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Public transportation in Sandnes – A mobility justice perspective



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ABSTRACT

Urban mobility is changing. The broad agreement on the need for sustainable mobility transitions has resulted in transport- and mobility-related measures locally and nationally worldwide. New trends in mobility call for attention to social justice and equity in mobility-related practices. Sandnes is a medium-sized city in the larger region Nord Jæren in Norway, well underway in its sustainable mobility transition. The Urban Growth Agreement (byvekstavtalen) has been signed by all municipalities in Nord Jæren to ensure that the increase in transport will be in terms of public transport, walk or bicycle. Literature on transport and mobility practices tends to be region-based and does not always account for social justice. Despite an increased focus on mobility justice globally, there is still a lack of knowledge on mobility justice in Norway and in Sandnes specifically. Sandnes differs from the other municipalities in Nord Jæren in use of land, size, and distances. Because mobility justice may be linked to context specifics, this study aims to fill this gap by investigating the practice of public transportation in two locations in Sandnes from a mobility justice perspective. To do so, this thesis aims to answer the following research questions; **What are the motivations for public transport or car transportation in the city center and in Hommersåk? What measures, from the respondents' perspectives, can be carried out in order to increase their use of public transport in Sandnes? To what degree can mobility justice variables be connected to the practice of public transportation in Sandnes?** The study follows a multiple methods qualitative approach in the attempt to answer the research questions, including semi-structured focus group discussions, a small-scale survey, and a few in-depth interviews. The findings show that there are many motivations and barriers to public transportation in Sandnes, some of which can be linked to the concept of mobility justice. Especially four mobility justice variables were important when deciding on a mode of transportation; economy, infrastructure, use of time, and life situations. The study demonstrates the need to further implement justice perspectives in governance and urban planning and to include the infrastructural dimension of governance in decision-making processes.

Keywords: Social justice, mobility justice, mobility transitions, transport planning, urban planning, Sandnes, Norway

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Table of contents

| | |
|--|-----------|
| 1. INTRODUCTION | 6 |
| 1.1 PROBLEM STATEMENT | 7 |
| 2. THEORETICAL LITERATURE REVIEW | 10 |
| 2.1 GOVERNANCE OF SUSTAINABLE MOBILITY TRANSITIONS | 10 |
| 2.2 MOBILITY JUSTICE | 14 |
| 2.3 TRANSPORT DESIGNS AND USER NEEDS | 16 |
| 3. ANALYTICAL FRAMEWORK: SOCIAL PRACTICE THEORY | 20 |
| 3.1 SOCIAL PRACTICE THEORY | 20 |
| 3.1.1 <i>Power and politics in Social Practice Theory</i> | 22 |
| 4. METHODOLOGY, CASE SELECTION AND METHODS | 24 |
| 4.1 RESEARCH STRATEGY AND RATIONALE FOR CASE STUDY SELECTION | 24 |
| 4.2 MULTIPLE METHODS MULTIPLE CASE STUDY | 30 |
| 4.3 DATA COLLECTION METHODS | 32 |
| 4.3.1 <i>Focus group discussions</i> | 33 |
| 4.1.2 <i>Small-scale qualitative survey</i> | 36 |
| 4.1.3 <i>In-depth personal interviews</i> | 37 |
| 4.4 ANALYSIS AND ANALYSIS PROCESS – CONSTANT COMPARATIVE ANALYSIS | 38 |
| 4.5 ETHICAL CONSIDERATIONS | 40 |
| 5. RESULTS, ANALYSIS AND DISCUSSION | 43 |
| 5.1 MATERIALS, COMPETENCES AND MEANINGS | 43 |
| 5.2 INFRASTRUCTURE | 46 |
| 5.2.1 <i>Routes</i> | 46 |
| 5.2.2 <i>Infrastructural improvements</i> | 49 |
| 5.2.3 <i>Digitalization</i> | 52 |
| 5.3 MOBILITY JUSTICE AND ECONOMY | 54 |
| 5.3.1 <i>Economy</i> | 56 |
| 5.4 TIME | 58 |
| 5.5 LIFE SITUATIONS | 60 |
| 6. CONCLUSION | 63 |
| REFERENCE LIST | 66 |
| APPENDIX | 75 |
| APPENDIX 1: INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSIONS IN NORWEGIAN | 75 |
| APPENDIX 2: SURVEY DISTRIBUTED IN BYPARKEN | 77 |

1. INTRODUCTION

The concept of sustainable development has been on the international agenda since the report *Our Common Future* was released in 1987 (Langhelle, 1999). Since then, the Sustainable Development Goals (SDGs) have been developed, adopted and acknowledged by all United Nations member states (United Nations, 2019). The role of transport within sustainable development traces back to the Earth Summit conference in 1992 and is mainstreamed across several goals and targets. Mobility can be connected to the SDG 3, 9 and 11 which says “to make cities and human settlements inclusive, safe, resilient and sustainable” (United Nations, 2019). Transport is responsible for approximately 23 percent of greenhouse gas emissions and, the sector is growing rapidly (IPCC, 2014). As a result, the Intergovernmental Panel on Climate Change (IPCC) suggested in their 2014 report that aggressive and sustained policies must be implemented within the transport sector (IPCC, 2014). The role of emission reduction in transport was further underlined in the 2018 *special report* on the global impacts that may follow with a rise of temperature of 1,5 Celsius. Here the authors state that “pathways limiting global warming would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems (*high confidence*)” (IPCC, 2018, p. 15). In the Northern countries, transport is responsible for more than one third of energy-related greenhouse gas emissions (Sovacool et al, 2018). In Norway, transport contributes to 30 percent of greenhouse gas emissions (SSB, 2019).

More recent, in the *Net Zero by 2050* report released by the International Energy Agency (IEA), transport-related measures are recognized as important to reach the net zero emission (NZE) scenario by 2050 (IEA, 2021). Amongst other measures, they suggest:

Transport mode switching. This includes a shift to cycling, walking, ridesharing or taking buses for trips in cities that would otherwise be made by car... Many of these types of behavioural changes would represent a break in familiar or habitual ways of life and as such would require a degree of public acceptance and even enthusiasm (IEA, 2021, p. 67).

The increased and deniable demand to reduce emissions from transportation has led to the implementation of different transport-related measures both nationally and locally worldwide. This has given rise to a discussion of mobility justice, and scholars are questioning whether the sustainable transition within the transport system is a just and unbiased process (Mattioli,

2017; Mullen & Mardsen, 2016; Sheller, 2018). The Norwegian Parliament has released and accepted a white paper on transport which included a zero-growth target, that has been adopted by municipalities and regions in the country through agreements and action plans (Norwegian Ministry of Transport and Communications, 2016). In 2020, the municipalities in Nord Jæren, Rogaland county, re-ratified the Urban Growth Agreement (byvekstavtalen), an agreement that includes transport-related measures, finance and effective use of land in line with the national plan for transportation. An important target in the Urban Growth Agreement is to increase the use of public transportation in Nord Jæren and to better the public transportation services in the region. Urban planning, land management and social privileges are amongst factors that can affect mobility justice (Sheller, 2018). Sheller (2018) builds on a gender studies approach to mobility justice by pointing out that mobility justice refers to a broad understanding of injustice as a gendered and racialized history as well as infrastructural issues. With Mimi Sheller's (2018) perspective on mobility (in)justice as a backdrop, this study will explore the public transportation system in Sandnes, Rogaland.

1.1 Problem statement

To follow up the zero growth target, the Urban Growth Agreement has been signed by the municipalities in Rogaland, the county and the Norwegian state. The Agreement aims at reduction in emissions, traffic jams, and noise through effective use of land. The goal in the agreement is that the mobility growth will be through an increase in public transport, bicycling and walking in line with the national zero-growth target. Bymiljøpakken (Urban Environment Package) is the joint project through which the measures are included.

The introduction has shown that mitigation measures have been implemented to reduce the traffic-related emissions in Norway, some of which will be further elaborated in the theoretical literature review. Several studies on mobility justice already exist, however, this researcher could not find any previous studies on mobility justice in Sandnes, Rogaland. While other mobility studies tend to focus on Nord Jæren as a whole, few, if any, qualitative studies on motivations for public transport have been carried out in Sandnes. Although region based studies provides valuable information about public transportation in the region, a location specific study may detect patterns of injustice that would not have been identified in a broader context. Mullen and Marsden (2016) note that context, whether being specific user needs or the context of the built and natural environment, is especially important when it

comes to mobility justice. Therefore, this thesis seeks to explore motivations for public transport from a mobility justice perspective within two specific locations in Sandnes city. As public transport is expected to play a significant role in future mobility in Sandnes, it is interesting to explore this transition from a mobility justice perspective. Public transportation in Sandnes is usually discussed within a larger region, Nord-Jæren, which includes other cities and districts in Stavanger, Randaberg and Sola as well as Sandnes (TØI, 2014; Uteng & Voll, 2016). However, Sandnes differs from the other regions in use of land and distances between the districts and the city center. There are several districts and suburbs in Sandnes with more than six kilometers to the city center, and the availability to public transportation varies with population density. Sandnes is growing rapidly, and numbers from Statistisk Sentralbyrå (SSB) indicates that Sandnes will reach a population close to 100 000 by 2050 (SSB, 2020). With the population growth, the zero-growth target and the use of land in mind, it is interesting to explore mobility justice and motivations for public transportation in Sandnes. The theoretical literature review on mobility justice will show that scholars have usually focused on specific justice mobility variables. Therefore, this study takes a rather holistic approach to explore how inhabitants in Sandnes relates to the term mobility justice and how it may affect their motivational choices for means of transportation. This approach is supported by the findings in Mullen and Marsden (2016) who conclude that examination of justice from an issue-specific perspective may demote wider policy related impacts on justice. The aim of this thesis is therefore to investigate how different mobility justice variables (e.g. infrastructure, availability, households, time) affects the motivations to take public transportation in Sandnes, Rogaland. To answer this problem statement, the following research questions have been developed:

1. What are the motivations for public transport or car transportation in the city center and in Hommersåk?
2. What measures, from the respondents' perspectives, can be carried out in order to increase the use of public transport in Sandnes?
3. To what degree can mobility justice variables be connected to the practice of public transportation in Sandnes?

It should be noted that this study follows an analytical approach that does not support behavioral analysis. Rather, action is viewed as a process that is influenced by cultural and historical specifics and not necessarily by individual choice. While this will be further

discussed in the chapter that presents the analytical framework, it is an important notice because this study uses behavioral words like ‘barrier’, ‘motivations’, and ‘choice’ to explain the complexity of action and practices. This approach was chosen because these are words that most people are familiar with when discussing and comparing practices. Yet, barriers often refer to specific measures that can be taken to make it easier for a person to choose a certain practice over another, which is not necessarily the case in practice-oriented frameworks (Shove, Pantzar and Watson, 2012)

2. THEORETICAL LITERATURE REVIEW

This chapter will present existing theoretical literature on the governance of sustainable mobility transitions, mobility justice and the variety of user needs to demonstrate the background and novelty of this study.

The first sub-section will present governance of sustainable mobility transitions as complex processes that involve different institutions on urban, national, and local scales. It focuses on who and what makes mobility unjust. The second sub-section will introduce the term mobility justice and present existing literature and studies that aim to understand mobility from a justice perspective before moving on to a third sub-section that highlights the range of different user needs and transport designs.

2.1 Governance of sustainable mobility transitions

In a manifestly complex world dominated by hegemonic ideologies of neoliberal capitalism, global finance, and commodity flows is it really possible to intervene and deliberately shift technologies, practices, and social arrangements – not to mention their systemic interaction and interdependencies – onto an altogether different, altogether more sustainable track? (Shove & Walker, 2007, p. 763)

If aggressive and sustained policies are to be implemented as suggested by IPCC (2014), a good starting point for this literature review is to look at where sustainable mobility transitions are governed. An article published in 2016 by Haarstad set out to investigate just that. Using a case study from Stavanger, he discusses how the built environment, material contexts, and hard regulative policies shape conditions for governance in different cities. Haarstad (2016) found that low-carbon mobility governance involves processes at three levels: vertical, horizontal, and infrastructural processes. A central point in his article is that scholars tend to emphasize either the horizontal or the vertical process rather than a combination of the two, and that the importance of the infrastructural should not be undermined. Vertical processes refer to a set of hierarchical governance institutions and formal legislation. This means that cities are located within such a hierarchical system and hence influenced by higher policy levels (Haarstad, 2016). The horizontal approach is less oriented towards hierarchical systems but rather influenced by “internal flows of discourses, ideas and knowledge” (Haarstad, 2016, p. 5). In other words, policymaking happens based on

adopted knowledge, changed and mutated to the specific context. The infrastructural process builds on a perspective in where the built environment influences “social practices, mind-sets and the way cities are used and experienced” (Haarstad, 2016, p. 6). As demonstrated by Haarstad (2016) the governance of sustainable mobility transitions are complex processes that involve several stakeholders and institutions on local, national, and global scales. All of these actors cannot be included in this literature review, however, a brief introduction to some of the actors and policies will be given.

As briefly mentioned in the introduction, the Intergovernmental Panel on Climate Change is an institution that provides knowledge on climate change on the macro scale. While the IPCC is not a governmental institution on its own, it acts on behalf of the United Nations by assessing to provide knowledge to policymakers. Its website state that “The IPCC was created to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options” (IPCC, n.d.). *Transforming our world: the 2030 Agenda for Sustainable Development*, most commonly known as the Sustainable Development Goals, is a plan for action that has been adopted by all United Nations member states (United Nations, n.d.). These three two are highly influential institutions that, together with the Paris Agreement, influence the governance and demonstrates the necessity of sustainable mobility transitions. Yet, Yeates (2019) questions how the SDG commitments are to be realized in practice and raises a concern about the focus on the economic conception of sustainable development instead of social equity. She argues that we need clear institutional action to accommodate social and environmental standards and that regional institutions should be allowed membership in international cooperations like the SDGs.

The European Union is a political union between 27 European countries. “What began as a purely economic union has evolved into an organization spanning policy areas, from climate, environment and health to external relations and security, justice and migration” (European Union, 2021). While the IPCC and the SDGs serve as guidelines for action, the European Union is a political organization with the ability to implement legislative policies for its member states. However, the EU is criticized for the lack of hard regulative policies, and concerns have been raised that policy measures are not extensive enough (Anable et al., 2010; Gössling, Cohen & Hares, 2016; Haarstad, 2016). Therefore, the need transport-related measures to accommodate climate change still remains (Gössling et al., 2016).

In Norway, the Ministry of Climate and the Environment has the overall responsibility for climate policies. In the 2019 climate action plan, a target to cut emissions by 30-40 percent in 2030 compared to 2005 levels was introduced (Norwegian Ministry of Climate and Environment, 2019). The Zero Growth Target is a target that applies to transport and refers to zero growth in car traffic despite population and mobility growth. A report released by the Norwegian Ministry of Climate and Environment (2019) states that the CO₂ tax is the main instrument for limiting emissions from the transport sector in Norway. This tax applies to the transport sector in that there is a higher cost connected to fuels in fossil-fuelled vehicles. As for public transport, a national plan was published in 2019 to achieve fossil-free public transport by 2025 (Norwegian Ministry of Climate and Environment & Norwegian Ministry of Transport, 2019). Yet, there are few national policies that aim to improve the public transport system and increase its passenger flow. Sovacool et al. (2018) discuss how Nordic states have aggressive and successful policies directed towards electricity, heat, and buildings, while the mobility dimension of climate change remains a pressing challenge. This is also discussed by Haarstad (2016) who explains that since there are few hard regulative policies towards cities from the Norwegian Government and the EU, the governance of sustainable mobility transitions may vary from city to city.

Sandnes Municipality has a few regulative mobility policies. They have adapted and signed 'byveksttalen' together with the other municipalities in Nord Jæren. Byveksttalen is a binding agreement between the municipalities, the state and the county to follow up the Zero Growth Target made by the Norwegian Government. The governance of the mobility system in Sandnes and Nord Jæren involves several institutions. On a local scale, the municipality has set the goals presented in table 1 for transport in Sandnes.

Main goals

| | |
|----|--|
| 1. | Sandnes Municipality shall contribute to the zero-growth in car traffic in line with regional climate targets |
| 2. | The municipality of Sandnes shall contribute to an internal network of travel chains for the future mobility development |
| 3. | The mobility shall contribute to health-promoting activities and social day-to-day life for everyone |
| 4. | The mobility shall contribute to the coordination of land use and transportation in Sandnes |

Table 1. Goals retrieved from transport and mobility plan for Sandnes (Sandnes Municipality, 2017, p. 6). Translated and structured in a table by the author of this thesis.

In recent years, sustainability scholars have increasingly recognized the infrastructural dimension of governance (Anable et al., 2010; Haarstad, 2016; McFarlane & Rutherford, 2008; Shove et al., 2012). McFarlane and Rutherford (2008) point to how infrastructure is usually seen as a political backdrop rather than an entity that is produced and transformed together with states and cities. They explain that “focusing on infrastructure (and their discursive and/or material dimensions) is a useful way of approaching the co-evolution of cities and technical networks in a global context” (McFarlane & Rutherford, 2008, p. 365). By pointing to different historical examples they demonstrate how infrastructure has the ability to put people or societal groups ‘in place’ and can therefore mobilize, shape, and reinforce social relations of power (McFarlane & Rutherford, 2008). There is indeed a clear link between the governance of sustainable mobility transitions and social justice, power, and inequity. This is also discussed by Yeates (2019, p. 40) who explain regional policy-making as

Different policy models promulgated through regional for and by regional organisations can stimulate discussion within regional and other contexts about what kind of development is desirable, the basis on which is built, and how it can be realised through context-specific responses

In connecting this to the specific examples from the transport sector, policymakers on a local scale tend to use tools like “cost and benefit analysis” or “transport modeling” in decision-making processes when deciding on new transport projects (Hickman & Dean, 2017; Martens, 2006). According to the Institute of Transport Economics (TØI) both transport modeling and

cost-benefit analysis are frequently used tools in Norway to calculate the effects of different transport-related measures (TØI, n.d.). However, social scientists agree that such tools often lack important social justice dimensions (Hickman & Dean, 2017; Martens, 2006). This social dimension to sustainability politics is also discussed by Davidson (2009, p. 617) who explains it with a simple question of: “what do we want to sustain?”. Davidson (2009) points to how political action may socially frame the people who are acted upon.

2.2 Mobility justice

The increasing focus on the role of transport to mitigate climate change has brought about a discussion on transportation and mobility justice (Mullen & Marsden, 2016). The previous section briefly connected the infrastructural dimension of governance to social injustice, and hence introduced an important concept in mobility justice. Mobility justice is a dimension of social justice that can be applied to mobility and transportation. While transport refers to getting from one place to another, mobility refers to a broader set of relations and social inclusion. Therefore, mobility (unlike transport) can also be linked to the lack of mobility or to difficulties that originate from the structure of our society. This section will further explain the term mobility justice and introduce some literature on the topic.

An important scholar within mobility justice literature is Mimi Sheller who has published several articles on mobility justice as well as conceptualizing the term. She explains that mobility justice is a broad term that can include analysis on micro, macro, and meso scales. Sheller (2018, p. 40) divides mobility justice into four categories

- (a) embodied relations of race, gender, age, disability, sexuality etc. that inform uneven freedom to movement;
- (b) uneven (non)urban spaces and unequal transport infrastructure and accessibility at the local and regional level (e.g. unequal distribution of automobility, public transit, biking access, ride-sharing, etc.);
- (c) national mobility regimes related to the differential mobilities of borders, migration, human trafficking, asylum seeking, detention, etc.; and
- (d) infrastructural issues relating to the uneven circulation of goods, resources and energy in planetary urbanization system.

Sheller (2018) builds on a gender studies approach to mobility justice by pointing out that mobility justice refers to a broad understanding of injustice as a gendered and racialized history as well as infrastructural issues. From Sheller’s (2018) point of view, mobility justice can include cross-border mobility of migrants as well as bodily and planetary issues

concerning mobility. She further points to how urban planning, land management and social privileges are amongst factors that can affect mobility justice. Sheller's (2018) approach to mobility justice is a good foundation to understand the term mobility justice. Her definition underlines the broadness of the term and how it may relate to different social groups and in diverse social situations. There are many previous studies on mobility justice, where most studies are limited to specific bodily or planetary justice variables such as economic resources, gender, households, disability, time, or infrastructural issues connected to mobility.

The concept of mobility justice can be linked to economic privileges, and several studies exist on the linkage between poverty and transport. What they have in common is that they showcase how economy may relate to mobility justice and how mobility injustice may affect other dimensions of social justice. Mattioli (2017) found in his study on forced car ownership that many households in the UK and Germany owned cars despite limited economic resources. His findings suggested that forced car ownership could increase material deprivation and economic stress in other aspects of life. In Germany, his findings suggested that forced car ownership was more common in rural areas while in the UK no such connections were found (Mattioli, 2017). Mattioli's findings are supported by Lucas, Mattioli, Verlinghieri and Guzman (2016) who found in their overview on transport poverty that low-income groups spend a higher percentage of their income on transport, while at the same time having access to transport systems of the lowest quality. The study concludes that problems of affordability and accessibility are to a large degree present in developed countries and that we cannot engineer ourselves out of the phenomenon of transport poverty.

Transport poverty is often recognized with limiting transport to necessary trips such as to work or studies (Lucas et al., 2016).

In 2018, a study on motivation and attitudes towards public transportation was published. A comparative study between two medium-sized cities was carried out to explore attitudes and motivation to use public transportation (Burian, Zajíclová, Ivan & Macku, 2018). The researchers found that the infrastructure of the cities was of importance in choosing a mode of transportation. While the study found that walking distance to public transport did not influence the means of transportation, spatial structure and population density could affect transportation choices. Burian et al. (2018) concluded that travel time was the most significant factor in choosing a mode of transportation and that the average speed of public transportation was slower for a smaller city. The authors further concluded that city and transport planning

should reflect the demands and behavior of the population and that improvements can be carried out to make city development more suitable. This is supported by Beirao and Cabral (2007) who claim that policymakers should pay more attention to travel attitudes, lifestyles, and behaviors to reduce the frequency of car use. Some authors have argued that one can increase the use of alternative transport by presenting information about prices, comfort, and availability (Kenyon & Lyon, 2003)

Nikolaeva et al. (2018, p. 357) suggest a shift in attention “towards exploring a range of possibilities of reconfiguring the political debate on planning fairer and more liveable cities”. Similarly, Sheller (2018) argues that attention should be paid to justice governance and institutional organizations as well as day-to-day experiences of injustice of different social groups.

2.3 Transport designs and user needs

Transport relates to nearly all living entities in the world and is necessary for life on earth; animals transport themselves in hunting and plants seed with the winds. In the human world, transport refers to getting from one place to another, often with the help of technological instruments such as cars, bikes, or buses in a built environment. Since transport relates to so many of us, it is only natural that there are different user needs in a transport system.

Woodcock (2012) emphasizes a user-centered approach to transport at all levels of a transport design. A transport design includes all matters that relate to the transport system; from policy and implementation to infrastructure and vehicle designs. This combination of psychology, biology, and engineering is called ergonomics (Woodcock, 2012). In a human or user-centered approach, the idea is that the built environment should be designed based on human requirements and capabilities. Woodcock further explains how a transport system should seek to maximize efficiency, comfort, and safety in designs that fit with humans abilities, this is also explained by Shove et al. (2012) when they refer to the transition from horse to cars and how the car (technology) later had to adapt and become more user-friendly. An example of a user-centered approach is when attention is given to the human in its interaction with the technology, in this case a vehicle. Gearing, steering and management of the pedals are mentioned as examples (Woodcock, 2012). Woodcock (2012) further mentions examples from World War 2 in where the machines were not human-centered, which lead to deaths and injuries. The second World War relates little to transport, however, the idea that technology should be adapted to humans rather than the other way around is an interesting idea. At first

sight, this does not coincide to posthuman thinking where humans and non-human entities work together in the 'web of life' (Moore, 2017). Rather, posthuman scholars criticize a human centered perspective and argue that human mastery mentality dismisses the importance of non-human agents. The standpoint in this thesis emphasizes both perspectives and argues that they complement each other. It is important that a transport system is human-centered because that makes us, the humans, more mobile. At the same time, engineers must recognize the limits of technologies and the limits of human competencies to create better systems. Therefore, ergonomics is a suitable word that allows the transport system "to maximize safety, efficiency and comfort through design which matches the operator's abilities" (Woodcock, 2012, p. 22).

While Woodcock (2012) describes user needs from an engineering point of view, and discusses how the interaction between the human and the technologies is of importance, user needs can also be linked to specific needs of individual human beings. Transport as a practice is usually not valuable as a practice itself. In a modern-day society, the point of transport is to connect to other practices. For example, one uses transport to get to work or extracurricular activities in where the point of transport is usually not the mode of transportation itself, but rather to get to the place you need to get to in the most efficient and available matter (Levin, 2019; Woodcock, 2012). Therefore, the practices that surround transport is of importance when discussing the variety of user needs. A study published in 2019 set out to investigate how the practice of public transport relates to everyday life (Levin, 2019). While emphasizing context to be of importance, the study found that younger people were more dependent on public transport in contrast to older citizens who were more likely to be car-dependent. An important notice is that younger people referred to ages between 14 and 16 and that older people were aged 63-97 years. Life events, such as retirement, childbirth, or change in jobs may disrupt and rearrange social practices, and perhaps especially travel practices. A recent article describes parenthood as an event that may affect travel behavior and result in an increment of car-oriented practices. The point that childbirth may lead to an increase in the use of cars is not a new phenomenon, however, the study sought to understand the processes that lead to such car practice adaptation (McCarthy, Delbosc, Currie & Molloy, 2019). McCarthy et al. (2019) found five distinct mobility patterns that could be linked to parenthood and they varied from those who had not changed their travel behaviors to those who had changed them drastically. The authors point to micro milestones, structural and physical barriers as factors that could lead to an increase in car-oriented practices (McCarthy et al.,

2019). Nonetheless, the study found that gender and caregiving roles to be of importance in this new structure of life. While there was little that pointed to gender as a factor in changed mobility patterns, the female was more likely to take on the role as a caregiver and this role could influence mobility patterns compared to their partner (McCarthy et al., 2019). The findings are closely linked to some of the topics that were explained in the previous section about mobility justice in where one can experience injustice based on gender. Therefore it is important to highlight that a change in mobility pattern itself is not equal to mobility injustice.

A study from Paris set out to investigate the user-related factors that affect the choice of route in public transportation (Grison, Gyselinck & Burkhardt, 2016). The study found that choices in routes depend on context and profile of the user. In terms of the context, the purpose of the transport was of importance while profiling detected that users either chose their route based on comfort or efficiency (Grison et al., 2016). The pleasantness of the travel was of importance as the user was more likely to accept transfers or connecting routes if the travel was for pleasure rather than duty. The study concluded that future mobility planning should take into account the users’ abilities and opinions when adopting new tools and mobility services (Grison et al., 2016).

The table (2) below presents a summary of the main elements of the literature presented in this chapter.

Summary of chapter 2 – Theoretical literature review

| | Main elements |
|---|--|
| Governance of sustainable mobility transitions | The section refers to those who govern and the various actors, institutions, and stakeholders in sustainable transitions. Actors were presented on different levels, globally, nationally, and locally. The infrastructural level of governance is emphasized amongst mobility justice scholars. |
| Mobility justice | The concept of mobility justice was introduced as a broad term that included cross-bordered gendered and racialized issues as |

| | |
|---|--|
| | well as bodily and planetary problems that relate to mobility. The section refers to those who are being governed, and presented literature on how transitions may lead to injustice in mobility systems. |
| Transport designs and user needs | The section described the various user needs and how transport designs have changed to accommodate these needs. The term ergonomics was introduced as a user-centered approach to mobility. Studies were presented to highlight the variety of user needs and the factors that affect these needs. |

Table 2. Presents a summary of the sub-sections presented in chapter 2.

In the first sub-section, the governance of sustainable mobility transitions was introduced as complex processes on different levels and with a variety of actors, institutions, and stakeholders. The second sub-section introduced mobility justice as a concept as well as highlighting relevant justice literature to show how injustice may look like in mobility transitions. This sub-section has demonstrated the importance of user needs in a transport system and given a brief introduction to literature on how user needs may vary with the users' profile and life situation. All the themes presented in this theoretical literature review are closely linked.

3. ANALYTICAL FRAMEWORK: SOCIAL PRACTICE THEORY

This chapter will give an introduction to the theoretical grounding in which the findings will be presented and analyzed within. Theory can be defined as “a set of interrelated concepts, which structure a systematic view of phenomena for the purpose of explaining or predicting” (Smith & Liehr referred to in Trigueros, 2018, p. 3). In other words, theory helps the researcher put the findings into context by building on theories that previously have been tested through research (Trigueros, 2018). Many theoretical, conceptual and analytical frameworks exist to help the researcher present, analyze and ground their data. There are specific frameworks that aim to explain sustainable transitions (such as the Multi-Level-Perspective), theories that try to explain human behaviors (such as the Theory of Planned Behaviour) or there are frameworks that focus on different justice dimensions (see for example Sovacool & Dworkin, 2015 and Sheller, 2018). In the context of mobility justice, an obstacle to using a framework that is limited in scope is to be able to detect patterns that cross interdisciplinary boundaries.

As explained above, frameworks come with advantages and disadvantages, and the best suitable framework essentially depends on what is being investigated. Based on the research questions introduced in the introduction, a framework that opens for user experiences, sustainability concept as well including dynamics of politics and power relations was considered favorable. Based on this, the Social Practice Theory (SPT) has been considered the most suitable analytical framework in this study.

3.1 Social Practice Theory

In explaining Social Practice Theory, it should be noted that the SPT is not a theory on its own, but rather refers to a series of related theories that build on ideas from social sciences. The core idea in practice theories is that they emphasize practices rather than human behavior as the unit of analysis. This means that practice theories focus on practices (such as eating breakfast or car driving) rather than the individual (the person who eats breakfast or drives the car). This thesis will base its theoretical foundation on the ideas that are presented by Shove et al. (2012) in *The Dynamics of Social Practice*.

SPT aims at exploring how societies change (or stays the same) by analyzing the dynamic aspects of social practice (Shove et al., 2012). This approach has been chosen because the

investigation of practices rather than humans allows for detection of patterns of inequalities and power that could have been missed using another framework.

In simple words, and as explained by Shove et al. (2012), SPT aims to explain the reason people act the way that they do. The SPT is less oriented toward technologies than many other frameworks used to describe sustainable transitions and opens for issues around power and politics in suggesting that human behavior and social structure are interdependent (Sovacool & Hess, 2017). The framework builds on Warde's understanding that "the source of changed behaviour lies in the development of practices" (referred to in Shove et al., 2012, p. 2). Therefore it is important to capture human behavior when exploring the dynamics of social practice.

Shove et al. (2012) point to the framework's ability to reflect the relations between agency and structure. The authors do not believe that behaviors are driven by common sense alone, nor do they share the position that change is a result of external forces. Rather, the authors build on Giddens' theory that "human activity, and the social structures which shape it are recursively related" (referred to in Shove et al., 2012, p. 3). While human activities are shaped and enabled by social structures, they are also shaping and reproducing these same structures. This can be linked back to the theoretical literature review in that those who govern sustainable mobility transitions are indeed a part of the same system which they seek to govern. By using a theory that investigates the practice rather than the user of the practice, one may be able to detect these structures and to include context-specific issues.

Shove et al. (2012) build on Schatzki's thinking, as well as theories of innovation when they suggest that three elements must be analyzed when using SPT as a framework. These elements are: materials, competences, and meanings (Shove et al., 2012; Sovacool & Hess, 2017). The framework recognizes that practice involves people, materials, knowledge, and skills in a dynamic process. Materials refer to physical things, technologies, and infrastructure. Competences refer to skills, technique, and practical knowledgeability while meanings can include ideas, aspirations, and symbolism. The authors also talk about *connections* which is not an element on its own but rather refers to the interaction between materials, competences, and meanings.

The elements can be easily explained with an example made by Schatzki on the game of football. He argues that in order to play the game you need a ball and goals (materials) and an understanding of the game and people to play with (competences) (Referred to in Shove et al., 2012). Thus, connections between the elements are of importance in any practice. This example has many similarities to the one made by Woodcock (2012) on the second World War in the theoretical literature review. Woodcock (2012) explained how ergonomics circles around the idea that technologies should adapt to the skills of the user. Examples of the dynamics between competences, meanings, and materials can be linked to all practices, and the elements are present in everything we do. The connection of these elements makes up how practices emerge and shift over time (Shove et al. 2012). Injustice happens when people or groups in a society lack access to an element that is crucial to carry out the specific practice. Here, the example from the theoretical literature review about forced car ownership is relevant in where the participants lacked the elements to other means of transportation. In the case of FCO it was often linked to economy (element of meaning) which again led to economic stress in other practices (e.g. extracurricular activities).

Shove et al. (2012) recognize historical events and the context of time and space as important factors in practice. They discuss how practices can make time, compete over time, and that that time is experienced through practices. Family life, work and weekend are good illustrations of how structures of society shapes and is reproduced by human activities. These shifts in patterns of daily life reflect the dynamics of social practice (Shove et al., 2012). Similarly, they argue that space is relevant for the distribution of practices. However, while time and space are important factors in social practices, the authors underscore that time and space are not elements equivalent to those of materials, meanings, and competences.

3.1.1 Power and politics in Social Practice Theory

As briefly mentioned above, the SPT framework opens for analysis of the relations of power and inequality in social practice. Shove et al. (2012) explains that practices emerge, shift and disappear as a result of shifting distribution of goods within a society. This means that practices can be connected to power relations in that different people may gain or lose with the emergence or shift in practices. Practices may lead to social exclusion or social privileges depending on the means to participate in the activity. Shove et al. (2012) points to how political decisions generally are made based on theories that assume that human behavior is a matter of personal choice and preferences.

| | Theories of behaviour | Theories of Practice |
|-----------------------------|--|---|
| Basis of action | Individual choice | Shared, social convention |
| Processes of change | Causal | Emergent |
| Positioning policy | External influence on the factors and drivers of behaviour | Embedded in the systems of practice it seeks to influence |
| Transferable lessons | Clear: based on universal laws | Limited by historical, cultural specificity |

Table 3. Adopted from Shove et al. (2012, p. 143)

The table (3) above shows how theories of behavior and theories of practice may come in conflict with one another, particularly when it comes to governance and policy-making. An example of this may be when decision-makers assume that human behavior is a matter of preferences and, therefore, implement measures and remove barriers to make it easier for people to ‘make the right choice’ (Shove et al. 2012). According to Shove et al. this may not always work as intended, as humans are historically and culturally shaped.

4. METHODOLOGY, CASE SELECTION AND METHODS

The study follows a qualitative methodology using multiple methods. I mainly employed focus group discussions, complemented by a small-scale questionnaire survey in ‘Byparken’ next to Sandnes bus station and two in-depth interviews. This study follows a qualitative approach, employing multiple methods to triangulate qualitative evidence for high validity. The study “involves the collection of different but complementary data on the same phenomena” (Edmonds & Kennedy, 2017, p. 181). The figure below demonstrates the methodological structure of this research.

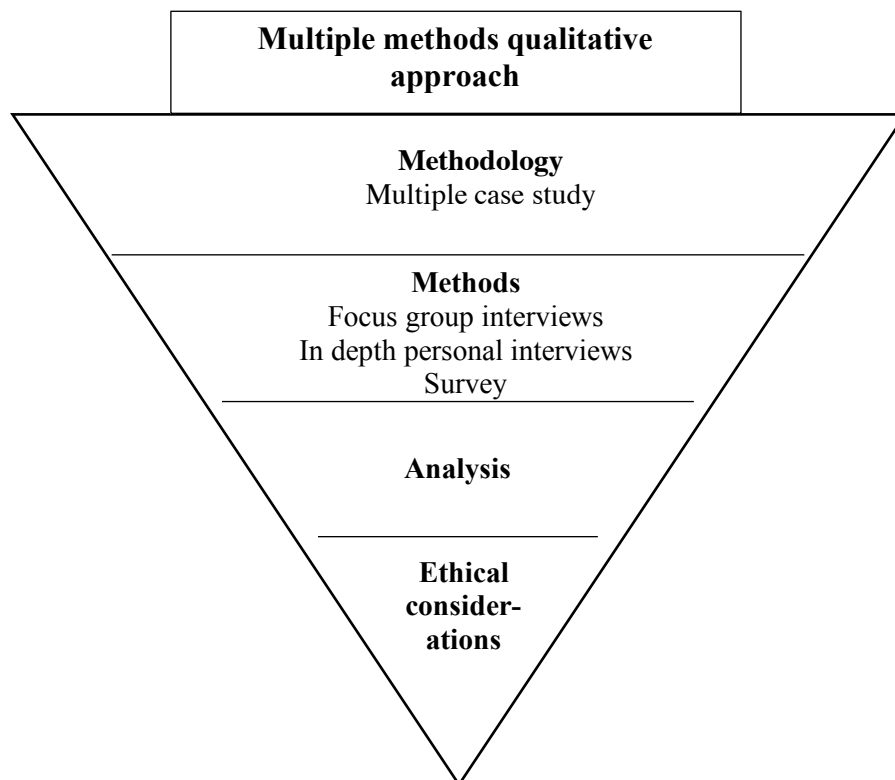


Figure 1. Methodological structure of the study

4.1 Research strategy and rationale for case study selection

The study follows a combination of the abductive and inductive research strategy. While the abductive research strategy focuses on the interpretation and recontextualization of a phenomenon, inductive logic aims at deriving generalizations (Blaikie & Priest, 2019;

Danermark, Ekström, Jakobsen & Karlsson, 2002). In this study, interpretation and recontextualization is considered necessary when exploring the meanings and motives for action. However, the aim of this study is not to test or develop a theory. Rather, the study aims at creating descriptions and generalizations for social practice, consistent with the inductive research strategy (Blaikie & Priest, 2019).

It became evident in the theoretical literature review that scholars are increasingly recognizing mobility justice as a concept in sustainable development (Sheller, 2018). However, the literature is often limited to larger urban cities with different contextual backgrounds. While other mobility studies have focused on Nord Jæren as a whole, few studies have been carried out in Sandnes Municipality alone. Moreover, few studies have set out with mobility justice as their starting point, rather, justice is often implemented into broader research problems or reports. Sandnes differs from the other municipalities, especially when it comes to the use of land and distances. This study attempts to fill this gap by investigating public transportation from a mobility justice perspective in Sandnes. Two locations in Sandnes Municipality were chosen; the urban city center and its suburb Hommersåk.

Sandnes is a medium-range city in Norway with approximately 80 000 inhabitants and several public transportation systems in place. Hommersåk is a typical district, with around 8000 residents with bus and boat connections. Kolumbus is the operating company for public bus – and boat transportation in both areas. Sandnes consist of 14 districts in where five of the districts are more than six kilometers from the city center. Buses and boats are operated by Kolumbus, while the train is managed by Go Ahead. Sandnes is a part of the larger region, Nord Jæren, which consists of 4 municipalities (Stavanger, Randaberg, Sola) including Sandnes. Stavanger is the largest city in Nord Jæren and its city center is located approximately 15 kilometers from Sandnes city center. Forus is an industrial and commercial area that crosses these municipal borders. The figures below (2 and 3) show the areas and their locations in a map.



Figure 2. Map of Hommersåk, Sandnes city center, Forus industrial park and Stavanger city center. Map retrieved from Google (n.d.).

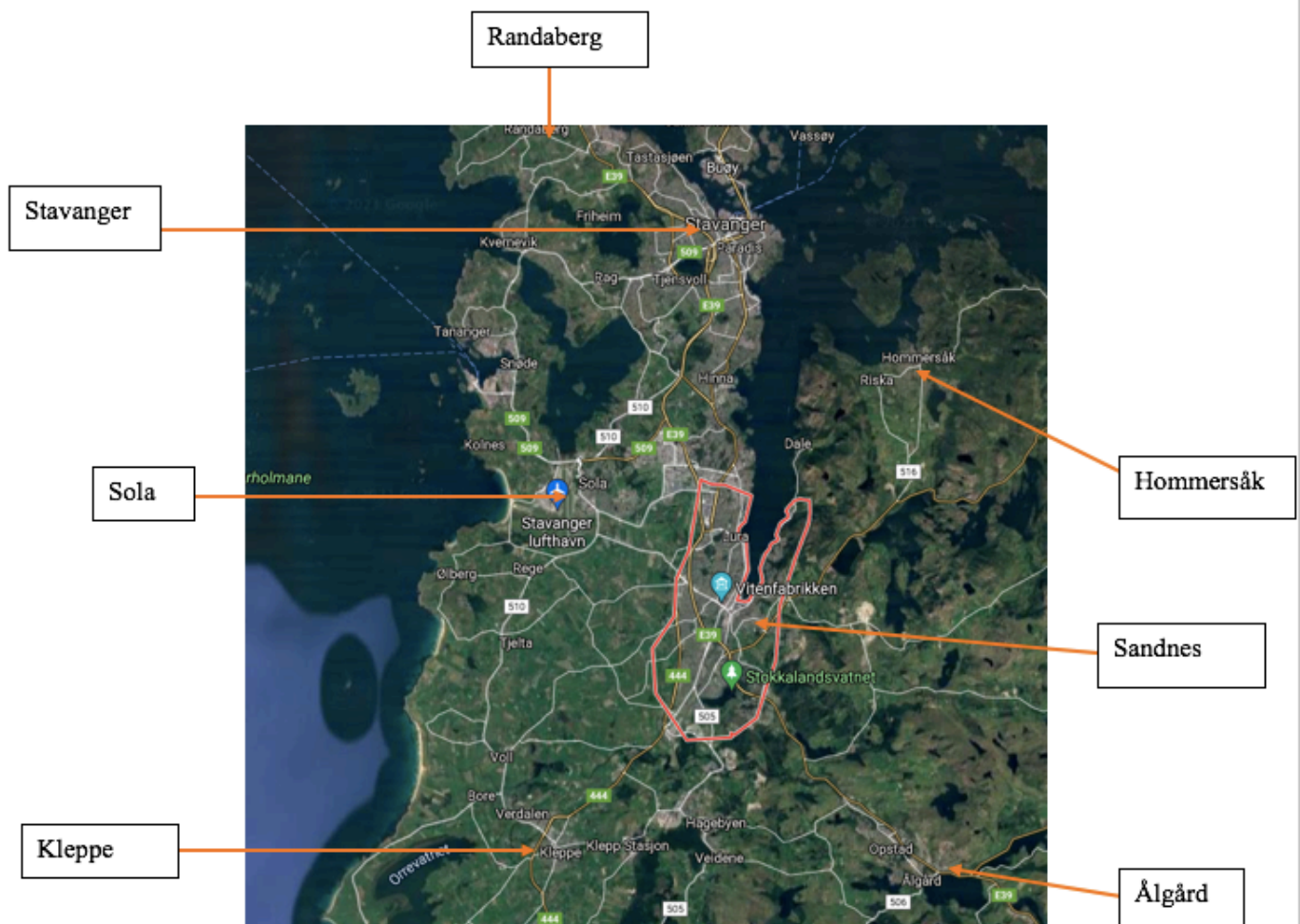


Figure 3. Map of Nord Jæren and nearby cities. From Randaberg to Ålgård the distance is approximately 36 kilometers. Map retrieved from Google (n.d.).

The inhabitants of Nord Jæren have long traditions with the use of private cars. According to a comparative study on access and use of public transportation, 91 percent of adults in Nord Jæren have a driver's license and 87 percent live in a household with access to one or more cars (Uteng & Voll, 2016). A national study showed that in 2013/2014 that the largest cities in Norway had a car driver percentage of around 45, while the share in Sandnes was close to 60 percent, which makes Sandnes one of the most car-dependent regions in the country (Sandnes Municipality, 2017). To reach the Zero Growth Target these habits need to be changed, thus Sandnes has implemented several measures to increase the use of public transport, bicycling, and walking. New toll stations have been implemented and the number of parking lots in the city center has been, and are planned to be further reduced to make sustainable traveling options more appealing than private cars (Sandnes Municipality, 2017). Although the overall goal is to reduce the use of private cars, Sandnes Municipality makes it clear that private cars

are expected to play a significant role in the future mobility system, with an expected car percentage of 50 by 2030 (Sandnes Municipality, 2017).

Sandnes, unlike Stavanger, does not have an action plan for transport and mobility, and transportation is only briefly mentioned in the climate and environmental action plan. However, transport is mainstreamed across several supporting documents and reports that serve as guidelines and foundations for the action plan (2019-2035). One of the supporting documents is the local transport and mobility plan. The plan consists of visions, goals, and strategies for future transport and mobility in Sandnes and contains four main goals presented in the theoretical literature review. These are: (1) Sandnes shall contribute to zero-growth in car traffic in line with regional climate targets, (2) Sandnes shall contribute to an internal network of travel chains for future mobility development, (3) the mobility shall contribute to health-promoting activities and social day-to-day life for everyone and (4) the mobility shall contribute to the coordination of land use and transportation (Sandnes Municipality, 2017).



Figure 4. Picture that shows Byparken next to the main mobility hub in Sandnes. The picture was taken by the researcher.



Figure 5. Picture that shows the main bus station in Sandnes. The picture was taken by the researcher

The figures (4 and 5) above show how the main bus station has been upgraded and what used to be a nearby parking space has been changed into an urban park called ‘Byparken’. The park is close to the main mobility hub in Sandnes city center and designed as a social space for inhabitants of all ages.

In Sandnes city center, there are various routes and departure times depending on where you need to go. The available public transport systems are buses or trains as well as bicycle rentals. A research in Kolumbus travel planner shows that the most frequently used bus route is route number 2 and 3, both of which drive in the direction of Stavanger and stop by Forus. Route 2 had 2 739 587 passengers in 2013 (Vasstveit, 2016). The figure (6) below show route 2 on a map of the area (Kolumbus, 2019).

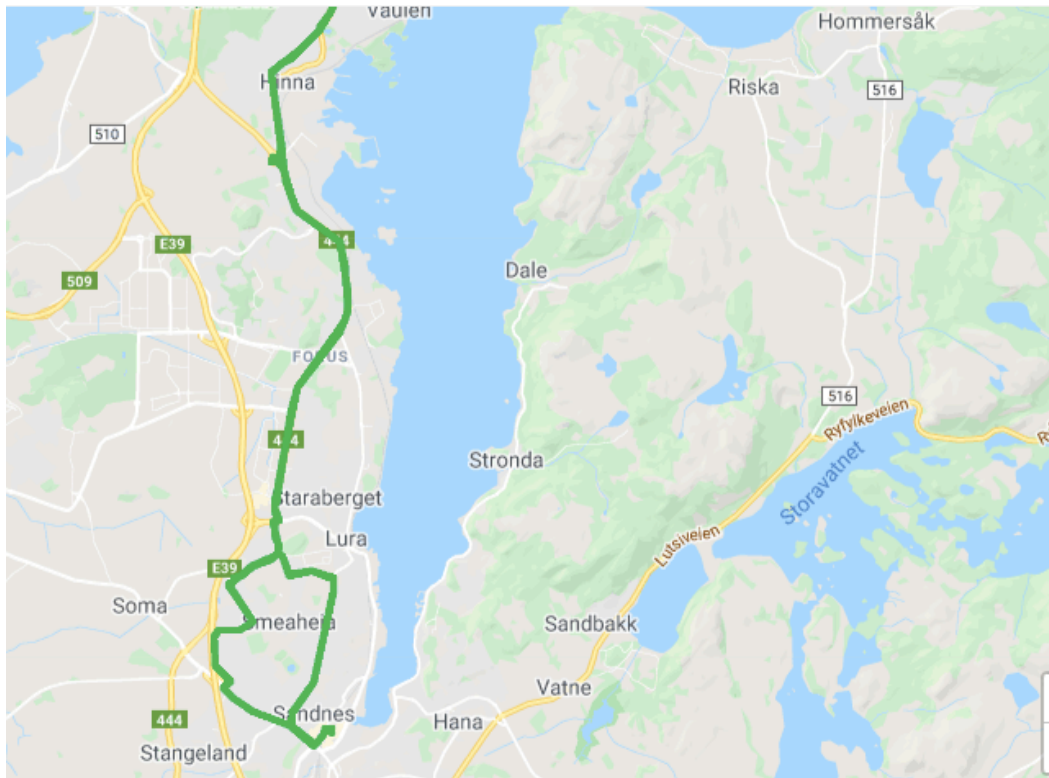


Figure 6. Route 2 retrieved from Kolumbus (2019).

The local transport and mobility plan found that the city center had the greatest potential to change from private car to public transport (Sandnes Municipality, 2017). Hommersåk is the second largest town in Sandnes and is located 12 kilometers from the city center (Sandnes Municipality, 2017). Hommersåk has a relatively large population density in where 7300 of the residents live within 3,8 square kilometers (Sandnes Municipality, 2017). The local transport and mobility plan state that Hommersåk has greater potential for changes in travel behavior in short trips due to the compact population density (Sandnes Municipality, 2017).

4.2 Multiple methods multiple case study

While a mixed methods approach is often described as an emergent methodology that mixes qualitative and quantitative data (Guetterman & Fetters, 2018), a qualitative approach can provide broad insight on meaning and motives that open scope for involvement from the researcher, elaboration, and interpretation on certain topics (Blaikie & Priest, 2019). The focus group discussions constitute the centre-piece of my data collection strategy, and cohere well with deeper probing through two in-depth interviews. The distributed questionnaires had the advantage of expanding the empirical basis by securing responses from people that the

researcher would not have reached using the initial plan alone. The survey had a qualitative setup in where the respondents were asked to reflect and raise their opinions on the questions.

Focus groups were conducted for both case study contexts, Sandnes and its suburb of Hommersåk. Yin (2018) defines case studies as

an empirical method that investigates a contemporary phenomenon (the “case”) in depth and within its real-world context, especially when the boundaries between phenomenon and the context may not be clearly evident (Yin, 2018, p. 15).

Case study as an approach is useful when the researcher aims at understanding a real-world case, and when it is expected that such an understanding will involve important contextual conditions to the case. The approach can be divided into single-case and multiple-case study designs within the same methodological framework. Both approaches have strengths and weaknesses; while a single-case study often provide enough evidence on their own, Yin points out that the findings of a multiple-case study are often considered more compelling (Yin, 2018). A single-case study differs from a multiple-case study in being limited to only one case and therefore limited to one perspective on the topic (Blaikie & Priest, 2019). In this study it was essential to get insight from two different locations for comparative purposes, therefore, a multiple-case design was considered favorable. Each location represented an individual case before being subjects to comparison and generalizations across the cases. The researcher has chosen an embedded approach due to the research questions being limited in scope. A holistic approach would require researching the single cases as a whole, including every aspect of the case. As the researcher is only interested in specific subunits of the case, the embedded approach has been considered favorable. The multiple-case study was carried out to get insight on two specific locations in Rogaland county, namely Hommersåk and Sandnes city center. The locations were carefully chosen based on their differences in terms of availability and public transportation options. The context and their differences will be further elaborated in the context chapter below.

Guetterman and Fetters (2018) explain that case studies integrate well with using multiple forms of data, as these can provide a more complete understanding of the case. This is also discussed by Yin (2018) who points out that mixed methods case studies allow for addressing broader and more complicated research questions. Guetterman and Fetters (2018) further describe two approaches to integrating mixed methods and case studies which they call MM-

CS and CS-MM. This study follows a case study-multiple methods design as shown in figure 1, adapted from research on mixed methods studies for my multiple methods qualitative case study.

Figure 7 builds on the designs made by Guetterman and Fetters and has been adapted to reflect the structure in this particular study.

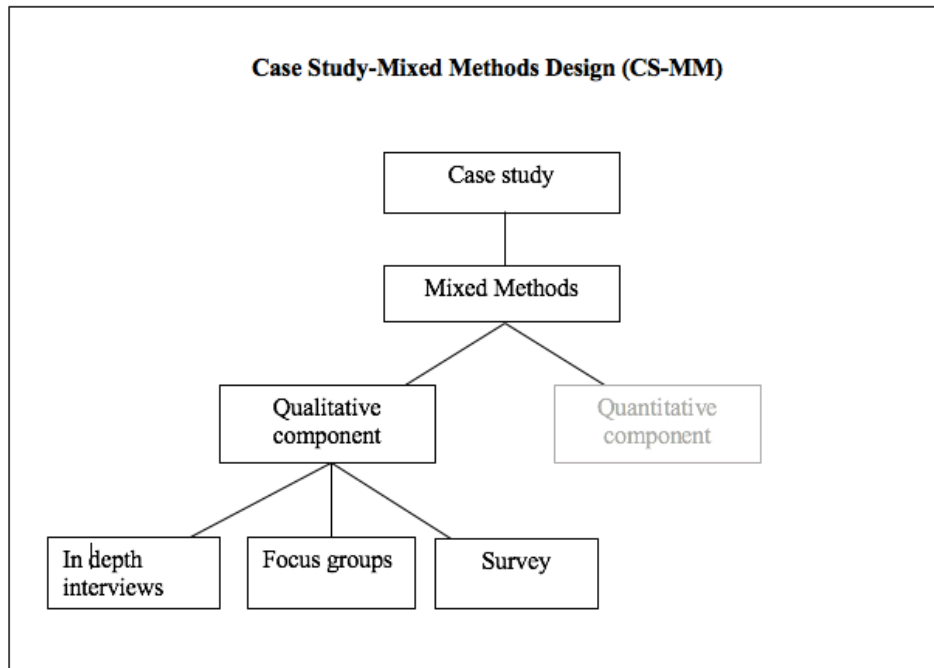


Figure 7. CS-MM adapted to this multiple methods qualitative case study. Based on ideas adapted from Guetterman and Fetters (2018, p. 901).

The study relies on both primary and secondary sources of information; semi-structured focus group discussions, in-depth personal interviews, a quantitative questionnaire as well as other available evidence based on desk study to increase the validity (Yin, 2018).

4.3 Data collection methods

This section will describe the methods that have been used in more detail. As previously explained, data was collected through focus group interviews, a survey, and a few in-depth personal interviews. The subsections below will explain how each of these methods were carried out and present the challenges and reflections that the researcher faced throughout the process of data collection.

4.3.1 Focus group discussions

One of the methods that was used to collect qualitative data were semi-structured focus group discussions in a semi-natural setting. By collecting data by interviews, you get the opportunity to explore attitudes, values, and behavior as well as experiences and the beliefs that the individual might have on the topic. Sovacool, Axen & Sorrell (2018) point to interviews as important for qualitative data because they offer insights into peoples' experiences, motivations, beliefs, understandings, and meanings. This benefit of interviews is also described by Yin (2018) who explains interviews as helpful in providing insights reflecting respondents' relativist perspectives. Focus group discussions differ from in-depth personal interviews in that the participants come together in smaller groups to discuss a given theme (Bjørklund, 2005). In a focus group, the group dynamic can bring about interesting and relevant information, and discussions may bring up topics or opinions that could have been missed in a personal interview.

The participants were chosen based on where they live, their relation to public transport, and other social factors. Because public transportation is something that relates to a broad variety of people, this variation in social factors had to be reflected in the interview sample. Recruiting a sample with different backgrounds is also an important condition to the method of focus group discussions because it may lead to interesting reflections (Bjørklund, 2005). It was important to include both users and non-users of public transport as well as different social conditions to increase the validity and to get a broad perspective. This way, the results are more likely to reflect the real world phenomena. As people in Nord Jæren have long traditions with the use of cars, this was also reflected in the interview sample in where the majority did not use public transport on a day-to-day basis.

The interviewees were contacted based on acquaintance with the researcher and snowballing in where they were recommended from other participants. 26 respondents participated, divided into six different focus groups, in where there were three groups from each location. When moving forward with focus groups as a method, it is important to consider the most beneficial number of participants per group. On this point, researchers tend to disagree, and the recommendations vary from 4 and up to 12 participants (Carlsen & Glenton, 2011; Krueger & Casey, 2015). In this study, the initial plan was to do two groups in each location, but with more participants in each group. However, because the interviews were carried out digitally, the researcher feared that too many participants could interfere with the 'digital

group dynamic'. Digital meetings differ from in-person meetings in many ways, some of which will be explained later in this chapter. The most important reason when deciding to descale the number of participants per group was the (possible) need to 'mute' and 'unmute' the microphone in between conversations and that the word had to be 'steered' more in terms of who got to talk and when. For these reasons, the focus group consisted of four to five participants with the exception of one group that consisted of three respondents because of a last-minute cancellation.

The interviews were conducted in mid-April 2021. This was done to ensure enough time to prepare for the interviews on forehand, and still have time for the analysis after the interviews were conducted. All participants agreed to record of the interviews on forehand. The focus group discussions were conducted in a semi-natural setting, as the participants were not engaged in the activity of interest but were rather interviewed about it (Blaikie & Priest, 2019). The time it took to conduct the interviews varied from 50 minutes in the shortest interview to close to 90 minutes in the longest interview. Because of the ongoing Covid-19 pandemic, the interviews were conducted using the digital platform Zoom. This was done because, at the time of the data collection, the Norwegian Government advised its population to social distancing and a maximum of two visitors. The researcher would have preferred to do the interviews in person, as the digital platform may not provide the same group dynamic as in-person interviews often does. Zoom was chosen as the favorable platform because the researcher considered it to be the most user-friendly option for participants who did not have experience with digital meetings. Guidance on how to enter the digital space was distributed along with information about the study. Still, the digital platform made some of the participants insecure and unsure of how to use it, these cases were solved differently depending on each participant's need. The researcher traveled to some of the participants' home to show them in person how to enter and use the digital space. In other cases, the researcher made sure to put the participant in a group with someone they knew, and they entered the digital space together at the time of the interview.

It is important to be aware that the skills and values of the researcher might influence the quality of a case study, therefore the researcher tried to be aware of her own capabilities and weaknesses throughout the interviews. Unstructured interviews differ from structured interviews in being guided conversations rather than structured questions (Yin, 2018). The method for this research was semi-structured focus group discussions, as the researcher had

prepared a questionnaire ahead of the meetings. The method chosen can be considered structured in that it includes a prepared questionnaire, but unstructured in that it allows for diversion and elaboration on important information. The questionnaire served as a conversational guide for the researcher and the respondents during the interviews, but the participants were encouraged to speak freely about the topics. The table below lists the interview guide that was used to guide the conversational topics.

Interview guide

| | |
|-------------------|---|
| Question 1 | Do you have access to a private car and a parking lot at your home and at your workplace? Do you own an electric vehicle? |
| Question 2 | How many travels do you have in a usual week to your workplace or other day-to-day activities? How many of these travels are by public transportation? |
| Question 3 | What are your thoughts about the public transportation system in Sandnes? |
| Question 4 | Why (or why not) do you use public transportation over personal vehicles in your day-to-day activities? |
| Question 5 | Rogaland county is responsible for several relevant transportation-related measures. 178 million NOK is granted per year to facilitate the operation of bus routes in Nord Jæren. What are your thoughts on this? |
| Question 6 | During the last year, the construction of Byparken was completed. How has this affected you in terms of your mobility? |
| Question 7 | If I mention the term ‘mobility justice’, what are your thoughts on this concept, and to what may it relate? <ul style="list-style-type: none"> a. Can the concept relate to yourself and travel behavior? b. Mobility justice can be linked to (amongst others) infrastructure, use of time, economy, skills, age, gender, health, and availability. How may this relate to yourself or your hometown? |
| Question 8 | The Norwegian state has granted 800 million NOK to improve the public transportation system in Nord Jæren during a time period of ten years (2020-2029). If you had the opportunity to influence this improvement, how would the public transportation system look like in 2029? |
| Question 9 | Looking back at your lives, how have your mobility patterns changed throughout your lives? |

| | |
|--------------------|---|
| Question 10 | Does Sandnes have a just public transportation system? |
| Question 11 | Should fossil-fuelled vehicles be prohibited? |
| Question 12 | What are your thoughts on climate change, and does climate change affect your mobility? |

Table 4. Interview guide for focus group discussions; minor simplifications, translated into English and structured in a table.

In conducting interviews, it is important that the researcher is aware that a potential weakness is that her engagement could affect the results of the study in how the questions are asked. The questionnaire consisted of pre-formulated open-ended and non-threatening questions to keep this weakness at a minimum (Yin, 2018). However, as the participants were encouraged to speak freely, the researcher did engage at some points during the interviews to ensure a good group dynamic and to steer the conversational topics to ensure relevance within the scope of the study.

4.1.2 Small-scale qualitative survey

Surveys are often connected to quantitative rather than qualitative research designs. Roberts (1999, p. 55) explains that “the survey method now includes sophisticated sampling techniques and statistical analyses that allow inferences to be drawn about the population”. In this study, a questionnaire was distributed in Byparken next to Sandnes bus station. The survey included questions that were similar to those in the focus group discussions and consisted of both open-ended and single-answer questions.

Survey

| | |
|-------------------|---|
| Question 1 | Approximately, how many travels do you perform in a regular week? |
| Question 2 | Do you have access to a car? |
| Question 3 | Why (or why not) do you use public transportation instead of a car in your day-to-day activities? |
| Question 4 | Describe shortly what you think about the new park, Byparken. |
| Question 5 | Does Sandnes have a just public transportation system? Describe briefly why (why not). |
| Question 6 | What are your thoughts on climate change, and does climate change affect your mobility? |

| | |
|-------------------|---|
| Question 7 | What are your thoughts on fossil-fuelled vehicles, should they be prohibited? |
|-------------------|---|

Table 5. The survey distributed in Byparken next to Sandnes bus station. Translated into English and structured in a table.

The researcher went to Byparken on a Saturday in late April and all questionnaires were distributed and collected on this particular day. This means that the survey was only available to those who were in the city center and walked past Byparken in a specific period of time. Pens were sanitized and distributed along with the survey to make sure that all participants were able to answer.

It is important to notice that while a survey may produce data of qualitative character, this does not necessarily equal qualitative research. This is, however, the case for this study as the survey was qualitative itself as well as being a part of a larger qualitative research design. The survey was considered to be an important source of evidence in this study to get a broader baseline perspective and from different people. Although the interviews included a variety of people with different backgrounds, recruitment through snowballing will always depend on the starting point to a higher or lesser degree. The quantitative questionnaire was used for triangulation and proved useful to increase the validity.

4.1.3 In-depth personal interviews

Two in-depth personal interviews were conducted with an aim at creating a life history narrative connected to mobility. Bronéus (2011) describes in-depth interviewing as a good method to gain individual perspective of a narrowly defined theme. The in-depth interviews were unstructured with one prepared question. The interviewees were asked one of the same questions as those in the focus group discussions to create a ‘life history’ connected to mobility. The question was: “Looking back at your lives, how have your mobility patterns changed throughout your lives?”. The in-depth interviews served as a validity check on the information that came up during the focus group discussions. In-depth interviews have the opportunity to fill in some of the challenges that are connected to focus group interviews because the respondent is not influenced by other participants. Initially, the plan was to conduct five to six in-depth interviews but because the focus group discussions provided novel insights and depth to the same question, it was decided to reduce the number of in-depth interviews to two.

Adriansen (2012, p. 41) describes that “In life history research, the intention is to understand how the patterns of different life stories can be related to their wider historical, social, environmental, and political context”. The in-depth personal interviews combined with the information collected in the focus group discussions were put together to create storylines where different practices and life situations were taken into account when explaining mobility patterns. This narrative dimension to the study contributed with insights to the participants worlds and their unique lives.

4.4 Analysis and analysis process – constant comparative analysis

In this section, the analysis and analysis process will be explained. Yin (2018) points out that the analytical step is the least developed aspect in a case study. Various approaches to analysis exist, some of which are better suitable in case studies and some of which are more suitable to focus group discussions. Generally, the best analytic techniques depend on the aim of the study and the skills of the researcher. In this study, the collected data were analysed through a constant comparative analytical framework. Krueger and Casey (2015) highlight this as a suitable approach when analyzing focus group discussions. At the same time, the author found that this technique was suitable for integrating the different methods that were used in this study. The SPT framework is a theoretical framework because it “is composed of theories that have been tested through research and give broad generalizations of the relationship among variables” (Trigueros, 2015, p. 3). Yet, the SPT framework gives an indication to what needs to be analyzed (materials, competences and meanings) and serves as an analytical framework in this thesis. Therefore, the analytical technique that was used in this study was a constant comparative framework, but it did include these predefined categories (materials, competences, and meanings) (Shove et al., 2012).

The benefits and typical uses of a constant comparative analysis is listed explained by Krueger and Casey in a table

Constant Comparative analytical approach

| Objective | Typical uses | Key task | Process |
|--|---|--|---|
| Identify patterns in the data, and discover relationships among ideas or concepts. | Development of theory. Identification of patterns or trends. | Compare one segment of data with another to identify similarities and differences. | (1) Data are grouped together on a similar dimension (2) This dimension is given a name; it then becomes a category (3) These patterns are arranged in relationship to each other |

Table 6. Constant comparative analytical framework. Table developed by Krueger and Casey (2015, p. 157). Table adjustments have been made by the author of this thesis.

The first step in the analysis process was to transcribe the discussions. The focus group discussions were fully transcript the same day as they were collected. Because the in-depth personal interviews were not recorded, they were not transcribed in the same sense as the focus group discussions. Rather, the notes were elaborated and transcribed into digital form shortly after the interviews. The transcription was always carried out shortly after the data collection to make sure that the researcher had the interviews fresh in mind to minimize risks of misinterpretation.

The constant comparative approach is an approach where the researcher analyses the data from a comparative perspective. This is done by constantly comparing different answers and themes across interviews and methods (Krueger & Casey, 2015). The focus group discussions and the answers from the survey were transcribed into a word document. Analytical tools such as NVivo were considered, but not used because of personal preferences, given the manageable volume of data for manual data analysis which allows for a more hands-on, tangible way of working with the raw data. The transcripts were printed out for the analytical process and colored marking pens were used to highlight important themes that later became categories.

After printing out the transcripts, they were read through several times before markers of different colors were used to identify patterns and themes. First, the markers were used to identify the elements of meaning, materials, and competences. Each of the elements had its own color. For example, the element of meaning was marked in pink and those of competences were marked in green. After the elements were identified, the themes were identified similarly using coloring in words instead of printing the transcripts out a second time. At this point, I had already read through the transcripts several times and was familiar with the documents. The second round of analysis allowed for the detection of repetitive issues and patterns. It is important to notice that while these processes were carried out separately, this was mainly done to ensure the quality of the analysis. All themes that were identified were essentially made out of elements that had already been identified in the first round of analysis. Yet, the second round of analysis proved valuable as it made the connections between the elements and patterns more visible. The survey was carried out a bit later than the interviews, and the analysis process had already begun. As the survey consisted of predefined questions, did not allow for free speech, and consisted of 25 respondents, it generated more specific and pre-categorized data than the interviews and was consequently easier to analyze. Therefore, it was not necessary to carry out two rounds of analysis here. Rather, the themes were identified in a single round of analysis, and the patterns were compared to those in the interviews, thus complementing the main primary data sourced through the focus group discussions.

4.5 Ethical considerations

In any study, it is important to be aware of ethical considerations that one might stand to encounter. Blaikie and Priest (2019, p. 50) state that “Social researchers have to balance the anticipated benefits of their research with potential physical, psychological, social, political, economic or legal harm it may cause”. As previously mentioned, the participants received information about the study before the interviews took place, and information was given verbally before the interviews. This was important to increase the comfort, honesty, and openness for the participants, as most of the participants had not been a part of a focus group interview before. Anonymity and confidentiality were assured verbally by both the researcher and the participants in the interviews. In the survey, this was solved by allowing the participants to put their filled questionnaire into a box. The questionnaire did not include any personal or identifiable information. In the interviews, the participants were notified of their

opportunity to withdraw from the research at any time during the research process.

Furthermore, the data collected was handled carefully to protect it from potential leaks; each participant had its own code number to protect the identity while analyzing the data on the computer. Their real identities were safely protected in a safe.

The positionality of the researcher is worth mentioning in this section. Holmes (2020, pp. 2-3) states that it is “essential for new researchers to acknowledge that their positionality is unique to them and that it can impact all aspects and stages of the research process”. The author of this thesis holds close ties to both locations chosen, I have lived in Hommersåk, and I am currently living in Sandnes city center. This personal connection to both sites has proven to be both valuable and challenging at all stages of the research process. The connection to the locations has played a role in the establishment of trust during the interviews as well as providing a broad sample of participants in the study. Knowledge of the public transport systems in both areas has helped to interpret and recontextualize findings. However, the researcher has been aware during the whole process that her relation to the sites could affect her objectivity. With this potential disadvantage in mind, it was important to prepare a good interview guide and not to ask leading questions.

All potential participants were be provided with information about the study in advance, but detailed information that could affect the respondents’ answers was not provided. In providing information to the participants, the template from Norsk Senter for Forskningsdata (NSD, Data Protection Official) was used and distributed to potential participants. All participants were informed of their right to withdraw at any point during the research process, and confidentiality was agreed upon and ensured by all participants before starting the interviews. This was done both to facilitate honest answers and to establish a trustworthy environment. As the researcher did not meet in person with all participants, most of the written consents were collected digitally in where the participants wrote an email with their consent to participate. Ideally, these consents would have been signed by hand and collected, and such collection was considered and reflected upon, but I decided not to (potentially) expose the participants to such a meet, as the infection rate was high at the time of the data collection.

Another ethical consideration that should be mentioned is that the interviews were carried out in Norwegian and translated into English. Quotes, highlights, and patterns have been

translated to the best of my abilities, but such translations always brings about risks of misinterpretation and capabilities. As pointed out by Murray and Wynne (2001) it can be nearly impossible to provide exact translations.

5. RESULTS, ANALYSIS AND DISCUSSION

As explained in the theory chapter, the findings will be presented in light of the theoretical framework Social Practice Theory. This framework has been chosen because it allows for the detection of patterns of power that could have been missed when using another framework while at the same time including important transition concepts. This approach was especially chosen because the SPT framework was considered suitable for including user experiences, opinions, and possibly barriers to public transportation. Because of the complexity of the findings, and that the elements are connected, it was viewed as beneficial to merge the results and the discussion into one single chapter. Therefore, this chapter starts with a summary of the findings presented through the elements of materials, competences, and meanings. The second section will discuss the implications for governance of sustainable mobility transitions and connect the findings to the specific context of Sandnes as well as the broader urban context. Here, linkages to the infrastructural dimension of governance will be outlined. In the third section, linkages to mobility justice and economy will be discussed. This will be done to demonstrate patterns of injustice in Sandnes and how they may be relevant cross-nations. The third section in this chapter will present and discuss findings connected to time. Here, linkages will be drawn back to user needs and Shove et al.'s (2012) perspective on time. In the last section, connections mobility patterns, and life situations will be outlined and discussed. It will become evident that the three sections from the literature review are closely linked and that they all relate to the concept of mobility justice.

5.1 Materials, competences and meanings

Material, competences, and meanings refer to the three levels of analysis that are presented in the SPT framework. Materials refer to physical things, technologies, and infrastructure. Competences refer to skills, technique, and practical knowledgeability while meanings can include ideas, aspirations, and symbolism (Shove et al., 2012). The findings connected to these components of practice are summarized in the table below. The plus (+) and minus (-) symbols indicate whether the factors were reinforcing or preventative for continued practice.

Summarized findings

| Components of practice | Car | Public transport |
|------------------------|---|--|
| Materials | Vehicle (+) Road infrastructure (+) Access to parking (+) Groceries (+) Electric vehicle (-+) | Access to public transport (+) Routes (-) Air condition (-) Connections (-) Separate bus-lanes (+) Distances, urban planning, residency (-+) Pram, stroller (-) Wheelchair (-) Hjem-jobb-hjem (+) |
| Meaning | Time (+) Simplicity (+) Flexibility or freedom (+) Environment (-) Cultural norms (+) Economy (-+) | Time (+) Economy (+ -) Environment (+) Safety (-) Alcohol (+) Traffic jams (+) Frequency (-) |
| Competences | Drivers license (+) | Digitalization (-+) Competence connected to bus drivers (-) Knowledge on time-tables or routes (-+) |

Table 7. Summarizes findings from focus group interviews connected to materials, meanings and, competences. Pluss or minus indicates whether the factors were reinforcing or preventative to continued practice. Those factors marked in red are frequently mentioned factors, but factors that none of the participants related to themselves.

Summarized findings

| Infrastructure | Economy | Time | Life situation |
|--|--|--|--|
| Mostly linked to materials such as routes, availability, frequency and connections. Digital infrastructure could be linked to competences. | Mostly linked to meaning. Will usually not influence transportation practice | Mostly linked to meaning, but also interact with infrastructure (material) | Can be linked to time, economy, and infrastructure |

Table 8. Summarizes findings from survey, focus group interviews, and in-depth interviews structured into new categories.

In the focus group discussions, all participants had access to cars. A few participants within both areas had limited access to a car or shared a car with their partner or other family members. All participants had access to parking lots at their home, their jobs, at the university or in other day-to-day activities except from two people who lived in Hommersåk. Five participants had an electric vehicle in Sandnes, while in Hommersåk none of the participants owned electric cars. Only a few of the participants used public transportation on a regular basis, others used it on occasion, while the majority of the participants seldom used public transportation services. In terms of materials, there were similar findings from the focus group discussions in Hommersåk and in Sandnes. However, a few differences will be outlined throughout the chapter. In terms of meanings, some of the topics that came up were freedom, flexibility, economy, safety, environment, and the ability to drink alcohol. Competences were connected to skills, techniques, and practical knowledge on digitalization, complicated timetables and lack of competences connected to bus drivers.

5.2 Infrastructure

The literature review of this thesis emphasized that governance of sustainable mobility transitions are complex processes that involve hierarchical, vertical, and infrastructural dimensions (Haarstad, 2016). Several important organizations, stakeholders, and institutions were presented a on local, national, and global scale to demonstrate the complexity of the setting in where sustainable transitions happen. The findings of this study clearly underline the importance of what Haarstad (2016) calls the infrastructural level of governance. As stated in the context section, Sandnes is a medium-range city with long traditions in the use of cars (Uteng & Voll, 2016). The findings indicate that the built environment in Sandnes greatly supports the practice of car driving over the practice of public transport. This was highlighted both in the interviews and in the distributed survey in where participants pointed to low availability, that public transport does not take them where they want to go or that the routes were too complex. An important notice for the following section is that while connections in the SPT framework refers to the connection between the elements (materials, meanings, competences), connections in this section will refer to connecting routes in public transportation that can be related to infrastructural barriers or other problems connected to materials. Connections were frequently mentioned as a barrier to public transportation because a change in route or means of transportation more often than not resulted in a long waiting period before the next bus, train or boat arrived.

5.2.1 Routes

The overall tendency is that the participants who used public transportation on a regular basis and out of choice were more satisfied with the infrastructural barriers that were presented from those who did not use public transportation. Yet, there were different opinions on the public transportation system in Sandnes, and the satisfaction varied from group to group, and at times from person to person. Those who did take public transportation had in common that the bus, boat, or train stop was located close to their home and that they seldom had to connect to other buses or means of transportation. A participant from Hommersåk explained that the simplicity of public transportation is why she chose to use this on a regular basis

when you work in the city center, it is very practical to take the bus. I understand those who work in other locations, where you have to connect with other buses or trains and

stuff like that. I like that you do not get stuck in traffic jams or need to pay attention in the traffic, it practically takes you from door to door (participant from Hommersåk).

This person lived in a central location in Hommersåk, with a short walk to the nearest bus stop. Her claim reflects the opinions expressed by those who used public transportation on a regular basis and did not need to connect routes. This applied to more people in Hommersåk than in Sandnes city center. Participants who lived close to Sandnes city center generally biked or walked more when they needed to do errands in town or get to their jobs. The tendency may be linked to that most of the population in Hommersåk work outside of town, therefore commute distances might be longer. A few of the participants in Sandnes lived closer than 3 kilometers from their job and chose to walk or bike instead of using public transportation services or their cars. Those in Sandnes who did use public transport on a regular basis used the train or bus to their job in Stavanger and did not connect means of transportation. In the cases of those who did not use public transport regularly, they often related it either to connections of routes, the routes themselves, or the time they felt they lost due to waiting. A participant who lived in Sandnes city center explained that while he had good availability to public transportation and did not have to wait long for the next bus to arrive, the routes were too complicated

I have the best of opportunities when it comes to public transport because my job is right next to the university, but I use my car...the routes are too advanced. It is like they zig-zag around before you get to the place you want to go to, at least in my experience (Participant from Sandnes).

His claim was supported by another respondent from Sandnes, but who were a part of another group

The problem with taking the bus is that when you drive on all these smaller roads... I have to swing by like 80 stops before I get to Madla and it takes a freaking hour and a quarter. There is just no way, not when I can drive there in 15 minutes, there is no contest (Participant from Sandnes).

Problems with routes could also be connected to that the buses did go to the places where the participants wanted to go. This was explained by several participants with similar examples. For example, a participant said that she would have wanted to take the bus for outdoor activities like hikes or the beach. However, there are few routes that take you that close to

nature. This was also highlighted by those who owned a cabin in where one participant explained how she had taken public transport to her cabin before, but could no longer take public transport because the routes had been discontinued.

Haarstad (2016) points to that sustainable mobility transitions may differ from city to city because there are few hard regulative policies from higher hierarchical levels. We know from the literature review that 'Byvekstavtalen' is a result of hierarchical governance where the Norwegian state has made a legislative agreement with the municipalities involved. As previously explained, the public transport system in Sandnes is a part of the larger region 'Nord Jæren'. In other words, while the municipalities in Rogaland may holistically govern their own mobility transition, the governance of public transport specifically is indeed county and region-based. This is good for a number of reasons. Kolumbus (2017) point to a seamless system in where the public transport system in Nord Jæren is market as one coherent transport system. Yet, along with a county-based governance comes the cross-municipal actors and stakeholders. Findings from this study indicate that the consumers are experiencing difficulties in traveling across municipalities. This was demonstrated both in words by a few participants, but also in the analysis which showed that those who had to travel cross municipalities more often had difficulties in finding a good route. The exception was to and from Stavanger city center, in where the participants did not express any trouble with the routes. Here, the findings were similar in both the city center and in Hommersåk in where the participants were more likely to use public transport frequently when they did not have to connect to other transport modes. However, people in Hommersåk pointed to low frequency in terms of ferry departures and were generally unhappy with the political discussion a few years back to cut the route. The CO₂ tax is the main instrument for limiting emissions from the transport sector in Norway (Norwegian Ministry of Climate and Environment, 2019). Barriers connected to economy were frequently mentioned in the interviews, but fuel prices were not brought up in any of the interviews. The findings are supported by arguments made by Ancaes (2011) who state that investments in public transport tend to disfavor disadvantaged areas in favor of larger metropolitans. Thus, public transport services often connect suburbs to larger city centers and not to other suburbs or smaller centers. Ancaes (2011) study was on Lisbon, a significantly larger metropolitan area than the one of Sandnes and Nord Jæren. Yet, the findings are similar in terms of cross-municipal travels or travels to smaller cities and suburbs. Ancaes (2011) further points to how slow, unreliable, and non-existent public transport may lead to social exclusion and lack of participation of those who

do not have accessibility. The evidence from this study from Sandnes indicates that, while most people have access to private vehicles, those who lack this access may not get to participate in events like ‘going to the beach’ or to a hike that starts in the nature area a bit outside of the city center. Berg and Ihlström (2019) made similar conclusions in their study on rural areas of Sweden where travel by private cars was considered necessary to be able to carry out everyday activities. This suggests that transport policy should not be limited to the ‘minimum needs’ of inhabitants, like getting to work and school. Rather, transport policies should evolve to include social travels as well, like for example shopping, errands, or in this case the beach (Waisman, Guicarch & Lecoq, 2013).

5.2.2 Infrastructural improvements

In the interviews, all participants were asked what they would do to improve the public transportation system over a ten-year period from 2019-2029 with 800 million Norwegian kroners at disposal. This question was based on funds that have been granted from the Norwegian to upgrade the public transportation system in Nord-Jæren. A suggestion that was frequently mentioned across groups was to implement a few commute routes and to supply these routes with a number of smaller shuttle buses from the less central parts of Sandnes. In Hommersåk it was suggested that such a route could go directly from Hommersåk dock to Sandnes city center, and a few smaller buses could bring people from Li, Maudland, and Kyrkjevollen (neighborhoods in Hommersåk) to connect with the bus on the commute route. In Sandnes, a similar solution was suggested on the route Sandnes-Stavanger. Here, one of the ideas was to keep and upgrade the train and to have smaller and frequent diagonal routes.

I think that the public transport axis, the train, should work as a spine and then you have small zones that build out from that and bring people to or from the last bit... but everything is connected. The thing that I think has happened way too often now is that the bus is driving parallel with the train to Stavanger for example... I never got that. So better coordination between the different entities (Participant from Sandnes).

The ideas are similar to the ones made by Woodcock (2012) on ergonomics. The idea that the public transport system should have a more user-centered approach is supported by Van Oort (2014) who suggests that the public transport designs should be improved to better suit passenger needs. Van Oort (2014) concluded that service performance is often measured by vehicle performance rather than passenger satisfaction and that passenger interests deserve greater attention in such measurements.

It was also suggested to open up the trail to the nearby town of Ålgård (Ålgårdsbanen), and to continue on the work with and extend the bus lanes. Some of the participants took the discussion a bit further and explained how they expect that the developments of autonomous vehicles will improve the quality of the public transport system in the years to come. Bybane was also suggested in two of the interviews, and many of the participants referred to good experiences with the public transport system in Bergen. However, most participants realized that Bybane was unlikely because it has already been politically discarded and because of the complexity when it comes to land use and distances in Nord-Jæren. All suggestions had in common that they referred to an effectivization, connections, and correspondence in routes. Here, the links between the entities are especially visible in how infrastructural improvements (materials) would increase the will to use public transportation because the time spent would be reduced (meaning). The findings suggest that the infrastructural dimension to governance is perhaps especially important in Sandnes because of distances and because of how the city is built.

Participants in the focus group interviews and respondents of the distributed survey were asked if what they thought of fossil-fuelled vehicles and whether they should be prohibited. The tables below demonstrate their answers.

Should fossil-fuelled cars be prohibited?

| | Yes | No | Do not know | Not yet | Unclear answer | Geographically conditioned |
|-------------------------------|-----|-----|-------------|---------|----------------|----------------------------|
| Number of participants | 1 | 12 | 1 | 5 | 3 | 2 |
| Percentage | 4% | 48% | 4% | 24% | 3% | 8% |

Table 9. Findings from the questionnaire distributed in Byparken

Should fossil-fuelled cars be prohibited?

| | |
|----------------------|--|
| Respondent 3 | I prefer electric vehicles. Fossil-fuelled cars can be banned when the “charging-grid” is MUCH better. |
| Respondent 10 | Fossil fuels in general will eventually go out of use; banning gas/diesel cars is an option but reasonable alternatives need to be available. |
| Respondent 15 | No, if people want to use fossil-fueled cars, they should get to do so. |
| Respondent 17 | We have got one electric car and a hybrid car. Forbid a bit strict. Maybe with diesel because they are more polluting |
| Respondent 21 | The next car will be an electric vehicle (in 1-2 years). We only have one car, and then we will wait until the range/charging is more expanded |

Table 10. Some of the comments from the questionnaire distributed in Byparken.

In the focus group interviews, all participants concluded that fossil-fuelled cars should not be forbidden except from one person. The findings were similar to those from the survey, in where many of the participants described an underdeveloped grid for electrical vehicles and that there are few good alternatives. The participants also connected this to injustice in where economic unprivileged would not be able to buy a new car, or that some would have to buy an older electric vehicle with a very short range. The findings suggest that rather than banning fossil-fuelled cars, or focus on individual behavior, governance should be concentrated around providing good and sustainable alternatives to make such options more attractive. This is supported by Shove et al. (2012) who explain that politics happen within a landscape that is in constant transition and that stakeholders and policy-makers are themselves a part of this ever-evolving landscape which they seek to govern. Therefore, they argue that politics should be concentrated around the elements in circulation, the relation between different practices, trajectories of practices and its users, and the reproduction pathways (Shove et al., 2012).

A great deal has happened in the latter alternative, the reproduction pathways, where the Norwegian Government has successfully implemented a high electric vehicle share, at least compared to other countries. Yet, findings from this study indicate that the practice of public transport is, for most people, not a competing practice to the practice of personal vehicles. Rather, the practice of public transport is a practice that is used on certain occasions. This will be further highlighted in the next chapter, but the results here demonstrate that policy should be focused on the relationship between the practices of public transport and personal vehicles and that the practice of public transport should be reproduced in such a manner that people

view it as a real option (or competition) to private vehicles. This can be done by reviewing the elements in circulation, which to a large extent has been done in this study, and to introduce new or reproduce those elements (materials, meanings, and competences) that are viewed as enhancing to the practice (Shove et al., 2012). A single study, especially a smaller-scale study, is not enough to map out the many elements in circulation. However, this study does give an indication of the elements in Sandnes, and an important finding is that several of these elements would benefit from infrastructural improvements, or the infrastructural dimension of governance, on the public transport system (Haarstad, 2016).

5.2.3 Digitalization

Digitalization is included in this chapter because it can be linked to infrastructure in that it is a human-built environment. Digital solutions are not here in a literal matter, yet they do influence our lives in the same manner as infrastructure. Linking this back to the literature review of this thesis, posthuman thinking was briefly mentioned. Here, links can be drawn to digitalization where humans are increasingly becoming a hybrid of humans and technology (Haraway, 1991). This argument underlines the point that in modern society, humans are increasingly dependent on digital instruments to carry out their day.

Digital time tables, bus tracking apps, or travel guides were mentioned in four focus groups as either reinforcing or preventative for the practice. Some participants had the apps downloaded, used them frequently, and considered them as a positive development, while other participants found them confusing. Findings show that the public transport system in Nord-Jæren requires smartphones (materials) and competencies on the specific apps in order to be involved in the practice. While none of the participants expressed difficulty connected to the material (the phone), several experienced difficulties connected to the apps. A person from Sandnes explained how she found it hard to orient herself in a complex system, others had trouble with using the apps, and some did not even know that specific apps existed.

Participant 1: There is a sanntids-app (app for GPS tracking) by Kolumbus. I have that one on my phone.

Participant 2: Not everyone knows how to use those, you know.

Prior to the dialogue presented here, a participant suggested implementing digital timetables at all bus stops that tell you when the next bus is expected. This was a suggestion that was

supported within the group to improve the public transportation system in Nord-Jæren, and in Hommersåk especially. In a focus group in Sandnes, one of the participants suggested that Kolumbus should make an app that showed you where to go to get to the nearest bus stop instead of just naming the stop after a street. Because she lacked a sense of place, she did not know where those streets were or which buses that went by. Another participant in the same group explained how such an app already exists, and that ‘Kolumbus reise’ (traveling app) was frequently used for that exact purpose in his family. A participant in another group explained that

I think it has got a lot to do with the simplicity that has become so simple that it becomes too advanced for the user group. I have experienced it myself because there were two or three different apps that you had to download...it is no wonder that I did not bother. Somehow it was easier when you could step on a bus and pay there (Participant from Sandnes).

As pointed out several times in this thesis already, Shove et al. (2012) emphasize that practices are built up by elements of materials, meanings, and competences. Digitalization is mentioned here as a barrier related to competences in where some participants lacked the skills to be involved with the practice of public transportation. The relation to mobility justice here seems rather obvious in where someone may be left on the station because they lack the skills to buy a digital bus ticket. Because transport relates to so many of us, the transport system needs to be adapted in such a manner that most people have the skills to use it, at least if we (the many actors involved in governance) want the practice to sustain and grow (Shove et al., 2012). Perhaps this argument applies even stronger to the practice of public transport because those who lack the elements connected to the use of private vehicles are often referred to the public transport system. What happens when you lack the competencies to drive a vehicle and do not have the skills to enter a bus or other public transport services? This was reflected upon in several of the focus groups in where participants referred back to experiences where wheelchairs or management of digital tickets had resulted in someone being left on the station. Here, connections can be drawn back to the arguments made by Woodcock (2012) in where the technological parts of a transport system should be adapted to human factors. Indeed, some may argue that this is exactly what digitalization is about: “maximize safety, efficiency and comfort through a design which matches the operator’s abilities” is after all the goal of ergonomics (Woodcock, 2012, p. 22). However, this study indicates that the inhabitants in Sandnes are experiencing difficulties in operating the public

transport system, perhaps especially elderly participants, but the issue was also brought up across ages and genders. Further, this study demonstrates the many user needs and differences in capabilities that may complexify the governance of sustainable mobility transitions.

Meanings connected to safety were generally not a concern amongst most participants. However, safety was an important factor for one of the participants in the study when she chose a transportation mode. Because she had recently become the mother of two, she was concerned about the safety on buses. When you bring a small child onto a bus, there are few safety measures. If the bus were to be involved in a crash, the baby lies unprotected in the pram. This participant did not have access to a car on a regular basis and chose to take the boat to Stavanger as the boat felt safer for her child. In 2019 a child was injured in an accident in Haugesund (a city in Rogaland county) in a bus that belonged to Kolumbus (Frafjord, Kalstad, Topdahl, 2019). Kolumbus' spokesperson referred to such accidents as unusual, but encouraged parents to secure the stroller and make use of the safety measures available onboard (Frafjord et al., 2019; Kolumbus, 2019). Few numbers are available on bus crashes, but in the EU bus crashes account for less than 1 percent of total road fatalities (Cafiso, Di Graziano, Pappalardo, 2012). This suggests that buses are generally a safe mode of travel compared to private vehicles. Yet, when bus accidents do occur they generally receive a lot of media coverage, likely because of the number of passengers involved. News on bus accidents could make the impression that bus crashes happen more frequently than they actually do, and draw the attention away from the safety measures that are available onboard. According to Kolumbus (2019), it is mandatory to use a seat belt and to secure strollers on board.

5.3 Mobility justice and economy

Some of the problems mentioned in the previous section can also be linked to the term of mobility justice and there is a close link between governance and social equity. While governance refers to politics, policies, and multiple stakeholders, social justice often relates to the people that are being acted or upon or 'governed'. Justice perspectives can reflect unfairness that happens as a result of governance or unfairness that happens because of other social issues, hence governance is one (out of several) dimension to mobility justice. The literature review introduced the term 'mobility justice' as a broad term that included different scales (micro, macro, meso) as well as gendered and racialized problems (Sheller, 2018). This

study set out with a rather holistic approach to investigate mobility justice in Sandnes, this means that some specific mobility justice-related topics may not have come up during the interviews and that the opinions raised may not reflect specific unprivileged societal groups.

In the focus group discussions, the participants were asked to reflect on the term “mobility justice” and connect it to either themselves or to the transport system in their hometown. Later on in the interview, they were asked whether they thought the public transport system in Sandnes was a just system. Two focus groups concluded that it was indeed a fair system, while four focus groups concluded that it was not. Counting individuals rather than groups the share equals 38% towards a just system and 62% towards an unjust public transport system. In all groups, the vote was unanimous. This may be connected to the group dynamic particularly to the method of focus groups, where a group discusses and reflects on a certain topic or a question together as a group rather than as separate individuals. The evidence from the focus groups shows no clear differences between the two locations, one group in each place concluded that Sandnes had a just public transport system.

The same question was asked in the distributed survey, table 6 summarizes answers from the questionnaire distributed at Byparken next to Sandnes bus station.

Does Sandnes have a just public transport system?

| | Yes | No | Do not know | Unclear answer |
|------------------------|-----|-----|-------------|----------------|
| Number of participants | 8 | 12 | 4 | 1 |
| Percentage | 32% | 48% | 16% | 4% |

Table 11. Findings from the questionnaire distributed in Byparken.

The questionnaire opened up scope for the respondents to give a brief comment to support their argument, those who found the public transport system to be unfair were more likely to put down a comment. Findings from the questionnaire support evidence from focus group interviews that mobility justice in public transport can be connected to residency, availability, and frequency. Time was not mentioned as a factor connected to justice in the questionnaire. A difference that is worth mentioning is that the respondents in the focus group interviews

were presented with key concepts from mobility justice literature while the respondents from Byparken did not receive such information. Shove et al. (2012, p. 135) state that “the emergence, persistence and disappearance of practices (guided and structured by dominant projects) generates highly uneven landscapes of opportunity and vastly unequal patterns of access”. In other words, injustice is a phenomenon that lies in the nature of practices. This is also true about transportation practices, Martens (2012) describes how space is always divided into center and periphery and that inequality and accessibility, therefore, is inevitable. This does not mean that policy is not needed because there will always be inequalities, rather it underscores the importance of the justice dimension in policy-making processes.

5.3.1 Economy

Economy was mentioned within all six focus groups as a factor that either contributed to their own mobility or as a factor that they linked to mobility justice in other specific or non-specific social groups. Economy was, along with time, the most frequently mentioned meaning for public transportation. Especially the few participants that had young children or those who were planning to start a family life in the near future brought up their concerns around family life and mobility costs. One of the participants who shared a vehicle with her partner listed economy as the biggest factor in why she used public transportation. She used public transportation in most of her day-to-day activities, like getting to school or to the city center, because her partner needed the car to get to work. This shows that economy was an important factor, although not always a decisive one, for the participants in the focus group discussions.

A person in Hommersåk explained that economy was one of the reasons she chose to use the car instead of public transportation. Because she had a large family, the car made more sense economically rather than buying bus tickets for all family members. Pricing was brought up in a different group, in where they reflected on how public transport is economically feasible with frequent use, but relatively expensive when only used once in a while. They suggested that some sort of recruitment arrangement or a specific number of free rides could be implemented to increase the use of public transport. Economy was also brought up as a reason to continue the practice of car driving. Several interviewees spoke about the toll stations and how they affected or did not affect their mobility. However, most participants did not change their means of transportation due to toll expenses, they rather changed their route if they could avoid driving through a toll booth. This could indicate that expenses connected to toll fees are viewed differently. There has been a significant public debate on the collection of toll fees in

recent years. Toll fees are therefore a facet of the economic factor connected to the use and ownership of cars, but they may also be perceived differently according to one's ideological point of view on taxation.

A participant from Sandnes explained that while he did think about the economics connected to his mobility, the benefits of car use outweighed the economic impact that is connected to the practice. His claim was supported amongst the group, and highly reflects opinions expressed in other focus group discussions. This can be linked back to governance tools such as the cost and benefit analysis or transport modeling and to the infrastructural findings that suggested that the mobility system in Sandnes to a large degree supports the use of private vehicles. This may indicate that while economy was indeed frequently mentioned during the interviews, the infrastructural barriers often outweighed the economic barriers to public transport. A participant from Sandnes explained

I do not know how much the tolls would have to be for me to stop driving, but it would have to be a lot (Participant from Sandnes).

Waisman et al. (2013) did a study on carbon policy and path-dependence. They found that if carbon policies were implemented as the only mitigation option from the transportation sector, the pricing of carbon would have to increase significantly to reach the emission targets. In such a scenario, private vehicles would be limited to the wealthy and thus be unfairly distributed. Therefore, Waisman et al. (2013) suggest implementing policies independent of carbon pricing. Toll fees were mentioned above as an instrument that is used in Sandnes Municipality. Waisman et al. (2013) further suggested deploying infrastructure to make low-carbon transportation modes more attractive. Sandnes Municipality has started this process by upgrading the main mobility hub and the urban park next to it. The majority of the participants, both in the survey and in the focus group discussions, agreed that Byparken made Sandnes city center more attractive. Yet, the upgrading did not influence their transportation mode. This suggests that continued upgrading along with other measures, like for example the infrastructural improvements suggested above, would make sustainable traveling options more appealing. Furthermore, transport policies should be included in other policy dimensions to unlock the current private vehicle dependence in Sandnes (Mäkinen, Kivimaa, and Ville, 2015).

5.4 Time

Time was one of the most frequently mentioned factors that affected the means of transportation. Shove et al. (2012) explains that time to a large extent is influenced by societal rhythms and how practices can shape and reinforce each other or compete over time. Time, as practice, is influenced by the elements of materials, meanings, and competences. In many ways, time can be connected to the element meaning. Yet, time as meaning does not explain how and why one can ‘make time’ for some practices but ‘do not have time’ for others. Nonetheless why some participants experienced public transport as a practice that ‘made time’ while others experienced the exact opposite. This can be connected to the variety of user needs and to how people prefer to spend their days. Sareen et al. (2021, p. 7) point to time and space as important factors on analysis in sustainable transitions and coin the term ‘changeography’. In other words, transitions are always conditioned by their setting in terms of cultural, social, and spatial contexts (Sareen et al. 2021).

The most frequently mentioned, and perhaps the most obvious connection between transportation mode and time is that the practice of cars and the practice of public transportation compete over time. This was implied by a number of participants, who explained that they drove their cars instead of using public transportation because public transport was considered to be a time-demanding practice. As demonstrated in some of the earlier examples, this was often linked to connections, routes, and frequency. Those who used public transportation on a daily basis either ‘gained’ time in a literal sense compared to driving or the ‘loss of time’ was not considered to be of valuable amount. This equation can be divided into three fractions:

- A. On a daily basis, one has to choose between public transport and car driving (competing over time).
- B. One chooses car driving if the car is considered the fastest option and if one have the materials and competences to do so (time as meaning).
- C. If there is a more compelling meaning, this could affect fraction B.

On the other hand, a participant explained that the public transport system in Sandnes works very well as a supplement to cars, others pointed to a highly functioning public transport system for “their use”. These examples demonstrate that the claim of competing over time is not necessarily true and that car driving and public transport can coexist in the “temporal infrastructures of society” (Shove et al. 2012, p. 129). In other words, participants explained

how they used public transport for certain occasions, often connected to other practices in where public transport was considered favorable, like for example a night out or bus training with a younger family member. In connecting this to routes, the aim of the travel was considered important. More participants expressed willingness to use public transportation if the travel was connected to pleasure. This corresponds with the arguments made by Grison et al. (2016) who found that people were more likely to accept connections if the travel was for pleasure. While Grison et al. (2016) studied was limited to public transportation only, links can be drawn to the choice of transportation mode in Sandnes.

Until now, time has been explained in a very literal manner, in where the participants either gained or lost time in different transport options. However, some participants explained that the time spent on a bus felt like a 'gain of time' in where they could spend the time on the bus doing other things (other practices). The time mentioned here is not in a literal matter because the number of minutes it takes to get from one place to another is more or less constant. Rather, it referred to their experienced time and how they got to spend it. One participant explained in a dialogue after another person said that he was not willing to put the time into public transport

I would have thought the opposite. It would have been fantastic, I would have thought that 'then I get to spend that time doing what I want to do, and not having to use that time driving'. I could listen to a podcast or read or just do nothing. So I would not have seen that as a waste of time, I would have considered it a gain of time (Participant from Sandnes).

While this participant explained that she would have wanted to take public transportation if she had better availability and frequency, another person from a different group felt the exact opposite:

I am thinking that for me it is the opposite. I have plenty of work-related conversations, at least on my way home from work, and I think it is lovely... I have a good time in the car, listening to music or podcasts to work every day (Participant from Sandnes).

The SPT framework emphasizes that practices are affected by culture and history rather than behavior as an individual choice (Shove et al., 2012). Two people in separate focus group interviews expressed how culture or social norms were a part of the reason they did not use

public transportation. The first participant explained how when she takes the bus, it brings back memories from when she did not have a driver's license:

before I got the license it was like 'OK, she is still stuck on the bus', so it kind of vibes me back to that. I don't know, it just makes me feel a little like 'don't you have another way to move around?' ...it is required to have the license, it is like there is a standard for that" (Participant from Hommersåk).

5.5 Life situations

Shove et al. (2012) explains how time also connects to practices that we are obliged to do, like job-related practices or family life. Therefore, the time available is not always experienced as your own. While such connections to time were not expressed in words during the interviews, several participants connected mobility to life situations and talked about 'the busyness of parenting' or the 'time available after pension'. In terms of user needs and human-oriented practices, the findings suggest a close connection between life situations and mobility patterns in Sandnes. The literature review explained how different people and life situations may generate a variety of user needs in any transport system (Levin, 2018; McCarthy et al., 2019; Woodcock, 2012). In the focus group interviews, all participants were asked about how their mobility or traveling patterns had changed in their lives. Based on findings from the focus group interviews and the in-depth personal interviews in where the participants talked about their life history, a clear link between mobility patterns and life situations have been outlined. It should be noted that the figure below represents the data from this particular study, and should not be viewed as a general guideline.

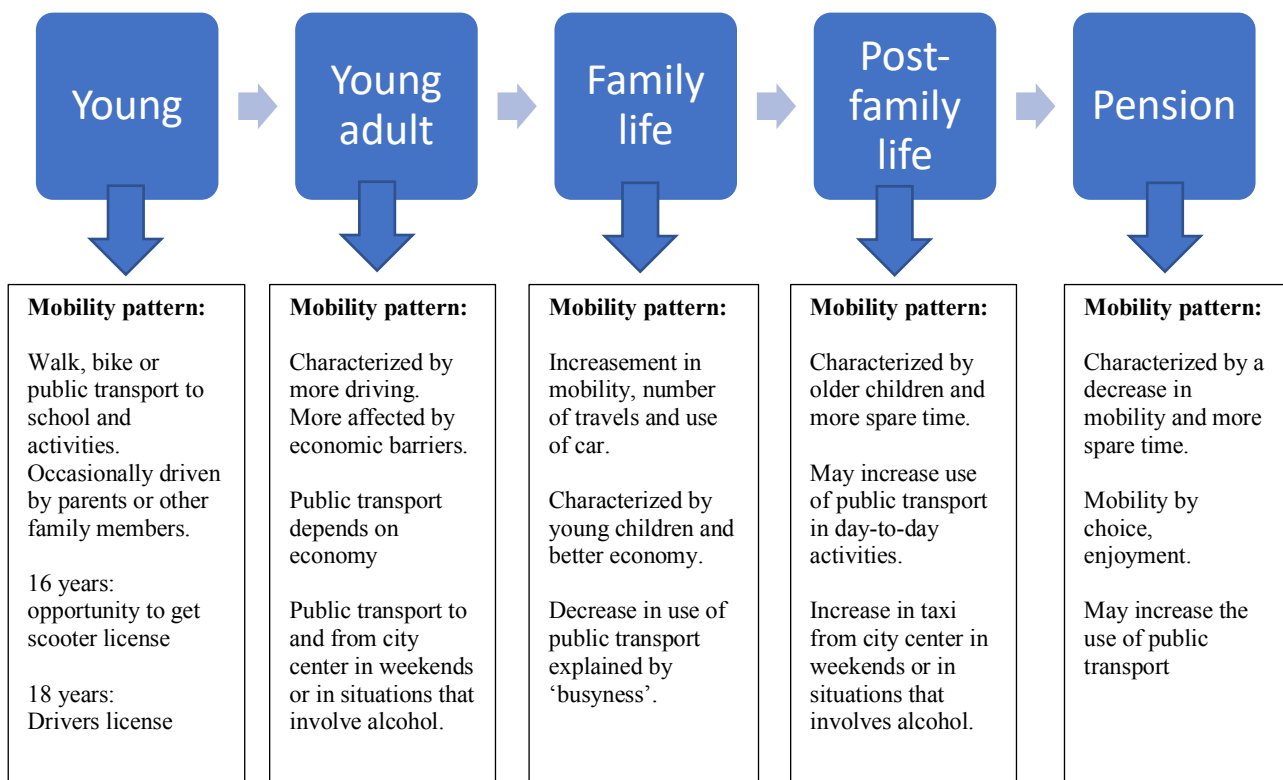


Figure 8. Demonstrates how dynamics of mobility *may* be affected by life situations.

The figure (8) presented here cannot serve as a pattern transferrable to whole populations or to all people within a society, but it serves as a good demonstration of how mobility patterns and life situations *may* be linked. The figure mainly serves as a visual demonstration of findings from this particular study. However, as demonstrated in the theoretical literature review, there are various user needs and variations that may overlap the categories presented here. For example, a person in the focus group discussion agreed with a similar representation of 'family life' to the one presented in the figure above, however, it did not apply to her specifically as an adult without children. This is an important notion, as the categories will vary with how people live their lives, and some may feel unrepresented in this particular visualization. Yet, the figure shows how mobility patterns may be influenced by busyness, economic status, or other social factors and life events. Above all, it demonstrates that the variety of user needs are not necessarily constant, but changes with lived lives and norms of society.

The findings of this study support the link between changed mobility pattern and parenthood as explained by McCarthy et al., (2019). Yet, the participants in this study from Sandnes gave little indication of differences linked to gender or the role of caretakers. Rather, the participants talked about ‘us’ and ‘our’ mobility when they talked about parenthood even if their partners were not present during the interview. This does not mean that the findings of McCarthy et al. (2019) are not transferrable to the population in Sandnes, but it indicates that the participants themselves did not make these connections. A more narrow study would have to be carried out to investigate whether such connections can be drawn in Sandnes. The findings demonstrated in the table support those of Levin (2018) that older participants were more likely to be car-dependent than younger participants. In terms of age, middle-aged participants were most likely to be car-dependent in this particular study. However, mobility patterns were more likely connected to life situations and economy rather than the age itself as suggested by McCarthy et al. (2019).

6. CONCLUSION

The undeniable demand to reduce GHG emissions has led to the implementation of mobility-related measures nationally and in a broader urban context. The medium-sized city Sandnes in Norway is no exception where the local government has committed to a zero growth in personal vehicles. Through the Zero Growth Target and the local mobility plan, it becomes evident that the aim in Sandnes is that the increase in mobility will be through walking, bicycling, and public transport. On the contrary, the increased focus on sustainable mobility calls for further attention to dimensions of social justice. Mobility justice is an increasingly recognized concept amongst social scientists, however, little literature exists on this particular dimension of justice in Sandnes. This study attempted to fill this gap by researching public transportation from two locations in Sandnes and by including specific contextual issues to the broader concept of mobility justice. Further, this study has questioned how life events may affect mobility patterns in specific life situations. This chapter will summarize the findings and attempt to answer the research questions that were presented in the introduction:

1. What are the motivations and barriers for public transport or car transportation in the city center and in Hommersåk?
2. What measures, from the respondents' perspectives, can be carried out in order to increase the use of public transport in Sandnes?
3. To what degree can mobility justice variables be connected to the practice of public transportation in Sandnes?

The study revealed many elements that either combined or separately influenced their transport practices. The most frequently mentioned barriers (elements) were further identified, discussed, and linked to previous research on mobility justice. These are: **(1) infrastructural issues, (2) economy, (3) time, and (4) life situations.**

In terms of **(1) infrastructural issues** the problem of availability, routes, frequency, and cross-municipal travels were frequently mentioned. Participants who did not use public transportation on a regular basis generally referred to a non-functioning public transportation system and those who did use public transportation had in common that they did not have to connect routes. The findings were discussed from a governance perspective where it was suggested to pay more attention to the increasingly recognized 'infrastructural dimension of

governance'. This means that in the case of Sandnes, infrastructure can be used as a governance tool, rather than a backdrop to other governance processes, to increase the use of public transportation. This was highly recognized when the participants suggested that infrastructural improvements could increase their use of public transportation. For the broader urban context, the findings suggest that specific (infrastructural) contextual should be included in future governance processes.

(2) Economy was frequently mentioned as an element of importance in transportation practices. The study did include participants who used public transportation services because of their economic status. Yet, the findings suggested that economy was not an issue for most people and most participants expressed willingness to pay more for a higher functioning practice. This was linked back to infrastructural issues in where the infrastructural barriers often outweighed economic issues. Participants were generally not satisfied *enough* to change their means of transportation despite economic benefits in public transportation practices. It has been underlined that this study cannot alone serve as evidence for forced car ownership, however, the participants often linked the practice of cars to a 'car adapted infrastructure' and pointed to how there 'is no real option' to private vehicles. Links were drawn to findings from other national and international studies with similar findings on the role of economy in transportation.

The study underlines the importance of **(3) time** in transport practices. Time was discussed from different perspectives connected to the practice of public transportation. Some participants felt that they 'gained' time with public transportation, this was consistent with the arguments made by Shove et al. (2012) in where they could spend the time on other practices. Yet, the most significant finding connected to time relates back to governance and the infrastructural barriers that led to an increased amount of time being spent on transport. This was showcased in the interviews where participants pointed to how public transport could increase the time of the travel by three times compared to private vehicles.

The fourth factor that was important in deciding on a mode of transportation was **(4) life situations**. Here, interviewees were asked to reflect back on their lives and how their mobility patterns had changed. Life situations were not an element on its own but rather consisted of a set of practices which could influence the elements of materials, meanings, and competences. Life events did influence the mobility patterns of the participants in this study, and the most

significant change was often linked to parenthood and family life. Connections could be drawn back to the factor of time, where the engagement in more practices often resulted in frequent use of private vehicles. Yet, while the findings suggested that mobility patterns change along with life situations and that specific events may lead to a decrease in the use of public transport, most participants favored the practice of cars despite these tendencies. This underlines the argument made by Shove et al. (2012) that *connections* between the elements are of importance when deciding on a mode of transportation.

On the basis of the factors presented above, this study demonstrates the complexity of sustainable mobility transitions. During the discussion, it became evident that all the chapters from the literature review relate to mobility justice, which further underlines the complexity of the concept. Actors in the governance of mobility transitions have the opportunity to make ‘just’ transport systems. Yet, such governance processes involve several stakeholders, institutions, and actors as well as different user needs. This study reveals that mobility justice variables do indeed affect the motivation to public transportation in Sandnes. However, the study did not detect any significant differences in the ‘experienced (in)justice’ in the city center and in Hommersåk. Rather, the participants talked about similar issues connected to the practice of public transportation. This can be linked to that the two locations were placed in the same municipality and thus within the same transportation system. The study revealed that many of the factors that influenced the practice of transport could evidently be linked back to infrastructural issues in where the basic line was that public transportation did not take the participants where they wanted to go in a reasonable amount of time. Therefore, the findings of this study further underline the point made by Haarstad (2016) not to undermine the infrastructural dimension to governance and to include the many user needs and mobility justice in decision-making processes.

Further, this study investigated mobility justice using a holistic approach. For future research, it could be useful to investigate the factors that were found in this research separately and from a more embedded approach. More knowledge is needed on these factors individually and how they may apply to specific marginalized social groups.

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Appendix

Appendix 1: Interview guide for focus group discussions in Norwegian

Guiding interview questions:

1. Hvem har tilgang på bil og parkeringsplass ved bolig og på eventuelt arbeid?
2. Er det noen her som eier el-bil?
3. På en vanlig uke, anslagsvis, hvor mange reiser gjennomfører du enten til jobb eller til fritidsaktiviteter?
4. Hvor ofte, anslagsvis, tar du kollektivtransport til jobb eller fritidsaktiviteter?

-Er svarene også gjeldene for tiden før koronapandemien? Eller kan dere tenke dere at svarene endres når pandemien er over?
5. Hva er deres tanker om kollektivtransport og tilbud i Sandnes?
6. Hvorfor (eller hvorfor ikke) tar du kollektivtransport fremfor bil til vanlige ærend. For eksempel til jobb, en tur til byen eller lignende? (Utdype om motivasjon og barrierer til kollektivtransport. Fordeler og ulemper).
7. Rogaland fylkeskommune er ansvarlig for flere relevante transporttiltak. Blant annet ytes det 178 millioner kroner årlig til Kolumbus som tilskudd til drift av bussrutene på Nord Jæren. Hva er deres tanker om dette tilskuddet?
8. I løpet av det siste året har utarbeidelsen av byparken, det som tidligere var en offentlig parkeringsplass like ved Sandnes rutebilstasjon blitt ferdigstilt. Hvordan har dette påvirket deg med tanke på mobilitet?
9. Hvis jeg nevner begrepet «mobility justice» som oversatt til norsk betyr bevegelsesrettferdighet. Hva tenker dere på da, og hva kan begrepet relateres til?
 - a. Kan begrepet mobility justice relateres til deg selv og dine reisevaner? På hvilken måte?
 - b. Hvis jeg sier begrepet mobility justice kan linkes til blant annet infrastruktur, bruk av tid, ferdigheter, tidsbruk, økonomi, kjønn, alder, helse og tilgjengelighet. Kan dere relatere noen av disse begrepene til transportsystemet på ditt hjemsted eller til deg selv?
10. Staten har bevilget 800 millioner kroner til utbedring av kollektivtilbudet på Nord Jæren i en tiårsperiode fra 2020-2029. Hvis du hadde mulighet til å påvirke denne utbedringen, hvordan ville kollektivtilbudet på Nord Jæren sett ut i år 2029?
11. Jeg vil gjerne at dere tenker tilbake på livet deres. På hvilken måte har mobiliteten (reisevanene) deres endret seg gjennom livet? Her vil jeg gjerne minne dere på igjen

om å ikke omtale tredjepersoner som en del av svaret deres.

12. Er kollektivsystemet i Sandnes rettferdig?

13. Hva tenker dere om biler? Burde fossilbiler forbys?

14. Hva tenker dere om klimaendringer, og påvirker klimaendringer din mobilitet?

Forskningsprosjekt - mobilitet i Sandnes

Studien gjennomføres anonymt som en del av masteroppgave i Energi, Miljø og Samfunn ved Universitetet i Stavanger. Tusen takk for ditt bidrag!

1. Anslagsvis hvor mange reiser utfører du en gjennomsnittlig uke?

2. Har du tilgang på bil?

3. Hvorfor (eller hvorfor ikke) tar du kollektivtransport over bil til hverdagsaktiviteter?

4. Beskriv kort hva du syntes om 'nye ruten' inkludert byparken (tidligere parkeringsplass ved Sandnes rutebilstasjon).

5. Har Sandnes ett rettferdig kollektivsystem? Beskriv kort hvorfor/hvorfor ikke

6. Hva tenker du om klimaendringer, og påvirker klimaendringer din mobilitet?

7. Hva tenker du om fossilbiler? Burde de forbys?

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