comparative notion – a dimension that only can be observed from situation to situation and not generally evaluated or estimated. The existing preconditions as well as the behaviour of individuals and social collectives frames the estimation of the social sustainability in a specific situation. This perspective on social sustainability provides a starting point for the study of residential situations conducted in this thesis. The situational and temporal preconditions as well as the household's different needs and requests will each constitute a frame for reflecting the social sustainability dimension.¹¹

3.3 FOUR DIMENSIONS OF SOCIAL SUSTAINABILITY

The four dimensions that Murphy presents as a conceptual framework for the social pillar are used for the discussion in this work (2012: 15). These dimensions are, *social cohesion*, *participation*, *equity* and *awareness of sustainability*. The dimensions contain relevant aspects of residential usability and demographic conditions. They also reflect critical factors in the study of pluralistic households. In this thesis, the dimensions have been related to the context of housing.

11 See Chapter 5, p 39.

The equity dimension: This is about the equal rights for all households to have access to a qualitative, well-functioning living space. In this context the housing shortage constitutes a critical factor. Limited economy and lack of living space are two other factors, both reflected in demographic conditions. Many foreign-born and single-parent households have a weaker economic situation than the average household, and these are also the household groups with the highest degree of overcrowding.¹² A weak household economy and lack of living space can mean decreased residential quality with limited privacy and residential conflicts as consequences. Households with a limited economy can have low prospects to move to another dwelling to solve their situation. In this context, residential usability can mean greater opportunity to arrange for a functioning everyday life or/and renting out a room to supplement the household's income. Also, when considering the equity dimension and demographic conditions, the increasing group of elderly households comes forth.¹³ The need to adapt the dwelling to the changing life situations in these households as they grow old or less physically able must be considered.

The long-term perspective that Schneider and Till introduce emphasises flexible housing's ability to respond to demographic changes because it provides adaptability for the uncertainty of future demands. It can also be understood as an equity perspective in terms of coming generations, as this makes the housing stock a long-term usable asset for diverse households in future generations (2007, 35-50).

The participation dimension: This can be related to the notion of user participation in the field of flexible housing.¹⁴ From the perspective of user participation, flexible space is seen not only as a practical use of physical space, but also as a means for the resident to engage with the dwelling, attaining social aspects such as belonging and identity, quality of life and self-realization. The notion describes the residents' ability to get involved in the design of their own homes. Habraken speaks about the idea of the dwelling as a 'possession of the occupant' and in a larger context he aims for the empowerment of the user (2011: 14-17). According to Schneider and Till, the principles of flexible housing during the user participation era

12 Chapter 2, p 23, Figure 2.7.

13 See Chapter 2, p 22, Figure 2.5.

14 See Chapter 2, p 12.

were seen as a democratisation as well as a decentralisation of the planning process (2007: 28).

The social cohesion dimension: This dimension focuses on the residential neighbourhood and community stability. Dempsey et al. address the sustainability of the community, and also refer to the neighbourhood (2011: 296). They define five interrelated dimensions that operate for sustainability: *social interaction/social networks in the community, participation in collective groups and networks in the community, community stability, pride/sense of place, and safety and security*. These are also relevant to this thesis for the social cohesion dimension and the stable community. Residential usability is here considered a factor that enhances community stability. The adaptable home can enable residents to stay in the same dwelling during a longer time span, and not have to move. This perspective on stable communities is also presented by Schneider and Till (2007: 35–50).

A stable neighbourhood is not always referred to as enhancing sustainability. In the research literature there is no common understanding of the role residential turn over plays for social sustainability in a neighbourhood (Dempsey et al., 2011: 296). Resident mobility can mean a low residential quality with low social cohesion in the area and reduced feelings of attachment, leading to high turnover (Bramley and Morgan 2003). But it can also mean the injection of new residents, enhancing social interaction with active participation (Kearns and Forrest 2000). For this thesis, the disagreement on the effects of community stability is evidence for the unpredictability of the precise factors shaping the sustainable community in a specific context. Therefore, the sustainability of stable communities is considered to be context dependent.

The awareness of sustainability dimension: This dimension highlights the established approach to how to dwell and how to use residential space. It relates to the question of why flexible housing has not gained more widespread employment in housing design today.¹⁵ Today expectations for residential design and how to dwell are reflected in a functionalistic design perspective, using a static template for residential life. The flexible housing idea calls for changeable space and possibilities to adapt a space throughout its life cycle. It relates to a long-term perspective on the dwelling as something transformative. To reform the current residential pattern, the conventional em-

15 See Chapter 2, p 14.

ployment of space, would require both the provision of adaptable dwellings and the awareness of the sustainability dimension. That awareness implies the insight into how spatial use can reinforce residential quality and adapt to changing living situations, and how staying in the same community can promote sustainability. Thus this dimension deals with the need to make residential usability part of the conventional routine for residential design.

4. METHODOLOGY

The research methodology for the thesis has been designed to explore the issues it identifies: to develop knowledge of how residential design and usability can relate to aspects of social sustainability and to find a working model that promotes social sustainability aspects within the practice of residential floor plan design. The methodology is based on qualitative research and has been performed as a mixed method research, employing two empirical studies and a 'research by design' component. The work has been conducted as an iterative process utilizing inductive reasoning, wherein frequently evolving reflections and questions have affected the next move in the research. Thus the different research issues have been developed both separately and in parallel, and during the work correlating subjects have evolved.

The first empirical study, *Empirical study of residential life*, focuses on residential qualities and aims to provide an overview of the qualities of everyday life and spatial use in the dwelling. The second empirical study, *Empirical study of social dimensions of residential space*, focuses on correlations between residential space and social dimensions. The aim for this study has been to investigate how residential usability relates to aspects of social sustainability.

A third component, *Research by design, a design strategy*, has focused on different ways of working with residential usability in the work with floor plans. The aim has been to find a design method or a design model that promotes the inclusion of social sustainability aspects in the design work with residential floor plans.

4. 1 EMPIRICAL STUDY OF RESIDENTIAL LIFE

The study of residential life has been performed through qualitative interviews with households and analyses of their dwellings projected as furnished floor plans. The study consists of two separate surveys of residential practice conducted before the start of work on this thesis. The surveys were made in Gothenburg during the years 2009 and 2011. The aim was to understand how the households studied used residential space in their everyday living situation and what aspects were understood as residential qualities.

The survey from 2009 was geographically based in central Gothenburg and was commissioned by the tenants' association. The households were randomly selected through a snowballing procedure, and selection was made to achieve a mix of household sizes, compositions and cultural backgrounds and also a diversity of floor plan types from different time periods (Nylander and Eriksson 2009). The other survey, commissioned by the municipal housing company Poseidon, concerned a specific residential neighbourhood in Gothenburg called Backa. The municipal housing company approached the households selected for this survey. The households had a variety of sizes and compositions and also various cultural backgrounds. The apartments consisted of four or five distinct floor plan types, since the area was developed during the Million Programme era of mass-production (Nylander and Braide Eriksson 2011).

Results from the two surveys illuminate the household's perspectives on residential qualities regarding detailing, surface materials, the capacity of spatial usability, and functions in the dwelling. The households' relation to the neighbourhood area, with its services and transportation infrastructure, are also illuminated. The survey from Backa (2011) stands out, as all households consisted of first- and second-generation immigrants. The neighbourhood at the time of the study also had problems with gang violence and vandalism.

For this thesis, the two surveys have been reexamined, and three residential situations selected for the empirical study of social dimensions of residential space. The two surveys are not further presented in this thesis but exist as two separate reports (Nylander and Eriksson 2009; Nylander and Braide Eriksson 2011).

4.2 EMPIRICAL STUDY OF SOCIAL DIMENSIONS OF RESIDENTIAL SPACE

In this study, three selected residential situations selected from the empirical study of residential life are reused, employing a new perspective. The point of departure for this study has been to understand how residential usability relates to aspects of social sustainability. The applied strategy has been to interpret the residents' subjective understanding of their residential situation, focusing on the floor plan layout and the actual use of space in the apartment. From the situation social dimensions have been considered, analysing the interviews and the furnished floor plan layouts (see further 4.2.3). The method is influenced by the social constructivist method described by Charmaz (2014 (2006)).

The study of the social dimensions of residential space does not consult any analyses from the previously conducted empirical study of residential life. Instead the households living situations are analysed from a new point of view.

4.2.1 *The Grounded theory method and applications for this work*

Parts of the method used in this study relate to Kathy Charmaz's book *Constructing Grounded Theory* (2014 (2006)).¹⁶ She asserts that the research acts are not given, but constructed. Charmaz's constructivist grounded theory adopts a relativist epistemology and seeks interpretive understanding rather than a variable analysis that produces abstract generalizations separate from the specific conditions of their production. The aim is to create interpretative understanding located in the particularities of time, space and situation. Thus relativism characterizes the procedures, and data can be seen as mutually constructed by the researcher and the researched (2014: 12–14).

In this study each residential situation is studied based on the specific context of time, space and household constellation. To enable interpretations of the social dimensions emerging in residential practice, a social constructivist perspective has been applied. When analysing the residential situations, the residents' presupposed subjective comprehension concerning spatial qualities and spatial use have been the starting point. Thus the situational and temporal preconditions as well as each household's different needs and requests have constituted a framework for reflecting the social sustainability dimension.¹⁷

¹⁶ Charmaz relates to the developers of the grounded theory, Glaser and Strauss, *The Discovery of Grounded Theory* (1995(1967)).

¹⁷ This connects to the discussion in Chapter 3.

4. 2. 2 *The selection of residential situations*

Two parameters set the frame for the selection of residential situations: the preconditions necessary for measuring spatial use and the aspiration to reflect a diverse use of residential space. The first engages the access of living space, the second the ongoing demographic transformation.

When considering the possibilities of measuring the use of space and spatial need in different living situations, the supply (quantity) of residential space has been considered a key factor. A household disposing a space sufficient to meet their stated needs or even provides some surplus space is not regarded as optimising the demand for residential space. The usability and adaptability of residential space is not accurately tested until there is a crowded situation. Thus it appears that the lack of space in a living situation can accentuate a dwellings' capacity for residential usability. This can in turn expose social aspects correlated to spatial supply.

The perspective on demography as a critical precondition for residential use and residential needs suggests the matter of the increasing number of different household types, the pluralistic households, and the developing mismatch between requests for residential space and contemporary residential design practice.¹⁸ In this context a selection of diverse 'untraditional household constellations' could provide insight into more diverse spatial needs than conventional design practice recognizes today. I believe the pluralistic household group can offer a more comprehensive and diverse frame for residential use, and also provide a more holistic perspective on the ongoing demographic transformation and diversifying spatial needs. Emphasising the pluralistic household also challenges the current residential design employing the nuclear family as a template for residential use. The apartments involved in the study are designed to target the nuclear family, and this is reflected in the fit and possible use of these apartments. The pluralistic households selected are: *the shared custody, the large family and the single parent household*.

18 See Chapter 2, p 18–24.

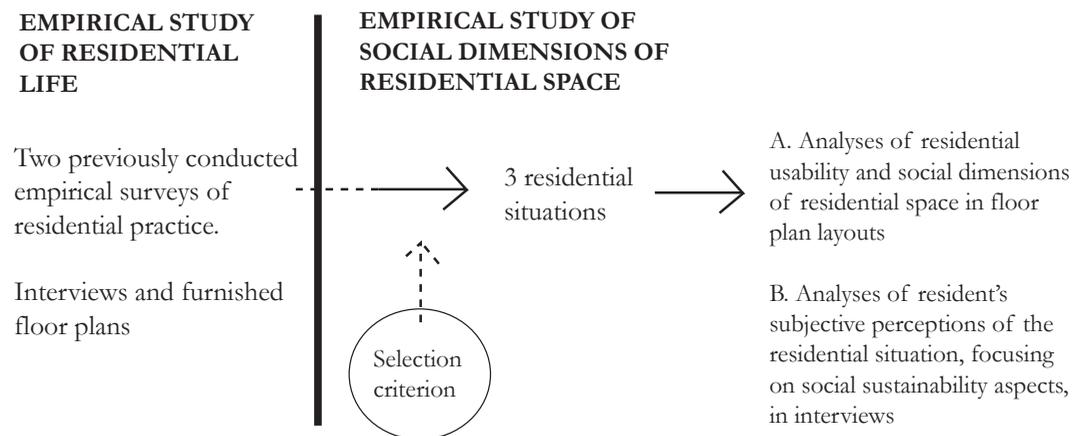


FIGURE 4.1 From the study of residential life, three selected residential situations are used. The study of social dimensions of residential space do not consult any analyses or results from the study of residential life, instead the households living situation are analysed from a new. Selection criterions are related to the demograpic transformation and aspects of residential usability.

4. 2. 3 *The analysis of residential situations*

The floor plans and interviews together constitute the foundation for the analysis. The work has been performed as an iterative process in which frequently evolving reflections and questions from interviews and floor plans have affected the next move. The theoretical studies have proceeded in parallel to the analysis work, and drilled down into relevant subjects.

The floorplan: The floor plan analyses are based upon the established, conventional form of analysis practiced by architects in their work designing floor plans. This can be described as figurative empirics, in which the floor plan embodies an entrenched, collective knowledge similar to a language. By ‘reading’ the qualities, use and capacity of a space can be understood. This constitutes a critical tool in architectural practice. One example of this is Ola Nylander’s dissertation, *The Architectural Properties of the Home* (Bostaden som arkitektur, 1998), a fundamental part of which is the analysis of floor plans.

In the study, the apartment’s capacity for residential usability is reflected in analyses of floor plan layouts and resident interviews. The residents’ understanding of their housing situation together with assimilations of the

floor plan layout establishes a basis for the analysis work. The apartment's spatial capacity is described through reflecting the flexibility and adaptability of rooms and room configurations in the dwelling. These reflections are presented in floor plan diagrams.¹⁹

The interview: The residents' subjective understanding of their residential situation is interpreted by reflecting their situational requests and use of residential space through aspects of social sustainability. As a framework for the discussion, four social dimensions are identified. These are Murphy's dimensions from the article about a framework for policy analyses of sustainable development (2012). These dimensions, Murphy asserts, provide a relevant framework for the dimension of social sustainability. In the proceeding analysis work these dimensions were found relevant both for the processes of residential usability and the ongoing demographic transformation. As previously mentioned, the dimensions are: *equity, awareness for sustainability, participation* and *social cohesion*.

4. 2. 4 *Limitations and remarks on the study*

The three living situations that comprise the starting point for the empirical study can be viewed in terms of reliability and validity. This can be considered a number that offers a minimum of data. That in turn implies that a more comprehensive study could provide a more nuanced result and a more solid base from which to draw conclusions. On the other hand, each one of the three living situations represents specific experienced lived situations, where the social aspects and the spatial need can be detected and reflected. The starting point also comprises three crowded living situations, an application aimed at emphasizing and strengthening the focus on the researched correlations between spatial flexibility and social sustainability. As a consequence, it may be that the results of the study only apply to crowded living situations, but it does appear that the usability and adaptability of a residential space is not accurately tested until there is a crowded situation. The use of crowded situations gives a better understanding of the dwelling's range of capacity to cope with a diversity of living situations.

19 See Appendix, p 102–107.

4.3 RESEARCH BY DESIGN, A DESIGN STRATEGY

To study possible models that could promote the design work with residential usability and also help social sustainability aspects become salient components in the work of designing residential floor plans, the method of research by design has been used. The work has been performed in conjunction with master of architecture studios over the course of three academic terms. The students have been working with multi-family housing design projects situated in different geographical contexts, developing different aspects of residential usability. Throughout the studio work, the goal of the research has been very much unclear - whether the focus should be on a specific design method or a spatial key element or something else.

The possible outcome of the work was difficult to foresee. Because of this, I deliberately chose a broad perspective for the studio work and processed the design work as an open-ended discussion. The discovery of design rules for a flexible optimization of space and general methods to support the design work could emerge as interesting outcomes. As a way of discussing the adaptability and usability of residential space in the floor plan design, the students were asked to present their floor plans as sequences of living situations during a set time-span for a defined household. Through a stipulated residential process, the correlations and effects of space and time in a residential situation could be understood. By furnishing the floor plans and writing short narratives about the households' living situation, students were able to visualize the spatial capacity of the floor plan. Over the course of their work, this procedure crystallized into an applicable method.

RESEARCH BY DESIGN

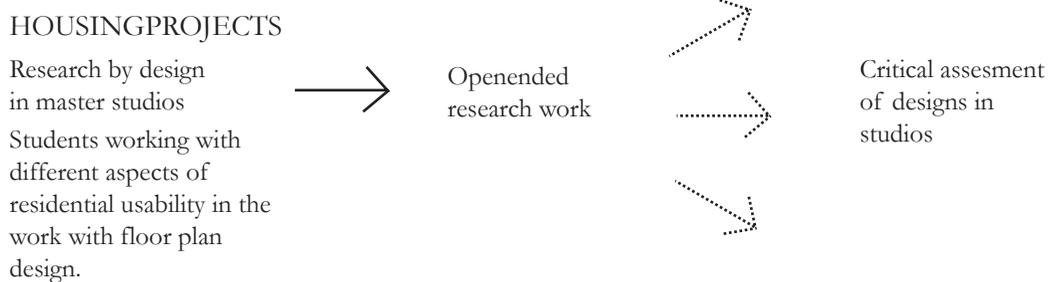


FIGURE 4.2 The research by design component is realized as an open-ended research work. Through critical assesments and discussions of the design work, the question of residential usability and correlating social aspects is inquired.

4. 4 ETHICAL QUESTIONS

The three selected households selected from the empirical study of residential life have been consulted and have agreed to take part in this work as anonymous households (Chapter 5). From the research by design component, the presentation of the Time-Space model employs floor plan design by master of architecture students (Chapter 6). They have agreed to the presentation in this research work.

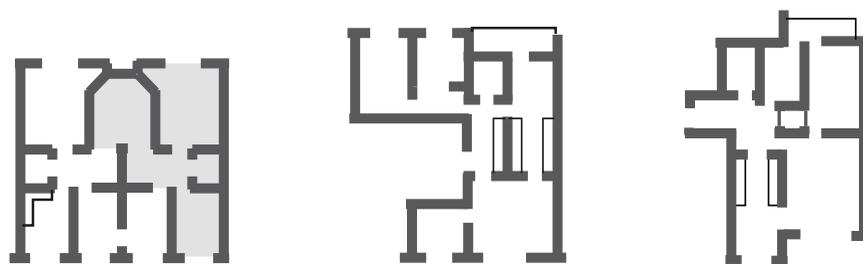
5. PLURALISTIC HOUSEHOLDS – A STUDY

The perspective on demography as a critical precondition for residential use and residential needs, suggests the importance of the increasing group of diverse household types, pluralistic households, and the developing mismatch between the demands made on residential space and contemporary residential design.²⁰ Thus the aim of this study is to understand more about residential use and related social aspects, for this group of households. The study contains a presentation of three pluralistic households with interviews and furnished floor plans together with analyses of the residential situations and each apartment's spatial capacity. The focus is on the employment of residential space and possible social aspects connected to the spatial requirements.

As a starting point, the analysis presupposes the residents' subjective comprehension concerning spatial qualities and spatial use. The situational and temporal preconditions as well as the household's different needs and requests will each constitute a frame for reflecting the social sustainability dimension. This approach correlates to the previously discussed contextuality of the social sustainability dimension.²¹

5. 1 RESIDENTIAL SITUATIONS: 1, 2 AND 3

The households' living situations are presented together with some quotations from the interviews. The complete interview and the coding can be found in Appendix.



1/ Shared custody household 2/ Large family household 3/ Singel parent household

²⁰ See Chapter 2, p 18.

²¹ See Chapter 3, p 26.

1 / SHARED CUSTODY HOUSEHOLD

The residential development presented in this example is used in a flexible way by the residents. The apartments in the building are constantly transformed in size and configuration. They are merged or divided depending on the residents' needs. The building was not deliberately designed to enable this type of flexibility, yet this has become a practice among the residents. The development is an owner-occupied co-operative. It was built in the 1930s to house workers in small, identical apartments, and is situated in the Masthugget neighbourhood of central Gothenburg.

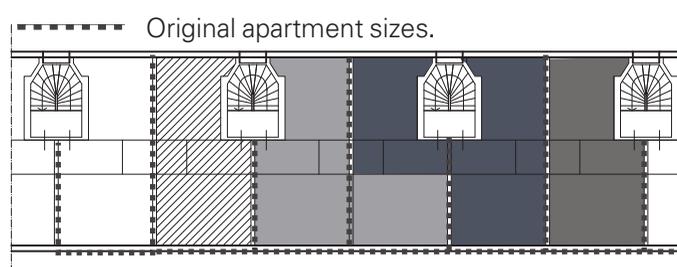


FIGURE 5.1 Floor plan structure of the residential estate showing the flexible use of space. Coloured areas show possible new apartment sizes enabled by the ongoing transformations of space. The housing structure allows for adaptation to existing living situations. The apartments can become larger or smaller by including or excluding space.

The parents have recently divorced and share custody of their three children. They live in the Masthugget neighbourhood, where they have social ties and feel connected to their neighbours. The children also go to school and day care here and both parents and children want to continue to live in this part of the city. When they divorced the parents looked for a specific residential solution. They wanted the children to sleep in the same rooms independent of which parent had the custody that week. They had heard of apartments that could be altered and adapted to the living situation. The parents finally came by two small apartments in a development that offered these opportunities.

Parent's comments about the future residential solution:

We had heard of apartments that can be disposed so that the children can have their own rooms and not have to move every second week which is regular when the parents divorce. We don't want the children to be torn away from home. We've been pondering on that, how will life be for us here in Masthugget where we have our home. The children have school and day-care here, and we want to sustain the continuity. We heard of a family that had bought three apartments in the housing. They have four children and could have the children's rooms shared in the middle and one small unit for their own living on each side of the children's rooms. We thought that sounded interesting. Then we had the chance to get hold of two two-room apartments in the housing. We have split the apartments so that the children have the rooms in between our separate apartments.

In the new apartments they solve the arrangement of living space by letting the children occupy two central rooms that connect to separate apartments on each side. They are satisfied with this solution and consider the desired living arrangements achieved. The residential flexibility and the possible transformation of the apartments can provide an acceptable solution for the family.

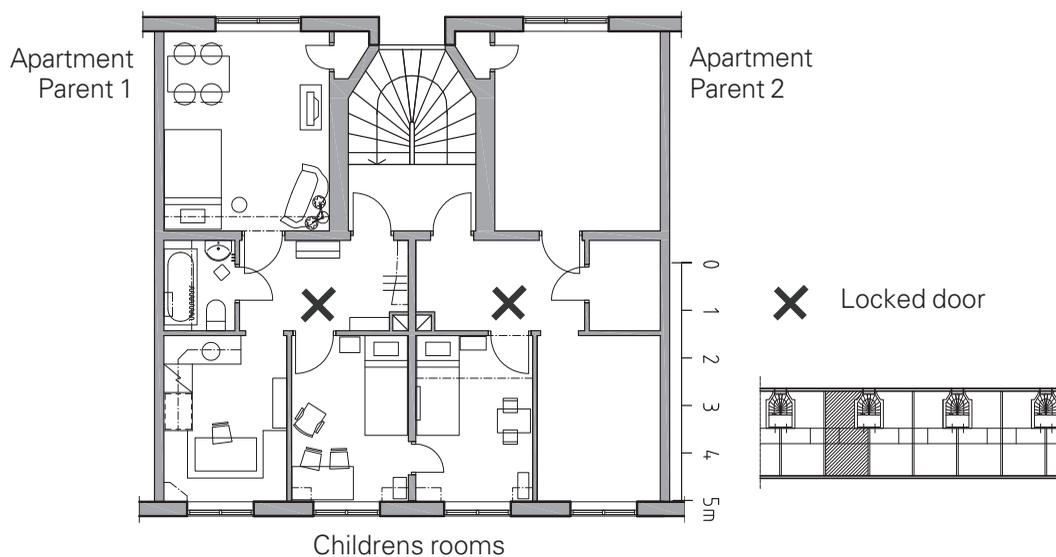


FIGURE 5.2 Floor plan shared custody household. Apartment: two room apartment, 54 m². Traditional housing, building year 1930, Gothenburg. Household: Parent 36 years, 3 children 9, 6 and 3 years. The children's rooms belong to either of the two apartments every other week. Locking one of the doors decides how the rooms can be accessed.

Characteristic for this residential situation are the possibilities for achieving a personal solution adapted to specific spatial needs. The on-going transformations of apartments in the building allows for adaptation to existing living situations.²²

For the parents, this practice makes it possible to influence their own living situation and realize what they consider to be a qualitative solution. They describe making the children move every other week as a 'split home'. They say allowing the children to stay in one place is essential for a safe and controlled way to proceed with the divorce.

Parent's comments about the new situation, being divorced and solving shared custody:

.../ It has worked out well so far. We have not had the reactions where the children get nervous as is common in these situations.

About divorce and splitting up from home:

.../ However things will develop this feels as a supple transfer for the children to slowly adapt to the new reality /.../ This will be a smoother transit for them not having to move [every other week].

The living situation presented here must be seen as an unusual solution to a very unusual request. This kind of residential usability must be considered rare for residents to accomplish. Still the case shows a strong connection between residential usability and social aspects.

22 The ability to alter the size of an apartment in this way cannot be taken for granted, since it depends on the neighbour's needs and ambitions in a specific situation. There are also administrative and regulative obstacles to this type of a flexible solution. In Sweden the form of tenure sets limits on this kind of flexible solution: the cooperative form of ownership can allow such size adjustments of space, whereas in a rental building this would be much more complicated to implement. An example of regulative demands that limit this type of flexible solution is the fire code. These obstacles and the small chances of two neighbours' needs coinciding make this type of flexible structure hard to implement. Although this appears to be an interesting way of attaining flexible space, other types of flexible structures can better provide a more frequent and individually based use of flexibility for Swedish conditions.

2 / LARGE FAMILY HOUSEHOLD

The household is a large family comprising two parents and five children. The parents are from India and Kenya. They met in Sweden and now live in the neighbourhood of Backa. They could not choose a residence, but had to accept this apartment. The housing area is from the late 1960s, located approximately fifteen minutes by bus from the city centre. The apartment is a leasehold flat. The wife also lived in this neighbourhood with her parents, when she came to Sweden at the age of twenty. She has four brothers and sisters living in the area and the family have an established social network here. The parents consider the neighbourhood unsafe because of recurring troubles with groups of young people harassing the area.²³ They still discuss staying as they are settled and know people here, but would desire to live in a house in the future.

When they moved into the apartment they were a family of four. The family has grown and they now experience a lack of living space. The space intended for eating cannot be used for this purpose, as it is designed for a specific number of people and cannot be altered. Instead they choose to use the living room for both eating and socializing since all of the other rooms are considered too small. The living room furniture is arranged along the walls and a large central carpet marks the eating and socializing space. Dinner is served sitting on the floor. This is considered to be a sufficient solution since it is a cultural habit to sit on the floor in their native countries.

All bedrooms are shared and there is no space for individual relaxation. There are no opportunities for doing homework in a quiet place or spending time alone. The bedroom sizes are also considered insufficient to meet the family's spatial needs. They are described as too small and difficult to furnish. Storage space is not sufficient. The family cannot use the balcony for recreation as it is used for storage.

Parent's comments about what is good with the apartment:

Oh, that's hard to think of. Nothing is good. It's all the while hard to adjust life to this space. It is good that you can watch the children from the kitchen window when they play outside, otherwise there is nothing that is good with this apartment.

23 During our interviews the neighbourhood had been the site of riots by gangs of local youths. This situation affects the family as well as many other residents in the district. Insecurity and suspicion characterize the every-day situation for many of the residents. Despite this, rootedness characterise the family's attitude to the area.



FIGURE 5.3 Floor plan large family household. Apartment: four room apartment, 79,6 m². Multi-family housing, building year 1968 (Million Program era), Gothenburg. Household: parents 36 and 38 years, 5 children 14, 11, 5, 3 and 1 year

Parent's comments about spatial usability:

As you can see we have no chairs and we have not room for a dinner table /.../ No, we sit here and eat [the floor]. But that is ok, it is part of our cultural habit. Before we used to have a table and chairs.

.../ I can show you, there is no space for us. I don't know how to furnish! We shuffle the furnishings from here to there to reach a workable solution. We try to find a good situation! We also constantly shift the children's rooms to look for a good solution. We constantly administrate furnishings.

The wife would prefer to have two large rooms to dispose for the common activities. She finds her daily life in this crowded situation difficult to cope with. The family perceives their living situation as very crowded and leaving no room for privacy or recreation. The future is unclear since they cannot see any obvious alternatives to their present situation.

Parent's comments about a better dwelling solution:

No, a large space, more space [would be needed]. We have a four-room apartment and it doesn't fit our needs. Instead we should get rid of the walls and have two large rooms /... / Then I can do the furnishings properly, then the walls do not make any hinder.

The family cannot find a solution to their limited space of the apartment and a temporary better living situation cannot be provided by altering the use of space or changing room sizes or numbers of rooms within the existing apartment space. The size of the rooms also magnifies the spatial shortage. The residential situation is a constant inconvenience and the possibility for finding a new, larger and affordable dwelling is small. Meanwhile there is no flexibility to solve the existing residential situation.

3 / SINGEL PARENT HOUSEHOLD

A single parent lives together with her daughter and a tenant. The housing is from the 1980s and is located approximately ten minutes by tram from the city centre. The apartment is a leasehold flat. Schools and daycare are located within short distances. The daughter goes to daycare here and both the parent and the daughter have social networks among the neighbours. The family earlier had a smaller apartment in this area. When they had the opportunity to change to a larger apartment they did so but it was important that it was in the same neighbourhood. There are many qualities that they value in this area. There is a diversity of people living here and there are many children. You can also find nature and a lake nearby.

About social networks and using the courtyards:

Yes, during spring and summer all of us spend most of the time out-doors. In the summer time many people do barbecues together.

Yes, I think I've many contacts here [knowing people in the area]. I know many people and the children know each other. I guess it's that time in life when you get to know people having small children playing together. There are three families we see regularly here /.../ I think this is a safe area to live in.

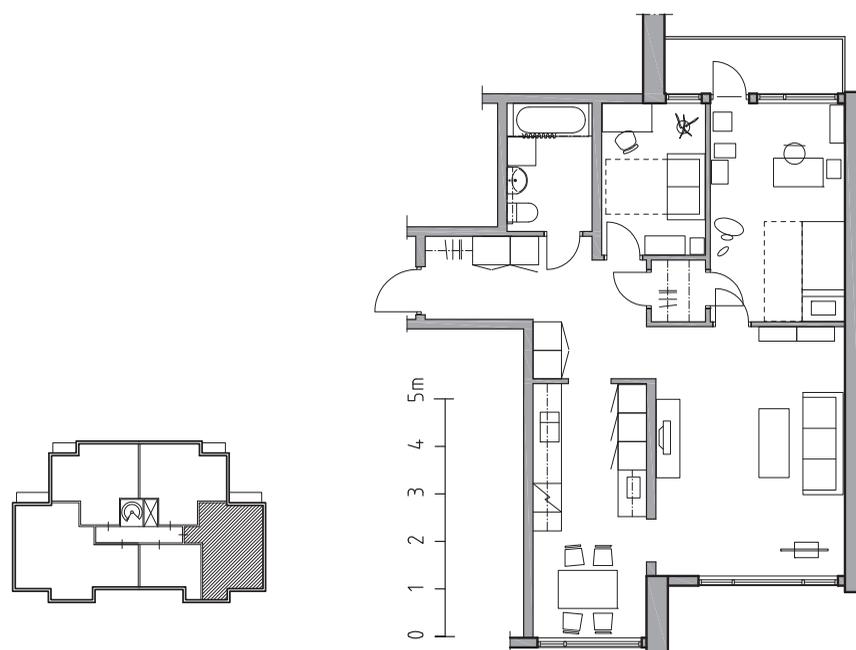


FIGURE 5.4 Floor plan single parent household. Apartment: three room apartment, 74 m². Multi-family housing, building year 1980, Mölndal. Household: parent 36 years, tenant 21 years, child 4 years.

The residence is a two-bedroom apartment. The parent does not have enough income to live here alone. To solve the situation she has a tenant. She prefers a two-bedroom apartment instead of a smaller one. One day she might be able to afford the apartment alone. She describes the extra room as a ‘quality space’, a room she can have as a private space on small occasions when the tenant is out or in between tenants. She also regards the tenant as a source of adult company.

The parent about the alternative of having a two-room apartment:

I don't want a two-room apartment. It is comfortable to have the small room as extra space. When there's many children here it's good to have that spear room to sit down in, read a book, breath, and be all alone. With the children you are so much in a rush all the time. I can't say: - Can you pick up the kids from day care today? Or - I'll go out now for an hour or two! I just don't have that possibility!

The parent shares the large bedroom with her daughter for sleeping. She has an extension bed that can be pulled out from under the daughter's bed. In daytime the room serves as the daughter's own room. Here she has all her belongings. If she has friends at home they often play in this room. The parent can use the living room or the kitchen as a retreat during the day. The

tenant, a twenty-one-year-old student, has the small bedroom. Here she has a convertible bed and a small desk. There is not much room for storage in the apartment, but the parent thinks it is sufficient.

In a subtenant situation like this or a collective household, the requirements for space are different than in the conventional nuclear family situation. The close relations that characterise the nuclear family are not necessarily the case for other household constellations. Private and public zones in the apartment can separate private spaces such as bedrooms from spaces where guests and unrelated visitors are received. This can avoid unwanted confrontations. Thus well-functioning private and public space in the dwelling that can accommodate both private and common activities becomes more important to achieve when the household members are not closely related.

The parent about the apartment's suitability for letting out:

I think it has to do with who you are. I think it's ok to have the bedrooms next to each other, for me it's no big deal. But you can't always go throw the living room if there is someone [unknown visitor] sitting there.

The parent about the room sizes and spatial usability:

I think it's too rectangular [living room]. If it would have been larger you could have split it into two parts dining in one and sofa in the other. As it is now this is not possible to do.

The parent thinks that the apartment works for the present use with the tenant, even though there is a lack of living space. The kitchen and the living room are used as common space by the whole household. This can occasionally mean unwanted confrontations, for example when tenant or parent have guests. Sound between the two bedrooms is also easily overheard.

The solution of renting one room out to be able to have a larger apartment seems to function for the household. The inconvenience of having a shortage of space that comes with the chosen solution appears to be acceptable for the parent. She also has an idea of a future usage of the apartment in which the small room becomes a working space and guest room. This choice, to be able to dispose of a larger apartment by renting one room out, can be seen as a flexible way of using residential space. According to the parent this provides a higher life quality and also a future residential ability.

5.2 THE PLURALISTIC HOUSEHOLD, SPATIAL REQUESTS AND DIMENSIONS OF SOCIAL SUSTAINABILITY

These residential situations exemplify pluralistic households' diverse requests for residential space, and possible correlating social aspects. The households' residential situations are here reflected through the applied framework with dimensions of social sustainability.²⁴ In addition, the workability of the residential usability is also reflected.

The equity dimension: This can be regarded as the equal rights for all households to have access to a qualitative, well-functioning living space.

The single parent household and the large family household stand out in the presented demographic statistics presented here.²⁵ Both groups, the single-parent and the foreign-background household, are increasing in number today. The two households in the study have a lack of living space and a limited economy to solve the situation. There are few or no choices for access to another dwelling. Their spatial request is to have a dwelling that allows everyday life to function, fulfilling needs such as retreat, privacy and safety. These can be regarded as basic residential needs, yet they are obviously not fulfilled for these households.

The single parent household has solved the limited economic situation by renting one room out. The spatial situation is crowded but the flexible way the tenant's room is used provides enough margin for the parent. The practice of renting one room out can be regarded as residential usability. The parent appears to be content with the solution. The large family household has tried different ways to furnish and use space. For them there is no obvious solution to their residential situation. The sizes of the rooms in the apartment are described as limiting. In this situation an apartment supplying residential usability might have provided an acceptable and perhaps temporary residential solution, but this is not definitive.

The participation dimension: From the perspective of user participation, the flexible space is seen not only as a practical use of physical space but as a means for the residents to engage with the dwelling, attaining social aspects such as belonging and identity, quality of life and self-realization.

24 See Chapter 3, p 27–30.

25 See Chapter 2, p 22–24.

One factor that emerged from the study are the different attitudes to the lack of residential space. All three households must be considered as having an extensive lack of living space. The shared custody household and single-parent household appear fairly content with their present residential capacity – they do not bring up the lack of living space as a major issue. Meanwhile the large family household expresses discontent and has obvious difficulties in managing the spatial needs in everyday situations. The shared custody household and single-parent household have had the opportunity to solve their residential situation through their own choice. This can be seen as a form of user participation. The shared custody household has merged two apartments and solved the question of the children having their permanent rooms, and the single-parent household has been able to choose a two-bedroom apartment instead of a smaller one, solving the economic issue by renting one room out. Both these solutions are here considered flexible ways of using the available residential capacity, where the residents themselves have been able to come up with a solution that can work for their residential needs.

An interpretation of these different attitudes can be that the personal choice and the possibility to solve the requests have an impact on the perceived residential situation: user participation can affect the perceived residential situation in a positive way. This reflects what is often brought up as one of the qualitative aspects of user participation.

The social cohesion dimension: The sustainability of the community. Dempsey et al. present five interrelated dimensions that operate for sustainability: social interaction/social networks in the community, participation in collective groups and networks in the community, community stability, pride/sense of place, and safety and security.

In all three residential situations the neighbourhood emerges as an important factor for the households. In the shared custody household and single parent household, the neighbourhood represents a substantial secure and familiar frame for the dwelling. In the large family household the problems with gangs have resulted in an unsafe neighbourhood. What used to be the social arena for the housing area is now threatened by gangs of young people spreading insecurity. Still the household has relatives and friends in the area and have a working social network. This can mean that the neighbourhood still provides a significant and important frame for the everyday life.

For the shared custody household and single parent household, the emerging social aspects connected to the neighbourhood are a sense of com-

munity attachment, belonging and identity, social cohesion, inclusion and interaction and also safety. For the large family household, social aspects such as belonging, social interaction and social inclusion may still be strong even though safety and identity can be questioned. All three households have established a social network in their area. The everyday use of services, daycare and schools also means a social cohesion.

The neighbourhood appears to be a substantial part of the dwelling quality for all three households. The five interrelated dimensions that Murphy speaks of are all present in the interviews. Social interaction and participation in collective groups stand out as critical issues, while pride and sense of place are also relevant for the residents. Community stability – the possibility to stay in the neighbourhood – can be seen as possibly enabled by residential usability. Providing adaptable dwellings increases the possibilities to stay, and this also affects the sense of safety in the neighbourhood, recognising people living near to you.

One example of flexible housing where this relation between residential usability and the ability to stay in the same home as spatial needs change is the experimental house in Järnbrott.²⁶ Results from a report show that the average time for a household to stay in their apartment in this housing estate is nineteen years. This can be compared to the average of seven years for the property owner's housing stock as a whole (Andersson, Jonasson and Olsson 1988: 39). The adaptable space provided by flexibility of course cannot be seen as the only factor affecting the longer stay in the same dwelling. The authors describe that the project's strong identity, being something special, attracted a specifically interested group of households. Their attraction to and identification with the project, along with a good sense of community in the neighbourhood, may also be factors that have made them stay longer than usual.

The awareness of sustainability dimensions: The awareness dimension implies insight into how spatial use can reinforce residential quality and respond to changing living situations, and how staying in the same community can promote sustainability. Thus, this dimension deals with the need to make residential usability part of the conventional residential routine for households.

The effects of residential usability appear to be an absent dimension for the households in the three residential situations. Still, two of the households have used their residential space in unconventional and adaptable

26 See Chapter 2, p 11, 14–15.

ways to solve their living situation. The shared custody household shifts the children's rooms between the apartments, and the single-parent household has a tenant to solve the economic situation, the parent practicing a type of compact living by sharing a bedroom with her daughter.

5. 2. 1 Residential usability - reflecting feasibility

When considering the efficiency of residential usability, contextual factors must be observed. Residential usability can provide spatial solutions for diverse needs, but every dwelling that offers residential usability cannot solve every spatial request. There will always be a limited capacity to the spatial usability provided, depending on the household constellation, spatial needs and requests. It must also be considered that spatial usability is not always exploited. From this perspective, a dwelling that offers diverse solutions for residing can accommodate a wider range of life processes, but the actual action from the resident is an equally important factor in making this process happen. Thus improved residential usability provides room for a degree of uncertainty in relation to the development of demographics and social needs (Schneider and Till 2007: 50).

,

6. RESIDENTIAL DESIGN ENGAGING SPACE AND TIME

Previous chapters have discussed theory and empirical cases but this thesis project has also aimed to go from theory to practice and to study possible ways to make aspects of social sustainability a salient component in design work concerned with residential space.

The study of a practical approach to the subject has been developed in a master of architecture studio environment with a research by design orientation. During the research, several designs were developed to study the notions of residential usability and social sustainability using different formulations of questions and varying perspectives. During this work the *time* and *space* dimensions emerged as vital tools for reflecting these notions. In the design work the residential process was implemented as an active factor in the work with the floor plan design. This way of working turned out to be a method for visualizing the existing spatial needs during a residential process. The method enables a long-term perspective on the spatial capacity of the residence: the estimation of a dwelling's spatial adaptability over time and consequently its spatial capability to promote aspects of social sustainability.

6.1 THE RESIDENTIAL PROCESS

The residential process is a central notion in the field of flexible housing, as mentioned in Chapter 2. In many works in that field the time factor – meaning changes in residential needs over time – is an important variable (Habraken 2011: 18–21; Priemus 1993: 19; Brand 1994: 2; Leupen 2006: 17–20; Schneider and Till 2007: 35; Duelund Mortensen et al. 2006: 52). Schneider and Till relate to the residential process claiming that housing is subject to a whole range of cyclic and non-cyclic changes (2007: 35). If residents' requirements are not fulfilled, at worst the dwelling may become obsolete.²⁷ Brand emphasises the questions of space and time as crucial, intertwined factors in design practice. He involves time as a major factor in the use of space. He describes architecture as a permanent restricting fea-

²⁷ Their reflection on the need for adaptable space as a consequence of the residential process is quoted in Chapter 2, p 10.

ture not attentive to the presence of time and emphasises the importance of the building's adaptability to respond to time and the need for spatial use (1994: 2).

In the Dutch housing tradition, the flexible housing idea, including the residential process, has had an obvious significance through the years. As early as the 1930s, Dutch architects Van den Broek and Leppla conducted research on processes of residential use combined with the different life phases. A dwelling had to be able to meet all the functional needs of the individual users (Van Eldonk and Fassbinder 1990: 29–31). Later Habraken also brings up the subject, describing dwelling as the result of a process and claims this as central for the perspective on the dwelling: 'If the dwelling has a function, it is that it exists to allow man to function' (2011: 21). Priemus subdivides the process of dwelling into external and internal cyclic and non-cyclic changes (1993: 19), defining the dwelling process as a naturally recurrent cycle. The view of the residential process as an essential part of residential design also appears to be present in more recent design practice in the Netherlands. Van Eldonk and Fassbinder describe the increasing diversity of household types and the fluctuation of various forms of accommodation as influencing factors for the drive towards flexible housing architecture developed in the first half of the 1990s (1990: 65).

6.2 THE TIME-SPACE MODEL

When reflecting on the master of architecture design studio work, the residential process provided a dynamic method or tool understanding the spatial capacity of a dwelling. The method reflects the capacity both from a short-term perspective – for the household inhabiting the dwelling, and from a long-term perspective – the dwelling's spatial capacity to encounter and to adapt to demographic changes.

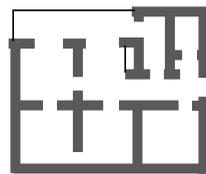
The method consists of a number of floor plan models for the same dwelling but presenting narratives of different living situations.²⁸ In this work, the method is named the *Time-Space model*. In this model the household's diverse residential situations are presented through furnished floor plan layouts, applying a time factor. This makes it possible to exemplify a residential process in the dwelling. The short-term perspective on the dwelling's spatial capacity can be visualized by using one stipulated residential household and designing for the different living situations that can appear

28 The method and preconditions are described closer in Chapter 4, p 37.

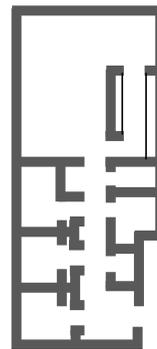
during a selected time span. The long-term perspective is captured by using the same procedure but for different types of households and over a longer time-span (making it possible to project the dwelling's capacity over its entire life-cycle). The Time-Space model becomes a tool to validate the capacity and range of residential usability.

6. 2. 1 *A model involving residential life*

Two examples from the master of architecture studio work will be displayed to present the Time-Space model and how it works.²⁹ The examples presented exemplify the two types of flexible floor plan design, adaptable and flexible space.³⁰ The visualised residential situations are projected throughout the apartment's residential use during both a short- and a long-term perspective, showing both the residential process for one household but also residential situations for diverse households, reflecting the dwellings capacity to encounter demographic changes. To provide a wide range of residential processes and diverse spatial needs, the household types displayed are both pluralistic households and the nuclear family.



Time-Space model 1
Adaptable space.
Master student design



Time-Space model 2
Flexible space
Master student design

29 Students performing the floor plan design have been consulted and acknowledged the use of their floor plan designs for this work.

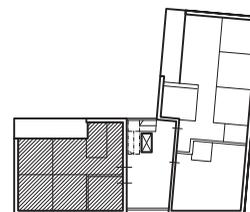
30 See Chapter 2, p 10.

TIME-SPACE MODEL 1 / ADAPTABLE SPACE / MASTER STUDENTS

A: COOPERATIVE HOUSEHOLD

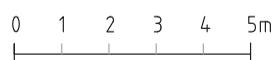
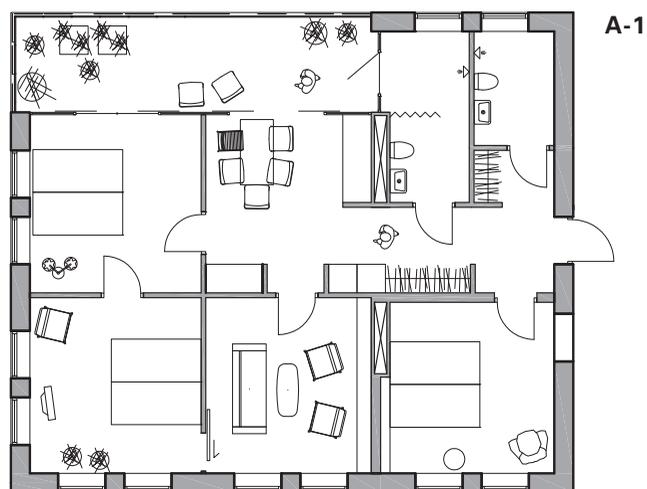
Master students: Sofia Wendel, Ylva Frid

APARTMENT: Three bedroom apartment, 90 m²



Fictive narratives reflect the residential process.

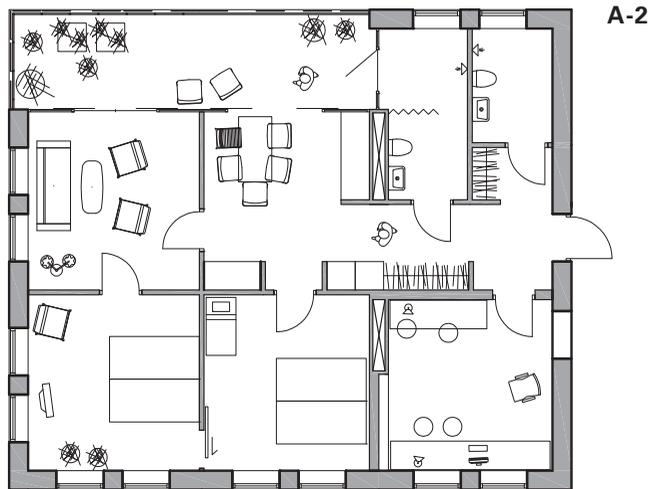
A sequential transformation of spatial use in the dwelling



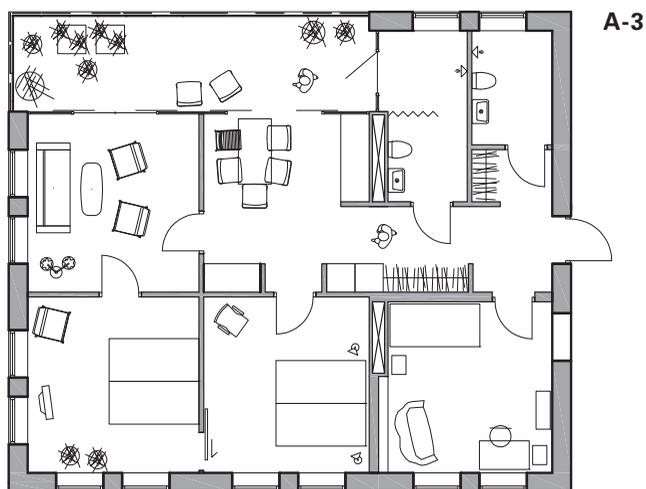
A-1. STARTING: Three couples share apartment. They have one private room each and a common kitchen and library.

Comment from resident:

We used to live in a larger apartment on our own but actually it was mostly left empty. It is great to share – always someone to talk to.



A-2. AFTER FOUR YEARS: One couple have moved out. Two couples remain sharing apartment. One of the couples also by now has a child. The household has a common kitchen and living room. The room next to the entrance is used as office of one of the parents. This makes it possible for him/her to keep up the own private firm and be flexible with parenthood and work.



A-3. AFTER EIGHT YEARS: The two couples still share the apartment. The child is now four years old, by now she has her own room.

TIME-SPACE MODEL 1 / ADAPTABLE SPACE / MASTER STUDENTS

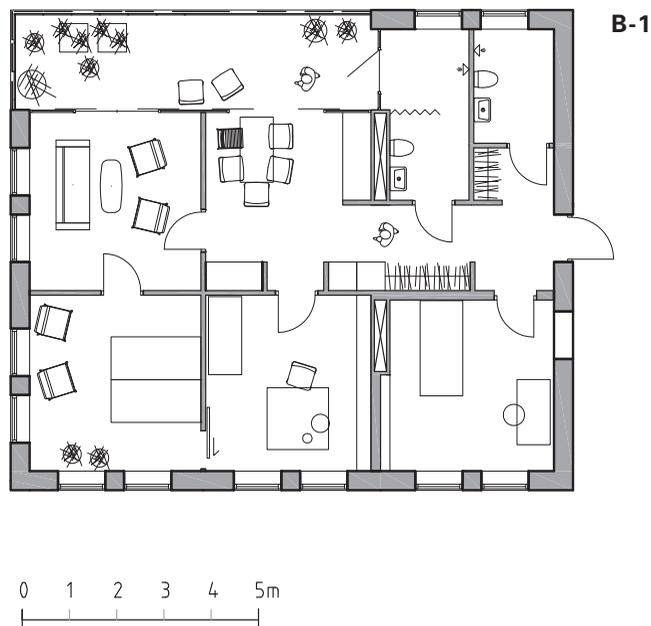
B: GENERATIONAL LIVING / OR RENTING ONE ROOM OUT

Master students: Sofia Wendel, Ylva Frid

APARTMENT: Three bedroom apartment, 90 m²

Fictive narratives reflect the residential process

A sequential transformation of spatial use in the dwelling

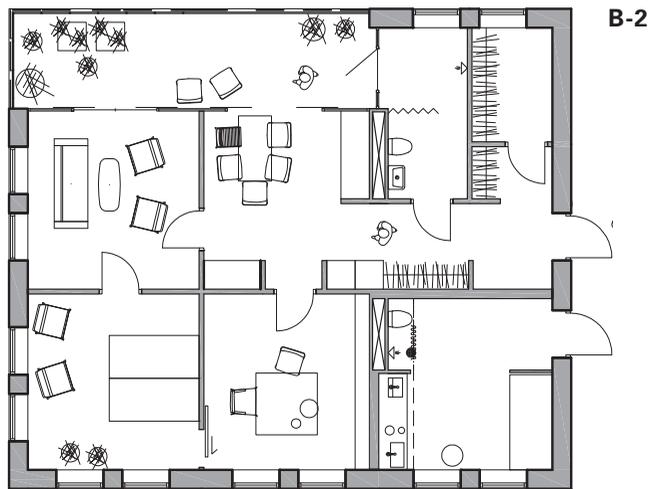


B-1. GENERATIONAL LIVING:

One couple with a young child live together with the grandmother.

Comment from parent:

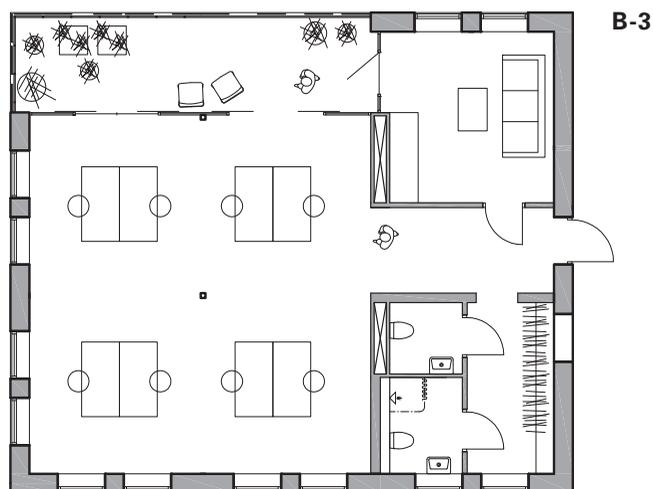
Of course I feel bad about working so much. I wish I could spend more time with my son, but it's great to have mum here.



B-2. HOUSEHOLD WITH TENANT: An older couple have split the apartment so that they can rent one room out and still be fairly undisturbed. They rent out to a young student at Chalmers University of Technology.

Comment from the man:

The extra money gives us the possibility to have a safe senescence, and that student turned out to be a nice young lady, practising football I believe.



B-3. HOUSING SURPLUS ON MARKET:

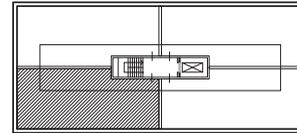
The apartment is transformed to office to adjust to market requests.

TIME-SPACE MODEL 2 / FLEXIBLE SPACE / MASTER STUDENTS

A: FAMILY, GROWING AND LATER CONTRACTING

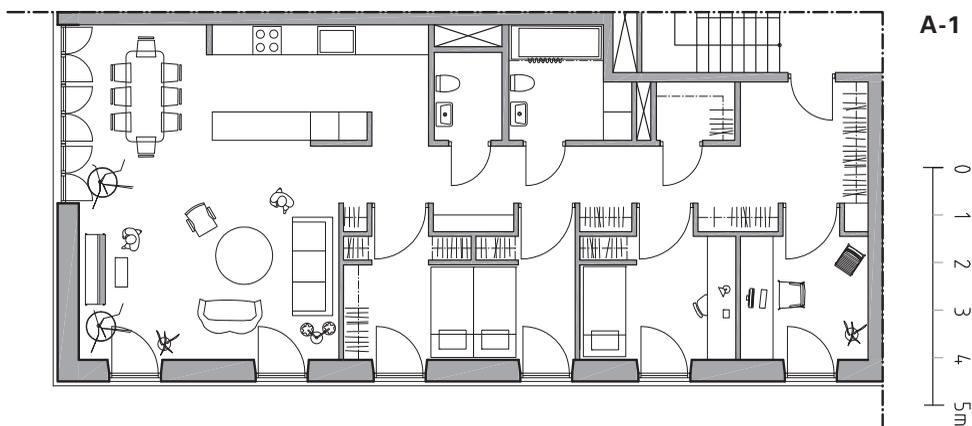
Master students: Johan Zetterholm, Jonas Tjäder

APARTMENT: Flexible number of rooms, 110 m²



Fictive narratives reflect the residential process

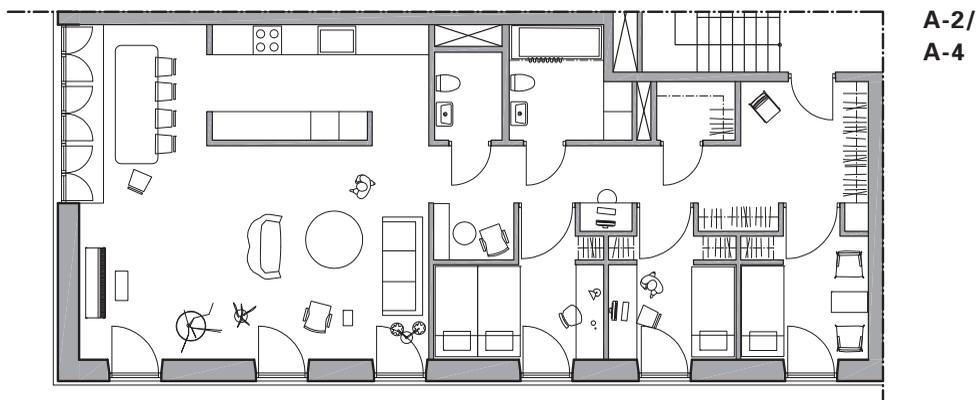
A sequential transformation of spatial use in the dwelling



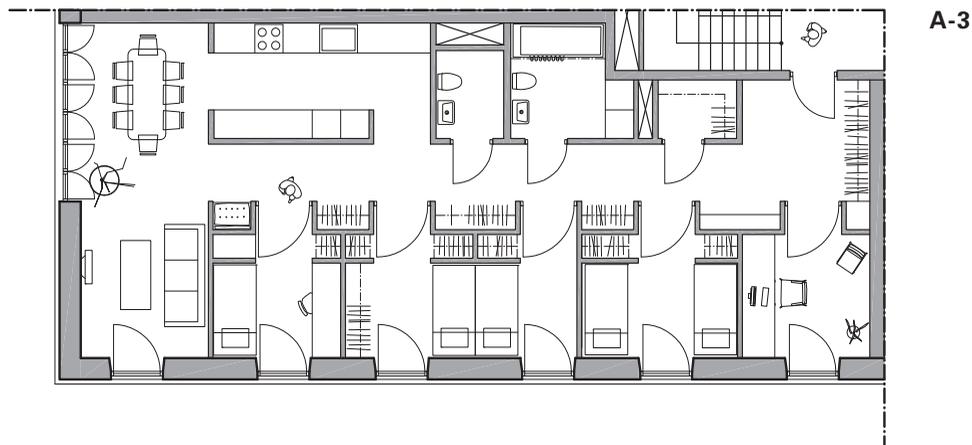
A-1. STARTING: Two parents moving into the apartment. They have one child.

Comment from parent:

We have lots of room. No need to worry about lack of living space!



A-2. AFTER FIVE YEARS: The family grows. They have another child. From the start the two children share one room but when school starts for the older one it's good to have separate rooms so that homework can be made undisturbed.



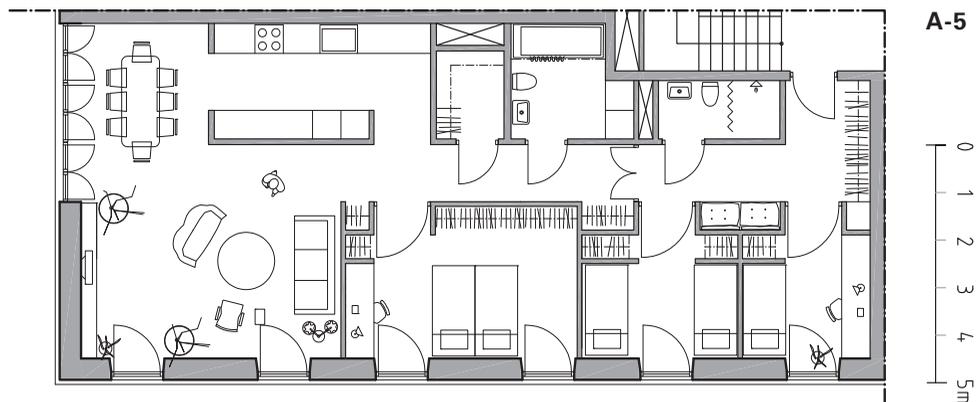
A-3. AFTER EIGHT YEARS: The family grows further. There are now three children. For the two younger children and the parents the separate working room makes an important space for concentration (work and homework). The oldest child has an own room.

Comment from parent:

Suddenly we are to crowded! We need more of everything: Storage, a larger living room and by now, I really want a balcony!

A-4. AFTER SIXTEEN YEARS: (same floor plan as A-2)

The oldest child has started working and is renting a small room in the neighbourhood. The two remaining children have one room each. The family stick by even though they experience a lack of living space. The children have friends and school in the neighbourhood and the whole family have a social context here.



A-5. AFTER TWENTYSEVEN YEARS: The children have moved and the parents still live in the same apartment. They are very happy to sometimes have visiting grandchildren. They now have one guest room so they can host both the family and friends visiting. They also rent one room out. This is a welcome economic addition to their income.

Comment from parent:

Fantastic to be able to do some traveling. That is thanks to the extra income from our lovely young students renting the room!

TIME-SPACE MODEL 2 / FLEXIBLE SPACE / MASTER STUDENTS



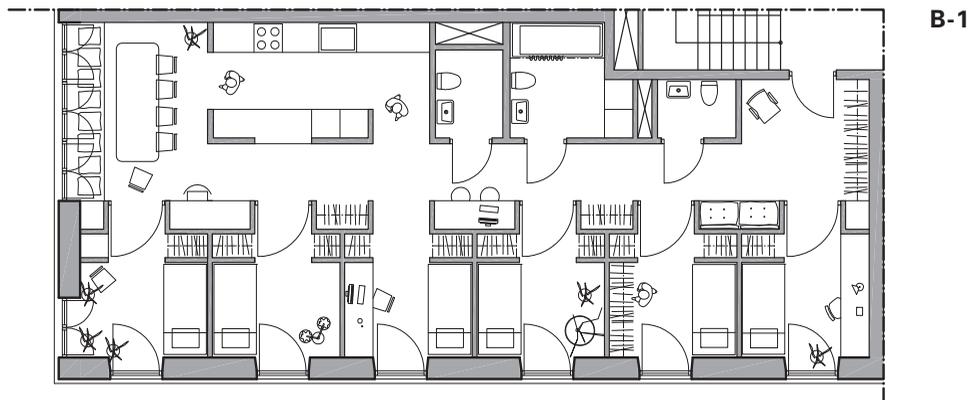
B: COLLECTIVE LIVING / SOLO LIVING WITH SPATIAL LIVING

Master students: Johan Zetterholm, Jonas Tjäder

APARTMENT: Flexible number of rooms, 110 m²

Fictive narratives reflect the residential process

A sequential transformation of spatial use in the dwelling

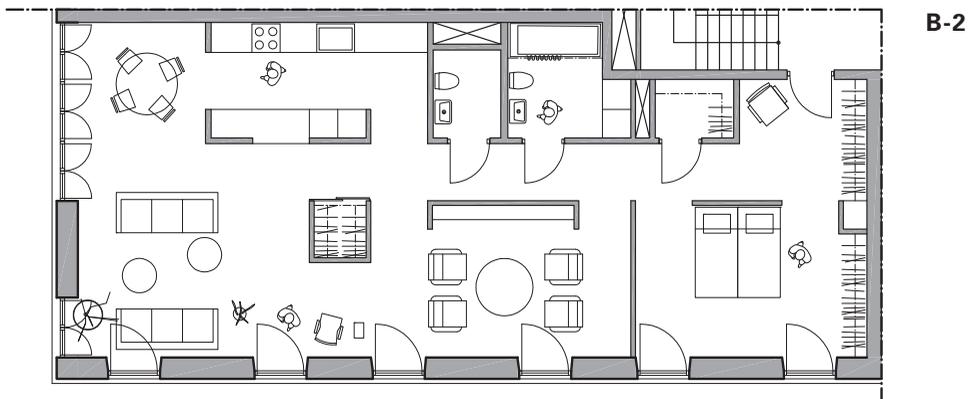


B-1. COLLECTIVE LIVING,

ELDERLY: A group of older women have created a collective living. They share many interests as cooking, reading and the French sport boule. There are several collective livings in the housing and in the entrance level there is a common dining hall and a large room for socialising.

Comment from resident:

*I really enjoy not having to be alone. Here I have lots of friends.
And most important is the bowling green just outside here!*



B-2. SOLO LIVING: A middle aged, hard working woman lives in this spatial apartment. She has her studio in the apartment. The little time she does something else than work she often invites friends, cooking large dinners. But, of course, sometimes the large dwelling can feel to empty!

Comment from resident:

*I guess I could rent out one room or two! This would both give me
some company and a smaller space to feel lonely in!*

6. 2. 2 The Time-Space model – Reflections

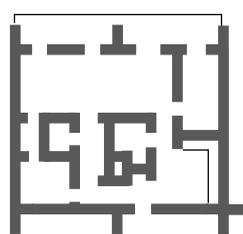
The validity of the Time-Space model needs to be commented upon. In the studio work the model is recognized as a tool that can be employed in the design work with residential floor plans to make it possible to visualize and estimate aspects of social sustainability. It is essential to point out, however, the weakness of the construction. The Time-Space model is a constructed framework, developed from a time-factor and the perceived use of residential space through floor plan layouts. Conventional frameworks or tools often need to be questioned. Framing can leave out critical variables or oversimplify a question. Referring back to Schneider and Till, the knowledge of future residential demands is not clear, and therefore the long-term perspective on residential design, with flexible housing that can respond to demographics and social needs, becomes difficult to foresee (2007: 37–38). This means that there is no clear direction for what spatial needs to supply. Also, referring back to previously established theories about the contextuality of social sustainability, it cannot be defined. The situational and temporal dimensions as well as the actions of the various individuals and groups involved determine the frames. In this context, both the unknown future demographic trends and the multifaceted dimensions of social sustainability are inconstant variables. Consequently the model cannot with absolute certainty reflect a long-term sustainability perspective, nor is it a guarantee for achieving social sustainability in a residential design. Still, it can allow us to estimate the residential capacity for the near future, as reflected in the known demographic preconditions. Also, as the unknown future demands cannot be foretold, the housing production will have to accept uncertainty (Schneider and Till 2007: 37–38). Adding a range of residential usability to the housing stock can make it better prepared to meet an unknown future. In conclusion, the Time-Space model appears to be a tool for supplying possible aspects of social sustainability in residential design work. Thus it can be a useful tool in architectural design work with residences but also when communicating spatial ideas, functions and social aspects in forums for planning new housing. This work considers the residential process to be a critical precondition for residential design work, which may call for a paradigm shift in the way we think about design.

7. THE VIVA PROJECT: REALIZING RESIDENTIAL USABILITY

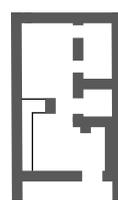
This thesis deals with questions of residential usability and how it can be understood and occasionally also implemented in residential design work. When discussing the implementation of that design, practical feasibility becomes a critical topic, and has a substantial impact on what is finally produced.

The question of how feasible residential usability is in contemporary housing projects generally depends on, among other things, how it is preconceived among developers. The general perception that residential usability, once provided, remains underutilized or fails to deliver enough qualities can make the subject of flexible space less interesting. Residential usability can also be understood as a too complex and perhaps also expensive amenity to implement.³¹

The Viva project, the realization of a housing development within the Positive Footprint Housing project, has been briefly presented in Chapter 1, and has been developed in parallel to this thesis work.³² Presenting examples of floor plans and interviewing the developers shows the results of the floor plans from the design work, and allows us to reflect upon the design solutions and contemplate the preconditions for realisation. This can illuminate how the subject of residential usability is conceived, as a way to understand the complexity and the multi-facetted perspectives on the question.



Time-Space model 1
Flexible space



Time-Space model 2
Flexible space

31 See Chapter 2, p 10.

32 See Chapter 1, p 2.

7. 1 THE VIVA PROJECT – RESIDENTIAL USABILITY DIMENSIONS

The Viva project is a complex housing project that embraces many different solutions of qualitative housing thinking. For this chapter, the project will be narrowed down to reflect the ways it deals with social sustainability issues and residential usability in particular. As the project has focused on social sustainability aspects on many levels, prioritizations have been made which, among other things, has affected the issues of residential usability.

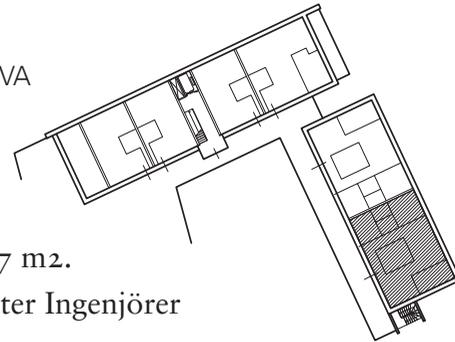
7. 1. 1 *Some strategic goals*

The apartments have been designed to provide diverse dwellings that can accommodate a variety of different households in the development. The apartments differ in size and some are on two levels, but the housing block mainly consists of small, efficient apartments. This is considered a strategy to lower the housing cost and make it affordable to a wider range of households. The many small apartments are complemented with common spaces that expand the residents' territory, enabling aspects of social interaction and by extension social inclusion, safety and identity. These common spaces include, for example, a conservatory, an outdoor space for relaxation, and a bike repair room. Other common facilities planned for the development are a car pool and a common pedestrian mall that connects the apartment's entrances, provides small seating places and enables social interaction. The mall is oriented to the south, which can make an attractive place to take in the sun.

Concerning the residential usability, this focus was not a strategy chosen for the design work from the start. But during the course of the work, the qualities of adaptability emerged as interesting to try out in the project. The larger dwellings in the housing block were designed to enable a diversity of spatial solutions, while the many small apartments do not have this capacity. The residential usability in the larger apartments is implemented through adding or subtracting walls in the dwelling. This type of adaptability has been found to be effective and is reasonable in terms of technical solutions, costs and market requests. Two examples of floor plans from the Viva project are presented here as a Time-Space model diagram in order to visualize the capacity of the adaptable design solution.

7. 1. 2 *The floor plans reflected through the Time-Space model*

TIME SPACE MODEL / FLEXIBLE SPACE / VIVA

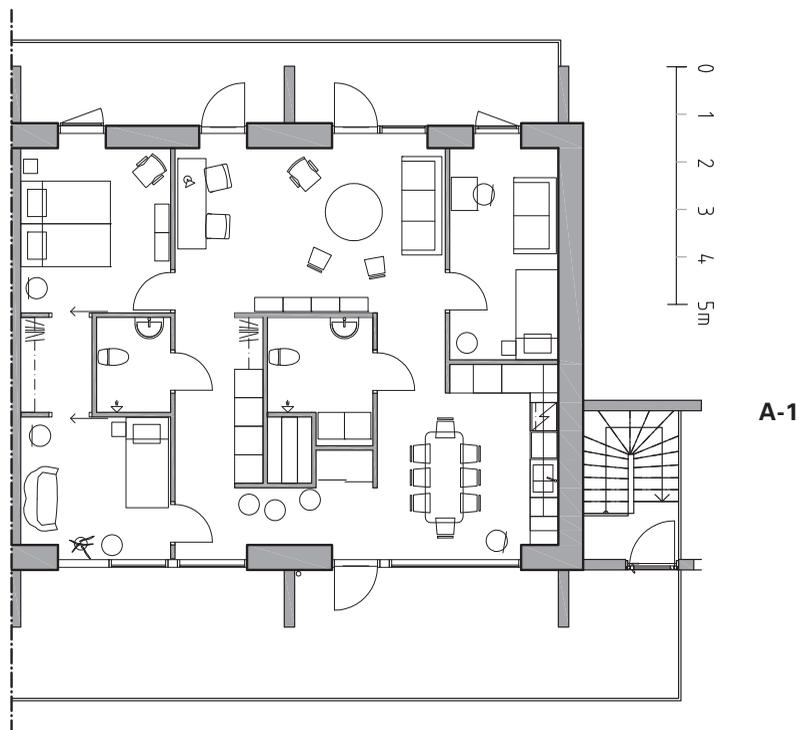


A: COOPERATIVE HOUSEHOLD 1

APARTMENT: flexible number of rooms, 97 m².

Architect: Malmström Edström Arkitekter Ingenjörer

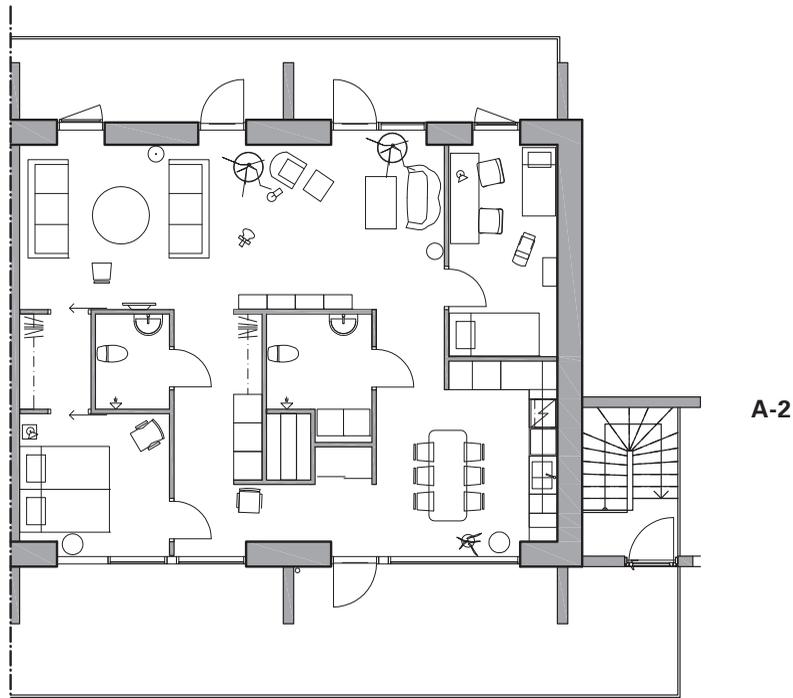
Fictive narratives reflect the residential process. A sequential transformation of spatial use in the dwelling.



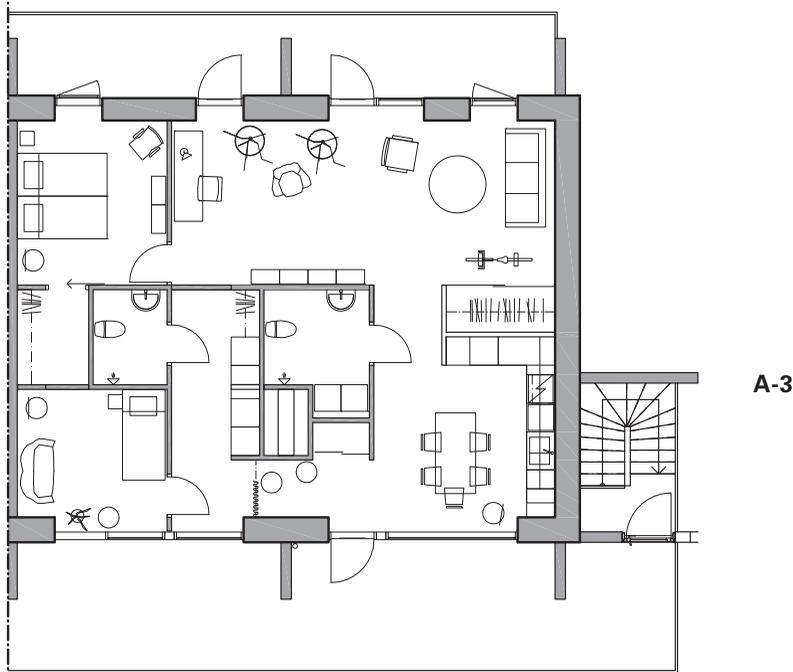
A-1. STARTING: One couple and two singles share the apartment. They have one private room each and a common kitchen and living room.

Comment from resident:

We take turns on doing the cooking and cleaning. Convenient living! And affordable!



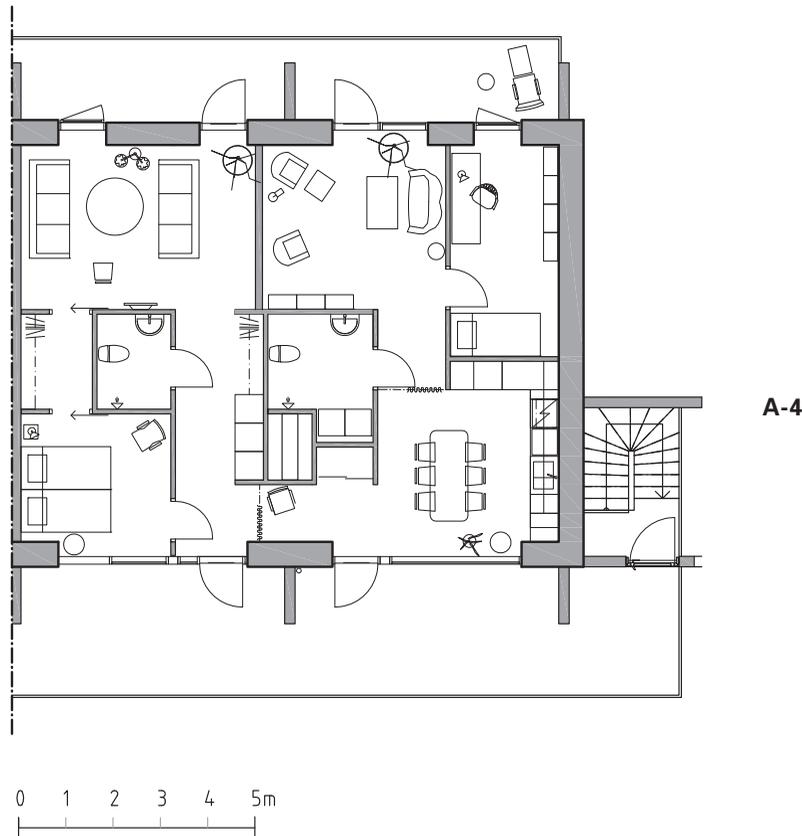
A-2. AFTER SIX YEARS: The singles have moved out. The couple remain in the apartment, and now they have two children two and four years old.



A-3. AFTER NINETEEN YEARS: One teenager has moved, the other has her own more separate part of the dwelling.

Comment from teenager still living at home:

For me it's good to not have to live too close to mum and dad. I like to see my friends and we often hang out late.



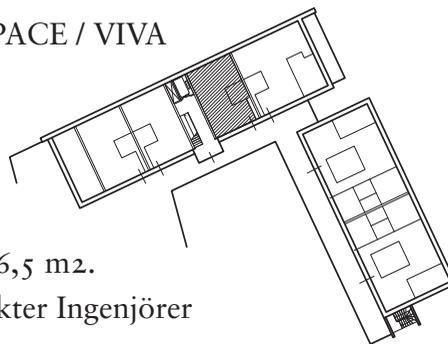
A-4. THE APARTMENT AFTER THIRTY FIVE YEARS:

There has been no request for large apartments in the Guldheden area in recent years. The apartments' floor plan design allow splitting the larger apartments into smaller units. This is good for the the Viva condominium development. The small units are popular and the Viva development is also appreciated for its conservatory and the social spot the entrance galleries provide. (The floor plan solution requires extended fire solution and extended technical solution.)

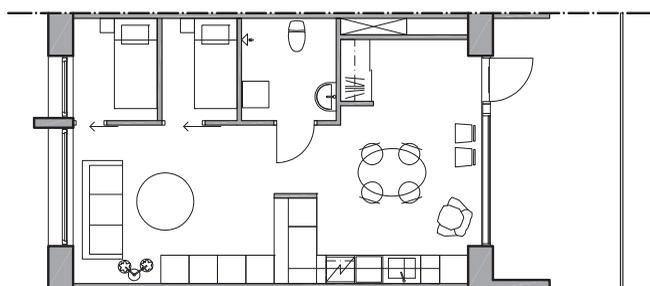
TIME SPACE MODEL / FLEXIBLE SPACE / VIVA

A: COOPERATIVE HOUSEHOLD 2

APARTMENT: one bedroom apartment, 46,5 m².
Architect: Malmström Edström Arkitekter Ingenjörer

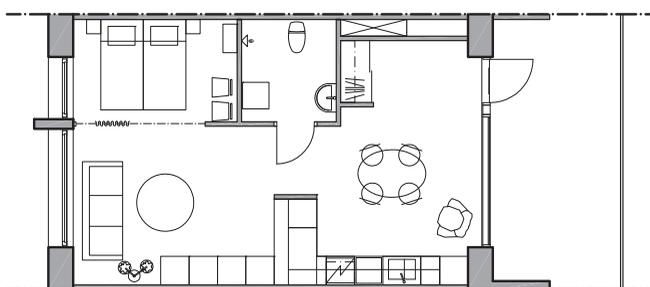


Fictive narratives reflect the residential process.
A sequential transformation of spatial use in the dwelling.



A-1

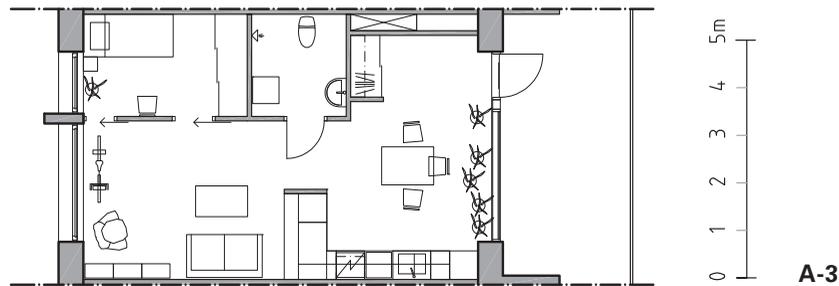
A-1. STARTING: Two students share the apartment. Being two here means crowded living, but the possibility to divide the sleeping space into two units makes the cooperative living work. The apartment is well situated on Guldheden, since both students study at nearby Chalmers University of Technology.



A-2

A-2 . AFTER FOUR YEARS: They fell in love. No wall is needed!

Comment from one of the students:
Who would have believed this!



A-3. AFTER SEVEN YEARS: Well, the relationship did not last. Studies abroad made it hard for the couple to stick together. One of them now lives alone in the apartment.

7. 2 THE VIVA PROJECT – PRECONDITIONS FOR RESIDENTIAL USABILITY

During the Viva project, there have been discussions of the effects and qualities of residential usability and how it can be implemented in the design of the dwellings. To better understand the existing preconditions and the priorities made regarding issues of residential usability, an interview was conducted with Mikael Ahlén and Anders Johansson, the head of marketing and project leader, respectively, for the developer Riksbyggen. They were asked to summarize their perspective on different solutions for residential usability in the dwelling, and to say what factors affected their decisions about those solutions during the design work with the Viva project. From the interview some issues emerged as critical for the results of how residential usability ultimately was designed. Some of these - the sizes of the dwellings, the preconceived idea of user participation, the preconditions of the market, and the technical solutions and building regulations - are reflected below with comments and quotations from the interview.

Sizes of dwellings: The many small apartments in the development reflect a priority that limited the option for flexibility. One reason for this is that the small units have a small range of façade exposure, which limited the options for daylighting and for alternative spatial solutions. Another flexibility factor affected by the focus on small, efficient dwellings is the possibility of working with the flexibility that general rooms can provide, as this demands more spatial solutions.

Marketing director:

In the Viva project we've really squeezed out every last square meter trying to minimize the size of the apartments – in order to invest instead in common areas. But of course then we come back to the fact that when we compress the floor area of the apartments, we lose a certain amount of the flexibility and generality.

Marketing director:

At the beginning of our work with the Viva project, there was a lot of discussion about generality versus flexibility. In the end, after looking at it from every possible angle, we ended up with quite a few small apartments in this project. We decided that wherever we could do it we would focus more on general floor plans that could be changed over time. It ended up being in the larger units ...

Interviewer:

I would really like you to comment on this idea of general spaces too. You've worked in that vein in the Viva project, but really the rooms are too small. And in many cases you have general rooms, too, which make the apartments feel bigger. Maybe that's a point you already knew from the start, but can you comment on this idea of general rooms and that way of working with apartments to create flexibility? What can you say about that?

Marketing director:

In the long run I think that generality, those general rooms, are good economically. Because what we build now, you know society's demands are going to change, and consumer behaviour, and then you're going to have to do some really substantial renovations in forty or fifty years to repair and adapt and so forth. But the [apartments] that are general, those don't need to be remodelled. So in the long run it's probably good to have general rooms, but it may be that in the short run, because you need to build a little bigger, you can't afford it. It's a matter of squeezing the most out every square meter.

User participation: The range of user participation enabled in the apartments in the Viva project is built upon the anticipated perspective of the typical resident. The apartment dweller is assumed to value convenience more than the typical single-family home owner.

The two aspects that appear to be critical for the resident's involvement when discussing residential usability are housing cost and the freedom to choose finishes and equipment. The opportunity to engage in one's home by working on it, and how this can mean positive social dimensions, is not reflected in the project.

Project leader:

But when I think about a single-family home, the tradition is that you buy a house because you want to be able to do whatever you want with it. But apartment living is often more convenient – I think that's the difference ...

Project leader:

Yeah, so it's a little problematic if you think about the total cost picture. You know if you buy a hundred different variations of something, or if you buy everything one at a time, you get flexibility – so if you're buying a new kitchen or new flooring, that's a way to get exactly what you want. But of course there's a reason to get together with other people and buy in bulk. That's what you get with a condominium association – you get together and a hundred people make a choice to do the same thing, and then you get a completely different price and it's a lot easier to get the work done by a skilled professional.

Project leader:

But I just have to say: money. You don't save a ton of money that way, but it's just that you can put your own personal stamp on it. [...] So it's probably the expectation of being able to exert some influence [on your home] that's the driving force, rather than saving money. It can be a little cheaper if you can get help from friends or something – that can save you some money. But that's not the main thing. And the question is if this [desire to do it yourself and have control in changing your own home] is common these days, and how significant it is. I don't know.

Market preconditions: How is the idea of an adaptable apartment presented for the resident, the customer? What is the developer's preconceived idea about the resident's relation to residential usability? How can it be sold in the market? It is interesting to understand how this quality can be presented, since flexibility cannot be seen as a conventional solution for an apartment.

Marketing director:

The way I see it, if we're offering one-bedroom, two-bedroom, and three-bedroom apartments, then it's very important that the marketing materials show the three opportunities, all furnished and ready to go, and it's important we talk about it. And when you're talking about a sale it's important you talk about the fact that the apartment is flexible – but that's not so interesting to the customer; what they're interested in is what does that mean, what are the implications of that? So: first that you can choose to have a separate bedroom, you can have a home office, and if there are just two of you now – a young couple – you have the ability to make another bedroom later. Now you're talking about a selling point – the implications and value added for the customer. This is something I expect all of our sales people to do, but relate it personally to the particular customer they're dealing with. Some of these things are more general, like the overall marketing of the units – they are flexible or changeable apartments. And of course that has value when the time comes to sell it to someone else. If you say you can change this apartment and the customer knows about that when he decides to move again, then your target audience goes beyond this customer and the apartment can appeal to a broader group.”

Project leader:

That ought to expand the pool of buyers, you would think. So yes, I can imagine buying this apartment even if we have plans to grow our family. After all, you're paying millions [of kronor] for the apartment. So if you tear down an interior partition and shorten an air duct and install a new floor, it's still hard to spend more than a hundred thousand ... In that context it's fantastic.

Interviewer:

It could also be interesting to give the customer that perspective that the unit can be changed at some point far in the future and not just right now. Otherwise you get stuck in the same rigid situation again, not understanding that the apartment can be modified.

Marketing director:

Yes, it's definitely good that the customer has an understanding of that. We have to become good at describing and showing these qualities.

Interviewer:

Normally we're only shown the nuclear family's living arrangement – a single diagram, only one floor plan. This [Time-Space model] shows how a home can be used and changed over a long time, maybe fifty years into the future. Do you think it's good to be able to see this? Do you use this long-term perspective of the apartment's usability?

Marketing director:

When we sell apartments to parents and growing families, it's natural for us to talk about these things. Now that you mention it, I don't think the issue comes up so often. Normally when we sell it's all about right now, and for the customer who's there right now. And I don't think that new construction marketing gets into these issues. As property managers we deal with them, but in that case we're dealing with owners of their own condominium units, and they're doing whatever they feel like in renovating their apartments.

Interviewer:

But how do you view all this as a sales argument? Like right now with Viva.

Project leader:

I believe that for the time being there are very few [who think about that] –that's the feeling and the image I have. One reason why there hasn't been so much emphasis on that question is that a lot of people just don't think that way. They don't see themselves living in the same place for very long. I think that's how it is. People have a pretty shorted-sighted view of it. 'We've sold our house now and we're moving to an apartment' – that's a typical client for us. 'We want the convenience, want a place just for us, and we can have the kids come to visit like this and like that ... and then a house in Spain, or a cottage for the summer.' There aren't very many who buy with that [long-term] perspective, except for a few families with

children. You'd have to buy a pretty big place right from the start, something you can grow into, and that's hard to afford.

Technical solutions and building process regulations: The rules and regulations for building development have affected the choices for residential usability on different levels, as have the regulations for the initial use of a new building.

Project leader:

... How do we make these flexible walls work? We design all the units as three-bedroom apartments, and then it's up to the customer to buy it as a two-bedroom or one-bedroom unit, so then we remove some of the mechanical equipment. But we still have to remember that if they want to put that wall back in there in the future, at least we've prepared for the ductwork. But then you have to think, how do you balance the system? There are a ton of things like that in a multi-family residential building. You think, if everyone suddenly remodels their apartment ... and then puts in their own ventilation system and their own diffusers, and this is a building we're supposed to be managing ... and it throws off the balance of the system – it's going to have consequences.

Marketing director:

I was also thinking about the legal requirements there are, too. In Sweden the building needs to be completed and you need to have a final inspection before it can be occupied. I think it would be possible to get around that, but we've never tried. What does it mean for the bank, for the financing – you've got a construction loan going the whole time you're building. If it's not considered finished until you have the final inspection, what do you do then?

Project leader:

You get pressure on the buyers to finish the interior work within a certain time frame; otherwise you run into trouble with the final inspection. You can get one of those preliminary injunctions, so you can occupy some parts of the building as they are finished. But that's a huge process too, arranging to inspect each apartment as it's completed. The trouble is, now you've got pressure on you – you can't just leave your apartment unfinished indefinitely ...

Interviewer:

So there's a lot to manage in a situation like this.

Project leader:

Yes, and those demands are perfectly natural, you have to admit. The authorities just want to know that before a place is occupied, we want to be sure it meets all the basic requirements in terms of building regulations about health, hygiene, safety ... I mean you don't want people sleeping on mattresses on the bare concrete floors in there just because it's cheap. People don't want that in Sweden.

Project leader:

In modern construction we also kind of paint ourselves into a corner. We have environmental classifications, right? Let's say gold, for example, and then sound class B. That makes everything that deals with flexibility more difficult. We impose these sound insulation requirements on ourselves because we want a high standard of living. So high-quality housing gives you a bunch of functional requirements that have to be organized, and then you end up with conflicting interests.

7.3 REFLECTING THE FEASIBILITY OF RESIDENTIAL USABILITY

The Viva project works with solutions for sustainable housing design, embracing economic, environmental and social sustainability goals. This task by definition embraces many complex and contradictory questions. The priorities established during the planning work, concerning the design of residences, shows the complexity of different questions as they affect the process that aims for sustainable solutions.

The market appears to have a critical impact on the feasibility of residential usability. Today the demand in the market is for small apartments, while there tends to be little or no demand for adaptable or flexible space. The Viva project has also focused on small, compact apartments that are fairly economical to build. The result is many small apartments and a fewer large apartments, of which the largest are adaptable and flexible. In the small apartments, flexibility or adaptability has not been implemented to any wider extent. The possible feasibility of more unconventional adaptable dwellings that provide a more comprehensive adaptability (with unfinished

space, for example)³³, was not regarded as a realistic option for the project. In this context the market has an impact on decisions made; to build an unconventional project is to take a risk.

The developer's conception of the user can also be a factor that affects the feasibility of residential usability. From the interview there appears to be a preconceived idea about the apartment-dweller as not requesting much direct interaction in the dwelling's design or construction - that is something more characteristic of single-family home owners. This issue can be regarded as relating to the user participation dimension³⁴, embracing the idea of allowing residents to engage with the dwelling, and thus enabling social aspects such as identity, quality of life and self-realization. There is a risk that this view of the dweller is overlooked in the contemporary housing design discussion.

The rules and regulations for technical solutions and environmental demands also appear to be a feasibility factor that affects the implementation of residential usability. In the Viva project the striving towards environmental sustainability goals means technical solutions that can limit the preconditions for spatial flexibility in the apartments. One example is the demands for ventilation, which employs a system not easy to adapt as the use of a space changes. The conventional systems for technical solutions we have today are not compatible with an apartment getting reorganized or transferring rooms to the apartment on one side or the other. Further progress will require a new way of thinking about technical systems.

33 Unfinished space: raw space: shell space in a building that has not yet been developed.

34 See Chapter 2, p 12.

8. RESULTS

8.1 KEY RESULTS

There are three key results from this work. One is the understanding that has emerged of the correlations among dimensions of social sustainability and residential usability. In this context, the equity dimension stands out, and leaves a critical assessment of the amplitude of the effects of residential usability.

The Time-Space model is a second key result. It enables an increased awareness of aspects of social sustainability in the design work with residences. The residential process is considered a critical factor in the discourse of residential floor plan design that embraces social sustainability dimensions.

The third key result of the work is the misfit detected between spatial requests and needs and the kind of residential design currently being provided. An important result is the illumination of the unconventional and diverse residential needs of the group of pluralistic households, and of how residential space works or does not work for their particular spatial requests and needs. This is especially important in light of the current focus of housing planning and production, the ongoing demographic transformation, and the consequences for long-term social sustainability qualities.

8.1.1 Residential usability: reflecting the four social sustainability dimensions

The equity dimension illuminates the group of diverse households with limited income and limited options to solve their residential situation. For these households, the results show that residential usability can make it possible for them to attain social aspects that can be regarded as extended residential needs by providing wider frames for the residential process. In this way a dysfunctional living situation can be avoided. Correlated social aspects include retreat, privacy and safety that enable the every day life in the dwelling to function.

One reflection that arose during my thesis work is that I have met many people with preconceived ideas about flexible housing. A common understanding is that it is technically complicated and expensive, not compatible with a conventional, qualitative alternative for housing design. The benefits of residential flexibility, the actual outcomes of a flexible usage of the residence, are many times referred to as a provision of joyful alternatives of spatial use.

It is plainly regarded as another extra amenity. The ongoing urbanization and the increasing housing shortage mean that some groups of households are left with no choices to solve a dysfunctional residential situation. These are many times households of limited income, often single parents, immigrants and young people who live with a shortage of living space. This can mean that extended residential qualities and social sustainability dimensions can be questioned. The equity dimension is sidestepped.³⁵ The understanding of residential flexibility as a provider of residential solutions that enable fundamental social aspects for every day life is not a common understanding among the actors in the field of residential planning and design. In this context the equity dimension of residential usability would need to be acknowledged to make the discussion more credible and just.

The result of the *user participation dimension* emerges as the resident's ability to implement their own residential solutions. Although the prevailing residential situation is crowded for all households, they present a different attitude to their situation. The two households that had the ability to solve their residential situations through their own choices, employing a form of residential usability, appear to be more content with their dwelling situations. This might be related to their ability to engage with the dwelling and solve everyday residential life, but also to attain social aspects such as identity, belonging and self-realization.

For *the social cohesion* dimension, the household's relation to the neighbourhood appears to be a critical quality. Social interaction, social networks and a sense of belonging come to the fore. Also social aspects such as pride, sense of place, and safety and security appear to be prevailing dimensions. In sum, the neighbourhood appears to be a substantial part of the dwelling quality for all three households. In this context, residential usability might possibly enable residents to stay in the same dwelling and consequently in the same neighbourhood despite changed residential needs.

The awareness of sustainability dimension appears to be an almost unknown dimension for most households. The residential solutions practiced in shared-custody and single-parent households is not driven by an awareness of sustainability, instead, actual need becomes the force for the unconventional use of residential space.

35 See chapter 3 p 28.

8. 1. 2 The Time-Space model: contemplating a paradigm shift within housing design

The empirical study of the social dimensions of residential space shows that the residential process continually means changing life conditions that imply new residential requests.³⁶ If spatial needs can be met, this also means that social sustainability dimensions can be retained over the course of a residential situation. In this context the residential process, is revealed to be a critical precondition for the design work with residential floor plans when considering social sustainability dimensions. This brings up the question of a paradigm shift in design thinking to focus on the residential process, and also on the pluralistic households as an increasing large group with the demographic transformation.

The relationship thus established between space and time, spatial usability and residential process, and the further exploration of these notions in the studio work, has resulted in a method for visualising a floor plan's capacity to respond to diverse living situations - the Time-Space model. This model allows us to involve social sustainability aspects in design practice, and can be a useful tool both in the architectural design work with residences and when communicating spatial ideas, functions and social aspects in housing development forums.

8. 1. 3 The demographic transformation: a precondition for residential design

Results from the empirical study of the social dimensions of residential space show that the design of floor plans representing function-based space, found in the large family household and the single parent household, have a limited capacity to adapt to required spatial needs. There is a mismatch between requests of residential space from these pluralistic households and contemporary residential design. The floor plans are a consequence of design work that uses a functionalistic frame as a design strategy without considering a residential process or the ongoing demographic transformation. The statistics presented in Chapter 2 describe a demographic transformation toward greater diversity among household types. From a long-term perspective this means increasing requests for diverse residential alternatives. The viewpoints of Schneider and Till, who claim that this demographic transformation constitutes a substantial precondition for the design of residential space, since it reflects the structure of households (2007: 37), in this context can be regarded as neglected or not known.

³⁶ See Chapter 5.

The unknown future perspective that Schneider and Till bring up when claiming housing as a long-term societal asset can be reflected through the proclamation in the Brundtland Report, the need to consider future generations (2007: 35–37)(WCED 1987). This perspective is essential to respect when considering what dwellings should be built today. Do we have a resilient perspective on the present housing production and do we promote future generations' ability to meet their own needs with the housing stock we're providing? In current housing production, the mindset on this issue tends to take a short-term perspective, avoiding the long-term question.

The discussion leads to two questions. First, is the long-term perspective on residential design a realistic dictum - will the flexibility be taken advantage of and the dwelling adapted to changing needs fifty or seventy years after completion? Second, who could be the champion for these sustainability values? The second question is difficult to answer. Considering the first, the example in Tensta presented in Chapter 2 describes a housing block in which the residential usability is employed fifty years after completion.³⁷ The project provides a strong example of the equity dimension's effect, and also shows how residential usability can respond to the ongoing demographic transformation and provide social sustainability from a long-term perspective. Still, this must be considered a rare project. This is not the way housing planning and housing production are typically conceived; for the most part the social sustainability perspective is not overlooked

8.2 FUTURE RESEARCH

When reflecting further research and reviewing possible issues that can progress and make this work more complete, to confirm, gradate and immerse the findings from this work regarding residential usability and the dimensions of social sustainability, is regarded as a relevant continuation.

The work will use a quantitative method involving empirical studies with interviews of households living in housing developments built with flexible design, and floor plan analyses of their apartments. Above the extended research on residential usability and the dimensions of social sustainability, the question of pluralistic households and diverse residential use and requests will be studied further.

37 See Chapter 2, p 13–14.

The Positive Footprint Housing project can also provide unique possibilities to study the relation between residential usability and social sustainability. As the Viva housing development will be completed and occupied in the near future, the possibility of following up during the start of the inhabiting process could offer interesting perspectives.

9. REFERENCES

- Andersson, B., Jonasson, K., Olsson, S. (1988) *Experimenthuset i Järnbrott*. Stockholm: Statens råd för byggnadsforskning.
- Andersson, E. (2011) Etisk estetik, *Svenska Dagbladet*, SvD Kultur, Januari 7: 11–15
- Andö, P. (2014) Vanligare att utrikes födda bor trångt, Nr 2014:74, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se/> »Hitta statistik»Artiklar»Vanligare att utrikes födda bor trångt (June 6, 2015) (Trångboddhet)
- Boström, M. (2012) A missing pillar? Challenges in theorizing and practical social sustainability: introduction to the special issue. I: *Sustainability: Science, Practice, & Policy*, 8(1): 3–14
- Bynert, S. (2008) Kollektivhus – Ett boende som allt fler väljer, *Svenska Dagbladet*, October 4, 2008. [Online], Available: <http://www.svd.se/kollektivhus--ett-boende-som-allt-fler-valjer> (June 26, 2015)
- Braide Eriksson, A. (2012) Housing inventions, Social hållbarhet och bostadsutformning, Positive Footprint Housing. Report, master of Architecture course. Department of Architecture, Chalmers University of Technology
- Braide Eriksson, A. (2013) Housing inventions, Social hållbarhet och bostadsutformning, Positive Footprint Housing. Report, master of Architecture course. Department of Architecture, Chalmers University of Technology
- Bramley G., Morgan, J. (2003) Building competitiveness and cohesion: the role of new housebuilding in Scotland's cities. *Housing Studies*, 18: 447–471
- Brand, S. (1994) *How Buildings learn: What happens after they're built*. New York: Penguin Books
- Charmaz, K. ((2006)2012) *Constructing Grounded theory*. London: Sage Publications Ltd
- Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011) The social dimension of sustainable development: defining urban social sustainability. *Sustainable Development* 19(5): 289–300.
- Duelund Mortensen, P., Welling, H, G. (2004) The Home as a Product. *Arkitektur Dk*, 8: 3–9
- Duelund Mortensen, P., Welling, H, G. Livö, M. (2005) Tid og rum i boligen. *Arkitekten Dk*, 15: 8–19
- Duelund Mortensen, P., Welling, H, G., Livö, M., Wiell Nordberg, L. (2006) Situations of dwelling – dwelling suiting situations. *Nordic Journal of Architectural Research*, Volume 9: 3

- Dyson, T. (2012) *Population and Development, the Demographic Transmission*. London: Zed Books
- Eldonk, J. van, Fassbinder, H. (1990) *Flexible Fixation: The Paradox of Dutch Housing Architecture*. Maastricht/Assen: Van Gorcum
- Friedman, A. (2002) *The Adaptable House*. New York: McGraw-Hill
- Groat, L., Wang, D. (2002) *Architectural Research Methods*. New York: John Wiley and Sons
- Gromark, S. (2007) La Cité Manifeste, Mulhouse 2005 – öppet, stort, ljust, fritt och ... billigt. In Nylander, O., Gromark, S., Nilsson, F., Redvall C., (Eds.) *Bostadens rum, Chalmersarkitekter om bostadens kvaliteter*. Värnamo: Arkus
- Glaser, B., Strauss, A. (1995 (1967)) *The Discovery of Grounded Theory*. London: Aldine Transaction
- Haase, A., Kabisch, S., Grossmann, K. (2011) *Residential Change and Demographic Challenge*. Farnham: Ashgate Publishing Limited
- Habraken, N.J. (2011 (1961)(1972)) *Supports: an alternative to mass housing*. London: Architectural Press
- Hamdi, N. (1990) *Housing without Houses: Participation, flexibility, enablement*. New York: Van Nostrand Reinhold
- Hindersson, P. (2014) Bo i kollektiv- Ett framtidskoncept, *Byggindustrin*. [Online], Available: <http://byggindustrin.se/artikel/nyhet/bo-i-kollektiv—ett-framtidskoncept—20086> (June 26, 2015)
- Johansson, H. & Saarikangas, K. (2009) Ambivalent Home. In Johansson, H & Saarikangas, K (Eds.) *Homes in Transformation, Dwelling, moving, belonging*. Helsinki: Finish Historical Society
- Karlsson, A. (2012) Regionala prognoser: Allt färre bor i glesbygd, *Välfärd*, Nr 2012: 2, Statistiska centralbyrån. [Online], Available: http://www.scb.se/Statistik/LE/LE0001/2012K02/LE0001_2012K02_TI_04_A05TI1202.pdf (August 14, 2012) (Urbaniseringen)
- Kearns, A., Forrest, R. (2000) Social cohesion and multilevel governance. *Urban Studies* 37: 995–1017
- Lehtonen, M.(2004) The environmental-social interface of sustainable development: capabilities, social capital, institutions. *Ecological Economics* 49, pp 199–214
- Leupen B. (2006) *Frame and Generic Space. A Study into the Changeable Dwelling Proceeding from the Permanent*. Rotterdam: 010 Publishers
- Lindén, A-L. (1995) Bostäder och hushåll: nuläge och framtid. *Volym 19, Rapport från forskargruppen Boende och bebyggelse, Sociologiska institutionen Lunds universitet*

- Lund, J. (2013) Ny våg av kollektivliv bland äldre, *ETC*, December 9, 2013. [Online], Available: <http://stockholm.etc.se/kultur-noje/ny-vag-kollektivliv-bland-aldre> (June 26, 2015)
- Malmqvist, I. (2012) När hemmet blir en vårdmiljö, in Abrahamsson, M., Nord, C. (eds.), *Äldres boende – Forskningsperspektiv i Norden*. Lund: Studentlitteratur
- Manum, B. (2006) *Apartment Layouts and Domestic Life: The Interior Space and Its Usability, a Study of Norwegian Apartments Built in the Period 1930-2005*. Dissertation. Oslo: Oslo School of Architecture and Design
- Murphy, K. (2012) The social pillar of sustainable development: a literature review and framework for policy analysis. *Sustainability: Science, Practice & Policy* 8(1)
- Nandorf, T. (2013) De bor på arbetsplatsen, *Dagens Nyheter*, January 2013. [Online], Available: <http://www.dn.se/ekonomi/jobbs-karriar/de-bor-pa-arbetsplatsen/> (June 26, 2015)
- News Cision (2015) NCC bygger etta som lätt blir femma i Linköping, NCC [Online], Available: http://news.cision.com/se/ncc/r/ncc-bygger-etta-som-latt-blir-femma-i-linkoping,c9802331?mc_cid=f037e96403&mc_eid=009e7d9590
- Nylander, O. (1998) *The Architectural Properties of the Home*. Dissertation. Göteborg: Chalmers University of Technology
- Nylander, O. (2007) Bostadens typologi. In *Bostaden och kunskapen*. Stockholm: Arkus
- Nylander, O., Eriksson, A. (2009) *Så använder vi våra bostäder*. Stockholm: AB Svensk Byggtjänst
- Nylander, O., Braide Eriksson, (2011) *Nya svenskar – Så använder vi våra bostäder*. Stockholm: AB Svensk Byggtjänst
- OED (2015) ”dink, n.5”. OED Online. June 2015. Oxford University Press. <http://www.oed.com/view/Entry/242067?rskey=6828D8&result=5&isAdvanced=false> (June 26, 2015)
- Olsson, S., Cruse Sondén, G., Ohlander, M. (1997) *Det lilla grannskapet*. ISBN 91-85620-13-0
- Priemus, H. (1993) Flexible housing: fundamentals and background, *Open House International*, 18: 19-26
- SCB (2015-a) Befolkning 2000–2014 och prognos 2015–2060 efter inrikes och utrikes födda. *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se>: » Hitta statistik » Befolkning » Befolkningsframskrivningar » Aktuell befolkningsprognos » Befolkning 2000–2014 och prognos 2015–2060 efter inrikes och utrikes födda (June 2, 2015)
- SCB (2015-b) Antal hushåll efter hushållstyp, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se>: » Hitta statistik » Hushållens ekonomi » Hushållens ekonomi (HEK)»Antal hushåll efter hushållstyp (June 2, 2015)

- SCB (2015-c) Befolkningens åldersstruktur 1960 och 2014 samt prognos, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se> » Hitta statistik » Befolkning » Befolkningsframskrivningar » Aktuell befolkningsprognos » Befolkningens åldersstruktur 1960 och 2014 samt prognos, (June 2, 2015)
- SCB (2015-e) Boende – fler indikatorer 2014, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se> » Hitta statistik » Levnadsförhållanden » Undersökningarna av levnadsförhållanden (ULF/SILC) (June 5, 2015) (Fördelning hushåll-trångboddhet) (Antal hushåll som bor i flerbostadshus) (Andel trångbodda hushåll)
- SCB (2015-f) Boende – fler indikatorer 1980–2007 / 2008–2009 / 2010–2011 / 2012–2013 / 2014, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se> » Hitta statistik » Levnadsförhållanden » Undersökningarna av levnadsförhållanden (ULF/SILC) (June 5, 2015) (Förändring andel trångbodda hushåll från 1994–2014)
- SCB (2015-g) Disponibel inkomst per konsumtionsenhet för individer 20-år efter hushållstyp samt förändringar i procent, *Statistiska centralbyrån*. [Online], Available: <http://www.scb.se> » Hitta statistik » Hushållens ekonomi » Hushållens ekonomi (HEK) » Disponibel inkomst – hushållstyper (June 26, 2015) (två-personers-hushåll, inkomster, dinks)
- Schneider, T., Till, J. (2007). (2007). *Flexible Housing*. Oxford: Architectural Press, Elsevier INC/Ltd
- Sjöström, A. (2015) Testar framtidens boende, *Byggvärlden* 8: 2015, p 12
- Stenberg, E. (2012-a) Restructuring, Swedish Modernist Housing, Nordic, *Journal of Architecture*, 3(2): 89-93
- Stenberg, E. (2012-b) Flexibelt miljonprogram kan möta nya bostadsbehov, In Formas Fokuserar, *Miljonprogrammet – utveckla eller avveckla?*. Stockholm: Formas
- Twigger-Ross, C. L., Uzzeli, D. L. (1996) Place and identity process, *Journal of Environmental Psychology*, 16: 205-220
- Vallance S., Perkins, P., C., Dixon, J., E. (2011) What is social sustainability? A clarification of concepts, *Geoforum*, 42: 342-348
- WCED (1987) Report of the World Commission on Environment and Development: Our Common Future, Chapter 2: Towards Sustainable Development, UN Documents. [Online], Available: <http://www.un-documents.net/wced-ocf.htm> (March 8, 2015)

10. APPENDIX

10.1 INTERVIEW CODING AND ANALYZING SOCIAL DIMENSIONS

1. SHARED CUSTODY HOUSEHOLD	
INTERVIEW CODING	
Social aspect	Excerpt from interview
<p>The parents wish to solve their living situation in a specific way. They say allowing the children to stay in one place is central to a safe and controlled way to proceed with their divorce. By implementing what they think is a good solution for their children, they get what they think is a qualitative and functional solution for their own lives.</p> <p>Social aspects:</p> <p>Safety, continuity</p> <p>Quality of life, happiness and well-being</p>	<p><i>‘We had heard about apartments you could divide up so that the kids could keep living in the same rooms even after the parents divorce. That means the children don’t have to be separated from their home. We went around thinking about how the heck you could make that work ...</i></p> <p><i>... It has actually worked really well so far. The kids have reacted really well to it. They haven’t had the kind of reactions that they often do after a divorce, that they become nervous. In fact it’s almost been the opposite, so that we’ve wondered, aren’t they going to have any reaction? When are they going to start asking questions, and so far they almost haven’t at all. They have this home base here. Now the kids’ mom and I have a very good relationship – we don’t fight and we work very well together at taking care of the kids, but I think it’s an exciting way to resolve the problem.’</i></p>

<p>The parent presents a strong relationship to the neighbourhood, with social connections. Continuity concerning daycare, schools and social networks appears to be of importance for the family.</p> <p>Social aspects:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p> <p>Quality of life, happiness and well-being</p>	<p><i>‘... How is it supposed to work with our lives here in Masthugget? We’ve established ourselves here. We have daycare here and we’re engaged in the parents’ cooperative.’</i></p>
<p>The ongoing transformations of the apartments allow for adaptation to existing living situations. The residences can become larger or smaller to adjust to economic or spatial needs. The issue with transforming the apartments fuels communication and concern among the residents. This can develop and strengthen a social network.</p> <p>Social aspects:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Attractive housing and public realm</p>	<p><i>Interviewer: “These “county governor’s buildings” really have a very generalized spatial arrangement, which means you could add them together end-to-end forever.’</i></p> <p><i>‘The apartments here are small, and a lot of people have done that in one way or another. You buy another apartment and expand upward or to one side. They’re all studios and one-bedrooms, but after those renovations we now have both three- and four-bedroom units. You see a lot of inventiveness – it’s fun, there are a lot of fun design solutions.’</i></p>

<p>The family sees possibilities to stay and develop their dwelling as their living situation changes. The future living situation is something that can be controlled.</p> <p>Social aspects:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p>	<p><i>Interviewer:</i> <i>'It's also a question of the apartments' changeability. It really feels like you've come up with an optimal solution for the way things are now. If you were to look forward in time, what will you do then?'</i></p> <p><i>'We'd probably buy the neighbour's one-bedroom apartment next door, or the one above or something. And it's nice to know that that opportunity actually exists, because we know quite a few people here, and as soon as anything happens the grapevine starts buzzing, or whatever you call it. Yeah, so we could just buy part of that apartment and sell the rest to someone else. So it'll probably work out for us to do something like that.'</i></p>
<p>Common commitments such as preschool attendance (some of the residents), the constant transformation of the apartments, and the usual housing cooperative issues appear to result in engagement and responsibility among the residents in the development.</p> <p>Social aspects:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p> <p>Quality of life, happiness, and well-being</p>	<p><i>Interviewer:</i> <i>'I've heard you use the courtyard quite a bit. Is that true?'</i></p> <p><i>'Yes, we did even before we started living here, since we had our kids in preschool here. Pretty much everyone who has kids in the preschool live around this courtyard.'</i></p> <p><i>Interviewer:</i> <i>'Is it a public preschool?'</i></p> <p><i>'No, it's a co-op. I'm the chairman of the co-op board, so I get to know people here. There's a real cooperative attitude here in the courtyard. People help each other out with important things.'</i></p>

1. SHARED CUSTODY HOUSEHOLD

Reflecting residential usability through interview coding and the four dimensions of social sustainability

The equity dimension: The household can afford to buy an apartment. The housing shortage may cause difficulties, but still the situation can be solved. To be able to buy an apartment that can function for all of the household's needs, however, may be quite rare. This type of residential usability is not achievable for every household, regardless of income.

The user participation dimension: Transforming the apartments fuels communication and concern among the residents. This can develop and strengthen a social network. For the parents, having the children move every other week makes a 'divided home'. Allowing the children to stay in one place they describe as central for a safe and controlled way to proceed with the divorce. For them, residential usability makes it possible to realize and influence their own living situation, and to what they consider a qualitative solution.

The apartment area of 54 square meters can be considered very small for four people, a residential situation with a lack of living space. Nevertheless, this is not brought up as a problem. The possible living qualities are what comes out in the interview. Taking charge of the situation to affect the quality of their lives, and satisfaction at solving the shared custody situation seem to be of great importance in their perception of life quality. In this context the family's shortage of space seems to be of minor importance.

The social cohesion dimension: The whole family has an established connection to the neighbourhood with schools, daycare, and social networks. These conditions they want to preserve. The solution of finding a new dwelling in the same neighbourhood makes it possible to keep these connections.

The awareness dimension: The residents in the housing cooperative are well aware of the unusual possibilities they have for transforming their dwellings. This residential usability improves the prospects for resolving future requests for residential space. The knowledge of the possibilities for staying in the same development despite a change in living situation can provide the households with continuity and safety in their living situations.

2. LARGE FAMILY HOUSEHOLD	
INTERVIEW CODING	
Social value	Excerpt from interview
<p>The family have both relatives and friends in the area. They have social connections and social life here. During the time of the interviews, feelings are mixed. Incidents of gangs of local youths terrorising the neighbourhood have totally changed the situation in the housing area. This creates suspicion and insecurity among the residents. The future living situation is not obvious and the household has few possibilities to affect the present living situation in an extensive way.</p> <p>Social aspects:</p> <p>Values both existing and at risk:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p>	<p><i>Interviewer:</i> ‘Do you have a lot of friends here in the neighbourhood that you spend time with socially?’</p> <p>‘Yes, my whole family lives here in the area. I’m one of five children.’</p> <p><i>Interviewer:</i> ‘So you have four siblings living here in the neighbourhood?’</p> <p>‘Yes, in different buildings. But I’m the only one with five kids. The others all have two.’</p> <p><i>Interviewer:</i> ‘Are they the ones you hang out with most – your family?’</p> <p>‘No, we see others too. We’re very close with our neighbours.’</p> <p>‘Yes, we’re happy here, but there are a lot of things going on these days – vandalism and fights, and we’ve heard a few times about murders in this area, too.’</p> <p>When we first came here they were little kids, and they’ve grown up in this gang, so we’ve seen it happen with our own eyes. So one day we thought that even if we move somewhere else, you’ve got a whole new neighbourhood you have to get to know, so it’s better to stay on here.</p> <p>We’d be glad to move to Mölnlycke or Härryda, but there’s a long wait for a place there. But not in an apartment – somewhere else.’</p> <p><i>Interviewer:</i> ‘Do you spend a lot of time out in the courtyards?’</p> <p>‘No, we’re scared to. Everything used to be just fine. Now we don’t want our kids to be alone out there, even in the courtyards. We always keep an eye on them.’</p> <p><i>Interviewer:</i> ‘Does that depend on which way you go? Are there parts of the neighbourhood that are dangerous and others that are less so?’</p> <p>‘We have never run into any trouble ourselves, but what we read in the paper and what we sometimes see and hear people say makes us afraid. In the last few weeks they burned a motorcycle outside the school and car over here. They’ve vandalised our car, too. We need to get a new car almost every year – they throw rocks at the windshield.’</p>

<p>This family of seven lives in an apartment of 79.6 m². Their everyday lives are filled with situations that remind them of the lack of living space. Everyday chores cannot be done without friction. The parents have nothing positive to say about the apartment's usability.</p> <p>Social aspects:</p> <p>Weak or non-existent values as result of the crowded situation:</p> <p>Quality of life, happiness, and well-being</p>	<p><i>'We are two adults and five children and we're really overcrowded here. They built really small rooms. You can have a bed and a wardrobe and that's it. And you can't even walk around – there's no space at all. There's only one room that's big – the master bedroom has a little space. But we need to have wardrobes there because with five kids we need a lot of storage. We don't have much room for storage.'</i></p> <p><i>Interviewer:</i> <i>'How does the kitchen work? There are a lot of you – can you sit and eat together there?'</i></p> <p><i>'See for yourself. We've taken away the chairs – there's no space for a table.'</i></p> <p><i>Interviewer:</i> <i>'So you don't have a dining table?'</i></p> <p><i>No, we sit here [on the floor] and eat. But that works in our culture. We used to have a table and chairs.'</i></p> <p><i>Interviewer: So the kids share rooms?'</i></p> <p><i>'Yes, they do.'</i></p> <p><i>Interviewer: 'Is it hard to find room for a desk? Where do they do their homework?'</i></p> <p><i>'We don't have a desk at all – there isn't room for it.'</i></p> <p><i>Interviewer: 'Is there a corner somewhere that's earmarked for sitting and reading, that's meant to be a little quieter?'</i></p> <p><i>'No ...'</i></p>
<p>There are no possibilities to provide a better living space because the apartment's floor plan doesn't allow flexible changes, and the real problem is the need for more space. There is no potential to expand the apartment to provide more living space. The family can move if they can get another apartment.</p> <p>Social aspects:</p> <p>Values both existing and at risk:</p> <p>Sense of community attachment, belonging, and identity</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p>	<p><i>Interviewer:</i> <i>'What do you think you'd need to make this easier – would larger rooms do it?'</i></p> <p><i>'No, one big space – more space. We've got an area divided into four rooms and it doesn't work for us. Instead we should take out the walls and have two big rooms. We've got four rooms here and it's not good.'</i></p> <p><i>Interviewer:</i> <i>'You'd rather have two big rooms that you could divide up however you like?'</i> <i>'Yes, then you can furnish the place right. Then the walls aren't in the way.'</i></p>

<p>The lack of living space is what comes out most prominently in the interview. Aspects of the dwelling's lack of good design related to cultural traditions emerge after questions from the interviewer. One idea that comes up on this subject is the provision of a private area with bedrooms and bathrooms separated from the more public part of the home.</p>	<p><i>Interviewer:</i> <i>'Do you think places you've lived in Sweden are very different from how you lived in India?'</i></p> <p><i>'I lived in one house that had four rooms in a row, and every room had its own bathroom or toilet. All four rooms opened onto a big corridor, and we had a kitchen at each end of the corridor. [...] A lot of people aren't able to afford having a bathroom for every room, but we actually did. Here we only have one bathroom and there's always a line for the bathroom. And they're always shouting, "Me first!" It's awful.'</i></p>
<p>Social aspects:</p>	<p><i>Interviewer:</i> <i>'Did you think, when you came into this apartment for the first time, that the rooms were arranged as they should be?'</i></p>
<p>Values questioned:</p>	<p><i>'The toilet shouldn't be right exactly in the middle, not right in the hall where you come in.'</i></p>
<p>Cultural diversity and traditions</p>	<p><i>Interviewer:</i> <i>You think it should be more hidden?'</i></p>
<p>Quality of life, happiness, well-being</p>	<p><i>'Yes. If there were two bathrooms it would be easier, but the way it is now everyone sees who's going in and out of there.'</i></p>
	<p><i>Interviewer:</i> <i>'Do you have an opinion about having the entrance to a bedroom from the living room?'</i></p>
	<p><i>'That seems uncomfortable, too. That part needs to be more private.'</i></p>
	<p><i>Interviewer:</i> <i>'What is it like to have guests over in India – do men and women divide up or do you all sit together?'</i></p>
	<p><i>'We all sit together.'</i></p>

2. LARGE FAMILY HOUSEHOLD

Reflecting residential usability through interview coding and the four dimensions of social sustainability

The equity dimension: The household has little opportunity to acquire another apartment because their economic situation is limited, they cannot buy an apartment, and there is currently a shortage of housing on the rental market. From this perspective the household cannot aspire to the equal right of all households to have access to a qualitative, well-functioning living space.

It appears that everyday life at home for the household is about handling a difficult residential situation. The apartment does not allow spatial changes, which could have provided a more functional, temporary solution.

The user participation dimension: This example shows a living situation that does not recognise the 'empowerment of the user'. A major question affecting everyday life for the family is the lack of living space. Primary functions such as relaxation and privacy are hard to sustain. The family cannot easily influence their living situation. Expanding or changing the dwelling design is not possible. The dwelling is understood as something that will not adapt to their needs. They have no possibilities to affect their living situation on their own.

The social cohesion dimension: The family has an established connection to the neighbourhood. The children go to school and daycare and they have relatives and friends in the area. These conditions make them hesitate about moving. At the time of the interviews, the neighbourhood was being terrorised by a teenage gang. The family feels unsafe in the neighbourhood.

The awareness dimension: The household views the apartment's capacity to provide alternative spatial solutions as small.

3. SINGLE PARENT HOUSEHOLD	
INTERVIEW CODING	
Social value	Excerpt from interview
<p>The parent has a connection to the area from earlier years. She considers it a good place to live.</p> <p>Social aspects:</p> <p>Sense of community attachment, belonging, and identity</p>	<p><i>‘I’ve lived here for two years. But I lived in the area once before.’</i></p> <p><i>Interviewer:</i> <i>‘Why did you move?’</i></p> <p><i>‘I had a studio apartment before that I rented out when I was working abroad. When my daughter and I moved home again we lived in that apartment for a year, but then we moved to a bigger place.’</i></p>
<p>Schools and daycare can be found throughout the neighbourhood. There are many families with children in the development. This turns the common spaces into meeting points for both adults and children. There are many shared activities among the residents. Social interaction allows many neighbours to know one another and gives them a feeling of safety.</p> <p>Social aspects:</p> <p>Social cohesion, inclusion, and interaction, safety, continuity</p>	<p><i>Interviewer:</i> <i>‘Was it important to live in the same neighbourhood?’</i></p> <p><i>‘For me it was important, because my daughter had started daycare here and she had her friends. Everything’s very familiar here – there’s a mix of people living here in terms of age, but a huge number of families with children, and there are two daycares, which is very good. Pre-school and elementary school are close by – it’s only a five-minute walk. It’s a quiet neighbourhood.’</i></p> <p><i>Interviewer:</i> <i>‘Do you use the courtyards much?’</i></p> <p><i>‘Yes, in the spring and summer we’re outside all the time, all of us together. In the summer a lot of people cook on the grill, and people grill together.’</i></p> <p><i>Interviewer:</i> <i>‘So you know people who live here?’</i></p> <p><i>‘Yes, I think I’ve got a pretty good idea of what goes on here. I know a lot of people, and the kids all know each other. I guess this is the age when you get to know a lot of people – when you’ve got little kids that play. There are three families that we see a lot and spends a lot of time with.’</i></p> <p><i>Interviewer:</i> <i>‘Do you feel safe here?’</i></p> <p><i>‘I think it feels like a safe neighbourhood.’</i></p>

<p>The parent let one room out in order to be able to afford the rent. She also appreciates the company of another adult and sees this as an extra benefit socially. The parent has no private space of her own. At night she shares a bedroom with her daughter. During the day she can use the common space, living room or kitchen. This living situation lacks adequate living space for the household. Nevertheless, the ability to find her own solution by letting one room out seems to make the situation fairly acceptable for the parent.</p> <p>Social aspects:</p> <p>Possibilities for recreation, privacy Quality of life, happiness, and well-being</p>	<p><i>Interviewer:</i> <i>'Which room is it you're renting out?'</i></p> <p><i>'It's the little bedroom, so my daughter and I sleep in her room. It's her room.'</i></p> <p><i>Interviewer:</i> <i>'Is there a social reason too, do you think, for you renting out a room?'</i></p> <p><i>'Yes, I think so, since I live alone. Mentally you have a different kind of interaction than when you're spending your time with a five-year-old.'</i></p> <p><i>Interviewer:</i> <i>'Do you think the apartment is suitable for renting out one of the rooms?'</i> <i>'I think that depends a little on your personality. I don't mind having our bedrooms right next door to each other – it doesn't matter to me. But you can't always go through the living room if there's someone sitting there.'</i></p>
<p>The future plan is to afford to live in the apartment without needing the money from a tenant. The parent can then use the small room for guests or as a working space. The future living situation is something that can be controlled.</p> <p>Social aspects:</p> <p>Possibilities for recreation, privacy Quality of life, continuity, happiness, and well-being</p>	<p><i>Interviewer:</i> <i>'You say you still use the room even though you rent it out – is that when she not here?'</i></p> <p><i>'Yes. When she moves out I'm going to turn that room into more of a workspace. That'll make it more my own room then. Right now I sit in the kitchen to work. That will give us one more room if we have visitors, like relatives sleeping over. When we used to have a studio, anyone who came to visit had to check into a hotel. That just doesn't work.'</i></p>

SINGLE PARENT HOUSEHOLD

Reflecting residential usability through interview coding and the four dimensions of social sustainability

The equity dimension: The household lives in a crowded situation. The mother has no space of her own; she shares the bedroom with her child. The household has a limited possibility of buying a dwelling that can function well for its needs, and the present housing shortage makes it difficult to change apartments. Still the parent appears to be content with the solution of having a tenant in order to help make the rent. The apartment's capacity to provide a spatial solution can be considered residential usability, in this case providing an acceptable solution to a crowded residential situation.

The user participation dimension: The parent has solved the residential situation through her own initiative. By using the apartment in a flexible way and leasing one room out to pay the rent, she can both solve the rental question and get some 'adult social interaction'. The rental room holds the potential of becoming a spare room for guests or for working at some point in the future. The parent can harbour the idea of a future extra room and a larger living space while letting out one room for the time being. This makes it possible for her to influence her own living situation and work for a future qualitative solution.

The social cohesion dimension: The neighbourhood area is important for the parent. She and her daughter have an established social network. There is an everyday life of social interaction among parents and children living in the neighbourhood. Daycare and school are situated a short distance away. By being able to choose this neighbourhood, social values such as social cohesion, inclusion, interaction, safety, and continuity can be preserved and promoted.

The awareness dimension: When reflecting the awareness dimension, the solution of renting out a room appears to be a conventional and culturally established way to use a residence. This can thereby be an obvious way to solve a residential situation for someone who prioritizes the extra income and social surplus over the possible inconveniences a tenant can mean.

10. 2 THE FLOOR PLANS AND THE CAPACITY OF SPATIAL USE

An apartment's residential usability is reflected in each residential situation and the diverse needs of each of the three pluralistic households. Framework for the reflection makes the household's subjective comprehension concerning spatial qualities, spatial needs and spatial use.

10. 2. 1 Analyzing residential usability in the three apartments

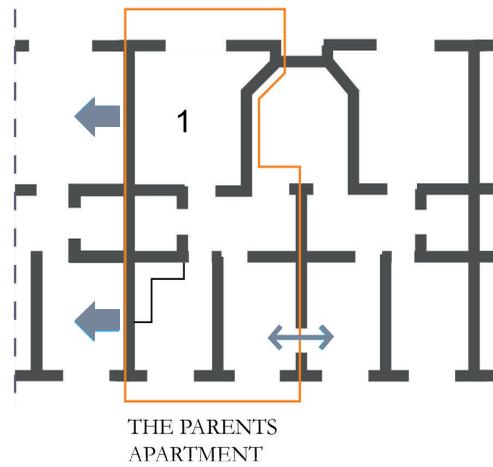
1. SHARED CUSTODY HOUSEHOLD

Reflection on residential usability in the apartment

The household lives in a crowded situation. Nevertheless, they don't bring this up as a problem in the interview. What comes out in the interview, instead, are the possible living qualities. Taking action to affect the quality of life and satisfaction, and solving the shared custody situation, seem to be of great importance for their quality of life. In this context the family's shortage of space seems to be of minor importance. This can perhaps be correlated to the possibilities for finding their own spatial solutions. The apartment consists of general rooms that can be used for different situations. This makes the use of the rooms exchangeable and the structure adaptable for different usages. The apartment can also become larger or smaller to adjust to economic or spatial needs by including or excluding space (selling or buying space/rooms). The practice of transforming apartments allows them to adapt to changing living situations.³⁸

KEYWORDS: general rooms, exchangeable structure, divide and connect

38 Administrative and regulative obstacles: In Sweden the form of ownership limits this kind of flexible design solution. The condominium form allows for changes in the size of any unit. This would be much more complicated and probably impossible to implement in leasehold housing. The example confirms a critical problem for flexible solutions. Administrative and regulative demands limit the range of operable flexible solutions. One example is fire safety regulations. Demands for preventing the spread of fire cannot be met in this type of flexible design, which ignores the division into fire cells.



FIGUR 10.1

1 **GENERAL ROOMS** Rooms with general sizes, allowing for different use can make the spatial capacity more flexible. One room in the apartment is used both as bedroom and room for socialising. The room size admits furnishing for these different functions with a bed, television and small sofa.

← **EXCHANGEABLE STRUCTURE** Through adding or subtracting rooms the apartments can become larger or smaller.

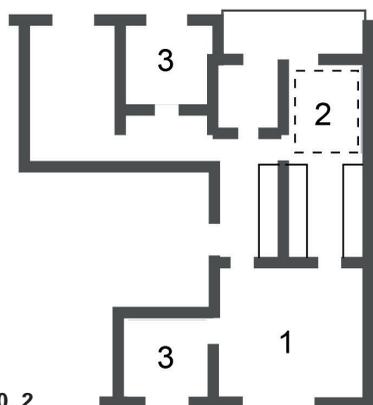
↔ **DIVIDE AND CONNECT** The apartments can be temporarily or permanently connected and/or divided.

2. LARGE FAMILY HOUSEHOLD

Reflection on residential usability in the apartment

The household lives in a crowded situation. The shortage of space causes friction in everyday situations. The bedrooms are small and difficult to use when there is need for a different arrangement than the one intended. Some of the rooms are too small to accommodate more than one person and still provide storage space. The space for meals in the kitchen is designed for a specific number of people, and is too small for the family to eat together. It appears difficult to find a temporary solution to provide a better residential situation until another dwelling solution can be found. The household cannot find any functional transformation of space. The dwelling is typical of apartments from the 1960s in Sweden, and the floor plan is designed to serve specific living situations and will not adjust or provide space for a more broad usage.³⁹

KEYWORDS: function-based space, general room



FIGUR 10. 2

1 GENERAL ROOM The living room is used both for socialising and for eating. The flexible use is solved by arranging the furnishing in the living room along the walls, and having a large central carpet for the gathering to meals – then sitting on the floor. The living room in this way becomes a flexible space, providing a general size, allowing for a diverse use.

³⁹ Swedish rules for housing design are formulated as specified functions: space for eating, space for sleeping and so on. This can make the rooms difficult to use for purposes other than the intended ones, as each is often designed to the minimum required for a particular purpose.

2 FUNCTION-BASED SPACE The intended space for meals in the kitchen is limited for a specific number of people and will not allow the family to eat together. The kitchen makes an example of function-based space.

3 FUNCTION-BASED SPACE The bedrooms are small and difficult to use when there is need for a different furnishing than the intended. To host more than one person in some of the rooms and also provide storage space is hard to solve. The bedrooms makes an example of function-based space.

3. SINGLE PARENT HOUSEHOLD

Reflection on residential usability in the apartment

The household lives in a crowded situation. The parent is in need of her own bedroom. This becomes clear in the interview discussion. Space for privacy and recreation is minimal. The ability to find her own solution appears critical for the parent and is also believed to affect the parent's attitude to the residential situation, where shortage of space seems to be less important than, for example, neighbourhood relations.

Having a tenant appears to have both positive and negative effects. Having another adult in the household is positive, while unexpected meetings with the tenant's guests in the home is described as less convenient. A single apartment shared by two unrelated households can require a more specialized design in terms of private and shared spaces. In this case the entrance to the large bedroom is through the living room. For the parent and the child this can mean unexpected confrontations with the tenant's guests. An entrance towards a more neutral space, for example a hallway, would have been more convenient.

The household cannot find a functional transformation of space to arrange another bedroom. The dwelling is a typical apartment from the 1980s in Sweden and the floor plan is designed to serve specific living situations and will not adjust or provide space for a more broad usage.⁴⁰

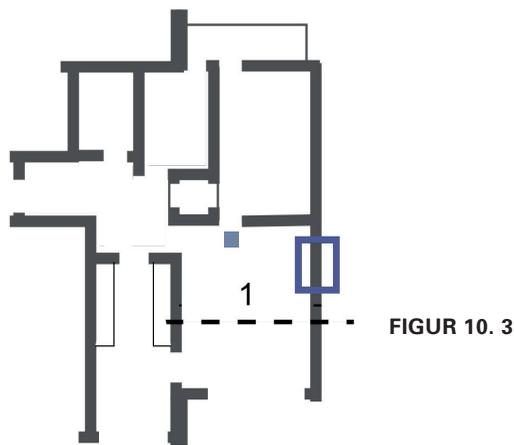
A potential feature of residential usability appears to have been overlooked in the floor plan design. By dividing the living room space, an additional room can be provided within the existing apartment and a temporarily better residential situation can be achieved. This transformation would require a second window to provide the required daylight, and occasionally also a few more square meters. From a long-term perspective, these minor upgrades could increase the residential usability for the households throughout the lifetime of the building.

Reflection: The apartment is designed for three people: two parents and one child. However, for the present household, also consisting of three persons, the dwelling does not suffice. This pluralistic household makes new demands

40 Swedish rules for housing design are formulated as specified functions: space for eating, space for sleeping and so on. This can make the rooms difficult to use for other purposes than the intended use, as the spaces often are designed to a minimum for attaining one certain purpose.

on living space. One more bedroom is needed, since all of them generally need their own bedroom if two of the three are not a couple. Renting out can also mean unknown tenants. This calls for the need of well-defined private and public space.

KEYWORDS: private-public space, dividable space



1 PRIVATE - PUBLIC SPACE Renting out can mean unknown tenants. This calls for the need of well-defined private and public space. Access to one of the bedrooms is through the frequently used living room. This can imply unwanted confrontations, an issue also mentioned in the interview

■ **POSSIBLE UNWANTED CONFRONTATIONS.** Tenants guests.

Divadable space Adding one room more within the existing apartment space can provide a better living situation, the parent can have a space for privacy and recreation. The small adjustments needed for an adaptable solution apparently seem to have been lost or deliberately neglected.

The living room can with additional daylight (one more window) and a small increase of floor area admit a dividable space. This would increase the residential usability and provide alternatives for the household to solve their every days needs.

--- **DIVIDABLE SPACE** can provide an additional room, this requires an additional window.

□ **ADDITIONAL WINDOW**

