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Livability in dense urban areas – an investigation of the built environment and residents' perceived living quality

Elise Stuve
Urban and regional planning
Faculty of landscape and society

Preface

This master thesis represents the end of my five-year urban and regional planning degree here at the University of Life Sciences (NMBU).

First of all, I will thank all the lecturers and those who have contributed to my professional learning during my time here at Ås. I am also very thankful for all the great people I have met. Furthermore, I will also thank my supervisor Jin Xue who has been a great supervisor helping, guiding and supporting me when I needed it. Thanks to all the informants who was willing to sign up and contributed to making this master thesis happen.

Finally, I want to thank my close family and friends who have been there for me during my studies and while working on the master thesis. You have particularly been a great support this semester.

Elise Stuve,
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Master candidate in urban and regional planning at NMBU.

Abstract

In recent years, the direction of policies has changed towards an increasing focus on the compact city to ensure a more sustainable urban development. The municipality of Oslo clearly states that the future growth should be dealt with according to the compact city strategy, building denser and concentrating new development inside the existing boundaries of the city. However, there has been a growing discussion regarding the negative consequences of densification. A common perception is that dense living is less livable than low-density environments and seen as an undesirable long-term option. This is considered less sustainable. In countries like Norway, traditions and widespread preferences for a suburban lifestyle does not support this and studies investigating the relationship between densification and livability show mixed results.

The thesis sheds light on how the built environment of dense urban areas influence perceived living quality of residents. Furthermore, it aims at investigating and getting a better understanding of the preferences and thoughts of residents in three relatively new and dense neighbourhoods in Oslo. How to enhance acceptance for dense living and what qualities of dense living people value are important and urgent questions to investigate. This has been done by conducting in-depth interviews with 13 residents living in the three case areas; Sørenga, Kværnerbyen and Solsiden.

The results emphasise that the built environment is influential to perceived living quality in dense urban areas. Furthermore, it is not necessarily the density alone that leads to dissatisfaction among residents but rather the related factors of the dwelling, neighbourhood and larger area. There were factors such as good layout of the dwelling, balcony, high level of privacy, sunlight and view and good dwelling position. At the neighbourhood level diversity of facilities and mixed-use, attractive outdoor areas and enough greenery, architectural quality and the lack of traffic and noise were important. Having accessibility to recreational areas, workplace and public transport were essential at the larger scale. The qualities of the built environment and how these are organised determines the perceived living quality to a great extent.

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1 Introduction

1.1 Theme and background

Except for the central parts of Oslo, the traditional urban form of the Oslo region is mostly characterised by suburbs, single-family houses, car dependency and separated land use (Mouratidis 2017a). However, the urban form is changing and in the recent years, the Oslo region has experienced a massive population growth and is facing great planning challenges related to this growth. To ensure a more sustainable urban development the direction of policies has changed towards an increasing focus on the compact city. In the municipal plan of Oslo, it is clearly stated that the future growth should be dealt with according to the compact city strategy, building denser and concentrating new development inside the existing boundaries of the city and around public transport hubs. Over half of the recent development has happened in the inner-city of Oslo and has led to greater densities in the urban areas (Oslo kommune 2015). Consequently, it is increasingly important to investigate and understand the consequences of this type of development.

While practitioners embrace this type of development, livability in dense urban areas remains a challenge. There seems to be a general perception that dense living is less livable and a temporary option, where the majority of people in dense areas are young professionals following a housing carrier, starting in the city centre and eventually moving out to the suburbs. Especially in western countries like Norway, traditions and widespread preference for single-family dwellings does not support this densification. However, if this type of development is going to be sustainable in the long run one needs to increase the acceptance for dense living. To improve the built environment and livability in dense urban areas can enhance the acceptance for dense living. Consequently, there is a need for more studies investigating and analysing the impact of built environment of dense urban areas on perceived living quality of residents.

The existing research on the impact of built environment of dense urban areas on livability is scarce and too little is known about the impact of densification on livability, especially from a resident's perspective. Furthermore, urban densification should be better managed with more focus on the quality aspects that support perceived living quality. There is a lack of empirical

knowledge on how the densification and high densities influence the perceived livability of residents.

The research addressing the built environment and livability has mostly used quantitative research methods. However, qualitative research methods are essential to allow us to get an even deeper and more coherent understanding of residents' thoughts and preferences. Furthermore, the existing research conducted in a Norwegian context has mainly addressed the older and more traditional neighbourhoods in Oslo. Due to massive development of new housing, it is increasingly important to also investigate the livability of these newly built areas. Furthermore, the differences between the new and old neighbourhoods can lead to different perceived living quality due to differences in aspects such as architecture, outdoor areas and size of dwellings.

Eventually, this study can hopefully be a contribution both in terms of providing context-dependent knowledge and theoretical development to the debate about densification and livability and give practitioners suggestions on how to improve the built environment and livability.

1.2 Research question

The aim of this thesis is to investigate how the built environment of dense neighbourhoods' influence livability in three relatively new and dense neighbourhoods in Oslo. It is desirable to reveal how residents evaluate their neighbourhoods in terms of positive and negative aspects, which qualities that are essential to their perceived living quality and their general preferences and thoughts of dense living. This can help us to get a better understanding of which qualities of the built environment that people find essential and how to make dense living more livable and attractive.

The research question is as follows:

- *How does the built environment of dense neighbourhoods influence perceived living quality in three newly developed areas in Oslo?*

Sub research questions:

- *How can the influences of dense living on perceived livability be conceptualised?*
- *What are the residents' perceptions on dense living and what do they consider as positive and negative aspects?*
- *How does the built environment of dense living influence the perceived living quality based on the residents' evaluation?*

The first sub-question is a theoretical question answered in the theory part of the thesis. The second question is of a more descriptive nature while the last one is an analytical one which is based on the evaluation of the residents and informed by the other two sub-questions.

1.3 Refining the thesis and chosen cases

This thesis is manly addressing the residential approach towards livability and densification, and it does not take into consideration how developers, market or practitioners in planning perceive livability. The reason for this is that that how dense living and livability is perceived is mainly based on peoples' subjective opinions and preferences. Consequently, to investigate residents perceived livability in dense areas are important to inform and guide urban planning in the future.

This thesis investigates how densification influences livability by studying three chosen case areas in Oslo. To use case study as a method is beneficial to investigate how residents evaluate the livability in an area. Furthermore, it provides the opportunity to reflect and discuss upon similarities and differences between the case areas. If there are many similar results found across the cases it might be possible to generalise (Silverman 2014). The chosen case areas are: Sørenga, Kværnerbyen and Solsiden in Nydalen. These are all relatively dense and newly built projects which have been subject to compact city development and densification.

The case selection has been based on some criteria:

- Relatively high density
- Compact city characteristics
- Within the outer ring road

- Newly developed within the last ten years
- Preferably some differences in terms of distance to city centre, morphology and average income

Because the overall aim of the thesis was to investigate the relationship between densification and livability, the case areas needed to be built as a result of compact city strategies and densification. Consequently, the case areas also had to entail the compact city characteristics such as mixed-use, high density, accessibility and public transport. That being said, compared to international standards of high-density areas, these cases are not particularly dense. However, in a Norwegian context, these areas are considered dense and have been subject to the policies of compact development and densification. Furthermore, another criteria was to choose cases within the inner-city areas of Oslo and consequently, within the outer ring road.

There were several reasons for investigating newly developed neighbourhoods. In addition to investigating peoples´ thoughts and preferences of dense living, it was also desirable to find out their motivation for moving in the first place. Consequently, it was a need to find residents who had moved quite recently. Investigating newly developed case areas would naturally include residents who had recently moved there. Furthermore, most of the research on livability and residential satisfaction in the Oslo context had already addressed the old neighbourhoods of the inner-city instead the new ones. In recent times, massive development to meet the growing number of residents in Oslo and for sustainability reasons, it is increasingly important to investigate how residents evaluate and perceive the living qualities in these newly built areas. It was also attempted to choose case areas that differed in terms aspects like distance to city centre (see figure 4), morphology and average income. Some of the neighbourhoods were also more well-received such as Solsiden, while Kværnerbyen has been subject to a lot of critiques and it would be interesting to see how and if this was reflected in the residents' evaluation.

1.4 Clarification of terms

Density

When talking about density one can either refer to the physical density in terms of the concentration of people or to the building density. Perceived density on the other hand, is the

individual perception of the number of people in an area, buildings, the open space and its organisation (Densityarchitecture 2013). In this paper it is mainly referred to the building density if not stated otherwise.

Livability

The term is an absolutely essential part of this thesis. Livability in an urban planning perspective is defined as "*the relationship between the characteristics of the physical environment and the degree of personal satisfaction*". Perceived living quality is closely related to the livability term and illustrated how the residents' perceived livability in an area. Both terms are elaborated more in the theory chapter.

Informants

The terms informant and resident both refers to the interviewed residents and are used interchangeably throughout the paper.

1.5 Structure of the thesis

The structure of this thesis starts with this introduction chapter (chapter 1) introducing the theme of the thesis, the background for studying this field, the research questions, how the thesis is refined, chosen cases and a short clarification of terms. In chapter 2 the methodology used to answer the research question is presented and described. Chapter 3 outlines a literature review of the existing debate about compact city and sustainability, livability and the livability versus compact city paradox. The chapter gives a short introduction and argues for the importance of conducting studies on the relationship between dense living and livability. Furthermore, a conceptual framework is presented at the end of the chapter. Chapter 4 gives a brief introduction to the three chosen cases. Chapter 5 includes the empirical analysis. This chapter outlines the analysis and results from the three case areas and ends with a cross-neighbourhood evaluation. The summary is represented in a table. Chapter 6 includes a discussion in light of the theory, conceptual framework and the results. Eventually, the conclusion is found on chapter 7.

2 Methodology

2.1 Research design

This part describes the relationship between the research question, theory, method and analysis, as illustrated in figure 1. The research questions have been the backbone in the entire thesis and has guided both the theory part, the interview guide, interviews and the analysis. The focus has been on conducting a research project that answered the research question. However, the work with the other parts of the thesis has also helped inform the research question and led to adjustments to ensure that there is a consistency and relationship between the different parts of the thesis.

Furthermore, the theory chapter has been important to inform the interview guide and the analysis. To have enough background information about the topic was essential before conducting the interviews. However, when conducting the interviews, it was also necessary to adjust the theory to make sure that it was detailed enough and covered what was most relevant to the collected data and the analysis. The theory part also answered the first sub-question and helped conceptualise what might be a complex and vague field of study.

The interviews have contributed to answering the sub- research questions in terms of throwing light on how the built environment influences the perceived living quality of the residents, their preferences and what is considered as positive and negative aspects of dense living. The information gathered from the interviews has together with the literature review been the basis for the analysis and discussion. Consequently, this has contributed to answering the main research question.

The analysis part has been based on the research questions, theory and the interviews. These have been essential to be able to analyse the results. The analysis has also informed the other parts and while working on this, it has been necessary to adjust the research question slightly.

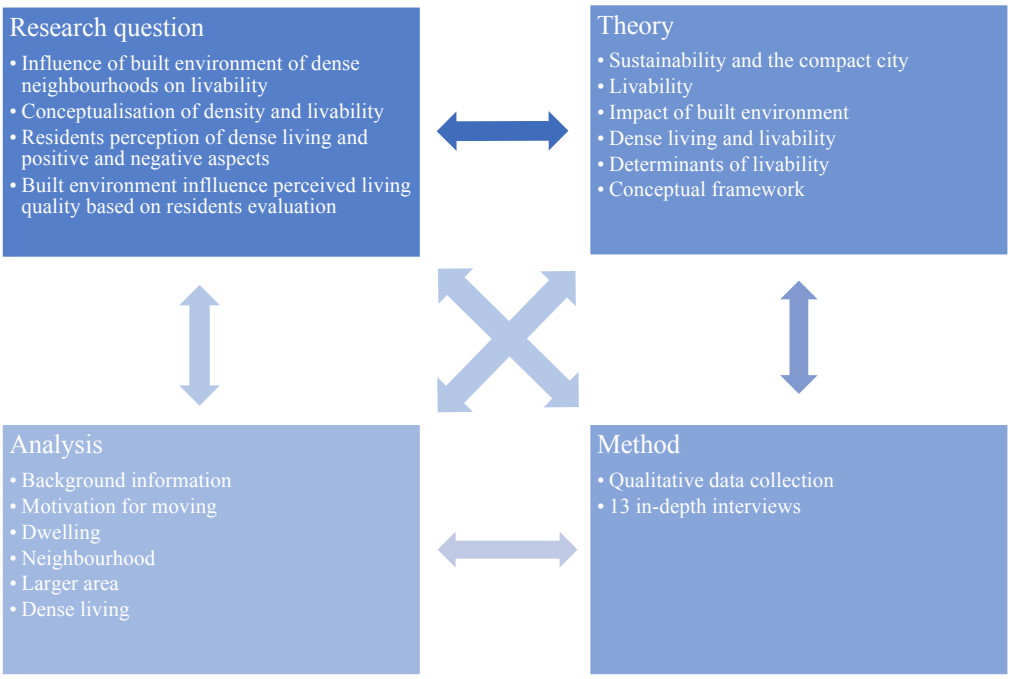


Figure 1. Research design

2.2 Chosen research methods

The aim of the data collection has been to investigate how densification influences the perceived living quality focusing on the built environment and to get a better understanding of the residential preferences, thoughts and evaluation on dense living. Consequently, a combination of a qualitative data collection method and observation of the case areas has been most beneficial to use.[1] In-depth interviews have been conducted to carry out this research. Conducting qualitative interviews can provide insight and help us to understand why people think and act as they do, related to dense living and personal preferences (Silverman 2015). This requires getting more exhaustive answers from the residents including information about factors such as household type, life stage and experiences which influence their perception and thoughts. Consequently, I have chosen not to use a quantitative data collection method, because it is not as suitable to get a deeper and more coherent understanding. In-depth interviews can give us a better understanding of residents' thoughts, motives and preferences in relation to dense living and the reason behind these. To use observation has included to

[1] Parts of the text in this chapter is adapted from the AOS340 assignment which intended to prepare for the master thesis.

walk around the neighbourhoods to get to know the area and get an impression. To know the area has been beneficial to the interviews and to understand the informants.

2.3 Conducting interviews

There are different types of interviews; structured, semi-structured and open-ended interviews (Silverman 2015). When conducting the interviews, the most appropriate way for the purpose of the study has been to use semi-structured interviews. This type of interview lets the informant speak quite freely, however, it has a predetermined interview guide to lead the conversation. Furthermore, one can ask customised follow-up questions to get more information. It was not desirable for the informant to feel like this was a very formal question-and-answer situation, and by using a semi-structured method the interviews could run more like a conversation. This enabled the informants to feel more comfortable and hopefully give better and more exhaustive answers. Having some sort of structure was important to avoid getting too much redundant information and to get enough relevant information about the important topics for answering the research questions.

All the interviews followed the same interview guide. To have the same interview guide was important to ensure that the interviews were comparable. The interview guide was based on the conceptual framework (figure 3) set forward in the theory part. The different topics covered in the interviews were the basic background information relevant to the topic, their motivation for moving there, what they associated with the livability term, they were able to point out strengths and weaknesses about their dwelling, neighbourhood and the location and share thoughts about dense living and the future. After answering the questions about the background information, the informants were given the chance to talk freely, however, roughly guided by the interview guide. First and foremost, the informants were asked questions on a more general basis, and then followed up with more specific questions about their neighbourhood to get an even deeper understanding of their preferences and needs.

The interviews were conducted during February and all the interviews except one, took place at the informants´ home. This was very useful to be able to observe not just the outdoor areas, but also the informant´s dwellings. This made it easier to relate and understand the informant. Each interview took about 45 minutes and there were taken audio recordings and some notes.

However, the latter was kept to a minimum, due to intention to keep the focus on the informant and to ask relevant follow-up questions and not spend too much time on taking notes. The audio recordings will be deleted afterwards.

2.4 Choosing informants

The selection of the informants was mainly done randomly. To find residents in the three chosen case areas, the respective housing corporations were contacted. First, they were asked to provide a list of relevant residents, however, they could not give out contact information of the residents. They offered to post the request on the housing corporations public webpage to reach out to the residents. Furthermore, the following methods might have been more unconventional. On the request of the housing corporations the Facebook page was used, and flyers were posted in the peoples´ mailboxes. The post on the Facebook pages gave the best response and was an easy way to reach out to the residents. However, the backside of using social media as a way to contact the residents is that some people might not be active users of Facebook, and therefore miss the opportunity to partake in the interviews. However, the request was also posted on both the webpage of the housing corporations and as flyers in peoples´ mailboxes. Based on the different channels used to reach out to people, one can assume that this opened up for many people to partake. Eventually, more residents than needed were willing to partake in the interviews for both Sørenga and Kværnerbyen, so the residents from these places were chosen based on personal characteristics such as age, household size and life stage. This has been done to choose an as wide selection of different residents as possible. In Solsiden no more people than needed were willing to partake in the interviews. Naturally, other residents with different views and preferences might have been interviewed if other methods to reach them would have been used. However, considering the limited time frame, these methods gave enough residents in a relatively short time.

Interviews with 13 residents in total were conducted. Considering the time frame, it has only been conducted this number of interviews because it was preferable to get in-depth information from the informants and not to interview as many as possible. Furthermore, conducting more interviews would have taken a lot of time in terms of preparations, the interview itself and processing the data. Four of residents were from Sørenga, four from Solsiden and five from Kværnerbyen. The selection of residents is between the age of 24-74.

Most of them are women, despite the desire to have an even distribution of women and men. It was not intended, but the selection of residents is relatively older and more educated. However, this might also reflect the general distribution of residents living in dense urban areas. The reason for this might be the simple fact that typical residents in these neighbourhoods are relatively older and more educated, or that these were the ones having the time and interest in being interviewed. Many of those being interviewed showed some interest and commitment to the topic, which contributed to getting more exhaustive answers.

2.5 Interpretation and analysing

When analysing the results from the interviews a comparison method had been used. Due to having the same interview guide for all the interviews, it has been easier to compare the results from the different informants and cases. The data analysis was based on the categorisation in the interview guide and conceptual framework following the different scales: the dwelling, neighbourhood and larger area. This has been the backbone for the analysis.

Before conducting the analysis, all interviews were roughly transcribed. Almost all of the information was included except from digressions or topics which was not considered relevant. This was time consuming but necessary to do. Furthermore, the data was categorised and organised into different topics. These topics were similar to the characteristics of the built environment outlined in the conceptual framework (figure 3) and the categories in the interview guide. Despite the fact that most of the information roughly followed the interview guide, the results were still complex and intertwined, and this was an important step to organise all the information and to make it possible to compare the results. During this step some of the information was also simplified and left out. However, this was carefully done to avoid losing any essential details or important findings. Furthermore, three tables were made for each case area. Using colour coding was helpful during this process. Different aspects mentioned by the residents were given an own colour which made it easier to see the similarities and differences between residents. E. g. when several residents mentioned the layout as an important aspect, this topic was coded with a certain colour. When all the data had been represented and organised into one text for each of the case areas, they were re-written to include the more analytical approach. It was essential to organise the data before doing the analysis, due to the vast amount of data gathered from the interviews. During this

process, the main aspects mentioned by the residents within each topic was identified and discussed in light of theory and own reflections. The theory was used to illuminate, explain and to compare with the results. The most essential aspects identified as relevant to the perceived living quality was outlined in the overall evaluation tables for each case area (figure 17, 19 and 21).

The interpretation and analysis has been based on a coherent understanding of each of the informants. As discussed initially, qualitative interviews are great to get a deeper and more complete picture of the residents and their thought, preferences and motives. It has been attempted to understand and interpret what each of the residents mean and how they perceived things. Eventually, a cross- neighbourhood analysis (figure 22) has been conducted based on the most important findings. Here, the same steps of comparison were done. Taking notes and using colour coding was also used to emphasise the similarities and differences. The focus has been on identifying similarities, differences and tendencies across the cases.

2.6 Validity and reliability

Both validity and reliability are important aspects to strive for to conduct a research of good quality. Validity is about trustworthiness. There are two main types of validity; internal and external validity. Internal validity is to which extent the obtained research data meet the requirements of a scientific research method and answers the research question. If the research design is inconsistent and poorly made, this will affect the integrity of the research (Shuttleworth 2008). It is important to the integrity of the research that the data collected comply with the purpose of the thesis and that the conclusions that are drawn is based on the empirical data collected. In this thesis questions directly linked to the research question have been asked, which strengthens the validity of the data. The residents have also given exhaustive answers where the most relevant aspects have been highlighted. Furthermore, it has been strived to ensure consistency and a red line throughout this thesis.

In terms of external validity, the results from a conducted research can be generalised to apply for a greater amount of data than the research conducted. The validity of this thesis is determined by to which degree the research can be useful in other contexts than Oslo. If there are many similar results found across the cases it might be possible to generalise (Silverman

2015). However, it is important to take into consideration that the context of Oslo might differ significantly from other places.

Reliability refers to how reliable the data are. This means the degree in which the results of a study are independent of accidental circumstances which can influence the results (Silverman 2015). This is closely related to replicability and consistency, which means that other researchers can repeat the process and analysis and come up with the same results and interpretations. It can be challenging to test qualitative research, however, it has been attempted to carefully explain the process and decisions made to increase the reliability. This includes explaining the reasons for the choices made, the process of finding case areas, informants and conducting interviews, the stages of analysis and other important decisions influential to the outcome. Furthermore, it is important to acknowledge that the interpretation of the data will be coloured by one's opinions and perceptions to a certain degree which might influence the final outcome.

2.7 Ethical considerations

During the work with this master thesis it has been strived to conduct a research project that complies with the rules about research ethics set forward by Personvernombudet (NSD). The thesis has been notified to the NSD due to containing personal data of the informants. Before conducting the interviews, the informants were firstly asked to participate and were given information regarding the research project. This included information about the aim and background for the research, what their participation meant and how the information would be handled. Furthermore, they were also given information about free consent and asked about permission to use audio recordings, which all the informants agreed to. To use audio recordings do have many advantages. All the recordings were roughly transcribed, because having to transcribe everything verbatim would have taken too much time considering the time available and the number of informants. However, to transcribe it roughly made it easier to get the information right and to avoid misunderstandings. The names of the informants were anonymised and information that could potentially be sensitive to people, such as housing prices or health were avoided or treated with care.

3 Theory part

3.1 Sustainability and the compact city

Since the release of the Brundtland Commission´s report "Our common future" in 1978, we have witnessed an increasing focus on sustainable development in planning, where the term includes both the environmental, economic and social sustainability (Hofstad et al. 2015). Initially, the environmental sustainability was the main focus for a long time, but there has now been an increasing emphasis on the social dimension. The focus on sustainable urban planning has resulted in the suggestion of several design concepts related to sustainable urban forms, including neotraditional development, urban containment, eco-city and the compact city concept (Jabareen 2006).

Both internationally and in Norway the compact city has been subject to an increasing focus and has been favoured as the best policy option to ensure a more sustainable urban development (Jabareen 2006; Mouratidis 2017a; Neuman 2005). The municipality of Oslo has adopted the densification strategy, which states that the future population growth should be dealt with according to the compact city strategy, concentrating new development within the existing boundaries of the city (Oslo kommune 2015). According to Neuman (2005) there is no official definition of the compact city, despite the term being extensively used and widely accepted. It is argued that the compact city is the opposite of urban sprawl and a large part of this interest relates to the negative impacts associated with urban sprawl. There are a number of reasons why urban sprawl is considered a less sustainable way of life. It contributes to increased traffic volume and a higher share of private car-based transport. It also occupies considerable more land and resources than compact urban areas, puts pressure on biodiversity and is less efficient in terms of infrastructure and energy use (Jabareen 2006) (Næss 2014). Professionals agree that the urban form and residential preferences concerning where to live and the acceptance of dense living, do have a great impact on the environmental sustainability (Howley 2009). Much of the background for the interest in sustainable urban planning relates to concerns about the negative impacts of urban sprawl, and the belief that higher residential densities, by living denser and in smaller dwellings, one can reduce the negative environmental impacts. This has been seen as the most effective tool to support densification, making urban areas more compact (Stefansdottir & Xue 2017).

The compact city concept includes several strategies which aim at creating higher densities and to avoid the problems of sprawl (Jabareen 2006). As seen in figure 2, the compact city can be characterised by dense urban areas, mixed land-use, clear boundaries between the city and its surroundings, an efficient public transport system and the favouring of walking and cycling. Increasing the densities in urban areas is considered the key strategy for managing urban growth and to ensure a more sustainable development. As a result, we have witnessed an increasing emphasis on densification policies (Howley et al. 2009). There are a number of reasons for the wide support; the compact city concept is claimed to reduce the transport dependency and therefore reduce the fuel emissions, be more efficient in terms of infrastructure, building materials and energy use, preserve contiguous green areas around the cities and include diverse and mixed use of dwellings, service and industrial purposes within short distance (Burton 2003; Hofstad et al. 2015). Furthermore, the European Commission strongly argues that the compact city is both more sustainable and improves the quality of life (Jabareen 2006).

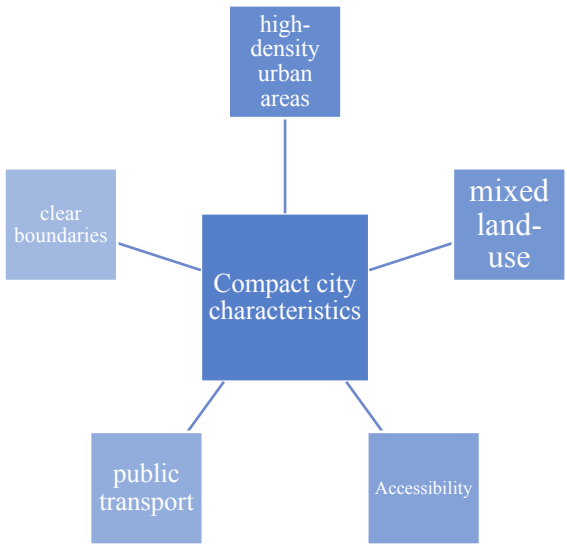


Figure 2. Compact city characteristics.

Sustainable development has, to a greater extent than ever before, been linked to the concepts of subjective well-being, quality of life and livability (Stefansdottir & Xue 2017). Contemporary urban planning is concerned with the relationship between the development of compact cities and livable urban areas, because creating sustainable cities requires more than just increasing residential densities (Howley et al. 2009). The desire to improve the quality of life in urban areas is an important agenda for planners (Godschalk 2004). Hence, it is increasingly important to investigate the content of livability.

3.2 Livability

Along with the sustainability debate, *livability* has increasingly been used by planners and policy makers as a principle in urban planning and place making for a long time. The livability and quality of life terms are usually used interchangeably and concern many of the same issues (Saitluanga 2014). Livability is a very vague term and there seems to be a lack of consensus on what it actually contains. It is argued that a livable city is a place of high quality where people want to live (Satu & Chiu 2017). Yang (2008) claims that many theorists use objective indicators to measure livability, such as housing prices or income, and argue that a useful conception is based on the perception and satisfaction of an individual.

Due to the lack of any established framework or a uniform definition of livability, the term has been understood and applied in many ways. It has been defined in various ways based on different urban contexts and dimensions, all emphasizing different livability characteristics (Satu & Chiu 2017). Many proponents of the livability term claim that it is possible to define livability and to provide some characteristics which remain constant over time. However, in their paper, Ruth & Franklin (2014) question this and stress that livability varies greatly across population groups and space. Livability is not only a tangible result of desirable urban conditions, but also a result of people´s perception of urban life. Consequently, they claim it is challenging to come up with an applicable definition on livability. Pacione (2003) also stresses that the definition of livability is relative to place, time and the values of the evaluator. However, there has been many attempts to define what constitutes livability in urban planning.

The paper of Stefansdottir & Xue mainly address these aspects as determinants of livability of the dwelling, but strongly argue for the importance of the surroundings and opportunities in the neighbourhood to perceived living quality. The various components of the built environment do have a role in stimulating the quality of life and subjective well-being, and therefore also the perceived living quality of a place. Satu & Chiu (2017 p. 5) call this a "place-based approach which incorporates the geographical contexts and fix livability to locations". Here, livability is argued to be derived from both the dwelling conditions, the neighbourhood and the immediate community. This is supported by a NIBR-report from 2014, describing livability as qualities on three different scales, where livability is defined as the characteristics of the dwelling, the neighbourhood and the larger area. It is emphasised

that livability is not only a matter of the quality of the dwelling itself, but also a matter of the broader context and location (Schmidt 2014). Barlindhaug et al. (2012) describe livability as something that cannot be defined and fully understood without taking into consideration the neighbourhood and surroundings, and they also address livability at different scales of the built environment: as the qualities of the dwelling/building, the outdoor area and the larger area. The perceived living quality is dependent on the location and is hence based on the evaluation of qualities at these three scales. Buys and Miller (2012) state that the built environment, of both the dwelling and the features of the neighbourhood, has a great impact on the physical character, quality of life and livability of a place.

Stefansdottir & Xue (2017) consequently define livability as the combination of human needs and subjective well-being with the opportunities in the built environment. This definition acknowledges the importance of the interaction between the built environment and the subjective aspects as important in defining livability. Another professional emphasising this relation is Pacione (2003) who states that livability is a quality not inherent in the environment but is a behaviour related function of the interaction between environmental characteristics and personal preferences. This definition is quite similar and relates to the concerns of social well-being. Leby & Hashim (2010) claims that is focuses on the subjective evaluation of residents´ living environment.

Furthermore, several professionals emphasise livability as not only dependent on the contextual characteristics, but also in relation to time and people´s preferences. In his paper, Okulicz-Kozaryn (2013) claims that livability is equivalent to quality of life and general well-being of a population in an area such as a city. Similar to the definition provided by Stefansdottir & Xue, the definition emphasises both the importance of human needs and subjective well-being to livability, and strongly argues that the main problem with the livability concept is that it is different to different people. Okulicz-Kozaryn (2013) emphasises that many of the measures of livability is objectively measured when what really matters is the perceived living quality. Individuals and households at different life stages may define livability differently, because of their age, personal needs and that their preferences differ with time. Hence, what is considered livable environments and how people evaluate different qualities will not be constant over time. People will have different attitudes towards dense living, to what is considered livable environments and which qualities they consider as important as their personal characteristics. The ideal about suburban living and a single-

family dwelling has long been dominant, but some professionals claim that one can see a change towards more people being willing to move to denser urban areas (Asker kommune 2012). This includes replacing the ideal about a single-family dwelling with shorter proximity to facilities and public transport. Results from a study conducted by Howley (2009) indicate that the perceived living quality of an area and the household life stage is crucial to people´s future choice of residence.

Common for all of these attempts to define livability, is that they all stress three important features: 1) perceived living quality is based on subjective well-being and human needs, 2) livability is determined by qualities and characteristics in the broader environmental context and at different scales, 3) and that livability will vary depending on time, both in terms of life stage and the societal level. Briefly summarised, livability is about the socio-physical relation (Satu & Chiu 2017). Based on these features, it can be concluded that livability in terms of urban planning is *the relationship between the characteristics of the physical environment and the degree of personal satisfaction.* Consequently, as Satu & Chiu stress (2017) livability is about the degree of satisfaction that residents experience towards their living environment, both measured by objective and subjective indicators. Livability is therefore a suitable concept to use when studying the residential satisfaction with different living environments, hereunder dense living.

3.3 Dense living and livability

As we saw initially, the compact city has been object to massive support as the most sustainable policy option. However, there has been a growing discussion regarding the negative consequences of this densification. Most of these concerns are directly related to the social sustainability of the compact city and are based on the negative effects of high-density environment on the quality of life. This has been suggested by several professionals (Mouratidis 2017a). Neuman (2005) introduces the expression “the compact city paradox”, which reflects the perception that the built environment of dense urban areas living includes lower livability. The challenge in urban areas are consequently to ensure high livability and at the same time build dense enough. The proponents of the compact city have advocated for livable dense environments, but there has not been sufficient empirical evidence to dismiss or confirm these concerns (Arundel & Ronald 2017). We do not have enough knowledge to

conclude that dense living has negative impacts on livability, and research studies show quite mixed empirical results on the impact of densification on livability. However, several studies indicate that density has a negative effect on livability and that dense living is perceived as undesirable.

As mentioned, it is argued that a common perception is that dense living implies lower livability (Buys & Miller 2012; Howley et al. 2009; Mouratidis 2017a). Dense living has also been seen as an undesirable long-term option. A study by Senior et al. (2004) reached the conclusion that people generally prefer suburban living over dense living, and do not think living in dense urban areas can compensate for low density living. Most of the residents stated that dense living was negative due to not having a garden, the restriction of roadside parking, lack of privacy, being too busy and they preferred a more spacious dwelling. They suggested that these qualities mentioned were more important than having proximity to facilities and most of them were families with young children and people in retirement age.

According to Allan & Blandy (2004) there is consensus that the majority of residents in dense areas are young professionals following a housing carrier, starting in the city centre and eventually moving out to the suburbs. However, they also identified more authentic inner-city residents being finished with the suburban family life or culturalists being attracted by the urban lifestyle. This is supported by Bramley et al. (2009) who state that many of these young adults are attracted to the city centre lifestyle and due to proximity to employment, services and facilities. They investigated the relationship between urban form and social sustainability and found that urban forms and housing types tends to be associated with dissatisfaction among residents compared to sprawled environments. Furthermore, they stress that the neighbourhood attachment, stability, safety, dwelling satisfaction and environmental quality was perceived as lower in high density urban areas. The findings suggested that people favour low-density living. Worth noting is that this study addressed medium, and not large sized cities with varying housing forms in Britain, which might not have had all the typical compact city characteristics.

Some critics have particularly raised concerns regarding the increasing pressure on outdoor areas, living quality and size and quality of dwellings. The lack of space has consistently seen as one of the main disadvantages of dense living in several studies. In an important study of residential satisfaction in the inner-city area in Brisbane, Australia Buys and Miller (2012)

addressed the impact of dwelling design, neighbourhood and neighbours on residential satisfaction and concluded that people generally favoured low density living. The main limitation of dense living was the lack of space and the residents stressed the desire to have more space, also in terms of having an extra room or a balcony. However, the majority of the sample were indeed extremely satisfied, and they found that residential satisfaction mainly depended on some specific attributes in relation to the dwelling and neighbourhood. These were the dwelling position, dwelling design and facilities, noise, safety, the condition of the local area and social contacts. The authors argue that it is increasingly acknowledged that the design of the dwelling and the features of the neighbourhood determines the livability of a place. This was also acknowledged by a key study conducted by NIBR in 2014 investigating densification and livability in three cases that had been subject to densification and compact city development. The study found that the densification negatively influenced the social sustainability, led to a lack of sunlight, pressure on common outdoor areas and too many small dwellings (Schmidt 2014). The fact that there were too many dwellings being too small lead to less stability and dwelling satisfaction. Furthermore, the reason for this was argued to be market-based development of urban areas is happening at the expense of important qualities.

A study conducted by Burton (2003) also investigated the relationship between compact city and social sustainability, and concluded that densification negatively affects the dwelling size, access to green areas and crime rates. Heath (2001) had a different approach, asking residents of suburban areas about the barriers and facilitators to dense living. The majority did not prefer dense living and identified noise, a too busy pace of life and crime as negative aspects of dense living. According to other authors the lack of greenery has also been a common urban problem (Howley et al. 2009; Mouratidis 2017a).

Despite the view of dense living as something undesirable, several of these studies acknowledge that factors related to the dwelling and neighbourhood determines the livability of a place. A very relevant study by Howley (2009) came to the similar conclusion. Negative attitude towards dense living was also uncovered in a study of residential preferences in new relatively density areas in Dublin. Here, they found that the perceived livability of residents in dense urban areas was lower than in the sprawled areas, and many of the residents evaluated their living quality in dense areas as poor. The most negative aspects of dense living were found to be the high cost of housing, the lack of space, the open spaces being too crowded.

Furthermore, the residents also stated that they experienced issues in relation to pollution, traffic congestion and noise. Several also found high density environments to be unsuitable to bring up children. This is also supported by a number of authors stressing that that densification can lead to negative consequences for residential satisfaction because inner city dwellers are exposed for noise, pollution and traffic (Burton 2003; Næss 2014; Mouratidis, 2017a). Howley and his colleagues (Howley et al. 2009) found similar results. However, they concluded that the high density itself was not necessary the source of dissatisfaction, but rather the related to factors such as traffic, noise, environmental quality, lack of services, facilities and community involvement. Furthermore, the key determinants of neighbourhood satisfaction were the dwelling satisfaction and qualities within the neighbourhood like job opportunities, safety, neighbourhood ties and cleanness. The findings suggested that to improve the design of the dwelling unit and neighbourhood can influence residential attitudes towards compact city living.

In contrast, proponents of the compact city argue that a city can indeed offer both high-density environments and still be livable. Neuman (2005) argues that what many people see as qualities in sprawled areas, are to be found in abundance in several cities, and are not only to be found in low density areas. Livability is not only a matter of the density alone but is a matter of urban form and personal preferences. Some empirical studies suggest that the compact city may influence livability in a positive manner. Using Amsterdam as a case, Arundel & Ronald (2017) focus on the impact of built form on residential satisfaction. They claim that previous studies are largely concerned with the effect of density alone and suggest that high densities do not have a negative impact on neighbourhood satisfaction. The study challenges the notion that high density includes lower livability and claim that the urban form of dense neighbourhoods is of greater importance than density alone. This view is supported by Howley at al. (2009) who argue that a city can be both dense and offer high living quality comparable to many sprawled areas, but it is crucial how the density is configured and the presence of important qualities.

Furthermore, there are some characteristics of dense living which are consistently found to positively influence the livability. Despite the majority of residents favouring dense living in the study conducted by Howley (2009), he also identified some benefits of dense living. Accessibility and related issues such as less commuting and better public transport were found to be one of the most common benefits of dense living. Dense urban areas imply that

buildings, facilities and people are located closer to each other which leads to better accessibility. This is supported by several other studies suggesting that accessibility to public transport, services and facilities within the local area and the larger city is one of the most positive aspects of dense living (Bramley et al. 2009; Leyden 2003; Mouratidis 2017a). Other aspects such as better cultural activities and social life were also seen as important in this study. How the compact city can be beneficial to social aspects and hence livability has also been investigated in many ways.

The built environment in dense urban areas may contribute to a better social life due to more frequent interaction between people and proximity to family and friends (Arundel & Ronald 2017). Leyden (2003) found that pedestrian-oriented and mixed-use neighbourhood enhanced the social engagement, while other proponents claim that it can be beneficial to social equity and health (Burton 2000). In several of his research papers Mouratidis (2017a; 2017b; 2018) emphasise that the built environment does influence subjective well-being and livability. In one of his studies, Mouratidis (2018) investigated the relationship between the built environment and social life and found that residents in compact neighbourhood in the Oslo metropolitan area were more satisfied with their personal relationships compared to residents in low density neighbourhoods. Aspects such as mixed land use, high density and short distance to the city centre positively contributed to more social interaction. The residents were able to socialise more with close ones, received more social support and had greater chances at making new acquaintances. Furthermore, attractive open spaces, outdoor areas and parks may contribute to increased social interaction and stronger neighbourhood ties due to interaction between residents and a shared interest in the immediate environment (Leby & Hashim 2010). Proponents also argue that high densities and mixed use can potentially reduce the level of social segregation in an area because these areas are more mixed than in many suburban areas (Burton 2000).

Another key study conducted by Mouratidis (2017a) investigated the impacts of compact city characteristics on livability, by using neighbourhood satisfaction. He stressed that there is not sufficient knowledge on the impacts of densification on livability to conclude that dense areas are less livable. In fact, the study found that the compact city has a positive influence on neighbourhood satisfaction and hence livability, and that residents in dense neighbourhoods were more satisfied than those living in sprawled areas. In addition to high accessibility, having less maintenance work in the interior space and garden was seen as beneficial by

many. However, the study emphasises that in order to ensure livable urban environments, there are several physical and social characteristics which need to be present, such as public transport, high accessibility, open spaces and parks, equality, safety and a limited noise and pollution. These findings have been confirmed by Mitrany (2005), who did a qualitative study of the influence of physical and social features on neighbourhood satisfaction in Israel. He found that dense areas were perceived much more positively in neighbourhoods with a greater prevalence of qualities like public transport, open spaces and walkability. Similarly, Kearney (2006) investigated the residential satisfaction at different densities in the US and did not find high density as a determinant to satisfaction. However, many of the empirical studies conducted in the US are not usually that dense and do not include all the compact city characteristics like many of the European and Australian cities does. These findings indicate that residential satisfaction is not directly a result of the density alone, but factors in the neighbourhood such as environmental quality, accessibility, social interaction and lack of noise and pollution (Buys & Miller 2012). Furthermore, this empirical research seems to show a positive relationship between areas with a high degree of compact city characteristics and residential satisfaction.

Eventually, the brief literature review reveals that the relationship between high densities and livability appears to be quite complex and often the findings are contradictory. Furthermore, this is a very context dependent topic, related to cultures and traditions. There are not sufficient studies within the Nordic context, and this research study aims at filling this gap and provide knowledge that can be compared to other geographical and cultural backgrounds. Consequently, there is a need to do more research and get more knowledge on the relationship between densification and livability, especially considering how prevalent the densification policies are in urban planning and the consequences of this development.

3.4 Determinants of livable environments

What kind of qualities of the built environment that characterise livable environments, is generally quite unclear. Some of the cited theorists have avoided listing any characteristics, due to the challenge of defining any specific characteristics that determine livability independent of time, space and preferences. Eventually, the term is a subjective one and it is essential to understand it through the context of people who live in the specific environment

(Leby & Hashim 2010). For this reason, some researchers stress the importance of conducting studies which is based on resident´s personal preferences to guide urban planning (Mouratidis 2018; Ruth & Franklin 2014; Yang 2008). The perceived living quality of an environment will vary according to people´s life cycle stage, age, needs and personal characteristics. However, some agreements can be made on what characterise livable environments and which characteristics people generally value. Though not exhaustively, several characteristics (both social and physical) of livable environments can be identified based on the empirical research addressed above:

Social factors

- Social interaction
- Social equity within and between neighbourhoods
- Stability
- Neighbourhood ties and attachment (sense of belonging)
- Perceived safety in terms of lack of crime

Accessibility

- Services and facilities
- Public transport
- Mixed land-use
- Pedestrian oriented

Environmental quality

- Urban parks
- Attractive outdoor areas
- Open spaces
- Lack of motorised traffic, noise and pollution

Building quality

- Balcony
- Privacy

Many authors have used different characteristics of built form to determine the satisfaction with both the dwelling, neighbourhood and the larger scale (Norouzian-Maleki et al. 2015;

Satu & Chiu 2017; Schmidt 2014; Visser et al. 2005). It is increasingly acknowledged, that the quality and livability of a place is determined by both the dwelling itself and the features of the broader context, and that livability can be measured at different scales (Buys & Miller 2012). Based on the conceptualisation by Schmidt (2014), the determinants of the built environment on livability can be found at these three following scales:

- *The dwelling* – dwelling design (size, number of rooms, layout), building quality, sunlight and view, dwelling position within the building, parking.
- *The neighbourhood* – perceived density, local facilities and mixed-use, outdoor space and green areas, design and aesthetic quality, traffic and noise, social environment.
- *The larger area* – Accessibility to recreational areas, employment, city centre and public transport.

3.4.1 The dwelling

As mentioned initially, to reduce the sizes of dwellings and to live denser is essential in the densification strategy (Stefansdottir & Xue 2017). The dwelling is a vital component of the built environment and plays a large role in the perceived living quality of residents. Randolph (2006) claims that the quality of dwellings in high-density environments will play a critical role in the long-term success of dense living, and potential dissatisfaction with the dwelling will have an important impact of residents´ attitudes towards dense living. Dissatisfaction with the dwelling can, according to Buys and Miller (2012), speed up individuals' decision to move. Consequently, it is necessary to study which characteristics of the dwelling that are considered the most important and how residents perceive these as determinants of livability.

According to the theory addressed above, we have seen that many challenges of dense living in relation to the dwelling is related to lack of sunlight, dwellings being too small and poor dwelling quality. Research also indicates that qualities like sunlight, having a nice view, privacy in the dwelling, spacious rooms and having a balcony are considered the highest valued qualities to residents (Barlindhaug et al. 2012; Schmidt 2014). The desire for having larger dwelling and less noise was also found in the research conducted by Buys and Miller (2012). The research showed that qualities like spacious rooms, dwelling size, dwelling position, layout and facilities in the dwelling determined the residents´ satisfaction. The latter

three were found to be the most important ones. Qualities like having a garden has by many be seen as a requirement (Senior et al. 2004).

In another NIBR study from 2012 Barlindhaug et al. (2012) investigated qualities influential to the price of a dwelling. Housing prices cannot be considered a measure for livability but can still give us an indication on what residents consider as important. They found that the dwelling layout was more important to smaller dwellings, and sunlight and view as the most important qualities when buying larger dwellings. Other essential qualities were parking and shielding against insight into the dwelling. The price was lower for the dwellings being located in the bottom floors in a building.

3.4.2 The neighbourhood

Studies show that reducing the size of the dwelling, puts greater pressure on the qualities of the neighbourhood because the living space is extended into these shared spaces (Stefansdottir & Xue, 2017), and the presence of several physical qualities in the neighbourhood is seen as essential to livability in dense urban areas (Leby & Hashim 2010; Mouratidis, 2017a). Furthermore, Steffansen (2012) claims that the physical qualities in the neighbourhood are often perceived as more important to residents than the qualities in the dwelling. The physical characteristics of the neighbourhood which can determine the perceived livability are often aspects such as perceived density, local facilities and mixed-use, aesthetic quality, outdoor space and green areas.

According to the NIBR-report from 2014 mentioned above, proximity to local facilities and nice outdoor areas were evaluated as the most important qualities in the neighbourhood. However, the studies show that parking options and common outdoor areas are scarce in dense areas, which negatively influenced the livability (Schmidt 2014). Having proximity to water and parks is seen as attractive qualities in a neighbourhood (Barlindhaug et al. 2012; Schmidt 2014). In the study by Buys and Miller (2012) the most important characteristics of the neighbourhood to determine residential satisfaction were the dwelling position in relation to local facilities, noise and tidiness for the area. Other qualities consistently found in high-density neighbourhoods that have a positive impact on livability is open spaces and quietness (Bramley et al. 2006; Leyden 2003; Mouratidis 2017a).

3.4.3 The larger area

This scale is about the relationship between the dwelling and neighbourhood in relation to the larger area. This includes aspects such as location relative to the city centre and work place, accessibility to public transport, larger recreational areas and other neighbourhoods. The location of dwelling in relation to the facilities and city centre influence travel behaviour and the perceived living quality, and research shows that high accessibility is considered one of the most important benefits of dense living (Mouratidis 2017a; Næss 2016). Other qualities found to be very important to residents' satisfaction is access to public transport and valuable recreational areas and water qualities (Schmidt 2014).

3.5 Conceptual framework

The influences of densification on livability is shown in the conceptual framework (figure 3). Firstly, presented below is a definition of livability. As defined initially, livability is *the relationship between qualities of the built environment and personal satisfaction*. Closely linked to the livability term is the perceived living quality, which illustrates how residents perceive livability in an area. As mentioned above, professionals claim that subjective measures are essential to study the relationship between density and livability and also to inform urban planning policies. How residents perceive the living quality largely depends on personal characteristics such as age, life stage, former experience, household and gender. These personal characteristics will influence peoples' thoughts on dense living, their motives when moving to/from dense areas and their satisfaction with the neighbourhood. The framework does not take into consideration other social aspects, such as health and general well-being. There are also externalities apart from personal characteristics influencing peoples' residential decisions. This includes housing prices and commuting costs. One main reason why people prefer low density living over dense living can be expensive housing prices in the inner-city areas and that people often balance the housing prices with the cost of commuting. Consequently, many people are willing to commute in order to get a larger dwelling outside the inner city. Many young households who needs more space due to a growing family are forced to move to the outskirts of the city, due to the housing prices and that they cannot afford a house in the city (Senior et al. 2004). Furthermore, the framework illustrates some specific characteristics of the built environment, which are important characteristics of perceived living quality. These are found within three main scales of the

built environment; 1) the dwelling 2) the neighbourhood and 3) the larger area. The purpose of this framework is to suggest how characteristics of the built environment are linked to perceived living quality.

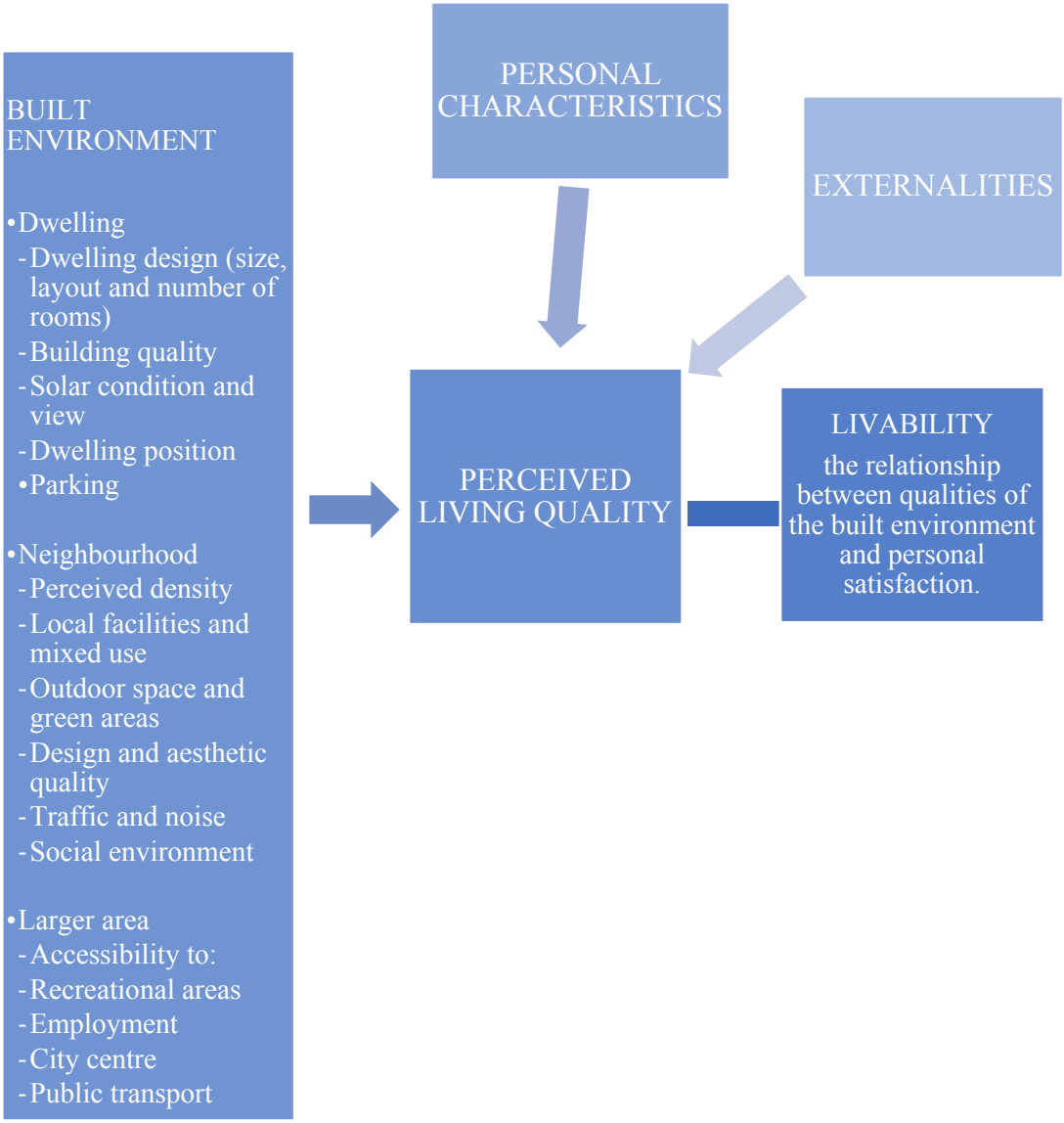


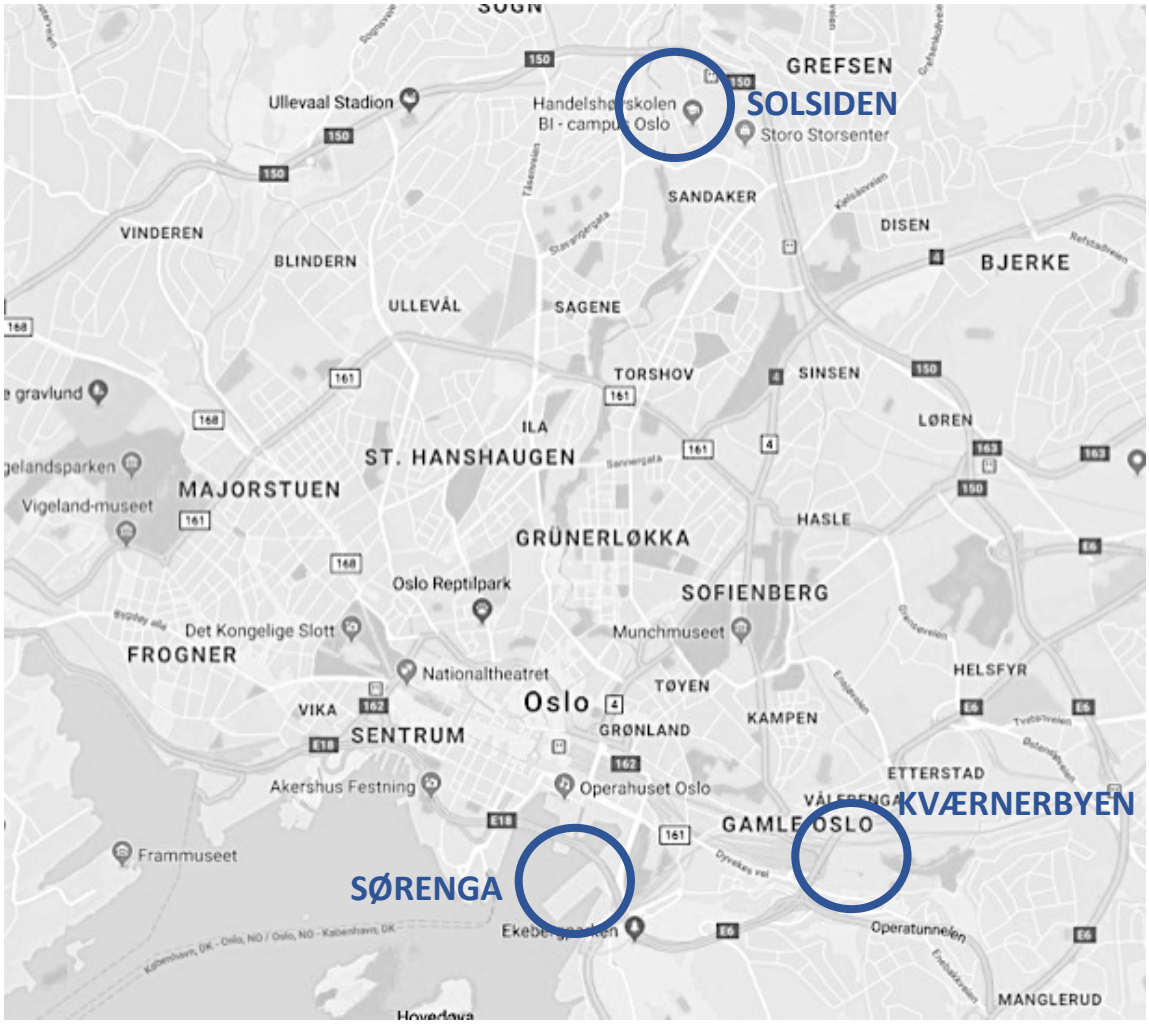
Figure 3. Conceptual framework.

4 Case areas

Common for the three case areas is that they are all large housing projects being a result of the market-based densification and compact city development. According to the municipal plan for Oslo, the areas of Fjordbyen and Nydalen has been identified as priority areas for development in the inner city. Kværnerbyen has also been considered an extension of the Fjordbyen development and is a part of the extensive urban development of the eastern parts of Oslo. By which is meant that the areas are essential transformation areas to ensure high densities and quality of architecture, green areas and urban spaces. They shall also be built according to existing urban space and connections (Oslo kommune 2015). The aim of this chapter is to give a brief introduction to the chosen cases Sørenga, Kværnerbyen and Solsiden.

4.1 Overall map of the cases

Figure 4. Map of the case areas. From: Google Maps.



4.2 Sørenga

Sørenga is centrally located in the eastern parts of Oslo on the pier formerly used as a container port (see figure 5). The area used to be characterised by industry, port functions and heavy infrastructure before it was subject to massive transformation (Oslo kommune 2017). Sørenga is included as a neighbourhood in the masterplan for Bjørvika and is surrounded by this newly built district and ongoing construction work (Røtnes et al. 2015).

Both Sørenga and the area of Bjørvika has long been under-prioritised areas in the urban planning in Oslo. However, these have been vital parts of the redevelopment of Oslo municipality's "Fjordbyen", which is a project aimed at opening up the city towards the water and to develop these areas along the water as a part of the extensive urban planning in Oslo. Furthermore, they have also been identified as important focus areas for sustainable urban development and densification. This development has included transforming large areas along the water to new housing, commercial activities and recreational purposes (Oslo kommune 2017).

The Sørenga project is considered one of the largest sustainable development projects in Oslo in recent times and has been developed as an entirely new district in Oslo (Oslo kommune 2017). The implementation of the project has been conducted by Sørenga Development and was finished in 2017. It consists of the total of around 746 dwellings in eight different blocks (Bjørvika Utvikling 2017). Sørenga is built having different varieties of the classic block structure. The atriums (figure 8) within each of the blocks are accessible for the public but located one floor higher than the public waterfront promenade. There is a clear distinction between the part of the blocks facing the public side and the more semi-public parts facing the central park (Røtnes et al. 2015). The first residents moved in in 2011. When developing Sørenga the focus has been on integrating it to the surrounding areas and to ensure recreational areas and facilities for the public. The seawater bath and waterfront promenade (figure 7) has been particularly successful (Oslo kommune 2017).

According to a report from the municipality of Oslo (Oslo kommune 2017) the average income of the residents in Sørenga is high compared to the rest of Oslo and other transformation areas. The majority of the residents are young adults between 20 and 44 years old.

Figure 5. Overview of Sørenga. From: E24.

Figure 6. The neighbourhood. From: VisitOslo.

Figure 7. The waterfront promenade. From: Urbanium

.

Figure 8. One of the atriums. From: Aftenposten.

4.3 Kværnerbyen

Kværnerbyen is located in the area of Lodalen east of the city centre of Oslo. The area has long been dominated by industry and is surrounded by large infrastructure such as the E6 highway and the railway (see figure 9). Furthermore, it is located in a valley and has limited connections to the surrounding areas (Røtnes et al. 2015). However, there are connection to recreational areas in Svartdalen and the distance to the city centre is small.

Similar to the development in Fjordbyen, Kværnerbyen has been subject to a massive transformation process from being an old industrial area to a new district with housing, commercial activities and offices in the inner city of Oslo (Asplan Viak 2013). In 2004 Kværnerbyen was in the municipal plan pointed out to be one of nine focus areas for new residential development and densification in Oslo. Due to the long term industrial activity, there has been little access and knowledge of this area before (Røtnes et al. 2015).

The neighbourhood is considered one of the largest residential development projects and is built and managed by the developer OBOS. The property was bought by OBOS in 2001 and together with the architect firm Arcasa an overall masterplan was prepared for the area. The aim was to create and transform it into an urban area and a new district with good connection to the surrounding neighbourhoods and recreational areas. Furthermore, to continue to use the historical references of the area in the project was desirable. It was important to facilitate for open and good urban spaces, good public transport and mixed use. The project is planned to include the total of 1650 dwellings and 3300 residents. The central buildings are organised with an open block structure while the outer buildings are lamella buildings functioning as noise shielding. The inner courtyards are raised above the street level and appears quite private. The outer ones are less private and do have a more open structure. The first residents moved in in 2007, however, the construction work is not finished. When finished, the neighbourhood will consist of ten housing corporations (Røtnes et al. 2015).

The average income in Kværnerbyen is quite similar to the rest of Oslo and there is an overweight, almost two thirds, of young adults (Oslo kommune 2017).

Figure 9. Overview of Kværnerbyen. From: Aftenposten.

Figure 10. Reuse of an old building. From: Krogsveen.

Figure 11. The neighbourhood. From: Aftenposten.

Figure 12. The Dreieskiva buildings. From: Archive.

4.4 Solsiden

The Solsiden neighbourhood in Nydalen is centrally located between the campus of the Norwegian Business School (BI), the Gullhaug square and Akerselva. Nydalen has been subject to a transformation process from being an old area primarily for industrial purposes to a new area with housing, offices, education and commercial activities. Furthermore, it is seen as a hub for public transport. The area has been built according to the strategies for sustainable urban planning and compact city development with high densities and mixed use (Schmidt 2014).

Solsiden was constructed by the developer Avantor and consists of seven buildings with their own housing corporations. The building has been constructed at different stages and the neighbourhood was finished in 2008. It has the total of 453 dwellings. The neighbourhood is organised with lamella buildings located as an open courtyard towards the river Akerselva. The courtyards are raised above the river and located at different levels and are accessible to the public (figure 14). The area was originally intended to be an area for commercial purposes, however, it was developed as a housing project due to signals from the municipality about the need for more housing. The aim of the developer has been to create a city within the city and the focus has been on creating attractive outdoor areas (Schmidt 2014).

In the current municipal plan, Nydalen has been identified as one of the focus areas in the municipal plan in Oslo, and there is massive development happening here (Oslo kommune 2015). Similar to Kværnerbyen, the average income for Nydalen is quite average compared to Oslo. Nydalen also has an overweight of young adults but has a slightly larger proportion of older people in relation to Kværnerbyen (Oslo kommune 2017).

Figure 13. Overview of Solsiden. From: Krogsveen.

Figure 14. Outdoor areas. From: Avantor.

Figure 15. The neighbourhood. From: Krogsveen.

5 Empirical analysis

This chapter outlines the results from the interviews conducted with the residents from the three case areas. The analysis has been structured based on what has been conceptualised as the three different levels of the built environment outlined in the theory chapter, hereunder the dwelling, the neighbourhood and the larger area.

The tables (figure 16, 18 and 20) outlined for each case area is an overview of the background information of each of the informants. As addressed in the conceptual framework, this information about their personal characteristics is highly relevant because it influences the informants´ preferences, needs, thoughts about dense living and also their perceived living quality.

5.1 Sørenga

5.1.1 Background information

	Gender	Age	Length of residence	Household size	Former dwelling type	Dwelling size
Resident 1	Female	63	4,5	1	Single-family dwelling	65
Resident 2	Female	53	2	2	Single-family dwelling	123
Resident 3	Female	56	2,5	1-3	Single-family dwelling	65
Resident 4	Male	46	2,5	5	Apartment	150

Figure 16. Background information Sørenga.

5.1.2 Motivation for moving

Having **proximity to the workplace** is considered an important motivation for moving to dense urban areas, and resident 1 and 3 stress that this was their main motivation. The latter adds that this also included moving back to Oslo because she missed it and to have **proximity to family and friends**. She has daughters studying abroad and it was important for her to have proximity to the central station. The dwelling and the location were attractive qualities and were the reason she ended up at Sørenga. Another main reason why many choose to

move to dense neighbourhoods is to have **less maintenance** and to get a **more convenient and easy lifestyle**, particularly for residents having lived in a single-family dwelling. Resident 2 claims that their children had grown up, their former house needed renovation and they had been planning to move for a while. They discovered Sørenga when visiting their son who already lived there. They found the location and the fact that the dwellings were newly built as attractive. Resident 4 clearly states that buying his **dream apartment** was his main motivation and he did not thrive in his former dwelling. He indicated that his dream apartment included aspects such as a newly built dwelling with elevator and good dwelling design, a good location, dwelling position and nice neighbours. The reasons for moving seem to differ among the residents based on their life stage and background as indicated in figure 16. However, according to existing theory, it is claimed that many choose to move to dense areas to have proximity to employment and facilities (Bramley et al. 2006), similar to resident 1 and 3. Resident 2 on the other hand seem to be what Allen and Blandy (2004) call a "authentic inner-city resident" who is finished with the suburban life and have moved here to reside. Resident 4 stands out from the rest having moved within the inner-city to get a better dwelling.

5.1.3 The dwelling

Dwelling design

Having a dwelling with a **good layout** is an essential element to the perceived living quality. This is expressed by all residents and three of them are very pleased with the layout. What is considered a good layout is very subjective and will depend on the needs of the household. Residents mention that a spacious living room, an own wing in the dwelling for bedrooms and good use of the space characterise a good layout. The two residents having the smallest dwellings and who mostly live alone state that having an open and airy living room and high ceilings are important. Resident 3 claims that she was not pleased with the layout when she first moved in due to the small living room. In relation to existing theory, the study conducted by Buys and Miller (2012) showed that the design of the dwelling, hereunder the dwelling layout, played a great role for the residential satisfaction in dense neighbourhoods. What was considered good layout was aspects such as good use of the space, large living rooms and having good sized rooms. Despite the different contexts, there seems to be many parallels between residents´ preferences. Similar to the results found in this study, most residents claimed that this was important to their satisfaction. One can also assume that due to the

dwellings being newly built, the layout of the dwelling might be better than in older apartment buildings.

Having a **spacious living room** is a quality which is important to a good layout and the perceived living quality, and is seen as significant to resident 2, 3 and 4. Resident 2 and 4 express great satisfaction with this quality. As mentioned, resident 3 was not satisfied with the dwelling design when she first moved in which indicates the importance of having a spacious living room. Despite the fact the she has a dwelling almost half the size of the other two residents, she still finds it important. This indicates that the size of the living room is seen relative to the size of the entire dwelling, and not as a defined size. After doing several changes to the dwelling, including opening up the living room and reducing the size of the bedrooms, resident 3´s perceived living quality increased considerably. From the way the residents speak, the results suggest that having a spacious living room is considered more important than having large bedrooms. This is supported by resident 4 who states that he preferably would have had larger bedrooms, however, a spacious living room is more important because this is where his family spends time together. Having a L-shaped living room contributes to the living room feeling more spacious. Resident 2 is very satisfied with this and she adds that that it is nice to have an open solution but with the living room area being a little separated. Both resident 2 and 3 claim that having a spacious living room also includes having an open and airy room. The importance of having a spacious living room has also been addressed in several research studies. In the report by NIBR residents explicitly stressed that having a spacious living room was one of the most important qualities in a dwelling (Schmidt 2014). Furthermore, high ceilings are also mentioned as a great quality by resident 1 and 3, which contributes to making a room feel more spacious.

Having an **own wing in the dwelling for the bedrooms** is seen as very positive, which is supported by resident 2 and 4. It is also something they both consider included in having a good layout. As shown in the table with the background information (figure 16), these are also the residents having the largest dwellings. Similar to research claiming that some qualities are more important to larger dwellings (Barlindhaug et al. 2012), it might be the case that this is a quality seen as more important to those having a larger dwelling.

Research has found that a **spacious dwelling** is seen as important and many prefer more space, however, the housing prices are often seen as a barrier. This is supported by resident 1

and 3. Resident 1 states that despite wanting more space, the housing prices are very high in this area and due to her lifestyle, she does not spend a lot of time at home. Resident 3 would at least have 20 square meters more than she currently has, and states that having another bathroom would be practical when having friends and family over. On the other hand, both resident 2 and 4 are satisfied with their dwelling size, both having over 120 square meters. Resident 4 claims that the disadvantages of the dwelling are minimal. Similarly, existing research shows that most residents generally weigh towards having more space which includes having an extra room, balcony or more storage (Buys & Miller 2012; Senior et al. 2004). However, one needs to separate between needs and wants, and the size of the dwelling seems to be adequate for most the residents´ needs, due to having enough rooms and space. This has something to do with the household size, as resident 1 living in a 65m2 dwelling could be very different from 3 persons, such as resident 3 and her children, living at the similar size. Consequently, the dwelling size do seem to influence their perceived living quality of resident 3.

Living in a new dwelling is seen as an important aspect due to having an **elevator**, which is particularly important to more grown up residents. This is supported by resident 2 and 4, who stress that older buildings without elevator negatively influence the perceived living quality. Having an elevator is related to their intention of moving, because they both imagine themselves growing old here.

Building quality

Having **good and comfortable materials** in the dwelling seems to positively influence the building quality and the perceived living quality. The results suggest that three of the residents´ express satisfaction with this, and resident 1 claims that this is important to her perceived living quality of the dwelling. On the other hand, several residents have complained about the building quality. Resident 1, 3 and 4 stress that they have been complaints about the building quality which have been corrected by the warranty. These have mostly been minor issues, such as small leaks and errors with the kitchen doors which does not seem to have considerably degraded the perceived living quality of the residents. However, one resident is quite dissatisfied with the quality:

"Ehm, it is a little bit over five years old, built in a period where there was a lot of development… and the quality is equivalent to this; they have used a lot of cheap materials ...

ehm … some elements are poorly isolated, so it is not exactly very high quality on the inside of the dwelling" (female, 56).

The reason for her dissatisfaction seems to be related to the **hasty construction process** and the use of **cheap materials**, which has resulted in several leaks and poor insulation. She adds that several other dwellings in the neighbourhood have experienced similar problems. Worth noting is that this is the only dwelling located at the ground floor, which might influence how warm the dwelling is, since it does not receive any heat from below. It might be an explanation why this is the only resident complaining about the insulation. These aspects seem to negatively influence her perception of the dwelling and the perceived living quality. Issues related to the developer and the poor building quality has also been addressed in a former research. It has been argued that the market-based development in dense urban areas, mainly focusing on profit, high utilisation and low budget, leads to smaller dwellings of lower quality (Howley 2009; Schmidt 2014). Similarly, the poor dwelling quality seems to be due to this type of market-based and hasty development.

Dwelling position and sun

The **dwelling position** plays a great role to the perceived living quality because it influences the other important qualities of the built environment.

Having a **balcony** is an essential quality contributing to getting more day- and sunlight and a better view. This almost seem to be a requirement to the residents at Sørenga and they are very pleased. Resident 1 and 2 clearly state that enough sunlight and a nice view are essential to their perceived living quality and the latter stress that these were qualities they specifically looked for when buying their dwelling. She likes to be able to enjoy the sun at her balcony in the morning and afternoon, however, the view not being as nice as her former dwelling, but she is satisfied.

On the other hand, resident 3 expresses some dissatisfaction with the **sunlight**, due to being located at the ground floor and due to the height of the buildings. Consequently, having a dwelling located at the ground floor may negatively influence the amount of sunlight and the view and consequently also the perceived living quality. The two NIBR reports also stress that these qualities are the most important to residents (Barlindhaug et al. 2012; Schmidt 2014). Both reports are based on a Norwegian context, and none of the other research studies

have particularly mentioned the importance of these qualities. One can wonder if this is particularly important to residents due to living in a country with so little amount of sun- and daylight. Resident 4, on the other hand, says that despite thinking that the view is an important quality, he has not been enjoying it much due to constantly being busy and on the go. However, he states that the solar conditions are much better compared to Tjuvholmen, which he also considered when buying his current dwelling.

Furthermore, two of the informants highly stress the **lack of privacy** due to the position of their dwelling as an important factor negatively influencing their perceived living quality. Resident 1 is very dissatisfied with the lack of privacy within her dwelling, due to the direct insight into the dwelling from two sides. This is both a consequence of the dwelling position and her perception of density in the neighbourhood. Due to poor communication with developer and that the neighbouring building was located closer imagined, she feels deceived by them. Consequently, her perception of density is negatively coloured by this. However, she adds that she is happy that the dwelling is located at the upper floor not having any apartments above her. Having a dwelling being located at the ground floor degrades the perceived living quality. Residents 3 express dissatisfaction with the lack of privacy mainly due to insight into her dwelling and being located at the ground floor. In the summer, due to the large amount of people, bars and restaurant in the neighbourhood, drunk people are walking outside her bedroom window, urinating and littering. These events are perceived as very bothering. Furthermore, having a lot of strangers walking straight past her windows can at times be perceived as unsafe and uncomfortable that people can look directly into her living room. She also wishes the shielding around her porch would have been better.
She indicates that other neighbours not living at the ground floor also have been bothered by the strangers walking through the area. However, these problems seem to be rare except from the summer. This issue might also be related to the fact that there is a free passage through the atrium round the clock which leads directly to the restaurants and bars along the pier.

In contrast, resident 3 and 4 are not dissatisfied with the lack of privacy. One of them feels that they have less privacy now than in their former dwelling. Having moved from a single-family dwelling, resident 2 states that she can hear the neighbours in another way than she did before. However, due to the good insulation and the design of the buildings, she does not experience this as a problem. It is worth noting that both of these residents appear more affluent and do have considerably larger dwellings located at a higher floor than the others,

where resident 4 have a corner top floor apartment. These findings confirm the former research done by Schmidt (2014) and Senior et al. (2004) stating that to have enough privacy is essential to residents. The latter research found that residents ultimately favoured suburban living and the one of the main disadvantages of dense living as the lack of privacy and the closeness to neighbours. Living in the ground floor in an apartment building is also seen as less attractive.

Parking

The car ownership situation among the interviewed residents is that half of the residents do not have a car. Those not having a car seem to be relying on using public transport and seem satisfied. On the other hand, resident 4 stresses that he is very dependent on using his car and seems very satisfied. Resident 2´s household has two cars. She states that reducing the **amount of car parking** is a disadvantage to them, and they had to buy one parking lot and rent the other. At the same time, she is pleased about the restrictions for street parking to reduce noise and traffic. Similar to resident 2, research show quite contradicting results. One of the main disadvantages of dense living is the amount of traffic and noise from motorised traffic but other research (Senior et al. 2004) show that people find the lack of roadside parking to be a negative aspect of dense living.

5.1.4 The neighbourhood

Perceived density

High density is an important factor of the built environment that may contribute to the lack of sunlight and less privacy in terms of closeness to neighbours. These qualities are found the be very important to residents and three of them express some sort of dissatisfaction with these issues generated by the density. Resident 3 stress that the density of the neighbourhood leads to a **lack of sunlight** and she indicates that the buildings should have more varying heights and that the distance between the buildings are just on the verge for what is considered okay. Furthermore, she expresses concern about the school they are planning in relation to the height and size of the buildings. However, she does not feel like the density affects the livability due to nice and open outdoor areas in between the buildings.

The other two residents argue that their dissatisfaction of the perceived density is due to the **closeness to neighbours**. Resident 2 thinks that the buildings are a little too close on the bedroom side of their dwelling. Consequently, they can look directly into the living room of

the dwelling located opposite to them. However, she states that this is on their bedroom side and that they do not spend a lot of time here anyways. It might be more bothering to the neighbours. Consequently, she indicates that she does not find it too dense and states that when living in an apartment building there need to be at least four or five floors. As addressed earlier, resident 1 was very dissatisfied with the perceived density in the neighbourhood. She stresses that the buildings are located too close to each other and the building are too tall. This negatively influences her perceived living quality due to the lack of privacy and insight into the dwelling. These qualities seem essential to her and she states that she would not have bought the dwelling if she was aware of these issues. Again, she claims that this has not been communicated in a proper manner by the developer. One can assume that if she felt properly informed by the developer and prepared for the closeness to the neighbours, her perception of density might have been different. She stresses that:

"I think that this lack of privacy is a great annoyance … and that has something to do with the fact that there is too high utilisation of the areas here. And that's a shame because one is building for hundreds of years in advance" (female, 63).

She also finds the balconies to be located too close to each other which is problematic to the degree of privacy. The population density can at times be experienced as annoying due to large crowds and a lot of noise in the summer, which might also be a result of the dwelling position in relation to the seawater bath. In contrast to these statements about the perceived density, resident 4 does not find the density as something negative.

"I don't understand, because they might as well have built five more floors … I almost feel like it is a little bit remote here" (male, 46).

He adds that the perceived density in terms of **concentration of people** has a lot to do with the customer base here – the more people living here, the more restaurants and other facilities, which he says is essential to his perceived living quality. However, it is important to take into account that this resident grew up in Oslo and has never lived in a single-family dwelling, in contrast to the other informants.

In general, the results are supporting most of the existing research at the topic. The results show that the residents' satisfaction with dense living is quite mixed and very subjective.

Some of the residents preferred low-density living which supports a large part of the theory stating that density implies lower livability. Similarly, Senior et al. (2004) stressed that people found the greatest disadvantage of dense living to be the lack of privacy, while another research showed that having enough sun- and daylight was essential to residents (Schmidt 2014). However, these results suggest that most of the residents do not find the density particularly degrading to the perceived living quality. The results also indicate that some of those who express dissatisfaction are actually not dissatisfied with the density itself, but just like the theory suggests, the **related factors** such as lack of sunlight and privacy. These factors are extremely important to many residents and are important to their perceived living quality. Furthermore, the proponents of compact city suggest that how the built environment is configured plays a large role. E.g residents 3 expressed some dissatisfaction with the density but did not find this degrading to her perceived living quality due to the design and the great outdoor areas. Consequently, density does not necessarily lead to lower livability if the related factors are ensured and facilitated for.

Local facilities

Having an adequate **number of local facilities** and **mixed-use** are factors that are found to be important. Furthermore, the have an activity centre is can positively influence the perceived living quality due to being a social meeting place. The residents at Sørenga seem to be quite satisfied with the facilities in the area. Facilities such as the grocery stores, post office and the Norwegian Tourist Organisation (DNT) are considered great. Resident 2 and 3 are very positive towards DNT and uses this a lot. Resident 1 states that she is pleased with the facilities here and understands that there need to be a large enough customer base for more facilities to be located here in the future.

One of the main aspects mentioned by residents are the **restaurants** in the neighbourhood. Resident 4 particularly stress the importance of supporting the local restaurants. He claims that he supports the local restaurants here by eating there at least twice a week, because it is important to him to have them here. Without them, his perceived living quality would have been considerably reduced. This might be related to his busy lifestyle and the need to have an easy and convenient living situation. Resident 2 seems pleased and stress that having some restaurants here is convenient when getting older. On the other hand, resident 3 claims that she has not been using the restaurant here a lot. Furthermore, several residents refer to Aker Brygge and indicate that they do not wish a similar development here at Sørenga, with lots of

business and commercial activity. Resident 2 states that they chose to move to Sørenga because the majority of the land use is for housing and some of it for commercial activity, instead of Aker Brygge where the main focus is on the commercial activity. She indicates that the reason is mainly due to less noise and traffic, which consistently are seen as common disadvantages of dense living.

Despite the positive evaluation, some of the residents still claim that there could have been **more local facilities**. Resident 3 explains that the facilities located at Sukkerbiten has been moved and the area is converted into a construction site due to all the building activity in the area. Consequently, she missed the concerts and bars in this area. Furthermore, she also prefers to use the facilities at Barcode instead of those at Sørenga, because there is more diversity there in terms of different facilities and closer to the shopping mall at Oslo City. Resident 4 is generally quite satisfied with the facilities but argues that there is a need for more diversity in terms of more stores and facilities. He understands the need for a larger customer base but indicates that a health and wellness centre could be necessary due to the large amount of older people living in the neighbourhood. This is also stressed by resident 1 who is disappointed by the lack of facilitation for older people. Since having children, resident 4 is a little disappointed that they have not started constructing the school he was promised, but he is satisfied with the kindergartens here. Research suggests that proximity to local facilities are important to the satisfaction of inner-city residents. Furthermore, mixed-use and accessibility is consistently seen as one of the characteristics of compact city and in the research conducted by Mouratidis (2017a) the informants highlighted the accessibility to facilities as the main advantage of dense living. They also express how easy it was to reach everything.

Outdoor space and green areas

To have attractive outdoor areas with enough greenery is important to the perceived living quality of residents in dense neighbourhoods. When asked to evaluate the green areas in the neighbourhood three of the residents indicate dissatisfaction with the lack of greenery. They stress that some of the planned green areas have been occupied by one of the kindergartens in the neighbourhood. Originally it was only planned for one but instead they built two. Resident 1 claims that there is a lot of pressure on the existing outdoor areas and that there is a **lack of green areas** in the neighbourhood. She expresses dissatisfaction with the lack of greenery and that the residents were promised more than they currently have. Furthermore, she points out

that she did not have very high expectations to the amount of green areas when the area is literally located on the water. Again, her perception might be influenced by her negative experience with the lack of information from the developer and she does not seem satisfied. Resident 2 is pleased about the general outdoor areas having a lot of flowers and greenery, but the atrium in their building was in a very poor condition when they moved in, only having a bare minimum of greenery and most being covered with stone. Consequently, they had to hire a landscape architect to improve the area. To have enough green lungs is very important to her, however, this does not seem to be degrading her overall perceived living quality. Resident 3 says that there could have been more green areas. Questioning whether they are finished or not, she claims that the canals look a bit miserable due to the lack of greenery and flowers. Similarly, research stress that the lack of green areas is a common urban problem (Howley et al. 2009; Mouratidis 2017a). To have a nice outdoor areas and enough green space in the neighbourhood is essential to residents perceived living quality and contribute to more social interaction, neighbourhood ties and better health (Leby & Hashim 2010; Schmidt 2014). However, knowledge on which specific elements within the outdoor areas that are important to residents is scarcer. All of the informants express that they are very satisfied with having a common rooftop terrace or outdoor area for each apartment building.

The seawater bath is a quality in the outdoor area which works as a meeting place and a public facility for everyone. All the residents are extremely pleased with the seawater bath and consider this to be influential to their perceived living quality. Resident 2 states that having the seawater bath is fantastic and to be able to go down there to sit at the pier after work is amazing. Furthermore, resident 1 claims this to be the best quality of the neighbourhood and she uses it all year round. Most of them seem to prefer using the seawater bath instead of their own balcony when spending time outdoors. However, three of the residents´ stress that being such a popular facility leads to some negative consequences. Resident 4 says that some days it can be extremely crowded there, and the success has led to some littering, noise and sanitation issues. Resident 1 and 2 also say that there is some noise from the sweater bath at certain days, but this does not seem to be bothering them much. The negative consequences do not seem to be even close to outweighing the positive synergy effects from this facility. Resident 4 also stress that there has been a huge need for a facility like this in the area. According to theory, having access to natural qualities in the city such as water or parks is considered very attractive and this is one of the qualities that have the largest influence on housing prices (Barlindhaug et al. 2012).

Design and aesthetic quality

A **coherent architectural design** but with individual differences within the neighbourhood can positively contribute to perceived living quality. The residents at Sørenga are very satisfied with the design of the buildings. This is supported by resident 1, 2 and 4 who are pleased about the architecture, and particularly that the neighbourhood looks homogeneous in terms of the covering, but that each building has a unique design. A general tendency might be that newly built neighbourhoods tend to have a coherent but a very monotone design. The fact that the courtyards are made by **different architects** with different designs and colours is perceived as very positive (see figure 6). Consequently, resident 4 claims that he is proud to live here and says it is very positive that the architecture does not appear "average". Due to being so proud of this neighbourhood, he seems to have a strong neighbourhood attachment. Unlike the existing research suggesting that neighbourhood attachment generally is lower in dense neighbourhoods, these findings are quite interesting suggesting that the architecture and design can influence the neighbourhood attachment and consequently also the perceived living quality. Furthermore, livable environments are often characterised by strong neighbourhood attachment (Mouratidis 2017ab). On the other hand, grey **colours** of the covering negatively influence the perceived living quality. Resident 4 stresses that he is dissatisfied with the brick of the buildings. Both he and residents 3 seem to prefer the lighter colours on the buildings and refer to Sørengstranda as more attractive due to this. However, resident 3 stress that the design of the buildings at Sørengstranda are very bunging and dominating in the landscape. What kind of colours that are attractive to residents has been addressed to a very little degree in research on livability and densification, however, some claim that the use of colours has a positive influence in residents' health (Henriksen 2018).

Terraced building heights is an important factor contributing to more sun- and daylight, and the residents are very satisfied. The buildings heights are terraced according to the sunlight and landscape, and resident 2 and 4 claim that it is easy to tell that they have designed the buildings to get a maximum amount of sunlight and view. The latter is extremely pleased with this built environment character because he gets more day- and sunlight into his dwelling. The fact that they have made it both functional and a well thought through design is something that positively influences his perceived living quality. Resident 2 adds that she is very pleased about how they have managed to keep the light within the courtyards and consequently stresses that the density does not negatively influence the amount of sunlight. On the other

hand, resident 3 claims that the courtyards in some of the buildings are as quite narrow, which might be related to her desire for more sunlight. Similarly, research suggest that having enough sun- and daylight is very important to residents and particularly important in a Norwegian context (Schmidt 2014).

Traffic and noise

Little amount of motorised traffic is considered an important factor contributing to a lack of noise, and the residents are very satisfied. As supported by resident 2, this is because of the underground parking, the high fees and parking ban in the streets.
However, the presence of facilities or outdoor areas can influence the noise levels. Some residents have experienced some noise in relation to the facilities in the neighbourhood, such as the restaurants and the seawater bath. However, this do not seem to be particularly bothering to most of the residents interviewed. Resident 2 says that in the summer there is some noise from the seawater bath. However, due to the soundproof windows and that the dwelling is located within an atrium, she is not bothered by this. Resident 4 stress that when moving here one need to put up with some noise. Nevertheless, resident 1 claim that the large crowds in the summer can be perceived as annoying due to a lot of noise. She adds that there has been a proposition to expand the time for alcohol serving, but this was strongly protested against by the residents.

The concern about **pollution** is also stressed by some residents. Resident 4 stresses that he was more concerned about the air quality and pollution due to the building activity and the proximity to the highway. However, this has not been a problem due to soundproof windows and the air condition within in dwelling. Resident 3 states that she sees the pollution and dust from the construction work as something negative. Issues related to traffic, congestion and noise has been found as common disadvantages of dense living (Howley 2009). Furthermore, several professionals claim (Burton 2003; sMouratidis 2017a; Næss 2014) that city dwellers are increasingly exposed to these problems. However, these types of problems do not seem to be significant at Sørenga. This might be related to several characteristics of the built environment. Restriction of parking and increasing the prices seem to have a positive influence to reduce the noise and traffic. Furthermore, other measures contributing to reducing noise levels are and improve the perceived living quality are the use of insulation, soundproof windows and the design of the buildings.

Social environment

Many of the residents have mentioned the social environment in their neighbourhood, which seems to be very important to them. One common issue addressed is the **number of dwellings being rented out.** Two of the residents' express dissatisfaction with this and resident 1 claims that this has turned into a property speculation where people buy more dwellings than allowed to get extra income from renting these out. Some of them are used for Airbnb purposes. The consequences are that the social environment has many residents not taking responsibility. This is also supported by resident 3 who claims that this leads to a lot of parties and noise.

On the other hand, resident 2 and 4 do not see this as a problem. They claim to be very satisfied with the social environment and neighbours and think that their neighbours seem to be genuinely concerned with creating a pleasant environment. Despite the dissatisfaction with the number of dwelling being rented out, resident 3 explains that she sometimes meets up with some of the neighbours to share a glass of wine in the summer. According to existing research, neighbourhood attachment and stability within dense neighbourhoods is found to be lower compared to the suburban ones. These findings both deny and confirm the findings. The results indicate that having many dwellings being rented out negatively influences the stability, neighbourhood ties and satisfaction within a neighbourhood. This is also suggested by the NIBR report stating that densification lead to poorer social sustainability (Schmidt 2014). On the other hand, research also shows that densification can improve the social interaction between people. This seems to be the case specifically for resident 3 who indicates an increased social interaction with neighbours. The findings from the other two residents indicated that having fewer and larger dwellings in a building may improve the social environment and also the perceived living quality.

Diversity in terms of a **mixed type of people** is considered both positive and negative to perceived quality of life. Resident 2 is very pleased that the residents in their neighbourhood are ranging from both young people, families and older ones. This is supported by resident 4 who stresses that the neighbours are very important to his perceived living quality. In his former dwelling the social environment was not good and was one of the reasons why he chose to move. In contrast to the other findings only illustrating the negative impact of density on social sustainability, these findings are more positive. They support the existing research by Burton (2000), who claims that residents living in compact areas are more likely to

socialise and make new acquaintances. Residents living in dense areas are to a greater extent "forced" to socialise with neighbours compared to those living in suburban areas with more private space. Furthermore, the social segregation might be reduced because these areas are more mixed types of people than many suburban areas, which seems to be the case here. However, the reason for the very contrasting evaluation of the social environment might be that both resident 2 and 4 live in a building with fewer dwellings. Furthermore, there is a very low number of dwellings being rented out. Resident 4 states that this was a conscious choice he made.

5.1.5 The larger area

Access to recreational areas

Proximity to recreational areas due to the central location of Sørenga positively influence the perceived living quality. When asked about the access to recreational areas, all of the informants seem extremely satisfied with the access to these areas. Resident 2, 3 and 4 point out that Ekeberg or Middelalderparken are important recreational areas which they frequently use. They all state that having access to these green areas are a very important quality to the perceived living quality. Resident 1 also claims that having **access to the sea** was the main reason why she decided to move to Sørenga. Having a nice view and access to recreational areas are very important qualities to her. Resident 2 states that;

"You get very close to both … well, everything that happens at sea… and you can look up at Holmenkollen and the Oslo forest, so you feel like you are in the centre of everything… you are within easy reach to everything. You can just take the metro up to Holmenkollen and put on your skis and you feel like taking an evening walk, you can just walk up to Ekeberg" (female, 53).

She is satisfied with the rest of the area and states that especially St.Hanshaugen and Majorstuen are very attractive due to the proximity to green parks without having to use private car. These findings support the existing research which suggests that the access to valuable recreational areas and having qualities like water is very important. Furthermore, research indicates that densification can lead to a lack of green areas in general, however, access to lager green areas and parks does not seem to be a considerable problem in this case. Most of them can either walk or use the public transport system.

Access to employment

Proximity to the workplace due to the **central location** of the neighbourhood is seen as an advantage of dense living, contributing to perceived living quality. Resident 1 and 3 are very satisfied with the proximity and accessibility to their workplaces and was the main reason for moving there. Resident 3 used to commute between Moss and Oslo and stresses that not having to commute is wonderful, and she can get directly get there by using one mean of public transport. To have accessibility to one´s workplace, better public transport and less commuting is seen as one of the most common benefits of dense living by several research studies (Bramley et al., 2006; Howley 2009; Leyden 2003; Mouratidis 2017a). Many people, like resident 3, choose to move to urban areas mainly to have proximity and accessibility to these things. Resident 4 who uses private car also stresses that having easy access to the main highway is perfect in relation to his job. However, the facilitation for cycling is a disadvantage to some residents. Resident 1 is dissatisfied with the lack of facilitation for cycling and finds it unsafe.

Access to city centre

All the informants have stressed that the location to the city centre is important to them. Both resident 2 and 3 are very pleased about the easy access to the central station and the city centre. The latter states that due to the close proximity she uses the city centre a lot more than before. Before she always took the car and went to a car-based shopping centre. As addressed in the former paragraph, accessibility to facilities and services is consistently found to be one of the greatest advantages of dense living, which is supported by these findings.

Public transport

There are some **mixed results** on the accessibility to public transport. Resident 1 and 4 says that they are not satisfied with the access to public transport. Resident 1 stress that it is quite far to walk to the public transport and claims that the accessibility to the rest of the city is negatively influenced because of this. They should have had a better public transport offer because there are so many people living at Sørenga, when it currently is both inconvenient and poorly facilitated for older people. Resident 4 also says that the public transport system is poor but assumes that it will improve continuously when finishing the construction work. However, he does not use the public transport system and is not affected by this. The other two informants are satisfied with the public transport and resident 2 is very pleased because the tram has started to go from Bjørvika. Existing research clearly indicates that accessibility

and public transport are one of the greatest advantages of dense living and Mouratidis (2017a) stresses that several compact city characteristics such as public transport and accessibility need to be present to ensure livable environments. All the informants emphasise the importance of a good public transport system, however, the results are contrasting, and some evaluate the public transport to be inadequate. This might be for the simple reason that there are still construction work going on in the area and some of these things, like public transport, is in an adjustment phase.

5.1.6 Dense living

Eventually, the informants were asked about their general thoughts of dense living and their future plans. The results varied based on both the residents´ life cycle stage, background and their motivation for moving to their current dwelling in the first place. Most of the residents are positive towards dense living, and most of them list several of the same advantages of dense living. All residents clearly state that one of the greatest advantages of living in an apartment is having **less maintenance work** and cleaning to do. Resident 1 highlights the lack of maintenance in terms of having to shovel snow, look after the roof and paint the outdoor walls as very carefree. This is also supported by resident 2 who says that;

"Now that it is winter and when is snows a lot, I am thinking that I am not going outdoors to shovel a ten-meter-long driveway to get out with the car or to get to work. So … these things are fantastic. And due to health reasons, these things matter a great deal to me ... these things are easier. All cleaning is done at one level, in the former dwelling it was three floors that needed to be cleaned … ehm … so to me it is more practical and easy to live here" (female, 53).

Furthermore, resident 1, 2 and 3 stress that everything being so **accessible** and having **proximity to work, friends and family**, restaurants and cafes, and other **facilities** are one of the greatest advantages of dense living. On the other hand, all of them say that they miss working with and spending time in the garden. Resident 2 explains that the household owns a cabin they can travel to in the weekends, which allows them to meet those needs.

When asked about their future plans **two of the residents weighted towards moving** in the future when they stop working or if a change of workplace happens. Similarly, their motivation for moving to Sørenga in the first place was because they wanted to live in

proximity to their work. Both residents state that they miss having more space and a garden. Resident 1´s reason for moving in the future is her preferences for suburban living and more space. She formerly lived in a single-family dwelling and claims that it is much better. Furthermore, she seems to think that most things are better with a single-family dwelling and could not imagine herself living in dense in the long run. Consequently, her view in dense living seem to influence her general evaluation of Sørenga. She adds that:

"I hear a lot of people saying that it is fine to live in the city for now when working, but that they cannot imagine themselves living here otherwise" (female, 63).

However, she states that for everyone to live in a single-family dwelling and having a lot of private space is expensive, and that the society cannot afford to have everyone thinking this way. She is a great advocate for a car-free city and less motorised traffic in the city and neighbourhood. Resident 3 also express the desire to move in the future. She imagines herself living in her current dwelling as long as she is still working and having children studying abroad. However, she seems satisfied with living dense mainly due to the great accessibility and is not planning to move back to a single-family dwelling. She would probably move within the inner city of Oslo. To live at the ground floor helps so that she does not miss single-family dwelling as much.

In contrast, the other residents who also consistently seemed more satisfied, are **not planning to move.** Both can imagine themselves growing old here. Resident 2 stresses that this dwelling is convenient and suits her households needs now and for the future, and she could not move back to a single-family dwelling. Resident 4 is the most positive towards dense living and claims that he would never imagine himself living in a single-family dwelling, even if he was given the offer. However, this might be related to his former experiences and lifestyle growing up in Oslo and never having lived in a single-family dwelling. He stresses that there are so many advantages of living in this dwelling, especially in relation to accessibility.

As addressed in the theory part, what residents consider as livable, preferences and thoughts of dense living will differ according to their personal characteristics such as life stage, occupation and former experiences. Quite similar to some of the findings, research show that many do not prefer dense living due to not having a garden, lack of parking, having more

space in general and the lack of privacy. Similarly, all of these elements are mentioned by residents who have formerly lived in low-density neighbourhoods. They stress that these are positive aspects of low-density living, however, there is only one of them who seem to find the lack of these to be considerable degrading to the perceived living quality. In a research conducted by Senior (2004) people were asked to rank their ideal living situation and stated that a single-family dwelling with short walking distance to facilities as the most favourable type of living. However, this is ideal and not reality. It is somehow unrealistic because single-family dwellings lower the density and increase the distances to other facilities. In addition, there is not a large enough population base to have many faculties located around.
Similar to what is suggested by the existing theory, many favour dense living due to better accessibility and less maintenance work. These reasons are also often the motivation for more grown up people to move from a single-family dwelling to an apartment within the city.

5.1.7 Overall evaluation

Factors important for perceived quality of life based on interviews with Sørenga residents		Perceptions of residents on these qualities
Dwelling	Good layout	Very satisfied. Includes having a spacious living room, an own wing for the bedrooms, good use of the space, high ceilings, L-shaped living room and good use of the space.
	Having balcony	Very satisfied. Important to all residents in terms of getting more sunlight and a better view.
	High level of privacy	Mixed. Some are very satisfied mostly due to the position of their dwelling and the size. The other two are very dissatisfied du to insight into their dwelling and closeness to neighbours.
	Enough sunlight	Mostly satisfied due to the dwelling position. One is slightly dissatisfied due to the density and the dwelling being located at ground floor.
	Good view	Mostly satisfied. One is slightly dissatisfied due to the dwelling being located at the ground floor.
	Good building quality	Mixed. Most residents are satisfied because of good and comfortable materials, but some complain about minor issues. One very dissatisfied

		due to cheap materials and hasty construction process.
Neighbourhood	Diversity of facilities	Satisfied, but more can be done to increase the diversity of stores and facilities. A health and wellness centre and more cultural facilities are suggested by residents.
	Enough greenery	Not satisfied. Three residents are dissatisfied with the lack of green areas. Pressure of the existing green areas and outdoor areas seem unfinished or too bare.
	Access to recreational areas within the neighbourhood	Very satisfied with the access to the sea and the seawater bath.
	Architectural quality	Satisfied. Having a coherent neighbourhood design, individually design courtyards, colours, terraced building heights.
	Lack of traffic and noise	Satisfied due to parking ban in the streets, high parking fees, soundproof windows, insulation and building design with atriums.
	Stability	Mixed. Some are satisfied due to living in building with fewer and larger dwellings. Others express dissatisfaction due to the number of dwellings being rented out, which leads to noise and many residents not taking responsibility.
Larger area	Proximity to recreational areas	Satisfied due to central location and proximity to the sea and areas such as Ekeberg and Middelalderparken.
	Good access to public transport	Mixed. Two of them are satisfied. Some are not satisfied due to the distance to public transport.
	Proximity to work place	Mostly satisfied due to central location and proximity to public transport and the highway. More can be done to facilitate for cycling.

Figure 17. Overall evaluation Sørenga.

5.2 Kværnerbyen

5.2.1 Background information

	Gender	Age	Length of residence	Household size	Former dwelling type	Dwelling size
Resident 1	Male	40	3	1	Apartment	106
Resident 2	Female and Male	53 and 58	1	2	Single-family dwelling	97
Resident 3	Female and male	26	1	2	Apartment in single-family dwelling	50
Resident 4	Female	66	2,5	2	Single-family dwelling	130
Resident 5	Female	38	5	4	Apartment	61

Figure 18. Background information Kværnerbyen.

5.2.2 Motivation for moving

Having closer **proximity to work**, **less maintenance** and to have a more **convenient and easy lifestyle** is considered important motivations for moving to dense urban areas. This is supported by resident 3 and her partner saying that they moved to get closer to their workplace and to not having to commute. However, the housing prices played a significant role and that they moved to Kværnerbyen was a coincidence. Resident 4 also stresses they moved to get closer to their workplace and due to approaching retirement they wanted to get an easier lifestyle in a one level dwelling instead of a large house. She states that having access to the variety of facilities in the city centre is great and very practical. Similarly, resident 2 and her partner moved to live more urban and to get an easier life with less snow shovelling, lawn mowing and such. They did not specifically choose Kværnerbyen, but rather fell for the dwelling design. Livability is about having a good dwelling standard, facilities in the neighbourhood and some infrastructure. They stress that:

"*When living at Stabekk, you have proximity to the sea, birdsong and squirrels, and you can sit at the porch … which are qualities that you trade for something else. And if it´s going to be*

perceived as livable, it´s important to have proximity to things like cafes and that you can spend time outdoors in a good way" (female and male, 53 and 58).

Similar to existing theory, two of the residents have lived the suburban family life, and with grown up children and a large house, they have chosen to move to a smaller dwelling in the city to have less maintenance and a more urban lifestyle (Allen & Blandy 2004).

Other states that their motivation was related to **economy** and to get a **larger dwelling.** Resident 5 moved from her former dwelling because the household needed a more spacious dwelling. Moving to Kværnerbyen was not her choice, but they were given economical support if they moved to the same areas as her mother. This was their only opportunity to afford a larger dwelling. Resident 1´s motivation for moving was primarily economically motivated. He bought the apartment to have a part to rent out, so he could get some extra income. He already lived in the city and the current dwelling is more spacious and located closer to the city centre than his former one, which was a great advantage. This motivation for moving might be a bit more unconventional, however, considering the expensive housing prices, many might need the extra income from renting out a part of their dwelling.

5.2.3 The dwelling

Dwelling design

The **layout of the dwelling** is an important factor contributing the perceived living quality, and the residents at Kværnerbyen are very satisfied. What is considered a good layout depends on the needs and preferences of the household. Residents mention aspects such as an own wing for the bedrooms, spacious living room and good use of the space.

Having a spacious and **open living room** is seen as important to a good layout by resident 2 and 5. Resident 2 and her partner particularly stress the importance of having a large and spacious living room when having a dwelling on one floor. Having a **L-shaped living room** is great due to making the room feel larger. Furthermore, they also seem very pleased about having an **own wing** in the dwelling with a master bedroom and a bathroom. For resident 3 and her partner having the smallest dwellings among the interviews residents find the **good use of the space** as particularly important. They stress that they did not want to pay a lot of money for some square meter they could not use. Similarly, the NIBR report from 2014 found that the dwelling layout was very important, but increasingly important the smaller the

dwelling was (Schmidt 2014). This is probably due to the reason stated by resident 3. Resident 4 stress that buying the dwelling during the construction phase was a great advantage due to being able to influence the dwelling design and layout.

One main aspect mentioned by residents is the **dwelling size**. Most of the residents are very pleased with the size of the dwelling and feel that it is adequate to their needs. However, three residents indicate the preference for more space. Resident 2 and her partner seem to find the guest bedrooms a little small, however, this seems to be about a general preference for more space rather than being something that they need. The other two residents do have considerable smaller dwellings than the rest. Resident 3 and her partner stress that they would like more space but due to economic considerations this limits itself. However, they do not spend a lot of time home and it does not seem to influence their perceived living quality. On the other hand, resident 5 states that because their dwelling is too small, and their household has increased since they moved there. This has influenced their perceived living quality to the extent that they are planning to move to the outskirts of Oslo. As addressed by existing research (Buys & Miller 2012; Senior et al. 2004), one of the main limitations of dense living is the lack of space and that many residents prefer more space. However, in cities like Oslo where the housing prices are extremely high, and some people, like resident 5, need to move to the outskirts of the city to be able to afford a larger dwelling. She stresses that if it was not for the housing prices they would have preferred to move closer to the city.

Having a **balcony** is an important quality to the perceived living quality and is mentioned as essential to most of the residents. This confirms the existing theory suggesting that a balcony is highly valued by residents (Schmidt 2014), especially in a Norwegian context. Similar to the desire for more space, many residents may feel like having a balcony gives them extra space. All of the residents are extremely satisfied with their balcony. Resident 3 and her partner say that having a balcony was essential to them because it is important to easily get some fresh air without having to go down all the stairs. Resident 5 supports this and says that:

"I don't know what I would have thought if it wasn't a balcony here, but ehm … I am extremely pleased to have to balcony and I could never have bought an apartment without a balcony. That would have been completely out of the question because that is so important to have in the summer and to have that outdoor space to get sunlight and fresh air" (female, 38).

An **energy efficient dwelling** is seen as important due to reducing the costs of heating and is supported by resident 3 and her partner. Having an elevator is also seen as positive to resident 1 and 4.

Building quality

Having **materials of good quality** and **personalised solutions** in the dwelling can positively influence the building quality and the perceived living quality. The evaluation of the building quality is very contrasting, and three of five residents are pleased and have not experienced any problems. On the other hand, resident 2 and 3 express dissatisfaction with the building quality due to being very **basic and boring**. Resident 3 and her partner stress that despite buying a new dwelling, they feel the need to renovate because of the plain and boring materials and quality. This is a disadvantage because they did not want to buy a dwelling that needed renovation. The same point is also made by resident 2 and her partner, who question whether it is actually necessary to build this way when mass producing the dwellings. They seem dissatisfied with the lack of personalised adaption and claim that the standard is very basic which leads to lower perceived living quality. What is meant by standard is the general quality of the equipment, such as the kitchen, and how luxury this is. Furthermore, they also express great dissatisfaction with the **building quality** and the developer OBOS. Their bathroom was constructed incorrectly and needed full renovation. This also applies for the air condition and windows. They claim that neighbours have also had problems with the fans in their dwellings and state that the communication with the developer is challenging.

"I think the standard is very boring and poor… which is contributing to people being angry and dissatisfied. People are extremely dissatisfied with OBOS here, and that is very understandable. Those people who have lived here the entire time are furious… The developer is acting very reluctant… Maybe we hadn't bought the dwelling if we were aware of all the problems here." (female and male, 53 and 58).

Resident 2 and her partner have not experienced any of these quality problems but wonder if the reason is that the developer spent more resources constructing the first building, where they live. Similarly, several research papers have argued that the market-based development of urban areas leads to lower quality (Howley et al. 2009; Schmidt 2014) which includes the use of mass produced solutions, cheaper and faster materials. This seems to be the case here. The fact that resident 2 and her partner are so upset about the way the developer has handled

the complaints, might have influenced their general evaluation of their dwelling and perceived living quality. However, in terms of the standard one can ask if people in general may have too high expectations to the overall luxury of their equipment and the interior such as floors, kitchen and bathroom. Many might have more than what they need, but still prefer a better standard.

Dwelling position and sun

The dwelling position is a very important factor due to influencing the amount of sunlight, view and privacy that contributes to the perceived living quality. All of the residents express the importance of having enough sun- and daylight, and most are quite pleased. Resident 1 stress that this is very important, however, that this is a rare quality one normally have to pay a lot for. This is also supported by resident 3. The results clearly indicate that there is a relationship between the dwelling position and the satisfaction with these qualities.

Two of the residents seem very satisfied with the **amount of sunlight** and **view** from their dwelling. Resident 4 is very satisfied with the view over the city and being able to enjoy the sun all day. Having bought the dwelling before it was built, she was concerned about these qualities and claims that being located at the upper levels is an advantage. She stresses that to go out to the balcony to enjoy the sun is very important to her, especially considering the dark winters. Resident 2 and her partner are also pleased about the amount of sun, but they could not imagine themselves living in the lower parts of the building due to density leading to a lot of shadow. The view is great, being able to spot the sea and not having anyone located directly opposite to them. It is worth mentioning that these residents are perceived as relatively more affluent and with dwellings in the upper floors.

On the other hand, three of the residents mention that the density and dwelling position negatively influences the solar condition and view. Resident 3 and her partner stress that they only get one hour of sun on their balcony in the summer. This is a consequence of the buildings being located to close to each other and the dwelling position, which negatively influences their perceived living quality. Resident 5 believes that her perceived living quality would improve if their dwelling was located in the upper parts of the building, getting more sun, daylight and a better view. However, she is still quite satisfied with the solar conditions taking into account that Kværnerbyen is located in valley. Consequently, having a dwelling located at in the bottom floors in the building negatively influence the amount of sunlight and

the view and therefore also the perceived living quality. Similarly, in the NIBR report from 2014 they found that densification directly led to a lack of sunlight into the dwellings. Furthermore, it has also been found that dwellings being located in the lower parts of a building is considered less attractive to residents due to the reasons listed by resident 5 (Schmidt 2014). The larger dwellings are also seen as increasingly concerned about the view and sunlight (Barlindhaug et al. 2012).

The **lack of privacy** is also mentioned as a result of the dwelling position. Some residents have expressed dissatisfaction with the lack of privacy in the dwelling, which is both influenced by the location of the dwelling in the building, but mostly the density. Former research conducted by Schmidt (2014) and Senior et al. (2004) state that to have enough privacy is essential to residents. As resident 1 stresses, this type of quality is a rarity to smaller and often less expensive dwellings. This will be further outlined below.

Parking

The **lack of parking** and **expensive fees** is by residents seen as negatively influencing their perceived living quality due to inconvenience of having visitors. The car ownership among the interviewed residents is that three of the residents have a car and use the underground parking provided. The residents seem satisfied with the parking, however, residents 3 and 5 express dissatisfaction with the parking situation. They state that having visitors and friends over is problematic because of the lack of parking and the expensive fees. Furthermore, residents 5 stress that even though they do not have a car it affects them too. This is considered very inconvenient. Resident 4 on the other hand, claims that finding parking when having guests has not been a problem. Research indicates that the lack of parking is seen as a disadvantage when living in dense areas (Senior et al. 2004) which seems to be the case here. However, the restriction of roadside parking in urban areas is a part of the overall sustainability strategies to reduce the private car use and includes more restriction of parking in the inner city.

5.2.4 The neighbourhood

Perceived density

High density is an important factor contributing to the lack of sunlight and less privacy in terms of closeness to neighbours. These are found to be very important to residents perceived living quality. When asked about the **density of the neighbourhood**, three of the residents

express some dissatisfaction with the neighbourhood being too dense. The two main reasons mentioned is that the dwellings are located too close and the lack of sunlight, as formerly mentioned.

Residents 2 and 3 think that the neighbourhood might be a little too dense due to the buildings being located too close to each other. Consequently, resident 3 and her partner seem to be bothered by the amount of insight into their living room and do feel a **lack of private space**. Fortunately, the opposite buildings have their front door and not the bedroom or living room towards them, which is seen as positive. However, they admit that it might not be that many people actually look into their dwelling and that they do not spend a lot of time at home during the week anyways. This might influence their perceived living quality to a certain degree. Furthermore, resident 5 stresses that the high density in the neighbourhood negatively influences her perceived living quality. She is aware that living in the inner-city of Oslo means living dense, but she likes the design of the satellite neighbourhoods much better because they have more greenery and space between the buildings. A satellite neighbourhood is located outside the city centre and is characterised by large and tall apartment blocks, great distance between the buildings and a lot of green areas and nature. This neighbourhood is too dense and feels like being on display to the neighbours, which is perceived as too dense. As seen in the background information (figure 18), her perception might be influenced by her life stage, having a growing household with other needs than when they moved in.

The **lack of sunlight** is also seen as a disadvantage, which is also related to the dwelling position. Resident 3 and her partner claim that the density negatively influence of the perceived living quality mostly due to the lack of sunlight in their dwelling. Resident 5 also indicates that she would like more sunlight. What is interesting here, is that the density itself is not the reason for the dissatisfaction, but rather the related factors such as the lack of sunlight and privacy. The same was acknowledged in the study by Buys and Miller (Buys & Miller 2012). They found that instead of the density alone being the reason for the dissatisfaction, the design and features of the dwelling and neighbourhood determined the perceived living quality. To have enough privacy and sunlight in the dwelling and outdoor areas are among the qualities rated the highest by residents in former studies (Barlindhaug et al. 2012; Schmidt 2014) and the lack of these degrades the perceived living quality. However, it does not seem to be that many studies directly addressing the privacy challenges of living dense.

In contrast to these evaluations, two of the residents are quite **satisfied with the density**. Resident 4 says that because there are many buildings in a small area and that these are located quite close, it gives a feeling of walking in the city streets. But at the same time there are also some open rooms in between, such as playgrounds and green areas. She seems positive and experiences the area as very thoughtfully planned. The evaluation of resident 1 stands out from the other, being very positive towards dense living and densification. He states that the area could have been much denser:

"I don't like that they build so much low-rise housing. This building is a seven or eight floor building – I could have easily had twenty floors here and have proper high-rise buildings. We need to build either downwards or upwards, and we can't continue to build in the outskirts of the city" (male, 40).

Furthermore, he does admit that the buildings are located quite dense and that neighbours are quite close, but he stresses that he would rather live dense than to build more in the outskirts of the city. This might be related the fact that the resident has lived in an apartment most of his life and seems to be very satisfied with this.

Local facilities

The lack of local facilities can negatively influence the travel behaviour and the perceived living quality. In general, four of five residents claim that they would prefer **more local facilities** in Kværnerbyen. Both resident 1 and 4 are quite satisfied the most necessary facilities in the neighbourhood, however, both stress the need for more facilities. The latter emphasises that she wants more facilities for daily use, restaurants and cafes in closer proximity. It is not far to walk to Vålerenga or the city centre, however, she adds that what is important to her perceived living quality is what is in the neighbourhood and having close proximity to facilities, activities, stores and cafes. She hopes that when the construction work finish and more people have moved in, it might increase the customer base and the facilities.

Furthermore, due to the lack of local facilities two of the informants seem to **feel dependent on using a car.** Resident 3 and her partner are quite pleased with the local facilities, but state that they sometimes drive to another place, such as Alna, to get a better selection of facilities and groceries. This is supported by resident 2 and her partner who seem quite dissatisfied with

the lack of facilities. She claims that they feel dependent on using their car because there are not enough facilities in close proximity. Furthermore, the city centre does not offer a pleasant shopping experience, due to the area being dominated by cars and traffic. They wish they could have more stores to choose from in their neighbourhood and the lack of facilities makes them question if they moved to the right neighbourhood. This negatively influence their perceived living quality. They highlight Bislett and St.Hanshaugen as very attractive neighbourhoods due to these being areas where you can live, but still have a variety of stores, restaurants, parks and a vibrant street life. These are unique urban qualities which mean a lot to the perceived living quality. Having proximity to facilities and services is consistently seen as one of the greatest advantages of dense living and is a common motivation for many people moving to the city (Bramley et al. 2009; Buys & Miller 2012). Similarly, one of the main motivation for moving for resident 2 and her partner was to have a more urban life. Consequently, the lack of facilities influences their livability. However, it is important to take into account that the neighbourhood is still under construction, and as resident 4 stresses, the customer base and facilities might improve considerably when the area is finished.

In contrast to the other informants, resident 5 is very satisfied with the amount of local facilities. This might be related to her life stage, and the fact that the household is moving out of the city and the preference for a quieter and less material life.

Outdoor space and green areas

To have attractive outdoor areas with enough greenery is important to the perceived living quality of residents in dense neighbourhoods. When asked to evaluate the outdoor areas and green space resident 1 and 4 are very satisfied and find it adequate and great for their needs. One aspect stressed by residents is that the outdoor areas are experienced as **aesthetically beautiful**. Most of the informants´ stress that they can tell that the developer has put a lot of work into making the outdoor areas attractive. The river and the **planting** are seen as great qualities by all (see figure 10), and research suggests that having proximity to **water elements** and parks are consistently seen as attractive qualities in urban areas (Barlindhaug et al. 2012; Schmidt 2014).

Outdoor areas being **too strictly organised** can contribute to the areas being perceived as less inviting. This is supported by resident 5 who finds the outdoor areas very beautiful, however, she claims that the area seems very planned and human-made. In relation to her children, she

says that having nature and some natural terrain around is healthier. This is also supported by resident 2 and her partner. They stress that the area is experienced as very planned and feels very defined by the architect. This makes the areas appear less inviting and cosy. She stresses that having too many rules is the same as having low livability. However, finding a balance between having too many rules and no rules are important. They also add that the outdoor areas are not very functional and use an example with the paths being zigzag-shaped, which look better on paper than in reality. Research does not particularly address this issue, but stress that having attractive open spaces, outdoor areas and parks can contribute to stronger neighbourhood ties and increased livability (Leby & Hashim 2010). However, despite the developers trying to make interesting and attractive outdoor areas, the results do not support the research findings. Despite the residents stating that the areas are aesthetically beautiful, the strictly organised environment seems to negatively influence their satisfaction.

The importance of having **enough green areas** is mentioned by several residents. Residents 2, 3 and 5 consider the outdoor areas as nice and green in the summer, however, they want more greenery. Two of them seem to like the outdoor areas but would preferably have more lawn instead of having so much asphalt. The latter suggests having more green walls and climbing plants. Furthermore, they admit that they do not use the outdoors areas a lot in the summer, but rather go somewhere else. If it was more facilities here, they might spend more time here. Similarly, residents 4 does not use the outdoor areas much because she has her own balcony which she prefers. To have proximity to green areas and parks is increasingly important and research stress that these are important for health and social reasons (Burton 2000; Buys & Miller 2012).

Design and aesthetic quality

In general, the residents are quite pleased with the design and aesthetic quality of the buildings. A **coherent architecture** and the use of colours contribute to the perceived living quality. Both resident 2 and 5 find the architecture very interesting, and the latter particularly stresses that the old archway and that the buildings have entrances from different levels contributes to making the built environment interesting.

A coherent architectural design of the buildings can positively influence the perceived living quality. This is supported by resident 4 who is very pleased with the coherent design of the neighbourhood due to using the same industrial design and covering on all the buildings.

Furthermore, the developer has emphasised and kept many of the **old industrial elements** when planning the neighbourhood (see figure 11), including preserving buildings such as Kværnerhallen and the old lamp posts. This seems very thoughtfully planned and positively influence her perceived living quality. In terms of existing research, the value of old historical elements has as a not been mentioned as a quality that contributes to livability. This might not be as important to residents as other aspects, however, might contribute to the overall satisfaction of the neighbourhood, outdoor areas and increase the feeling of neighbourhood attachment.

Coloured buildings are mentioned as very positive. Resident 4 expresses that the areas at Vålerenga and Kampen with small houses is very attractive, due to great architecture and colourful buildings. Similarly, resident 5 is very pleased that they have used a red colour on their building which makes the neighbourhood more inviting and warm (see figure 12). However, she is not pleased with the grey colour on the newly constructed buildings in the neighbourhood. Resident 1 and 3 claim that they like the architecture at Sørenga better and add that the most recently constructed buildings in Kværnerbyen also have a nicer design due to having lighter colours. The existing research does acknowledge that architecture and aesthetics environments can influence the perceived living quality in a positive manner, however, it does not elaborate this further. However, based on what the resident says and theory (Henriksen 2018) the use of colours can influence the perceived living quality to some extent.

Traffic and noise

Taking into account that Kværnerbyen is located between several large highways and the railway, the residents are generally satisfied with the lack of noise and traffic. In terms of noise, all except one explicitly stress that it is very quiet here.

Little motorised traffic in the neighbourhood is an important factor contributing to a lack of noise which positively influence the perceived living quality. All the residents in Kværnerbyen are very satisfied and resident 3, 4 and 5 state that this is because of the many speed bumps and few parking options in the neighbourhood. Other elements of the built environment contributing to less noise is the insulation, windows and placement of the buildings. Resident 1 and 4 are very pleased about the insulation of the dwellings and that even when being outdoors there are not much noise. The latter states that this might be

because of the large office building, Kværnerhallen, which is located as a barrier between the neighbourhood and the highway. On the other hand, resident 2 and her partner seem to be bothered by some noise. They can hear the highway from their dwelling and adds that this implies pros and cons. Pros in terms of having easy access to the highway. The reason for their dissatisfaction might be a direct result of their dwelling position and balcony being located facing towards the highway.

Furthermore, ongoing **construction work** might negatively influence the perceived living quality. Resident 4 expresses some dissatisfaction with the ongoing construction work and traffic and is pleased that they moved in quite late. This has not negatively influenced her perceived living quality. Resident 2 and her partner find this very bothering. They are unwillingly woken up at six every morning, and stress that they do not think that those planning the neighbourhood understand how exhausting it is to live like this over time. Similarly, theory also suggest that people living in urban areas are exposed to issues such as pollution, noise and traffic (Burton 2003; Mouratidis 2017a; Næss 2014). However, most of the residents in the neighbourhood seems to be quite satisfied with the lack of traffic and noise due to measures taken in the built environment. The dissatisfaction is mostly related to the ongoing construction work, which is quite temporary. Having small children and due to being located in a valley resident 5 has expressed some concerns regarding pollution in Kværnerbyen.

Social environment

The residents are quite satisfied with the social environment in the neighbourhood. Two of the residents are pleased with the **common Facebook group**, where they can give each other advice and solve problems. However, resident 4 says that there are a lot of discussions there among residents. She stresses that these things happen when many people are located in a small area, and it is important to accept that people are different.

Having a **mix of people** can positively influence the perceived living quality. Resident 2 and 3 are both pleased that there are many people at different stages of their life living here. Resident 3 and her partner seem pleased about having a lot of people at their age and families in the neighbourhood. It is a good combination between grown up households and younger once which makes it possible to play loud music once in a while. It is claimed that low-density neighbourhoods are often very segregated and that denser and in mixed communities

can reduce the level of social segregation and inequity (Burton 2000). There seems to a good mix in the neighbourhood, however, there is a lack of facilitation of meeting places in the neighbourhood.

Mixed use and **facilitation for meeting places** is important to contribute to more social interaction between neighbours and consequently the perceived living quality. This is supported by resident 2 and her partner who stress that there has not been facilitated for any meeting points in the neighbourhood. She emphasises that they have the building called Fyrhuset, which was intended to be a restaurant but did not happen. This might also be due to the lack of facilities in the neighbourhood, and theory suggests that pedestrian-oriented and mixed-use neighbourhoods enhances social engagement and social interaction (Leyden 2003; Mouratidis 2018). Furthermore, these things take a while when moving to a newly developed neighbourhood and might lead to less interaction with neighbours. Research suggests that dense urban areas are characterised by lower neighbourhood attachment and safety (Howley 2009; Heath 2001). The results do not support this and indicate that people perceive Kværnerbyen as very **safe**. Due to being so closely located to the city centre, there are security guards in the neighbourhood. However, one of the residents adds this area being quiet and located in a valley could potentially been perceived as a bit unsafe.

Having **family and friends close** can contribute to increased neighbourhood attachment due to feeling more ownership to an area. Resident 5 stresses that living in close proximity to family and friends in the neighbourhood increases their perceived living quality and makes them feel more attached to the neighbourhood. Studies found that shorter distances to the city centre, mixed land-use and higher densities positively influenced social interaction for residents. As in the latter case, they are able to socialise more with close ones, received more support and make new acquaintances (Mouratidis 2018).

5.2.5 The larger area

Access to recreational areas

Proximity to recreational areas due to the **central location** of Kværnerbyen positively influence the perceived living quality, and most of the residents seem very satisfied. Resident 2 and her partner stress that to have proximity to recreational areas was essential to them when moving. Furthermore, resident 4 states that the Svardal park, Ekeberg and the park at Vålerenga are all great recreational areas in close proximity. She is extremely satisfied with

being able to reach a lot of great areas by walking, both terms of recreational areas in the nature and the city centre. Resident 5 who explains that it is practical with the easy access to the Svartdal park with native forest and not having to travel far. She says that they have used the recreational areas a lot, and areas like these are even more important when living dense. The parks in Oslo are great, however, she wished that they could preserve more of those small clusters of forest and refers to Kjelsås and Grefsen as attractive due to the closeness to the forest. The seawater bath at Sørenga is seen as a nice quality, which is supported by resident 2 and 4. Similarly, it is found that having proximity and access to recreational areas is essential to ensure livable urban environments (Mouratidis 2017a; Schmidt 2014).

On the other hand, two of the residents are less satisfied with the accessibility. Residents 1 and 2 claim that it is inconvenient that Kværnerbyen is located at the **bottom of a valley**, and it is a long and steep way up the hill in order to reach a nice recreational area. The first resident was more satisfied with the access to recreational areas at his former home at Lambertseter, but still seems quite satisfied. Resident 3 and her partner say that they do not use the Ekeberg park much and that they would rather drive somewhere. It is easy to get on to the highway.

Another aspect mentioned is that the recreational areas are **quite dark**. Resident 2 says that the Svardal park is very dark in the evening which makes it feel unsafe to walk there alone as a girl. She also thinks that the Svartdal park is not as sunny, but that they also use the park at Vålerenga. Theory suggests that the built environment can negatively affect the perceived living quality if an area is poorly maintained and might have a detrimental psychological effect on residents (Bramley et al. 2009). In this case, the area might not be poorly maintained, but having dark pathways with no lights can have a similar effect and reduce the perceived living quality.

Access to employment

Proximity to the workplace due to the **central location** leads to better perceived living quality, and all the residents are very satisfied. Resident 1 claims that close proximity to the bus to get to work has been extremely important to him when buying a dwelling. This is supported by resident 3 who stresses that this was one of the best qualities of the neighbourhood and most important one, and it is just a short bus ride. Similarly, close proximity to employment and walkability is consistently seen as characteristics of livable

places, and many of the residents have stated that this was their main motivation to move. To be able to walk to her job is something that resident 4 considers as great. Resident 1 and 2 state that they both use their bike to work, which is great and very fast. However, resident 2 adds that more people should do the same, but she wants better **facilitation for cyclists** around the Barcode area.

Access to city centre

When asked about the access to city centre, all residents except one explicitly stress the importance of being **closely located to the city centre**. Resident 4 says that when shopping major commodities having a car is practical, however, for regular shopping it is great to take the bus to the city centre. Furthermore, Kværnerbyen is great because one can walk to the city centre in 20 minutes. It is nice to have the feeling of being close to the city centre, but still have some distance. Resident 5 confirms this when saying that the city centre is easy to reach, but an advantage is that Kværnerbyen is not a place you travel through. Resident 3 and her partner says that the location is good in relation to almost everything and add that Majorstuen and Sørenga are very attractive places because they are even closer located to the city centre and consequently have more diversity in terms of shops and proximity to public transport. Here, they use the car regularly, but there you can just walk out the door. Similar to the existing theory, it seems like the residents are very pleased about the location in relation to the city centre. However, two of the residents are pleased that they are still a little bit away from the centre. They did not state particularly why, but one can assume that this is related to less traffic and noise.

Public transport

Proximity to a good public transport system is important to the perceived living quality. All the residents are very pleased with the public transport in terms of distance, number of stops close by and the frequency of the departures. Resident 1 and 5 claim that having proximity to public transport was crucial to them when moving there. Several residents also stress that building the **stair up to the bus stop** has considerably improved the accessibility.

The only negative mentioned is that the bus is often late and overcrowded during rush hours. Resident 2 and her partner are concerned that this might be a larger problem as more people move in there. They also add that having a metro would be preferable but understand that this is not realistic. Earlier they considered moving to Fornebu when looking at dwellings, but due

to the poor public transport, they could not have moved there. Having less commuting and a better public transport system is suggested to be one of the most common benefits of dense living (Mouratidis 2017a). On the other hand, the theory does not address the issues with the public transport being too crowded or late during rush hours, which might be a common phenomenon in dense urban areas where many people are using public transport.

5.2.6 Dense living

Eventually, the informants shared their general thoughts of dense living and their future plans. Many of the advantages of dense living was related to the **lack of maintenance** and having a **more convenient lifestyle**. Resident 1 is satisfied with living dense and in an apartment. He has never lived in a single-family dwelling since his childhood, but he knows how time- and energy consuming the maintenance is when having a house. He stresses that not having to do maintenance outside the dwelling is nice and he is pleased about getting home from job and not having to think about this. This aspect of dense living is also highlighted by many of the other residents. Resident 4, 5 and 2 state that they are pleased about living in an apartment and that it is very easy in terms of cleaning, gardening, shovelling snow or other maintenance. The latter says that when living in a single-family dwelling it is always something that needs to be done. This is supported by resident 4, who also adds that having a house and a cabin which needs to be maintained is demanding. However, an apartment is so much more convenient because they only have responsibility for the inside of the dwelling. This makes life much easier. She also adds that it is nice to have less space. A vast body of literature states that the main disadvantage of dense living is the lack of space, and that people in general prefer more space (Buys & Miller 2012; Senior et al 2004). This is confirmed by several residents, but it is interesting that resident 4 finds that having less space an advantage of dense living. However, this seems to be related to the advantage of having less maintenance work and less material things to keep track of.

Resident 2 and 3 stress that having a garden is something things they miss from their former dwelling. Resident 3 and her partner say that they spent a lot of time in the garden. However, one large disadvantage was the **accessibility to their workplaces**, and claim that this quality is more compelling to them at this current stage of life. Having short travel distance to their work gives them so much extra time. They claim that they spend a minimal of time of travelling and consequently have more time for family, friends, work and exercise. This is also supported by resident 2 and her partner saying that it is a huge advantage that they save

one and a half hour per day at transportation, which give them much more time for leisure. As suggested by the existing theory, many find dense living attractive due to the **accessibility** to everything. Having accessibility to everything, especially to the work place seems the most important to the younger residents. Those having lived the family life in a single-family dwelling seem to find that the main advantage of dense living is to have less maintenance work. According to the study by Mouratidis (2017a) having less maintenance work in the interior and exterior space is, in addition to accessibility, are considered the most attractive aspects of dense living.

However, resident 2 and her partner stress that the disadvantage of dense living is that it is **demanding and stressful**. Due to living in a neighbourhood which is still under construction, they are dissatisfied with the constant need to adapt to ongoing construction work. The lack of communication with the developer might also have contributed to their dissatisfaction. Due to the lack of research on dense living and livability on newly developed neighbourhoods, existing research does not address these issues in further.

When it comes to the future plans, the results are varying. **Three of the residents are not planning to move**. Resident 1 claims that he is satisfied with his current home but might consider moving if he finds another dwelling with a better bathroom, solar conditions or closer to the forest. However, having a part he can rent out to get some extra income is the most important to him. He prefers dense living and would not consider moving to a single-family dwelling. This is supported by resident 2 and her partner who are planning to continue to live in an apartment in Oslo. However, they explain that when living dense they felt the need to have a cabin where they can be outdoors. This has been important to them. Resident 4 is not planning to move in the future proximity due to being very satisfied. To have accessibility to all the facilities in the city and to have proximity to their workplaces is great. Similar to the theory, she describes her attitude towards dense living here:

"It´s a time for everything – we have lived in a house when we had small children and that was very easy when letting them out to play outdoors instead of … then it's a little miserable to just have a balcony and to have to follow them outdoors every time … So, it´s a time for everything. I have lived in a single-family dwelling my entire adult life with children, and now it´s fine to move to an apartment again. So, it´s cyclical based on where you are in life" (female, 66).

On the other hand, **two of the households are planning to move** in the future proximity. Resident 3 and her partner clearly state that they are going to move out of the inner-city areas of Oslo in the future, to get a larger dwelling with garden and proximity to the forest. Similar to the existing theory, they prefer low-density living. As suggested by theory, they are at a life stage where they focus on following a carrier both in terms of job and housing and want to move out to the suburbs eventually (Allen & Blandy 2004). Furthermore, they can get a larger dwelling for less money outside the city. They cannot imagine themselves living dense for the rest of their lives. However, they add that this might not happen yet, and they might move within the inner-city areas of Oslo first. They are very satisfied with their current dwelling and it fit their current lifestyle.

As mentioned initially, resident 5 states that they are moving to the outskirts of Oslo and have already bought a single-family dwelling. The reason for this is the need for more air, greenery and space. Their current dwelling is too small for their household and she explains that they find the location more important than the material standard of the dwelling. In the new dwelling the dwelling standard is lower, but they have proximity to playgrounds, green areas, schools, public transport and grocery stores. She adds that they are very satisfied with Kværnerbyen but gets a more relieved and calm feeling when being in more rural areas. She also claims that it is a time for everything, and that they might even move back to the city later because it is easy and accessible to everything. However, she clearly states that having proximity to nature during the childhood is extremely important, especially in terms of having closeness to plants and living animals and for children to be active in the nature. In the city one has a constant pressure to buy things, which she finds unhealthy.

While the more grown up residents´ favour dense living due to lack of maintenance and being finished with the suburban family life, the younger residents' express preference for low-density living. Naturally, this is a result of their life stages. As found by Senior et al. (2004) these residents do favour low-density living due to the preference for a garden and more space. Furthermore, they do not view dense living as suitable for bringing up children (Howley et al. 2009).

5.2.7 Overall evaluation

Factors important for perceived quality of life based on interviews with Kværnerbyen residents		Perceptions of residents on these qualities
Dwelling	Good layout	Very satisfied. Includes having spacious living room, own wing for bedrooms, good use of the space and L-shaped living room.
	Having balcony	Satisfied. Very important to get extra space and sunlight.
	High level of privacy	Mixed. Some are very satisfied, but three residents express dissatisfaction due to the closeness to neighbours and insight into the dwellings.
	Elevator	Satisfied.
	Enough sunlight	Mixed. Two of the residents are very satisfied due to being located in the upper floors and having large balconies, while some express dissatisfaction with the amount of sun due the density and to the being located in the lower floors.
	Good building quality	Mixed. Some residents are very satisfied, while two of the residents are dissatisfied with the poor building quality and the basic and boring standard.
Neighbourhood	Diversity of facilities	Mixed. One resident is satisfied while the rest is dissatisfied due to the lack of facilities. More can be done to improve the diversity of local facilities.
	Attractive outdoor areas and enough greenery.	Mixed. Some very satisfied due to planting and nice outdoor areas, but others find the area too planned and strictly organised. Three residents would want more greenery.
	Access to recreational areas within the neighbourhood	Satisfied with the river.
	Architectural quality	Satisfied. Includes a coherent architecture, the use of old industrial elements and colours.
	Lack of noise	Mixed. Most are very satisfied due to the lack of motorised traffic, speed bumps, placement of buildings, insulation and soundproof windows. Two residents are dissatisfied due to the construction work.

Larger area	Good public transport	Satisfied due to the close proximity, frequent departures and number of stops close by.
	Good access to recreational areas	Mixed. Three residents are very pleased with the close proximity. Some find it inconvenient due to the long and steep hill to reach the areas.
	Proximity to work place	Satisfied du to central location and proximity to public transport. More can be done to facilitate for cycling.

Figure 19. Overall evaluation Kværnerbyen.

5.3 Solsiden

5.3.1 Background information

	Gender	Age	Length of residence	Household size	Former dwelling type	Dwelling size
Resident 1	Female	69	10	2	Single-family dwelling	85
Resident 2	Female and male	24	1	2	Single-family dwelling	45
Resident 3	Female	23	0,5	2	Single-family dwelling	53
Resident 4	Male	74	2	1	Single-family dwelling	100

Figure 20. Background information Solsiden.

5.3.2 Motivation for moving

Having an **easier life and less maintenance** is considered an important motivation for moving to dense urban areas. Resident 1 states that they wanted something more convenient and easy. Their children are all grown up and consequently they did not need so much space. She is very satisfied with moving to Nydalen. Their former dwelling was a single-family generation dwelling, and when moving is was crucial to her that her mother also came along and moved to Nydalen. This was an area where her mother was familiar with, had friends here and had access to facilities like the Storo shopping centre. Resident 4 states that he also lived in a single-family dwelling with a large garden. He clearly states that having less maintenance in terms of gardening, snow shovelling and less stairs was more convenient when getting older. He chose Solsiden primarily because his son already lived here and that he discovered the neighbourhood when visiting. The second reason was the large terrace that weighed up.

He also considered some dwellings at Nordstrand, however, there were too much noise from the traffic. Similar results were found in the study by Mouratidis (2017a), where people also stress the advantages of having less maintenance with the garden and interior and these residents seems to be what is considered as "successful agers" who have moved to the city to have less maintenance and to retire (Allen & Blandy 2004).

To have **proximity to the workplace, family and friend** is also important reasons for moving. Resident 2 states that they also wanted to start their housing carrier. Essential to them was the location, size of the dwelling, that the building was relatively new and having a balcony. Furthermore, resident 3 explains that both her and her partner got a job in Oslo and finish their studies very soon. Both agreed that they wanted to move to the city, they did not want to commute between their home, workplace and friends. Similarly, having proximity to facilities, services and employment is stressed as one of the most attractive aspects of dense living (Allen & Blandy 2004). Resident being at the same stage of life seem to have the same motivations for moving.

5.3.3 The dwelling

Dwelling design

Having a **good dwelling layout** positively contributes to perceived living quality, and all the residents at Solsiden are very pleased. What is considered a good layout are aspects such as good-sized rooms, good use of space and enough storage. Resident 4 stresses that he has the best layout in the building because his dwelling has a rectangular shape and is a corner apartment. Similarly, research has suggested that the dwelling design and layout plays a large role to the residential satisfaction. In the study by Buys and Miller (Buys & Miller 2012) a good layout included aspects such as good use of the space, large living rooms and good-sized rooms, which is quite similar to the results for Solsiden.

When it comes to the size of the dwelling most of the residents find it adequate to their needs. However, there is a general tendency that residents **prefer a more spacious dwelling** either in terms of more space or an extra room. This is supported by resident 1, 2 and 3. Resident 1 explains that they bought the apartment at the construction stage and were able to influence the design, and consequently added an extra room which works as a library and guestroom. However, she states that when both of them need to work, they would want an extra room, but she adds that they just have to adjust. The same point is made by resident 2 and her partner

stating that they find it problematic to have the office desk and bed in the same room. However, none of the residents seem to find this considerably degrading to their perceived living quality. Resident 3 claims that she is thinking that the larger dwelling the better. The major disadvantage is that the dwelling is very small, but she acknowledges that when buying a dwelling in Oslo, one has to give up some things due to expensive housing prices. However, she says it is worth it. Furthermore, she adds that the dwelling design makes the dwelling feel larger. Critics of the compact city stress that people generally favour low-density living due to the preference for a more spacious dwelling (Senior et al. 2004). This seems to be the case, however, for most of the residents the dwelling seems to be adequate for their needs.

Having a **balcony** is an essential quality contributing to getting more day- and sunlight and a better view which positively influence the perceived living quality. The residents at Solsiden are very pleased. Resident 2 and her partner stress that having a balcony was something that they found very important when looking for a new home. This was essential to them and also gives them some extra space in addition to their indoor area. This is supported by resident 3 who says that having a sunny balcony facing west is a huge advantage in their dwelling. Resident 4 emphases that to have the access to a private outdoor area is very important to his perceived living quality. He uses his current dwelling as an example of what he considers as good livability. According to the NIBR report from 2014 having a balcony was among the highest valued qualities to residents (Schmidt 2014). As discussed earlier, is seems like having a balcony is a requirement to most of the residents. Especially for resident 2 and her partner having a small dwelling, their balcony seems increasingly important as extra space.

An **environmental friendly heating** system in terms of district heating and energy efficiency is mentioned as a great quality to all resident. Resident 3 and resident 2 and her partner are satisfied with the heating system and the dwelling being insulated properly which reduces costs. Resident 1 adds that former house at Grefsen had a great view but was often cold and required a lot of heating which was negative. Similar to this research, the NIBR report from 2014 also addressed Solsiden as a neighbourhood. They did however, address the social sustainability and market-based development to a larger extent. The report states that environmental friendly heating is important, but this has not been particular explored in other research studies (Schmidt 2014). Naturally, due to the climate this might be considerably more relevant and important in a Norwegian context.

Resident 2 and her partner seem to think that having **high ceilings** and spacious rooms is attractive and refer to Frogner due to the architecture, high ceilings and spacious rooms. Resident 3 and 4 are pleased about having an **elevator**.

Furthermore, having a **nice view** and enough **sun- and daylight** are mentioned as important qualities by resident 1 and 4. These qualities are considered great and resident 1 adds that to her, these are all elements that she finds essential to a good perceived living quality. Similar to the research, having a nice view and enough sunlight is seen as more important by residents with larger and more expensive dwellings (Barlindhaug et al. 2012). This seems to be the case here, when both these residents have larger dwellings located at the top floors.

Building quality

Good use of materials and **standard** seem to positively influence the perceived living quality, and most of the residents are pleased about the building quality. Two of the residents' stress that they are pleased with the materials and standard, however, this is something they expect due to being so newly built. On the other hand, resident 2 and her partner seem to think that the building quality is inadequate and that the buildings were built during a hectic period **using cheap materials**. They stress that the windows are leaning and that they have some complaints about the bathroom. Furthermore, they find the interior very **basic and anonymous**. They have gotten used to it, but claim that this definitely is a disadvantage about the dwelling. There has been raised concerns about the densification and this type of market-based development of urban areas and according to the NIBR report from 2014 the building standard of the dwelling in Solsiden was not considered adequate (Schmidt 2014).

Dwelling position and sun

The dwelling position is an important factor influential to the amount of sunlight, privacy in a dwelling and safety, and consequently also the perceived living quality. Three of the residents express satisfaction with their dwelling position, however, dwellings being located at the ground floor is consistently seen as less attractive to residents. Resident 2 and her partner stress that the dwelling location was important to them and that they did not want to have a dwelling at the ground floor when living in the city due to **safety** and burglary risks. Some of the dwellings at the ground floor have experienced burglary. Both resident 3 and 4 are very satisfied with being located in the upper floors and having a corner apartment. Similarly,

theory has found that dwellings located at the ground floor is normally considered less attractive and is generally priced lower (Barlindhaug et al. 2012).

Having a dwelling not directly facing a neighbouring dwelling is seen as positive to the degree of privacy and the perceived living quality. Most mention that the **degree of privacy** in their dwelling is great. Having a corner apartment seem to be particularly attractive. Resident 3 is pleased about having a minimum of insight into their dwelling due to the shielding around their balcony and that no other dwellings are located directly above them. Furthermore, resident 1 is also very satisfied having a lot of privacy in her dwelling. She stresses that is very inconvenient being located in the lower floors because the solar conditions are poor, and they view directly into to the wall of the neighbouring building. It is worth to mention that all the residents interviewed live in dwellings that are located in the third floor or higher, and none of them are located directly opposite another dwelling. This might lead to a more positive overall evaluation. Several studies (Schmidt 2014; Senior et al. 2004) suggest that having enough privacy is seen as essential to residents and that dense living often implies a lack of privacy, but most of these residents are pleased. Similarly, resident 2 and her partner say that they are located a little bit too close to the Norwegian Business School BI and that it is a lot of insight into their dwelling. However, they have gotten used to it and normally spent a large part of the day at work anyway.

The **amount of sunlight** is largely dependent on the dwelling position, which is confirmed by former studies (Barlindhaug et al. 2012; Schmidt 2014). Resident 3 supports this and explains that she is very satisfied with the dwelling position due to their dwelling being located in the corner. Consequently, they have more sun and a larger balcony. She claims that the solar conditions are very influential to their perceived living quality. On the other side, resident 2 and her partner stress that due to being located at the shadow side of the building, they are dissatisfied with the lack of sun.

Parking

Three of the residents do have a car, however, most of them rarely use it. Resident 1 explains that they do have a car, but this is only used when going on longer trips. All of the residents seem satisfied with the parking. However, residents 3 and 4 find the parking quite expensive. The latter adds that it is inconvenient that visitors have to pay. On the other hand, the fact that you have to **pay for the parking** in the streets and that there are not any roads on the front

side of the neighbourhood is great to reduce the amount of motorised traffic. He is very satisfied with this. He adds that it is quite far to walk to the car park which makes it easier and faster to walk. However, as suggested by theory (Senior et al. 2004) the restriction of parking is seen as a disadvantage of dense living. At the same time, the results indicate that these restrictions can also lead to positive outcomes such as less traffic and noise for residents.

5.3.4 The neighbourhood

Perceived density

High density is very influential to the perceived living quality due to being related to factors such as sunlight and privacy. Some of the residents express that the area is quite dense. Resident 4 claims that the distance between the buildings is perceived as quite small. This is just on the verge for what is considered okay, however, if the distance was smaller it might have been too dense here. However, this does not seem to influence his perceived living quality considerably.

Another main aspect related to the perceived living quality is the **degree of privacy**. Resident 2 and her partner stress that the BI building is located too close and which influence their degree of privacy and also the perceived living quality slightly. Furthermore, resident 3 seems to not have given the density a lot of thought but adds that that it is quite dense. However, she expresses satisfaction with the lack of insight into their dwelling, and that this is a reason why the neighbourhood is not perceived as too dense. As we have seen, the perceived density is closely linked to the dwelling position in the building. This is an interesting finding since it indicates that that the lack of privacy and sunlight makes the area feel denser. As the theory suggests, high density is not necessarily the source of dissatisfaction, but the related factors do play a significant role on the perceived living quality (Howley et al. 2009; Buys & Miller 2012).

Some residents express concern about the **densification process that is happening in Nydalen**. This is supported by resident 4. He expresses concern regarding this development, stating that it is fine as long as those qualities like the river is preserved. However, if these essential areas are densified it might be too dense. He refers to the development at Lillo Gård where he claims that the density is too high and negatively influences the livability. He also finds Kværnerbyen too dense and the solar conditions poor. This concern is also supported by resident 1. She seems very concerned about the densification;

"The new building being constructed concerns me. That´s not good … These developers have got too much freedom and have free rein regarding how much they are going to build … I actually think that the politicians are a bit scared of using the power that they could have used. They must get it together … So, we need to be careful, we can´t just let the capital control the development" (female 69).

She says that she is very concerned about the impact on the living quality, and that we need to look at those successful places that combines high density with quality and why it works well. One cannot be too eager to densify, and when the development change we have built too dense.

Local facilities

Diversity of local facilities contributes to the perceived living quality, and all the residents are extremely pleased and feel like they have what they need. The **cafes and restaurants** are highlighted as positive qualities. Resident 4 stresses that the cafes and restaurants are positive elements because they are contributing to making Nydalen more vibrant. Despite that the area for commercial purposes is limited within the building, residents seem pleased about the mixed use. Furthermore, resident 3 states that livability is about having proximity to **grocery stores** in the neighbourhood, which is the case here. The **cultural facilities** are also pointed out. Resident 1 emphasises that the cultural facilities like library and the theatre are very important to her and adds that Sagene is an attractive area due to the architecture and local niche stores. Resident 2 and her partner explain that they would have moved to Grünerløkka because there are a lot of things happening there in terms of facilities, activities and bars. These are typical urban qualities that they find particularly attractive. In the former study conducted by NIBR addressing Solsiden they point out that the residents were dissatisfied with the local facilities in the neighbourhood. This does not match the findings here. The reason might be that there has been a lot of focus on developing Nydalen the recent years and they have redeveloped the area around the metro with more stores and facilities. Furthermore, they might have had a different selection of residents with other preferences and thoughts. However, the access to facilities and services is seen as one of the advantages of dense living (Mouratidis 2017a).

Outdoor space and green areas

Having attractive and green outdoor areas is important to the perceived living quality. All the residents are generally satisfied with the outdoor areas, and many consider the areas to be adequate to their use and needs. Similar to existing research (Mouratidis 2017a; Schmidt 2014), the river is pointed out as a main aspect and all the informants clearly stress that the **area around the river** is fantastic (see figure 13), with many people using it in the summer. Resident 4 states that:

"Good perceived living quality is about having good outdoor areas, such as the river" (male 74).

Resident 2 and her partner explain that they have not used the outdoor areas that much, due to having a large terrace. However, there are some complaints about the **lack of greenery**. When asked about the outdoor areas resident 3 stresses that these are great, and the area around the river is influential to their perceived living quality. It is positive that they can look down at the green areas by the river, however, she would like more greenery here. This is supported by resident 1 who expresses concern about the densification in relation to the outdoor areas. She is afraid that with the development in Nydalen will result in overcrowding of the few outdoor areas they have. Furthermore, she states that she does not find the green areas adequate, especially in relation to how many people that are moving to Nydalen in the future. The lack of green areas is seen as a common urban problem (Mouratidis 2017a; Howley et al. 2009) and it seems like it has not been facilitated for enough green areas between the buildings at Solsiden. Despite there being areas between the buildings, the green outdoor areas which are being used are those in relation to the river. Similar to the NIBR study from 2014, the rest of the outdoor areas are shaded and do have a lot of asphalt (Schmidt 2014).

Another point made is the **facilitation for children** in the outdoor areas. Resident 1 stresses that this topic has been discussed among the neighbours and it seems like they have not facilitated for the children here. Many of the places where children can play are too far away for them to walk to by themselves. This is partly supported by resident 4 who says that they have some green areas and playgrounds nearby which is great for them. However, he has the impression that most families choose to move when the children are getting old enough to walk. Similarly, as suggested by theory many residents consider dense environments as unsuitable to raise children and many feel the need to have more space and green areas, and

consequently choose to move to the lower density neighbourhoods (Howley 2009). The lack of facilitation for children was also criticised the in the NIBR study (Schmidt 2014).

Design and aesthetic quality

Attractive and coherent architecture in the neighbourhood positively contribute to the perceived living quality. Three of the residents express satisfaction with the architecture and the aesthetic quality in the neighbourhood (see figure 15). One aspect mentioned is the **terraced building heights** which has been designed according to the solar conditions and landscape. Resident 2 and her partner seem to be very pleased about this. Another main point is **the coherent architecture** in the area. Resident 2 and her partner also stress that the brick and glass match the rest of the architecture in the area. This is also supported by resident 3 who is very pleased with the modern architecture and says that this was something that positively influenced them when buying their dwelling. One of the residents points out that the commercial buildings in the neighbourhood, such as the Statnett building, appears quite **massive**. The resident seems to feel like the building are not adjusted to the surroundings and to the human scale, which seems to negatively influence her perception.

Resident 4 expresses that he is pleased about that the entrances to the buildings are located at **different levels** and that they have chosen to have a passage through the buildings to break up the design. Furthermore, he is very pleased that they have kept some of the **old industrial buildings** in the area, which positively contributes to his perceived living quality. It seems like the historical grounding positively influenced his neighbourhood attachment and aesthetic quality of the areas and consequently the perceived living quality. However, he expresses concerns about the preservation of these in relation to densification. Resident 1 refers to Sagene as a very attractive neighbourhood and claims that the architecture plays a great deal to how she perceives the living quality in an area. The impact of the architecture on the perceived living quality has not been addressed much in the current research. However, similar to theory suggesting that the built environment can have a psychological effect on people (Bramley et al. 2009), one can assume that beautiful architecture positively influence livability.

Traffic and noise

Good public transport and the **restriction of parking** are considered important factors contributing to less traffic and noise. The residents are very pleased about the lack of traffic

and quietness in the neighbourhood, which seem to be very important to them. This is supported by resident 4 who stresses that the lack of noise is the most important quality to him. If there was a lot of noise in the neighbourhood and from the traffic he would have moved. Furthermore, all of the residents including him are very pleased about the quietness in the neighbourhood. This is also supported by resident 1 and she adds that when living in Nydalen there is no need to use a private car, when having such a great public transport system. She claims that she would never have lived in the city centre of Oslo due to the noise and pollution from the traffic. On the other hand, she expresses concern about the development in the area and how this influences the amount of traffic in Nydalen.

In contrast to the existing theory stating that many perceive the restriction of parking as a negative aspect of dense living (Senior et al. 2004), resident 1 and 4 find it very positive that one has to pay for parking in the streets. The reason is that this leads to less traffic and noise than in many other places.

Social environment

The residents are generally quite pleased about the social environment in the neighbourhood. Having **family and friends in close proximity** is something that both resident 1 and 4 are very satisfied with. This was also partly the reason why both of the residents chose to move here. This supports the existing theory stating that higher densities may lead to a better social life and more social support due to the shorter distances to family and friends (Mouratidis 2018). This is seen as a positive consequence of density which seem to increase the residents' satisfaction.

Having nice neighbours is also seen as a main aspect. Resident 1 is very satisfied with the nice neighbours across the hall. Her satisfaction might be determined by the fact that she does live in the top floor where all the dwellings are considerably larger and more expensive, and consequently do have lower residential turnover. Furthermore, she explains that there have been some incidents with noise from the **dwellings that are being rented out**. These are located in the lower floors. Having too many of these dwellings being rented out is seen as a disadvantage to her and she claims that those renting out only focus on earning money and not on who the dwellings are being rented out to. Similar to the study by NIBR (Schmidt 2014) they found that densification degraded the social sustainability and lead to less stability in

Solsiden. The main reason for this was that densification lead to smaller dwellings and more residential turnover.

The area is perceived as **well maintained** and both resident 2 and her partner and resident 4 are pleased about the cleanness and up-keep of the neighbourhood. The area is also perceived as very safe by resident 1. Resident 3 explains that she does not feel like there are a lot of people living here due to rarely meeting neighbours in the hallways. According to theory, having well-maintained and attractive common areas will increase the perceived living quality and neighbourhood attachment (Leby & Hashim 2010) and the residents at Solsiden seem very pleased with the maintenance and up-keep of the neighbourhood.

5.3.5 The larger area

Access to recreational areas

The **location of Solsiden in relation to the river** influence the perceived living quality. The river is considered an extremely important quality mentioned by all the residents. All emphasise that the river is an important green arm which is great to follow to get to the larger recreational areas such as the forest or to the inner city. Three of the residents stress that they use this quality a lot. Again, resident 4 is very satisfied with being able to look at all the old industrial buildings along the river and stresses that there is a lot of people using the trail along the river. This seems to be the most important quality in the neighbourhood is safe to say that improves the livability for all the residents.

Access to employment

Proximity to the workplace due to the **central location** in relation to the **public transport** is seen as important to the perceived living quality. Most of the residents use the public transport system to get to work, and consequently how they evaluate the accessibility to employment will depend on this. Resident 4 is very pleased with the access to his workplace. Despite spending more time taking the metro to his workplace than the car, but he still prefers using the metro. Resident 3 supports this and thinks that livability is about having easy access to her workplace. Research also show that high accessibility is considered one of the most important benefits of dense living and many choose to move to dense urban areas to have less commuting and better access to their workplaces (Mouratidis 2017a; Næss 2016). She has not started working yet, due to still writing her master thesis. However, she finds it quite expensive to use the car. On the other hand, resident 2 and her partner claim that they have to

use two modes of transport to get to work, which is a little inconvenient. However, this is not a large problem to them.

Accessibility to city centre

When asked about the accessibility to the city centre, all the residents were very positive. They all stress that the location of Solsiden and accessibility to the city is fantastic. This is mostly due to the great **public transport system**. Resident 2 and her partner stress that their former dwelling had a poor location and that he location is everything to them. They claim that the dwelling where you are sleeping is not that important, but rather the opportunities you have in the close proximity.

Accessibility to public transport

Like already indicated, the residents are extremely satisfied with the public transport system. Building denser and in proximity to public transport is essential in the compact city development. They state that it is easy to get to almost anywhere in the city and resident 1 stresses that there is no need to have a car when living here. Resident 2 and her partner claim that despite living quite far from the city centre in terms of distance, the metro makes it feel a lot closer. Resident 4 is very satisfied and states that compared to his former home at Nordstrand, where the metro departed 4 times per hour, the metro now departs 12 times per hours. This is great.

5.3.6 Dense living

Eventually, the informants shared their general thoughts of dense living and their future plans. Most of the residents are positive towards dense living and list several of the same advantages of dense living. Residents state that one of the greatest advantages of living in an apartment is having **less maintenance work** and to **have an easier life.**

Resident 1 stresses that having a more convenient home and easier life is a great advantage. She is very pleased the have moved to an apartment in the city and does not miss the garden. However, if it was not for their cabin where they spend a lot of time, she would have missed the garden and probably have moved. However, there was always a conflict with having both a house and a cabin in relation to maintenance. She is also pleased to drop the snow shovelling and lawn moving in her current home. Resident 4 stresses that living here is very convenient and easy, due to having an elevator, a dwelling on one level and the accessibility

to public transport and facilities. He misses the garden quite a lot, however, not the maintenance that followed. Similarly, resident 2 and her partner add that they do not need so much space which is great in terms of having less cleaning. While studying they lived in a house, and they stress that the maintenance is much easier with an apartment. This also feels more intimate.

The other main advantage with living dense is the **closeness to the workplace, facilities and friends.** Resident 3 claims that having proximity to work and friends are advantages of living dense. She does not want to commute so living outside the city is not an option. Resident 2 and her partner are satisfied with living dense and in an apartment. They consider themselves as "urban people", despite coming from smaller towns. High density is fine, and they stress that the advantages of living dense are the accessibility to their workplace and employment opportunities, friends and facilities. Furthermore, to not having to plan everything in advance is great. They state that;

"If high density is a consequence of living in the city, that´s fine. More people, more opportunities" (female and male, 24).

Three of the residents do not have any plans to move in the future proximity. This is supported by resident 1 who clearly states that they are not moving back to a single-family dwelling. They had to get rid of a lot of thing when moving here, which was fine. She claims that dense living is about the right attitude and to adjust. Resident 4 has no plans to move either. It is convenient, and he is not particularly concerned about the densification here, only in terms of the view from his dwelling. According to Allen and Blandy (2004) these residents can be characterised as "authentic inner-city dwellers". Furthermore, to continue to live dense is also something that resident 2 and her partner are planning to. They are imagining themselves having children while living in the city, however they stress that;

"This dwelling is spacious enough for two people, but it´s not a dwelling where you can have a child in. That out of the question" (female and male, 24).

On the other hand, resident 3 **cannot see herself living dense in the long run**. She finds dense living great being at this stage of her life, however, she wants to move to a smaller town when having children. Preferably a suburb. Oslo is very expensive, and the housing prices are

considerably lower outside of the city. Furthermore, she prefers living in a smaller town where you can run into friends and acquaintances. She adds that she might moving back to the city when retiring.

5.3.7 Overall evaluation

Factors important for perceived quality of life based on interviews with Solsiden residents		Perceptions of residents on these qualities
Dwelling	Good layout	Satisfied. Includes having good-sized rooms, good use of space, high ceilings and enough storage.
	Having balcony	Satisfied. Essential in order to get more space, sunlight, more space and a better view.
	Environmental friendly heating system	Satisfied due to energy efficiency and district heating.
	High level of privacy	Mixed: Most are very satisfied mostly due to the position of their dwelling and the size. One slightly less satisfied due to closeness to neighbouring building.
	Enough sunlight	Mixed. Mostly are very satisfied. One resident less pleased due to dwelling being located at the shadow side of the building.
	Elevator	Satisfied.
	Safety	Satisfied due up-keep and dwelling position.
	Good building quality	Mixed: Most residents are satisfied due to good materials and standard. One resident dissatisfied due to cheap materials and very basic interior.
Neighbourhood	Diversity of facilities	Satisfied due to proximity to cafes, restaurants, grocery stores and cultural facilities.
	Attractive outdoor areas and enough greenery	Mixed. Some are very satisfied, especially due to the river. Two residents mention the lack of greenery. More can be done to facilitate for children.
	Access to recreational areas within the neighbourhood	Satisfied. The river is very important to residents.
	Architectural quality	Satisfied due to coherent architecture, interesting design, terraced building heights and the use of old industrial elements.

	Lack of traffic and noise	Satisfied due to closeness to public transport and restriction of parking.
	Stability	Mixed. One dissatisfied due to many dwellings being rented out.
Larger area	Proximity to recreational areas	Satisfied due to the river being a green arm which leads to larger recreational areas.
	Good access to public transport	Satisfied.
	Proximity to work place	Mostly satisfied due to proximity to public transport and the ring road.

Figure 21. Overall evaluation Solsiden.

5.4 Cross-neighbourhood evaluation

This cross-neighbourhood evaluation will give a summary of the different case areas in light of how the built environment influence the perceived living quality and similarities across the cases.

Factors important for perceived quality of life based on interviews with all residents		Perceptions of residents on these qualities
Dwelling	Good layout	Satisfied in all neighbourhoods. Includes having a spacious living room, own wing for the bedrooms, good use of space, good-sized rooms, high ceilings, L-shaped living room.
	Balcony	Satisfied in all neighbourhoods. Leads to more extra space, more sunlight and fresh air.
	Environmental friendly heating system and energy efficiency	Mentioned by residents in Kværnerbyen and Solsiden.
	Elevator	Mentioned by residents in all case areas.
	High level of privacy	Several residents express dissatisfaction due to density and dwelling position.
	Enough sunlight	Most satisfied in Sørenga and Solsiden. Several residents express dissatisfaction due to density and dwelling position.
	Good building quality	Includes having good materials, standard and personalised solutions.

		Some residents dissatisfied in each case area.
Neighbourhood	Diversity of facilities and mixed-use	Includes typical urban qualities like grocery stores, restaurant, cafes and cultural facilities. Lack of facilities in Sørenga and Kværnerbyen.
	Attractive outdoor areas and enough greenery	Lack of green areas in all case areas. Includes areas not too covered by stone and asphalt or too strictly organised.
	Access to recreational areas within the neighbourhood	Satisfied. Having water qualities like a river or the sea is seen as great.
	Architectural quality	Satisfied. Includes a coherent architecture, use of colours, terraced building heights and old historical elements.
	Lack of traffic and noise	Satisfied. Includes good public transport, restriction of parking, insulation, soundproof windows and building design.
	Stability	People living in buildings having larger and fewer dwellings leads to more stability.
Larger area	Proximity to recreational areas	Satisfied. Facilitation for cycling and walking, preservation of green areas and parks.
	Good access to public transport	Satisfied. Proximity to public transport.
	Proximity to work place	Some dissatisfaction. Need for better facilitation for cycling and walking.

Figure 22. Table for cross-neighbourhood evaluation.

6 Discussion

This research has investigated how the built environment of dense urban areas can influence the perceived living quality of residents in three neighbourhoods in Oslo. The background for investigating this has been the common perception that dense living implies lower livability and is seen as temporary.

Similar to what is suggested by the conceptual framework, the results indicate that the built environment of dense neighbourhoods do influence the perceived living quality of residents in the three case areas. A number of studies have also argued for the importance of the built environment to livability and social sustainability (Burton 2000; Buys & Miller 2012). In general, the majority of the residents are satisfied with living in dense neighbourhoods and it is suggested that dense living does not necessarily leads to lower perceived living quality. This contradicts the common perception that dense living implies lower livability stated by many professionals (Buys & Miller 2012; Howley et al. 2009; Mouratidis 2017a). On the other hand, these findings can be a bit biased because people who choose to live in dense areas do this largely based on their preferences and are consequently more satisfied. However, dense living can potentially be seen as an attractive option to many residents. The perceived living quality will also be influenced by personal characteristics such as the residents' former experiences, their life stage, age and household and externalities such as housing prices. Furthermore, the research suggests that the perceived living quality of residents in dense urban areas in Oslo is determined by some important qualities of the built environment. This is supported by several of these research studies pointing out that livability does depend on some specific characteristics of the built environment.

As illustrated in the conceptual framework, the perceived living quality is influenced by qualities at three different levels of the built environment. By addressing multiple levels, the results suggest specific aspects of the dwelling, neighbourhood and larger area that play an important role to residents perceived living quality. The factors seen as the most important to the perceived living quality at the dwelling level are primarily – a good layout, balcony, good dwelling position, high level of privacy, enough sunlight and view and good building quality. In general, there is not enough research done on the specific factors of the dwelling that can contribute to livability and it is important to investigate how the built environment can be

improved and consequently also the livability. Buys and Miller (2012, p. 335) argue that there is "relatively little academic research on the specific dwelling design characteristics inner-urban-higher-density residents most value".

Residents from all the case areas valued having a good dwelling layout. Aspects contributing to this are elements such as a spacious living room, good use of space and high ceilings. It indicated that having a L-shaped living room and an own wing in the dwelling for the bedrooms is seen as most important to larger dwellings, while for the smaller ones the good use of the space is particularly important. However, there is a general preference for more space. The preference for more space is suggested by several research studies (Buys & Miller 2012; Senior et al. 2004) and despite that most of the residents preferred a larger living room or an extra room, most of them find the dwelling adequate to the households needs. Furthermore, as suggested by the conceptual framework the housing prices is seen as a barrier to many of the residents wanting more space. One resident in Kværnerbyen stresses that due to the lack of space and a growing household they have to move to the outskirts of the city to afford a larger dwelling.

A good building quality was found to be significant to residents, and the good use of materials, high quality and more a personalised standard in the dwellings will improve the built environment and the perceived living quality. Most of the residents across the neighbourhoods are very pleased, however, several residents expressed dissatisfaction with the lack of these qualities. Residents also frequently commented that a balcony is essential because it contributes to getting more sunlight, fresh air and a better view which are all important factors to residents.

A high degree of privacy and enough sunlight are constantly found to be very important qualities to residents and are directly related to the density and the dwelling position in the building. Most residents do not feel like the density negatively influence their perceived living quality, which might be related to the fact that most of the interviewed residents are not located in the lowest floors in the building. The results suggest that the density itself is not necessarily the reason for residents' dissatisfaction, but rather these related factors. Similarly, this is also suggested by a number of research studies (Buys & Miller 2012; Howley 2009) but there is a need for more suggestions for how these factors can be improved in order to increase the livability. The results suggest that those being located at the lower floors in a

building is consistently found to be less satisfied due to a lack of privacy in terms of insight into the dwelling and lack of sunlight and view. However, the use of shielding, vegetation, physical barriers and not having rooms opposite to each other in neighbouring dwellings can improve the degree of privacy. Furthermore, the results suggest that terraced building heights and architectural design allowing more sun- and daylight are important to improve the built environment and consequently the perceived living quality. However, not all can live in the upper floors, but to build high first floors or use some of the ground floors for commercial purposes might be a solution. Interesting is that the findings emphasising the importance of privacy and sunlight are not consistent with a large amount of the research from other countries outside Norway (Barlindhaug et al. 2012; Schmidt 2014). The reasons for this might be the fact that the general standard of living is quite high here in addition to the climate considerations. Cultural values do reflect the desire for high degree of privacy and sunlight which seem to be reflected in this study.

At the neighbourhood level aspects particularly important are diversity of facilities and mixed-use, attractive outdoor areas and enough greenery, architectural quality and the lack of traffic and noise. Having a diversity of facilities and mixed-use is significant to residents, and to ensure a variety of restaurants, cafes, cultural facilities and grocery stores will improve the built environment and the perceived living quality. Very influential to the perceived living quality of the residents is attractive outdoor areas and enough greenery and qualities like a river or the sea is consistently seen as extremely successful across all neighbourhoods. This is frequently stressed by all residents and also in existing research (Barlindhaug et al. 2012; Schmidt 2014). To have outdoor areas not being too covered with asphalt and including more green walls and plants are also measures to ensure more greenery and to improve the built environment. These measures should be fairly easy to implement and too often “left-over” areas or open spaces are covered with asphalt.

Architectural quality is found to both influence the neighbourhood attachment and the perceived living quality. A coherent architecture of the neighbourhood with individual features for each building is stressed as positive by residents from all the neighbourhoods. The use of different architect offices for the different buildings at Sørenga is emphasised by residents. The same applies for the use of lighter colours and old historical elements in the outdoor areas and architecture. These are elements that seems to be valued by residents regardless of personal characteristics and there need to be subject to more research.

Existing research stress that some of the most common reasons for dissatisfaction is noise, traffic, litter and crime (Burton 2003; Buys and Miller 2012; Howley at al. 2009; Mouratidis 2017a). These are all significant factors, however, does not seem to be a problem to most residents. Many are very satisfied with the lack of noise and traffic due to the use of speed bumps, parking restrictions, expensive fees for parking, good public transport, insulation of dwellings, soundproof windows and the design of the buildings. E.g. in Kværnerbyen it is claimed that the large building Kværnerhallen is strategically placed to reduce noise. It appears that many of the reasons for dissatisfaction is more related to the fact that these areas are newly built, such as the lack of facilities, construction work, green areas and complaints about the buildings quality.

Furthermore, to have accessibility to employment opportunities, recreational areas, good public transport and a central location are vital at the larger scale. This is stressed as important across all the cases and access to recreational qualities is seen as great. This is mainly related to the location of the neighbourhood, but measures that can be taken to improve the livability is to facilitate for walking and cycling, ensure a good public transport system and the preservation of green parks close by.

Eventually, it is important to emphasise that based on the general understanding of the interviewed residents, there is a common preference for low-density living. The majority of the residents have either lived or are intending to move to lower density neighbourhoods in future proximity. Many of the interviewed residents are relatively older and have previously lived in a low-density neighbourhood. They have moved to an apartment for residing, which is a direct result of their personal characteristics such as life stage, former living situation and age. One of the residents from Sørenga express that she does favour low-density living, but that she is at a stage on her life where having a garden and more space belongs to the past. It appears to be the case for more of the residents. Furthermore, one must take into consideration that many people living in inner-city areas are consistently more positive towards this because they have chosen to live there. However, many residents express that they are satisfied with living dense and do not plan to move in the future proximity.

By improving the built environment in dense urban areas and consequently the perceived living qualities, one can enhance the acceptance of dense living.

7 Conclusion

The aim of this master thesis has been to investigate how the built environment of dense neighbourhoods influence the perceived living quality in three case areas in Oslo. In-depth interviews with 13 residents from three relatively new and dense neighbourhoods in Oslo have been conducted to investigate residents' perception of dense living and how they evaluate their neighbourhoods in terms of positive and negative aspects.

The research clearly indicates that the built environment of dense neighbourhoods does influence the perceived living quality in the three case areas. It is also suggested that dense living does not necessary lead to lower perceived living quality. This is not particularly a result of the density alone, but rather the related factors of the dwelling, neighbourhood and larger area. In other words, qualities of the built environment and how these are organised determines the perceived living quality to a great extent.

The results from this study can help to advance the research in this field, both in terms of context-dependent knowledge and theoretical development. Due to the scarce research conducted on livability and dense living in a Nordic context, this study is an essential contribution to fill this gap. Furthermore, it can also provide knowledge that can be compared to other geographical and cultural backgrounds. In terms of theoretical development, it can be a contribution to the debate about livability in dense urban areas and to inform practice. This includes giving practitioners advice on how to improve the built environment and perceived living quality of resident, and consequently also the acceptance for dense living.

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8.1 References images

Figure 1: Research design.

Figure 2: Compact city characteristics.

Figure 3: Conceptual framework.

Figure 4: *Map of the case areas*. Available at: Google Maps.

Figure 5: E24 (2017). *LO-topp får sponset leilighet i et av Oslos dyreste strøk*. Available at: https://e24.no/makro-og-politikk/eiendom/lo-topp-faar-sponset-leilighet-i-et-av-oslos-dyreste-stroek/24116634 (28 April 2018).

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Figure 11: OBOS (2016). OBOS-medlemmer får forkjøpsrett på 7.600 boliger i år. Available at: https://www.aftenposten.no/brandStudio/OBOS-medlemmer-far-forkjopsrett-pa-7600-boliger-i-ar-109b.html (02 May 2018).

Figure 12: OBOS (n.d). *Dreieskiva-kvartalet i Kværnerbyen*. Availabe at: http://archive.is/br9bH (02 May 2018).

Figure 13: Krogsveen (n.d). *Nydalen alle 5*. Available at: https://krogsveen.no/Selge-bolig/Solgte-boliger/Bolig/Leilighet/Nydalen-alle-5-874643942 (02 May 2018).

Figure 14: Avantor (n.d). *Gjennomførte prosjekter.* Available at: http://avantor.no/gjennomforte-prosjekter/ (02 May 2018).

9 Attachments

Attachment 1. Interview guide.

Kort informasjon om prosjektet:

Mitt navn er Elise Stuve og jeg studerer by- og regionplanlegging ved NMBU. Min masteroppgave handler om bokvalitet og fortetting. Formålet med dette prosjektet er å undersøke hvordan konsekvensene av fortetting påvirker bokvalitet og å undersøke beboeres syn på det å bo i tett by. Mange forbinder det å bo i tett by med å ha lavere bokvalitet, men forskningen på området viser blandede resultater.

Jeg intervjuer personer som bor i de tre utvalgte caseområdene; Sørenga, Kværnerbyen og Solsiden. Svarene vil bli anonymisert i oppgaven, og jeg vil gjerne ta lydopptak av intervjuet slik at jeg får med meg alt. Opptakene blir selvsagt slettet i etterkant, og ingen andre kommer til å ha tilgang til dataene. Jeg vil også informere om at du når som helst kan trekke deg fra intervjuet eller ta en pause.

Bakgrunnsinformasjon om informanten:

1. Alder.
2. Yrke/utdannelse.
3. Hvor lenge har du bodd på ditt nåværende bosted?
4. Hvor bodde du før du flyttet hit?
5. Hva var motivasjonen din ved å flytte hit? Hvorfor valgte du akkurat dette stedet, og var det andre steder du vurderte?

- Oppfølgingsspørsmål: Hvorfor det? Hvilke kvaliteter var det der som du anså som attraktive?

6. Størrelse på husholdningen.

Bokvalitet:

1. Hva tenker du omkring begrepet bokvalitet? (hva forbinder du med begrepet, hva legger du i bokvalitet).

Boligen:

1. Hvordan oppfatter du kvaliteten på boligen din?
2. Kan du trekke frem noen fordeler og ulemper ved boligen?

- Oppfølgingsspørsmål: Hva tenker du om
    - Boligens størrelse?
    - Antall rom i boligen?
    - Planløsningen på boligen?
    - Boligtypen?
    - Solforhold?
    - Materialer og kvalitet?
    - Parkering?

    - Plassering av boligen i bygget?
3. Synes du at du har nok privat plass i boligen din?
4. Hva slags kvaliteter anser du som viktigst for deg for at du skal trives i boligen?
5. Synes du at boligen passer til husholdningen sine behov og preferanser?

Nabolaget:

1. Hvordan oppfatter du bokvaliteten i nabolaget?
2. Kan du trekke frem noen fordeler og ulemper med nabolaget?

- Oppfølgingsspørsmål: Hva tenker du om nabolagets
    - Åpne rom og plasser/uteoppholdsarealer?
    - Tettheten?
    - De lokale fasilitetene (kafeer, restauranter, butikker)
    - Bygningene og arkitekturen
    - Plassering av bygningene
    - Er det nok grønne områder og lekeplasser?
    - Trafikk?

3. Er det noen andre nabolag i Oslo som du kommer på, som du anser som svært attraktive eller som mindre attraktive?

- Oppfølgingsspørsmål: Hvorfor det? Hva mener du med det?

Byen:

4. Hvordan synes du boligens beliggenhet/tilgjengelighet er i forhold til resten av byen?
5. Hvordan opplever du beliggenheten i forhold til jobb og diverse fasiliteter?
6. Hvordan opplever du tilgjengeligheten til rekreasjonsområder?
7. Hvordan synes du kollektivtilbudet er?

Tidligere og fremtidig bosted:

8. Hvor har du bodd tidligere?
9. Hvordan sammenlikner du tidligere bosted med nåværende bosted?

- Oppfølgingsspørsmål:
    - Hva er fordeler og ulemper med tidligere bosted?

10. Var boligpriser avgjørende i flytteprosessen?
11. Hva tenker du om å bo i tett by i lengden? Hvor ser du for deg å bo i fremtiden?
12. Har du/dere planer om å flytte i nærmere fremtid.

- Oppfølgingsspørsmål:
    - Hvorfor?

Avsluttende spørsmål:

13. Er det noe du ønsker å legge til? Noe du vil si?
14. Tusen takk for at du ønsket å stille opp!
15. Spørsmål om kontakt i ettertid for å sende utkast av intervjuet (evt. ekstra spørsmål)?

Norges miljø- og biovitenskapelige universitet
Noregs miljø- og biovitskapelege universitet
Norwegian University of Life Sciences

Postboks 5003
NO-1432 Ås
Norway