In general, in the transport sector, it is a male dominated sector. As soon as I move to more mobility and especially sustainable mobility, women come into the picture"

(Weinreich, 2020)

"I definitely feel that Sweden is much more into this subject [gender] than we are in Denmark. And maybe this is - I'm just making a disclaimer because now I'm being very Danish, right? My feeling towards this is: just make some safe infrastructure for everyone"

(Hjuler, 2020)

"I think it's both the people that are saying, 'gender equality is a thing in Denmark - it's not a problem - things are going very well - I don't see the problem myself - and we are well educated people, we have solved that problem', and the people who are thinking, 'if we go down that road and take that discussion, then we will be labeled as the feminists'"

(Schousboe, 2020)

Gendered transport planning:
how Danish transport planning processes blackbox gender

"You won't get anywhere with the 'f'-word [feminism], in Denmark at least"

(Sødring and Wille-Garvin, 2020)

"We talk in no way about gender when we plan something – in no way"

(Nielsen, 2020)

Alexandra Pickett Porrazzo
Caroline Samson

Sustainable Cities – Aalborg University
Master's thesis
June 2020

"I think the more diverse kind of design teams and user groups and input you can get, the better the project will be"

(Winther, 2020)

"I'm actually quite confident that we will explore it more because we are going to get more opportunities with our new systems"

(Hejlskov, 2020)

Master's program:
Sustainable Cities
Aalborg University, Copenhagen

Authors:
Alexandra Pickett Porrazzo
Caroline Samson

Supervisor:
Malene Freudendal-Pedersen

Date:
June 4, 2020

Number of normal pages:
72

Abstract

In cities across the world, studies have shown that gender impacts the way people use transport systems, and the reason why they travel differently. Differences in how and why women and men travel differently, on average, are seen to be partially a matter of choice, and partially a matter of constraint. Furthermore, these differences are recognized as having significant consequences, especially for social and environmental sustainability. In a European context, gendered differences have been increasingly acknowledged as relevant for transport planners to consider in their planning processes. Transport planning, however, is a traditional discipline, where considering more social, 'soft', or qualitative elements may not come naturally.

This thesis studies the intersection of transport and gender in Denmark. The Danish context is considered particularly interesting because of a found reluctance in Denmark towards issues of inequality and general discussions about feminism. Blackboxing is identified as a useful theory to describe and unpack transport planning processes, and the ways in which they standardize and simplify elements such as gender. A literature review results in the assumption that gender is being blackboxed in Danish transport planning, and leads to the research question, '**to what extent and why is gender blackboxed in Danish transport planning?**' Interviews with ten Danish transport planners are utilized to gain insight into what elements of Danish transport planning are blackboxing gender, and why gender is blackboxed, according to the Danish transport planners.

Elements of transport planning processes such as data collection, data analysis, and user group identification are pointed out as having many parts which blackbox gender, perhaps unbeknownst to the transport planners. Reasons given by the transport planners for a more active lack of consideration for gender include, a lack of knowledge about how to consider gender, obstructive elements of personal and national identity, and asymmetrical perceptions of their organizations' roles. It is found that gender is blackboxed to a great extent, through various transport planning processes and for interrelated reasons.

Preface

This master's thesis is presented as the culminating project for the degree of Master of Engineering in Sustainable Cities from Aalborg University in Copenhagen. Written between February 3, 2020 and June 4, 2020, this thesis builds off of empirical data which was gathered in the same time period.

The COVID19 crisis and the consequences of the lock-down of society and the university since March 13, 2020 influenced the activities that have been possible to stage and carry out as part of this thesis. This means that activities have been limited to online activities. The most direct effect to this thesis was the uncertainty created at the organizations where our interviewees work, and our inability to conduct our interviews in-person. Luckily, we had set up interviews with almost all of our desired interviewees before COVID19 'hit' Denmark. All but one interview were able to be switched to virtual interviews. Any contact we made after Denmark's lock down, however, was turned down. Furthermore, the conduction of virtual interviews was impacted with small connection issues. When assessing this thesis, please bear this in mind.

We would like to express a deep gratitude to our supervisor, Malene Freudendal-Pedersen for her steadfast support, critical eye, and belief in us. Thanks also to those persons interviewed – Michala Hvidt Breengaard, Leif Gjesing Hansen, Mette Hejlskov, Sidsel Birk Hjuler, Christian Møller, Kåre Stig Nielsen, Caroline Schousboe, Sten Sødring, Marianne Weinreich, Sara Wille-Garvin, and Kristian Winther – for sharing their experiences, giving their time, and having the flexibility and willingness to meet virtually on short notice. Special thanks are also given to Caroline Schousboe, Ida Ørum Groth, Jan Erik Schneider-Tilli, Michala Hvidt Breengaard, and Søren Have for their insight into this subject and relevant connections. Lastly, we would like to thank our respective families and loved ones for giving us love, keeping us fed, and providing us support from near and afar.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

DTU - Danish Technical University

EIGE - European Institute for Gender Equality

GPG - Gender pay gap

OTM - Ørestadstrafikmodel

PRM - Persons with Reduced Mobility

TU - Transportundersøgelse

Chapter 1

Introduction

Developing a sustainable city requires the effort and collaboration of planners across many sectors to make decisions which improve the environmental, economic, and social impact of their work. Danish transport planners are currently maintaining and designing a system which, as of 2016, is not only responsible for 36% of energy-related CO_2 emissions in Denmark (Ahanchian et al., 2019; International Energy Agency and Norden, 2016), but also enables and reacts to the labour market, health care organizations, educational institutions, and other services required by citizens within the Danish welfare state (EIGE, 2016). The work of Danish transport planners can thus be seen as being highly relevant to the environmental, economic, and social sustainability of Danish cities.

Within the transport sector, gender equality has been shown to be related and important to the sustainability of that sector (Hanson, 2010; Singh, 2019; Umaña-Barrios and Gil, 2017). The gender breakdown of transport planners has, for example, been on the EU agenda for many years in the aim of optimizing environmental, economic, and social benefits for society (European Economic and Social Committee, 2015). While one researcher has argued that environmental sustainability is inseparable from gender equality in transport (Hanson, 2010), others have argued that women can be seen as change agents to lead the way to a more sustainable city (Trivector, 2019). Along another vein, the Norwegian transport and gender researcher Hjorthol (2008) argues that, "the study of men and women's daily travel patterns can be seen as a 'barometer' of the state of equality between men and women in society" (Hjorthol, 2008, p. 206). Gender can be seen both as a useful tool to advance the sustainability of a city's transport system, and as an approach to increase gender equality in that city.

One concept which describes the inclusion of gender in transport is that of the 'gender gap' (Criado Perez, 2019). In the context of the transport sector, the gender gap refers not only to how and why, on average, women and men travel differently, but also to differences in the treatment, employment, and role of the average woman and the average man within the transport sector. Both globally, within Europe, and in a Danish context, research has shown that the average woman and the average man use the transport system in different ways (Beall, 1996; Christiansen and Baescu, 2019; Frändberg and Vilhelmson, 2011; Polk, 1998; Singh, 2019) and that there are a variety of reasons for these differences (CIVITAS, 2014; Sovacool et al., 2019). Transport planners are overwhelmingly male (EIGE, 2016; European Economic and Social Committee, 2015; Kronsell et al., 2016; Mejia-Dorantes,

2019); and design parameters seem to reflect both the male body (e.g. car safety tests (Forman et al., 2019; Transportation Research Board, 2006)) and assume the travel patterns of the average male (e.g. focus on commuter routes (Foster, 2018)).

In the context of the gender gap, some researchers argue that transport planners, "need to move towards a gender-aware planning process since most planning activities have been and continues to be gender-blind" (University of Copenhagen, 2007, p. 36). Some researchers have pointed to the positive economic benefits of implementing policies to increase gender equality (Bachtrögler et al., 2019). Similarly, positive externalities, such as decreased healthcare system costs, have been catalogued in Sweden ('Gender Equal Snow Clearing in Karlskoga', 2020). Other researchers have pointed to the negative environmental consequences (Kronsell et al., 2016) and furthered social inequalities (De Madariaga, 2013) of the current processes of designing a transport system around travel behaviour which resembles that of the average man (Singh, 2019).

Many recommendations for addressing the gender gap exist for transport planners in a European context (e.g. Faith-Ell and Levin, 2013; International Transport Forum, 2019; Kronsell et al., 2016; United Nations Economic and Social Council, 2008; University of Copenhagen, 2007; Women Mobilize Women, 2020). Some recommendations are more general; others refer specifically to gender mainstreaming[1] as a political strategy. At the transport planning level, however, recommendations do not seem to be systematically taken into account in practice (Antonson and Levin, 2018). In Europe, some researchers posit that this is because of a, "general low awareness level of the existing links between gender, mobility and sustainable development" (CIVITAS, 2014, p. 23). There seems to be ineffectual dissemination of best practice, also in Denmark (Breengaard, 2020).

In Denmark, even less research has been done in terms of the intersection of transport and gender than its neighboring Nordic countries (Breengaard, 2020). Furthermore, there is a general lack of public debate around gender (Nielsen, 2016), and issues of gender and diversity are not put forward as key

[1] According to the European Institute for Gender Equality (EIGE), gender mainstreaming is a strategy used to integrate a gender perspective in all policies and programs in the aims of increasing gender equality and decreasing discrimination (EIGE, n.d.).

elements in the curriculums of technical educations[2]. From a Danish perspective, these patterns may be expected, as gender inequality is generally not discussed (Freudendal-Pedersen, 2013). From a removed, international perspective, however, it may seem strange not to discuss a topic which could both improve gender equality and support national sustainability targets. In this thesis, this removed perspective is used to question the inner workings of the transport sector within the larger Danish cultural context. In order to do so, it explores the deeds and thoughts of the transport planners who work within this sector.

To fully understand the extent to which gender is being considered in Danish transport planning, blackboxing theory is used to structure and unpack the transport planning processes of Danish transport planners. Blackboxing describes the process through which complex technologies and processes make assumptions and standardize nuances and complexities (Latour, 1999). Blackboxing has previously been used to study policy makers behind certain technologies (Dorpenyo, 2019), to consider systems and processes as sites of standardization (Gössling et al., 2016), and to look at transport planning as a system which involves a complex network of blackboxed parts (Nostikasari, 2015).

Blackboxing is understood as being an inevitable process engaged with by actors such as transport planners in order to simplify and make sense of a complex world. Furthermore, blackboxing is seen as a particularly useful tool to identify gender gaps because gender, and especially women's experiences, are often blackboxed within old technologies and standardized processes (Criado Perez, 2019; Harding, 1986; Martin, 1991; Star, 1991). Equipped with the knowledge of gender gaps in transport systems and an assumption that gender is blackboxed in Danish transport planning, this thesis aims to answer the following research question:

To what extent and why is gender being blackboxed in Danish transport planning?

[2] The curriculums of a handful of technical educations at Danish Technical University, Aalborg University, and Copenhagen University were researched in a Google search.

In order to answer this research question, two sub-questions are explored, discussed, and answered:

1. **What** elements of transport planning processes blackbox gender in a Danish context?
2. **Why** are gendered elements blackboxed according to Danish transport planners?

While the '**what**' question uncovers blackboxing processes which may be passive or unbeknownst to the transport planners, the '**why**' question looks at reasons that the transport planners themselves may choose to actively not consider gender. In this way, a more holistic understanding is gained: the physical tools are explored, organizational cultures are uncovered, and Danish identity is discussed. Ultimately, in understanding the extent to which and why gender is blackboxed in Danish transport planning, this thesis lays the groundwork for how to increase gender considerations in this specific context.

1.1 Report structure

To answer the research question, this thesis is structured as follows:

In the rest of this chapter, a brief scoping is presented, and terminology defined. Chapter 2 then lays out the theoretical context for this thesis. This theoretical context can also be seen as an exploration and justification of the assumption that gender is blackboxed in transport planning in Denmark. It consists of a literature review which presents state-of-the-art knowledge of the intersection between transport, gender, and Denmark. This knowledge is based on research about Denmark, where available, and Europe, where Danish specific data is lacking. It ends up exposing the assumptions made about gender in the transport world and the hidden nature of gender in Denmark.

Chapter 3 builds on this context, describing blackboxing theory as a way to look into simplified assumptions and hidden nuances within technical processes. Chapter 4 then presents the methodology used in this thesis, including an analytical framework. The analytical framework describes specifically how blackboxing is used as a tool to structure Chapter 5.

Chapter 5 is an analytical discussion based on interviews and an email exchange with ten Danish transport planners. It analyzes the planning

processes which transport planners are engaging in that blackbox gender in Danish transport planning, and the reasons identified by the transport planners themselves about why they blackbox gender. Furthermore, small discussions 'interrupt' the analysis, tying links to the theoretical context from Chapter 2 and the blackboxing theory from Chapter 3. Chapter 5 first answers the '**what**' sub-question and then the '**why**' sub-question, building from section to section using the proposed framework, as presented in Section 4.4.

Chapter 6 concludes on the research question, summing up what planning processes transport planners are engaged in which can be seen as blackboxing gender, and the reasons they identify for why they actively engage in processes which blackbox gender. Ultimately, this chapter concludes on the extent to which and why gender is being blackboxed in Danish transport planning. Furthermore, it includes a methodological reflection, pointing out how the methods used have affected the results of this thesis.

Using the conclusions, Chapter 7 presents some recommendations for transport planners. It does not add anything to the research question but is an extra element that sheds more light on how Danish transport planners could move forward after reading this thesis.

1.2 Scope

The knowledge gap about gendered transport in general, and especially in a Danish context, is quite large. There are many directions that this thesis could have taken to start to close that gap. For one, this thesis uses interviews with one, and in some cases two, transport planners at each included organization. Instead, it could have looked deeper into one organization and dug into their planning processes, assessing also specific organizational cultures. For another, this thesis uses a relatively broad definition of 'transport planner' and thus includes transport planners from a wide range of organizations, from political institutions to consultancies to architectural firms. Instead, it could have delved into the processes of one type of organization, focusing on the role of consultancies, for example, in blackboxing gender in transport planning. On a different scale, this thesis considers the interviewed transport planners as representatives of their organizations. It could have more directly focused on their individual identities and analyzed blackboxing processes using this perspective more

actively. Instead, this thesis is focused on gaining a broader understanding of transport planners in Denmark. Ultimately this results in a piece of work which can be used as a steppingstone to further research the role of transport planners globally in blackboxing gender. Moreover, it results in the identification of elements to be aware of when developing context-sensitive steps for Danish transport planners to take.

On another note, it is important to scope this study with regard to its focus on gender, and in some cases, women's experiences specifically, as a blackboxed element in Danish transport planning. In the case of gender, in most cultures, societies, and communities, women are a marginalized group which is negatively impacted by gender being blackboxed. Moreover, the blackboxed nature of women's experiences are seen as having a negative impact on transport planning. While this thesis emphasizes the positive impacts considering gender in transport planning has for women, it also recognizes the benefits to everyone when women are considered. Furthermore, while this thesis focuses mainly on women and men as the genders seen or not seen in transport planning, it acknowledges the existence of other genders. In addition, the focus on gender in this thesis is seen as a steppingstone to a more nuanced, intersectional exposure of the transport world. Socio-economic status, age, race, ethnicity, immigration status, and sexual identity are other identifiers which may have separate or synergistic effects on travel behaviour and patterns. With this in mind, this thesis should be seen as a steppingstone to further studies which can build off of the findings with a more nuanced eye.

Lastly, as mentioned, this thesis is scoped to a Danish context. While the types of questions proposed could be transposed to study other localities, the assumptions and findings are not. The thesis benefits from this scoping in that the findings should be directly applicable to Danish transport planners.

1.3 Terminology

The terms found in Table 1 are defined for the context of this thesis.

Table 1: Terminology

Term	*Definition*
Average[3] woman or man	a woman or man who displays behaviour and characteristics shown to be typical to the group of which they are a part.
Gender	socially constructed. Norms and expectations are dependent upon and contribute to both the idea of a gender and the eventual socialization of individuals who identify as that gender.
Gender equal (**ratio**)	any group where the breakdown of women to men is between 50/50 and 40/60.
Mobility[4]	the ability of people to move from one place to another.
Planning processes	data collection, data analysis, marketing, user targeting, design of transport vehicles and infrastructure, route planning, and funding.
Transport	"the movement of people or goods from one place to another" ('Transport', n.d.).
Transport gender gap	the difference in how and why women and men travel. It also refers to gendered inequalities in hiring and education of people working within transport.
Transport planners	professionals working with elements related to the creation of the transport system.

[3] The 'average' is important to bear in mind, as this thesis discusses general travel behaviour of groups which are heterogeneous and made up of individuals who are affected by other demographics as well (Beall, 1996).

[4] While this thesis focuses on transport planners who are working with transport (i.e. moving people), it also touches the field of mobility (i.e. the ability of people to move). Furthermore, mobility is increasingly a part of transport planners' work; this is apparent in not only the names of some of the departments within the organizations, but also in the way that some transport planners talk about their own work.

Chapter 2

The transport gender gap and its context

This chapter sets the theoretical context of this thesis. It delves into the connection between transport, gender, and Denmark, thus exploring the assumption that gender is blackboxed in transport planning in Denmark. The first section of this chapter elaborates on how gender is perceived in Denmark. The following sections uncover researched connections between transport and gender. Altogether, this chapter lays out the context in which the transport planners studied in this thesis work.

2.1 Gender in Denmark

According to a recent report put out by the World Economic Forum in 2019, Denmark ranked 14 out of 153 countries in gender equality (World Economic Forum, 2019). Given its otherwise 'high' status as a leader in gender equality (McKinsey & Company and Innovation Fund Denmark, 2018), it is interesting to see how Denmark is not only far from equal, but also that it ranks surprisingly low compared to other Nordic countries[5] (Pedersen, 2019). As Borchorst and Siim (2008) write, "it is remarkable that the majority of the Swedish political parties today call themselves feminist, whereas gender issues are placed low on the political agenda in Denmark, and the political significance of gender is limited" (Borchorst and Siim, 2008, p. 211). While Sweden attempts to revise existing organizational cultures and Norway attempts to create equal opportunities, Denmark attempts to 'fix' women (Nielsen, 2016). The following section depicts various perspectives on why Denmark, a relatively equal country, struggles with addressing gender equality, especially compared to its Scandinavian neighbors.

Freudendal-Pedersen (2013) writes about the general reluctance of Nordic people to talk about social differences, including gender. She posits that, "in a country like Denmark, wanting to represent a modern and equal society, it is simply not ideologically correct to articulate social, economic or cultural differences" (Freudendal-Pedersen, 2013, p. 213). According to Freudendal-Pedersen (2013), people in the Nordic countries feel like they are a part of the middle class, strive to be part of the 'norm', and see themselves as equal in the eyes of the government and each other. Acknowledging differences in experience, like those resulting in gendered travel behaviour, for example, may be interpreted as an attack on one's identity and the success of the Nordic welfare system (Freudendal-Pedersen, 2013). People evade talking about social differences because those differences, such as differences

[5] Iceland, Norway, Finland, and Sweden ranked 1, 2, 3, and 4, respectively.

between genders, "are in direct conflict with Nordic people's understanding of themselves" (Freudendal-Pedersen, 2013, pp. 212–213).

As an example, Freudendal-Pedersen (2013) points to a statistic which shows that, "men drive 32 percent more than women in Denmark, but gendered mobilities fall into the same category as class, and are seldom articulated in either the media or research" (Freudendal-Pedersen, 2013, p. 213). These differences are avoided rather than dissected in both the initial research on mobility, and also on the dissemination of that research to the general public and planning communities. Moreover, while Freudendal-Pedersen (2013) mostly discusses Nordic welfare-state conditions generally, she still differentiates Denmark from its neighbors, writing, "it is safe to say that both Norway and Sweden are more articulate about these issues than Denmark" (Freudendal-Pedersen, 2013, p. 217).

Andersen and Samshiri-Petersen (2016) find indicators that Danes, compared to Norwegians and Swedes, "are more stuck in the maintenance of traditional gender roles" and less concerned with gender equality as a problem (Andersen and Shamshiri-Petersen, 2016, p. 7). In a multitude of categories, they find that Danes' perception of gender equality and gender differences differ significantly from those of Norwegians and Swedes. For example, they find that, "the support for gender equality is surprisingly low in Denmark" (Andersen and Shamshiri-Petersen, 2016, p. 10), and that, "altogether, Norwegians and Swedes are somewhat more concerned with ignorance and substantially more concerned with discrimination than the Danes" (Andersen and Shamshiri-Petersen, 2016, p. 13). Further, "Norwegian and in particular Swedish respondents are more inclined than the Danes to see under-representation of women on top positions as a problem" (Andersen and Shamshiri-Petersen, 2016, p. 13); and with regard to gender quota requirements[6], Danish support, "is extremely low, 12 per cent among women and 8 per cent among men. In Norway and Sweden, the proportions are 30 and 25 per cent, respectively – and substantially higher than among men" (Andersen and Shamshiri-Petersen, 2016, p. 15).

Borchorst et al. (cited in Nielsen, 2016) write about the history of the feminist movement in Denmark, and how it may not only explain the current lack of

[6] Since 2012, there has existed a non-binding requirement for, "the largest Danish companies to set targets for female representation on corporate boards" (Danish Business Authority (2017) in McKinsey & Company and Innovation Fund Denmark, 2018, p. 23).

strong discourse, but also a point of departure from Norway and Sweden. They posit that the strong empowerment discourse which exists in Denmark today, emanated, "from the bottom-up activities of a powerful Danish women's movement during the 1970s and 1980s" (Borchorst et al., cited in Nielsen, 2016, p. 4). However, while the women's movement led to many different perspectives on the role of women in society in many other countries in the 1990s, it consolidated into one perspective, the empowerment perspective, in both public and political debates in Denmark. In Norway and Sweden, "feminist scholars have been more directly engaged in the public and political debates", leading to a, "higher degree of impact on public policy development as well as awareness in the public arena" (Borchorst et al., cited in Nielsen, 2016, p. 4). Different prevailing feminist perspectives in Norway and Sweden meant the active and public discussion of those perspectives. Sweden, specifically, has since the 1970s been a forerunner, "in introducing policies promoting the economic independence of women, the reconciliation of parenthood and working life, women's labour market participation and women's political representation" (Bastian and Börjesson, 2018, pp. 71–72). Meanwhile in Denmark, gender equality adopted a 'taken-for-granted status' (Nielsen, 2016).

Borchorst and Siim (2008) problematize the predominating idea that welfare-state models like those found in the Scandinavian countries are women friendly, as postulated in the late 1980s by Norwegian political scientist Helga Hernes. Borchorst and Siim (2008) argue that, "new challenges related to globalization and multiculturalism have changed the social conditions for women-friendliness and state feminism" (Borchorst and Siim, 2008, p. 221). In their problematization, they use Denmark as a case to show that even in a welfare-state with a prominent women's movement, there can still result, "weak institutionalization of gender equality policies", a, "failure of state feminism", and a, "growing gap between the official version of gender equality and feminist accounts" (Borchorst and Siim, 2008, p. 218). Moving forward, they call for structural changes in social and equality policies which recognize the class, gender, and cultural diversity of women.

Nielsen (2016) writes about the impact of the 'taken-for-granted status' and apathetic attitude towards gender equality in Denmark on the Danish research system. He finds that, "Norwegian and Swedish legislative frameworks provide clearer structures of responsibility for universities' work with [gender equality] than what is the case in Denmark" (Nielsen, 2016, p. 33). This may explain the disparity between women and men professors,

where, as of 2017, "Denmark holds the lowest representation of women professors in each of the main scientific fields" (Nielsen, 2016, p. 5). Nielsen (2016) argues that gender equality concerns in academic institutions are closely tied to the governance of and policy engagement with gender equality concerns; and, "women researchers may potentially also lead to more active [gender equality] work" (Nielsen, 2016, p. 36).

Breengaard (2020) is one of the few researchers studying gender alongside transport in Denmark. Breengaard (2020) posits that there are few researchers in the area because, "we [Danes] consider ourselves to be very equal" and also because feminism, more specifically, is, "kind of a dangerous topic in Denmark". Breengaard (2020) believes that transport planners play a huge role in including gender into transport planning. Currently, however, she argues that transport planners do not have the knowledge about how to consider gender in their planning (Breengaard, 2020). In addition to this lack of knowledge, Breengaard (2020) points to certain cultural beliefs as a reason for the lack of gender considerations in Denmark. She poses reasons why, for example, Danish and Swedish gender politics differ:

> "We [Danes] follow the population rather than making policies to change things. And it's a very slow process. And then I think it's also that we have this more liberal idea, that everybody has the same opportunities, that it's not about gender" (Breengaard, 2020).

As previous research exposes, there seems to be a unique relationship between gender, policy, and planning in Denmark (Andersen and Shamshiri-Petersen, 2016; Breengaard, 2020; Nielsen, 2016).

This section has addressed Denmark's relationship to gender equality, especially compared to Norway and Sweden. Where Freudendal-Pedersen (2013) points to the Nordic welfare state to explain the reluctance of Danes to address general inequality, Andersen and Shamshiri-Petersen (2016) posit that Danes are even more resistant to opinions which discuss and encourage gender equality. Meanwhile, Borchorst et al. (cited in Nielsen, 2016) point to the early consolidation of the feminist movement as an explanation for the 'taken-for-granted status' which gender equality has in Denmark. Borchorst and Siim (2008) further argue that the growing diversity of women in Denmark calls for a reassessment of that status. Lastly, Breengaard (2020) confirms the presence of these conversations in the Danish transport planning 'world'.

2.2 Gender and transport

The following section describes the intersection of gender and transport. It first lays out the differences between the transport patterns of the average woman and the average man. Second, it expands on possible reasons for why gendered transport patterns exist and persist. In order to do so, it describes average differences between women and men as transport users. Third, it depicts the ways in which transport planners may struggle to account for those differences. Fourth, it outlines some general recommendations that exist about how to make gender considerations in the transport sector. Last, it considers certain complicating factors, or ways in which gender is not the only relevant identifier in transport planning. By the end of this section, the gender gaps of transport and transport planning should be apparent.

2.2.1 Transport patterns

There is a growing evidence that women and men use the transport system in different ways (Beall, 1996; Frändberg and Vilhelmson, 2011; Polk, 1998; Uteng and Cresswell, 2008). This section describes and illustrates some of the differences between how women and men travel, on average.

A

Figure 1: Transport pattern A

Women are more likely to travel shorter distances than men

(Breengaard and Oldrup, 2009; Christiansen and Baescu, 2019; CIVITAS, 2014; De Madariaga, 2013; EIGE, 2016; Frändberg and Vilhelmson, 2011; Sovacool et al., 2018)

B

Figure 2: Transport pattern B

Women are more likely to escort other passengers, such as children and elderly people

(Christiansen and Baescu, 2019; CIVITAS, 2014; Greed and Reeves, 2005; Hjorthol and Næss, 2006; Sovacool et al., 2018)

C

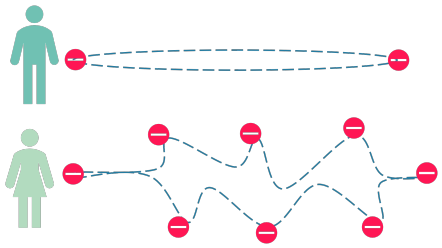


Figure 3: Transport pattern C

Women are more likely to trip chain

(Breengaard and Oldrup, 2009; CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013; EIGE, 2016; Frändberg and Vilhelmson, 2011; Greed and Reeves, 2005; 'Women Mobilize Women', n.d.)

D

Figure 4: Transport pattern D

Women tend to travel shorter distances to work

(CIVITAS, 2014; Hjorthol and Næss, 2006; Næss, 2008; Sandow and Westin, 2010)

E

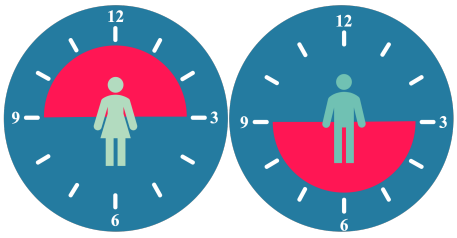


Figure 5: Transport pattern E

Men are more likely to travel for work-related trips during rush hours

(Beall, 1996; CIVITAS, 2014; EIGE, 2016; Greed and Reeves, 2005)

F

Figure 6: Transport pattern F

Women are less willing to travel after dark

(EIGE, 2016)

G

Figure 7: Transport pattern G

Women tend to walk, bike, and use public transport more than men

(Breengaard and Oldrup, 2009; Christiansen and Baescu, 2019; CIVITAS, 2014; De Madariaga, 2013; Frändberg and Vilhelmson, 2011; Gauquelin, 2020; Hjorthol, 2008; Jørgensen, 2008; Kronsell et al., 2016; Næss, 2008; Sovacool et al., 2019)

H

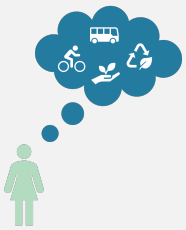


Figure 8: Transport pattern H

Women are more willing to adapt to more sustainable transport modes than men

(CIVITAS, 2014; EIGE, 2016; Hjorthol, 2008; Kronsell et al., 2016; Polk, 1998; Sovacool et al., 2018)

I

Figure 9: Transport pattern I

Men tend to use cars, motorcycles, e-scooters, segways, scooters, and skateboards more than women

(Christiansen and Baescu, 2019; CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013; Frändberg and Vilhelmson, 2011; Gauquelin, 2020; Sovacool et al., 2019)

J

Figure 10: Transport pattern J

Men are more likely to own a car – both combustion and electric – than women

(Beall, 1996; CIVITAS, 2014; EIGE, 2016; Greed and Reeves, 2005; Sovacool et al., 2019)

K

Figure 11: Transport pattern K

Men are more likely to use sharing-services, such as bike-sharing and car-sharing

(Alonso-Almeida, 2019; Breengaard, 2020)

L

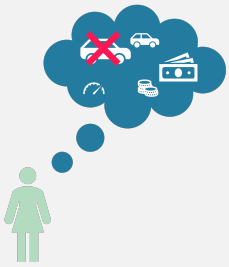


Figure 12: Transport pattern L

Women have stronger preferences for safety and convenience when driving a car – often preferring smaller, more fuel-efficient, and less expensive cars – compared to men

(Sovacool et al., 2019, 2018)

M

Figure 13: Transport pattern M

Women tend to be safer drivers

(CIVITAS, 2014; EIGE, 2016; Jørgensen, 2008; Prati et al., 2019; Sovacool et al., 2019)

N

Figure 14: Transport pattern N

Women are less likely to be involved in car crashes, but are more likely to be injured than men when involved in car crashes

(Forman et al., 2019; Transportation Research Board, 2006)

2.2.2 Gendered needs and values

The section above demonstrates the different ways in which women and men travel, on average. The following section elaborates on some of the reasons for these differences, expounding upon the different values and needs women and men have, on average. In this way, the socially constructed nature of gender is emphasized. First, gendered differences in values are laid out. Then gendered needs based on three different phenomena are described: paid work, unpaid work, and safety. It should be noted that while each of these values and needs is discussed separately, they are all closely connected, and the descriptions reflect this.

Feminine and masculine values

One reason given for why women and men travel differently, on average, is that different values are attributed to both certain forms of transportation and to femininity or masculinity (Breengaard, 2020; Breengaard and Oldrup, 2009; EIGE, 2012; Kronsell et al., 2016; Sovacool et al., 2019, 2018; Uteng and Cresswell, 2008). Speed and power, for example, are values which have often been associated with both cars, and also masculinity (Breengaard and Oldrup, 2009; Sovacool et al., 2019). To that point, Breengaard and Oldrup (2009) argue that,

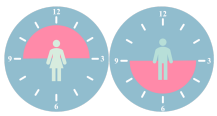
> "cultural conceptions of cars are linked to a gendered universe, where control of technology and fascination with speed is associated with masculine competence, while women's relationship with cars arises from use value, safety, and responsibility" (Breengaard and Oldrup, 2009, p. 13).

Similarly, in studying electric vehicles, Sovacool et al. (2019) find that, "women reported attaching less importance to design attributes such as speed, power, or sound, whereas men reported prioritizing speed, acceleration, status, and (at times) sex appeal" (Sovacool et al., 2019, p. 200). The general connection between men, masculinity, and car use could explain, in part, patterns I, J, and K.

Valuing sustainability, on the other hand, has been argued to be associated more with femininity (EIGE, 2012; Sovacool et al., 2018). Women have not only been shown, on average, to use more low-carbon forms of transportation than men (CIVITAS, 2014; EIGE, 2016; Hjorthol, 2008; Kronsell et al., 2016; Polk, 1998; Sovacool et al., 2018), but also to value climate conscious behaviour more. A Danish study, for example, shows that, "62% of women and 54% of men stated that they would be willing to pay more for sustainable goods" (EIGE, 2012, p. 22). Similarly, "in Sweden, nearly 80% of women and 65% of men say it is important to take action against climate change" (EIGE, 2012, p. 28). Sovacool et al. (2018) puts forward research which argues not only that, "women hold more pro-environmental or pro-sustainability values" (Sovacool et al., 2018, p. 88), but also that transport preferences such as for smaller cars or cycling could result from these values. Female values and corresponding preferences for low-carbon forms of transportation could explain, in part, patterns G, H, and L.

Paid work: the labour market

Gendered transport can also be partly explained by differences between the average woman's and man's experiences in the labour market (Beall, 1996; Breengaard and Oldrup, 2009; CIVITAS, 2014; De Madariaga, 2013; Sandow and Westin, 2010; Singh, 2019). Gender is relevant to the average person's experience in the labour market in many ways, three of which are discussed here: part-time work, the gender pay gap, and location of the workplace.



First, gender is related to part-time work in that throughout Europe, women are more likely to hold part-time work than men (CIVITAS, 2014; De Madariaga, 2013; EIGE, 2016; European Union, 2013; Eurostat, 2019). According to Eurostat data, 8.4% of men in the EU were employed part-time in 2019, compared to 29.9% of women. In Denmark 15.3% of men worked part-time, compared to 33.9% of women. Meanwhile, in Denmark, female part-time workers worked fewer hours per week (14.7 hours) compared to male part-time workers (20.4 hours) (European Union, 2013). Differing hours spent in places of 'typical' employment could explain, in part, pattern E: while men spend the 'typical' workday at a 'typical' workplace, and travel within rush hours, women are more likely to travel outside of rush hours.

Part-time work is closely connected to another way in which the average woman and man experience the labour market: the gender pay gap (European Union, 2013; Hjorthol, 2008). The gender pay gap, "abbreviated as GPG, refers to the difference in average wages between men and women" (European Union, 2013, p. 220). According to the European Union (2018), in 2016 the GPG in Denmark was 15%[7] (European Union, 2018). Further, data from 2011 shows that the GPG differed between part-time work (2.6%) and full-time work (17.3%), and also between the public sector (13.5%) and private sector (18.2%) (European Union, 2013). This trend could explain the fact that women are more conscious of the economic impact of travel (Beall, 1996; CIVITAS, 2014; EIGE, 2016; Hjorthol, 2008; Hjorthol and Næss, 2006), and correspondingly, patterns G, J, and L.

Third, differences between the location and type of work that women and men hold, on average, might explain some elements of gendered travel patterns (Breengaard, 2020; Breengaard and Oldrup, 2009; Singh, 2019). According to Breengaard and Oldrup (2009),

> "studies show that in terms of locations, the labour market is divided by gender, with workplaces that employ mostly men (for example, the financial/white-collar sector) usually situated in city centres, whereas workplaces with predominantly female occupations (schools, kindergartens) are spread throughout suburban areas" (Breengaard and Oldrup, 2009, p. 13).

[7] 15% refers to the "difference between earnings of male and female employees as a percentage of male earnings" (European Union, 2018, p. 25).

Moreover, Breengaard and Oldrup (2009) point to studies which connect travel distances to power or position in the labour market. Given that women, on average, often occupy positions with less power, "women's shorter travel distances reflect the segregation of the labour market" (Breengaard and Oldrup, 2009, p. 16). The trend of women working in occupations that are located closer to home, and men often working further from home, might explain pattern D.

Unpaid work

Another reason given for why women and men differ in their transport patterns, is the difference in unpaid work completed by women and men, on average. Unpaid work describes household work, care for children and the elderly, and dropping off and picking up children, amongst other things (Beall, 1996; CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013; Frändberg and Vilhelmson, 2011; Gauquelin, 2020; Hjorthol, 2008; Hjorthol and Næss, 2006; Sandow and Westin, 2010). According to the European Institute for Gender Equality (EIGE), "in Denmark and Sweden, women spend around 30 hours per week on unpaid work, while men spend around 20" (EIGE, 2012, p. 25).

On average, women are spending more hours caring for children or elderly people and completing tasks outside of the paid workforce. Beall (1996), for example, posits that,

> "as mothers and carers, women have to escort others. For example, women are most likely to be the ones looking after young children, elderly or sick relatives, and visiting schools and clinics. It is women who assume most domestic and community management responsibilities and women are prevalent in the informal economy. Women engaged in informal sector activities are often burdened with heavy loads" (Beall, 1996, p. 14).

This unpaid work is visible in the transport system. De Madariaga (2013) construes that this is because unpaid work is often considered as a leisure and personal activity, and therefore is not valued by transport planners. Not only are women more likely to escort others while using transport systems, but also to carry other types of baggage while traveling (Damyanovic et al., 2013). Christensen and Breengaard (2019) add to this, arguing that there a need for transport systems as a whole which are planned for different lengths and types of trips, not just to and from a paid place of work. This is in




addition to more practical elements such as working elevators and benches to accommodate for children or bags. Otherwise, as Prati et al. (2019) point out, biking and walking may be considered more practical, convenient, and reliable to many. Patterns A, B, C, and G seem to be partially explained by differences in unpaid work needs.

A few researchers argue that the gender gap in unpaid work and the resulting gendered nature of transport patterns, stem from a patriarchal family structure (Hjorthol, 2008; Singh, 2019; Sovacool et al., 2018). Sovacool et al. (2018), for example, write that it is the,

> "patriarchal nature of gender relations that demand that women subsume responsibility for the private sphere and the household in nurturing and caring roles, thereby limiting women's freedom to assume positions of power or participation in the labor market, and reinforcing gender inequality in patterns of mobility" (Sovacool et al., 2018, p. 89).

Women have been restricted by their duties within a patriarchal family structure (Singh, 2019) and are thus limited in their use of the transport system (Hjorthol, 2008; Sovacool et al., 2018). This can be seen, for example, in the sharing economy, where bike-sharing and car-sharing services do not always offer child seats, thereby excluding users travelling with children (Singh, 2019). Pattern K is partly explained by this.

Safety

Various researchers have studied the way in which the built transport environment affects different genders differently (Christensen and Breengaard, 2019; CIVITAS, 2014; Kronsell et al., 2016; Singh, 2019; Strandbygaard et al., 2020). Within gender studies, some have specifically focused on the effect of the built environment on perceptions of safety (Beall, 1996; Ceccato et al., 2019; CIVITAS, 2014). According to CIVITAS (2014),

> "public transport services often fall short of the quality, safety and comfort measures required by the different target groups such as women, disabled people, the elderly and children. Women are also more exposed to danger through sexual harassment" (CIVITAS, 2014, p. 26).

Compared to the average man, the average woman often both feels unsafe, and is also statistically more at risk for harassment when using public

transport (CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013). Sense of safety is thus an element identified by researchers as being essential to making women feel comfortable and satisfied, especially at public transport stations (Ceccato et al., 2019; CIVITAS, 2014; De Madariaga, 2013; Strandbygaard, 2016; Strandbygaard et al., 2020). This could be a part of the reason for pattern F.

Safety does not only have to do with an individual's sense of safety, but also safety within the built environment. In studying car crashes, the Transportation Research Board (2006) finds that, "women are more likely than men to be injured in crashes of the same severity; however, men's crashes are more likely to be fatal" (Transportation Research Board, 2006, p. 3). According to some research, women are less likely to be involved in crashes in general, and also more severe crashes, because they have a more positive view on the law and safety (e.g. speed limits) (EIGE, 2016; Jørgensen, 2008; Prati et al., 2019; Sovacool et al., 2019; Transportation Research Board, 2006). This could be a reason for patterns M and N.

To explain the phenomenon of women being more likely than men to be injured in the same type of crashes, De Madariaga (2013) comments on differences in average body sizes, writing that, "women's smaller body size and strength have specific implications for the design of spaces, vehicles, and security devices that are often designed to a standard male reference" (De Madariaga, 2013, p. 48). Criado Perez (2019) also asserts the importance of considering different body sizes in design standards and overall transport planning. Further, CIVITAS (2014) points to the connection between safety and accessibility, arguing that, "the design of vehicles on the one hand, and of stations and bus stops on the other, needs several improvements in order to be equally accessible to all users" (CIVITAS, 2014, p. 26).

2.2.3 Gender and planning

The values and needs of women and men can be, to varying degrees, taken into account by transport planners. The work of transport planners is therefore seen both as a part of the reason for why transport patterns are gendered and also as a unique set of concerns. The following section illustrates three problems that transport planners deal with, and as a result, affect gendered transport patterns: a lack of representation of women in the transport sector, a lack of knowledge created about gendered transport, and a historical lack of consideration for gender in transport infrastructure design.

Lack of gender diversity

As earlier uncovered, women are underrepresented in leadership positions and among research professors in Denmark (Andersen and Shamshiri-Petersen, 2016; Nielsen, 2016). Specifically within the transport sector, further issues with gender representation are found (Breengaard, 2020; EIGE, 2016; European Economic and Social Committee, 2015; Kronsell et al., 2016; Mejia-Dorantes, 2019; Polk, 2008).

In a study about gender representation in transport organizations within the EU, Mejia-Dorantes (2019) exposes a gender gap in the number of transport workers. Moreover, she points out that,

> "the gender gap is even higher when we look in detail at the different transport sectors. For example, within the companies, it is evident that departments like Human Resources and other areas that are related to administrative or cleaning tasks have an important rate of female employees. Other departments, which have typical stereotypic jobs like drivers, mechanics or engineering have a remarkably bigger gender gap" (Mejia-Dorantes, 2019, p. 2).

Even in the presence of equal representation within an organization, inequalities can exist within specific job types or departments (Mejia-Dorantes, 2019). Furthermore, decision making positions within transport organizations are often filled by mostly men (EIGE, 2016). According to EIGE (2016),

> "men continue to predominate in decision making in the transport sector. According to the '*Women employment in urban public transport sector*' study, the share of women on management boards is less than 20 % and women represent only 9.3 % of drivers. This means there is an unbalanced participation of women and men in planning and deciding on policy actions, which may affect both women and men citizens" (EIGE, 2016, p. 6).

Using European numbers, the transport sector can be seen to be both run and operated predominantly by men (EIGE, 2016). While there is limited research on the gender breakdown of transport planners in Denmark, Breengaard (2020) found that few transport ministers in Denmark have been

women – 3 out of 61[8], since 1900. Furthermore, in a Swedish study, Kronsell et al. (2016) argue that not only is there an imbalance in the gender breakdown within transport organizations, but also in the power relations within those organizations. They find that,

> "women are involved in groups that have less power in deciding on infrastructure and are assigned to areas that could possibly be coded as less masculine, i.e., the environment. It also seems that there are masculine norms embedded in these processes, as masculinity is connected with good negotiating and competence, but also in the way that gender considerations are ignored" (Kronsell et al., 2016, p. 706).

Polk (2008) problematizes the underrepresentation of women and corresponding overrepresentation of men in the transport sector. She points to the transport manuals produced by this unequal sector, and argues that the resulting solutions and decisions are most often either very technical, or based on the average male body, and the travel behaviour of the average man (Polk, 2008). Overall, while research on gender diversity in Danish transport planning is lacking, the research from European and Swedish perspectives expose a clear pattern: transport planners operate within a sector which lacks gender diversity.

Lack of knowledge

This section has so far illustrated a context for transport planners where there is low gender diversity amongst colleagues in the transport sector. The next contextual element discussed in this section is the lack of research and knowledge that exists about gendered transport. The lack of knowledge about gendered transport is extensive (Criado Perez, 2019); therefore this section focuses especially on the context of Denmark and its immediate neighbors, Norway and Sweden.

According to the Swedish researcher Polk (2008), the lack of knowledge about gender in the transport sector can be seen, in part, as a result of gender being systematically and normatively categorized as a social subject, not as a technical one. Polk (2008) construes that this categorization results in a transport sector where, "traditional goals are prioritized, like adequate road

[8] There have been 61 people who have been the minister responsible for transport since 1900 ('Transportministre fra Danmark', n.d.).

capacity for cars and trucks, minimising congestion, and general safety (zero deaths)" (Polk, 2008, p. 232). Meanwhile, as the Danish researcher Strandbygaard (2016) points out, more qualitative elements of transport such as personal sense of safety and comfort are ignored.

Polk (2008) also points out that a lack of knowledge about the importance of considering gender to the success and sustainability of transport systems is self-fulfilling. When there is little knowledge about the importance of gender, there is little incentive for transport organizations, governments, and universities to put money and other resources into gaining more knowledge. A systematic integration framework is needed, but there is little well disseminated knowledge on what to do with gender in transport (Breengaard, 2020).

According to Breengaard (2020), the data often used by Danish transport planners is that produced by the Danish Technical University (DTU), including their TU data, and what is available in Statbank Denmark (Statistikbanken). This data is not consistently disaggregated by gender[9]. In general, compared to research published in Sweden, and also in Norway, Denmark has very little research about the intersection of transport and gender. There are 60% more peer-reviewed articles about transport and gender published in Sweden, and 40% more in Norway, than there are in Denmark[10]. Furthermore, in Sweden (Faith-Ell and Levin, 2013; Kronsell et al., 2016) and Europe (International Transport Forum, 2019; United Nations Economic and Social Council, 2008; University of Copenhagen, 2007; Women Mobilize Women, 2020), there have been recommendations published for transport planners about how to integrate gender into transport planning. There have not been any specifically in a Danish context; and there is no evidence that Danish transport planners have been using the European recommendations. With that being said, many of the existing recommendations seem to be applicable in a Danish context and are outlined below.

[9] An exploration of the most recently published TU data and the Statistikbanken in May 2020 showed that while there is some published data disaggregated by gender, it is not consistently disaggregated.

[10] See Methodology (Chapter 4) for explanation.

Existing recommendations

Based on the transport gender gap, many organizations, researchers, and practitioners have taken the opportunity to create lists of their best-practice examples and recommendations for transport planners to consider gender in the design and creation of transport systems. This list sheds light on some of the main recommendations for how to take gender into account, embodying the principle that what is good for the average woman, does not make it worse for the average man (Greed and Reeves, 2005). The list is not comprehensive but can be used for transport planners to understand and optimize their role in creating more inclusive transport systems.

- **Engage women in the planning process** (De Madariaga, 2013; European Economic and Social Committee, 2015; Kronsell et al., 2016; Women Mobilize Women, 2020).
- **Hire female workers in all transport related tasks: drivers, stewards, planners, managers, policymakers, decision-makers, etc.** (Christensen and Breengaard, 2019; CIVITAS, 2014; Criado Perez, 2019; Damyanovic et al., 2013; De Madariaga, 2013; EIGE, 2016; European Economic and Social Committee, 2015; Gauquelin, 2020; Kronsell et al., 2016; Women Mobilize Women, 2020).
- **Create and use gender-disaggregated data** (Criado Perez, 2019; De Madariaga, 2013; European Economic and Social Committee, 2015; Women Mobilize Women, 2020).
- **Design public areas with visibility, lighting, and security cameras** (EIGE, 2016; Women Mobilize Women, 2020).
- **Focus on first-mile and last-mile efforts** (CIVITAS, 2014; Damyanovic et al., 2013; Greed and Reeves, 2005; Singh, 2019; Women Mobilize Women, 2020).
- **Plan for 'slow' transport such as walking and cycling** (Damyanovic et al., 2013; Gauquelin, 2020; Women Mobilize Women, 2020).
- **Consider users making non-work-related trips** (De Madariaga, 2013; Women Mobilize Women, 2020).
- **Provide real-time information about public transport schedules** (CIVITAS, 2014; Women Mobilize Women, 2020).
- **Support different needs e.g. different sized shared-cars and include child seats with sharing-services to support parents** (CIVITAS, 2014; De Madariaga, 2013; Prati et al., 2019; Sovacool et al., 2019).
- **Support and do more research** (Breengaard, 2020; European Economic and Social Committee, 2015; Kronsell et al., 2016; Singh, 2019).

Historical lack of consideration

Not only do transport planners operate in a sector in which there is low gender diversity and a lack of knowledge about gendered transport, but they also design using standard procedures which are often developed using assumptions which, albeit unknowingly, prioritize men (Singh, 2019); furthermore, these assumptions often maintain a built environment which has been built for the average man (CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013; European Economic and Social Committee, 2015; Singh, 2019). These two elements are seen as both impacting the work of transport planners, and subsequently, user behaviour.

First, Singh (2019) writes about standards which lock transport planners into certain planning methods. She writes,

> "urban transport planning and policy-making still follow the standards, procedures and methodologies that were developed in the industrialized world with a clear bias in favour of the work trips … such methods were assumed to be gender-neutral since the focus was not on planning for people, but for cars. However, the division of roles and responsibilities in a traditional society meant that men made trips to work using motorized means of transport and women were left to take care of all the other non-work trips" (Singh, 2019, p. 4).

Standards which favor paid work trips have side-lined unpaid work trips, and consequently affect women and men differently. These standards, however, do not exist in isolation. A handful of researchers have also pointed to the built environment as having been designed and planned for cars, commuters, and people in the paid workforce (CIVITAS, 2014; Damyanovic et al., 2013; De Madariaga, 2013; European Economic and Social Committee, 2015; Singh, 2019).

In a report written by CIVITAS (2014), for example, they write,

> "public transport and collective services are, unfortunately, not designed for them [women, elderly and people with reduced mobility] (i.e. they are designed for commuting to the city centre during rush hours, disregarding the needs of part-time/shift-working or non-working people)" (CIVITAS, 2014, p. 26).

De Madariaga (2013) agrees, arguing that the transport system is planned for those in the paid workforce. This results in neglecting the needs of women, on average, who do a majority of the unpaid work in Denmark and across the world (Eurostat, 2019). Furthermore, some researchers have pointed out that since cities have not changed drastically since this gendered infrastructure was built, urban landscapes, including transport systems, are still built and planned for the average man (Damyanovic et al., 2013; Singh, 2019). Kronsell et al. (2016) represent the opinion that this is a catastrophic phenomenon, as the needed sustainable transition does not easily result from planning based around average male travel behaviour (Kronsell et al., 2016).

2.2.4 Complicating factors

The previous sections illustrate that there are many reasons for the transport gender gap. While these reasons are all gender related, there are other demographic factors that can likewise be used to explain the differences (Breengaard, 2020; Breengaard and Oldrup, 2009; Christiansen and Baescu, 2019; Polk, 2008). Factors such as age (Breengaard and Oldrup, 2009; Jeekel, 2019; Singh, 2019), household type (Singh, 2019), level of urbanity (Bastian and Börjesson, 2018; EIGE, 2016; Freudendal-Pedersen, 2013), social status (Singh, 2019), income and level of education (Breengaard and Oldrup, 2009; Singh, 2019), race (Singh, 2019), among others, affect a person's experience of the transport system. To fully understand the patterns described above, all elements should be considered (Breengaard and Oldrup, 2009).

Chapter 3

Blackboxing theory

In the following chapter, blackboxing theory is illuminated upon in five parts. First, blackboxing is defined. Second, systems of power and inequality hidden within blackboxing are explored. Third, discussions around gender inequality are portrayed in light of blackboxing. Fourth, blackboxing is put forward as a self-fulfilling, performative, process. Finally, the relevance of the identities of blackboxers is exposed.

3.1 Blackboxing definition

In his book, 'Pandora's Hope' (1999), the French sociologist Bruno Latour describes the concept of blackboxing. While blackboxing is not a term that Latour created (Hsu, 2007), it has been widely used in Science and Technology Studies, and developed thereafter. Blackboxing, Latour (1999) construes, is,

> "an expression from the sociology of science that refers to the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs, not its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become" (Latour, 1999, p. 304).

The nuances and complexities of technologies are made invisible as technologies are developed and normalized. Further, "each of the parts inside the black box is itself a black box full of parts" (Latour, 1999, p. 185). Blackboxed instruments are blackboxed themselves; and the assumptions and complexities made and hidden at an instrument's conception are multiplied as those instruments persist and proliferate.

3.2 Power dynamics of black boxes

In her essay 'Power, technology and the phenomenology of conventions: On being allergic to onions', Susan Leigh Star (1991) augments Latour's blackbox. She writes,

> "technology freezes inscriptions, knowledge, information, alliances and actions inside black boxes, where they become invisible, transportable, and powerful in hitherto unknown ways as part of socio-technical networks" (Star, 1991, p. 32).

What is key here, is the power dynamic Star (1991) points to as part of the socio-technical network as a result of blackboxing. Black boxes do not just exist, but bring with them power, oppression, marginalization, and empowerment. Furthermore, Star (1991) argues that,

> "there are important joint issues in opening the black boxes of science and technology, in examining previously invisible work, and, especially, in attempting to represent more than one point of view within a network" (Star, 1991, p. 33).

Black boxes often carry with them one point of view, either that of the majority, the 'norm', or other accepted groups within society. It is difficult, meaningful, and arguably necessary, for black boxes to be opened. The experiences of marginalized and minority groups are disproportionately hidden within black boxes; and in making the contents of black boxes visible, power dynamics are exposed, and the experiences of those groups can be represented.

Star (1991) illustrates her point by describing her experience of being allergic to onions. Anytime she goes out to eat at a restaurant, Star (1991) is part of a minority, a group of people allergic to onions. Being such, she has to advocate for herself so that she can go to restaurants, as other 'normal' people do, without suffering an allergic reaction. Three takeaways become clear through Star's portrayal of her experiences. First, Star (1991) remarks that, "I will get an onion where I have requested none (approximately 4 times out of 5), at restaurants of all types, and all levels of quality, all over the world" (Star, 1991, p. 35). The way of making food seems to be a blackboxed process. Requests outside of the norm are not taken seriously or forgotten. In other words, and as she later writes, "no networks are stabilized or standardized for everyone. Not even McDonald's" (Star, 1991, p. 44). Blackboxed processes are built for and benefit certain groups and not others.

Second, Star (1991) writes that on various occasions, she ordered, "along with everyone else, omitted the codicil about onions, took an extra plastic knife from the counter, and scraped off the offending onions" (Star, 1991, p. 35). In this way, she avoided both the feeling of inconveniencing the waiter, as well as her own stress about whether her request would be taken seriously. Star (1991) takes on the burden of 'dealing' with the onion. In doing so, she expedites the food making process, but she also furthers her own invisibility.

The burden of invisibility and the role of increasing consideration is on the minority.

The third takeaway concerns externalities. Star (1991) observes, "later, others sign on to the standardized technologies in order to gain from the already-established structures and benefit from these network externalities" (Star, 1991, p. 40). There are those who benefit from a standardized food making process, from black boxes. For them, there is no incentive to open up the black boxes, acknowledge the nuances within, and try to accommodate others. The network externalities are in their favor. In this way, both those who created, and those who benefit from, a black box shape the existence and propagation of the black box. Furthermore, network externalities of black boxes skew the perception of value of the technology or system for those who benefit.

Star (1991) writes further about the value of any particular blackboxed technology or process. She describes the phenomenon of an expensive technology which leads to a decrease in productivity of a particular organization. Star (1991) argues that technologies, and other blackboxed elements, do not achieve their full value or potential because of the invisible, often cultural, ways by which technologies and processes are engaged. Without understanding the interior of the black box, its value is hidden, not understood, and underutilized.

3.3 Gender and black boxes

As discussed by American philosopher, Sandra Harding, one diverse marginalized group is women. In her 1986 book, 'The Science Question in Feminism', Sandra Harding writes about the benefits of feminist critiques. She questions whether, "overtly antisexist research designs [are] inherently more objective than overtly sexist, or more important, "sex-blind" (i.e., gender-blind) ones" (Harding, 1986, p. 23). To answer this question, Harding (1986) problematizes three prominent feminist epistemologies, emphasizing the sensitivity that exists around feminist criticisms. Feminist criticisms, she writes, "threaten both our cultural identity as a democratic and socially progressive society and our core personal identities as gender-distinct individuals" (Harding, 1986, p. 29). They are, however, important and essential to the progression of science, as, "they have made it possible for us to formulate new questions about science… [and] they quickly bring to our attention the socially damaging incoherences in all the nonfeminist

discourses" (Harding, 1986, p. 29). While Harding's (1986) work does not address blackboxing in nomenclature, it opens up a discussion about the blackboxing of women's experiences through the exclusion of women in 'old' studies. Actively addressing gender in new studies allows for healthy criticism of existing black boxes.

American anthropologist, Emily Martin (1991) argues that it is not only beneficial, but imperative for new studies to actively question what had been assumed in the past. In her 1991 article, 'The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles', Martin (1991) studies the culture and beliefs that lie behind biological descriptions. She writes, "we need to understand the way in which the cultural content in scientific descriptions changes as biological discoveries unfold, and whether that cultural content is solidly entrenched or easily changed" (Martin, 1991, p. 492). New studies are weighed down by the 'culture of the past'. In other words, one cannot assume new studies will be representative of the current culture (Martin, 1991). While Martin (1991) does not directly name blackboxing, it can be seen as a useful concept describing what is happening to culture for it to be hidden in the assumptions behind scientific descriptions.

3.4 Performativity of black boxes

Michel Callon (2006) describes the concept of performativity in his paper 'What does it mean to say that economics is performative?', posing an answer to the question, "how can a discourse be outside of reality that it describes and simultaneously participate in the construction of that reality as an object by acting on it?" (Callon, 2006, p. 7). He argues that performativity describes discourses which both describe a reality from the outside and at the same time affect that reality through their descriptions. In the context of blackboxing, black boxes can be seen as performative discourses. Black boxes both describe the world in a standardized way, and then act upon that standardized, non-nuanced knowledge.

By understanding black boxes as being performative, one can also see how black boxes are the sites of self-fulfilling prophecies. As Callon (2006) puts it,

> "If I believe this statement and if this belief is shared by the other agents, and I believe that they believe it, then what was simply an assumption turns into a reality. Everyone ends up aligning

> themselves to the model and everyone's expectations are fulfilled by everyone else's behaviors" (Callon, 2006, pp. 15–16).

Truths about the world are created by believing in the truths represented by black boxes. Furthermore, this performative process does not happen in isolation. Many 'agents' are involved; Callon (2006) calls the process 'co-performation'.

In this light, performativity is problematized by Callon (2006). He contends that, "the programs represented in co-performation favor the agencies whose competencies are already firmly established" (Callon, 2006, p. 47). The agents and ways of thinking involved in the performative process which are already established, benefit. Marginalized agents and ways of thinking do not. In the context of blackboxing, the skewed power dynamics of the co-performative process serve as one explanation for the skewed power dynamics found in blackboxed technologies and processes.

3.5 Black boxes reflect their makers

Blackboxing has been established as a conceptual process which obscures the nuances and assumptions of a technology or scientific process, at the detriment to minorities and marginalized groups. In the context of gender studies, a lack of criticism of potentially culturally entrenched processes further shape the effect of blackboxing and the understanding of blackboxed elements. Furthermore, blackboxing has been seen as a performative process, where already established ways of thinking are cemented and new or marginalized ways of thinking never gain traction. What have yet to be acknowledged, however, are the people, or actors, who work with blackboxed knowledge, and create black boxes.

Star (1991) refers to Callon where he writes in 1986 about the translation processes which occur, for example in blackboxing processes. He writes,

> "to translate is to displace … but to translate is also to express in one's own language what others say and want, why they act in the way they do and how they associate with each other; it is to establish oneself as a spokesman. At the end of the process, if it is successful, only voices speaking in unison will be heard" (Callon, cited in Star, 1991, p. 45).

Actors involved in black boxing processes do not do so objectively. They are the spokespeople who use their own language and perspectives to create and propagate black boxes. Black boxes end up benefiting the type of people who look and act like the people who make them. This is a phenomenon also called 'I-methodology' (Oudshoorn et al., 2016). The identities and life experiences of the people working with black boxes is argued to affect and matter to the black boxes created.

Chapter 4

Methodology

The following chapter consists of four sections. First, the interpretivist epistemology and its use in this thesis is described. Second, the research design is presented. Third, the methods employed in this thesis are depicted. Finally, the analytical framework is introduced.

4.1 Epistemology

The work within this thesis is conducted within an interpretivist framework. The influence of this framework on our work is many-fold. First, as researchers, we acknowledge that our own subjective experience and viewpoints play a role in the knowledge created in this thesis. Our academic indoctrination, cultures, and social upbringing result in a unique framing and interpretation of the social world (Latour, 2005). The construction of the interviews, for example, can be seen as a result of us, the researchers, formulating the questions and interpreting the discussions (Blaikie, 2000). Furthermore, in organizing and presenting the results as we have, we have constructed a certain narrative, translating the statements and making certain views visible and others invisible (Latour, 2005).

Second, we view the transport planners whom we study as having a direct impact on the world in which they live and work. Transport planners make decisions, actively and passively, about who is visible and prioritized in the transport system. Transport planners play a role in creating knowledge and realities by, for example, making assumptions, including user groups in their planning processes, and adopting certain tools and practices. The interpretivist framework invites considerations for the I-methodology.

Third, we understand and contribute to the socially constructed nature of gender by defining and working with gender as we do. Norms and expectations contribute to the construction of gender in this thesis. The I-methodology is related both to us, one Danish researcher and one American researcher, and also to the transport planners. We acknowledge this and attempt to unpack it as we analyze and discuss what the transport planners say, but also as we study gender in a specific cultural context. Moreover, we acknowledge that this way of defining and studying gender impacts the results that we find.

4.2 Research design

This thesis has an exploratory research design. Exploratory research attempts to understand a phenomenon in the field that it explores, not to find

simple or final answers (Blaikie, 2000). While working within an interpretivist framework, exploratory research allows us as researchers to follow the transport planners down trains of thought which they, and we, find interesting. During the research process, we build from our own preconceptions and research, but allow ourselves to explore the field and perhaps change our own perceptions. This is particularly relevant given our own multi-national background – as one American and one Dane – as national identity seems to affect perceptions of gender. Moreover, as expressed in the introduction (Chapter 1), this thesis aims to lay the groundwork for future research related to transport, gender, and Denmark. Blaikie (2000) argues that,

> "exploratory research is necessary when little is known about the topic being investigated, or about the context in which the research is to be conducted. Perhaps the topic has never been investigated before, or never in that particular context" (Blaikie, 2000, p. 73).

As explored in Chapter 2, little is known about gendered transport in Denmark. By using an explorative research design, we start to fill that gap (Blaikie, 2000).

The research question asked in this thesis also utilizes the benefits of an exploratory research design. In answering the research question, this thesis aims to serve as a steppingstone to further research which can help transport planners integrate gender into their planning processes. However, according to Blaikie (2000), it is first necessary to know what it is happening, and why it is happening. He writes, "we need to know what is going on before we can explain it, and we need to know why something behaves that way it does before we can be confident about introducing an intervention to change it" (Blaikie, 2000, pp. 61–62). After making an assumption that gender is being blackboxed in Danish transport planning, as laid out in the theoretical context (Chapter 2), this thesis looks into what elements of transport planning processes are blackboxing gender in a Danish context. It then analyzes and discusses why gendered elements are blackboxed according to Danish transport planners. By asking 'what' and 'why', we explore gendered transport in Denmark, a field in which there is limited research. The result provides a better understanding of the intersection between transport, gender, and Denmark, and ultimately can be used as a steppingstone for more research about how to change Danish transport planning processes.

4.3 Methods

This section depicts the methods engaged with in this thesis. This thesis employs a multi-method approach, collecting and analyzing qualitative data in two main ways: a literature review and interviews. The first section describes how the literature review was constructed to create the theoretical context of the transport gender gap (Chapter 2). The following sections describe how the interviews were conducted, and how they are analyzed and discussed. This also includes a description of the interviewed transport planners.

4.3.1 Literature review

One of the first choices we make in this thesis is to assume that gender is being blackboxed in Danish transport planning. This assumption is based on both our intuition and initial research. The impact of our intuition is discussed in Section 4.1, where we recognize ourselves as products of our pasts and indoctrinated by our cultures. The initial research was completed in the form of a literature review and is presented as the theoretical context (Chapter 2). Two literature reviews were completed, one on the intersection of gender and Denmark, and the other on the intersection of gender and transport. The literature review on the intersection of gender and transport is, in part, justified by a literature search, described here.

To discover the breadth of the research done on the intersection of transport, gender, and Denmark, compared to its neighboring Nordic countries, a literature search was completed. For this purpose, the Scopus search engine was used. It was chosen because it was identified as the largest citation database of peer-reviewed literature (Aalborg Universitet, n.d.). Furthermore, it was recommended by a librarian at Aalborg University because of its large database within science, technology, social science, arts, and humanities. Technically, three searches were completed, one for Denmark, another for Norway, and a final one for Sweden. It was specified that three elements – country name, gender, and transport – must each be found in either the article title, in the abstract, or as a keyword.

The results of the literature search show that there exists around 40% more peer-reviewed literature about gendered transport in Norway than in Denmark, and around 60% more peer-reviewed literature about gendered transport in Sweden than in Denmark. The same literature gap between Denmark and Norway and Sweden is confirmed by the Danish researcher,

Breengaard (2020). A more detailed description of the search terms, subject area, and results can be found in Appendix II.

Based on the gap shown in the literature search, it was decided that the literature review on the intersection on gender and transport could not be based solely on Danish research. It was therefore decided to include European research on gendered transport. Furthermore, one interview was done with a Danish researcher to fill out some gaps (Breengaard, 2020). With this being said, Danish literature was preferred, followed by Scandinavian literature, and then European literature. In this sense, we attempted to create a literature review related as much as possible to a Danish context.

4.3.2 Interviews

The next choices made were those about how to choose and conduct interviews with Danish transport planners. At an early stage, it was decided that studying multiple organizations rather than one would further the goal of gaining a broad understanding of Danish transport planning as a whole. This section describes first how different types of organizations were categorized as relevant to this thesis, second how the specific organizations and representative individuals were chosen, third who specifically those individual transport planners are, and finally how their interviews were conducted.

Choice of organizations

In determining what organizations to include, two considerations were made. First and foremost, the organizations should altogether depict a comprehensive picture of the transport sector in Denmark. Second, practical time considerations for completing the thesis were respected.

To the first consideration, transport planners are seen as a diverse group of actors ranging from national politicians to architects. The groups of actors considered include:

- sector actors (organizations who work specifically within one transport sector, e.g. Arriva, BaneDanmark, DBS, Donkey Republic, Green Mobility, Lime, Metro, Movia, ShareNow, Supercykelstier, SwapFiets, etc.)
- political actors (national, regional, and municipal policy makers and government officials (embedsmænd), e.g. Copenhagen Municipality, Region Hovedstaden, politicians in different parties, etc.)

- project actors (actors who work on transport projects amongst other types of projects, e.g. Arup, Cowi, Gehl, Gottlieb Paludan Architects, MOE, Niras, Rambøll, etc.)
- interest groups (political institutions working for an agenda, e.g. Dansk Vejforening/ITS, FDM, Kvinfo, etc.)

Both the different groups of actors, and the specific actors considered for this thesis were identified using 1) our own knowledge of the transport sector in Denmark, and 2) conversations with initial contacts[11] at BaneDanmark, Copenhagen University, Rambøll, Region Hovedstaden, and Aalborg University. This method of identifying organizations may explain why while all of the selected transport planners work in Denmark, they all currently work mainly with projects in the Greater Copenhagen region.

Due to the second consideration - available time and resources - we decided to narrow down the list of groups to exclude politicians from political actors and interest groups as a whole. This decision was made after actors within these groups did not respond to an initial email. We acknowledge that politicians and interest groups are very important to the transport sector. Our focus, however, narrowed alongside the exclusion of these groups to study transport planners making direct decisions about physical vehicles and infrastructure. Only sector actors, project actors, and one government official are thereby used in the analytical discussion (Chapter 5) to understand the planning processes of the transport planners in Denmark. They are the actors referred to as transport planners.

Choice of transport planners

After deciding on the types of organizations to contact, the next step was to identify and reach out to transport planners within those organizations. To do so, we used the same initial contacts, previous research, and professional experience. These identified transport planners were reached out to by email. If there was no initial contact in an organization, we reached out via phone, where available, and otherwise over email. Organizations where transport planners were contacted, and the corresponding responses are outlined in Appendix III. The result of these contacts are the organizations and transport planners in Table 2.

[11] Both our previous research and professional experience – at Gate 21 and Carless Consult – led to the identification of initial contacts for this thesis.

Table 2: Interviewed Danish transport planners

Organization	*Transport planner*
Region Hovedstaden	Caroline Schousboe
BaneDanmark	Kåre Stig Nielsen
DSB	Christian Møller
Metro	Leif Gjesing Hansen
ShareNow	Mette Hejlskov
Supercykelstier	Sidsel Birk Hjuler
Arup	Kristian Winther
Gottlieb Paludan Architects	Sten Sødring & Sara Wille-Garvin[12]
Rambøll	Marianne Weinreich

As can be seen in Table 2, ten transport planners at nine organizations are included in this thesis. We found that the network we developed from our personal and professional contacts resulted in more 'yes' responses. If we did not have an initial contact, the response was more likely to be 'no', especially when contacted after the lock-down of society due to the COVID19 crisis. DSB was one organization where the transport planner did not have time for the interview because of the COVID19 crisis; he was able, however, to respond briefly on email. Therefore, this transport planner – Møller (2020) – at DSB is less represented in the analytical discussion (Chapter 5).

Description of the transport planners

In the analytical discussion (Chapter 5) each of the transport planners is treated as a representative of their organization. However, as the interpretivist epistemology recognizes, it is important to know who the transport planners are and what their role is. A brief description of the transport planners and their role is described here.

[12] In the analytical discussion (Chapter 5), references to Sødring (2020) or Wille-Garvin (2020) refer to what specifically Sødring or Wille-Garvin said within the interview which is referred to as (Sødring & Wille-Garvin, 2020) in the reference list.

Caroline Schousboe

Project Manager for Regional Development at Region Hovedstaden: Schousboe is responsible for the traffic and mobility plan at Region Hovedstaden. She is further responsible for communicating the plan: what the plan is about and how will they use it in the future. Region Hovedstaden funds transport projects which deal with busses, regional trains, and the Copenhagen light rail. They do not control the general maintenance or service of these different transport modes. Regional Development receives 15% of Region Hovedstaden's total budget (Schousboe, 2020).

Kåre Stig Nielsen

Team Manager at BaneDanmark's building and platform maintenance department: Nielsen works with access to the buildings and platforms on train stations, amongst other tasks. BaneDanmark and DSB share ownership of the train stations in Denmark. In general, DSB owns the stations, while BaneDanmark owns the platforms and tunnels, stairs, and elevators that lead to the station (Nielsen, 2020).

Christian Møller

Assistant to the directors at DSB: DSB is a major train operator in Denmark (Møller, 2020).

Leif Gjesing Hansen

Chief Consultant at Metro's planning department: Hansen works within a small department which analyzes who uses the metro and where to locate new metro and light rail lines. He also does consultancy work for Metro's owners, Region Hovedstaden and the municipalities in Greater Copenhagen. Furthermore, he analyzes the future demand for transport, congestion problems, how to improve environmental aims, etc. Hansen has experience as an associate professor working with mobility at Aalborg University, Roskilde University, and Copenhagen Business School (Hansen, 2020).

Mette Hejlskov

Social Media and Marketing Consultant at ShareNow: Hejlskov works, in part, to create communication plans and materials for ShareNow Denmark. ShareNow is a daughter company of BMW and Daimler; their head office is in Germany. It is a car-sharing service located in 16 cities in 8 countries. The

department in Denmark is a franchise, and is operated and funded by Arriva Denmark (Hejlskov, 2020).

Sidsel Birk Hjuler

Head of Office at Supercykelstier (Cycle Superhighways): Hjuler manages and coordinates the secretariat. It is formed as the collaboration between 28 municipalities and one region. The secretariat, however, employs four full-time workers and two student assistants (Hjuler, 2020).

Kristian Winther

Architect at Arup: Winther was lead architect on CityRingen and a design architect on Nordhavn station, both parts of the Copenhagen metro. Winther has further worked with urban development and urban strategy, strategic work, and internal creative training. He has experience in working at Arup in Denmark, but also at some of Arup's other branches in London and New Zealand (Winther, 2020).

Sten Sødring

Head of Communications and Development at Gottlieb Paludan Architects: Sødring has an architecture background. He works not only on transport projects, but also on the development and strategic phases of more general projects. Part of this work is negotiating project briefs with the partners (Sødring and Wille-Garvin, 2020).

Sara Wille-Garvin

Urban planner at Gottlieb Paludan Architects: Wille-Garvin works on transport projects at Gottlieb Paludan Architects. She works with how to integrate transport structures into the urban setting and often in the design phase of projects (Sødring and Wille-Garvin, 2020).

Marianne Weinreich

Market Manager in Rambøll's Smart Mobility department: Weinreich has a social science background but has promoted cycling and sustainable mobility in different consultancies over the past 20 years. At Rambøll, Weinreich works with stakeholder engagement and strategy development in Smart Mobility. The Smart Mobility department at Rambøll has branches in Denmark, Norway, Sweden, Finland, Germany, Singapore, and India (Weinreich, 2020).

Interview execution

Semi-structured interviews were conducted with all but one[13] of the described transport planners above. Nine interviews in total were conducted with ten transport planners[14]. According to Kvale and Brinkmann (2009), the use of interviews is a good method to gain an in-depth understanding about topics with which the interviewee works and knows a lot about. Semi-structured interviews are seen as particularly useful to fulfill the aims of an exploratory research design. A semi-structured nature allows for the interviewer to both guide the interviewees through certain topics, while leaving the door open for interviewees to respond more freely and reflect their own knowledge and interest (Kvale and Brinkmann, 2009).

An interview guide was made and customized for each interviewee, and can be found in Appendix I. The interview guides were developed based on knowledge about the transport gender gap (Chapter 2) and blackboxing (Chapter 3). The interview guides were sent to the transport planners prior to the interview; this was done both because we expected that some questions might need preparation (e.g. the gender breakdown of their organization), and because we assumed that gender was a 'new' topic for the transport planners, and would warrant some longer thought than the one hour interviews would provide. The implications of this choice are discussed further in the methodological reflection in the conclusion (Chapter 6).

A preference for English interviews and a willingness for Danish interviews was expressed in our communication with the interviewees. All of the transport planners are native Danish speakers, and there were varying levels of comfort with speaking English. Two of the eight interviews were done in Danish. At the time that the interviews were conducted – March 2020 – the COVID19 crisis caused a lock-down of society in Denmark. We, alongside all of the transport planners, were working from home. All of the interviews were therefore completed as virtual interviews. This is viewed as having a relatively significant impact on our ability as interviewers to connect with our interviewees. Furthermore, follow-up conversations may have not happened naturally given the different circumstances. We acknowledge that possible misunderstandings might have been enhanced in this situation.

---

[13] The transport planner from DSB responded over email.

[14] Sten Sødring and Sara Wille-Garvin interviewed together as representatives of Gottlieb Paludan Architects.

Coding of interviews

After conducting the interviews, the interviews were transcribed. The transcriptions were then transferred to NVivo. NVivo was used to code the interviews. Initial codes were created based on the content of the interviews, the theoretical context (Chapter 2), and blackboxing theory (Chapter 3). To ensure all codes were included, both researchers did the initial coding of the interviews separately, and these coded interviews were discussed and merged afterwards. After they were coded and merged, we went through all of the interviews again, to make sure that they were all coded using the same codes. These codes were further discussed in the context of blackboxing theory (Chapter 3), in which they fit well. The analytical framework (Section 4.4.) describes the influence of the blackboxing theory in creating or forming these codes – from now on 'areas – in more detail. What is important here is that the six areas analyzed and discussed in the analytical discussion (Chapter 5) were developed by the researchers from the overlapping knowledge they gained from the blackboxing theory (Chapter 3) as they were coding the interviews.

After identifying statements to be used in the analytical discussion (Chapter 5), any Danish statements were translated to English. Two transport planners – at Arup and Rambøll – asked to proof their quotations before the thesis was published. The quotations were therefore sent over email in May. Small edits were received within a week and corresponding changes were made.

4.3.3 Analytical discussion

After conducting, transcribing, and organizing the interviews, the analytical discussion (Chapter 5) was formed to analyze and discuss the content of the interviews. Sometimes direct statements from the transport planners are used; other times they are paraphrased. If transport planners were seen to emphasize the same thing, paraphrasing or a statement of agreement is utilized. The main text of the analytical discussion (Chapter 5) attempts to depict what the transport planners said in a non-judgmental fashion. There are take-away boxes placed at the end of each sub-section which include the general 'take-aways'. Discussion boxes are placed throughout the main text to evaluate and discuss statements and themes critically. These discussion boxes are also used to bring in knowledge from the theoretical context (Chapter 2) and blackboxing theory (Chapter 3).

4.4 Analytical framework

Two different theoretical frameworks are put forward in the above chapters (Chapter 2 and Chapter 3). While Chapter 2 outlines a theoretical context for this thesis, Chapter 3 describes blackboxing theory as a tool which is utilized to frame the analytical discussion (Chapter 5). The following section describes how the analytical discussion (Chapter 5) is framed.

Chapter 2 depicts the current state of gender in both the transport world and to Denmark. In doing so, it contextualizes this thesis as both a discussion of transport in the intersection of gender and Denmark, and a discussion of Denmark in the intersection of gender and transport. Ultimately this supports an assumption of the research question, that gender is blackboxed in Danish transport planning. At the intersection of gender and Denmark, it becomes clear that discussions about gender equality in Denmark are sensitive and to a certain extent, non-existent. At the intersection of gender and transport, it becomes clear that studying gendered transport is lacking and important, and that context specific knowledge for Denmark is needed.

Given the context of the transport gender gap in Denmark, blackboxing is identified as a useful concept to understand both the hidden nature of women in transport and gender in Denmark. Moreover, blackboxing is seen as a useful theoretical viewpoint not only for uncovering hidden elements within a technical field such as transport planning, but also for exposing the reasons why elements are hidden. Six areas of blackboxing have been identified based on the coded interviews with Danish transport planners. These six areas structure the analytical discussion (Chapter 5): **Identifying user groups**, **Collecting and analyzing data**, **Representation**, **Perception of role**, **Knowledge availability**, and **National identity**.

These six areas ultimately answer two types of questions: **What** elements of transport planning processes blackbox gender in a Danish context? And **why** are gendered elements blackboxed according to Danish transport planners? Figure 15 depicts the six areas which answer these questions in one image. The core of the figure is two planning processes (**what**) which, from a removed perspective, can be seen as blackboxing gender. The layers on the outside of the figure are the four reasons (**why**) identified by transport planners for why gendered elements are blackboxed. Each of these six areas are described below, moving from the core to the outside. These descriptions are rooted in the area's emergence from the blackboxing theory (Chapter 3).

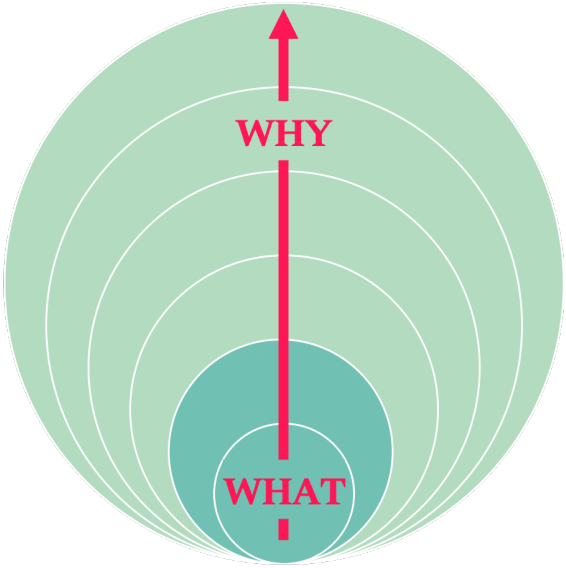


Figure 15: Analytical framework with 'what' and 'why' arrows

***What** elements of transport planning processes blackbox gender in a Danish context?*

First, Star (1991) argues that blackboxed processes carry one point of view, leading to unequal benefits to different user groups. In the context of this thesis, Star's point is used to see that there are users who have been considered and planned for, and others who have not been represented. For users of a transport system whose views have been considered, the transport system functions well. The needs of the users of that system who do not fit into the norms set by transport planners, however, are often not considered. In the analytical discussion (Chapter 5), this point is used to analyze and discuss which **user** groups are being seen and targeted by Danish transport planners, and if they are gender specific.

Second, Harding (1986) asserts that feminist discourse is missing in many scientific studies, implying that women and gender studies are blackboxed, ignored and not considered. She argues that it is beneficial not only for women, but for scientific studies in general if they actively address women and other pieces which are currently missing. In this thesis, Harding's point is used to argue for the consideration of knowledge creation processes to understand where gendered perspectives are often lost or simplified in transport planning processes. In the context of the analytical discussion (Chapter 5), this framing is used to ask the planners what processes they use to gather **data** and make analyses with regard to gender.

Third, Callon (1986 in Star, 1991, p. 45) is quoted as emphasizing that in translation processes, scientists reflect, represent, and assert their own language and perspective as much as they displace and construct the objects with which they work. In the context of this thesis, Callon's argument is used to see the presence of the I-methodology in transport planning. When designing transport systems, transport planners reflect their own identity and life experiences into the infrastructure they design and routes they plan. This point is used to design a section of the analytical discussion (Chapter 5) which looks at the **representation** of women and men within Danish organizations working with transport planning. Moreover, it is used to address representation as a reason actively considered as affecting the planning processes of and by transport planners.

Fourth, Star (1991) writes about the burden of responsibility set on minorities and marginalized groups on fitting into a system not built for them. In the context of transport planning, this point helps question where the responsibility for changing a transport system which benefits certain user groups lies. In the analytical discussion (Chapter 5), this point frames a section in which transport planners are asked what **role** they and others have in changing transport planning processes to consider gender.

Fifth, both Latour (1999) and Star (1991) acknowledge that knowledge is limited by black boxes. In the context of this thesis, transport planners are seen as operating in a context where they have limited access to knowledge about gendered transport. In the analytical discussion (Chapter 5), this point is used to structure a section which delves into analyzing and discussing the **knowledge** about gendered transport which is available to transport planners.

Sixth, Martin (1991) posits that cultures of the past influence current day processes, technologies, and systems. She argues that cultures of the past must be exposed to understand if they are entrenched in current practices or if they can be easily moved. In the context of this thesis, the cultures of the past which are exposed are those surrounding feminism and gender in Denmark. In the analytical discussion (Chapter 5), this element sets up a section which focuses on elements of **national identity** which are identified as affecting the Danish transport planners.

The analytical discussion (Chapter 5) expands on each of these six areas illustrated in Figure 16. By exploring these six areas and thus answering the '**what**' and '**why**' questions, Chapter 5 ultimately answers to what extent and why gender is being blackboxed in Danish transport planning, the research question posed in this thesis.

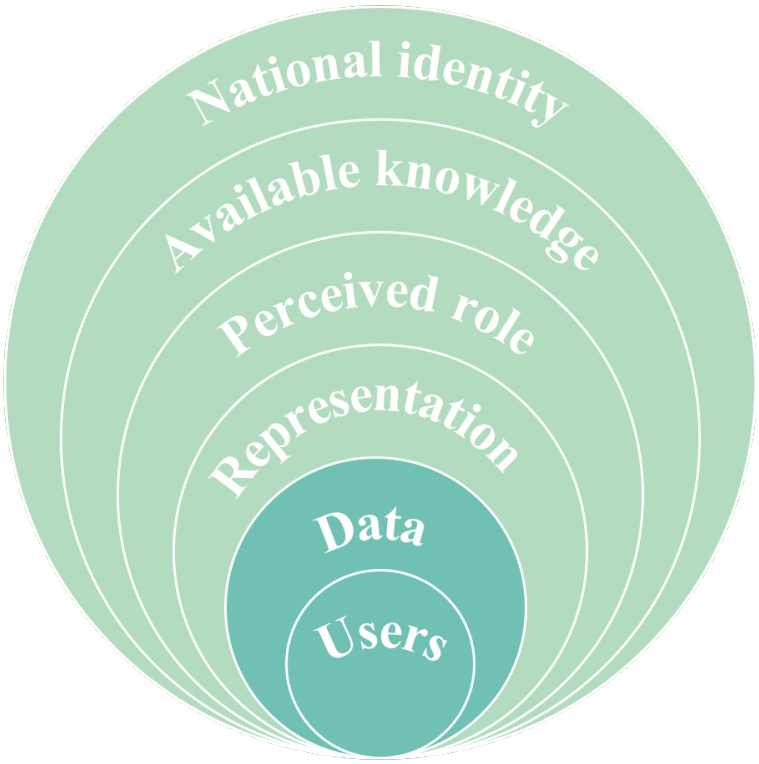


Figure 16: Analytical framework

Chapter 5

Danish transport planning gender gaps

The following chapter outlines and describes black boxes related to gender which are made and propagated in transport planning processes. In order to discuss these blackboxed elements, interviews completed with the transport planners at Arup, BaneDanmark, DSB, Gottlieb Paludan Architects, Metro, Rambøll, Region Hovedstaden, ShareNow, and Supercykelstier are discussed. The chapter is, as introduced above, structured by the framework developed from the blackboxing theory (Chapter 3). The framework consists of six areas which are analyzed and discussed in the context of two questions: **What** elements of transport planning processes blackbox gender in a Danish context? And **why** are gendered elements blackboxed according to Danish transport planners? Section 5.1 starts in the center of the framework, delving into the planning processes which are considered as potential sites of blackboxing. Section 5.2 follows towards the outside of the circle with reasons identified by the transport planners themselves for why gendered elements are blackboxed. Section 5.3 briefly summarizes the 'what' and 'why' questions. While each section generally exhibits the qualities of an analysis, it is interrupted and commented upon by discussion boxes, which can also be read independently. The boxes point to some interesting elements from the interviews which often also relate to the blackboxing theory (Chapter 3) or the theoretical context (Chapter 2). At the end of each sub-section, there is a take-away box which summarizes each of the six areas respectively.

5.1 What planning processes are blackboxing gender

The following section answers '**what** elements of transport planning processes blackbox gender in a Danish context?' It does so by presenting the transport planners' user groups, and data collection and analysis processes.

5.1.1 Identifying user groups

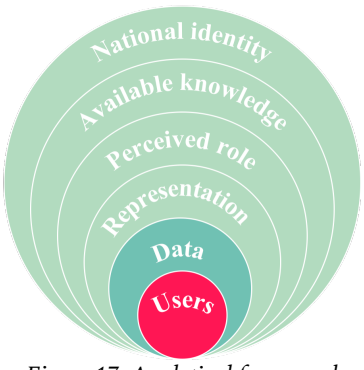


Figure 17: Analytical framework with emphasis on 'Users'

According to the study of Danish transport planners, gender is not an element that has been systematically taken into account in planning processes (e.g. design of vehicles, route planning) (Hansen, 2020; Hejlskov, 2020; Hjuler, 2020; Møller, 2020; Nielsen, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). For example, Nielsen (2020) states that at BaneDanmark, "we talk in no way about gender

when we plan something – in no way." Schousboe (2020) argues that in Region Hovedstaden they have the knowledge, data, and intention to do it, "but once you come down to it and we make it [transport projects] – it's not a clear factor." Weinreich (2020) proclaims that, "in my experience, from 20 years, it [gender] is not something that is incorporated into projects or seen as relevant in Denmark." Weinreich (2020), however, speaks from her current position within the Smart Mobility department at Rambøll, and is the only transport planner who is actively working to create awareness and advocating for gender to be considered in transport planning in a systematic way.

Instead, a majority of the transport planners explicitly state that they intend to plan transport systems for 'everyone' (Hansen, 2020; Hjuler, 2020; Nielsen, 2020; Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). At Gottlieb Paludan Architects, for example, Sødring expresses this intent, saying, "we design spaces that are supposed to be able to be used by everyone" (Sødring and Wille-Garvin, 2020). Each of the transport planners, however, including Sødring, seems to have slightly different ideas about what planning for 'everyone' entails.

At Metro designing for 'everyone' means not specifically considering gender, or women as a special user group. Hansen (2020), explains that it is outlined in Metro's CSR, "that specific groups should not have special access, but that it [the metro] is open for everyone." Winther (2020) describes that at national Arup, there is a lot of interest and focus on, "the differences between male and female travelers and so on." However,

> "in terms of the design in Denmark, I don't think that we talk too much about it. I think it's more about being inclusive, so that the designs and the projects are accessible for everybody" (Winther, 2020).

Møller (2020), from DSB, expressed a similar sentiment, writing that DSB, "works from a unisex/gender neutral consideration" and that, "the station should be safe to access no matter who you are." These transport planners suggest a correlation between gender blindness and gender neutrality, at least in the Danish context.

Planning for everyone

Almost every transport planner mentioned their aim to plan for 'everyone'. The blackboxing theory, however, argues that blackboxed processes, such as transport planning, cannot benefit everyone equally. Furthermore, according to the theory on the transport gender gap, 'normal' transport design is shown to disproportionately benefit the average man, as opposed to the average woman.

The disconnect between the voiced desire of many transport planners to plan for 'everyone' and the resulting male biased infrastructures can be explained in a few ways. For one, it could be explained by the assumption that transport planners see users as being equal and having equal needs. Users are therefore seen as interacting with transport infrastructure in the same way; equal design is thus equitable. On the other hand, it could be explained by the assumption that transport planners lack knowledge about the ways that different designs impact different users differently. So even given different users, transport planners might not know how to think about bias in specific design elements and route planning decisions.

DSB is not the only transport planner to mention safety and security in relation to the idea of planning for 'everyone' (Hansen, 2020; Hjuler, 2020; Møller, 2020; Winther, 2020). Among the transport planners who mention safety as a central focal point of planning, there are differences in why they believe this focus should be pursued. Like DSB, at Arup, Winther (2020) operates under the assumption that, "if urban spaces aren't safe, then it's unsafe for everybody" (Winther, 2020). At Metro, Hansen (2020) takes a step further and articulates knowledge of a PhD (e.g. Strandbygaard, 2016; Strandbygaard et al., 2020) which discusses the relationship between mobility, safety, and gender in Denmark. Hansen (2020) is still hesitant to discuss gender, however, because, "I think that you risk shooting the messenger in the discussion if you do it, because many just react if you go too much into gender." At Supercykelstier, Hjuler (2020) agrees. She argues, "let's talk about unsafe areas, and not get involved with whether you are a man or a woman" (Hjuler, 2020).

Safety for everyone

A few transport planners express arguments for not considering gender that seem based on the belief that safety is created by spaces; and therefore, safe spaces are safe for everyone. However, the theory on the transport gender gap points to the role of gender in any individual person's *sense* of safety. Fear is created not only by spaces, but by a person's socialization mixed with the space they are in.

In light of the blackboxing theory, I-methodology can be seen as important for planners when considering designing safe spaces for everyone. I-methodology, or the impact of personal identifiers, socialization, and experience on a transport planner's work, would affect how that planner assesses the safety of the spaces which they design. For example, the average male planner might not be aware of elements of a station design which would make the average woman feel unsafe.

Hjuler (2020) does not want to discuss gender and thinks that Supercykelstier can address everyone by focusing on other categorizations. She says,

> "when it comes to target groups and how we get better at making good infrastructure, I think I would not work with gender as the main topic, but different emotions linked to cycling – Is it too hard? Is there a flow? Does it feel safe? – stuff like that" (Hjuler, 2020).

ShareNow is one of the transport planners that does not explicitly state that their planning is for everyone, and also talks about target user groups. User groups mentioned by Hejlskov (2020) include users who aim to get the most out of their city, users who are environmentally oriented, users who like technology and cars, and general commuters. Unlike Supercykelstier, however, ShareNow seems open to using gender as a category to better target users. Hejlskov (2020) says, "if we discover that there is a big potential in segmenting more and focusing more on these specific target groups [women and men], then we will."

Other than gender, and the user groups identified by ShareNow and Supercykelstier, a few other user group exceptions (to everyone) are mentioned. Supercykelstier also specifically plans for commuters (Hjuler, 2020), and Arup, BaneDanmark, Gottlieb Paludan Architects, Metro, and Rambøll focus on people with reduced mobility (e.g. handicapped people, elderly people, people with bags or prams, etc.) (Hansen, 2020; Nielsen, 2020;

Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). Nielsen (2020) and Sødring (2020) mention that for their work done on rail infrastructure, people with reduced mobility (PRM) are required by EU regulation to be considered (Nielsen, 2020).

Tools used by the transport planners also have an effect on what user groups they consider or prioritize. Hansen (2020), for example, talks about Metro's use of the OTM (Ørestadstrafikmodel) modelling tool. This is relevant as the tool only accounts for where people live, work, and go to school (Hansen, 2020). Commuters may therefore be overrepresented. Hejlskov (2020), meanwhile, mentions that ShareNow has recently taken on a CRM back office, which means they have new capacities to segment customers.

Alignment of assumptions

A few transport planners use tools to plan routes and make decisions about users. The blackboxing theory reveals that technological tools, such as those used by transport planners, are the sites of assumptions which disproportionately negatively affect minority and marginalized groups. The theory on the transport gender gap exposes that these assumptions may have to do with the length and purpose of trips, number of stops, and time of day traveling takes place. Furthermore, it can be seen that the OTM model, for example, is based on the relationship between paid workplaces and homes, not unpaid 'workplaces' and homes.

While the assumptions made in the tools may be aligned with assumptions transport planners are actively making, awareness of this alignment is not apparent in the interviews. The blackboxing theory asserts that in order to better align practices with desired outcomes, blackboxed tools and processes need to be reassessed in light of gender.

Take-aways about user groups

In the identification of user groups, one of the main places in which gender can be considered to be blackboxed is in the idea of 'everyone'. Many transport planners identified 'everyone' as the users benefiting from their planning. However, by saying 'everyone', the differences between users are disregarded as being relevant to either the design or use of the transport system. Furthermore, blackboxing can also be located in how the idea of 'everyone' manifests. PRM and commuters are the two groups identified most directly by transport planners as being exceptions to 'everyone'. So 'everyone' is planned for, but commuters are prioritized and PRM are taken into account. Gendered differences are either blackboxed within the 'average' person, or women's experiences are blackboxed outside of the 'average', describing reduced mobility. Furthermore, tools are used as part of planning processes, and are the site of blackboxing similar assumptions about who is important to consider and what sort of travel they make.

5.1.2 Collecting and analyzing data

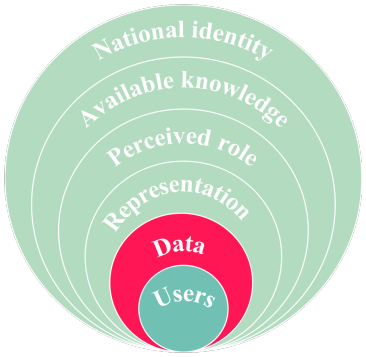


Figure 18: Analytical framework with emphasis on 'Data'

Each transport planner creates and receives various types of data and analyses. While certain transport planners may be more likely to gather their own data from user surveys and ticket purchases, others work less directly with their users, and more with the outputs of universities, transport operators, or municipal actors. While some analyses are systematically ingrained in tools and organizational structures, others are demanded on a project-by-project basis. This sub-section describes the processes through which data is collected and analyzed by the different transport planners.

Transport planners at Arup, Gottlieb Paludan Architects, Rambøll, ShareNow, and Supercykelstier mention internal research initiatives which collect data. Supercykelstier, for example, "make [their] own measurements every year on the Super Cycle Highways that we have implemented" in addition to the non-standardized studies done by the municipalities they work with and studies done by DTU. Furthermore, in ShareNow's CRM customer base they,

> "have a lot of customer knowledge and we know how many trips each customer makes, how long trips they do, how much money they spend, all these kinds of things. So, we have a product guy (as we call him). He puts all these things together to get an overview of customers" (Hejlskov, 2020).

At Rambøll, they are used to gathering and analyzing data, and have recently applied for an internal project to study gendered mobility at Rambøll. They hope to,

> "do a gender discussion paper, a green paper, where we want to analyze transport data by gender, carry out new surveys looking specifically at gender differences in new mobility services and do focus group interviews with women, and then compare between our seven Smart Mobility countries" (Weinreich, 2020).

Wille-Garvin from Gottlieb Paludan Architects, says that they gain knowledge from, "general engagement with the field - not formalized", referring to seminars and the media (Sødring and Wille-Garvin, 2020). Lastly, at Arup, they obtain data similarly. However Winther (2020) adds that in addition to publications, newspapers, and the media, they also have some ongoing projects, often in collaboration with universities, "where you can study things that are not necessarily related to a specific project, but on more general topics" (Winther, 2020).

Disseminating gender knowledge

A few transport planners identify 'general engagement with the field' and seminars as sources of knowledge. Neither of these transport planners actively consider gender in their planning. The theory on the transport gender gap identifies, however, a few examples of where 'the field' argues for the active consideration of gender in transport planning in Denmark.

There seems to be a discrepancy between available knowledge and actions. The blackboxing theory identifies strong cultural norms and accompanying positive externalities as two possible explanations for a lack of action. First, there could be a reluctance by transport planners to heed research that is happening outside of Denmark. Second, gender may be blackboxed as a 'social' subject in Denmark, and therefore considered irrelevant to transport planners. Third, general resistance to feminist discussions (as discussed in Section 5.3.3) may result in the lack of desire by transport planners to engage with gender discussions when confronted.

Several transport planners collaborate with universities to obtain and process data relevant to their organizations. While Winther (2020) at Arup mentions, "some research projects ongoing, not in Denmark necessarily, but we always have some research projects where we collaborate with universities," Schousboe (2020) at Region Hovedstaden is the only other transport planner to mention connections to a broad range of universities. About her work at Region Hovedstaden, Schousboe (2020) states that, "we see ourselves as a part of a system that work[s] with universities and Gate 21: people who are out there, making the newest knowledge available for the projects." DTU is mentioned several times by transport planners as the research institute with which they are most closely connected. Region Hovedstaden, ShareNow, and Supercykelstier all mentioned either DTU's transport survey (Transportvaneundersøgelse (TU)) as a database for understanding travel behaviour (Schousboe, 2020), or DTU as an actor which completed relevant analyses (Hejlskov, 2020; Hjuler, 2020; Schousboe, 2020). BaneDanmark is also connected to DTU, but specifically in the training of future railway engineers (Nielsen, 2020).

University collaboration

A few transport planners collaborate directly with universities to gather and analyze data. Many transport planners mention working specifically with DTU's transport survey. All of the universities mentioned were Danish universities.

As pointed out in the theory on the transport gender gap, gender does not receive much media time or research funding in Denmark. Furthermore, even the research that is done about gender is often done in a different faculty than transport research. In this way, gender can be seen as being blackboxed in the research relevant to and accessed by transport planners.

There also seems to be a cyclical, if not performative, element to the relationship between transport planning and research. Transport planners do not ask for research which delves into gender inequalities and the possibilities for different user groups because they might not see it as important. They might not see it as important because there is little knowledge on it. And there is little knowledge on it, to a certain extent, because nobody is asking for knowledge to be created.

Universities, however, are not the only external source of data identified by transport planners. ShareNow works closely with MediaCom to commission analyses (Hejlskov, 2020). According to Schousboe (2020), Region

Hovedstaden, "pay[s] DTU to make the [TU] data available for other partners that we work with. So, when we work with Atkins or Rambøll, they can use the data on our behalf." BaneDanmark receives non-gender disaggregated passenger numbers from the Danish Transport-, Construction-, and Housing authority in order to prioritize station work (Nielsen, 2020). Region Hovedstaden and Metro both mention passenger numbers they receive from Rejsekort and ticket counts from DSB (Hansen, 2020; Schousboe, 2020). Region Hovedstaden also receives analyses from transport operators such as Movia, Letbanen, and the local train lines. Supercykelstier works closely with the municipalities and obtains non-standardized data from them. In addition, Hjuler (2020) mentions that Supercykelstier works closely with actors in Belgium, The Netherlands, Sweden (Skåne, Stockholm, Gothenburg), Norway (Oslo), and Finland (Helsinki) to, "learn as much as we can from each other – everybody is trying to figure out how to do this in the best way" (Hjuler, 2020).

While Supercykelstier works with external actors internationally, Arup, Rambøll, and ShareNow are three organizations which exist internationally, as well as in Denmark. For Arup, this means that the Danish office gains knowledge from research projects going on in other parts of the world. For Weinreich (2020) at Rambøll, being a multinational organization means that a gender agenda can be argued for in Denmark. She points out that,

> "as an international company, working also outside Scandinavia where the gap is even bigger, we need to know that this [gendered transport] exists. Because otherwise we can't be good advisors to our clients in geographies where this is an even bigger problem than here" (Weinreich, 2020).

For ShareNow, their external headquarters may give them guidelines, but as a franchise owned by Arriva, and with cars from Mercedes and BMW, they have many parties involved.

Rambøll and ShareNow are two transport organizations where interviewees referenced direct access to gender disaggregated data and the intention to analyze and work with gender as a dependent variable. Rambøll is actively mining gender disaggregated data. Within Smart Mobility, they are starting the process of learning what gender disaggregated data exists, in the hope, "that gender and gender data becomes more and more part of projects" (Weinreich, 2020). ShareNow has access to all of its gender disaggregated

customer base data and expects new disaggregation abilities in their new back office (Hejlskov, 2020). Hejlskov says about considering gender that,

> "I think our marketing is where we already have started a little bit. But in terms of product and price, that is something that has not been explored yet. But, I'm actually quite confident that we will explore it more because we are going to get more opportunities with our new systems" (Hejlskov, 2020).

Metro, Region Hovedstaden, and Supercykelstier are three transport organizations that may have access to gender disaggregated data, but do not systematically use it. Supercykelstier has access to surveys which include demographic information, but Hjuler (2020) is hesitant to work with gender, instead arguing, "I think I would break it down in categories like that [difficulty, flow, safety], rather than genders. I think it is much easier to actually make it concrete." At Region Hovedstaden, Schousboe (2020) says that she does not remember having, "any reports where we could have broken it down to gender" (Schousboe, 2020). However, she later states that, "if we wanted to see different mobilities based on gender, we probably would be able to get it out of the data set" they receive from DTU or Rambøll. In Metro, Hansen (2020) says that they have access to data from DSB tickets, Rejsekort, and that which is produced from modelling. While the ticket and Rejsekort data may not have gender 'attached' to it, the travel behaviour data in the model may. Hansen (2020) states, "yeah, there is [demographic data]. Maybe there is gender, and certain ages," but he is unsure if gender is considered other than as a background geographic variable in OTM (Hansen, 2020). OTM is also mentioned by Region Hovedstaden.

Decisions on what type of data to collect and analyses to complete are based, for many transport planners, on their relationships with other actors. As is expanded upon further on, the analyses and data received and collected by transport organizations such as BaneDanmark, Region Hovedstaden, and Supercykelstier are influenced by a political agenda. Meanwhile, for a transport planner such as Arup, Gottlieb Paludan Architects, or Rambøll, relevant analyses are often determined, "in collaboration with the client" (Sødring and Wille-Garvin, 2020). The latter group do not have a big say in what any particular project is based on (Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020).

Transport planners such as BaneDanmark and Metro seem to also be affected by their own organizations' actions in the past. The split ownership

structure of stations between BaneDanmark and DSB, for example, are laid out in 20-year-old plans. CityRingen metro, designed by Arup for Metro, was "updated in several areas" between the phases of metro development, but still "based on the standard used on the first phase of the metro" from ten years prior (Winther, 2020).

As it relates to data and analysis processes mentioned by all transport planners, identified places of change include ShareNow's CRM back office, a future, "activity-based model" of the OTM (Hansen, 2020), and a newly funded gender group within Smart Mobility at Rambøll (Weinreich, 2020).

Old processes

For a few transport planners, their current planning processes are built off of old data sets and analytical tools. It is not clear from the interviews whether these older elements have been recently reassessed for their applicability. The blackboxing theory, however, argues that blackboxed technologies and processes need to be assessed with regard to cultures of the past. If not, gender will keep being blackboxed until a new tool is introduced.

Take-aways about data and analysis

The transport planners collect and analyze very different types of data and in many different ways. So, while it is difficult to generalize the specific sites of blackboxing, certain trends emerge about the processes of collecting and analyzing data. For example, the process of collecting data is not the site of blackboxing for most transport planners. In the receiving of data from external sources, however, gender is blackboxed.

Furthermore, the analyzing of data is considered to be a site of blackboxing, as most transport planners neither receive nor make analyses with gender as a dependent factor. Another interesting point is that the external sources of data and analyses themselves seem to be a site of blackboxing. International knowledge and seminars are not found to be the site of blackboxing. But old processes within the transport organizations could be.

5.2 Why gender is blackboxed

This section answers '**why** are gendered elements blackboxed according to Danish transport planners?' It does so by looking at the representation of women and men in the included organizations, the transport planners' own perceived role, what knowledge is available to them, and what sense of national identity exists.

5.2.1 Representation

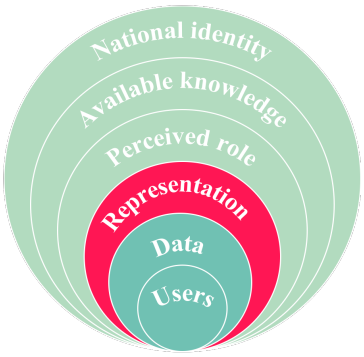


Figure 19: Analytical framework with emphasis on 'Representation'

The following sub-section discusses how transport planners view the gender breakdown of their department, organization, and field. These transport planners themselves equally represent women and men. The interviewed transport planners at Rambøll, Region Hovedstaden, ShareNow, Supercykelstier, and one at Gottlieb Paludan Architects are women. The interviewed transport planners at Arup, BaneDanmark, DSB, Metro, and one at Gottlieb Paludan Architects are men.

Most of the transport planners identified an equal split of women and men working within their organizations (Hansen, 2020; Hjuler, 2020; Nielsen, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Winther, 2020). Hejlskov (2020) at ShareNow and Weinreich (2020) at Rambøll (2020) construe that there are more men than women at their organizations. The specifics of each organization can be seen in Table 3.

A few transport planners reflected on hiring practices when asked about the gender breakdown of their departments. Schousboe (2020) at Region Hovedstaden and Winther (2020) at Arup identify a concentrated effort to hire a gender equal staff. Conversely, Nielsen (2020) at BaneDanmark

remarks, “I have been hired by the state for 27-28 years, and I have never experienced that gender has been considered [in planning], nor in hiring.”

Table 3: Gender breakdown of organizations

Organization	*Employees (# - department)*	*Gender breakdown (% women/men)*[15]
Arup	70 - All of Arup Denmark	50/50
BaneDanmark	2442* - All of BaneDanmark	40/60
DSB	7100* - All of DSB	Unknown
Gottlieb Paludan Architects	23 - Mobility departments	40/60
Metro	20 - Planning department	50/50
Rambøll	250 - In Smart Mobility across seven countries	More men than women
Region Hovedstaden	20 - Mobility department	50/50
ShareNow	25 - All of ShareNow Denmark	20/80
Supercykelstier	8 - All of Supercykelstier	60/40

*The number of employees at BaneDanmark and DSB where not mentioned in the interviews and were therefore found online (BaneDanmark, n.d.; DSB, n.d.).

Other transport planners reflected on considerations they make for gender representation on transport project groups. The transport planners at Arup, BaneDanmark, Gottlieb Paludan Architects, and Region Hovedstaden do not consider gender when putting together project groups (Nielsen, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Winther, 2020). Schousboe

[15] The percentages presented by the transport planners have varying levels of preciseness. Hjuler (2020) at Supercykelstier was able to give the exact number of the women and men she works alongside. Hansen (2020) checked the CSR report. Winther (2020), at Arup, had consulted with HR before the interview. Most of the transport planners, however, acknowledged their breakdown as a guess based on their experience (Hejlskov, 2020; Nielsen, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Weinreich, 2020). Furthermore, numbers and percentages for whole organizations reflect the breakdown of the planners, managers, developers, and people working within HR and marketing, amongst others.

(2020) asserts that at Region Hovedstaden, "it is kind of easy not to have that as a focus, because we are sort of 50/50, so usually it just splits naturally." Meanwhile, at Arup, BaneDanmark, and Gottlieb Paludan Architects the transport planners emphasize that realities such as professional qualifications and availability limit their ability to consider gender (Nielsen, 2020; Sødring and Wille-Garvin, 2020; Winther, 2020). As an example, Winther (2020) says that,

> "for the specific project, I think yes, ideally you always want to make a balance but it's also a reality (because we are a fairly small office) that you can't always put together a perfect blend team because you know there's different disciplines and people are working on different projects" (Winther, 2020).

When asked about the gender breakdown of the actors with whom the transport planners work on a regular basis, there is a clear trend. At Arup, Winther (2020) states, "it's a pretty easy question to answer. Because it's not a 50/50 split. It's pretty far away from that. It's probably more like 80% males, 20% females." Weinreich (2020) agrees; she says, "in general in the transport sector, it is a male dominated sector" (Weinreich, 2020). At Metro, Hansen (2020) says, "when I look at the stewards who walk at the stations and on the platforms, there are probably more men." At BaneDanmark, however, Nielsen (2020) introduces a nuance, saying,

> "I could imagine there are more men than women at the workplaces [we work with]. But all train personnel, the people walking in the train cars, are women. I think it is also about 40% women and 60% men" (Nielsen, 2020).

From the interviews, two things are clear: 1) there are more men than women work as external partners to the transport planners, and 2) those external partners seemed to have gendered jobs within their workplaces.

Some of the transport planners commented on the different types of work men and women do within their own organizations (Hansen, 2020; Hejlskov, 2020; Nielsen, 2020; Sødring and Wille-Garvin, 2020). At Metro, Hansen (2020) suggests that there is an equal split of women and men working as economists, more women hired as social scientists and in HR, communications, and finances, and more men working with engineering. At ShareNow, Hejlskov (2020) puts forward that the people working with the cars are more often men and those working in customer service, often part

time, are more likely to be women. Nielsen (2020) comments that BaneDanmark, "is definitely a male-heavy company, but that is because many of the people repairing the train tracks are men. But if you take all the 'soft' disciplines, office disciplines - there are a lot of women." Nielsen (2020) goes on to propose that there are more women working in HR, purchasing, communication, and potentially 'infrastructure', whereas men make up the majority of the large number of maintenance workers.

Equality in representation?

Most transport planners perceive that there is equality in the ratio of women to men within their organizations. However, very few perceive equality in the ratio of women to men working in specific areas. Men are perceived to hold positions more closely related to transport infrastructure, whereas women are not perceived to hold technical positions. These perceptions are aligned with the current theory on the transport gender gap.

It is important to recognize the discrepancy between gender representation at an organization level versus in specific work areas. The blackboxing theory exposes the representation of women and men in transport organizations as relevant to the work that transport organizations produce. If organizations wish to have gender equality within their organization, and reap the benefits of diverse planning groups, then they will have to achieve equality of their planners and engineers. An over representation of any group of people has the danger of planning a world unintentionally for that group of people. In this case, men are overrepresented in engineering and planning roles; as a result, transport systems in Denmark can be expected to be more suited for men. With all of this being said, in the organizations with more women working in HR, it could be expected that more women would be hired.

A few transport planners emphasize gender representation as it is related specifically to 'hard' and 'soft' transport disciplines (Sødring and Wille-Garvin, 2020; Weinreich, 2020). Sødring (2020), for example, speaks about Gottlieb Paludan Architects and says,

> "in one part of the spectrum, we have heavy rail projects, or bridges or stuff like that. It is a very traditionally male business. And then we have the other end of the spectrum with mobility intertwined with the public realm surrounding the station. And there is a tendency to see more female employees working there" (Sødring and Wille-Garvin, 2020).

Wille-Garvin (2020), also from Gottlieb Paludan Architects, suggests that compared to the isolated transport world of bridges and tunnels, holistic projects have, "more to do with the backgrounds and the education and the interests of female planners, of architects, designers" (Sødring and Wille-Garvin, 2020). Therefore, Wille-Garvin (2020) thinks that,

> "there will be more women in the transportation field in the future because transportation projects are developing or have already developed into projects that have a lot more to do with the surrounding cities and landscapes than they used to" (Wille-Garvin, 2020).

Weinreich (2020) speaks to a similar pattern at transport conferences; she says,

> "as soon as I move to more mobility and especially sustainable mobility, women come into the picture. It is very visible at conferences, that at conferences about sustainable mobility, about cycling, about walking, there are so many more women that are in that field. Kind of the 'harder' the topic gets, the more men are present" (Weinreich, 2020).

Several transport planners further recognize the connection between representation in their organizations and project groups on the quality and type of work that they do (Nielsen, 2020; Schousboe, 2020; Weinreich, 2020; Winther, 2020). While Hansen (2020) points out the male bias of traditional transport planning, Schousboe (2020), Weinreich (2020), and Winther (2020) argue for potential solutions. To start, Hansen (2020) implies that traditional transport planning has focused on, "the hardcore parameters such as travel time, speed, and prices," which may benefit male commuters. "It wasn't until recently," Hansen (2020) posits, "that we started to think about how one can make the stations more accessible for 'soft' travelers," or those people walking and biking to stations.

Schousboe (2020), from Region Hovedstaden, gives a possible reason for this type of thinking, saying that,

> "we tend to think about the same kind of people as ourselves - and we are quite capable, midlife-something, women and men. We are not disabled. We are not elderly. Sometimes we have children with

us. But I think the problem [is] raising our heads and seeing other groups than ourselves" (Schousboe, 2020).

Weinreich (2020) agrees, stating that, "every time we have a service, or we design a solution, I think people should think if they have this unconscious bias" (Weinreich, 2020). From Arup, Winther (2020) summarizes, saying, "I think the more diverse kind of design teams and user groups and input you can get, the better the project will be." Diverse groups lead to better, more inclusive projects. Importantly, Winther (2020) here recognizes that general diversity, not only gender diversity, changes and improves projects. With all of this being said, however, Nielsen (2020) acknowledges that it is sometimes difficult to create diversity. He says, "we are hiring pictures of ourselves" (Nielsen, 2020).

Take-aways about representation

Some of the transport planners point to representation within their organization as affecting their work. While the transport planners characterize the organizations with which they work as having a generally equal ratio of women to men, many of them identify more men working as engineers or working 'technically' with transport, and more women working in more office functions or with the more social side of planning. The identity of the planners is identified by some as a potential reason for why gender is blackboxed 'naturally'.

5.2.2 Perceived role

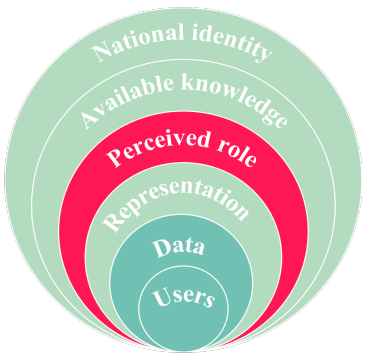


Figure 20: Analytical framework with emphasis on 'Perceived role'

The following sub-section explores the opinions which the transport planners have about whose responsibility it is to integrate gender into transport planning. Given that no transport planner is currently systematically considering gender, this sub-section explores one reason why they are not. The transport planners were asked what type of pressure it would take for gender to be taken into consideration in their planning processes, including who or what is needed for them to change.

Different transport planners have different beliefs about what their role is. On one side of the spectrum, Weinreich (2020) argues that all actors in the 'transport-chain' have a role to play in pushing the agenda: planners, architects, consultants, transport operators, service providers, etc. On the other side, at BaneDanmark, Nielsen (2020) says that there needs to be either research or political regulations for them to take gender into consideration. Furthermore, "if a requirement comes, then we implement it immediately and start to work with it" (Nielsen, 2020). Most of the transport planners, however, describe how their organization could personally play at least a small role in introducing gender considerations.

Transport planners with mainly architectural and consulting roles identify areas where they could raise gender considerations but are still hesitant regarding their relationship with their clients (Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). Transport planners at Gottlieb Paludan Architects, for example, argue that they only take certain user groups or considerations into account if either the actors creating the brief demand it, or if the considerations show an important value (Sødring and Wille-Garvin, 2020). Winther (2020) at Arup expresses a similar hesitation, saying that, "typically as a consultant, when you get a job you don't make those kinds of demands." With that being said, Winther (2020) does say that,

> "you make contract negotiations, typically about money and people and so on. I don't think anybody would disagree if you said, 'well we'll have a 50/50 split on our project'. Nobody would say no to that" (Winther, 2020).

Weinreich (2020) at Rambøll both agrees as pushes at this point, saying,

> "we can of course internally say that we want to discuss this [gender] with the client - raise the question. That we can say. But if the client does not want to work with this topic, we cannot force the client. But we can say that in every project we raise it [gender considerations]" (Weinreich, 2020).

Alongside Weinreich (2020), Hejlskov (2020) and Schousboe (2020) are relatively optimistic and open about considering gender within Region Hovedstaden and ShareNow. Hejlskov (2020) at ShareNow posits that, "it's not that we can't do something ourselves in order to push it." She emphasizes, however, that they are driven mainly by making money (Hejlskov, 2020). Schousboe (2020) at Region Hovedstaden, is even more

optimistic. She says, "I think actually we would be able to do it [drive some sort of gender agenda]" (Schousboe, 2020). Region Hovedstaden could require that gender considerations be a part of the projects they are funding. At Rambøll, Weinreich (2020) is pushing hard to open these opportunities; she argues that, "to change this, we really need to question everything. In a daily routine, the routine will maybe kill all that questioning if you are not constantly being reminded about doing it" (Weinreich, 2020). So, Weinreich (2020) argues, everyone should be aware of their transport planning impact, and be further open to the public about it (e.g. publishing gender disaggregated data).

Hejlskov (2020) from ShareNow, stands out from the other transport planners, and emphasizes the relationship ShareNow has with the customers. She says that,

> "I think if that talk becomes widespread enough, then it will also affect companies, including us. We are very much reliant on our customers' satisfaction. So, if they see us as a company that doesn't speak to their needs or their beliefs, then obviously that has a big impact. So, in that sense we will try to follow the flow" (Hejlskov, 2020).

So, if the demand from the public is there, ShareNow would follow it, as it would mean a lot to their business (Hejlskov, 2020).

Many of the transport planners believe that change regarding gender considerations should start with bottom up pressure from the public; ultimately, they believe that this pressure will influence politicians to then make top down regulations (Hejlskov, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Winther, 2020). Schousboe (2020), for example, is hopeful, saying that maybe the top down approach would work better, but if people expressed the difficulties they meet, "maybe our politicians would hear about it more and they would bring it up." At Gottlieb Paludan Architects, Sødring (2020) furthers this point to say that while bottom up pressures could start the process, top down pressure is necessary for change. He says,

> "I think it would require a lot of bottom up rebellion in order to influence the political level. And I think it has to come down again from the top in order to actually be an integrated part of what we do" (Sødring and Wille-Garvin, 2020).

Hejlskov (2020), is a bit wary of top down regulation, expressing that, "I'm not personally a big fan of the whole demanding … just forcing it down on people. But at the same time, I believe it's sort of necessary to get people to move in that direction." Overall, while there is a general distaste for top down regulation, many transport planners acknowledge it necessary to bring about change.

In general, multiple transport planners acknowledge the importance of the political agenda in Denmark to their work (Hjuler, 2020; Schousboe, 2020; Weinreich, 2020). Schousboe (2020) says that, "if politicians make it a focus point, then we - as an administration - have to make it a focus point. So, I think they have quite a large role of putting it on the agenda and making it a central point of focus". Winther (2020) from Arup and Nielsen (2020) from BaneDanmark both give suggestions for how regulations could positively influence gender considerations within transport planning. Winther (2020) suggests that procurement regulations could require gender considerations, meaning that proposals, "would score diversity" points if their team is diverse. Big public investment plans would then be encouraged to consider gender. Nielsen (2020) suggests that the role of regulation could deal with quotas. He points to the fact that while both Norway and Sweden have introduced gender quotas on boards of directors, Denmark has not. He says that because we tend to hire images of ourselves, "I think a stepping-stone is implementing quotas" (Nielsen, 2020). If business as usual continues, he posits, "the number of women [in technical jobs] will increase, but it will take many years. So, if you want to improve the development in the short term, there needs to be quotas", suggesting the quotas could end in 20-30 years.

Speed of change

The blackboxing theory points out that black boxes often result in minorities and marginalized groups being responsible for asking for change. In this case, some transport planners recognize that change does not happen fast enough to positively impact not only the groups who directly suffer, but for society, which indirectly suffers from a lack of gender consideration. However, even the transport planners who identify ways in which they could change, have not. Many still call for bottom up pressure or top down regulation to come first, before they as organizations act.

Take-aways about perceived role

While some of the transport planners do acknowledge certain actions that they could take to consider gender, most of them also, or only, point to the public or politicians to drive the inclusion of gender into the transport agenda. In general, there seems to be a lack of incentive for transport planners to take their own initiative and consider gender. With that being said, a few transport planners seemed open to the idea of gender quotas or certain 'top down' initiatives because of the otherwise slow speed of change.

5.2.3 Available knowledge

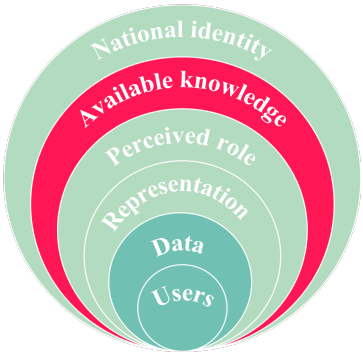


Figure 21: Analytical framework with emphasis on 'Available knowledge'

One of the main reasons for why gender is not taken into consideration by the transport planners is due to a lack of knowledge. While one transport planner directly points out a lack of knowledge about how and why women and men travel differently, most have some knowledge on this subject. A couple of transport planners, however, identify a lack of knowledge about the context or organization specific relevance of gendered transport.

With regard to how and why women and men travel differently, transport planners had differing levels of knowledge. On one side of the spectrum, Nielsen (2020) expresses clearly that he, "actually has no knowledge about whether there is a difference in different genders' use of public transportation. Absolutely none." On the other hand, at Arup, Winther (2020) expresses the knowledge that, "in many places outside Denmark, metros are designed for young professionals who go to work," not for people with prams or bags. Meanwhile, at Metro, Hansen (2020) displays the knowledge he personally gained previously as a researcher about gender issues in transport. He furthermore mentions internal company knowledge of men valuing certain 'hardcore travel parameters', such as speed, and women fitting into the category of 'soft travelers', who may value other qualitative parameters (Hansen, 2020). Schousboe (2020) says that when working on transport projects at Region Hovedstaden, gender, "is not a specific focus, but it is a talked-about thing – it comes up quite a lot that men and women travel differently." She then goes on to mention both different

transport patterns and issues of safety and unpaid work which give reason to those patterns (Schousboe, 2020). In Smart Mobility at Rambøll, Weinreich (2020) says that the process has gone from educating colleagues on gendered differences to starting the process of digging deeper into what those context-specific differences are and how to work with them. At Gottlieb Paludan Architects, Sødring (2020) asserts that, from his view,

> "we have some knowledge already; and I think that the knowledge that we have is that the world is designed for men. All design parameters, all design standards are taking their starting point in the male body for instance, or male parameters. And in all kinds of design manuals and stuff, women are just slightly smaller than men" (Sødring and Wille-Garvin, 2020).

At Gottlieb Paludan Architects, Region Hovedstaden, and Supercykelstier, a gap is identified in the transport planners' knowledge of why and how it is important for their organizations specifically to consider gender in their planning processes. For example, at Gottlieb Paludan Architects, Wille-Garvin (2020) says, "I think we lack the competencies and the knowledge. [We lack] the specific design knowledge in our firm" (Sødring and Wille-Garvin, 2020). At Supercykelstier, Hjuler (2020) says that in order for her to include gender considerations into her work, "it needs to be way more concrete what it is that I have to do." Lastly, while Schousboe (2020) does not directly say that Region Hovedstaden needs context specific knowledge on how to use gender in their planning processes, she does say that despite the knowledge that they do have on how women and men travel differently, there are "glitches in making things come to text on a document. So, it is not directly worked on in the projects … we forget about it" (Schousboe, 2020).

At DSB and Metro, there seems to be a similar lack of knowledge, but perhaps unknown amongst these transport planners. At Metro, Hansen (2020) expresses some knowledge about the connection between safety and design. He is still hesitant, however, to consider gender, and does not specifically address gender as informing safe design. Similarly, at DSB, Møller (2020) expresses by email that DSB focuses generally on safety, and that, "the time schedule is considered gender neutral in its structure." From the email correspondence, it seems that DSB does not consider gendered effects of their planning and that they assume their current time schedule benefits all genders equally. It should be pointed out that both Hansen (2020) at Metro and Møller (2020) at DSB point to safety considerations when asked

about gender considerations. This seems to be consistent with what Weinreich (2020) says about gender not being incorporated into transport projects in Denmark unless, "it's very specifically around safety and security" (Weinreich, 2020). Meanwhile, she says, "in EU projects, and in international projects, gender is something that you always talk about" (Weinreich, 2020).

Knowledge

Many of the transport planners know about differences between typically male and female travel behaviour, and yet, gender is blackboxed in many of their planning processes. To this point, many transport planners say that they do not know what to do with information about how women and men travel differently.

The blackboxing theory points out that knowledge is often limited by black boxes. It is interesting therefore to consider which black boxes are limiting transport planners' knowledge about design specific action. Perhaps that knowledge is not being made in a Danish context because of the historical relationship between gender and Denmark, as pointed out in the transport gender gap. Perhaps transport planners are not asking for that type of knowledge because they do not perceive it to have value. Furthermore, there may be a performative element to new knowledge creation about gender in Danish transport. If the transport planners do not know the importance of considering gender, they will not ask for new knowledge. If they do not ask for new knowledge, it will not be created. If new knowledge is not created, transport planners will not know of the importance of considering gender.

Take-aways about available knowledge

There is a certain amount of knowledge which the transport planners lack in order to consider gender. While there does not seem to be a lack of knowledge that women and men travel differently, some transport planners say that they do not know what to do with that knowledge. Given design and context specific knowledge about how to consider gender and what the benefits would be, some transport planners say they would do so.

5.2.4 National identity

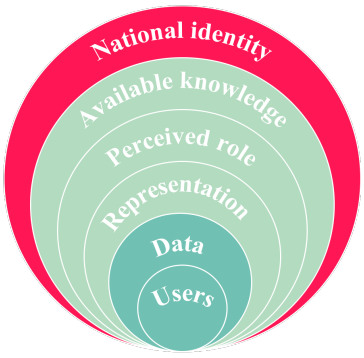


Figure 22: Analytical framework with emphasis on 'National identity'

Two main points about national identity are identified by the transport planners as relevant for why gender is not considered in Danish transport planning. The first point is the perception of existing equality in Denmark. The second point is a general resistance to the concept of feminism in Denmark. Schousboe (2020) identifies both of these points when asked why she believes transport planners in Denmark do not consider gender differences. She succinctly asserts,

> "I think it's both the people that are saying, 'gender equality is a thing in Denmark … it's not a problem … things are going very well … I don't see the problem myself … and we are well educated people, we have solved that problem', and the people who are thinking, 'if we go down that road and take that discussion, then we will be labeled as feminists'" (Schousboe, 2020).

The perception of gender equality is not only perceived by Schousboe (2020) at Region Hovedstaden, but by Weinreich (2020) at Rambøll and Nielsen (2020) at BaneDanmark. Weinreich (2020) reflects that in Scandinavia, "we see ourselves as very equal" and that, "because we have come a long way with gender equality in Denmark and Scandinavia, that maybe we are deluding ourselves into thinking that we have total equality" (Weinreich, 2020). On account of this belief, she says, people argue that, "it's just not an issue, so we don't discuss that" (Weinreich, 2020). Nielsen (2020) confirms this idea within BaneDanmark, saying that, "I experience that we have a lot of equality at my workplace. We get the same salary, and we get the same opportunity to speak." But he also recognizes a dissonance between the equality he experiences at work and in society (Nielsen, 2020).

A general resistance to the concept of feminism is expressed by a number of transport planners (Hansen, 2020; Hjuler, 2020; Schousboe, 2020; Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). At Metro, Hansen (2020) shies away from discussing gender differences because, "many people just react if you involve too much gender, and some misunderstand this feminism discussion." In this way, Hansen (2020) implies that talking about

feminist issues is not productive. Sødring (2020) from Gottlieb Paludan Architects expresses a similar sentiment, saying, "you won't get anywhere with the 'f'-word [feminism], in Denmark at least" (Sødring and Wille-Garvin, 2020). To this, Weinreich (2020) has learned to, "talk about gender, and not feminism. The word feminism gives people connotations that make the dialogue, what should I call it … conflict-ridden" (Weinreich, 2020).

Performative black box around national identity

Some transport planners seem to avoid feminism because of a perception that it will not be received well by others. This type of reaction, to beliefs about other peoples' beliefs, is related to performativity, as discussed within the blackboxing theory.

In this case, transport planners see the existence of a strong sense of national identity amongst Danish people; furthermore, they see this as a barrier to including gender in their planning processes. To a certain extent, they seem to expect that the public, politicians, and other transport planners exhibit this same sense of national identity. In addition, there seems to exist the belief that Danish transport planners do not work with gender. They themselves, therefore, do not want to include gender, and thus propagate the idea, and fact, that transport planners do not, and should not, work with gender.

In a slightly different vein, a few transport planners seem to avoid the concept of feminism because they themselves reject of the feminist debate. Winther (2020), from Arup, implies that feminism is not worth the discussion, saying, "we're making things a little bit worse, and that probably makes us forget other things." Hjuler (2020) agrees, arguing that many perspectives get lost in two-dimensional feminism. She says,

> "it becomes too rapidly two dimensional: how many women and how many men? What about everyone in between? What are we doing with all the people who don't fit into the black and white boxes?" (Hjuler, 2020).

There seems to be an association between feminism and the consideration of only gender, not other demographic characteristics.

Questioning equality

Many of the transport planners express some level of resistance to discussing gender inequality or the concept of feminism. This resistance is consistent with the transport gender gap, where a general reluctance of people in Nordic countries to discuss social differences is acknowledged. In Denmark specifically, decades of acceptance of the state of feminism and gender equality have ingrained a particular apprehension for the idea of gender inequality in Denmark.

In the blackboxing theory, this sense of equality ingrained in national identity can be seen as an example of a 'culture of the past'. Despite existing inequalities, people react to and protect this culture of the past. Transport planners are both seen as individuals who feel this national identity, and also as societal actors who propagate and construct black boxes which hide the existing and hidden inequalities.

A few transport planners are aware of the disconnect between the ingrained belief in equality and the actual state of gender equality in Denmark. Some of these transport planners continue to lean away from discussing gender. These planners seem to be subject to the performative blackboxing of gender's importance in Denmark. On the other hand, one transport planner is actively leaning into discussions of gender. However, this planner has a certain amount of knowledge, an international role, and private funding.

The same transport planners who avoid feminism as a two-dimensional concept, Arup and Supercykelstier, also mention the idea of weakness and victimhood while discussing gender considerations. From Arup, Winther (2020) expresses his opinion that in discussing how to design safe urban spaces for women, "you turn them [women] into victims. So, I think if urban spaces aren't safe, then it's unsafe for everybody." Hjuler (2020), with Supercykelstier, similarly expresses a problem with, "the idea that women are more scared of dark places ... who cares if it's a woman or if it's a man?" Both of these transport planners lean away from considering women as a distinct group in the design of safe spaces; they do so to avoid saying that women are victims or more afraid than men. Weinreich (2020) indirectly echoes these concerns and suggests that,

> "I think it's because especially in Scandinavia, we are so emancipated and so strong, that when we talk about this, women are sometimes made weak ... and I think we need to shift away from

that, to say, it's not about being strong or weak. It's just about having different concerns" (Weinreich, 2020).

Weak or not?

Some transport planners are reluctant to discuss gendered transport because of their assumptions that it will label women as weak. One transport planner questions this assumption, pointing out that there are just different ways of traveling, not weak or strong travelers. The theory on the transport gender gap is aligned with this perspective, pointing out that it is the design of the transport system and structural inequalities which lead to individuals traveling differently, not something inherently weak or strong about individuals.

In the context of the blackboxing theory, women can be seen as a group whose experiences, on average, are not planned for by transport planners. From an individual's perspective, asking to be seen and planned for, while outside of the norm, is not an expression of weakness but an acknowledgement of existing differences. From a transport planner's perspective, acknowledging differences of users is not an identification of weakness, but an identification of differences. Ultimately, this will result in a transport system more fitting to the population.

A few transport planners emphasize the Danish-ness of their perceptions on gender (Hjuler, 2020; Sødring and Wille-Garvin, 2020; Weinreich, 2020; Winther, 2020). Sødring (2020) specifies that feminism as a word meets resistance in Denmark. Weinreich (2020) shares that in Denmark, compared to other countries, the relevance of gender is questioned. Hjuler (2020) emphasizes that,

> "I definitely feel that Sweden is much more into this subject [gender] than we are in Denmark. And maybe this is - I'm just making a disclaimer because now I'm being very Danish, right? My feeling towards this is: just make some safe infrastructure for everyone" (Hjuler, 2020).

She implies that it is very 'Danish' to either not consider gender, or to focus on 'everyone'. Winther (2020), emphasizes another aspect of Danish culture. He asserts that,

> "in Sweden there's a little bit of a different culture. I mean they have a very inclusive, kind of consensus culture, where a lot of people are heard. And a lot of people have to agree on decisions.

Maybe a little bit more than in Denmark" (Winther, 2020).

Winther (2020) implies that, unlike in Sweden, all opinions don't need to be heard in Denmark.

Take-aways about national identity

According to some of the transport planners, there is a strong sense of national identity which prevents gender from being considered. Beliefs such as that gender equality exists in Denmark and a general, but strong, resistance to talking about feminism seem to infiltrate into many thoughts of considering gender.

Furthermore, a few of the transport planners seem to believe that other people would not be interested in discussing gender in their organizations and beyond. The agreement to participate in this thesis in combination with an expressed interest by many transport planners in learning more about gender and transport, however, suggests that there is more openness to talking about gender than meets the eye.

5.3 Summarizing the what and the why

The previous sections have analyzed and discussed the six different areas of the framework illustrated in Figure 16, as first presented in the analytical framework (Section 4.4). This section starts to merge these areas together. In answering the '**what**' question, it emphasizes the somewhat established context and passive nature of the planning processes which are blackboxing gender. In answering the '**why**' question, it elaborates on the interconnected nature of the reasons which the transport planners give for why they more actively or knowingly choose to blackbox gender. Ultimately, it finds that gender is blackboxed to a great extent in Danish transport planning and for a variety of interconnected reasons, including personal and national identities, a lack of knowledge, and perceptions of role.

***What** elements of transport planning processes blackbox gender in a Danish context?*

While this thesis includes a relatively wide range of transport planners, who work for both public and private interests, certain established processes became apparent and can be seen throughout this chapter. Both the identification of user groups and the collection and analysis of data can be identified as processes which blackbox gender, in part because of established, and in some cases antiquated, practices.

Many of the transport planners used language about 'everyone' in identifying who they are planning for. Furthermore, a few of the transport planners specifically said that they do not want to separate their users into non-nuanced groups or into groups of weak versus strong people. While these aims may seem admirable on the front, they are also consistent with a desire to plan equally and a misjudgment of the benefits of planning equitably. The focus on planning equally may be firmly established within Danish national identity as a belief in equality. The lack of equitable planning may be connected to an antiquated way of planning transportation systems – traditionally for male commuters – and a corresponding lack of knowledge that change is needed. Additionally, identifying more 'open' user groups, which every person could technically fit inside, may be adequate on one level, but it also ignores the knowledge to be gained about socially constructed desires, beliefs, and habits of different genders.

While data collection and analysis processes may be unique to each organization, some patterns exist regarding the blackboxing of gender. In collecting their own data, most transport planners have data which is disaggregated by gender. It is when many of the transport planners get data collected or analyzed by a third party that gender is blackboxed. Furthermore, as is apparent from the transport gender gap (Chapter 2), there is a wealth of International knowledge and recommendations which exist for the utilization of the transport planners. However, in many cases, the established relationships between transport organizations and, in some cases, antiquated processes and older tools may prevent this knowledge and these recommendations from being 'discovered'. New tools and updated dissemination of available knowledge could prove to prevent the blackboxing of gender at early stages of collection and analysis.

Why are gendered elements blackboxed according to Danish transport planners?

While many of the transport planners characterize the organizations with which they work as having a generally equal ratio of women to men, many of them also identify more men working as engineers or working 'technically' with transport, and more women working in office functions, or with the more social side of planning. Some of the transport planners also generally portray the Danish transport sector as a very male dominated world. Furthermore, certain elements – speed, efficiency, commuting – are associated with a 'good' economically efficient and profitable transport system. These elements are also those which have been historically connected to the average male traveler. Moreover, they seem to be built into the tools that some of the transport operators use and the assumptions that they make about what type of user should be prioritized.

A few transport planners have pointed to a slow increase in the representation of women in transport. Many of the transport planners point to the importance of representation for the opinions and experiences of certain groups to be heard and seen in transport design. One transport planner spoke to what he saw as increasing considerations for more qualitative elements of the transport experience. These two increases are not necessarily unrelated.

Many of the transport planners expressed an interest in learning more about what they could do to design, run, and manage a transport system which better supports women, especially if these improvements were connected to improved sustainability, economy, and value for them and their clients. However, the transport planners identified a few reasons why they are either hesitant about considering gender, or why it would be difficult. One reason, as mentioned above, is the fact that it does not come naturally if there is a lack of diversity in the engineers and other planners who are making decisions and assumptions (i.e. blackboxing). This diversity was described as not only having to do with gender, but also, socio-economic and employment status. This point could further be pushed to argue that there should also be diversity of ability, race, immigration status, and age amongst planners.

Another reason given by transport planners for why they do not, or may not, consider gender in their transport planning has to do with national identity. Many of the transport planners identify strong beliefs that they have, or they believe other people have, about gender and feminism. Specifically, the belief that gender equality exists in Denmark is identified as a barrier to asking for

knowledge that women and men experience the transport system differently, on average. The agreement to participate in this thesis, in combination with an expressed interest by many transport planners in learning more about gender and transport, however, suggests that the transport planners could be more open to considering gender, if given more knowledge. Another relevant and discussed element of national identity was the resistance to feminism as a concept. In general, discussions of gender seemed to lead to conversations about feminism. A few of the transport planners pointed to feminism as an inconceivable concept to talk about in their work. Therefore, it was pointed out by one transport planner that gender itself should be emphasized.

The transport planners also identified lack of knowledge as a reason for why they have not considered gender, and increased knowledge as something they would need in order to consider gender in the future. While most of the planners seemed to know that women and men travel differently, some of the transport planners pointed out that they do not know what to do with that information. They asked, therefore, for design and context specific information about how to consider gender and what the benefits would be. This knowledge could conceivably be created at the organization itself, in an internal project, by researchers at Danish universities, or a collaboration between the two. However, based on the current state of transport and gender in Denmark, new knowledge may not be created without the active request of the transport planners.

Chapter 6

Conclusion

Throughout Europe, the intersection of gender and transport is increasingly integrated, researched, and politically supported. In Denmark, issues having to do with gender have been historically ignored in public, academic, and political debates. Gender considerations in transport planning, however, have been shown to positively impact both the experiences of women and men, and general society from both equality and sustainability perspectives. Chapter 2 explored the intersection of transport, gender, and Denmark to support the assumption that gender is being hidden, ignored, and neglected in the Danish transport system, and to demonstrate the need to examine the people who maintain, create, and make decisions about that system. This thesis then answers the following research question:

To what extent and why is gender blackboxed in Danish transport planning?

Blackboxing is seen as a normal and necessary process in transport planners' work. Transport planners have to make decisions about how to understand, and thus simplify, users with complex and varying needs while operating within political and cultural frameworks. Blackboxing theory, however, problematizes uninformed and heedless blackboxing because of the negative effects which fall, albeit potentially unintentionally, disproportionately on minorities and marginalized groups (Star, 1991). It has therefore been used to identify areas of examination relevant to the work of transport planners. Blackboxing is seen to be particularly beneficial because it proposes areas of examination which not only answer what is happening within practical processes, but also the more cultural or normative reasons why. In exploring six identified areas – user group identification, data collection and analysis, representation, available knowledge, perceived role, national identity – two sub-questions were answered.

First, the question '**what** elements of transport planning processes blackbox gender in a Danish context?' was analyzed and discussed. In so, it uncovered that internal data collection processes are not identified by many transport planners as the site of blackboxing. However, the creation of analyses internally, the data and analyses received from third parties, and the idea of 'everyone' as a target group are potential sites of blackboxing.

Second, the question '**why** are gendered elements blackboxed according to Danish transport planners?' was analyzed and discussed. Reasons given by Danish transport planners include first, that gender is blackboxed by the gender of the planners themselves and in the idea that there is equal

representation in an organization. Second, blackboxing is put forward as being propagated in the lack of political pressure for gender considerations. Third, the blackboxing of gender is explained in part by the lack of properly disseminated knowledge about what transport planners should do about gender in their work. Last but not least, gender is blackboxed in the idea of equality and anti-feminist attitudes which seem to exist in Denmark.

Together, each of these sub-questions provide a deeper understanding of the planning processes happening and the thought processes behind them. The insights of Danish transport planners shed light on the existence of both established tools and organizational practices and also more cultural and normative elements which make assumptions about gender. Furthermore, some of these insights show how through the active choices that transport planners are making, gender becomes blackboxed. Other insights, however, shed light on the fact that the planning processes of transport planners are often dependent on external factors such as the work of other actors or the cultural and political context.

The methods allowed for both active and passive blackboxing processes engaged with by transport planners to be exposed. Ultimately, gender is seen to be blackboxed to a great extent in Danish transport planning, as it is happening on different levels and due to personal and national identities, a lack of knowledge, and perceptions of role. The eight recommendations found in Chapter 7 can be seen as stemming from the work that led to this conclusion.

Methodological reflections

The diverse insights developed by this thesis expose the extent to which and why gender is being blackboxed in Danish transport planning. The methods engaged with, however, have also played a role in what has been exposed. First, this thesis used an exploratory research approach and interviewed a wide range of transport planners. While the interviews with some of the transport planners led to in-depth discussions about the planning processes and tools used, others resulted in conversations about Danish national identity. By talking to different types of planners, patterns found amongst many planners working in the Danish transport system were exposed. While the choice to have an exploratory approach and a wide range of planners may have its drawbacks (i.e.

the results cannot be generalized), together they bring to light the general ways that blackboxing is occurring and the sites where it might be interesting to study more.

Second, semi-structured interviews were used to gather knowledge about transport planners and the processes they engage in. While a survey, questionnaire, or internet search could have generated some results about the gender breakdown or an organization's 'beliefs' about gender (e.g. from their CSR), the advantage of the interview method is that individual perceptions and potentially unrelated beliefs came to light. With this being said, knowledge about the transport planners' identities could have been more actively engaged with. Furthermore, by talking to the transport planners in a semi-structured way, unexpected elements (e.g. awareness of I-methodology, contradictions) were able to be expanded upon.

Third, the transport planners received the interview guides before the interviews. This choice allowed for arguably more fruitful conversations as each transport planner had time to reflect on a topic which they otherwise may not have thought much about. It may have, however, also produced a conveyed certainty about certain responses where it was not warranted.

Last, the six areas analyzed and their corresponding discussion boxes can be seen in light of the interpretivist epistemology engaged with in this thesis. Decisions about what areas and discussions to take up reflect, in part, the interests of the researchers. The thesis that results is a collaborative creation of both the transport planners and the researchers.

Chapter 7

Moving forward

This thesis has exposed the extent to which and why gender is blackboxed in Danish transport planning. It has described a specific transport planning culture which future studies can use to ask how gender can be introduced into Danish transport planning. It has also, however, uncovered some themes which start to answer that question. This list of eight recommendations builds off of the knowledge about what planning processes currently blackbox gender, in addition to taking the reasons why gender might otherwise be blackboxed into account. Hopefully these recommendations are thereby relevant to and achievable for Danish transport planners.

1. Evaluate gender gaps in data collection and analyses

Collecting and asking for disaggregated data gives power to transport planners to choose when it is significant to act on gendered differences, and when it is not. However, many transport planners do not currently make or receive gender disaggregated data, or analyses which consider the relevance of gender. So, collect and ask for it if possible so that at least one more dimension of 'everyone' can be taken into account.

2. Invest in tools and procedures which value non-commuters and trip chaining

In order to provide equal support and access to women and men, transport planners should work to invest in tools, and develop practices, which value more nuanced transport patterns. Not only will this increase gender equality in transport today, but it could support gender equality in the future as men continue to take on a larger portion of unpaid work.

3. Increase representation of women in all parts of the organization

Increased gender diversity on planning teams has been identified as a driver of more gender sensitive, and better, planning. In order to capitalize on this, transport planners should consider developing quotas or goals for equal representation of women and men in each department or sector of their organization.

4. Research on social, economic, and environmental impacts of gender

Knowledge on specific impacts of gender considerations for the transport sector in Denmark is lacking. Transport planners have an opportunity to both play a role in filling that knowledge gap, and also to gain useful

knowledge for their organizations. Seek out opportunities to learn more by working with internal research groups, seeking industrial PhD students, and strengthening partnerships with a wide range of universities; this could help develop the more qualitative side of transport.

5. Include gender in sustainability agendas and evaluation of SDGs

Gender equality in transport is closely connected with both social and environmental sustainability. Furthermore, gender equality is SDG 5. So, include gender in any existing sustainability agenda or SDG targets; attaching gender to a larger agenda may ward off external skepticism.

6. Utilize benefits of an international company as a way to circumvent Danish norms

Danes are not good at talking about gender inequality. In organizations that have international branches, gender can be studied in all of those branches as a way to argue for gendered research. Collaboration and knowledge sharing between branches about this gendered research could lead to new methods of studying gender and deepened comparative knowledge.

7. Hold workshops within organization

Engage colleagues and work with them to learn more. Put together workshops and utilize internal diversity groups. Start internal conversations about the ways in which gender matters. The gender gap is large, but by starting internally, it can start to be filled.

8. Ask if there is a gender impact

One way to start planning for both women and men is to ask whether there are gendered differences or impacts of each decision you make. When planning a route, designing a station, creating a project group, and putting together a marketing campaign, ask if and how that plan, design, group, or campaign impacts, benefits, or affects women and men differently.

References

Aalborg Universitet, n.d. *Info om database*. [online] Universitetsbiblioteket. Available at: <https://www.aub.aau.dk/find-materiale/databaser/info?id=1408796> [Accessed 1 June 2020].

Ahanchian, M., Gregg, J., Tattini, J. and Karlsson, K., 2019. Analyzing effects of transport policies on travelers' rational behaviour for modal shift in Denmark. *Case Studies on Transport Policy*, 7(4), pp. 849-861.

Alonso-Almeida, M., 2019. Carsharing: Another gender issue? Drivers of carsharing usage among women and relationship to perceived value. *Travel Behaviour and Society,* 17, pp. 36-45.

Andersen, J. and Shamshiri-Petersen, D., 2016. Attitudes Towards Gender Equality in Denmark, Sweden And Norway. Vejle.

Antonson, H. and Levin, L., 2018. A crack in the Swedish welfare façade? A review of assessing social impacts in transport infrastructure planning. *Progress in Planning*, 138, p. 100428.

Bachtrögler, J., Bock-Schappelwein, J., Eckerstorfer, P., Huber, P., Mayrhuber, C., Sommer, M. and Streicher, G., 2019. *Gender Equality as a Grown Factor: The Economic Benefits of Gender Budgeting in Vienna*. Austrian Institute for Economic Research.

BaneDanmark. n.d. *Vores organisation*. [online] Available at: <https://www.bane.dk/da/Om-Banedanmark/Organisation> [Accessed 1 June 2020].

Bastian, A. and Börjesson, M., 2018. The city as a driver of new mobility patterns, cycling and gender equality: Travel behaviour trends in Stockholm 1985–2015. *Travel Behaviour and Society*, 13, pp. 71-87.

Beall, J., 1996. *Urban Governance: Why Gender Matters.* New York: UNDP, pp. 1-24.

Blaikie, N., 2000. *Designing Social Research*. Cambridge: Polity press.

Borchorst, A. and Siim, B., 2008. Woman-friendly policies and state feminism: Theorizing Scandinavian gender equality. *Feminist Theory*, 9(2), pp. 207-224.

Breengaard, M., 2020. Personal Interview.

Breengaard, M. and Oldrup, H., 2009. A gendered approach to sustainable transport: What's driving you? *NIKK Magasin*, (2), pp. 12-14.

Callon, M., 2006. What Does it Mean to Say that Economics is Performative? IDEAS Working Paper Series from RePEc.

Ceccato, V., Vasquez, L., Langefors, L., Canabarro, A. and Petersson, R., 2019. *En Trygg Stadsmiljö: Teori och Praktik för Brottsförebyggande & Trygghetsskapande Åtgärder.* Stockholm: Institutionen för samhällsplanering och miljö.

Christensen, H. and Breengaard, M., 2019. *Debat: Lad os stille feministiske krav til transportpolitikken og sikre alle lige adgang til mobilitet*. Information, [online] Available at: <https://www.information.dk/debat/2019/04/lad-stille-feministiske-krav-transportpolitikken-sikre-lige-adgang-mobilitet> [Accessed 1 June 2020].

Christiansen, H. and Baescu, O., 2019. *TU Årsrapport for Danmark 2018.*

CIVITAS, 2014. *Smart Choices for Cities; Gender Equality and Mobility: Mind the Gap!* CIVITAS WIKI Policy Analysis series.

Criado Perez, C., 2019. *Invisible Women: Exposing Data Bias in a World Designed for Men*. 1st ed. London: Random House.

Damyanovic, D., Reinwald, F. and Weikmann, A., 2013. *Gender Mainstreaming in Urban Planning and Urban Development.* Vienna: Urban Development Vienna.

De Madariaga, I., 2013. From Women in Transport to Gender in Transport: Challenging Conceptual Frameworks for Improved Policymaking. *Journal of International Affairs*, 67(1), pp. 43-65.

Dorpenyo, I., 2019. Risky Election, Vulnerable Technology: Localizing Biometric Use in Elections for the Sake of Justice. *Technical Communication Quarterly*, 28(4), pp. 361-375.

DSB. n.d. *Virksomheden*. [online] Available at: <https://www.dsb.dk/om-dsb/virksomheden/> [Accessed 1 June 2020].

EIGE. n.d. *What Is Gender Mainstreaming*. [online] Available at: <https://eige.europa.eu/gender-mainstreaming/what-is-gender-mainstreaming> [Accessed 1 June 2020].

EIGE, 2012. *Review of the Implementation in the EU of Area K of the Beijing Platform for Action: Women and the Environment - Gender Equality and Climate Change.* Luxembourg: Publications Office.

EIGE, 2016. *Gender in Transport*. Luxembourg: Publications Office.

European Economic and Social Committee, 2015. *Opinion of the European Economic and Social Committee on Women and Transport*. Brussels.

European Union, 2018. *Key Figures on Europe: Statistics Illustrated*. Publications Office of the European Union.

European Union, 2013. *European Social Statistics*. Luxembourg: Publications Office of the European Union.

Eurostat, 2019. *Part-time employment as percentage of the total employment, by sex, age and citizenship (%).* [online database accessed 5 May 2020].

Faith-Ell, C. and Levin, L., 2013. *Kön i trafiken*. Stockholm: Sveriges kommuner och landsting.

Forman, J., Poplin, G., Shaw, C., McMurry, T., Schmidt, K., Ash, J. and Sunnevang, C., 2019. Automobile injury trends in the contemporary fleet: Belted occupants in frontal collisions. *Traffic Injury Prevention*, 20(6), pp. 607-612.

Foster, S., 2018. *Smart Cities Must Reflect Women's Transportation Needs*. [online] Smash. Available at: <https://www.smashstrategies.com/2018/01/smart-cities-must-reflect-womens-transportation-needs/> [Accessed 1 June 2020].

Freudendal-Pedersen, M., 2013. Tracing the super-rich and their mobilities in a Scandinavian welfare state. In: T. Birtchnell and J. Caletrío, ed., *Elite Mobilities*. Routledge, pp. 209-225.

Frändberg, L. and Vilhelmson, B., 2011. More or less travel: personal mobility trends in the Swedish population focusing gender and cohort. *Journal of Transport Geography*, 19(6), pp. 1235-1244.

Gauquelin, A., 2020. *The Gender Gap in Shared Micromobility*. [online] The Urban Mobility Blog. Available at: <https://urbanmobilitydaily.com/the-gender-gap-in-shared-micromobility/> [Accessed 1 June 2020].

Greed, C. and Reeves, D., 2005. Mainstreaming equality into strategic spatial policy making: are town planners losing sight of gender? *Construction Management and Economics*, 23(10), pp. 1059-1070.

Include Gender. 2020. *Gender Equal Snow Clearing in Karlskoga*. [online] Available at: <https://www.includegender.org/gender-equality-in-practice/planning-and-urban-development/gender-equal-snow-clearing-in-karlskoga/> [Accessed 1 June 2020].

Gössling, S., Cohen, S. and Hares, A., 2016. Inside the black box: EU policy officers' perspectives on transport and climate change mitigation. *Journal of Transport Geography*, 57, pp. 83-93.

Hansen, L., 2020. Personal Interview.

Hanson, S., 2010. Gender and mobility: new approaches for informing sustainability. *Gender, Place & Culture*, 17(1), pp. 5-23.

Harding, S., 1986. *The Science Question in Feminism*. Ithaca: Cornell University Press.

Hejlskov, M., 2020. Personal Interview.

Hjorthol, R., 2008. Daily Mobility of Men and Women: A Barometer of Gender Equality? In: T. Uteng and T. Cresswell, ed., *Gendered Mobilities*. Hampshire: Ashgate Publishing, Ltd., pp. 193-210.

Hjorthol, R. and Næss, K., 2006. *Gender Equality in Transport: Summary*. Oslo: Institute of Transport Economics.

Hjuler, S., 2020. Personal Interview.

Hsu, H., 2007. *Opening the "Black Box" of the "Black Box": The Metaphor of the "Black Box" and its Use in STS*.

International Energy Agency and Norden, 2016. *Nordic Energy Technology Perspectives 2016: Cities, Flexibility and Pathways to Carbon-Neutrality*.

International Transport Forum, 2019. *Transport Connectivity: A Gender Perspective*. Paris: OECD Publishing.

Jeekel, H., 2019. Transport Disadvantages: Social and Societal Perspectives. In: H. Jeekel, ed., *Inclusive Transport*. Elsevier Science Publishing Co. Inc., pp. 57-91.

Jørgensen, A., 2008. The Culture of Automobility: How Interacting Drivers Relate to Legal Standards and to Each Other in Traffic. In: T. Uteng and T. Cresswell, ed., *Gendered Mobilities*. Hampshire: Ashgate Publishing, Ltd., pp. 99-111.

Kronsell, A., Rosqvist, L. and Hiselius, L., 2016. Achieving climate objectives in transport policy by including women and challenging gender norms: The Swedish case. *International Journal of Sustainable Transportation*, 10(8), pp. 703-711.

Kvale, S. and Brinkmann, S., 2009. *Interview: Introduktion til et håndværk*. 2nd ed. Copenhagen: Hans Reitzel.

Latour, B., 1999. *Pandora's Hope: Essays on the Reality of Science Studies.* Cambridge: Harvard University Press.

Latour, B., 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory.* Oxford: Oxford University Press.

Martin, E., 1991. The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles. *Signs: Journal of Women in Culture and Society*, 16(3), pp. 485-501.

McKinsey & Company and Innovation Fund Denmark, 2018. *Bridging the Talent Gap in Denmark: Insights from Female Representation in STEM*.

Mejia-Dorantes, L., 2019. Discussing measures to reduce the gender gap in transport companies: A qualitative approach. *Research in Transportation Business & Management*, 31.

Møller, C., 2020. Personal Interview.

Nielsen, K., 2020. Personal Interview.

Nielsen, M., 2016. Scandinavian Approaches to Gender Equality in Academia: A Comparative Study. *Scandinavian Journal of Educational Research*, 61(3), pp. 295-318.

Nostikasari, D., 2015. Representations of everyday travel experiences: Case study of the Dallas-Fort Worth Metropolitan Area. *Transport Policy*, 44, pp. 96-107.

Næss, P., 2008. Gender Differences in the Influence of Urban Structure on Daily Travel. In: T. Uteng and T. Cresswell, ed., *Gendered Mobilities.* Hampshire: Ashgate Publishing, Ltd., pp. 173-192.

Oudshoorn, N., Rommes, E. and Stienstra, M., 2004. Configuring the User as Everybody: Gender and Design Cultures in Information and Communication Technologies. *Science, Technology, & Human Values*, 29(1), pp. 30-63.

Pedersen, K., 2019. *Ny rapport: Der går mindst 100 år, før der er ligestilling.* Finans, [online] Available at: <https://finans.dk/okonomi/ECE11826981/ny-rapport-der-gaar-mindst-100-aar-foer-der-er-ligestilling/> [Accessed 1 June 2020].

Polk, M., 1998. *Gendered Mobility: A Study of Women's and Men's Relations to Automobility in Sweden.* Humanekologiska Skrifter 17. Doctoral dissertation. Göteborg: Department for Interdisciplinary Studies, Section of Human Ecology.

Polk, M., 2008. Gender Mainstreaming in Swedish Transport Policy. In: T. Uteng and T. Cresswell, ed., *Gendered Mobilities*. Hampshire: Ashgate Publishing, Ltd., pp. 229-241.

Prati, G., Fraboni, F., De Angelis, M., Pietrantoni, L., Johnson, D. and Shires, J., 2019. Gender differences in cycling patterns and attitudes towards cycling in a sample of European regular cyclists. *Journal of Transport Geography*, 78, pp. 1-7.

Sandow, E. and Westin, K., 2010. The persevering commuter: Duration of long-distance commuting. *Transportation Research Part A: Policy and Practice*, 44(6), pp. 433-445.

Schousboe, C., 2020. Personal Interview.

Singh, Y., 2019. Is smart mobility also gender-smart? *Journal of Gender Studies*, pp. 1-15.

Sovacool, B., Kester, J., Noel, L. and de Rubens, G., 2018. The demographics of decarbonizing transport: The influence of gender, education, occupation, age, and household size on electric mobility preferences in the Nordic region. *Global Environmental Change*, 52, pp. 86-100.

Sovacool, B., Kester, J., Noel, L. and Zarazua de Rubens, G., 2019. Are electric vehicles masculinized? Gender, identity, and environmental values in Nordic transport practices and vehicle-to-grid (V2G) preferences. *Transportation Research Part D: Transport and Environment*, 72, pp. 187-202.

Star, S., 1991. Power, technology and the phenomenology of conventions: on being allergic to onions. In: J. Law, ed., *A Sociology of monsters: essays on power, technology, and domination*. London: Routledge, pp. 26-56.

Strandbygaard, S., Jones, A., Jensen, L., Grönlund, B. and Nielsen, O., 2020. Fear follows form: a study of the relationship between neighbourhood type, income and fear of crime at train stations. *Journal of Transport and Land Use*.

Strandbygaard, S., 2016. Lokalmiljøet omkring stationen: Sammenhængen mellem oplevet tryghed og brugen af kollektiv transport. *Danish Journal of Transportation Research*, 2015.

Sødring, S. and Wille-Garvin, S., 2020. Personal Interview.

In: Cambridge English Dictionary. n.d. *Transport*. [online] Cambridge University Press. Available at: <https://dictionary.cambridge.org/dictionary/english/transport> [Accessed 1 June 2020.

Transportation Research Board, 2006. *Research on Women's Issues in Transportation, Volume 1: Conference Overview and Plenary Papers.* Washington, D.C: National Academies of Sciences, Engineering, and Medicine.

Wikipedia. n.d. *Transportministre fra Danmark*. [online] Available at: <https://da.wikipedia.org/wiki/Transportministre_fra_Danmark> [1 June 2020].

Trivector, 2019. *Varför arbeta med social hällbarthet i transportsektorn - och hur?*

University of Copenhagen, 2007. *TRANSGEN - Gender Mainstreaming European Transport Research and Policies: Building the Knowledge Base and Mapping Good Practices*. Copenhagen: The Co-ordination for Gender Studies.

Umaña-Barrios, N. and Gil, A., 2017. How Can Spatial Design Promote Inclusivity, Gender Equality and Overall Sustainability in Costa Rica's Urban Mobility System? *Procedia Engineering*, 198, pp. 1018-1035.

United Nations Economic and Social Council, 2008. *The Inland Transport Committee and Gender Issues in Transport*. United Nations.

Uteng, T. and Cresswell, T. ed., 2008. *Gendered Mobilities*. Hampshire: Ashgate Publishing Ltd.

Weinreich, M., 2020. Personal Interview.

Winther, K., 2020. Personal Interview.

Women Mobilize Women, n.d. *5 Principles to Empower Women in Transport Poster*. [image] Available at: <https://womenmobilize.org/wp-content/uploads/2020/02/5-Principles-to-Empower-Women-in-Transport-Poster.pdf> [Accessed 1 June 2020].

World Economic Forum, 2019. *Global Gender Gap Report 2020*. Switzerland: World Economic Forum.

Appendices

Appendix I: Interview guides

Arup (Kristian Winther)

Aim	**Questions**
Description	What (transport) projects are you currently working with at Arup?
Feminism in DK	*When we say feminism, what do you think?*
Representation in Arup	What is the gender breakdown of the employees working with transport projects at Arup? When you create a transport project group, is the representation of the genders of project group members considered? What is the gender breakdown of the people who you work with outside of Arup (in relation to transport projects, fx. bygherre)?
Transport projects and gender	Do you feel that you and your colleagues are aware of gender differences in how and why people use the transport system in different ways? • *(Of what you know of, what do you think is important?)* Do you and your colleagues act on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you designing for? • Which 'groups' of users are regularly and systematically considered in designing transport projects? (handicapped, children, commuters, women, men) • Why? Have you noticed a difference in gender sensitivity in Danish architecture planning as opposed to Australia (or other places)?
What are drivers and barriers in considering gender in designing transport projects at Arup?	Do your clients demand a gendered perspective in your designs (fx. for the metro Cityring)? • If so, which clients are demanding it? • Why do they demand it? (mission, money, policy, etc…) Do you think that taking gender into consideration in the design of stations or vehicles is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What factors could or do stop you from actively considering gender in your designs? Do you think that there is a need for a new perspective in designing transport stations/vehicles? What would need to happen in order for gender to be systematically considered in Arup transport projects? (top down (policy of firm or government) or bottom up demand) Would it be possible for you (Arup) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*

BaneDanmark (Kåre Stig Nielsen)

Aim	**Questions**
Description	Briefly, what is currently happening with regard to buildings and platforms in BaneDK?
Transport projects and gender	Do you feel that you and your colleagues are aware of gender differences in how and why people use the transport system in different ways? • *(Of what you know of, what do you think is important?)* Do you and your colleagues **act** on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you designing for? • Which 'groups' of users are regularly and systematically considered in designing transport projects? (handicapped, children, commuters, women, men) • Why?
What are drivers and barriers in considering gender in designing transport projects at BaneDK?	Do you feel that there is a demand for gender sensitive planning for train platforms and buildings? • If so, who is demanding it? • Why do they demand it? (mission, money, policy, etc…) Do you think that taking gender into consideration in the design of stations or platforms is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What factors could (or do) stop you from actively considering gender in your designs? Do you think that there is a need for a new perspective in designing stations? What would need to happen in order for gender to be systematically considered in platform and station design? (top down (policy) or bottom up demand) Would it be possible for you (BaneDK) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*
Representation in BaneDanmark	What is the gender breakdown of the employees working at BaneDK? When creating project groups, is the representation of the genders of project group members considered? What is the gender breakdown of the other actors who you work with outside of BaneDK?
Feminism in DK	*When we say feminism, what do you think?*
Relationship with DSB	How does the joint responsibility for the platforms (between DSB and BaneDK) function in reality? • How closely do you work together?

Gottlieb Paludan Architects (Sten Sødring & Sara Wille-Garvin)

Aim	**Questions**
Description	What (transport) projects are you currently working with at GPA?
Transport projects and gender	Do you feel that you and your colleagues are aware of gender differences in how and why people use the transport system in different ways? • *(Of what you know of, what do you think is important?)* Do you and your colleagues act on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you designing for? • Which 'groups' of users are regularly and systematically considered in designing transport projects? (handicapped, children, commuters, women, men) • Why?
What are drivers and barriers in considering gender in designing transport projects at GPA?	Do your clients demand a gendered perspective in your designs (fx. for the Aarhus letbane)? • If so, which clients are demanding it? • Why do they demand it? (mission, money, policy, etc…) Do you think that taking gender into consideration in the design of stations or transport vehicles is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What factors could or do stop you from actively considering gender in your designs? Do you think that there is a need for a new perspective in designing transport stations/vehicles? What would need to happen in order for gender to be systematically considered in GPA transport projects? (top down (policy of firm or government) or bottom up demand) Would it be possible for you (GPA) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*
Feminism in DK	*When we say feminism, what do you think?*
Representation in GPA	What is the gender breakdown of the employees working with transport at GPA? When you create a transport project group, is the representation of different genders considered? What is the gender breakdown of the people who you work with outside of GPA (in relation to transport projects, fx. bygherre)?

Metro (Leif Gjesing Hansen)

Aim	**Questions**
Description	Briefly, what do you do at Metro and how long have you been working here?
Transport projects and gender	Do you feel that you and your colleagues are aware of gender differences in how and why people use the transport system in different ways? • *(Of what you know of, what do you think is important?)* Do you and your colleagues **act** on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you designing for? • Which 'groups' of users are regularly and systematically considered in designing transport projects? (handicapped, children, commuters, women, men) • Why?
Data/gaining new knowledge	Where do you get your data/knowledge from (e.g. for the Letbane)? • How is data collected? How is it analyzed? • Is that data disaggregated by gender?/Are analyses using gender as a dependent factor?
What are drivers and barriers in considering gender in designing transport projects at Metro?	Do you think that taking gender into consideration in the design of stations or trains is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What factors could (or do) stop you from actively considering gender in your designs? Do you think that there is a need for a new perspective in designing transport stations/trains? What would need to happen in order for gender to be systematically considered in train and station design? (top down (policy) or bottom up demand) Would it be possible for you (Metro) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*
Representation in Metro	What is the gender breakdown of the employees working at Metro? When creating project groups, is the representation of the genders of project group members considered? What is the gender breakdown of the other actors who you work with outside of Metro?
Feminism in DK	*When we say feminism, what do you think?*

Rambøll (Marianne Weinreich)

Aim	**Questions**
Description	What is your main role in Rambøll? What projects are you currently working with at Rambøll?
Transport projects and gender	Do you feel that your colleagues are aware of gender differences in how and why people travel differently? Do you and your colleagues act on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you planning for? • Which 'groups' of users are regularly and systematically considered? (handicapped, children, commuters, women, men)
Data collection and analysis	How do you obtain data?/Do you collect all data on travel behaviour yourself (fx.), or use someone else's? Do you always collect gender disaggregated data in transport projects? Do you complete analyses with gender as a dependent variable (ex. seeing the gender breakdown of types of work or for length of trip)? • If so, do you always? When would you, and when would you not?
What are drivers and barriers to considering gender in transport planning at Rambøll?	Do your clients demand a gendered perspective in transport projects? • If so, who is demanding it? • Why do they demand it? (mission, money, policy, etc…) Do you think that taking gender into consideration in transport consulting is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What would prevent you from being able to implement gender sensitive transport planning? Do you think that there is a need for a new perspective in transport? What would need to happen in order for gender to be systematically considered in transport projects? (top down (policy, 'big' Rambøll) or bottom up demand) Would it be possible for you (Rambøll) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*
Feminism in DK	*When we say feminism, what do you think?*
Representation in Rambøll	What is the gender breakdown of the Smart Mobility section at Rambøll? What about the Transport section? (In Denmark) When you create a project group, is the representation of different genders (and other diversity indicators) considered? What is the gender breakdown of the people who you work with outside of Rambøll (ex. other organizations, municipalities, etc..)?

Region Hovedstaden (Caroline Schousboe)

Aim	**Questions**
Description	What do you do in Region H? What transport project have you been involved in? How big of a focus does regional development have within RH? Within regional development, how big of a department is mobility?
Feminism in DK	*When we say feminism, what do you think?*
Representation in transport department in Region H	What is the gender breakdown working with transport within regional development? Is the diversity of people considered when putting together a project team? Specifically, is gender representation considered?
Transport projects and gender	Do you feel that the ways and reasons for gendered travel behaviour are known in your department? In general, what sorts of 'groups' are considered in transport project development (handicapped, children, commuters, women, men)? Specifically, in the work that you do (deciding what transport projects to invest in...knudepunkter, letbane, etc..), is gender discussed at all? How do you decide which projects to invest in? In working with other organizations, do you set any requirements for them to include/consider gender?
Data collection and analysis	When analyses are done for transport projects... • Who does these analyses (DTU, or others)? • Is the collected data disaggregated by gender? • Is gender used as a dependent variable? • Have you found any gendered differences from these analyses? Are they reported?
What would it take, for gender to be prioritized in transport planning in Region H?	Do you think that taking gender into consideration in transport projects would be relevant for your regional goals (developing a sustainable region, etc..) • Could it be a useful perspective/hot topic? Why or why not? How **could** the Region put gender on the agenda? Do you think that there is a need for a new perspective to create momentum in the transport sector/make a change? If so, could gender be that new perspective? What would need to happen in order for gender to have a larger role in transport planning (top down demand or from citizens/municipality)?

ShareNow (Mette Hejlskov)

Aim	**Questions**
Description	Briefly, what do you do at ShareNow and how long have you been working here? How does the work done by ShareNow in Denmark relate to the work done in Germany and the rest of the world? • In marketing, how much of your marketing is focused on aiming towards Danish population specifically? • What sort of decisions does your product guy get to make in DK?
Data/gaining new knowledge	Where do you get your data/knowledge from? • How is data collected? How is it analyzed? • Is that data disaggregated by gender?/Are analyses using gender as a dependent factor?
Transport projects and gender	Do you feel that you and your colleagues are aware of gender differences in how and why people use the transport system in different ways? • *(Of what you know of, what do you think is important?)* Do you and your colleagues act on gendered travel behaviour knowledge? • If so, how? • If not, why not? Who are you designing for? Who are you marketing to? • Which 'groups' of users are regularly and systematically considered in the design and/or marketing? (handicapped, children, commuters, women, men) • Why?
What are drivers and barriers in considering gender in designing transport projects at ShareNow?	Do you feel that there is a demand for gender sensitivity in design and marketing of shared cars? • If so, who is demanding it? • Why do they demand it? (mission, money, policy, etc…) Do you think that taking gender into consideration in the design and/or marketing of ShareNow vehicles is relevant/important? • Could it be a useful perspective/hot topic? Why or why not? What factors could (or do) stop you from actively considering gender in your designs? Do you think that there is a need for a new perspective/momentum with shared vehicles? What would need to happen in order for gender to be systematically considered in your work? (top down (policy) or bottom up demand) Would it be possible for you (ShareNow) to drive a gender-agenda? *(If you were required to consider gender in your work, where would you start?)*
Feminism in DK	*When we say feminism, what do you think?*
Representation in ShareNow	What is the gender breakdown of the employees working at ShareNow (in DK…and if you know, overall)?

Supercykelstier (Sidsel Birk Hjuler)

Aim	**Questions**
Description	What is your main role in Supercykelstier?
Feminism in DK	*When we say feminism, what do you think?*
Representation in Supercykelstier	How many co-workers do you have at Supercykelstier? What is the gender breakdown of those co-workers? • What is the gender breakdown of the people you are responsible for Supercykelstier/work in the municipalities?
Transport projects and gender	Do you feel that Supercykelstier employees are aware of gender differences in how and why people bike? What 'groups' of users are you aware of, and do you target? (handicapped, children, commuters, women, men) • Is this 'targeting' in marketing, or in the design/placement of the routes? In making decisions about where to create supercykelstier, do you consider different user groups in these decisions? • If so, who? Women and men?
Data collection and analysis	From one of your reports, we can see that you have collected data about the percentage of men and women using the supercykelstier (55% and 45% of respondents). • Do you always collect gender disaggregated data? • Do you do any analyses which use gender as a dependent variable (ex. seeing the gender breakdown of types of work or for length of trip)? Do you use gendered data to improve Supercykelstier? • If so, how? Do you share any of your data with your partnered kommuner (or other organizations)...so that they could do their own analyses?
Marketing	What is important for you in the communication of your work to the public? What groups of people do you target? • Why? • How?
What would it take, for gender to be prioritized the planning of Supercykelstier routes?	Do you think that taking gender into consideration in your planning would be relevant for Supercykelstier? • Could it be a useful perspective/hot topic? Why or why not? Do you think that there is a need for a new perspective in biking (a driver for greater change in the percentage of people biking)? What would need to happen in order for gender to have a larger role in Supercykelstier's work? (top down or bottom up demand) *(If you were required to consider gender in your work, where would you start?)*

Appendix II: Literature search

Country	Search Terms	Search Engine	Subject Area	Results (#)
Denmark	Gender [Article title, Abstract, Keywords] AND transport* [Article title, Abstract, Keywords] AND (Denmark OR DK OR Danish) [Article title, Abstract, Keywords]	Scopus	Social Sciences, Environmental Sciences, Engineering, Psychology, Multidisciplinary, Decision Sciences, Arts and Humanities, Computer Science, Energy, Business, Management and Accounting, Earth and Planetary Sciences, Economics, Econometrics and Finance, Materials Science, Undefined	25
Sweden	Gender [Article title, Abstract, Keywords] AND transport* [Article title, Abstract, Keywords] AND (Sweden OR SE OR Swedish) [Article title, Abstract, Keywords]	Scopus	Social Sciences, Environmental Sciences, Engineering, Psychology, Multidisciplinary, Decision Sciences, Arts and Humanities, Computer Science, Energy, Business, Management and Accounting, Earth and Planetary Sciences, Economics, Econometrics and Finance, Materials Science, Undefined	65
Norway	Gender [Article title, Abstract, Keywords] AND transport* [Article title, Abstract, Keywords] AND (Norway OR NO OR Norwegian) [Article title, Abstract, Keywords]	Scopus	Social Sciences, Environmental Sciences, Engineering, Psychology, Multidisciplinary, Decision Sciences, Arts and Humanities, Computer Science, Energy, Business, Management and Accounting, Earth and Planetary Sciences, Economics, Econometrics and Finance, Materials Science, Undefined	37

Appendix III: Contacted Danish transport organizations

Organization	**Response**
Arup	Yes to interview in person. Switched to virtual.
BaneDanmark	Yes to interview in person. Switched to virtual.
Copenhagen Municipality*	Yes to interview in person. Switched to interview questions over email. No email as of June 3, 2020.
Donkey Republic*	No response.
DSB*	No to interview in person. Yes to interview questions over email.
GoMore*	No because of limited resources to help students in addition to COVID19.
Gottlieb Paludan Architects	Yes to interview in person. Switched to virtual.
Metro	Yes to virtual interview.
Movia*	No response.
NaBoGo*	No response.
Rambøll	Yes to interview in person. Switched to virtual.
Region Hovedstaden	Yes to interview in person. Switched to virtual.
Rejsekort/Rejseplanen	Yes to virtual interview. Response two weeks prior to thesis hand-in; late due to COVID19.
ShareNow	Yes to interview in person. Switched to virtual.
Supercykelstier	Yes to interview in person. Switched to virtual.
Swapfiets*	No because of COVID19.

*An asterisk symbolizes that there was no initial contact at this organization.