

GREEN TRANSPORT TECHNOLOGY AND DIVERSITY

**A Guide for
Danish Municipalities**



See online version
<https://koensforskning.soc.ku.dk/projekter/groen-transport/>

CO-ORDINATION FOR
GENDER STUDIES

Hilda Rømer Christensen og Michala Hvidt Breengard:
Green Transport, Technology and Diversity.
A Guide for Danish Municipalities

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The results of the project include this publication as well as a number of case videos focused on green transport, technology and diversity (Grøn Transport, teknologi og diversitet). The visual dissemination includes an introduction and separate cases from three municipalities, followed by a short summary of methods. The videos have been produced in collaboration with the communication company, flowerhaus – Haderslev, Denmark and will be made available online at <https://koensforskning.soc.ku.dk/projekter/groen-transport/>.



INTRODUCTION

Green transportation for all? A guide for Danish municipalities

This publication presents new perspectives on the development of an intelligent, inclusive, and innovative transportation system for everyone. We know that transport can be seen as a wicked problem. For some of us, discussing the issues of transport and diversity may seem very timely, while others may consider it completely irrelevant and incomprehensible! What, really, is the issue at stake, some may ask? Are we not all users of the same public transportation system? Are we not all motorists, cyclists, passengers, and pedestrians who wish to go about our journeys in the most effective and smartest way possible? In other words, do we not all have strikingly similar mobility needs and transportation habits?

The short answer to these questions is 'no'. Transportation and mobility are central to modern society, but the possibilities for transporting oneself are unevenly distributed. The take up of means of transport as well as the way one moves around are influenced by structural conditions, personal identities, history, and culture. These all shape the framework for transportation possibilities. It is a widespread assumption that transportation depends on the free choices of individuals. Yet, this is to disregard the fact that locality, gender, age, disability, income, and ethnicity all play a part in determining how easy or how difficult it is for people to move around. In addition, these factors mean that individuals may face limitations on their mobility which are ignored in the present transport policy and planning.

The green transport transition and the enormous focus on new and smart technologies has caught the attention of the public and of politicians. Smart technologies are considered by experts and politicians alike as serving as a panacea for the problems of climate change. Smart technology promises to meet the demands of increased urbanization, congestion, and changing mobility needs. Yet, in reality, new technologies are used differently by different citizens – hence, there is a potential to increase and overlook inequalities within the transportation system. The aim of this publication is to draw attention to and substantiate the challenges and opportunities that arise from creating a green transportation system that takes all citizens into account.

GREEN TRANSPORTATION – What's the problem?

The green transition, which includes transportation as a central topic, is often characterized by the strong belief in a 'technological fix'. New and smart transportation solutions, epitomized by the shiny electric and driverless car, are commonly viewed as the solution to the challenges of the future. Yet, when considering users in all their diversities (gender, age, income, ethnicity, and disability), the central question becomes: Who will use these new and smart solutions? And is the current focus to the benefit of all? Smart transport solutions, are still far from being 'smart' for everyone. How can those who are presently worst off be included in the new solutions – e.g. elderly and young people living in the countryside, where there are no buses, or those with disabilities and walking impairments? But the challenges also extend to the many "in the middle" who want to move into more active transportation, such as cycling, which requires safe lanes, better conditions for pedestrians etc.

Photo: Thomas Lekfeldt/Ritzau



Current municipal strategies in Denmark are included in the so-called DK2020 climate action plans. According to the DK2020 plans, municipalities need to actively engage their citizens in order to achieve climate targets. The inclusion of citizens is important in order to create change and encourage people to practice new sustainable lifestyles. DK2020 is also meant to ensure that all citizens have a platform to raise their concerns and wishes. As such, the inclusion of citizens goes hand in hand with a focus on diversity.

Through the DK2020 project, led by the think-tank Concito, 95 Danish municipalities have committed to developing climate action plans that are in line with the objectives of the 2015 Paris Agreement. As a major CO2 emitter, transportation is included as one of the most significant parts of these action plans.

Research has shown that new and smart transportation solutions are primarily used by the privileged (e.g. motorists) and most mobile, while less privileged and less mobile groups are left with inconvenient forms of mobility. This is not only a problem at the level of the individual citizen. It is a problem for society as a whole when the mobility of certain groups is constrained, weakened, or not taken into account, as this prevents them from participation in employment as well as in social life. Moreover, it also presents a problem for the green transition if large parts of the population are unable to make use of the solutions which are being invested in. Sustainable transport solutions are only sustainable to the extent to which they are used.

- *Where were the women when the first charging stations were set up? And why is it that I must have a charging cable in the car, which has to be lifted out of the car and connected to the charging stand before the car can be charged at publicly available charging stations?*
- *At petrol stations there has always been a hose on the petrol tank. The charging cable is difficult to get in and out of the car. It's too thick to just roll it up and takes up half the luggage compartment in competition with the shopping bags. During winters both your clothes and the car's trunk get dirty because the charging cable is on the ground while charging.*
- *It shouldn't be a bigger challenge for me than for my boyfriend. But it is.*

*Laila Kildesgaard, founder of Stederskaberfolk,
Altinget 8.3. 2023*

These challenges, combined, encourage increased attention on social perspectives in relation to green transport management and its intersection with new technologies. Who are the users of electrical vehicles? Who are the cyclists and who makes use of public transport? These questions should be posed if one wishes to show who benefits from our collective transportation system. Also, more specific data and knowledge is essential when it comes to launching new and more inclusive provisions and practices.

In this project, we approached staff and council members in 10 Danish municipalities with a focus on sustainable transportation, technology, and diversity regarding their current practices and needs.

Summary of the outcome of consultations with 10 Danish municipalities with a focus on sustainable transportation, technology, and diversity

- We would like to get more knowledge about the latest research and methods.
- We would like, to an even greater extent, to consider and incorporate specific groups into the municipalities' transport strategy.
- We need to have data related to mobility which includes gender, age, ethnicity, sexuality and disability.
- We are already spearheading strong initiatives but still lack long-term strategies for sustainable transportation – e.g. cycling and pedestrian strategies.
- We would like to obtain inspiration and ideas for solutions that can be put into practice without any additional large expenditure.
- We would like to have new ways of communicating our plans.
- We would like concrete instructions and exercises.

Data from a recent Danish transportation survey and the municipalities DK2020-plans reveal, not surprisingly, that there are differences between municipalities in relation to current transportation practices. These differences can, in part, be explained by municipalities' size, geographical location, and the social composition of residents in terms of income, education, ethnicity, age, etc. In addition, there are varying political and cultural traditions, which means that municipalities that seem to be strikingly similar may have very different strategies. For example, they may have different visions and priorities in relation to the reduction of motorized transportation and encouragement to use more active and green forms of transport (see the tables at the end of this publication).

Conversations with municipality employees and municipal legislatures illustrate that problems and potential solutions are interlinked. Despite differences, they address similar themes. Congestion and prioritization of non-motorized transport, lack of data and the lack of a holistic and comprehensive approach to transport planning and policy are noted as challenges in many of these municipalities. When it comes to diversity and the reflection



of different groups of citizens, the municipal consultations show that these are more implicit than explicit, and also woven into an array of local, national and global agendas.

In general, transport was not prioritized; the topic was almost non-existent in municipal politics. There has generally been a very weak tradition of dealing with transport.
North Zealand municipality

Democracy, transportation, climate politics, and diversity

The relationship between democracy, transportation, climate politics and diversity is relevant when we look at municipal strategies and political priorities. In general, women in municipal councils consider public transportation to be more important than men, irrespective of party affiliation. Research shows that municipalities with a greater mix of genders and ages on technical committees tend to have a greater engagement and focus on the

green transition and on solutions. This is due to the fact that greater diversity ensures a variety of perspectives in the decision process.

In the 2020s, the gender composition of Danish municipal councils continues to remain skewed in most legislative assemblies. In Table 1, the gender and age composition of a range of municipal councils is shown (figures are from 2022). The female:male ratio increases in councils in the Greater Copenhagen and suburban municipalities. Women are in the majority in Copenhagen, while they form the lowest number in Sønderborg municipality located in Jutland.

The skew is largest within technical and environmental committees, where most of the decisions related to local transportation are taken. Many of these committees are fairly small, comprising only four or five people. Therefore, the addition or subtraction of one individual can mean a huge change in terms of percentages. The percentage of women in technical committees, also known as the ‘asphalt committee’, varies greatly, from 50% in Copenhagen municipality to 14% in Herning municipality, and way down to 0% in Ishøj municipality.

Increasingly, Danish municipalities have created climate and environmental committees as a result of the increased prioritization of these issues. See Table 2. These committees have a less skewed female:male ratio with 71% female in Fredensborg municipality, 50% in Copenhagen municipality, and 14% in Kolding and Herning municipalities.

In terms of age, there is a considerable skew towards mature people with an average age of 44–60 years in both technical and environmental committees.

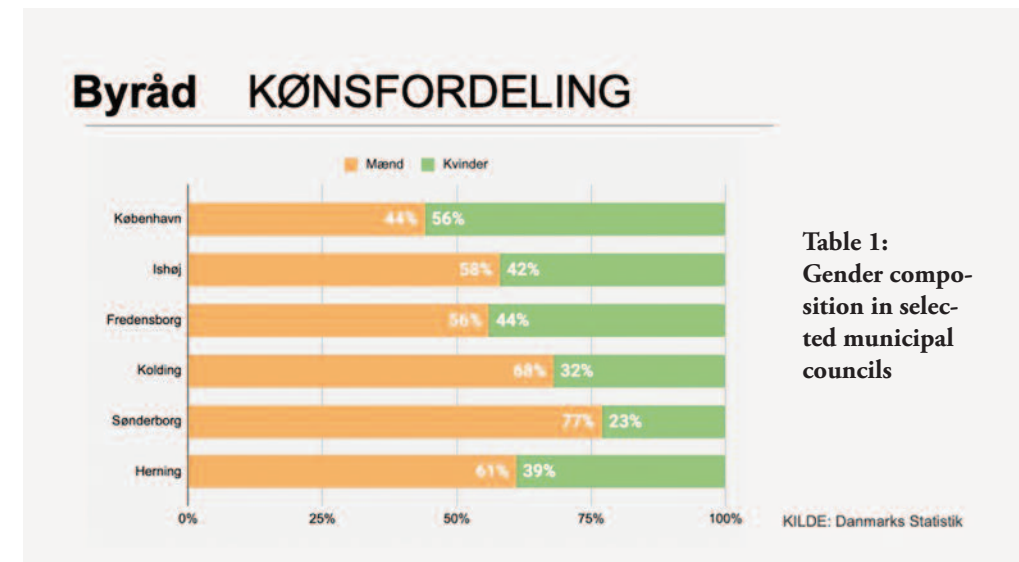


Table 1:
Gender composition in selected municipal councils

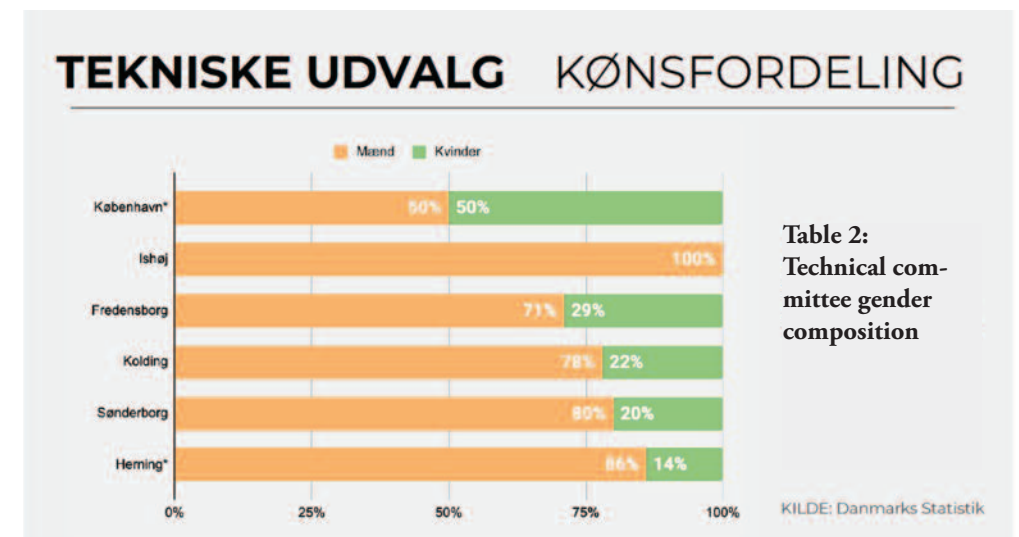


Table 2:
Technical committee gender composition

Does gender make a difference in transport politics?



Trafikminister Sonja Mikkelsen, SD, 1998-2000:
"I believe that there is a direct correlation between, on the one hand, male decision-makers, middle-aged male drivers, motorway investments and relatively declining investments in public transport."



Transportminister Ole Birk Olesen, LA, 2016-2019:
"We spend the money from the Storebælt on car drivers and not everything else."

The transportation sector as a workplace

Transportation is one of the most gender-segregated sectors across Europe as well as in Denmark. In Denmark, women make up only 12% of the labour force in road transport, 27% in maritime transport and 32% in air transport (figures from 2017). Women are often located in cleaning and service functions while men dominate operational functions, such as airline pilots or drivers in the freight and haulage industry. Both international and Danish research shows that explanations of this gender-segregated sector can be linked to cultural expectations around who should carry out the functions as well as inflexible working hours and poor working conditions.

A Danish campaign was launched in 2020 entitled 'More Women in the Driver's Seat'. The campaign was led by a collaboration between transportation providers, labour unions and industrial organizations with the goal of increasing the number of female freight and haulage drivers from the current figure of 2% to 10% by 2030. Some of the suggestions in this campaign could, with great benefit, also be expanded to cover the transportation sector as a whole, especially in relation to working hours and working culture.

An indicator for smart transport and diversity

- Inputs for the political engine room

In the Danish Ministry of Transport's manual of socio-economic analysis of the transportation sector (2015), it is emphasized that travel time, traffic safety, and economic growth are the elements that should be prioritized as most important. However, the manual does not include reflections on who benefits from the actions, who will get to their destination at a faster rate or for whom the safety and economic advantages are intended. Inputs from municipal staff and council members have drawn our attention to the lack of systematic indicators in the current decision-making process related to transportation and mobility. Several also note the need to include diversity in the criteria that form the basis of political decisions about transportation and mobility.

In connection with a recently completed EU project (TInnGO), we have developed a five-dimensional indicator which can guide the promotion of transport and diversity. In technical terms, this type of indicator is referred to as a composite indicator, which means that it is composed of several dimensions.

An indicator of smart transport with five dimensions

1. Economic Availability

Transportation is not smart if citizens cannot afford it. Prices should be viewed in relation to all forms of transport – smart/electrical vehicles, public transport, bicycles, and walking.

2. Effective Transportation

A transportation system that is effective for different types of travel and users; smart forms of transport including for work, social, and care-related trips. For instance, taking into account different users in terms of age, disability as well as social class.

3. Attractive Transportation

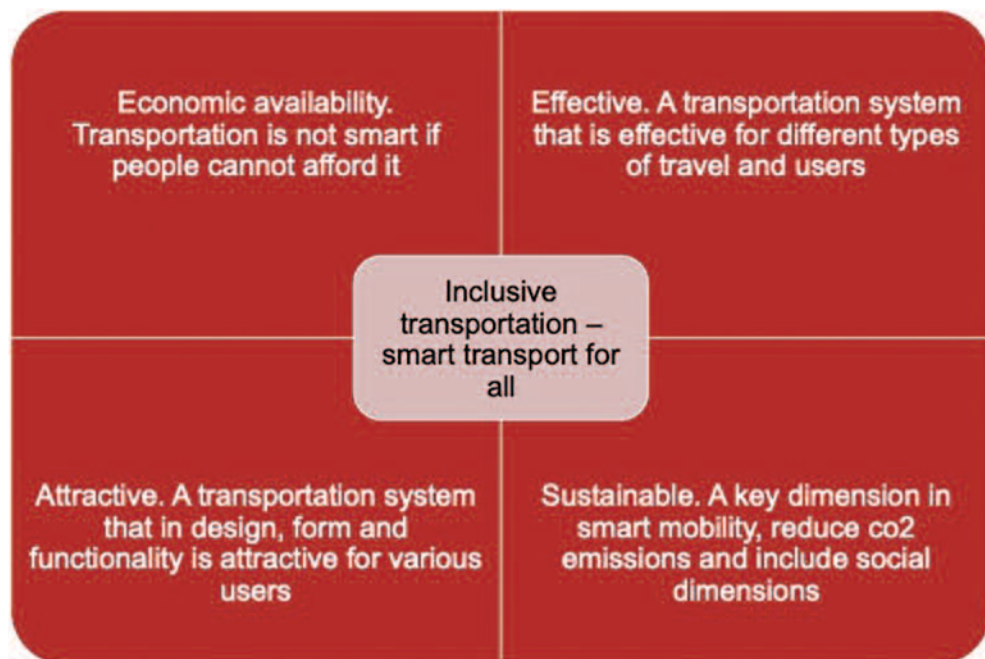
A transportation system that works and where design, form and functionality is attractive and modern for a broad range of citizens; also in relation to hygiene, safety, and comfort. An attractive transportation system is flexible and will adapt to users' needs and wishes.

4. Sustainable Transportation

A key dimension in smart transport is green and sustainable mobility. The goal of smart transport is to reduce CO2 emissions but also to include a social dimension as well as address a broad range of citizens.

5. Inclusive Transportation

An inclusive transportation system integrates the four dimensions above which are included in the sense that it combats discrimination and inequality in relation to ethnicity, gender, sexuality, etc.



What would happen if politicians and planners used this schedule when they made plans and enshrined strategies? What would municipality traffic and mobility planning look like? How would infrastructure plans for the entire country look?

Mobility and transportation obviously should be included as equality indicators, not only locally but in Europe and in global perspectives, in order to enhance growth, welfare, and the green transition. Danish municipalities play an important role in terms of daily practice and changes in customs and traditions, which also make municipalities vital actors in the revision and introduction of green transportation. A focus on the connection between diversity, transportation, and mobility in the green transition project would strengthen the Danish climate politics agenda and help Denmark achieve its green vision.

This guide and inspirational catalogue is meant as a wake up call for work with diversity as part of the green transition and of transportation. In the following sections, different approaches and methods for this work will be presented. This includes a section of training as well as cases and contributions from the Nordic countries, Sweden and Norway, and from the Danish Passagerpuls which could inspire new actions and approaches in the Danish municipalities.



Read more here

- Tinngo Gender smart mobility observatory: EU Horizon 2020 project with 17 see webpage with links, and training modules partners, see <https://transportgenderobservatory.eu/>
- Hilda Rømer Christensen, Michala Hvidt Brengaard, Lena Levin: Gender smart mobility. Concepts, methods, cases. Routledge 2023. <https://www.taylorfrancis.com/books/oa-mono/10.4324/9781003191025/gender-smart-mobility-hilda-r%C3%B8mer-christensen-michala-hvidt-brengaard-lena-levin>

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- Indsigerne trækker bl.a. på svensk forskning – og der er behov for at skaffe mere viden om sammenhængen mellem demokrati og transport og klima politik også i Danmark
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INSPIRATIONAL CATALOGUE

GREEN TRANSPORT – TECHNOLOGY AND DIVERSITY

This inspirational catalogue is aimed at employees within the transport, environment, planning, and engineering fields in Danish municipalities.

In the catalogue, you will gain knowledge about:

- Social differences in transport
- Gender and diversity
- Inclusive transport planning
- Methods and approaches for working with transport for all.

In addition, you can see five inspirational short films about diversity and green transport at www.koensforskning.soc.ku.dk/projekter/groen-transport/

Herning municipality has invented a new smart bus solution for users of wheel chairs. See more in the short film about transport in the city of Herning at www.koensforskning.soc.ku.dk/projekter/groen-transport/

GENDER DIFFERENCES IN TRANSPORT

In Denmark, there is a widespread understanding that women and men are equal. Both women and men are on the labour market, taking parental leave, and raising children. These everyday tasks require that both women and men can transport themselves from one place to another.

Even though there are ongoing changes in gender roles and divisions of labour, we still face differences that have an impact on women's and men's travel patterns. The differences are due to continuing structural imbalances in society, but also in the transport sector itself. Historically, employees' travel needs have been privileged in relation to the domestic sphere, and this hierarchy continues in the planning of transport, although often in an invisible form. By 'invisible' it is meant that transport research, policy, and planning assume that transport modes and needs are gender-neutral, despite the diverse use of these modes. This neutrality is reflected in terms such as 'users' or 'passengers', which are often used to describe actions in the field of transport. The question is what constitutes the understanding of a 'passenger' or 'user' and their transport needs and travel patterns?

Given the hierarchy of the private and public domains, we might expect that certain needs will be privileged over others. Much transport planning, for example, is based on the assumption that the need to travel by car from home to work during rush hour is the predominant mode of travel.

Women are more likely to...

Take journeys with several stops on the way (e.g. home-children's institution-work-children's institution-supermarket-home).

Make more non-work-related trips.

Travel in suburban areas.

Travel outside peak hours.

Travel in more sustainable ways, e.g. by walking and using public transport

Stop driving due to social conditions, e.g. finances or lack of driving experience.

Men are more likely to...

Make direct trips between A and B (home-work).

Travel more kilometres

Travel longer.

Travel more often.

Stop driving for health reasons

Stop driving later than women.

Source: TInnGo Observatory – European observatory for gender smart transport innovation (transportgenderobservatory.eu)

Working questions

- Which travel needs and transport patterns are prioritized in the municipality's policy, planning, and design of transport?
- What does a safe city look like from the perspectives of different citizens?
- How is the accessibility of the city for all citizens ensured?



SOCIAL PERSPECTIVES ON SMART TRANSPORT

When is transport 'smart'?

Smart transport commonly refers to new digital and technological transport solutions. A social perspective on smart transport shifts this isolated focus on transport solutions to a focus on different citizens' use of them. The question becomes whether the solutions are smart for a variety of citizens, asking 'for whom is it smart?'.

Smart transport is a key element in the creation of a well-functioning society, but only to the extent that transport solutions meet the mobility needs of all groups in a population. The social perspective on smart transport contributes to making future transport more innovative and 'smart' – from the start to the end.

“At one point we introduced small buses instead of the big diesel buses for reasons of climate and environment. But the small buses were very unpopular because they had poor accessibility. The municipality thought they were doing something good, but many citizens were frustrated by the lack of accessibility and space in the small buses, e.g. for walkers. It was not thought through well enough. We thought we were ordering a smart product – but that was not the case.”

North Zealand municipality

WHAT'S THE PROBLEM? WHAT'S THE CHALLENGE?

Research has shown that people's transport habits and needs are different. Gender, age, income, location, and ethnicity are some of the social dimensions that have an impact on how the population moves around in everyday life.

Problem

Men's transport habits and needs have dominated the transport sector. The interests, values, and needs of various social groups have therefore been underrepresented. There is an imbalance between which needs and habits are represented in the transport system.

Challenge

How can a greater balance and better solutions be created by the new green transport solutions?



INTERSECTIONALITY

An intersectional perspective means that several social categories, such as gender, age, ethnicity, income, and disability, are not analyzed in isolation. On the contrary, they are analyzed as coherent and integrated and not as isolated categories.

‘An intersectional analysis addresses new understandings of social relations and power relations’ (Crenshaw 1989).

Intersectionality is an analysis identifying the many factors that lead to differences in various social groups' transport behaviour, their choice of transport mode, and barriers of accessibility. Intersectionality expands the understanding of men and women as two homogeneous groups and works with a more complex understanding of gender as a multifaceted social category. Incorporating an intersectional perspective into transport policy, planning and design means paying attention to how different social categories interact with different transport patterns and needs.

Working questions

- Have interactions of gender and other categories, such as age, ethnicity, disability, geographic location, income, and sexuality, been included in designing a given transport solution?
- Is there a clearly defined target group? Target groups, such as women or elderly people, contain many differing individuals and needs. It may be necessary to work with smaller groupings within the overall target group, e.g. ‘income’, ‘children’, ‘single/couple’.
- Is a perspective on gender and diversity included in measures to improve transport safety? Some places can feel particularly unsafe for women, sexual minorities, and older people (e.g. deserted and dark streets or train platforms).



NEUTRAL VERSUS INCLUSIVE APPROACHES

Gender and diversity neutrality means making no distinction between genders and/or other social categories. The lack of distinction may occur because it is assumed that we already have gender equality and people can do whatever they want. In other cases, gender neutrality comes from an isolated focus on the initiative or on 'things'. Few, for example, will think that a municipality's new bicycle rack is really a gendered rack, or that the asphalt is socially skewed.

In contrast, a gender- and diversity-inclusive approach would say that it may well be that an initiative or a thing in itself is gender-neutral; the point is that the users are not 'neutral' but, on the contrary, they differ. A gender- and diversity-inclusive approach emphasizes people's various prerequisites regarding the use of things and measures.

So, a gender- and diversity-inclusive approach to transport requires knowledge about the differences in mobility patterns and needs. Without knowledge, we cannot ensure that everyone will in fact be included.

“In general, in my department there is an understanding of mobility for everyone, which seems to be guided by gender neutrality – and not out of consideration for specific groups. This means that some considerations, e.g. for people with walking difficulties, are included in the planning, but at the same time the prevailing understanding is that we have equality in the area of mobility – so it is not a subject that is prioritized.”

Zealand municipality

Working questions

- Is there resistance to talking about gender and equality in some areas?
- How is 'gender' included in the municipality's work?
- What will the result be if gender and diversity are not considered in the municipality's transport planning?



DIVERSITY AND GREEN TRANSPORT

Why is the focus on different social groups important in the green transformation of transport?

Perspectives on diversity in green transport solutions can help to:

- increase knowledge about how green measures in the transport area can meet and change the transport habits and mobility needs of various groups of citizens.
- contribute to a more sustainable, inclusive and equal transport system – as well as society as a whole – by involving different groups in strategies and initiatives.

How can the relationship between green transport and different concepts be understood?

Diversity	Who has the resources to make green transport choices in everyday life, and who does not
Mobility	Green transport must meet the mobility needs of citizens and not just be 'green.'
Gender	Various genders have different degrees of 'green' transport habits. The transport habits that are prioritized have an impact on how green the transport will be.
Smart transport	Smart transport is not necessarily green if technology and digitization are the sole focus
Sustainability	Solutions are only sustainable to the extent that they are actually used.



AN INCLUSIVE WORK ENVIRONMENT

The transport sector is a very gendered labour market. Female employees are mainly found in service jobs and rarely in areas such as technology, manufacturing and construction. Furthermore, there is a clear overrepresentation of men in the sector. The gender imbalances in the transport sector as a labour market are mainly due to:

Education: The transport-related education system has a significant gender bias with more men in, for example, STEM (science, technology, engineering, and mathematics) studies, which makes a gender-balanced recruitment policy more difficult.

Stereotypes: The transport sector has a reputation for being dirty and hard work – something that is more closely associated with the 'masculine' than the 'feminine'. Stereotypes of men as technically minded and women as service-oriented reflect their positions in the transport sector.

The lack of representation of women in transport is problematic for the sector's desire to attract more talent. Diversity increases innovation. In addition, people tend to see the world from their own point of view – this also applies to people in the transport sector. If you always take the car to work, you do not experience what it means when the bus route is closed. When you do not have walking difficulties or never travel with a pram, you might not realize the problem encountered when the lift on the platform is out of order.

“There should be greater gender balance in both the so-called hard and the so-called soft committees. Selections with greater gender balance are preferable. The city council culture here is more masculine and traditional than what I know from other political contexts. Nothing will really happen until 50% quotas are introduced in all committees.”

Jutland municipality

Working questions

- Is management prepared to work with gender and diversity in transport policy, planning, and design?
- How many women, men, young and elderly people, and people with an ethnic minority background are represented in the municipality's various departments?
- Is it possible for people with different types of disabilities to work in the municipality?



CENTRAL CONCEPTS

Smart Transport refers to modes of transport that aim to reduce the major transport challenges of the twenty-first century. Although smart transport is often associated with technological innovations in the automotive industry, it can take many different forms, including public transport, walking, and cycling.

Gender refers to the social constructions of roles and behaviours associated with being a woman or a man as well as other gendered identities.

Diversity refers to the multitude of social categories, such as age, ethnicity, class, sexuality, disability, etc.

A critical approach to norms

Gender norms refer to the standards and expectations that exist for how women and men are, look and behave. These norms have changed over time and across places. A critical approach to norms means asking questions about them. Norms rarely reflect reality, as reality is far more nuanced and complex. By being critical of norms, you avoid reproducing stereotypical understandings of gender.

Working questions

- Which norms are present in our work?
- What effect does a given standard have on the working environment and on our results?
- Do our norms mean that people who fall outside the norm might find it difficult to be part of our team?
- What happens if we break these norms and how do we do it?



PERSPECTIVES ON AN INCLUSIVE TRANSPORT SYSTEM

The gender dimension Forms of transport policy, planning, and design that consider the gender differences in people's transport habits and needs.

The diversity dimension Forms of transport policy, planning, and design that consider the multiple (age, income, geography, ethnicity, disability) differences in people's transport habits and needs.

Representation Different social groups (e.g. gender, age, income, geography, ethnicity, disability) are represented in transport policy, planning, and design.

Gender and diversity mainstreaming Gender and diversity are moved from the margins to the mainstream. Integration of the social dimensions is a pervasive perspective in transport policy, planning and design.

While gender stereotypes are cultural notions of how men and women (should) behave, they also influence norms for how we understand a 'normal body'. Today, the male body is predominant in investigations of car accidents or the testing of airbags. The use of only the male body in tests means that other individuals are left out of the design. For example, conventional seat belts do not fit pregnant women properly. This misfit means that car accidents can be fatal for pregnant women and unborn children.



METHODS AND APPROACHES TO WORKING WITH GREEN TRANSPORT FOR ALL

Gender and diversity mainstreaming

Integration of gender and diversity is also called gender and diversity mainstreaming. Mainstreaming is a strategy that involves moving gender and diversity from the margins to the mainstream. This means integrating gender and diversity perspectives in all processes of policymaking, planning, and design. The aim of the mainstreaming strategy is to make gender and diversity visible in work and innovation processes that might appear 'neutral'.

Gender and diversity mainstreaming has a double focus. One focus looks at how gender and diversity are included in transport and mobility services and planning. The second focusses on the representation of different social groups in councils and committees, etc.:

- (1) A perspective on gender and diversity in policy, planning, design, and services.
- (2) A question about the equal representation of different social groups in policy areas.

Gender and diversity mainstreaming has several tools for identifying imbalances and inequalities in work processes where gender and diversity have so far been invisible or not considered important. In the following, we present a number of these methods and tools that can help to address differences and inequalities.



AN INDICATOR WITH FIVE DIMENSIONS FOR SMART TRANSPORT

As mentioned in the Introduction to this publication, we have developed an indicator which can be used to incorporate diversity into work on smart transport. The indicator's five dimensions are reviewed below. Together, these five dimensions can help to guide efforts to include diversity in transport planning as well as policy in the area.

Inclusive	Smart transport systems must address different groups of citizens in non-stereotypical ways from start to end. This means that the diversity of citizens must be considered in all processes, from the development of design, issues of accessibility, security to communication and marketing.
Affordable	Public and private investments should consider the economic factors surrounding the transport available to different groups of citizens. Investments must support transport innovation that accommodates various forms of transport, including walking, cycling, and public transport.
Effective	Accessible transport should be ensured for everyone. Smart mobility regulations should also include cycling and walking. Municipalities are obliged to produce smart and efficient means of public transport rather than cater for luxury smart cars for individual use.
Attractive	Transport planning should provide safe, accessible, and livable spaces in all districts. This includes smart solutions for shared transport and various non-motorized forms of transport for many groups of citizens.
Sustainable	Non-motorized transport must be included in the development of smart transport. Measures should be taken to motivate different groups of citizens to prefer non-motorized modes of transport. Electric bikes and shared sustainable modes of transport can be made cheaper and accessible to everyone, including parents with children, people travelling with luggage or goods, older people, and people with disabilities.

Working questions

Attractive

- Are there gender differences in how attractive a given initiative appears?
- What does 'attractive' look like when multiple social categories are included, such as age and ethnicity?
- Remember that women (and LGBTQ+ people) often feel unsafe on dark and deserted roads, and at bus stops and train platforms.

Affordable

- What does 'affordable' look like from a gender perspective?
- For whom is a given initiative 'affordable' when several social categories are included, e.g. age, ethnicity?
- Remember the gender pay gap and that women are generally have fewer resources than men.

Effective

- How is a given initiative effective for women and men, respectively?
- What does 'effective' look like when other categories are included, e.g. when controlled for age?
- For whom is a solution effective and, especially, who does not find it effective?

Sustainable

- Are sustainable transport solutions offered to various social groups with regard to, for example, finance, disability, and age?
- Are some groups more attracted to sustainable mobility solutions than others, and are these differences considered?
- Remember that sustainable transport includes a social dimension, which means that transport solutions must remain attractive to different users, even when their needs change.

Inclusive

- Are gender differences in transport patterns and needs considered?
- Are some groups more vulnerable than others or do they experience discrimination in their daily use of transport?
- Does the design of the transport system work for all citizens? What about elderly people, people with disabilities or those travelling with prams? Do these groups have access to transportation that is as easy as fully mobile individuals?

GENDER BUDGETING – WITH AN INTERSECTIONAL PERSPECTIVE

Gender budgeting is a method of examining how public resources are used and who benefits from them. The purpose is to ensure that public funds and resources are distributed equally among the population. Gender budgeting challenges gender and diversity neutrality as well as assumptions of ‘planning for everyone’.

Using gender budgeting as a method involves an assessment of whether initiatives that are used mostly by one gender are allocated more money than initiatives used by others. Based on gender budgeting, policy, and decision-making processes can be restructured so that resources better meet the goals of equality. Intersectionality is relevant to include in processes of gender budgeting in order to capture inequalities due to other categories, such as age, disability, or ethnicity.

An example from Boden municipality in northern Sweden

A new contract for local bus services was the reason for new investments in the Swedish municipality of Boden’s local traffic. A perspective on gender and diversity perspective was added to the planning process to ensure a more equal distribution of resources among the city’s citizens. The municipality of Boden carried out gender budgeting of investments and found that most funds were spent on typical boys’ leisure activities: 80% was spent on sports such as ice hockey, while 20% was spent on leisure activities typically dominated by girls, such as horse riding. After the process of gender budgeting, more investment was directed towards leisure activities for girls. It was decided, for example, to increase the bus connection to the riding centre.

Working questions

- How are the municipality's budgets distributed in relation to gendered interests and activities?
- Does the budget meet all citizens' needs?
- Who benefits from the resources – and who does not?



GENDER STATISTICS

Gender statistics highlight the differences and inequalities between women and men in a given area. Gender statistics means:

- (a) collecting data and presenting it by gender as a primary classification
- (b) obtaining data that describe gender differences
- (c) collecting data based on definitions that capture gender diversity in different areas of people's lives
- (d) using data collection methods that consider stereotypes as well as social and cultural factors that may result in gender bias.

To ensure that actions benefit everyone (including across age, ethnicity, disability, education, income, etc.), gender statistics must include an intersectional perspective. Data is ideally collected both at the beginning and at the end of an initiative to establish a baseline for the planning process. This will ensure that the action moves in the desired direction as well as measuring the effects.



Working questions

- What data already exists on the population's mobility needs and travel habits?
- What categories are included in the data (gender, age, location, income, ethnicity, disability etc.)?
- Which categories are the most important to include in working processes?





GENDER AND DIVERSITY ACTION PLANS

Gender and diversity action plans are intended to correct existing inequalities either internally within an organization or in the services it provides. The aim is to ensure that working environments and services appear relevant, inclusive and attractive to a broad range of people. Action plans can target various issues, including:

1. Opportunities to participate in activities
2. People's access to opportunities
3. The distribution of rights
4. Opportunities to influence and make decisions
5. Income and benefits
6. Control over and use of resources.

Gender and diversity action plans are context-dependent in defining and operationalizing goals, as well as in deciding how the action plan is implemented. Processes of defining and implementing involve several steps that help to keep track of the process and to evaluate the results. These steps involve the following 10 elements:

1. A vision that defines the goal of the action plan, such as a more equal representation of different social groups in committees and public hearings.
2. One or more principles that indicate the background or starting point for the action plan, e.g. equality, fair mobility, or equal accessibility.
3. A set of political goals that relate to the objectives of the action plan at an overall level, e.g. EU, national, or local level.
4. A definition of the action plan's short- and long-term goals.
5. Formulation of how the planning of activities is organized to achieve the political goals.

6. Allocation of responsibility for each activity.

7. Clarification of implementation, including who should be involved in the process (e.g. equality networks, older people's associations, disability associations) and how to secure resources.

8. A definition of priority areas of action to achieve the goal, such as conducting a gender or diversity impact assessment of mobility and accessibility.

9. Allocation of the necessary resources via budgeting and ensuring time and place for activities.

10. Follow-up, evaluation, and revision.

Several countries have already implemented action plans for greater equality in the field of transport. A good example is Transport for London in the UK, which for many years has worked with action plans for gender and diversity in London's transport system (see References for links to a selection of Transport for London action plans).

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Working questions

- What is achieved by including a variety of groups of people in public hearings?
- How likely are different social groups to participate in public activities? How are they invited and how are their experiences included? Are there any groups that are neglected?
- What does a balanced distribution of employees with diverse backgrounds look like?
- How are employees from different social groups attracted to work groups and planning projects?
- What is representation like in political committees?
- In which areas of transportation can the biggest inequalities be found when looking at national data of transport modalities.
- How is the diversity of travel patterns and needs addressed in the latest priorities?
- How does accessibility and efficiency look like from a variety of citizens' point of view?



INSPIRATION FROM THE OUTSIDE

Personal safety and toilets:

Women and men have different needs in public transport

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People have different needs, also, within the public transportation system. For nearly 10 years, Passagerpulsen has investigated passengers experience with public transport.¹ Taken together, surveys paint a picture of profound differences in women's and men's experiences, needs, and wishes when they travel by bus, trains, and the Metro. Passagerpulsen is one of the few organizations in Denmark that (metaphorically speaking) takes the pulse of public transport users. Passagerpulsen is also part of the Danish Consumer Council, and is thereby an independent interest agency for the users of public transport.

Public transportation

The public transportation system is, and should be, a collective system where we all share the same facilities. Ensuring seamless functionality for everybody requires the organization of a system which takes into account the differing needs of different people and, more concretely, the differing needs of passengers.

'Passengers' consist of a wide variety of people, all of whom have different needs. Since 2014, Passagerpulsen has acted as the voice of passengers and has conducted several analyses and surveys of various themes within public transportation. In order to illuminate the subject of gender, we have extracted figures from several of these analyses.

In the surveys, we asked respondents which gender they identify with. Nearly everyone, close to 100%, identified as either a man or a woman. So we only have data to illustrate the differences between these two majority groups. People who identify with a gender beyond the male/female binary divide might have other wishes and experiences of public transport. Yet, it would require more fine-grained data to illuminate this subject.



Safety in daily public transportation – differences between genders

In a population survey from 2020, 55% of men emphasized that safety was important in relation to their daily transportation compared to 66% of women. Clearly, more women than men considered it important that travelling on public transport should be safe.

In the same survey, 50% of women said that the public transportation system felt like a safe place for them. For men, the figure is 57%. Therefore, while more women than men consider safety to be more important, they experience less safety than men.

Another example, illustrating the same issues, can be estimated from the 2021 population survey in which respondents were asked: What could increase your usage of bus, trains, and the subway? Nearly one-third of women (32%) emphasized that increased safety on stations could to a large or very large extent lead to increased usage of public transportation. In comparison, only 23% of men provided a similar answer.

What is required to create a safe perception of public transportation may vary greatly, but insufficient data limits us from making any empirically grounded assumptions about the differences. Fundamentally, however, conditions such as lighting, interior design, and the presence of and ability to contact transport staff shapes the perception of safety on public transportation.

Good access is of greater importance for women

While safety and security can be hard to define, there are several physical characteristics related to public transport where women's wishes can differ from those of men.

In the 2021 population survey, respondents were asked about facilities that should be included at transportation hubs, such as stations and bus terminals, in order to make them attractive for general usage. Facilities such as lifts, escalators, and step-free access into and out of trains were more frequently cited by women than by men.

There might be various explanations for these gender differences. For example, there are more elderly women than elderly men and they might have impaired mobility. Pregnant women and people traveling with prams or small children with them on a journey may also have a practical need for these facilities to a greater extent, which could also explain gender differences.

Gendered priorities

– risk-taking men and sufficient time for women

Escalators and lifts are examples of facilities that benefit certain groups more than others while they are no bother to anyone – passengers who do not need lifts are not annoyed by their presence.

In other areas, there is a difference in women's and men's wishes regarding public trans-

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portation. One example of this is the difference in attitudes towards the principles behind timetables. The 2021 population survey revealed that women, to a larger extent than men, prefer a timetable where there is a comfortable level of travel time (e.g. to change from one bus to another) rather than a timetable optimized towards the shortest possible travel time.

59% of female respondents prefer to have sufficient time to travel, e.g. when changing from one bus to another, compared to a shorter travel time. Only 41% of male respondents held such an attitude. The explanation could be linked to an assumption that men are greater risk-takers and are more inclined to gamble than women. Moreover, it could also be linked differing wishes regarding facilities, as outlined above; if women, to a larger degree, have difficulty in rushing up or down a flight of stairs in order to catch the next bus due to reduced mobility, it is obvious that they would like more time for travel.

Longer travel time, of course, increases the total transportation time in situations where users have to change from one mode of transportation to another. The obvious consequence of adjusting timetables to accommodate the needs of one group is that there is a risk of annoying another group – for example, people who wish to reach their destination as fast as possible and do not experience any difficulty rushing to catch a bus or train.

Men have nothing against disgusting toilets

In the 2021 population survey, respondents were also asked about their preferences regarding toilet facilities; these results reveal yet further differences in men's and women's preferences.

61% of women preferred a pay-to-use toilet that is clean in 9 out of 10 instances rather than a free-to-use toilet without any guarantees of cleanliness. In contrast, only 43% of men preferred a pay-to-use toilet.

This is not a profound difference when we consider women have different needs to men. The need to change sanitary pads, tampons, and baby diapers during travel requires longer stays at toilet facilities and higher standards of hygiene. These factors could also make it necessary for women to use toilet facilities more often.

Women just want to sit down

When on board buses, trains, and Metros, there is also a difference in women's and men's preferences. In the 2021 population survey, 55% of women stated that train carriages should be designed so as to maximize the chance of obtaining a seat. For men, on the other hand, the figure was only 41%. More men preferred a train carriage design that guaranteed good legroom even if it reduced the chances of getting a seat. In contrast, only 33% of women gave the same answer.

Differences in the use of digital self-service solutions

There is also a difference between men and women in relation to the use of Rejsekort² and Rejseplanen.³ In 2022, Passagerpulsen conducted a study on the digitalization of public transportation. More women than men (80% versus 72%) stated that digital self-service solutions have made it easier or much easier to plan a journey.

Women also make more use of digital self-service solutions and use the Rejseplanens app to plan their journeys. 52% of women used the app compared to 44% of men. One reason for this (which has not been tested) could be age and the differences in approaches to safety and security – women may have a greater need to double-check departure times to ensure that they can reach their train, bus, or metro.

However, digital solutions are not welcomed without reservations. Among women, there is a worry about whether 'checking in and out' with Rejsekort actually works. 42% of women worried about this while only 28% of men did so.

Passagerpulsen has data

As mentioned in the Introduction, public transportation is a common good, shared between all citizens. The differences described in this section are important for politicians, traffic companies, regions, and municipalities to be aware of when choosing the design of public transportation systems.

The decisions made will affect the accessibility of public transport. Hence, awareness and knowledge about different passenger groups' needs is essential for the appropriate design of a public transportation system (and facilities!) that caters for everybody and for collective well-being.

In this section, we have covered a range of topics, but Passagerpulsen has considerable knowledge about public transportation on a much broader scale. At the same time, we can run context-specific studies on data we hold in-house. Any reader who wishes to gain a deeper understanding or more knowledge of the topics covered here is more than welcome to contact us.

Notes

1. Passenger Pulse is a passenger watchdog at the Danish Consumer Council. The goal of the organization is a better public transportation system for passengers in Denmark – <https://passagerpulsen.taenk.dk/english>.
2. National electronic ticketing system
3. National digital travel planner

SNOW REMOVAL IS ALSO EQUALITY POLITICS

Examples of how Swedish municipalities work with gender and diversity in transportation

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Introduction

During winter, it snows in Sweden and my first example of equality politics within the transportation sector, is related to snow removal. Karlskoga municipality was the first municipality with equality in snow removal.

This is how things were in the past: snow would first be removed on ring roads, often late at night or early in the morning when a few trucks had passed by. After the ring roads, big streets, which often connect to male-dominated large workplaces, would be made

snow free. Lastly, bus stops as well as pavements and cycle lanes would be made free of snow.

Undoubtedly, it is harder to reach your destination through one decimeter of snow as a pedestrian than it is as a motorist. This is why it was decided to plough pavements and bike lanes before roads. Pre-schools now have top priority, as parents often have to travel to them before work. Large workplaces have second priority and now include female-dominated workplaces like hospitals and various municipal institutions. Pavements and bike roads to schools have third priority. Only when the fundamental infrastructural network has been opened up are the bigger streets and roads ploughed free of snow.

It has not become more expensive for the municipality to clear snow in this particular order. Rather, the municipality has become more equal regarding the distribution of resources. It has also made the city more accessible for everyone, especially children who don't have the luxury of 'taking the car' and older people who often injure themselves as a result of icy and slippery surfaces.

While Karlskoga was the first municipality to institutionalize these choices, a few other municipalities have also introduced equality in snow removal. There are many other measures which increase equality in the transportation chapter and this section will provide a few more examples. Before doing so, however, an overview of equality politics and why it is so important for the transportation sector will be provided.

Equality politics in the transportation sector

Equality politics was shaped during the twentieth century and the biggest developments occurred within several sectors during the 1970s, but not in the transportation sector. It was not until the beginning of the twenty-first century that the Swedish government formulated a transportation policy which encompassed gender equality (Box 1).

At the beginning of the twenty-first century, research also began to devote more attention to how transportation politics fulfils the requirements of equality, how transportation

Box 1. Political goals in transport

The design, functionality and usage of the transportation system should contribute to a fundamental level of accessibility for all citizens. Moreover, it should be of decent quality and usability while contributing to the possibility of development in the whole country. The transportation system should also be equal which should be understood as appreciative of women's and men's differentiated transportation needs. (Regeringskansliet [Government Chancellery] 2023).



Foto: Hejdlösa Bilder/VTI

is used by men and women and also how different modes of transport meet the travel requirements of men and women.

Prior to this, we already knew that men are more frequent users of motorized cars and that they have been central in the formation and shaping of the public transport system. Research also shows that more men than women cause serious traffic accidents. Planning and decision-making within the transportation sector has often been shaped by men, based on their experiences and needs. To some extent, this remains the case today, but there is now increased awareness of how men and women make different use of transportation. Not only do our bodies look dissimilar but also our travel needs, and it is recognized that the male perspective dominates planning. When awareness of these intrinsic aspects increases, it is only natural that things can start to change (Halling, Faith-Ell & Levin, 2016; Levin et al 2020; 2021; Levin & Gil Solá, 2021; Lindqvist Scholten & Joelsson, 2019).

The municipality of Karlskoga serves as a case to illustrate this. The background for the changes in this particular municipality was that a few years ago municipal directors gathered in a workshop related to the themes of gender equality and diversity. One of the male directors within the traffic unit confidently asserted that snow clearing has nothing to do with equality. However, in conjunction with his colleagues, he started questioning the prevailing norms and ended up concluding that snow clearing is, to the greatest possible extent, related to equality politics.

There are currently six gender equality policy goals in Sweden and many of the research projects that have been completed in close co-operation with transport planners in municipalities and regions have worked on aligning these goals and implementing them in the transportation sector (Box 2).

Box 2. Operationalization of the gender equality policy goals

 <p>1. Equal division of power and influence There should be equal distribution of power and influence between women and men in decision making and planning processes in infrastructure planning.</p>	<p>4. Equal distribution of unpaid housework and provision of care The infrastructure system should help create conditions that permit equal responsibility for housework for both women and men.</p>
 <p>2. Economic gender equality The infrastructure system should contribute to a society in which women and men have the same access to paid work, which will provide them with the means to achieve lifelong economic independence.</p>	<p>5. Equal health The transport system should minimise the risk of injuries and of poor health due to pollution (i.e., noise and air pollution) for women and men, girls and boys. The transport system should give women and men, girls and boys the same access to leisure activities.</p>
 <p>3. Equal education The infrastructure system should contribute to a society in which girls and boys, women and men, have the same access to education which will provide them with personal development and means to achieve independence.</p>	<p>6. Eliminate all forms of violence against all women and girls Risk and fear of exposure to gendered violence or crime in relation to transportation to education and work, as well as the negative impacts of gendered violence on mobility, should be eliminated.</p>

We regard the transportation system as an enabler of other activities (i.e. enabling people to reach all the places that are important in everyday life). Gender equality and diversity in the transportation sector means that both women and men have power over their mobility, as well as over investment and maintenance in the transportation system. Women and men should have the same opportunities to reach their educational institution or workplace while simultaneously having the space to develop, be economically independent and provide for themselves for the rest of their lives. Both women and men should have the possibility to share household and caring work, take their children to school/pre-school and make shopping trips on the way to and from their workplace (this often means having to make chain-trips with the use of the transportation system).

The transportation system should contribute to sound health and not impact the health of females, males, girls or boys negatively. In addition, it should work for both women/men and girls/boys when travelling to recreational or leisure activities. No one should feel nervous or fearful or be a victim of violence or threats within the transportation system (on footpaths, cycle paths, public transport, parking spaces etc.). However, more women than men have a greater fear of, or already experience, sexualized violence or harassment in all kinds of public environments. Within the public transportation environment in particular, this question need to gain more attention.

There are many examples of how gender and diversity can be applied to the transportation system (see e.g., Christensen, Hvidt Breengaard & Levin, 2023; Lindqvist Scholten & Joelsson, 2019). Within the EU-financed research project, TInnGO, workshops with municipalities and other actors have been arranged wherein a variety of methods have been developed (H2020 Grant No. 824249) (see e.g., Hvidt Breengaard, Christensen, Levin & Henriksson, 2021; Levin et al, 2021). As a result, issues of gender equality and diversity have been amplified in a clearer fashion. Below are a few examples from these workshops.

Gender budgeting and JämGIS

Boden municipality in northern Sweden brokered an agreement on local public transport using biogas for the years 2020–2030, while simultaneously introducing a discounted youth travel pass, priced at 500 SEK per annum. Alongside the introduction of the youth travel pass, there were also rising passenger numbers and this led to increased political support for public transportation. A new framework for public transportation was introduced and an extended master plan with an associated traffic and parking strategy was implemented, with proximity to bus stops in a wide variety of areas. In conjunction with this, members of Boden's youth municipal council also drew attention to children's and young people's leisure travel. As a result, a citizen initiative concerning improved travel to and from young people's leisure and recreational activities was put forward. Young girls'

travel to and from leisure and recreational activities garnered more attention. The municipality conducted an equality measure in the budget (gender budgeting) and found that 80% of resources were allocated towards boys' leisure trips while only 20% were allocated for girls' leisure trips. This resulted in the creation of a new bus route with more trips to a horse stable and a leisure area on the outskirts of town. This new bus route specifically caters for girls who visit this part of town to participate in horse riding classes, thus maintaining the well-being of the horses as well as enjoying each other's company.

Gender budgeting can amply be characterized as gender mainstreaming, applied to budgets. It entails that resource redistribution and its related consequences are analyzed through an equality lens and that incomes as well as expenses are adjusted to further equality. Another Swedish municipality that is worth mentioning in this regard is Lycksele which is highlighted as a good example by the Swedish Gender Equality Agency (Jämställdhetsmyndigheten, 2022). The municipality has created a tool called JämGIS. All recreational and leisure associations are included on the activity map, which is on the internet. On the map, associations detail the gender distribution of those who have attended practices or other gatherings. Moreover, permanent staff at municipal facilities such as swimming pools and hockey rinks have begun counting visitors and included gender as part of this data collection. Subsequently, this data is connected with JämGIS. The tool is also connected to the municipality's economic system which handles the recreational and leisure activities budget; this means that resource redistribution also can be added to the system.

Facts: Boden municipality has circa 30,000 inhabitants and is part of the Norrbotten region. Lycksele municipality has circa 13,000 inhabitants and is part of the Vasterbotten region.

Traffic safety and accessibility with the 8–80 method

Since 2020, Huddinge municipality in Sweden has worked with a method called 8–80 which entails an inclusive working method for increased equality with a particular focus on gender and various ages (Box 3). The municipality selects 1–2 areas every year which it subsequently scrutinizes in terms of traffic safety and accessibility using indicators of children and older people. The areas are selected based on priority ranking according to the municipal traffic safety plan. Data collection forms the basis for the analysis, which also happens through workshops and surveys with schools and nursing homes. The analysis is conducted with reference to physical design, visibility, lightning, placement, tilt and other aspects in relation to the stipulated guidelines. Much data is collected, and the works-

hops and interviews complement the municipality's technical data. The result is a new working method and the prioritized measures are carried out. Economic resources have been allocated towards this work.

Fact: Huddinge municipality has circa 115,000 inhabitants. It is located south of the city of Stockholm and is part of the Stockholm region

Box 3. '8–80 Cities' strategic work

The 8–80 method means that if a public environment is safe and accessible for an 8-year-old and a 80-year-old then it is safe for everyone!

An international network 8–80 Cities offers a cooperation domain, including methods for data gathering and analyses. Within this network, municipalities can also publish activities and share experiences (8–80 Cities, 2023).

Prerequisites for Equality Work

Finally, I would like to share some insights in relation to the prerequisites for equality work.

- There needs to be an expressed desire among municipal management to work with equality integration.
- The organization needs to be open to implementing the changes that are required, based on information that has been gathered through evaluations and research.
- The organization and its members should reflect on its practices.
- Everyone who works with transportation planning needs to appreciate that equality is not a project that is completed at some point in time and thereby concluded.
- Equality planning is part of a process which develops successively and, like any other part of the transport infrastructure planning, need to be based on expert knowledge. The planning project should involve experts on the sustainable development goals, which means not only experts on technology and environmental issues but also social aspects.
- The investigations of equality (like any other part of the planning process) need to be related to the actual context. There is not just one method but several working methods! Methods and ways of working need to be adjusted and related to the context and involve citizens perspective – as e.g. the examples with the gender budgeting in the municipality of Boden and the 8-80 method in the municipality of Huddinge has shown.

- Active action-taking is essential! Crucially, the first step is to show how something is working in practice and to identify what is needed to be done, then something also has to be done! We have suggested a stepwise and systematic work with Gender and Diversity Action Planning (GADAP) based on investigation – analysis – solution. An important part is also to decide who is responsible for the actions (see Hvidt Brengaard, Rømer Christensen, Levin & Henriksson 2021).
- Equality work needs to be followed up. Therefore, it is important that knowledge is documented and is connected to the internal work in the municipalities.

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Smart Mobilities:

A Gendered Perspective

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Gendered Mobilities is linked to the phenomenon of *gendering*, which is associated with the traditional role assigning and normalization of behavior, routines, and patterns to the different sexes, along with the differing preferences of men and women. While the Nordic countries are classic examples of equality between the sexes, examples highlighting differences between men and women on a variety of issues related to both structural conditions and preferences can be found in this region as well. Certain differences can be ascribed to the historical development of the societies, while others continue to persist due to differences in structural conditions, preferences and choices between men and women.

These conditions and preferences have often been ignored in development planning, since most often the different sectors of development operate separately and direct their policies in isolated silos – education, health, employment, social welfare, etc. However, the sector underpinning all the development agendas – namely energy and transport – has traditionally operated in strict engineering domains while the societal and gendered ramifications of under-delivery of these services have been not understood and have thus remained unaddressed. The issues of personal security and sexual harassment also remain a highly gendered topic, and do not affect the daily mobilities of men to the same extent as women. Even though women are relatively secure in the Nordic countries, the level of perceived physical safety varies.

Though car license-holding for women in the Global North has risen sharply in recent decades (Hjorthol, 2008), this development has not automatically led to an equal distribution of car-driving between men and women. Women are still, to a greater degree, car passengers than men are (Polk, 2003). Studies show that women have a strong preference for sustainable modes of transport as they both use more public transport and have higher walking frequency as compared to men. Given their propensity to use more public transport, to walk more, and their high incidences of trip-chaining, women use multi-modes rather than one mode alone (Heinen and Chatterjee, 2015). When women do opt to drive, it has been documented that they prefer smaller cars (Mokhtarian and Choo, 2004). Women travel shorter distances, and their trip duration is also limited as compared to men. This is evident in their commuting or work-related trip patterns but holds true for other trip purposes as well (Hjorthol, 2008; Scheiner et al., 2011). In comparison to men, long-distance commuting remains much more restricted for women (Scheiner et al.,

2011). Given the unabated development of car-based societies, it is not surprising that certain travel trends exhibit converging tendencies over time for the respective genders. As Scheiner (2018) comments, elements of license-holding, car availability, mode choice (car driving), trip distances, and trip duration seem to be converging over time. However, we need to analyze these tendencies in light of what Scheiner (2018) calls attention to – women perhaps are less habitual, more responsible, more sustainable, and more sociable (Matthies et al., 2002; Polk, 2003; Hjorthol, 2008). This effectively means that the converging and shifting of women’s sustainable travel behavior towards a car-based, unsustainable one could be in response to the structural conditions that has underpinned city planning in the past decades. This shift has some serious implications, both from the perspectives of climate change and the inclusivity agenda. However, research simultaneously indicates that this (unsustainable) shift can be steered towards a more sustainable direction through the creation of conditions conducive to walking, cycling, and public transport. But this needs a consistent focus.

For example, based on interactive map-based solution, the following map from Oslo highlights how preferences of cycling routes vary among men and women. A high density of female cyclists was recorded on roads passing through residential areas which were quieter and had low traffic volumes. For men, a higher volume was recorded on the cycle paths built along the main arterial network, ran parallel to road networks with high traffic volume but provided opportunities to cycle at higher speeds. These are important details to be taken further in future planning.

Figure 4: Varied route preferences by men and women, Oslo. Source: de Jong et. al. (2018)



Smart cities – amplifying gender gaps?

Smart cities is the buzz word in the world of urban planning today. An emerging criticism of the smart cities approach is the gap between the technical/digital approach, inclusion, and quality-of-life approaches. Lauwers and Papa (2015) claim the shift from conventional mobility planning towards smart mobility is primarily applying new technology to existing infrastructures instead of creating better solutions. For example, buses are being retrofitted with tracking devices rather than public transport supply being increased and outcome measures such as access to work, education, etc. being checked. In this sense, smart mobility concerns itself primarily with innovative technological or consumer-centric solutions rather than adopting a social sustainability lens to the entire mobility agenda.

There is ample evidence from the Global North that smart solutions can be highly exclusive since they fail to connect to the mobility patterns and needs of the different groups. Shaheen et al. (2014) studied 23 bike-sharing programs in North America and found that the main obstacles identified for low-income groups were the need for smart devices, debit/credit cards, minimum bank balance, or deposit against vandalism or theft. A bigger issue than access to digital services or a smartphone is the lack of digital literacy – the knowledge, comfort, and confidence to use smartphones. Even in developed economies like the Nordics, disparities in digital literacy exist, especially regarding the current elderly population. These differences have a strong tendency to compound and reduce people’s access to smart solutions and services.

Data on the use of car sharing, for instance, shows a relatively small proportion of women users (refer Table 1). By contrast, ‘ride-sharing’/‘ride-hailing’ operators such as Lyft or Uber indicate a heavy usage by women (Dogtiev, 2017). This sits well with the knowledge we have on women’s mobility patterns – short trips, linking multiple trip purposes and destinations and escort trips, and accessing places not served by the traditional public transport routes or schedules.

In mapping the main motivations of female users of ride-hailing services, IFC and Accenture (2018: xii) underscore the issue of safety. Since the ride-hailing services store detailed information about the driver, are digitally connected and can be tracked in real-time, they diminish the chances of unsolicited behavior with female passengers onboard.

In a study based on a survey collecting gendered responses data on the adoption and use of emerging mobility options and technologies in the Greater Phoenix Metropolitan Area, Capasso da Silva et. al. (2019) found that women are less likely than men to adopt shared rides in autonomous vehicle (AV) ride-hailing services with unfamiliar passengers. The authors emphasize two pointers for the eventual deployment of shared AVs: (i) the need to develop safety protocols and targeted campaigns for enhancing women’s willingness to share AV rides, and (ii) special services such as female-only services might enhance automated mobility acceptance for women.

Similarly, analysis of approximately 7 million trips taken on Oslo’s shared bikes for the

Car-sharing provider and/or location	Share of male customers	Share of female customers	Source
cambio, Brussels (Belgium)	58%	42%	Taxistop, cambio, 2009
Several providers (Italy)	58%	4%	Italian Ministry of Environment, 2009
Three providers in London (UK)	69%	31%	Synovate, 2006
Mobility, Switzerland	53%	47%	Bundesamt für Energie (Swiss Federal Office of Energy 2006)
Two providers in Frankfurt (Germany)	63%	37%	TraffiQ, 2007
Ten providers in Germany	58%42%		Wuppertal Institute 2007

Source: Loose, 2010: 54, quoted in Lenz (2020)

Table 1: Gender split among private customers of various car-sharing providers in Europe around 2010

year 2017-2018, revealed a highly gendered narrative. We see a strong correlation between the zones with high concentration of female employment sectors and the dominant female biking routes. There seems to be a high usage of city bikes by women for commuting purposes. However, there existed a dissociation between the peripheral location of female-dominant employment sectors (for example, hospitals) and the heavy central concentration (which also coincides with male-dominated employment sectors) of the docking stations of Oslo's city bikes.

Way forward

When we fuse the findings from women's daily trip patterns, the core idea of mobilities, and the current deployment and usage of smart mobility options, a clear pattern emerges: Smart mobilities, if interpreted purely in terms of providing solutions such as car-sharing, bike-sharing etc. without linking them with the inherent context of different users, will

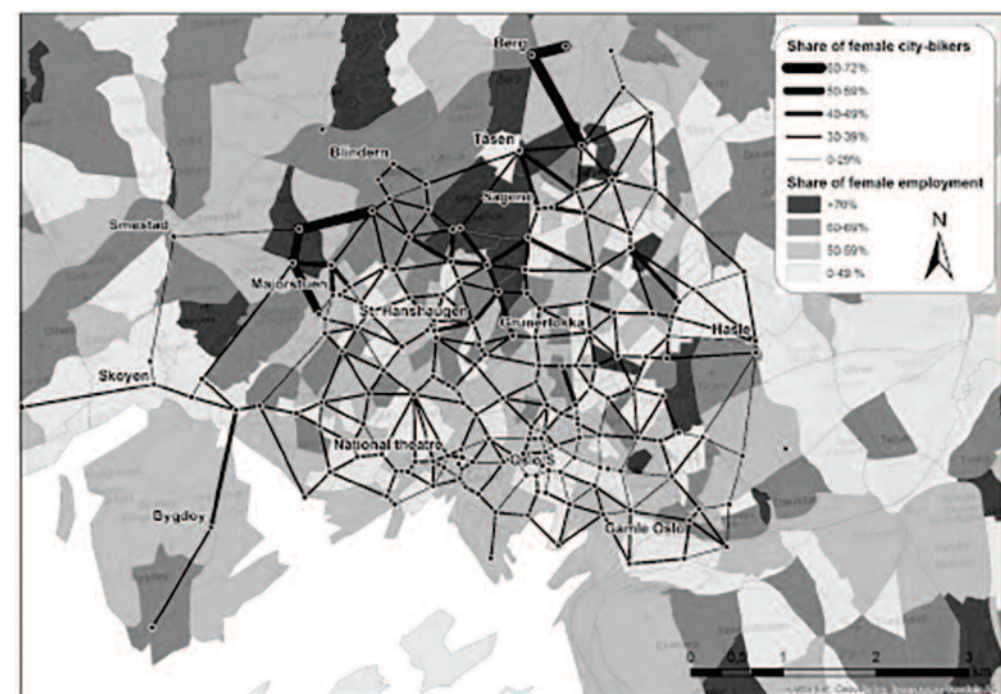


Figure 2: Popularity of routes vis-à-vis share of female employment in the different zones of Oslo. Source: Priya Uteng et al. (2020)

fail to be truly smart. Questions such as “Who are the potential users of a particular solution?” need to be addressed before launching a scheme.

Simultaneously, digital solutions provide ample opportunities to both collect data and undertake new kinds of data analyses. This section builds on the fact that rather than advocating simple data collection, it is imperative that **collected data in surveys is segregated at the level of gender, activities (land-use) and time-use**, which can essentially inform the transport planning authorities to take a more needs-oriented approach.

Integrating data collection across sectors holds potential for addressing the needs of women in a more robust and target-oriented fashion. Given such benchmarking, it will become easier to assess the specific kinds of alterations needed in the mobility systems to adapt towards gendered needs.

Further, there exists a need to **link the ‘soft’ or qualitative information to the ‘hard’ data** information. This can aid in developing a model that corresponds much more to ‘everyday transport functioning’ than the much-used, classical, techno-economical approach to transport model designing.

Before launching so-called smart cities/mobility projects, studies employing both tra-

ditional methods such as focus groups/questionnaire surveys/measuring actual behavioral response to different measures, and new methods such as mobile app-based data collection, should be undertaken to **understand the existing travel behavior and adaptive preferences of different groups.**

To make the transport systems gender-responsive, it would be useful to have a simple and overarching framework that underlines the **relevance of transport to women's employment as well as livelihoods, income security and domestic care work.** In other words, mobility is needed to facilitate women's access to markets, jobs and services (e.g. health centers, schools, childcare centers, shops, etc.). Additionally, the **transport sector itself can be a source of employment for women,** and more essentially, influencing the field of transport at large to be more mindful of women's needs and preferences. Traditionally, the transport sector remains heavily male-dominated in terms of employment and technical focus. Issues regarding **safety, affordability, accessibility, availability, acceptability, and accommodation** are vital and need to be taken into transport design and planning. We need to build transport systems that take these gender specificities into account.

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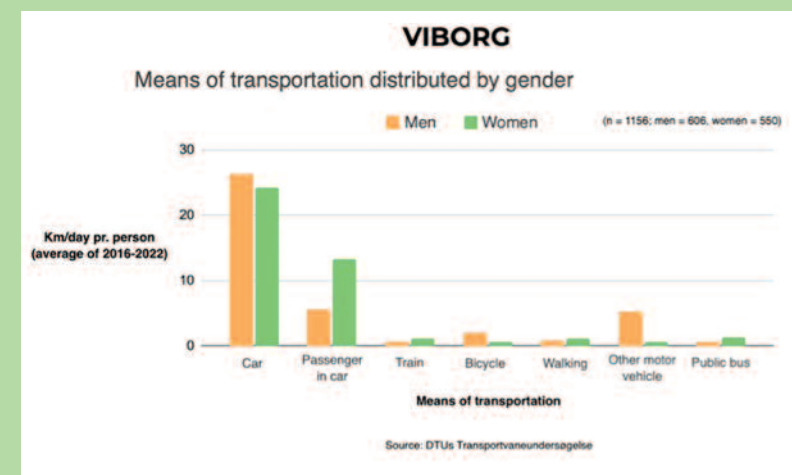
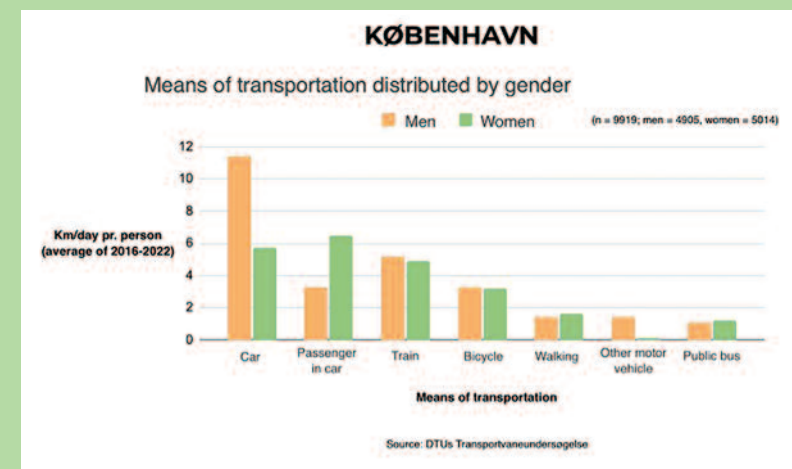
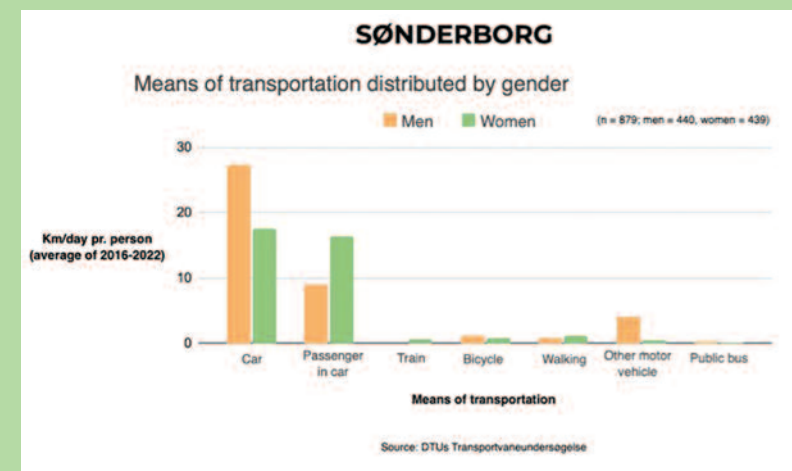
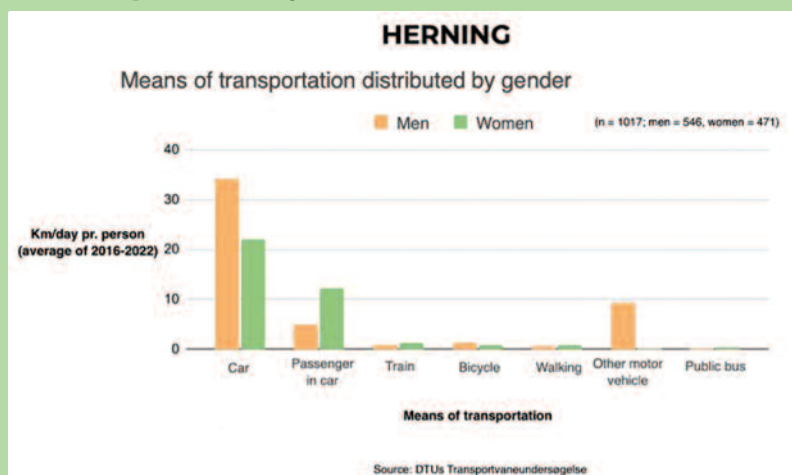
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Numbers from Danish municipalities

The following data based on The Danish National Travel Survey (TU) at Transport DTU present transport work divided into groups of means of transport categorized by gender, male/female. The tables show the average number of kilometers pr. person per day in 10 municipalities in Denmark, during the period 2016-2022. The number of observations (n) and the gender distribution are noted beneath every diagram. The transport mode groups 'Car' and 'Other motor vehicle' indicate that the individual is the driver of that motor vehicle.

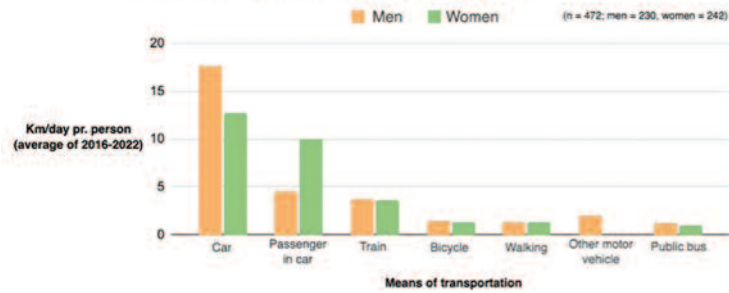
"Car" is clearly the preferred mode of transportation across all municipalities, with the highest average kilometers per person per day. Men are leading as car drivers and distances in all municipalities. For example, men in Herning travel an average of 12.1 km more per day than women. In all municipalities, women have the highest number of kilometers as passengers in cars. Women also show higher mileage per person per day in the "Train" category in all municipalities – with Fredensborg as an exception. Overall, municipalities on Zealand show higher average kilometers in trains. Cycling is at a low level in daily transport work, except in Copenhagen.

Source: Transportvaneundersøgelsen. TU/DTU



FURESØ

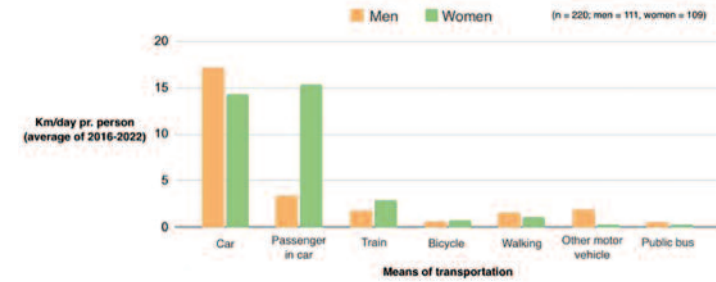
Means of transportation distributed by gender



Source: DTUs Transportvaneundersøgelse

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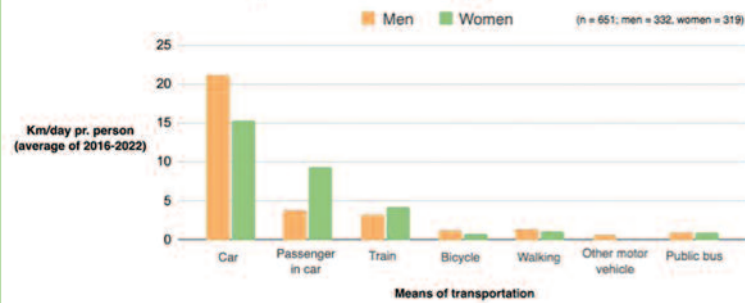
Means of transportation distributed by gender



Source: DTUs Transportvaneundersøgelse

RUDERSDAL

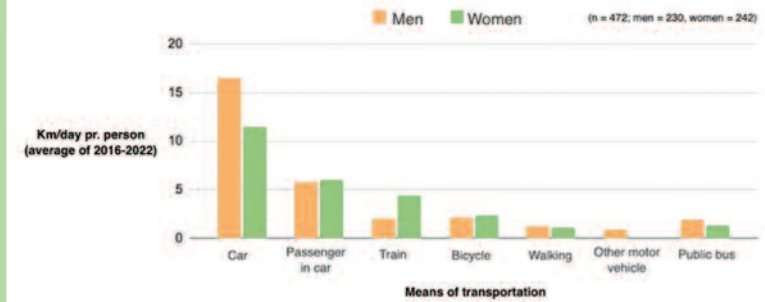
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Source: DTUs Transportvaneundersøgelse

GLADSAXE

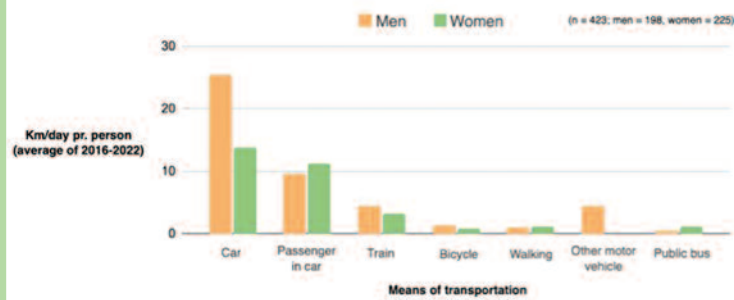
Means of transportation distributed by gender



Source: DTUs Transportvaneundersøgelse

FREDENSBORG

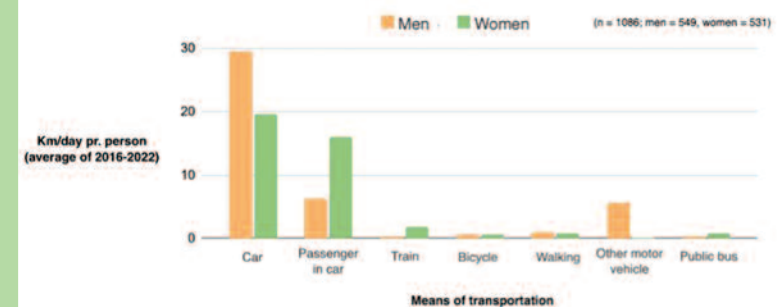
Means of transportation distributed by gender



Source: DTUs Transportvaneundersøgelse

KOLDING

Means of transportation distributed by gender



Source: DTUs Transportvaneundersøgelse

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