

# Implementation of Utility Cycling in Norway to Reach the Zero-Growth goal

A MASTER THESIS BY  
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## Summary

The cycling share in Norway has remained at steady throughout the decades. With the problem of congested roads and lack of space in urban environments are getting more and more apparent, numerous national and local goals and strategies have been developed. The overall national plans in Norway is to increase the cycling shear from 4% to 8%, and in the larger cities even more to up to 20%. These plans and strategies will furthermore contribute to Norway reaching the goal of cutting the overall CO<sub>2</sub> emissions by 55% by 2030 (Regjeringen, 2022).

With these challenges from Norway in mind and the goals of reaching a cycling modal share of 20% in the city of Oslo, we posed the following research question and sub-questions:

*How are travelers' behavior and attitudes towards the practice of cycling and what factors improve practices of cycling to train stations?*

*Sub-question 1: How do the materials shape the practice of cycling to the train station?*

*Sub-question 2: How do the other two components in practice theory affect people's practices in regard to cycling to the train station?*

Through our education as sustainable cities engineers, we have researched this thesis using mobilities turn as the grounding theory for our thesis which lays the foundation for changing the planning approach regarding mobility from focusing on the endpoint of mobility to focus on the mobility itself in between the endpoints. With this theoretical framework as our underlying theory, we have used Practice Theory as the applied theory that gives us a vocabulary and a tool for investigating, understanding, and explaining the social phenomena of bicycling practices.

We will have the commute with train stations as a point of departure for this research, as these travelers may be more inclined as to change to cycling, than full-time car users. As an approach to answer these questions we will be looking at three train stations, Through our desk research we found that the physical elements affect people's behavior towards cycling, and we will therefore analyze the physical elements surrounding them in a site analysis in addition to the mapping of the travelers' attitudes through a survey.

Our key findings through mapping of the physical attributes at the site analysis are that the current planning processes focus on the materials such as the bicycling infrastructure, the

facilities, the bicycle parking options, and other areas reserved for the bicycle and cyclists, which can increase the number of bicyclists. These components alone are not sufficient in order to increase utility bicycle use.

By viewing the challenges regarding the low level of cycling in Norway through a social practice theory lens we discovered that the elements of competencies and materials greatly affect the overall practice of cycling in Norway. Further finding show that the theses elements are also greatly affected by the materials, and then especially by the infrastructure of the cycle network and by the design of the stations. These findings are also backed up by previous research. However, the benefits of this practice theory approach are that by identifying which elements and connections between them are weak or strong, to push towards a wanted change.

Moreover, to change the travelers' behaviors and attitudes towards bicycling our norms, attitudes, and values related to cycling needs to change. The three elements of practice theory interconnected provides a space to sustain the practice of bicycling and gives overall benefit to society in regards to cycling being environmentally friendly, economical, and beneficial for health on the national scale.

## Acknowledgments

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## Preface

With a bachelor's degree in urban planning, our experience is that are some general tendencies to look at challenges in the urban space with a technical approach. When looking at cycling in Norway we recognize that there is a great potential for improvement. The inspiration for looking at cycling in particular, stems from living and studying in Copenhagen. Through our sociotechnical study program at Aalborg University in Copenhagen we found that such an approach seems to be a more appropriate approach to complex challenges in the urban area, it opens up an arena to reach the Sustainable development goals.

The knowledge we gained in this study program paved the way for us to understand how to plan a more sustainable future. The knowledge of how social change helps break up the silo thinking that is a hindrance to a sustainable transition for many sectors, but especially for the transport sector, where the urban development and transport planning is separated which are interdependent of each other.

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Chapter

1



Introduction

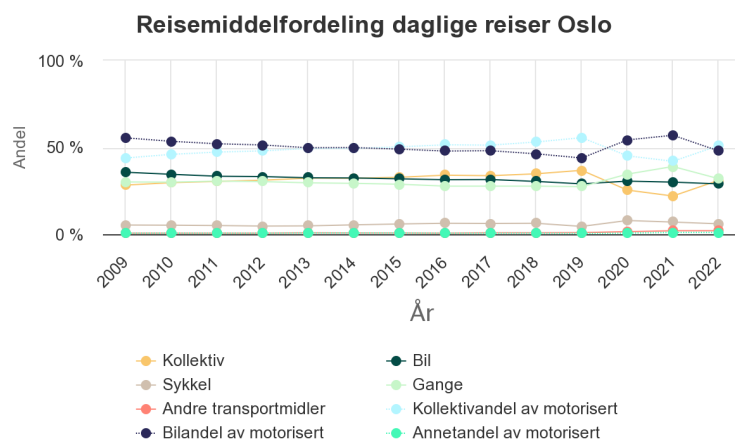
# 1. Introduction

With a national goal of increasing bicycle share in Norway the following chapter will give an overview of the current state of cycling in Norway, the role a cyclist has in the urban space, mainstream approaches to increase bicycle share and how habits can be hard to break.

## 1.1 State of Cycling in Norway

The transportation sector is responsible for nearly 25% of global greenhouse gas emissions (IPCC, 2022). In light of this, the Norwegian government has set a target to reduce CO<sub>2</sub> emissions alongside the European Union (Norwegian ministry of Climate and environment, 2019). As a result, the transport industry is crucial key sector to look at when wanting to achieving sustainability.

Norway has a long-term goal that the bicycle share should be eight percent of all journeys, the current modal share involving cycling being 4% on a national basis. In the cities, the proportion of bicycle journeys must amount to 20 per cent (Statens vegvesen, 2023). National transport plan for Norway is collaborated by the government and was published in March 2021. The plan reflects the plan for the next 12 years on how to implement the overall goal for the transport sector: an effective, sustainable, and safe transport system in 2050 (Ministry of transport, 2021).



Grafen viser utvikling i andel daglige reiser i prosent, fordelt på forskjellige reisemidler.  
Oslo kommunes statistikkbank

Figure 1: Modal share for daily travel Oslo. (Oslo kommune, 2022)

To attempt to reach this goal there has been presented a strategy referred to as *the zero-growth* target. This target involves that passenger transport growth in urban areas must be taken up by public transport, cycling and walking. The zero-growth target in the National Transport Plan (NTP) involves that all growth in passenger transport in the cities must be taken by public transport, cycling and walking (Ministry of transport, 2021). The zero-vision goal for killed or hurt people in traffic. This transport plan has a goal to contribute to achieving the climate and sustainable development goals (Ministry of transport, 2021).

With increased population and economic growth, there is also an expectation of increased passenger transportation. The zero-growth target implies that passenger transport growth in urban areas must be met by public transportation, cycling, and walking, and can be viewed as a combination of four measures: reducing passenger car transport and promoting each of the three alternative modes of transportation, walking, cycling, and public transportation (Ministry of transport, 2021). This measure sheet focuses on the measure's greenhouse gas impact, but it's important to note that the political goal has additional goals beyond reducing greenhouse gases, such as efficient land use, reducing noise, improving accessibility, and contributing to better air quality (Ministry of transport, 2021).

The mobility in a city is an important foundation of the accessibility in the city. Cities have expanded throughout history with the continuance in improvement of transportation.

Better arrangements and increased safety for cycling are important factors in influencing travel habits. A significant part of future transport growth can be taken by bicycle and walking if the conditions are better facilitated.

It is a goal in many Norwegian urban areas to make better arrangements for cycling and to increase the cycling share of all journeys undertaken. The reason is, among other things, that the cities want to follow up on national goals and guidelines in the NTP and the Climate Statement on reducing car use and greenhouse gas emissions (Ministry of Transport, 2021: Ministry of Climate and Environment, 2019). In addition, more people walking, cycling, and traveling collectively will contribute to improved local air quality and provide major health benefits. In Oslo municipality's cycling strategy for 2015-2025, there is, among other things, a goal that the proportion of bicycles should be increased to at least 16 per cent (Statens vegvesen, 2016).

So, how is the urban space used in Norway? A lot of space dedicated to cars, parking. With the goals of reducing carbon emissions by 55% by 2030, the government is limiting the cars in the urban space in order to push towards urban green mobility. How does this affect livability? Is it more likely that people who live in the city and are affected by this change are more or less open to it? Is this new initiative something that can initiate change in peoples' practices?

## 1.2 The Norwegian Cyclist - Up on the Sidewalk

Historically cyclists in Norway have not had their own designated space in the urban environment. Since the emergence of cars cyclists have always been looked at as a nuisance in traffic, and often in news articles at the time been referred to as the menaces in traffic. Because cars were looked at as the transport mode of the future and to make the flow of driving more comfortable the cyclists were forced up on the sidewalk, as Rabben (2017) puts it in his book *The history of bicycling in Norway* (translated by author). This put the cyclists in the same category as the pedestrians, making for a battle of the sidewalks between the two groups. The pedestrians feel unsafe with the high speed of the cyclists zoom and zig zagging through the crowds on the sidewalk, and the cyclist gets a less efficient flow, and uncertainty in regard to where their place in the traffic picture is. Hence, in newer times cyclists have then been categorized as not quite part of conventional traffic, but more in the category of leisure activity. This in connection with the strong Norwegian culture of appreciation of the outdoors and hiking, made for the cyclist being an extension of this and often used for a means to get outside close to nature, but not looked at as an equally useful mode for utility (Rabben, 2017)

This culture still has strong ties to the overall motivation for Norwegians to date. The highest valued motivation to choose bikes is a mode of transport that implements physical exercise in daily life, according to a report made by the Norwegian Institute of Transport Economics (Veisten et al., 2021). Additionally, the improved physical fitness and health are among the motives that many people emphasize when choosing to cycle or walk to/from work or for other errands.

Furthermore, the feeling of unsafety seems to be a persisting barrier for the cyclist to date. Here there is a distinction between the perceived safety and the actual safety, meaning less accidents etc. Numbers show that risk of injuries and death are low Norway, and as low compared to high cyclic-share countries of The Netherlands and Denmark. And the actual safety risk is not

other members of traffic, but due to the poor maintenance of the infrastructure. According to the Norwegian Public Roads Administration (NPRA, Statens vegvesen) more than 25% of cycling accidents that end in fatality are not caused by other traffic groups but single accidents. The causes for both serious injuries and injuries resulting in fatality were referred to in a report as due to “trivial matters” like falls due to holes in the road, slipping on tram tracks, and not being able to ride over high curbs. Generally, a lack of keeping up a satisfactory standard of the existing infrastructure. Additionally, a lack of maintenance in different weather conditions, like snow in the winter, and gravel in the early spring, were reported to cause injuries. (Espedal, M., and Amundsen, K., S. 2014; Elvik, 2021).

The perceived safety is an important barrier for potential to increase the cycling share for low-cycling cities. According to the Norwegian Institute of Transport Economics (Elvik, 2014) there is a clear correlation between the concept of safety for the individual cyclist and coincides with a greater cycling volume. The feeling of safety was not only affected by the physical infrastructure, but also by the cyclist's skill set and experience (Elvik, 2014). This indicates that by facilitating a safer infrastructure for cyclists and potential cyclists with little experience can be one of the conditions that can lead to a model shift for this group of potential cyclists. (Elvik, 2014)

A high cycling share is difficult to achieve without a normalization of cycling. For the individual, it is about the bicycle being experienced as a real travel alternative when the daily transport needs are to be met. For society, it is about cycling not being considered an activity only by a certain group of the population. The studies summarized show that cyclists have different needs for safety, comfort, and accessibility, and that there are differences between experienced and inexperienced cyclists, cyclists and non-cyclists, and women and men. Establishing infrastructure that facilitates cyclists of different shapes, ages, preferences, and perceptions of safety can contribute to the desirable shift in the distribution of means of travel.

### 1.3 Mainstream approaches to increase bicycling

We discovered that the measures could be divided into two main categories, namely physical, structural measures and measures that focus on mapping behavior and attitudes, through a document review of research looking for ways to promote utility cycling. We will go over the

key findings of the mainstream strategy used in Norway to raise the cycle-share in the section that follows. Firstly, looking at the physical measures argued to affect cycling.

### 1.3.1 Physical Approach

As mentioned in Chapter 1.1 *State of cycling in Norway*, in order to achieve the political objectives of increasing urban green mobility via public transportation, walking, and bicycling, an increase in bicycle use is essential. The municipality of Oslo wants to see an increase in bicycle travel from 8% in 2014 to at least 16% by 2025. Through the desk research we discover measures that were found to be especially important when increasing the cycling share, these include cohesive, high-standard bicycling infrastructure consisting of attractive cycleways separated from other traffic, and good cycling solutions at junctions which increases cyclists' safety, security, and accessibility in the urban space (Sørensen et al., 2020).

Additionally, surveys directed towards both cyclists and non-cyclists provide, among other things, that cyclists prefer their own cycle paths/lanes that separate them from other traffic, and that for many, but not all, cyclists, safety is important. Some utility cyclists seem to value short journey times more than safety. Many, but not all, studies show that a more coherent cycle network leads to increased cycling (Sørensen et al., 2020).

With the topography in Norway being hilly, there has not been a large amount of cyclist. Which then again have not come a long way with implementing the bicycle infrastructure. This technology has come a long way in different European cities like the Netherlands and Denmark being known as the most advanced bicycling cities in the world.

In the National Transport Plan for the period 2018 to 2029 the following targets for cycling have been set:

- On a national basis, bicycle traffic in Norway must make up at least 8 percent of all journeys (Sørensen et al., 2020)
- In the nine largest urban areas, bicycle traffic is to be increased to 20 per cent (Sørensen et al., 2020)
- 80 percent of children and young people must walk or cycle to and from school.
- The targets must be reached without an increase in the number of cyclists killed or seriously injured. (Ministry of Transport, 2021; Ministry of Climate and Environment, 2019)

Achieving the goals will require extensive provision of cycling infrastructure and investment in safety.

Numerous factors, according to analysis, influence the decision to cycle. Structural factors such as natural conditions, demographic, socio-cultural conditions and urban structural conditions provide opportunities or limitations for the use of bicycles. Additionally, selecting a mode of transportation requires consideration of factors related to transportation. These elements may include bicycle equipment, public transportation characteristics, and parking arrangements. Structural and transport-related factors operate in cooperation and will be able to stimulate more or less bicycle use. To encourage more people to cycle, a complex use of means is required, in which better cycling arrangements are made through infrastructure measures, but other means that strengthen the bicycle's competitiveness against other modes of transportation are also used. With that in mind, this analysis focuses on people's practices, mapping out why change is difficult.

Since car transportation is typically faster than alternatives, the biggest obstacles for an individual who wants to reduce their use of a car and switch to public transportation, cycling, or walking are related to time and inconvenience costs. When compared to the alternatives, passenger cars are now thought of as saving time, which is highly valued for making daily life between work, school, picking up children from the kindergarten, and leisure activities go more quickly.

Cycling and walking takes more time which increases the time costs of these activities compared to take the car, especially in areas that are well-equipped for cars and that avoid rush-hour traffic without significant queues. For short journeys and in areas that are poorly prepared for car traffic, cycling and walking can have lower time costs than driving. Therefore, inadequate bicycle and pedestrian infrastructure can make travel difficult and take longer. However, walking or riding a bicycle can be a more practical and time efficient alternative to driving a private vehicle on short trips, if the infrastructure for this is in place, because the time difference between them is less than for long distances.

Additionally, the high car share of the infrastructure leads to even more barriers for the few cyclist, even on short trips. The possibility of traffic accidents as well as the perception of safety and comfort along the route can be significant barriers when switching from personal

vehicles to bicycles and walking. These obstacles will be strengthened by the presence of motorized traffic, poor lighting, inadequate routes, and difficult driving conditions.

On short trips, cycling can be a viable alternative to driving a private vehicle, but this still requires good infrastructure and well-maintained cycle paths. However, how can the cycle be a viable option for these longer trips in a city like Oslo where there are numerous districts connected to the city for work and other services. Combining cycling and public transportation is one option mentioned in the literature; in this case, we'll look at cycling combined with train travel (van Mil et al., 2021).

### 1.3.2 Cycling and Public Transport in Harmony

As a feasible way to reach the goal of zero-growth the combination of cycling and public transport has often been a popular choice. The Norwegian Institute of Transport Economics (TØI) describes the combination to have many positive effects. Compared to a car, both public transportation and cycling present several difficulties. The bicycle is most competitive on shorter journeys, and public transportation rarely offers the same flexibility as the car with regards to route selection and travel time.

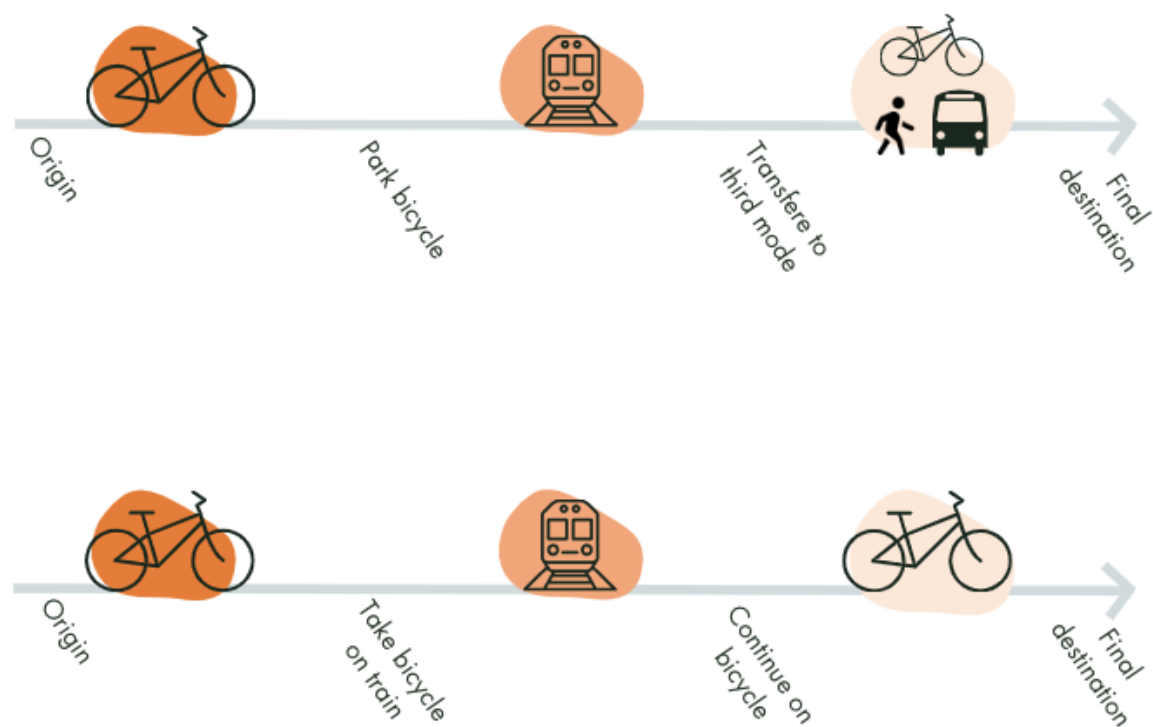
Public transport and cycling can, however, complement each other well as being an environmentally friendly alternative to the private car, if infrastructure, facilities and design are arranged for combination trips. In order to improve the travel from point A to B, public transport and cycling should be combined so that their weaknesses can be minimized. This could involve, for instance, giving priority to public transportation on certain stretches with high traffic that lead into the city center, where it has advantages, while attempting to take advantage of the bicycle's flexibility on shorter, less-congested routes.

Another option is to prioritize cycling and public transportation at various times of the year. For instance, during the cycling season, cycling can be prioritized more, whereas during the winter, public transportation can be prioritized more. However, it is crucial to note that increasing the number of cyclists outside of the typical cycling season is both necessary and desirable if we are to achieve the desired bicycle share (Sørensen, 2013).

Other researchers who argue the same points are Van Mil et al. (2021). They argue that the



combination of bike and public transport can be a viable substitute/competitor to the private car, as this combination provides the speed, range, and comfort of the public transport (in this case train), and the flexibility of the bicycle. Looking further into what of public transport and cycling there is Van Mill et al. (2021) describes two types of combined cycling and public transport, one is where you bring the bike with you on the train, and from the destination station can use your own bike to get to the final destination. The second is where you park your bike at the station. Van Mill et al. (2021) refers to this as Bike-on-Board and Bike-and-Ride respectively (van Mil et al., 2021).



*Figure 2: The different types of train-cycle trips adapted from van Mil et al. (2021)*

Above is a diagram of the two types of bicycle and public transport combination trips. The upper line illustrates the Bike-and-Ride and the lower one illustrates the Bike-on-Board. The possibility to choose either of the two combination trips are dependent on the design of the stations, the trains and the facilities at the destination.

### 1.3.3 Behavior-Change Strategy

But how does one get someone to choose cycling as a mode of transport over the comfort of the private car. One widespread method has been to look at the population's and individual

people's attitudes and behavior. In fact, several studies have been conducted on the relationship between attitudes and behavior. A common feature of these studies is that they focus on single factors for changing behavior, rather than a combined picture of the various factors that effect modal choice. Such factors that determine travel behavior can be roughly defined into two groups, internal and external factors. Internal factors can be habits, knowledge, and values, while external factors can be infrastructure and weather. It has been assumed that attitudes are a key factor in travel behavior, Anable et al (2006), however argues that but this has an insufficient approach to explain behavior. They argue that measures that have shown to have an effect are projects targeted at in neighborhoods and workplaces, which creates a sense of community and normalization of certain modes of transport (Anable et al., 2006).

#### 1.4 Habits can be hard to break

People's travel habits must change in order for transportation to transition to sustainable modes. However, increasing the cycle share requires more than simply eliminating the car from society, due to the urban environment and how we live our everyday life have been formed and developed with the accessibility of the car in mind. One can live in the suburbs while still having quick and easy access to the workplace in the city center, all due to this development of cars and urban sprawl. To simply put a bike in the place of the car on such commutes is not a substitute people will accept. Shorter trips were found to have less time-cost for cyclists compared to the private car user, in addition, the combination trips with train, may be a good way to introduce the utility cycling back to the Norwegian people.

As cycling to train stations seem to be good way to promote cycling, this will be the point of departure for this thesis. We will examine cycling as a practice, how it is molded, and how it may be modified, in order to examine more closely what elements, contribute to the formation of travel behavior. A practice is based on the physical materials; this is consistent with results that encourage fragmentation (infrastructure, parking lots, etc.), but in order to create a habit or practice that gets ingrained in daily life, numerous aspects must be present.

Chapter

2



Research Question

## 2. Research Question

***How are travelers' behavior and attitudes towards the practice of cycling and what factors improve practices of cycling to train stations?***

How do the materials shape the practice of cycling to the train station?

How do the other two components in practice theory affect people's practices in regard to cycling to the train station?

Chapter

3



# Theoretical framework

### 3. Theoretical framework

In the following chapter the theoretical framework of this project is described. The framework is divided into two main concepts, the grounding theory which is included for giving insight into the field of investigation as well as linking the planning practices to mobility to gain a holistic understanding of mobility and the need to rethink planning perspective of mobility. The second component is the applied theory which helps with its application of the three elements of practice theory and that a collaboration of those elements is needed to understand a practice.

#### 3.1. Grounding Theory

Grounding theory is a systematic methodology and a way of thinking about and conceptualizing the knowledge gained through this thesis. The grounding theory is used for getting a holistic understanding of movement, and understanding of how mobilities are fluid and how to see people's behavior towards bicycling in a holistic perspective.

##### 3.1.1 Mobilities Turn

Mobilities turn is a theoretical framework developed by John Urry which lays the foundation for changing the planning approach regarding mobility from focusing on the end point of mobility to focus on the mobility itself in-between the end points. John Urry describes mobilities turn as a shift in thinking that views the world as something constantly in change (Urry, 2000). This is drawn together all forms of movement to see them holistically rather than separate actions to get from point A to B.

As the world is on the move these intersecting mobilities have different consequences for different people in the world. The issues of movement and mobility are at the center of navigation. *“Which is why as an effect ‘mobility turn’ is spreading into and transforming the social sciences, transcending the difference between transport research and social research, putting social relations into travel, and connecting different forms of transport with complex patterns of social experience conducted through communications at a distance”* (Sheller et al., 2006).

This understanding of the framework further provides an understanding of how temporal places provide an in between ness that is something that is appreciated (Urry et al., 2006). This is further described by Jan Gehls important book “Life between buildings” where people live and behave in public spaces and that the activities performed outside has an importance to us (Gehl, 2011). The importance of an attractive outdoor space when getting from one point to another helps understanding the public life of cities. In order to make sustainable changes and gradual transitions in the design process there is a need for flexibility and public involvement (Gehl, 1987).

Urry (2000) argues that mobility is linked to identity, culture, and societal norms and in breaking through viewing mobility as traveling measure, it gets a deeper meaning and social relevance (Urry, 2000; Sheller et al., 2006). Which is why the holistic perspective of mobility provides an understanding of that automobility impacts both the public spaces and the opportunity to come together to utilize this space for contemporary mobility (Sheller et al., 2006). The diverse mobilities of people and objects, and the complex interdependencies between the social consequences of these mobilities moves sociology towards that focus and brings together the social concerns of sociology (Urry, 2000; Sheller,2014).

There is an emphasis on practice and the meanings, and movement in all its diverse forms. This paradigm also emphasizes how all mobilities entail specific immobile infrastructures that create the bounds for mobilities and further improves the mobility (Graham et al., 2001). The complexity of how every system whether mobile or immobile relates to how every system is fluid and the fluidity of mobility (Graham et al., 2001; Urry, 2003a). Fluid interdependence of mobility leads to a more connected mobility paradigm. This change of thought is influential to the field of sociology and urban mobility.

This mobility paradigm created the spatial turn in social sciences as Urry’s work on mobility spatializations and relational space (Sheller, 2017). The meaning of the actual movement as a key point in building the new way of understanding mobilities (Urry, 2000). This work of mobilities turn will be used as the understanding of how mobilities is fluid and how to see people’s behavior towards bicycling in a holistic perspective and to understand how the change in mobility is practiced in the contemporary city of Oslo.

## 3.2. Applicable Theory

By applying concepts and theoretical constructs to a real-world case, the applicable theory provides us with a set of concepts, or a lens, with which we view the problem posed. These concepts will be directly applied to the analysis. The criteria defined will be further presented in the following section.

### 3.2.1 Practice Theory

Social Practice Theory, referred to as Practice Theory from here on, is a theory that, like other social theories, gives us a vocabulary and a tool for investigating, understanding, and explaining social phenomena. The concept practice has a long history in the social science literature. The theories behind it have been developed by, among others, de Certeau, Foucault, Latour, Giddens, and Bourdieu (Huseby, 2019). In this the thesis we take a point of departure from Shove, Pantzar and Watson's understanding of the practice theory "*The Dynamics of Social Practice*" from 2012. From here we also get a conceptualization of the various components of practice, to be further discussed in the following.

### 3.2.1 The Shoveien Elements

Within the family of Social Practice theories, there are multiple authors/experts/contributors that focus on the social aspects within a practice. Shove differs from other earlier approaches to the practice theory, as she brings in the physical elements as well as the social elements. She argues that by including this physical element of *materials* helps to bridge the gap between the physical and the social aspects.

A notable difference between Shove's approach and other researchers in the field is the importance she places on things and materials. Traditionally, practice theory has focused on the importance of shared understandings, norms, meaning, and practical awareness, all very classic social phenomena, and both Giddens' and Bourdieu's practice theories are mainly social (Shove et al 2012). Shove's social practice theory, for its part, starts from the fact that things and our physical surroundings also have an important, constitutive role in daily life.

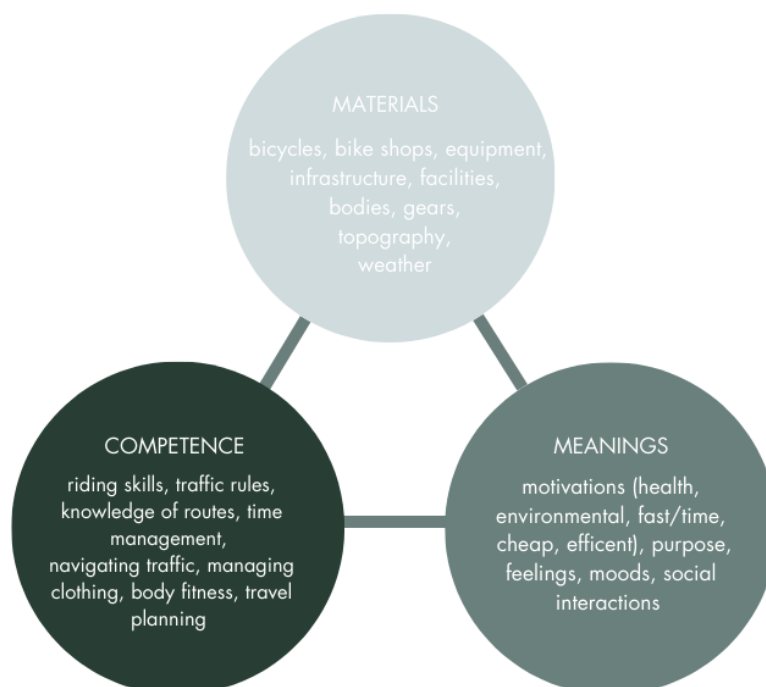
Giddens's practice theory, according to Shove, is good at explaining how practices help keep societies stable but poor at explaining change. As a result, Shove believes Giddens leaves many important questions unanswered. Such as how practices change, develop, and disappear (Shove



et al 2012). All questions that are important to answer if we want to change unsustainable practices that contribute to global warming today.

The starting point of Shove is that social practices consist of a set of elements that will serve as a framework for understanding the everyday practices that shape people's behavior and social interactions. These elements are connected when the practice is carried out. It is when the links between these elements are made, changed, or broken that social practices arise, develop, persist, and/or disappear (Shove et al. 2012). And it is the elements themselves and the links between them, that Shove is most interested in. This is where her theory differs from much other social theory - and practice theory - which tends to start with the actors (individuals) and follow them (Shove et al. 2012). The three main factors that affect how practices are carried out and maintained over time are the following:

- materials – including things, technologies, our physical surroundings, materials from which things are made of.
- meanings – symbolic meanings, ideas, and aspiration
- competence – skills, knowledge, and techniques (Shove, 2012)



*Figur 3: The three elements of practice according to Shove et al. (2012)*

Competence refers to the skills, knowledge, and abilities required to effectively perform a practice. This covers both technical skills (like knowing how to use a tool or machine) and social skills (like knowing how to get along with people while practicing). Competence is a learned trait that is influenced by both materiality and meaning. It is acquired through education and experience. In the element of competence, bring together different forms of conscious and unconscious knowledge that enable us to move in the world. Here, Shove and co. include both the background knowledge described as practical awareness, practical knowledge about how to perform an action, shared understandings of what is good or 'right' to do in a social setting, and pure, conscious knowledge.

The element meaning represents the social and symbolic meaning of entering, or carrying out, a social practice. Meaning refers to our personal and social reasons for doing what we do, rooted in meaning in the present or past, and/or with a future plan in mind. Meaning refers to the cultural and symbolic values associated with a practice. Depending on the context and social group, a practice's meaning can change, which can have an impact on how individuals choose to participate in it.

The last element, materials, refers to things and our physical surroundings. It can be everything from objects, infrastructure, the nature around us, tools, and our own bodies (Shove et al. 2012). Materiality refers to the physical objects and infrastructure required for a practice to take place. They could be any physical assets needed to carry out a practice, including tools, machines, and buildings, to mention a few. The way a practice is carried out and how it affects the environment are both influenced by materiality.

A main point of the theory is that practices arise, are maintained, and disappear when links between the elements arise and break. For Shove, this approach is also a response to the challenge of explaining changes in the understanding of the actor/structure relationship, without prioritizing either actor or structure. (*Shove et al., 2012*).

### 3.2.2 The Shoveien elements in relation to the practice of utility cycling

Using a bicycle for practical purposes, such as grocery shopping, errand-running, or commuting to work, is known as utility cycling. To demonstrate how the three components of Shove's practice theory interact, let's use this practice as an example.

The physical equipment needed to engage in utility cycling, such as the bicycle, a lock, a helmet, and a basket for carrying goods, is considered part of the practice's materiality. The materials' quality and availability can affect how simple or difficult the practice is to carry out. It might be harder to use a bicycle for transportation if there aren't secure bicycle parking facilities or safe bicycle lanes, for instance.

Materials will be examined here by looking at the existing infrastructure, which is usually pointed out as important factors to help increase the attractiveness of utilizing bicycles. This will be further described in subchapter 4.4 *Mapping the Physical Attributes* To examine the strength of the practice. How is it producing, reproducing, and recruiting other practitioners? Competence in utility cycling requires both technical and social skills. The ability to maneuver through traffic and various types of road conditions are examples of technical skills, as are knowledge of bike maintenance and repair. Understanding local cycling norms and etiquette are examples of social skills. They also include knowing how to interact with other cyclists, pedestrians, and drivers. These skills are acquired through practice and experience.

Utility cycling has a specific meaning that is influenced by the cultural and symbolic values associated with cycling, such as the idea that cycling is healthy, affordable, and environmentally friendly. These values may vary between various social groups or geographical areas. Cycling, for instance, may be seen as a leisure activity or a status symbol in some cities, but it may also be seen as a necessity for daily transportation in others.

*Tabell 1: Competence, Material and Meaning in relation to cycling*

| Competence  | Meanings  | Material   |
|---|---|--|
| <ul style="list-style-type: none"> <li>· Riding skills</li> <li>· knowledge of traffic rules</li> <li>· knowledge of routes accessible, time management (taking the fastest route, and being able to have choices)</li> </ul> | <ul style="list-style-type: none"> <li>· motivations (health, environmental, fast/time, cheap, efficient)</li> <li>· purpose</li> <li>· beliefs</li> <li>· feelings</li> <li>· moods</li> </ul> | <ul style="list-style-type: none"> <li>· bikes</li> <li>· bike shops (what type of bike they offer)</li> <li>· equipment (helmets, locks)</li> <li>· infrastructure (roads, parking, traffic light and signs)</li> </ul> |

- |                              |                       |              |
|------------------------------|-----------------------|--------------|
| · navigation traffic         | · social interactions | · facilities |
| · managing clothing          |                       | · bodies     |
| · body fitness               |                       | · gears      |
| · Individual travel planning |                       | · topography |
|                              |                       | · weather    |

Utility cycling has a specific meaning that is influenced by the cultural and symbolic values associated with cycling, such as the idea that cycling is healthy, affordable, and environmentally friendly. These values may vary between various social groups or geographical areas. Cycling, for instance, may be seen as a leisure activity or a status symbol in some cities, but it may also be seen as a necessity for daily transportation in others.

By understanding how these three elements interact with one another, Shove's practice theory helps us better understand why people engage in particular practices, how practices change over time, and how they may be influenced by social, economic, and environmental factors. The utility cycling practice is influenced by the interaction between the three components of Shove's practice theory. People's decisions regarding whether and how they choose to use bicycles as a mode of transportation are influenced by a variety of factors, including the materials' accessibility and quality, the cultural and symbolic significance associated with cycling, and the knowledge and abilities necessary to cycle safely.

### 3.2.3 Changing Practices

According to Shove, the changes in a practice consist of breaking and creating connections between already existing elements.

It is necessary to frequently renew connections between defining elements for some configurations to continue to work. Practices should be seen as ongoing processes because the same elements are consistently connected (Shove et al., 2012). Every practice is part of a dynamic context that includes other practices; no practice exists in isolation. Practice relationships must also be taken into account when looking at change through a practice theory lens. Practices constantly interact with one another; some interactions may benefit one practice while hindering another; the outcome of these interactions may be change or a lack of change. Utility cycling, for instance, may compete with driving, and other daily needs may reinforce the current modal share, making change more challenging. (Shove et al. 2012)

### 3.2.4 Why Practice Theory

Practice theories maintain that individual actions take place within a larger social, cultural, historical, and material context, in contrast to models of behavior change that rely on informing people and raising awareness levels to cause individual behavior change. According to practice theory, rather than individual choice and intention acting independently from the outside world, the situated context shapes and prefigures what is rational to do at any given time (Schatzki, 2002).

The measures being suggested to be implemented to improve the cycling share are all predicated on the notion that it is the users personal decision to use the bike and integrate it into their daily lives.

Practice theory is frequently applied in attempts to change practices, especially when doing so is required for environmental reasons. Practices are by nature dynamic, so ideas of "change" within a practice ontology, specifically, wanted change, differ significantly from the linear presumptions associated with technological determinism or rational individual agency. (Morehem, 2021)

According to research, the benefits of cycling are frequently obvious, and the main barriers preventing more people from taking up the sport are roadblocks and a lack of awareness of the benefits. (Hesjevoll et al., 2016). This suggests that many people can incorporate utility cycling into their daily lives, with only minor obstacles and ignorance standing in their way. (Moreham, 2021).

According to earlier research, top-down interventions that are restricted to harsh/physical measures can raise a population's utility cycling level. However, the study found that this is based on individual choice, and that the individual always makes well-informed, logical decisions based on factors like economy, efficiency, etc. Furthermore, the research shows that, as long as the infrastructure is presented in good condition, cyclists will come. (Hesjevoll et al., 2016).

However, by looking at the goal of getting more people to cycle in general from a practice theory perspective, which both includes elements of physical infrastructure, one gets a better picture of the individual and their choices to choose or not choose the bicycle. Here, for example, meanings play an equally important role as the infrastructure, which includes the meaning behind the trip and the meanings an individual has when making a trip.

### 3.2.5 Practice Theory in this paper/thesis

We will in this report firstly look and map at the physical measures that may or may not be present at the various case stations, as multiple studies suggest is the best intervention towards a modal change. Then introduction the remaining two elements of the Shovian elements of a practice, namely Meanings and Competences, and find out in which capacity these elements are aligning with a practice of cycling to the station.

Chapter

4



Methodology

## 4. Methodology

The following chapter presents the methods which are used through the thesis. Each subchapter will include a short description of the method followed by a description of how the method is used in the report. The methodology consists of a chapter about the use of case study, desk research, surveys and mapping of the physical attributes observed.

### 4.1. Case Study

The research design of this thesis consist of a case study design as this thesis is evaluating three cases in regards to bicycle use. A case study allows for an in-depth and multilevel explorations of a complex issue in a natural real-life context (Crowe, 2011). When approaching this methodology, it is important to have a clear idea of the design, planning, analysis, interpretation of the case study. this section will answer the following questions: What is a case study? What are case studies used for? How are case studies conducted? What are the potential pitfalls and how can these be avoided?

This case is selected for its uniqueness and the fact that Norway is not that far from biking capitals like Amsterdam and Copenhagen but there is a vast difference between the number of bikers in Oslo compared to the biking capitals. The reason for this difference can be explained by the topography and weather in Norway as well as the lack of bicycling culture. This case study is a collective case study where the number of cases are selected. This offers the advantage of allowing comparisons between the different cases and to further see the fact that even though there is not a strong biking culture in Norway there are certain places in well designed places with good infrastructure where there is a difference in bicycle users.

These cases are used in a detailed site analysis which determines the physical components surrounding bicycle planning. The analysis is done through multiple case studies in order to compare three different stations in regards to bicycle use surrounding these stations. The choice to have multiple case studies is to compare the different cases to assess the similarities and differences, as well as to get a clearer overview of relevancy of the research question. With multiple cases the nuances of bicycle use is analyzed. But with a single case study there would be a greater understanding and greater research done as opposed to with multiple cases where



the depth of the cases is less. However, the larger picture of the project is showcased through the diversity of the research conducted as well as the diversity in the case studies uncovered.

The cases were chosen based on collected data and the literature review conducted of bicycling in Norway. The cases are all on the edge of Oslo, the capital, and the most innovative city in Norway in regards to bicycling. The bicycle infrastructure in Oslo is discovered through the literature review to be incredible with national bicycle routes, but is the infrastructure good enough for utility bicycle use?

The three different cases depict three levels of bicycle use in the city. With Hauketo station being a station with a great public transport connection and a lesser approachable bicycle paths. The bicycle routes from the station is incoherently connected to the bicycle infrastructure in Oslo as they mostly are tracks with the possibility of cycling. The placement of this station also makes this a hub. This makes this an interesting case as it is hypothesized that the bicycling share around this station might be low.

Grorud station was chosen due to the connecting bicycle infrastructure to the station. Even as the station has bus connections and is in a residential area the hub at Grorud is not around the station. The bicycling infrastructure is connecting the station to the bicycle paths to Oslo S. The marked bicycle path is a part of the greater infrastructure in Oslo. What makes this an interesting case is the infrastructure that is hypothesized to provide bicyclist to the station and even though the station is not as highly trafficked as the other two stations it is hypothesized that there would be high bicycle traffic.

Lørenskog station is a station very close to the eastern border with Oslo. One of the interesting finds at the station is the bicycle hotels they have for bicycle parking. This factor combined with the station's extraordinary location makes analyzing this station's utility bicycle usage unique. With the station located at the municipality border between Oslo municipality and Lørenskog municipality it brings travelers from both outside of Oslo and travelers in Oslo to this point. With the tollbooth into Oslo municipality and the zone system for public transport this station is an attractive station that has the benefit of being cost-effective by being in between both municipalities.

Quantitative and qualitative data collection is used in the case study which in combination forms mixed methods approach. As these cases depict different amounts of bicycling and different accessibility to bicycling these cases widen the scope of analysis making it approachable to analyze and determine the cause of the research problem. The essential factor of looking at a well-planned city in regard to bicycle planning and in regard to places outside of the city center that is not the top priority is why these three unique cases were chosen.

The cases that have been chosen for this study are, in our opinion, cases that illuminate different characteristics of the surrounding society and bicycle practices in Oslo. They can therefore be used as a form of metaphor or reflection of how the differences of these case can clarify how to increase bicycle use to the stations.

It has thus been our expectation that by examining these stations we will be able to contribute relevant knowledge about the bicycling practices to the stations, and that the empirical evidence that forms the background for this knowledge will be available through the analysis.

#### 4.2 Desk Research

In order to collect information regarding the gap in the research, desk research has been conducted. The research gathered has provided insight into the field of investigation. The desk research conducted in the beginning of the investigation revealed the existing research conducted on this field. the existing research revealed that there is numerous research done on bicycle use in Norway and how to improve this. This research pointed to the fact that a safe and accessible infrastructure can instigate an increase in number of bicycle users in Norway (Sørensen et al., 2020). The research also revealed a gap in the research where there is a need to look at how to increase bicycle use in Oslo. In order to do this the desk research conducted has uncovered the introduction to the report, theoretical framework, methodologies and analyses.

Triangulation of the research collected is significant in order to conduct a thorough analysis. In the planning proses of this paper research showed that the national transport plan has a goal of increasing the national bicycle use to eight percent until this year, 2023 (Nasjonal transportplan, 2017). As well as a goal of 20% bicycle use in the nine largest metropolitan areas in Norway (Nasjonal transportplan, 2017). This is in regard to the governments zero-growth

objective regarding decreasing car use in metropolitan areas. This further indicates the need for the current increase in mobility to be accounted for by foot, biking or in the form of public transport (Nasjonal transportplan, 2017).

The triangulation also help to strengthen the validity of the project because several empirical sources have been used and it can strengthen the reasons that lead to the findings in the survey. In the project, we have tried to achieve a triangulation by going on site visits, looking at previous research on the subject, as well as mapping out the gap in the research that express a broad picture of the bicycling practices in the urban space.

The combination of the data therefore makes it possible to answer the project's problem formulation, as well as provide a more complex approach to the subject.

A qualitative approach has been selected due to the ability to get a detailed insights from a variety of people traveling through the stations, which could not have been gathered through a quantitative approach. The methodological choice is based on the ‘mobilities turn’ outlining the need looking at movement as something fluid.

#### 4.3. Surveys

“Social surveys could capture beliefs, practices, or situations from random samples using a survey questionnaire or structured interview” (Ali et al., 2022)

The survey approach is one of the techniques most frequently used in social science research. The ideal application of social survey research is to learn about a group of people's attitudes and current behaviors. Because the primary goal of surveys is to learn more about larger populations, surveys should include as many participants as possible. Survey research, according to Creswell (2009) and Babbie (2012), qualitatively describes trends, behaviors, or attitudes of a population based on a sample study, we will however describe the data qualitatively, using descriptive statistical analysis on the survey responses.

As the goal was to encourage as many people to participate as possible, stood on the station and asked a preset set of questions in addition to offering a QR-code that leads to an online version of the survey (Ali et al., 2022). The survey's questions were created using the factors outlined by Ali et al. (2022) as a general framework for creating a social survey. A survey

should consider a few important factors, according to Ali et al. (2022). When creating a survey, it is important to consider the demographic information of the intended survey respondents. The questions posed by the questionnaire should be simple, uncomplicated, and free of jargon. Because some participants might only be able to respond to one of them, it is a good idea to avoid two-part questions. In a closed-ended questionnaire, it is beneficial to include a section that allows responses (Ali et al., 2022).

The survey was carried out in-person at the selected stations, so it is classified as an interview survey (Ali et al., 2022). One advantage of this type of survey is that it gets a higher response rate and encourages participation when the interviewers are present (even when respondents used the QR-code to respond, everyone who agreed to take the survey responded). The participants can ask for clarification of the questions if needed, this happened at some occasions where participants needed clarification of the question “Is it more efficient to cycle?,” where the clarification was whether that was meant to the specific station, or in general, the intention was that it would be in general. However, this restricts the sample size because only two respondents could respond to the survey at once. This method is time consuming, but we decided to use it for this research to ensure that respondents participated. As the goal is to collect data that can help us understand the meanings and competencies of the population of a given station, the survey format is chosen so that there is a predetermined set of questions that are made with these elements in mind.

The selected people for this survey was not completely random, as we will be asking people at the selected stations from the case study, to answer the questions. This is to determine which of the stations they use, and if there is a difference within the local stations regarding their attitudes, and use of the bike. The data collection at the stations were conducted over a week, from 24th of April to 28th of April, during different times of day, the weather was widely varying from heavy snow, on the first day, to clear skies and milder temperature the next couple of days. Also, we chose varying times of day, from rush hours to mid-day off peak times. Based on the elements of competences and meanings of the population, the questions will focus on norms, abilities etc. of the respondents.

The participants would answer the survey by selecting an option in a likert scale. Likert scales evaluates attitudes by asking respondents to rate how strongly they agree or disagree with a series of statements about a subject. Five-point scales are most commonly used when using a

Likert scale in various social studies. It is also easier to use because it can convert respondents' responses into five distinct possibilities, with a natural option serving as a midway point and ranging from strongly disagree to strongly agree (Tanujaya et al., 2023). In addition to this natural midpoint, which is intended to represent the participants' position between disagreement and agreement, a "I don't know" option will be included as a sixth option so that the participant can indicate an absence of opinion. According to Tanujaya et al. (2023), the option "I don't know" should not be presented as the midpoint, and the best option for this midpoint is "natural" (Tanujaya et al., 2023).

In an attempt to identify and uncover the habits, attitude, culture and social bonds, and converting them into quantitative data we decided to formulate the survey with a number of closed-ended questions. The use of closed-ended questions is helpful to gain a generalized opinion of the population. Additionally, getting as many people as possible to respond was the goal, and since closed-ended questions are simpler to receive responses to, these kinds of questions are final by nature since they are intended to produce data that is easily measurable and straightforward to code. Additionally, they enable researchers to group respondents into groups according to the options they have chosen (QuestioPro, n.d.).

#### Additional comments

We questioned the respondents about any additional comments they might have regarding biking when the written survey was being put together. At each station, we received some respondents who provided additional information about their attitudes. Some expressed regret for not riding their bikes in the previous 30 days, while others stated that they usually did, but that the weather prevented them from doing so. Norway had experienced an unusually cold spring, and it snowed on the first day of the survey, disrupting train service and causing some trains to be canceled.

#### 4.4 Mapping the Physical Aspects/attributes

We will examine the physical aspects at the stations, also briefly mentioned in subchapter 4.1 *Case studies*, and look at how physical features needs to be present to encourage people to take rides more. These aspects are critical and, for the most part, correspond to the component materials that Shove lists as one of the components of a practice. We will investigate the

relationship between this aspect and the other two (competencies and meaning) in order to better understand how practice is carried out at these case stations.

Based on research that has revealed which physical elements are needed to get people to cycle more, we will look at these elements at the stations and see how it turns out there. These elements are important, and largely coincide with the element materials that Shove describes as one of the elements that make up a practice. Therefore, we will further look at the connection between this element and the other two (competencies and meaning) to see what the practice is like at these case stations.

To identify the *cycle friendliness*, we are identifying some important factors related to the physical aspects on and surrounding the stations. Based on the aspects presented from The Norwegian Institute of Transport Economics (Rynning et al., 2022) we chose some attributes, that formulated as statements that promote bicycle use, to apply to the case stations. The following are the physical aspects, that promote bicycle use, chosen to look at closer:

### **Accessibility to location**

Bike riding is a practical alternative to a utility cycle depending on proximity to and the number of target points.

### **Safety**

Safety when utilizing the bicycle to the station. This interconnects with the cycling infrastructure and facilities at the station.

### **Characteristics of streets and cycle path (Mobility)**

High street density, a good grid network, and street design rather than road design. Typical characteristics are buildings right next to the pavement, streetlights, benches, pavements, separation between road and pavement, narrow roadway for cars.

### **Cycling infrastructure and facilities**

Cycling as a mode of transportation is supported by high-quality bicycle parking at key destination points, service stations for repairs, changing rooms/showers at workplaces, etc.

### **Signage and orientability**

By using logical connections, clear bicycle signage, and recognizable structures and features, the area is simple to navigate.

### **Accessibility to public transport**

High-standard bicycle parking at important destination points (workplaces, schools, city centers, shopping centers), service points for repairs, changing rooms/showers at workplaces etc., supports cycling as a means of travel.

### **Car accessibility**

Low car availability combined with challenging access to major roads, high parking rates and few/no parking options, tolls, lines, etc. reduces the appeal of driving and increases the competitiveness of bicycles versus cars.

(Rynning and Hagen, 2022)

Chapter

5

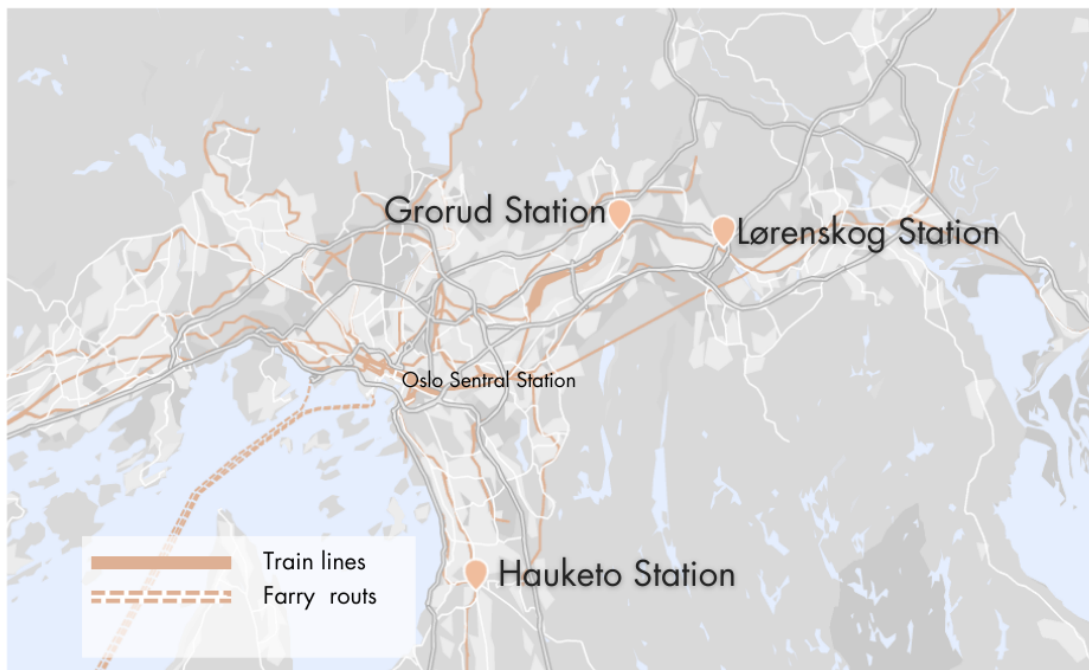


# Analysis 1: Materials



## 5. Analysis 1

The empirical evidence is presented and analyzed in this part of the analysis. The cases chosen in this analysis will highlight different infrastructural elements that are present at the stations and the immediate surroundings. Firstly, there will be a presentation of the physical elements found through observations and desk research, and then through the theoretical framework, the element of materials is analyzed in order to connect the physical elements to materials in Practice theory and how to increase bicycle use around the stations.



*Figure 4: Overview of Oslos train lines and the locations of the case stations*

As described in subchapter 4.1 *Case studies* the three cases chosen for this case study are based on the uniqueness and the difference in biking culture in the different stations. In the following sections the location, mobility options from the station, availability from the station is presented as well as the space allocated for car use, car access and parking, and bicycle use, bicycle access and parking, and safety at the different stations.

With the site analysis conducted, the second part of the analysis connects these components to the second element of practice; materials. This includes how the infrastructure is planned and how these components observed are one part of increasing bicycling shares to the station.

## 5.1 The bicycle infrastructure in Oslo today

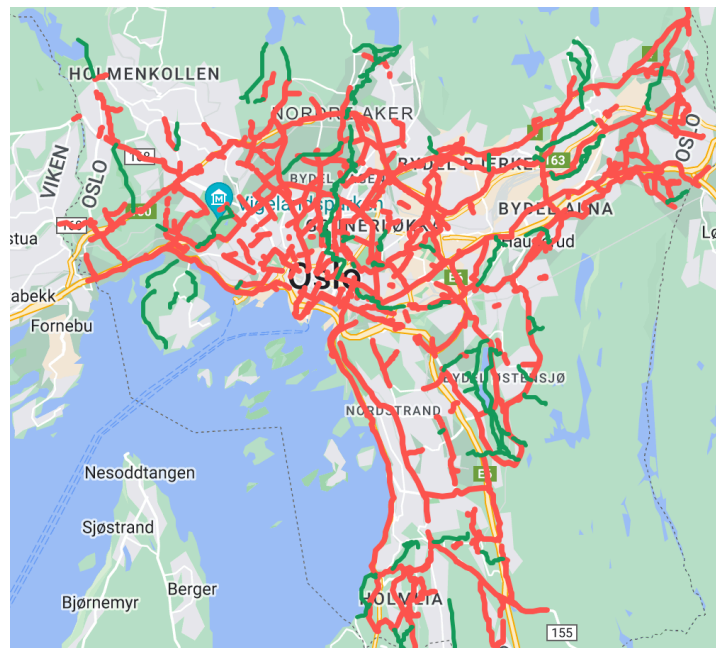


Figure 5: Bicycle infrastructure in Oslo (Oslo commune 2020)

The current bicycle infrastructure is as visualized above consisting of hiking trails that are used for utility cycling and marked bicycle trails. The infrastructure is connecting a large part of Oslo municipality together in order to create a safe and available bicycle trail to the citizens of the Oslo. With the current infrastructure there is a gap where the bicycle infrastructure could be more cohesive to achieve an accessible infrastructure for all the citizens in the municipality and increase the amount of utility bicycling in Oslo.

The municipality of Oslo has developed a bike path map that shows a specific route and the different types of bike paths on the selected route. The categories of paths are as follows: combined cycle - and pedestrian path physically separated from car traffic, cycle path with separated pedestrian area, cycle path in the road, and recommended cycle routes for cyclists in mixed traffic (Statens vegvesen, 2013)

## 5.2 Goals for increasing utility bicycle use

The goal of an increase in the amount of bicycles is a part of several central objectives for Oslo, including the goal in the governments climate agreement that growth in passenger transport should be achieved by walking, cycling and public transport (Ministry of transport,2021). The goals is to provide improved accessibility to the cycle path network through a finer meshed

cycle path network. With the future bicycle infrastructure, at least 80% of Oslo's population must live within 200 meters of the bicycle infrastructure (Oslo municipality et al., 2016).

Development of the bicycle infrastructure provides shorter journey times, is area efficient, can contribute to city life and increased trade, better accessibility and capacity for public transport, better urban environment, less climate emissions and improved public health. This means that investment in the bicycle infrastructure provides a high social benefit.

In order to increase utility bicycle use the development of infrastructure is only focusing one of the elements of practice, namely materials. However, this is often described in research as the only measure that can lead to change in people's behavior. When observing and analyzing these three different cases we see the difference in bicycle use, the difference in infrastructure and the difference in mobility in these stations and how that affects travelers' utility bicycle use.

A site analysis will uncover the physical aspects that are present the various case stations. By describing and presenting these aspects, according to the elements described in chapter 4.4. *mapping the physical attributes*, there will be drawn a clearer picture of the materials at the stations, and their *cycle friendliness* as of today. The following will, firstly, describe these attributes, and secondly analyze these attributes in relations to the element of materials.

## 5.3 Site analysis Hauketo

### 5.3.1 Location

Hauketo station is a station on the south outskirts of Oslo. Hauketo station is located on the Østfold Railway at kilometer 8.68 from Oslo S. The height above sea level is 63.7 metres. The station was opened in 1925 (banenor.no, 2023). this station is a mobilityhub on the southern part of oslo where the railway station is connected to the bus station that intertwine the station with districts nearby as well as intertwine the station with the city.

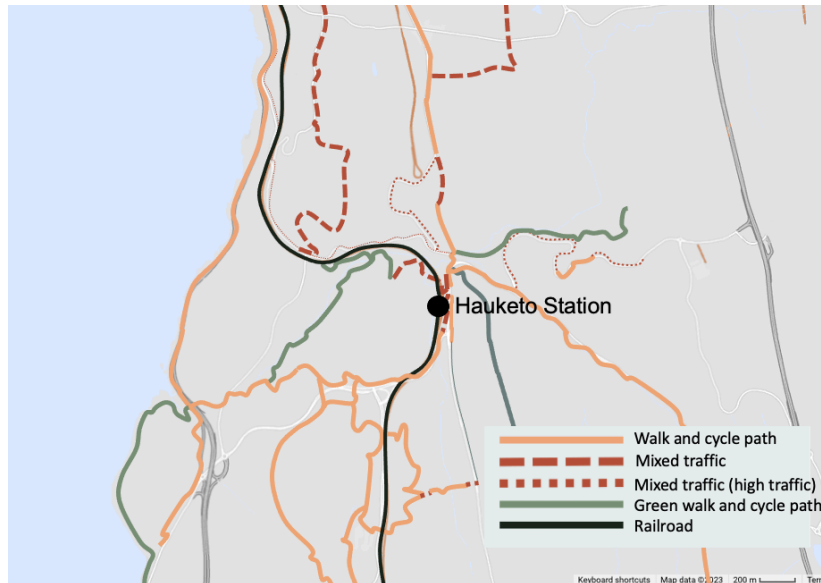


Figure 6: Overview of Hauketo station, and the related bicycle infrastructure

### 5.3.2 Mobility

As the station is a mobility hub on the south edge of Oslo it has great bus public transport connections intertwining the station with the city center as well as the outer part of this district. Hauketo station which is a stop on the local trains L2 and L2x between Stabekk and Ski, is a part of the eastbound trains that travel to the municipalities on the east coast of the Oslo fjord. The busstation connected to the station consists of 9 buses that connect the surrounding areas with the station, in addition to buses that go into the city. Buses 73,77,77x that have routes in close proximity to neighboring districts and buses 79, 81, 87, 88, 19N, 81N goes in to the city.



Figure 7: visual trip through the station of Hauketo

### 5.3.3 Availability

The station also neighbors a large quantity of residences in different sizes, differing from apartments to small houses. There are also a couple of grocery stores, an international grocery store, a pharmacy and a pizza restaurant located in the old station building which makes this station an important node in the district.

The station also lies in close proximity to a couple of kindergartens, Elvehøy barnehage, Sløreåsen barnehage, Lia barnehage, Ljabru Gård Steinerbarnehage and Bakketoppen barnehage. There are also two primary schools, Prinsdal skole and Hallagerbakken skole, and

a secondary school, Hauketo skole. Around the station there are religious buildings located as well as Hauketo-Prinsdal church, Tauheed Mosque, Masjid Aisha Mosque. There is also a close proximity to green areas, parks and playgrounds such as Vestre Lekeplass, Rugdeberget, prinsdal idrettspark, Asperudtoppen park and Hallager hundepark.



Figure 8: Hauketo map of target points

#### 5.3.4 Car use, Car Access, and Parking

As the station is located centrally in Hauketo district the main traffic artery is FV155 and connects to Nedre Prinsdals vei which has an annual average daily traffic (AADT) of 19 000. Even though the station is located in a central location with a variety of mobility connections there is a high amount of car traffic happening which affects the bicycling to and from the station.

Parking spaces allocated for Hauketo station is 100 cars (Parkopedia, 2023). The parking space allows for free parking with a maximum possible stay for 2 days (Parkopedia, 2023). This is one element that contradicts the municipalities' goal of reducing the number of cars and encourage other modes of transportation.

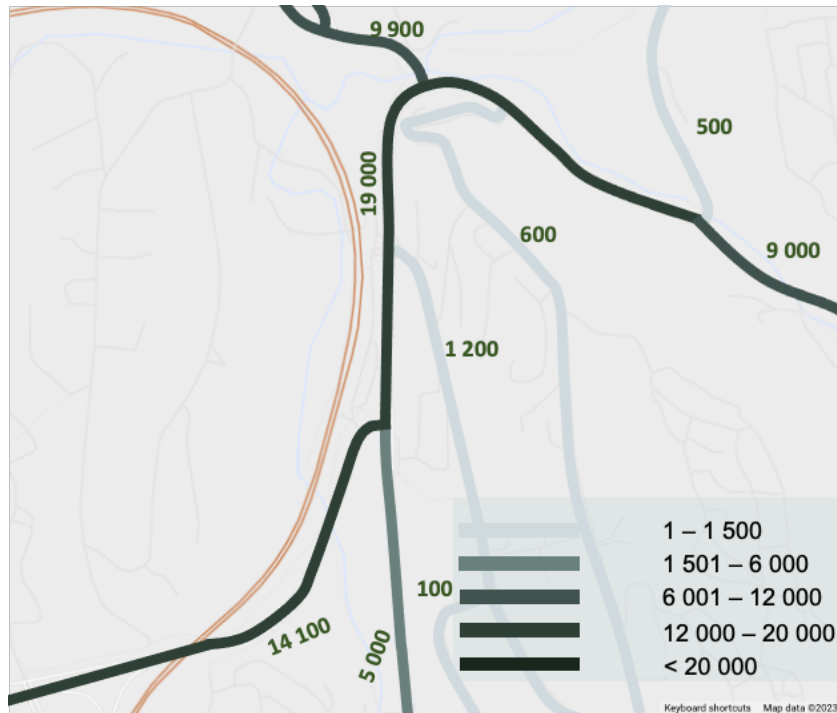


Figure 9: Hauketo Annual, average daily traffic (AADT)

### 5.3.5 Bicycle Infrastructure and Parking

The bicycle infrastructure around Hauketo station connects the surrounding areas with Hauketo. The topography is flat, with the surface being 70 % asphalt and 30% gravel, and it is a rapid route to travel to Downtown Oslo (syklistforeningen, 2021). It is observed that the combined bicycling and pedestrian path is not connected and thus is making the cyclists cross the roads multiple times. With there being a infrastructure to cycle to the city it must be noted that the route extends through a golf course and riding school, through idyllic woodlands and through low-traffic residential areas (syklistforeningen,2021). There is a mixed road for cyclists and pedestrians that carries through most of the routes with the exception of when it nears the city center where it becomes a separate infrastructure for the cyclists.

When observing the station and its bicycle parking qualities it was observed that the station has bicycle stands both with and without a roof. The bicycle stands are placed in close proximity to the station and in the parking lot, which contributes to the accessibility and safety of the parked bicycle. The pictures below depict the average usage of the bicycle stands on the week that the survey was conducted. There are not a lot of parked bicycles on the stands that indicates that the measures to increase bicycling does need improvements.





*Figure 10: bicycle stand without roof at the station.*



*Figure 11: Bicycle stand with roof at the station*

### 5.3.6 Safety

The last component that was observed is the safety of using the bicycle and parking the bicycle at the station. The bicycle parking stands depicted that the usage was low. One of the largest factors for low usage of bicycle parking stands is the fear of losing the bicycle. Especially with newer bicycles, the chance of getting it stolen is high.

The safety of bicycling comes from safe bicycling environment where there is the need for clear, understandable signs that are on a readable size and do not contain excessive information. The signs need to be legible from a long distance and have a logical route and location reference. This applies to main routes to and from the neighboring districts and into the city center, where in many places there are footpaths and bicycling paths which are on both dirt roads and national bicycle roads. It was observed that there were signage by the station and that it was clear and concise for bicyclists.





Figure 12: Hauketo station parking and cycling paths

## 5.4 Site Analysis Grorud

This station is chosen as the bicycling infrastructure around Grorud was developed and improved in 2020 (syklistforeningen, 2021). That connects the station with bicycle trail to the city. This station has the infrastructure that can improve utility bicycling in Oslo, but why is it that there still is a low percentage of bicyclists to the station?

### 5.4.1 Location

Grorud station is a station on the east outskirts of Oslo. Grorud station is located 10.50 kilometers from Oslo S, 127 meters above sea level. The station was opened in 1854 (banenor.no, 2023). This station is located right in the middle of downtown Oslo and Lillestrøm, which is a large hub outside of Oslo. This places this station in a densely populated district in Oslo. This station unlike Hauketo is not located at the district hub of Grorud. Grorud district has a hub where the metro, buses and a collection of mall and grocery stores is located. With the station being 1.5 km to the hub this station is not as highly trafficked as the other stations that are observed.

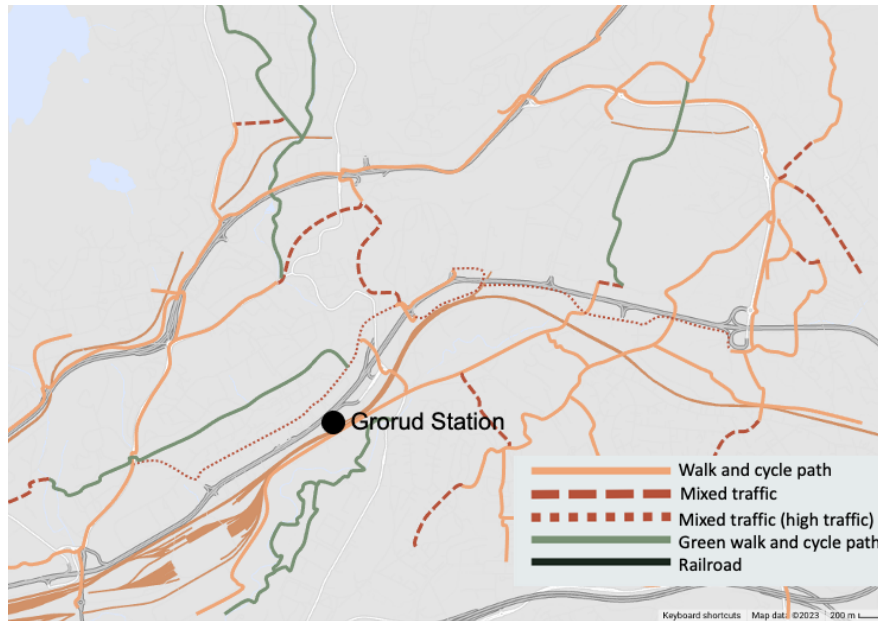


Figure 13: Grorud overview map

#### 5.4.2 Mobility

This station is served by the local trains (L1) between Spikkestad and Lillestrøm on “Hovedbanen”, the primary line and the first line from Oslo central station. The station has connections to several local buses, as well as the airbus that travels to the airport. The local buses are numbers 33, 65, 66,67, 79 and 5N which connects the station to different hubs in the neighborhood. The walking distance to the different bus stations is up to 200 meters.

#### 5.4.3 Availability

The station is located in a greatly populated area with different types of residential buildings nearby which accounts for close proximity to travel across the city. With the different bus lines that connect the north, south, east, and west part of Grorud together. The train station lies in close proximity to two kindergartens, stjerneblokkveien barnehage and Scala private barnehage, a secondary school, Groruddalen skole. The station also lies in close proximity to parks and trails in the area such as Hølaløkka, Alnaparken, Verdensparken and Furuset kulturpark.



Figure 14: Availability Grorud station

#### 5.4.4 Car Use, Car Access, and Parking

Car access to the station is from all sides as Grorud station is located in a central place in regards to the infrastructure. Following the train line, Rv163 extends from southwest towards Lørenskog in northeast of the station. The road running right by the station, Grorudveien, connects the station with Grorud district as it travels across the station from northwest to east. The residential building along this road varies and thus there is a speed limit of 50 km/h. There is also a roundabout that connects the Rv163 to Grorudveien which also constitutes for decreasing the speed limit and making it safe for other transportation methods.

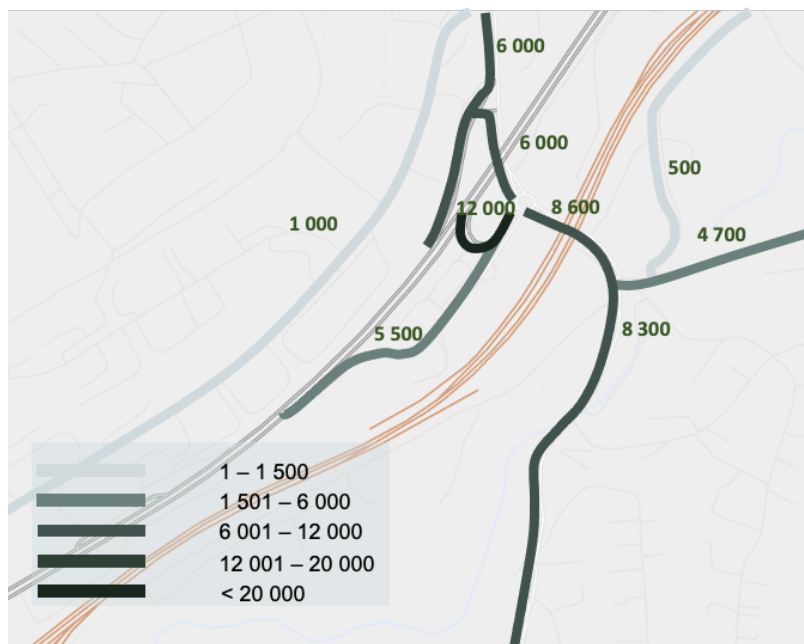


Figure 15: Grorud Annual average daily traffic (AADT)

Grorud station has a parking area that consists of 62 spaces (Parkopedia, 2023). The parking space allows for free parking at the weekend and weekdays after 17.00. Outside of that timeframe it is 85 NOK per week and 250 NOK for 30 days (Parkopedia, 2023). Which is an offer provided for travelers that travel by train that uses a seasonal ticket for train travel (Parkopedia, 2023).

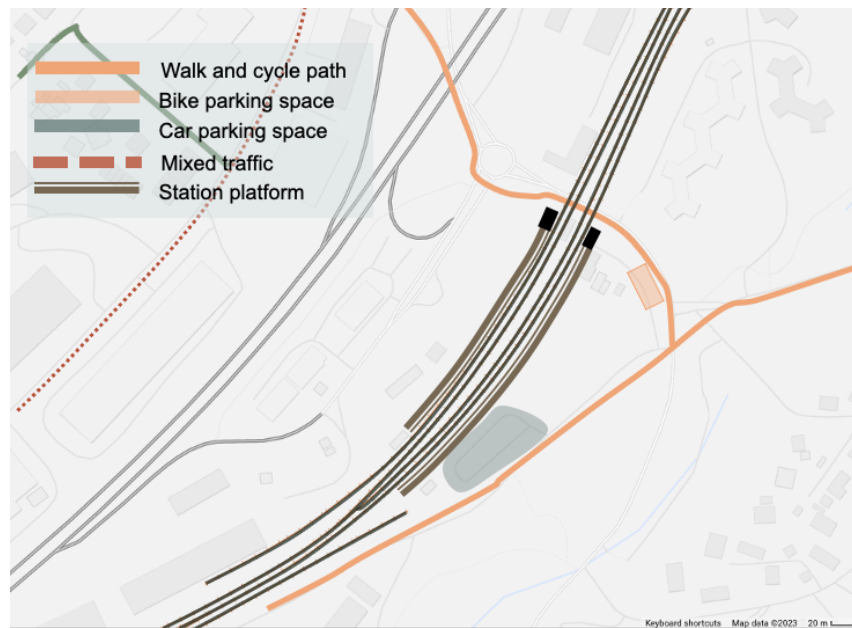


Figure 16: Grorud station parking and infrastructure

#### 5.4.5 Bicycle Infrastructure and Parking

The bicycle infrastructure around Grorud station is an extension of an existing cycle path that stretches through two municipalities and three districts. There is an excellent separate cycle path from Grorud station. The trail is a three-meter wide cycle path and pedestrians have their own raised pavement which is two meters wide. The trail consists of 50% asphalt and 50% gravel.

Travelers can cycle along a train line and some industrial areas where it is quiet and peaceful. After a couple of kilometers, it turns onto a dirt road and people can cycle in quiet and peaceful surroundings on a footpath along the river Alnaelva. The bicycle road is a 3.2 kilometer high-standard cycle path with pavement has been built between the station towards the city center, along Rv163, Østre Aker vei.

The bicycling infrastructure around Grorud station is newly developed and improved up to the standard that the municipality want the city to have, but what is surprising is that the allocated parking space for bicycles at Grorud station does not account for that many cyclists that the municipality have calculated will utilize the bicycle trail. The bicycle parking is also located approximately 50 meters from the train station, and it is a bit hidden away from the car parking, the station building and the entrances. This bicycle stand is under the roof and is also placed along Grorudveien which is a highly trafficked road with an AADT of 8600. The location of the bicycle stand is a factor that determines if people want to park their cycles there.



*Figure 17: Cycle parking Grorud*

#### 5.4.6 Safety

In the subsection above the placement of the bicycle parking is described and with it being place beside a highly trafficked road the safety of the bicycle is in question. This placement along with the proximity to the station as the car parking lot does bring light to why there only was one bicycle parked there on the week of conducting surveys. As the car park is further away in a secluded space a relocation of this bicycle stand might further increase its usage.

As the bicycle trail has good lighting and clear signage this further increases the safety around bicycling around the station. The signage provides an overview for new cyclists and provides an easier opportunity for bicycling without being inconvenienced by searching up the path.

## 5.5 Site Analysis Lørenskog

This station is chosen for its unique location and increased measures for utility bicycling to the station. So, this begs the question are these measures for increased utility bicycling is that affecting bicycling to Lørenskog station?

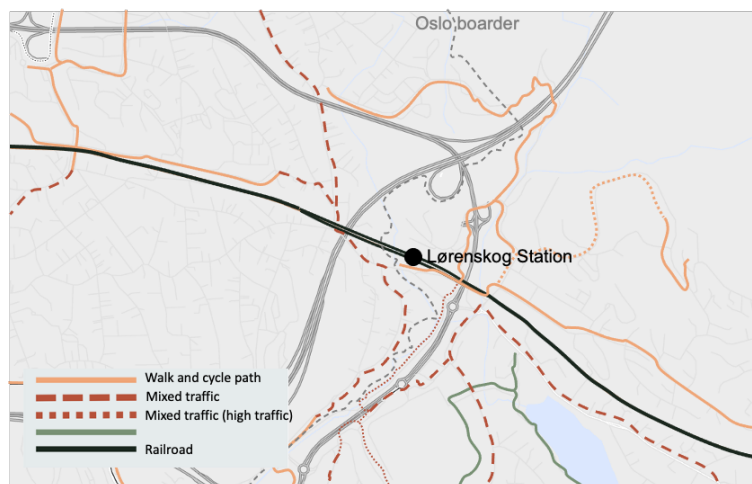


Figure 18: Lørenskog station overview

### 5.5.1 Location

Lørenskog station is a station very close to the eastern border with Oslo. The station is 14 km from Oslo Central Station and 159 meters above sea level. This stations extraordinary location makes analyzing this stations utility bicycle usage unique. With the station located at the municipality border between Oslo municipality and Lørenskog municipality it brings travelers from both outside of Oslo and travelers in Oslo to this point. With the tollbooth into Oslo municipality and the zone system for public transport this station is an attractive station that has the benefit of being in between both municipalities.

As the station is located by the border, it is not the district hub. Lørenskog has a hub with more bus connections, grocery stores, shopping malls. Even though the station is 2.4 km away from Lørenskog hub there is significant traffic flow to the station.

### 5.5.2 Mobility

Lørenskog station is also served by the local trains (L1) between Spikkestad and Lillestrøm on “Hovedbanen”, the primary line and the first line from Oslo central station. The station is connected to a bus station that connects the station to both Lørenskog municipality as well as Oslo municipality. There are several bus lines that travel from the station, for example line 25, 67 and 120. Busses number 25 and 67 connects the station to Oslo while bus 120 connects the station to Lørenskog hub and goes further into Lørenskog municipality.

### 5.5.3 Availability

The station is located in a relatively densely built-up area with newly built apartments as well as single-family housing and large amount of houses are within 15 minutes' walking distance of the station.

Even though the station is not located at the center of Lørenskog district it is in close proximity to several educational spaces, Wang Ung Romerike, a secondary school, Steinsrud barnehage, a kindergarten, Luhr skole, a primary school. The station is also in close proximity to Jumpyard SNØ, Megafun and SNØ, which is a trampoline park, an amusement park and an indoor Snowsport center that offers cross-country skiing, alpine skiing, snowboarding, freeskiing and ice climbing under the same roof regardless of the time of the year.



Figure 19: Accesability Lørenskog station



#### 5.5.4 Car Use, Car Access, and Parking

Car access to the station is from the east through Fv351, Høybråtenveien in Oslo and from the west through Rv163 connecting with Fv351, Høybråtenveien. The access roads have a speed limit of 40 km/h while the Rv163 has a speed limit of 70 km/h that reduces with the roundabout connecting it to Fv351. On both stretches, the speed limit is 40 - 50 km/h and an AADT of 3900. In addition to the traffic from Rv163 with an AADT of over 20 000 and both pedestrian crossings and bus pockets ensure that there is good vehicle flow around the station.

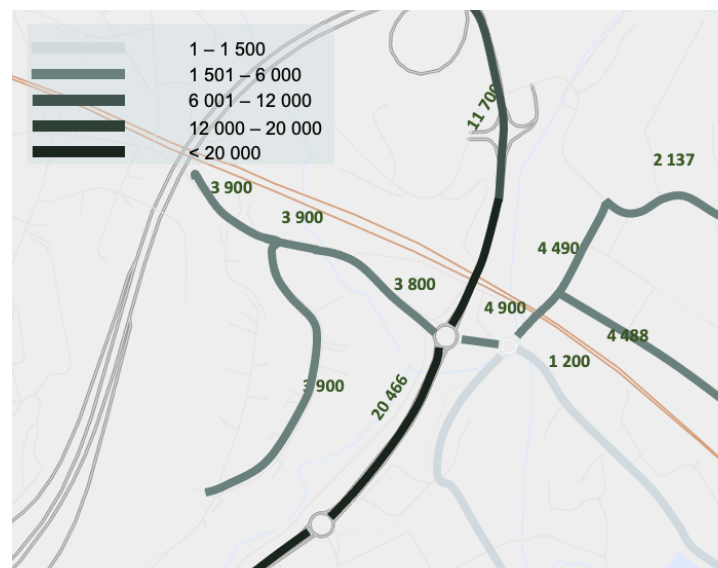


Figure 20: Lørenskog Annual average daily traffic (AADT)

The station has 4 parking spaces allocated. These spaces allow for 285 cars. (Parkopedia, 2023). The parking space allows for free parking in the weekend and weekdays after 17.00. Outside of that timeframe it is 85 NOK per week and 250 NOK for 30 days (Parkopedia, 2023). Which is an offer provided for travelers that travel by train that uses a sessional ticket for train travel (Parkopedia, 2023).

The carparking in the north is placed in Oslo district making it accessible for Oslo resident to utilize it without having to pay for the toll between the districts. This tollbooth is also the reason for the excessive parking options at the other side of it as well. With the ticket pricing for public transport in Oslo and Lørenskog municipality being in regard to a zone and with Lørenskog station being on the border between the two municipalities the station is exactly in zone 1. This means that users in Lørenskog (zone 2) are benefiting from parking at the station to take the



train into the city rather than taking public transport to the station. The map below shows the infrastructure around the station, as well as car access and parking options.

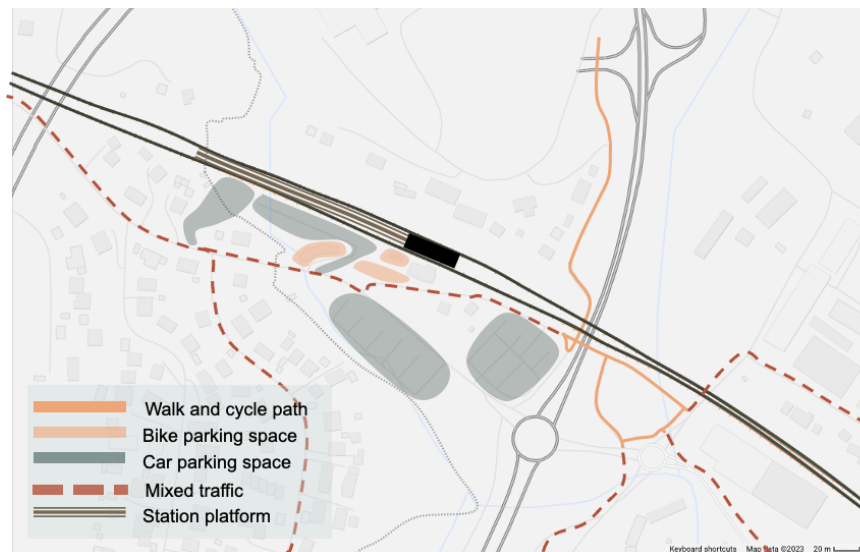


Figure 21: Lørenskog station parking and infrastructure

#### 5.5.5 Bicycle Infrastructure and Parking

Bicycling infrastructure around the station consist of a combined trail for cyclists and pedestrians with 50% asphalt and 50% gravel. There are some places along the trail where there is crossing a couple of roads and pedestrian crossings, but generally it has a good flow and few stops along the trail to get to the station from Lørenskog, as well as getting from Lørenskog station to Oslo.

Bicycle parking allocated to the station is located by the entrance allowing for easy accessibility. The bicycle parking options consists of locked bicycle storage called bicycle hotels as well as bicycle stands with and without a roof. This allows for parking availability for all kinds of bicycle needs. The factor that differentiated Lørenskog station from the other cases is the more safe option of bicycle hotel that costs 50 kroner for 30 days and provides a safe and dry space for the bike while travelling (Lørenskog kommune, 2023).

With the bicycle hotel there has been a particular focus on protection against weather (rain, snow) and security against theft. The bicycle parking spaces have a parking capacity of 40-50 bicycles. If the travelers do not feel the need to pay for bicycle parking there are more options of free parking with and without roof which is observed to be used to a higher extent. When going on a site visit it was observed to have electric bicycles parked on a stand under a roof.



*Figure 22: Bicycle parking hotel*



*Figure 23: Service station inside the parking hotel*



*Figure 24: outside parking by the entrance*



*Figure 25: outside parking with roof*

#### 5.5.6 Safety

Bicycle parking and storage are important factors to safety. During the week of observations, it was noticed that there were less than ten bicycles in the bicycle hotels and more than double outside of the hotel. Which makes for an interesting finding regarding why this measure to increase safe bicycle parking is not utilized as well as bicycle stands.

In regards to safety with cycling it was observed that the station did not have clear and precise traffic signs on the cycling routes that could benefit both current, advanced cyclists and for those who are potential new cyclists. At the station there is currently poor signage, while the

surrounding cycling infrastructure is rich which connects the station with the surrounding area it is not easily navigable for a new cyclist to the area.

With the station being located in a residential area there is good lighting around the station which is an important element in safety for users of the station. Good lighting makes it safe and secure to travel along central thoroughfares both during the day and at night.

## 5.6 What is Encouraging Cyclists at the Stations?

The analysis conducted above gives an overview of the modal split of the three stations. When looking at the car as the main mode of transport the stations have prioritized car use and thus have encouraged car use in the form of accessibility to good parking in all the stations. Bicycling to the stations varies from the different stations with Hauketo station being a mobility hub that has well planned public transport connections, Grorud station having a separate bicycling trail but low number of cyclist, and Lørenskog station having measures that studies have shown increases bicycle use but is not improving the number of bicyclists to the station.

The site analysis presents that the measures provided at the station to park a car at the station has high priority compared to parking a bicycle at the station. Clearly prioritizing car use opposed to bicycling. This contradicts every goal Oslo municipality has set for encouraging utility bicycle use in Oslo. So how have the measures implemented in the different stations improved bicycle use?

The infrastructure surrounding the different stations has been greatly improved and is Oslo municipalities greatest improvement to increase utility bicycle use. As the infrastructure vary with Grorud station having a separate bicycling path from pedestrians that interconnect the station with the surrounding areas and residences, and Lørenskog and Hauketo station have interconnected bicycling and pedestrians' infrastructure. The number of bicyclists to Grorud station should be higher than what is observed.

As the bicycling infrastructure in Oslo is improving continuously the differences at all three of these stations becomes clearer. The bicycling trail going through the mobility hub at Hauketo station, is met by the high frequency of buses and passengers. This means a cyclist must maneuver through the passengers boarding and disembarking from the buses, and onto the

sidewalk. The large number of people in the rush hours that are waiting for the buses make clusters that are difficult to navigate through. This makes the attractiveness to cycle to the station less. Even if the cycle path to the station may be of good quality this obstacle can be stressful and uncomfortable for less experienced cyclist.

The bicycling path connecting Grorud station to the surrounding area is newly improved and encourages the use of cycling to the station. Through observations at the station, it is revealed that the safety regarding bicycle parking by the station is lacking and even though the infrastructure is there it is still a small number of cyclists utilizing the new infrastructure.

In Lørenskog station the bicycling path on Oslo municipalities side is revealed to be less safe and as a mixed use trail it is not clear signage to get to the station. This is resulted by the tight urban space in that part of the city, on Lørenskog municipalities side of the station there is more open landscape that is utilized for bicycling space. Even though the bicycling trail is designed for both pedestrians and cyclists there are more cyclists utilizing the infrastructure. With the station having an assortment of bicycle parking options it is more accessible to use the cycle as a mode of transportation and the bicycle parking provides a safe environment to leave the bicycle.

With the current amount of observed bicycles how can the planning for increased utility bicycle use be implemented in order to reach the goal Oslo municipality has of having 15% of utility travel be by bicycle? In order to increase utility bicycle use there is a need to look the practice of bicycling. The current planning process of these stations as well as research into increasing bicycle use in Oslo municipality has determined that the development of infrastructure is vital to increase utility bicycle use. But the infrastructure is not the only component that needs to be improved to increase utility bicycle use. In the three elements of practice according to Shove et al. materials refers to the physical objects and infrastructure required for a practice to take place.

The infrastructure component of materiality is determined by the government to be the most important factor in regards to changing travelers behavior towards utility bicycling. The element of materiality is one of the elements that are defined by “bicycles, equipment, infrastructure, facilities, gears, topography, weather”. A practice is therefore comprised by

materials which is comprised by infrastructure. The other important element of materials that are observed at the stations is the available facilities regarding bicycle parking.

It is observed that the difference in parking facilities determines a cyclists' desire to park at the station. As every bicycling trip starts and ends with a parked cycle, this is furthermore as an important factor as the infrastructure. As a cyclist there is always an option to lock the cycle up to a bicycle stand, or a post, a sign, or a bench. It is therefore reasonable to believe that bicycle parking is not required to be hard, and thus the cycle do not need to be stored in a safe space. When observing the different stations, it is vital to note that it is important to have the possibility to store the cycle in a safe space. Which is why in the same way that there is a need to plan and design for a mode of transport to be mobile, it must also be planned for it to be immobile, and this is where the importance of offering cycle parking with quality and a good location comes into play.

This analysis has uncovered the priority of infrastructure and facilities in the planning process, but these are just a few of the components of the element of materials that has been incorporated in the planning process. The next chapter will therefor go into depth about the remaining two elements in practice theory: meaning and competencies, and how all of the elements together form the practice of bicycling to the stations.

Chapter

6



# Analysis 2: Meanings and Competence

## 6. Analysis 2

This section combines the results of the survey conducted at the stations to determine whether the empirical data is consistent with the theoretical framework of Shove's practice theory. More specifically, the two remaining elements of the Shovian practice theory that are meanings and competencies. The first part of each subsection will present and describe the results from the survey, to later be compared to each other and analyzed to determine in which capacity these elements are present in the three cases.

The elements are interconnected and dependent on one another, however, to determine how strong the connections in the practice may be, we chose to look at them separately to identify whether one or more are present in the practice, and which element to focus on to strengthen the connections and to further work to get a stronger utility cycling practice. It is important to note, however, that factors can be included in multiple elements. The survey responses will be the starting point for this chapter, which will be supplemented with other similar surveys conducted on a larger population, but with a general focus on attitudes toward cycling in Oslo.

The surveys conducted visualized below shows that the travelers are a diverse group, based on their different ages and locations. But we can see some common factors emerging that align with the general attitudes of the population.

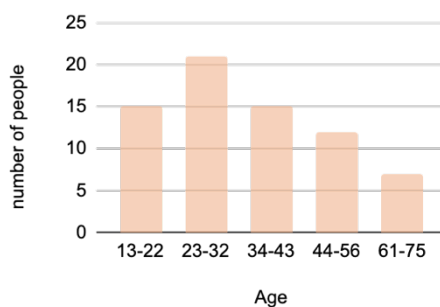


Figure 26: Age of the travelers

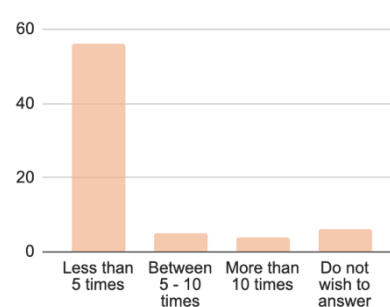


Figure 27: Number of trips over the last 30 days

In order to identify a current practice at the three case stations in this chapter, we will finally, in the combine the findings in relation to the three elements. We will firstly look at the questions that falls within the category of meaning, and next the same for the competence.

## 6.1 Meanings

As described in Chapter 3.2.1 *Practice theory*, meanings refer to the social and symbolic meaning of engaging in or carrying out a social practice, which is represented by the element meaning. Meaning refers to our personal and social reasons for doing what we do, which are rooted in meaning in the present or past, and/or with a future plan in mind. The cultural and symbolic values associated with a practice are referred to as its meaning. A practice's meaning may change depending on the situation and social group, which may influence how people decide to engage in it.

### 6.1.1 Motivations to Cycle

Cycling requires physical activity and is frequently associated with closeness to nature and the outdoors, which has historically been a highly valued value in Norwegian culture. Bicycling to the mountains on a hike and bicycling to the park as a child. This is reflected in the answers given, where some of the reasons and motivations to cycle, and combining cycling with other forms of transportation, are discussed.

The first day on site, getting travelers to participate in the survey, the weather was particularly bad. The survey was conducted in April, which was thought to give a median/normal picture of the station, as we know the cycling share is higher in summer and lower in winter (Ellis, 2017). But on this particular day there was an abrupt, heavy snowfall, which we expect affected the responses of the participants during the period of the data collection.

As a tool to map the overall motivations and barriers to discover the reasons one may have to cycle or refrain from the practice, several statements have been made about cycling and cycling facilities in Oslo, with which the respondents agree or disagree. The tables below depict the motivation being connected to physical activity and being out in fresh air.



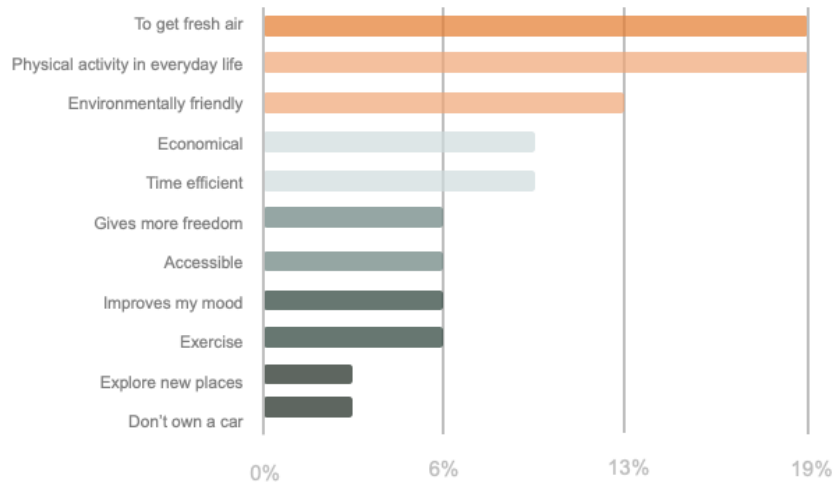


Figure 28: Motivations to cycle overall

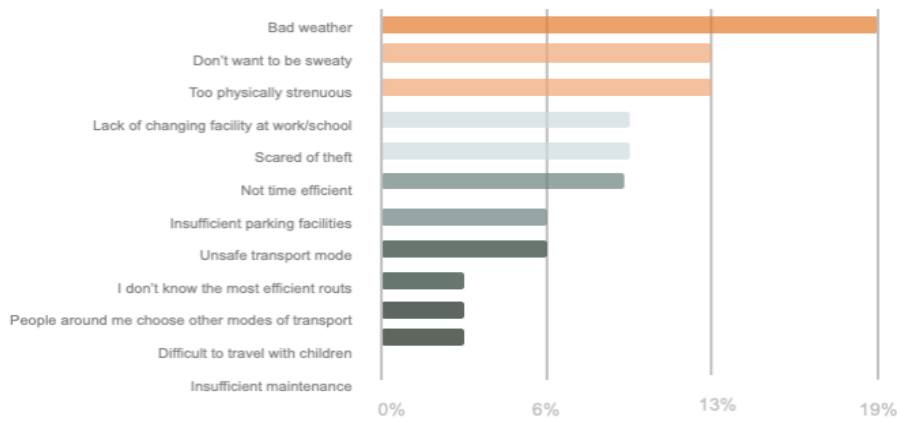


Figure 29: Barriers to cycle overall

The following sections will dive into the survey response at each of the case stations. The questions that we argue falls within the category of meaning includes if they feel safe in traffic as a cyclist, it is more time efficient to cycle, if they are motivated to cycle in the morning, and if they as a cyclist feel respected by other members in traffic (i.e. car drivers, pedestrians, bus drivers, etc.)

These questions are factors that increases the travelers meaning towards the practice of bicycling. All of these factors combined does determine their attitude towards bicycling.

### 6.1.2 Hauketo Station

16. Jeg er motivert til å sykle på morgenen

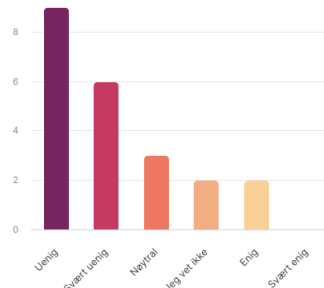
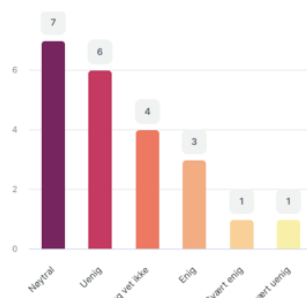


Figure 30: Hauketo "I'm motivated to cycle in the morning"

#### Motivated in the morning to cycle

At Hauketo station most of the travelers said they strongly disagreed with the statement about whether one feels motivated to cycle in the morning, accounting for 67% of the respondents there was a negative attitude to getting to the stations by bike in the mornings. As the station is located close to a public transport hub where many buses from around the area stop, and the route needed to navigate, as described in Chapter 5.6 *What is encouraging cyclists to the station*, is located near a busy road with the need to maneuver through different obstacles, there is an understanding that the motivation for not choosing to cycle in the morning. This is usually a time when one wants a quiet start to the day. And furthermore, one must cycle home at the end of a busy day. We noted as we conducted the survey, that the general moods of the people changed throughout the day, and more people declined to answer our survey in the late afternoon, especially at Hauketo Station. Disagree: 40%, strongly disagree: 27%, neutral: 13%.

17. Jeg føler med respektert av andre trafikanter som en syklist



Figur 31: Hauketo "I feel respected as a cyclist in traffic"

11. Jeg føler meg trygg i trafikken når jeg sykler

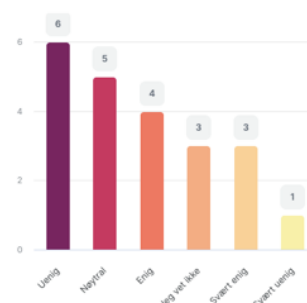


Figure 32: Hauketo "I feel safe as a cyclist in traffic"

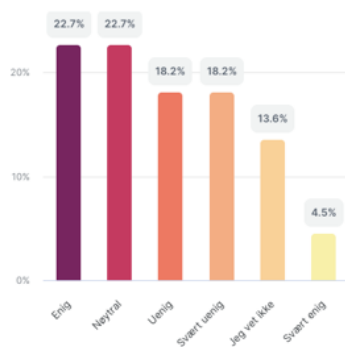
### Feeling respected as a cyclist

I feel respected by other groups in traffic when cycling. a big share (50%) of the respondents answered within the neutral scale, meaning they either answered *neutral* or *I don't know*. This suggests that not many of the participants have the experience to answer the questions more definitively. The natural answers are often looked at as a way for the participant to opt-out of participating in that statement posed. Compared to the general attitude survey for Oslo, where most of the cyclists express that they feel scared and unsafe in a busy, mixed traffic area, which is how we characterize the mentioned route around the station. Half of the participants do not feel very strongly about this statement, and we therefore draw the conclusion that they have not had the experience needed. Neutral: 31%, Agree: 27%, I don't know: 18%.

### Feeling safe as a cyclist

Related to the feeling of being respected in traffic, is the general feeling of safety. Here we see some of the same tendencies as with the statement about feeling respected. The top three responses vary from *disagree* to *neutral*, to *agree*. These responses are all located in the middle of the scale and show that there are differences in what the participants' experiences are. Here, like the previous statement, there is no immediate, clear, and cohesive answer or attitude to this statement. It could be interpreted as a there is no clear meaning connected to the practice of cycling at these stations that includes a feeling of safety. Disagree: 22 %, neutral 23%, agree: 18%.

#### 15. Det er mer tidseffektivt å bruke sykkel



Figur 33: Hauketo "It's time efficient to cycle"

### Efficiency

For the statement of efficiency of bicycling, the participant's answers ranged from agree to neutral to disagree. Combining these results with the results of the above-mentioned statements, there could be drawn a conclusion that the attitudes are spread, so there are no clear attitudes or norms toward cycling at this station. There is no immediate clear attitude that can be taken from these answers. However, this can tell us that the element of meaning connected to the practice of cycling is not well established. Agree 22%, neutral 22% and disagree 18%.

### 6.1.3 Grorud Station

#### 16. Jeg er motivert til å sykle på morgenen

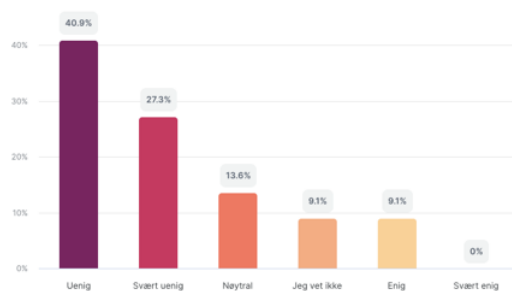


Figure 34: Grorud "I'm motivated to cycle in the morning"

#### Motivated in the morning to cycle

At Grorud station when the travelers were asked if they felt driven to bike in the morning, the majority of travelers replied they strongly disagreed with the idea. 72% of the respondents either disagreed or strongly disagreed with being motivated to choose to cycle in the morning.

#### 17. Jeg føler med respektert av andre trafikanter som en syklist

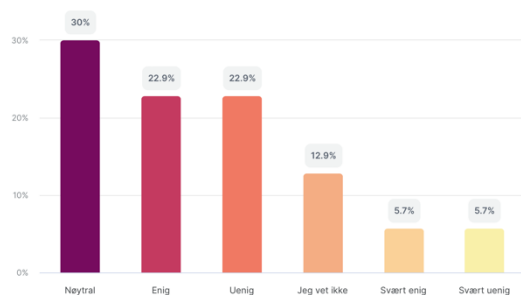


Figure 35: Grorud "I feel respected as a cyclist in traffic"

#### 11. Jeg føler meg trygg i trafikken når jeg sykler

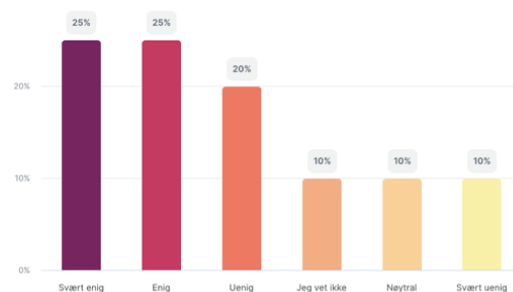


Figure 36: Grorud "I feel safe as a cyclist in traffic"

#### Feeling respected as a cyclist

Disagree: 30%, neutral: 25% agree: 20%.

of the responses reflect a neutral attitude towards the statement. As the question of feeling respected requires an underlying understanding of what it is like, or what it may be like to put yourself in traffic as a cyclist. We argue that a cyclist would have strong/stronger attitudes towards the statement, so by following this argument, the participant who answered within the

neutral scale (including both neutral and I don't know), are not experienced or practicing cyclists.

### Feeling safe as a cyclist

Feeling safe and feeling respected are strongly connected, arguably. However, here the attitudes are not as neutral as towards the feeling of respect. The pattern here resembles the scatter of attitudes previously mentioned. Strongly agree and agree are tied, with an amount of 50% having a positive attitude, and agree with the statement of it being safe.

#### 15. Det er mer tidseffektivt å bruke sykkel

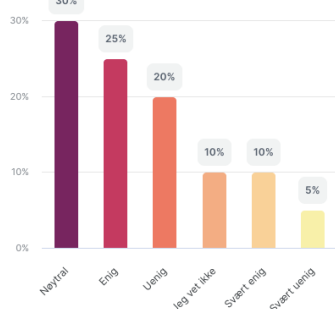


Figure 37: Grorud "It's time efficient to cycle"

### Efficiency

At Grorud station the travelers' answers are in line with the attitudes towards the bike being a efficient mode of transport with the Hauketo station, with the responses ranging from positive to negative, and natural. Neutral: 30%, agree 25% and disagree 20%. Neutral being the highest, meaning that they may not have tried to cycle/compared it to their current travel practice.

## 6.1.4 Lørenskog Station

#### 16. Jeg er motivert til å sykle på morgenen

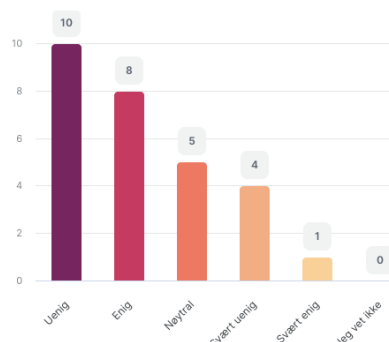


Figure 38: Lørenskog "I'm motivated to cycle in the morning"

### Motivated in the morning to cycle

Much alike the other two stations, the travelers mostly disagree in whether they feel motivated to cycle in the morning. However, the second most answered was agreeing with the statement. This differs from the stations of Grorud and Hauketo. Unlike the two other stations there are no "extreme" in the top three (81% of the total responses) for the responses, like strongly disagree.

35% agree and 28% disagree.

11. Jeg føler meg trygg i trafikken når jeg sykler

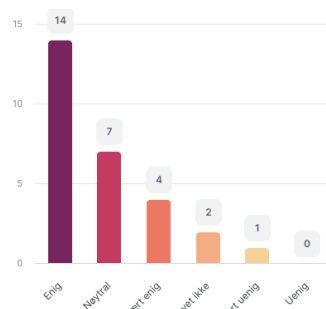


Figure 39: Lørenskog "I feel respected as a cyclist in traffic"

17. Jeg føler meg respektert av andre trafikanter som en syklist

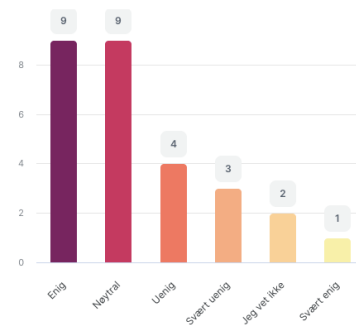


Figure 40: Lørenskog "I feel safe as a cyclist in traffic"

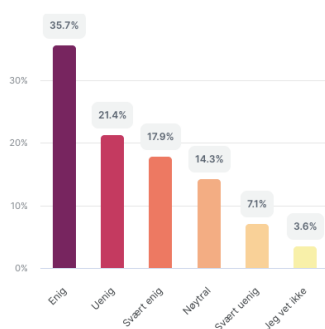
## Feeling safe and feeling respected

The feeling of safety at Lørenskog station differ significantly from the other two stations. 50% of the travelers responded that they feel safe when traversing traffic as a cyclist. Next is the neutral; 25%, and the strongly agree: 14% = 90% of the travelers' response don't have any strongly negative feelings regarding feeling safe in traffic as a cyclist.

## Feeling respected

As the feeling of being respected and the feeling of safety are interlinked, we also see that for this statement that the travelers' answers were a tie between agreeing and feeling neutral towards the statement. Agree with feeling respected 32% and 32 % feel neutral towards the statement. Disagree and strongly disagree are the next; combining these two are representing 24% of the overall responses at this station.

15. Det er mer tidseffektivt å bruke sykkel



efficient to cycle

## Efficiency

Also differing from the general tendencies at the other two stations, this is one of the statements that stands out in the survey. The travelers also believe that the efficiency by bike is quite efficient, with a share of 35% agreeing with the statement showing a clear tendency for Lørenskog station. 21% disagree, strongly agree 18%. Combining the strongly agree and agree an overall of 53% have positive feelings/associations towards the time efficiency of cycling as a mode of transport.

### 6.1.5 Meanings at the case stations

By addressing the meanings, we will uncover which values are present for the travelers, and what culture surrounds the practice of cycling in Norway. This is often affected by different aspects like historical views, policies, city development and society as a whole.

For the majority of the statements, the respondents remain on the agree-naturally-disagree scale, not evoking many strong emotions. The statements about motivation to cycle in the morning are the only ones that stand out as stirring up strong emotions; the majority of the top-rated respondents at all stations strongly disagree with this statement. When travelers are confronted with what cycling will actually entail in their daily lives, this gives a good indication of their true attitudes. By placing the statement in its proper context rather than using a make-believe scenario, the respondents may be able to better understand the statement and are more likely to respond strongly.

It is obvious that choosing to cycle, especially on days and conditions when the survey was conducted, requires a set of meanings that are stronger than the disadvantage of this in terrain and weather like we experienced during the data collection time. For some people, this might be due to environmental considerations or the incorporation of additional expertise into daily commutes. However, for most, the overall practice of getting to the final destination heavily depends on the most convenient, and efficient modes of transport. Contrary to Copenhagen, where cycling is considered to be for everyone, not just the athletic, fit, and "strong and fearless," as Geller (2006) puts it, people. The meaning of the practice of cycling in Copenhagen is the efficiency of the mode. It is often the obvious choice because it is the most convenient, accessible, and simply the most time-efficient mode of transport (Larsen, 2017). Historically, Norway has not prioritized bicycle-friendly infrastructure, and local solutions to the development of the infrastructure vary greatly. It may be argued that for a person to choose to cycle to the station, one must have a strong personal meaning behind it.

As Larsen (2017) points out, when describing the meanings of cycling in Copenhagen:

*“Cycling needs to be seen as something that is normal – not a niche, not something special or something “green” and certainly not stuck in a corner locked in competition with public transit for increased market share. Cycling is treated, and should be treated, as a very important part of the overall transportation system in Copenhagen.” (Larsen, 2017, p. 885)*

Even though being close to nature and breathing fresh air is one of the main reasons people cycle, what matters most to travelers most is probably efficiency and comfort?

In a high cycling society, the meanings/competences are not so strong, but contrastingly, in cities where there are only a few who cycle, and the material component of the practice is not as greatly represented, the other components seem to need to be stronger for the individual practitioner (Larsen, 2017). According to Aldred and Jungnickel (2014), cities with "emerging" cycling cultures have much stronger and more noticeable cycling cultures than cities with "established" cycling cultures. When everyone cycles, no one is a "cyclist"; it is not who you are but simply what you do, according to Aldred and Jungnickel (2014). In the latter, citizens perceive cycling as a normalized practice, and the meaning of cycling loses importance for the individual. The opposite, once more, is true of cities where cycling is emerging, i.e., where it is still in its infancy, where resources are scarce, or where it calls for higher levels of proficiency. In this situation, cycling demands much more work from the practitioners, but this also "may be more likely to coalesce into an identity" (Aldred & Jungnickel, 2014).

A quote by a traveler at Grorud station:

“  
I cycle in the morning for exercise.  
My bike is too expensive, so I don't  
won't to have to risk it being damage  
by the salt, or risk it being stolen”

The salt is frequently applied to the roads to help the ice melt and have a lower freezing point, but as he mentioned, this can harm bicycles. Even though the motivation for this person is to get exercise, like many of the other travelers, the fear of damage and theft is a greater barrier and is part of the meaning that prevents the establishment of utility cycling.



The trend observed in the survey is somewhat consistent with the typical motivations for choosing to cycle in high cycling cities like Copenhagen (Gössling, 2013), where cycling is typically regarded as the most effective and quick mode of transportation. We can draw the conclusion that the primary reason people cycle is because it is an effective mode of transportation (Henderson and Gulsrud, 2019). According to the responses from the three different stations, the majority of respondents said they thought cycling was a good mode of transportation.

Perhaps the most significant definition of efficiency is that it refers to a practice different from driving a car or taking public transportation. This is a competing practice. In a busy, everyday life, one must strike a balance between. This is also true for the meaning of comfort (safety will be influenced by this term of comfort). Comfort is crucial, particularly when traveling to work. Several people commented that they wanted to add more than three responses to the motivations of cycling (Figure 28), because, as they said, there were so many good points/choices.

Furthermore from the overall barriers for cycling, the top response was that it was not efficient, contradicting the findings on the separate stations. Also, the highest response on the question about barriers was bad weather. competes Next is that its tiresome and one do not have to be sweaty at their destination. This correlates with the idea that the bicycle is looked at as a form of exercise and one have to go fast and be sporty to be able to cycle.

barriers and cycling: when talking about the weather as a barrier, we can look to another Norwegian city with higher share of cycling, namely Trondheim. Here the weather is the same/or worse, and the terrain is also steep and challenging at times. However here there has been a higher number of cyclist here as the meaning of bicycling is higher there.

Looking at the efficiency component of meaning, this is a component that is part of other competing practices, such as public transport and the private car. However, the travelers respond that they generally believe that the efficiency of the bike is good. However when comparing this to the amount of cycle trips done over thirty days, there may not be a basis for the travelers to conclude this. The travelers may experience the congestion of traffic, and cancelation of trains is frustrating, and therefore draw the conclusion that there may be better to just cycle themselves. As we tried to asked one traveler on bike to answer our survey, but at

the time the planned train he was going to take was canceled, he had to continue to his destination by bike.

With these meanings affecting the travelers behaviors and attitudes towards how they view the practice of utility bicycling, the next part of the analysis will cover the element of competencies.

## 6.2 Competence

In this part of the analysis, the competencies regarding the practice of bicycling is analyzed through the theoretical framework of Shove's practice theory. The findings are based on the conducted surveys at the three stations. Firstly, the analysis will reflect on how the social background influences the behavior and use of bicycles. The travelers have been asked a set of questions varied from when they learned how to bicycle, if they keep up the practice, and what influences their choice to utilize the bicycle as a part of their travels. Subsequently the analysis will reflect on which competencies are required to cycle to the stations and if these competencies affects the travelers behaviors.

### 6.2.1 Skills to practice bicycling

In order to look at bicycle practices to travel to the station there is a need to determine when travelers learned to cycle. Most of the travelers have learned how to cycle from a young age, especially in primary school. In Norway there are opportunities to give children the possibility to acquire good skills on a bicycle and basic knowledge of road safety (sykkeldyktig.no, 2023). In order to determine if the children have learned skills regarding the knowledge of road safety and bicycling rules, a bicycle test is conducted in fourth grade. The children will then get a bicycle license that grants them permission to cycle to school without a guardian. With this bicycle license children cycle to extracurricular activities, to friends and school.

The bicycle test is conducted by *sykkeldyktig* which is a collaborative project between Trygg Trafikk, the Norwegian Automobile Association and the National Association of Cyclists. The project receives support from the Ministry of Transport and the Ministry of education (sykkeldyktig.no, 2023). Even with the bicycle test parents and other guardians play an important role in ensuring that children develop cycling skills, understanding of traffic and

good behavior in traffic. Which is why most travelers learned how to cycle before getting their license in grade 4.

From the survey conducted at the three stations travelers has answered the following regarding what age they learned to cycle:

5. Når lærte du deg å sykle?

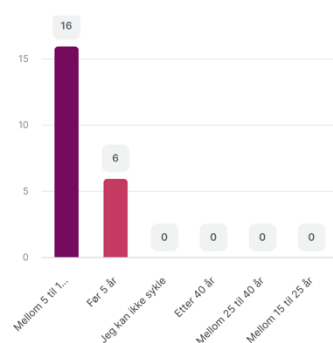
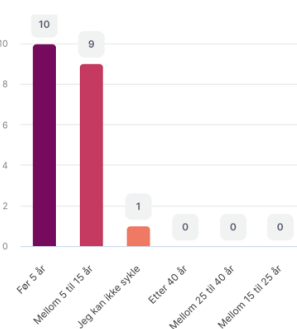


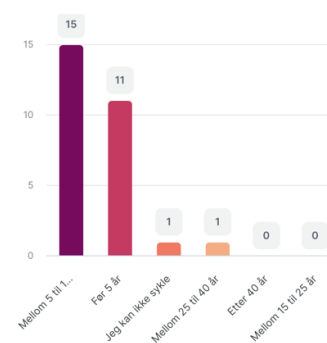
Figure 44: Hauketo station

5. Når lærte du deg å sykle?



Figur 42: Grorud station

5. Når lærte du deg å sykle?



Figur 43: Lørenskog station

The answers from the travelers was that 57% of travelers learned how to ride the bicycle in primary school. A whole 39% learned how to utilize a bicycle in kindergarten. Overall, 96% of the travelers had gained the skill before becoming an adult. The remaining 4% consist of travelers that do not know how to cycle and travelers who learned the skill between the ages of 25 to 40 years old.

With the governmental goal of increasing bicycle use for utility transport, bicycling has been deemed an important mode of transport for children and this practice is hoped to be carried throughout their life. The questions below from the conducted surveys from the different stations determines if this practice has been carried out through adulthood, if these competencies differ for each station and if the competencies learned at childhood affects travelers bicycle use to the stations.

## 6.2.2. Hauketo Station

Following Shove et al. (2022, p. 19) the element of competence encompasses skill, know-how and technique. Within the practice of increasing the cycle share, the surveys have looked at knowledge, skills, and experiences that the travelers make use of in regards to cycle to the stations (Kayers, 2019). Observations conducted at Hauketo station revealed that there was a

low amount of bicyclist to the station. The first question below determines if the travelers have the materials required to perform this practice.

6. Eier du en sykkel, hvis ja, hva slags sykkel?

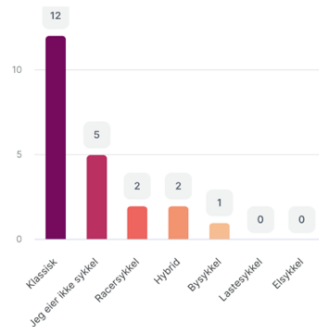


Figure 45: Owning bicycle at Hauketo

The question is “if the travelers owned a bicycle, and if they did, what kind of cycle they owned”. 23% of the travelers answered no while 77% answered yes. The most owned bicycles are the classical bicycles, and some answered that they owned racer and hybrid bicycles. There was also one person at Hauketo station that disclosed that they use a city bike when travelling in and around the city. Which is a sharing mobility service accessible for travelers in the city.

The next couple of questions in the survey determine if the travelers have the knowledge of the routes, time management and if they are physically able to cycle to and from the station in this topography and weather.

8. Jeg kan den mest effektive ruten fra hjemmet mitt til stasjonen

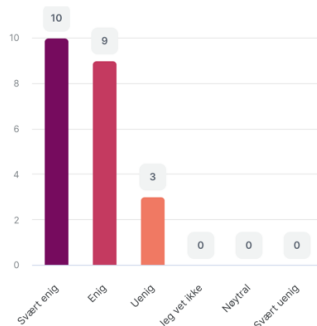


Figure 48: effective route to station

12. Jeg kan navigere meg som en syklist gjennom trafikken

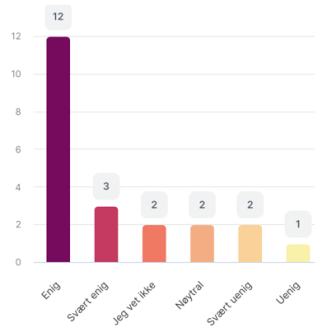


Figure 47: can navigate as a cyclist

13. Jeg kan sykle uavhengig av bratt terreng

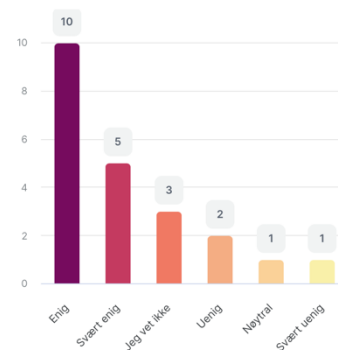


Figure 46: Can cycle regardless of terrain

For the statement “I know the most effective route from my home to the station” using the Likert scale 87% of travelers answered that they strongly agreed or agreed to the statement while 14% answered that they did disagree. For the statement “I can navigate as a cyclist through traffic” 68% of travelers answered that they agreed or strongly agreed with the statement while 9% answered that they were neutral, 9 % answered that they did not know and 14% answered that they disagreed or strongly disagreed with the statement. For the statement “I can cycle regardless of terrain” 68% of travelers answered that they agreed or strongly agreed with the statement while 14 % answered that they did not know, 14% answered that they disagreed or strongly disagreed with the statement and 4% answered that they were neutral to the statement.

The information gathered here determines that most of the travelers do have the competencies to practice bicycling. The knowledge about the infrastructure depict competency regarding travel planning and confidence of the bicyclists. With the knowledge about bicycling present, what is hindering the travelers to practice bicycling? The topography at Hauketo combined with the large quantity of people waiting for the bus, and the combined bicycle and pedestrians trail makes navigating through the trail to the station exhausting. These next couple of questions determines the traveler's health and knowledge about facilities available for bicyclists.

9. Det er god tilgang til garderobes/skiftestrom på skolen/arbeidsplassen min

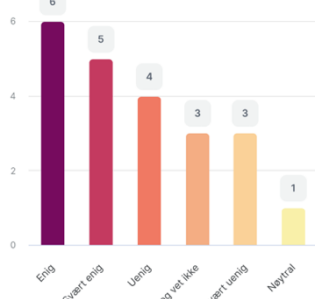


Figure 50: Changing facilities at work

10. Jeg kan fysisk sykle

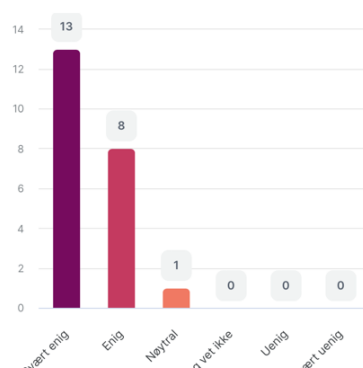


Figure 51: can physically cycle

14. Jeg kan sykle sammenhengende i 30 minutter

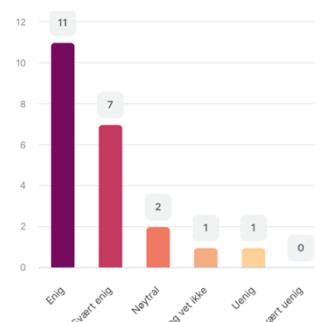


Figure 52: Cycle for 30 minutes

For the statement “there are good availability to changing rooms at my school/workplace” the answers differed with 50% answering that they agreed or strongly agreed, 14% answered that they do not know, 4% answered that they were neutral towards the statement and another 32% answered that they disagreed or strongly disagreed with the statement.

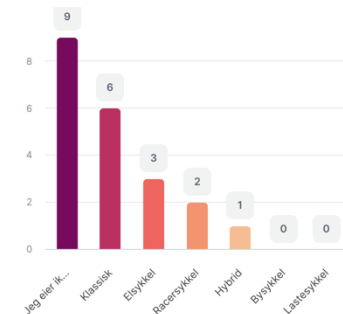
For the statements “I can physically cycle” and “I can cycle continuously for 30 minutes” most of the travelers agreed or strongly agreed with that statement while 11 % answered they were neutral/did not know/ disagreed to that statement.

The most interesting question is the knowledge about the availability of changing rooms at the workplace/school as only 50% agreed with that statement. This indicate that the 18% that were neutral and did not know do not utilize utility bicycle as a practice. The other 32% that disagreed with the statement represent travelers that might have tried bicycling to work/school and felt the facilities provided to keep doing that practice was inadequate.

## 6.2.4. Grorud Station

At Grorud station the surveys regarding competencies revealed that many of the travelers did not own their own bicycle. Out of all the travelers 43% of the travelers answered they did not own one while 57% answered that they did. The most owned bicycles are the classical bicycles, while some travelers answered that they owned electric, racer and hybrid bicycles. This is unpredicted as Grorud station has the most greatest bicycling infrastructure compared to the other two stations.

6. Eier du en sykkel, hvis ja, hva slags sykkel?



Figure

54: Owning a bicycle in Grorud

The next couple of questions similar to the previous stations determines the traveler's knowledge regarding navigating through the infrastructure, time management and if they physically can cycle regardless of the terrain around Grorud station.

8. Jeg kan den mest effektive ruten fra hjemmet mitt til stasjonen

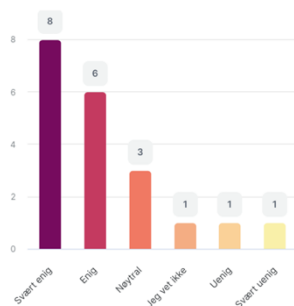


Figure 55: know the effective route

12. Jeg kan navigere meg som en syklist gjennom trafikken

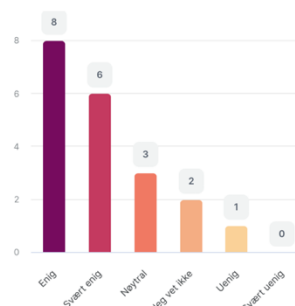


Figure 56: Can navigate as a cyclist

13. Jeg kan sykle uavhengig av bratt terreng

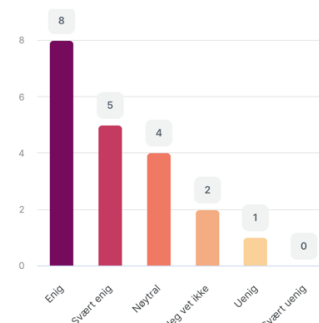


Figure 57: Can cycle regardless of terrain

For the statement “*I know the most effective route from my home to the station*”. 70% of travelers answered that they strongly agreed or agreed to the statement while 15% answered that they were neutral and 15% answered that they did not know, did disagree, or strongly disagreed. For the statement “*I can navigate as a cyclist through traffic*” 70% of travelers answered that they agreed or strongly agreed with the statement while 15% answered that they were neutral, 10 % answered that they did not know and 5% answered that they disagreed with the statement. For the statement “*I can cycle regardless of terrain*” 65% of travelers answered that they agreed or strongly agreed with the statement while 20% answered that they were

neutral, 10 % answered that they did not know and 5% answered that they disagreed with the statement.

The information gathered at Grorud station reveals that the majority of the travelers do have the competencies to practice bicycling. The knowledge about the infrastructure depict high level of competency regarding travel planning, navigation of the infrastructure and the confidence of the bicyclists. The site analysis conducted reveals that there still is a small number of bicyclists to the station. With the knowledge about bicycling present, what is then hindering the travelers at Grorud to practice bicycling. The secluded bicycling trail and the infrastructure are inviting measures that should increase bicycle use. But the physical aspect of bicycling is not coinciding with the measures implemented. The questions below gives more insight about the travelers knowledge regarding the availability of facilities and their physical ability to cycle.

9. Det er god tilgang til garderobes/skifterom på skolen/arbeidsplassen min

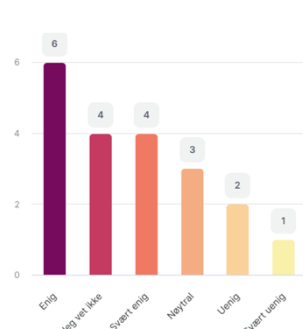


Figure 58: Changing facilities at work

10. Jeg kan fysisk sykle

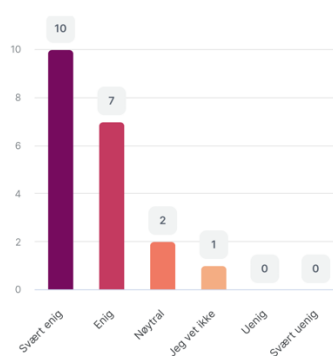


Figure 59: can physically cycle

14. Jeg kan sykle sammenhengende i 30 minutter

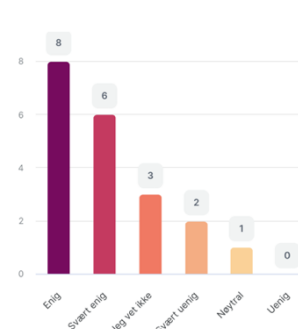


Figure 60: Can cycle for 30 mins

For the statement “*there are good availability to changing rooms at my school/workplace*” the answers differed with 50% answering that they agreed or strongly agreed, 20% answered that they do not know, 15% answered that they were neutral towards the statement and another 15% answered that they disagreed or strongly disagreed with the statement.

For the statement “*I can physically cycle*” 85% of travelers agreed or strongly agreed with that statement while 10 % answered they were neutral and 5% answered that they do not know. For the statement “*I can cycle continuously for 30 minutes*” 70% of travelers answered that they agreed or strongly agreed with the statement while 5% answered that they were neutral, 15 %

answered that they did not know and 10% answered that they strongly disagreed with the statement.

Once again does the question about availability of changing facilities at work/school give the most interesting answer as 50% of travelers did know about the facilities indicating that they have the knowledge despite not utilizing bicycling as a part of their travel.

#### 6.2.4. Lørenskog Station

During the observation of Lørenskog station it was observed that there was a large amount of bicyclist compared to the two other stations. This makes the first answer of the survey clearly different from both Hauketo and Grorud station.

6. Eier du en sykkel, hvis ja, hva slags sykkel?

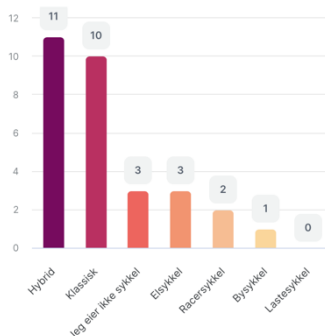


Figure 61: Owning a bicycle in Grorud

For the question “ *they owned a bicycle, and if they did, what kind of cycle they owned,*” 11% of the travelers answered no while 89% answered yes. The most owned bicycles are the classical bicycles and hybrid bicycles, and some travelers answered that they owned electric and racer bicycles. At Lørenskog station one traveler also revealed that they used the city bicycle for utility use in the city which further indicates that bicycling around Lørenskog is more practiced than around the two other stations.

The next couple of questions are similar to the previous stations and determines the traveler’s knowledge regarding navigating through the infrastructure, time management and if they physically can cycle regardless of the terrain around Lørenskog station.



8. Jeg kan den mest effektive ruten fra hjemmet mitt til stasjonen

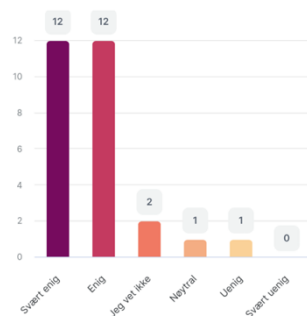


Figure 64: Know the effective route

12. Jeg kan navigere meg som en syklist gjennom trafikken

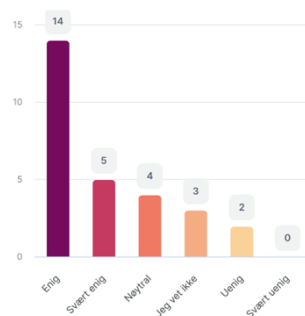


Figure 63: Can navigate through traffic

13. Jeg kan sykle uavhengig av bratt terreng

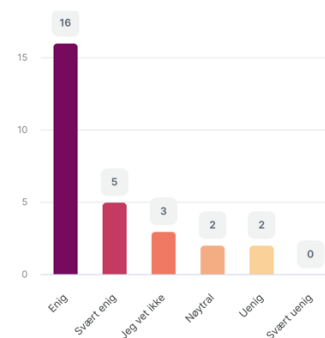


Figure 62: Can cycle regardless of terrain

For the statement “*I know the most effective route from my home to the station*”. 86% of travelers answered that they strongly agreed or agreed to the statement while 3.5% answered that they were neutral and 7% answered that they did not know, 3.5% did disagree or strongly disagreed. For the statement “*I can navigate as a cyclist through traffic*” 68% of travelers answered that they agreed or strongly agreed with the statement while 14% answered that they were neutral, 11 % answered that they did not know and 7% answered that they disagreed with the statement. For the statement “*I can cycle regardless of terrain*” 75% of travelers answered that they agreed or strongly agreed with the statement while 7% answered that they were neutral, 11 % answered that they did not know and 7% answered that they disagreed with the statement

The information gathered through the surveys revealed that the majority of travelers have the competencies to practice bicycling. The knowledge about the infrastructure depicts high level of competency regarding travel planning, navigation of the infrastructure and the confidence of the bicyclists. This is match the observations made at the station as Lørenskog station has the largest amount of bicyclists. Furthermore, the questions below gives more insight about the travelers knowledge regarding the availability of facilities and their physical ability to cycle.

9. Det er god tilgang til garderobes/skiftoom på skolen/arbeidsplassen min

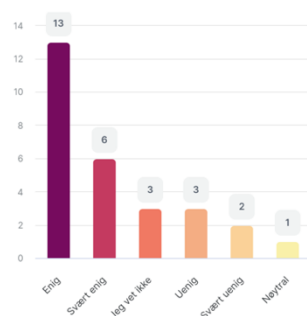


Figure 66: Changing at work/school

10. Jeg kan fysisk sykle

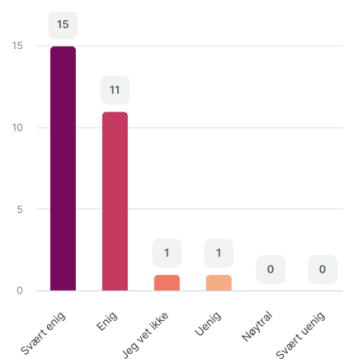


Figure 67: Can physically cycle

14. Jeg kan sykle sammenhengende i 30 minutter

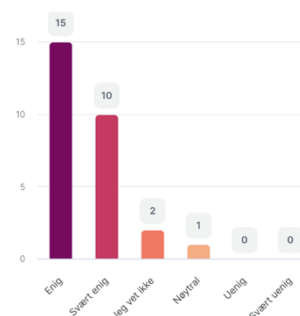


Figure 65: Can cycle for 30 mins

For the statement “*there are good availability to changing rooms at my school/workplace*” the answers differed with 68% answering that they agreed or strongly agreed, 11% answered that they do not know, 3% answered that they were neutral towards the statement and another 18% answered that they disagreed or strongly disagreed with the statement.

For the statement “*I can physically cycle*” 93% of travelers agreed or strongly agreed with that statement while 3,5 % answered they were neutral and 3,5% answered that they do not know.

For the statement “*I can cycle continuously for 30 minutes*” 90% of travelers answered that they agreed or strongly agreed with the statement while 3% answered that they were neutral, 7% answered that they did not know if they agreed or disagreed with the statement.

Once again does the question about availability of changing facilities at work/school gives the most interesting answer as 68% of travelers did know about the facilities indicating that there is higher knowledge at Lørenskog station regarding utilizing bicycling as a part of their travel compared to the other two stations.

#### 6.2.5. Competencies

The surveys conducted in these three cases demonstrate how a lot of the competencies’ surrounding bicycling is present through the knowledge that the travelers have. Each paragraph covers different competencies that combined with the other two elements of practice theory makes a practice. In the practice of increasing bicycle use to the station, it is uncovered that there is a difference in competencies at the three stations. With the different competencies the

travelers have different expertise and knowledge regarding bicycle infrastructure, bicycle safety and bicycle culture.

The knowledge regarding the infrastructure and planning to cycle is uncovered through the surveys conducted. It is a crucial ability to know where the safe, fast, and convenient bicycle paths are. The surveys uncovered that most travelers had that ability despite not utilizing bicycling as a practice. The cyclist use of the available infrastructure and the knowledge of utilizing the infrastructure are some important competencies as well as the knowledge of bicycle parking options and safety regarding bicycle parking. At all of the stations the surveys revealed that the travelers have high knowledge about the bicycle parking options and safety regarding bicycle parking.

A lot of the knowledge regarding cycling practices is learned in childhood. The underlying competencies of knowledge about the traffic rules and navigating traffic create the foundation of safety regarding the practice. As travelers' behaviors towards a practice is affected by their sense of safety. With the knowledge being incorporated in childhood the practice is implemented into the social environment. The answers from all of the stations reflected that most of the travelers learned it in primary school and thus there is a higher probability of bicycling being incorporated into travelers' practices.

Time management is also a competency that is mentioned in chapter 6.1 *Meanings* which affects the travelers' motivations to execute a practice. Motivations which refer to interpersonal aspects that determines the traveler's commitment to use the bicycle as the main mode of transport. The motivations also are a component in meanings. The motivations of utilizing the bicycle can be driven by environmental purposes, physical health purposes, mental health purposes, and other purposes. The knowledge behind the travelers' motivations is what is founding these purposes.

The accessibility to bicycle in the urban environment is also a competency that is overlooked as the incorporation of bicycle infrastructure is assumed to cover the accessibility to a safe bicycle path. Which is why being aware of the urban environment is another competency. In order to cycle safely it is necessary to be aware of both pedestrians and cars and how to navigate the cycle when the traffic interconnects. These two factors are the factors that differs in the surveys at the three stations. At Hauketo it is revealed that the accessibility is not there even

though there is a combined bicycle and pedestrian path available due to the high traffic of people at the bus station. At Grorud and Lørenskog it is more accessible to cycle.

The knowledge about facilities that encourage bicycling is revealed to be low on both Hauketo and Grorud station but a bit higher at Lørenskog station. The knowledge about facilities shows that there is more knowledge where the practice is performed. The amount of bicyclist at the other stations is lower than at Lørenskog.

The data collected through the surveys conveys that there is a lot of knowledge present about bicycling infrastructure and bicycling safety at all of the stations. There is confidence among the travelers about their ability to cycle but there is also lack of knowledge about how the practice of cycling affects the travelers. The data collected shows that there is a large number of travelers that own a bicycle even though they do not utilize it. Even though there is high competencies regarding the practice of bicycling without the interconnectedness of competencies, materials and meaning there cannot be an improvement of the practice of bicycling.

Chapter

7



Discussion

## 7. Discussion

In this chapter the findings from the conducted analysis of the practice of utility bicycling will be discussed. The discussion will consist of a comparison of the site analysis in regards to the materiality of bicycling and the surveys conducted to determine the meanings and competencies that the travelers have towards bicycling as a practice.

The comparison of the three elements of Shoves practice theory gives the opportunity to investigate the main differences between how the current planning process of bicycle planning affects the practice of utility bicycling and which elements needs to be incorporated to improve the amount of bicyclist who practice utility bicycling. Comparing the materials, meanings, and competencies of the practice of utility bicycling enables the possibility to determine How the travelers' behavior and attitudes towards the practice of cycling are and what factors improve practices of cycling to train stations?

### 7.1 Materials of Practice theory

Increment of utility bicycling in the current planning process of the three stations as well as research into increasing bicycle use in Oslo municipality has determined that the development of infrastructure is vital to increase utility bicycle use. As determined in the first analysis the infrastructure is not the only component that needs to be improved in order to increase utility bicycle use.

Infrastructure is only one component of the element of materiality. The way a practice is carried out and how it affects the environment are both influenced by materiality. The components of materiality is described by figure 3 and they are as follows; bicycles, bicycle shops, equipment, infrastructure, facilities, bodies, gears, topography and weather. All of these components combined together create strong materiality that can improve the practice of bicycling.

The infrastructure component of materiality is determined by the current planning processes to be important in increasing utility bicycle use, and it is also observed that parking facilities also increases utility bicycle use. The observations at the different stations proved it is important to have the possibility to store the cycle in a safe space. Which is why in the same way that there

is a need to plan and design for a mode of transport to be mobile, it must also be planned for it to be immobile, and this is where the importance of offering cycle parking with quality and a good location comes into play.

The analysis uncovered the importance of awareness about bicycle parking both in the cityscape and in the decision-making processes of planning for a station. Good bicycle parking means better accessibility for pedestrians and people with disabilities and can contribute positively to the city's aesthetic. In order to be attractive, bicycle parking must be placed visibly in the streetscape and be of good quality. By placing the bicycle parking in a visible and well-lit place, social control increases, and thus the risk of bicycle theft is reduced. This is a factor that differentiates Lørenskog station from Hauketo and Grorud station. The inviting bicycle parking structures are observed to be more utilized here and thus increases the utility bicycle use to the station.

Lighting, access, and overview are key qualities for the station to be attractive around the clock. Practical bicycle parking spaces usually meet these requirements, and therefore the difference in the stations regarding bicycle parking is another factor that affect bicycle practices. Even with the infrastructure at Grorud station, the lack of safe parking is analyzed to be an important factor to the lack of bicyclist parking at the station.

Two of the components that affects bicycling as a practice to the station is the topography and the weather as they are two components that makes utility bicycling a daily practice hard. Norwegian weather is known for its unpredictableness which does not usually invite for bicycling. Through the analysis it is determined that the unpredictable weather that changes multiple times throughout the day is a large factor in a low amount of bicyclist.

The topography on the other hand is observed to be manageable by bicyclists as the travelers have answered that they are physically able to cycle regardless of the terrain and thus the topography is evidently not affecting the practice of utility bicycling negatively. These two components of materiality are factors that cannot be changed, but it is interesting to clarify which components affect the behaviors of travelers.

One of the components in materiality is the physical bicycle. It is uncovered in the analysis that the majority of travelers owned their own bicycle. The ownership of material does give incentive to utilize the material. Considering the monetary factors of traveling by train, utilizing the existing material is presumed to be the preferred method, but the analysis uncovered that it was not the case. This factor did not affect the practice of bicycling to the station.

When considering the component of facilities, it is determined that there were available facilities for changing after cycling. This also applies on the train. There are available toilets that can provide a space to clean up after an exhausting bicycle ride to the station. This is another component in materiality that can increase the practice of utility cycling.

If the materials to perform the practice of bicycling is weak it hinders the possibility of increasing bicyclists to the stations. There has been implemented good infrastructure for bicyclist in Oslo, but there are still stretches of the infrastructure where the cyclists have to share the space with pedestrians which provides a complication. This inconvenience the cyclist and the pedestrians as the safety factor gets affected by the need to navigate through each other. Cyclist also have to consider the car and the car infrastructure as well, especially when crossing the road there is a need to consider the car and pedestrians. While most of the infrastructure is not intertwined with the car, there are parts whereas a cyclist there is a need to cross the road or bike close to the road.

The distribution of space is one of the issues in Oslo as the cyclists needs to consider pedestrians and cars in the urban landscape making it less attractive to practice bicycling. Even when the infrastructure is designed for cyclists, the infrastructure is not visible for other users. If there are no cyclists at the bicycle trail pedestrians do tend to use this path which then again influence the materiality of bicycling.

All the components mentioned above combined does make the element of materiality. Even though research show that infrastructure is a vital part in increasing the practice of bicycling, and the observations show that the equipment of safe bicycle parking options increase the practice of bicycling, all the element together does affect the increasement of the practice.



## 7.2 Meanings of Practice theory

The interviewees appear content with the accessibility of the cycle and footpaths as well as the urban design on the one hand, but they choose not to use them because of poor upkeep and quality. Ineffective cycle paths can make the equipment more challenging to use, which in turn can amplify the effects of other barriers like time, logistics, planning, and a sense of mastery.

The image that the cyclist is looked at as a menace in traffic, can both act as a deterrent for the non-cyclist, and also give a bad image/view towards the current cyclist, even when they follow traffic rules and are observant of the surroundings when cycling. Participation can be affected by this image because one does not want to be associated with this type of image, or, one can feel incompetent and inadequate to be within the image of a sporty, fast cyclist, which can work as barriers.

The general public's perception of the opposition to cyclists is revealed by statements along the lines of "the police are negative" and "it has long been a negative attitude that has affected the opposition." However, in reality this description, or generalization, cannot be put on all cyclists when trying to improve the cycle culture.

It is not a given that the loaded opinions of the cycling culture, is what best describes the low cycling share, as the cycling menace is described.

By making cycling a practical option for combining with other modes of transportation to get to a train station, cycling can become more normalized and reach more people who do not fit this description.

As the infrastructure near Grorud station shows, the infrastructure at some stretches separated from other infrastructure all together. Infrastructure must be located where people actually travel and where there are conflicts between various traffic groups, in addition to being of high quality. The traffic picture at Haukto station, for example, was described as challenging for cyclists to read and navigate.

There are locations with what might be characterized as good infrastructure for cycling, but it is not very well used. The placement of the cycle paths in areas where they are convenient to construct and do not obstruct other, supposedly "more important," uses like car roads and the like may help to explain this.

A great investment in the cycle infrastructure entails that the cycling culture moves from being almost a niche phenomenon for the “strong and fearless” to be the norm, like in Copenhagen where one does not look at it much as anything other than an efficient and convenient mode of transport.

To try and alter the cycle culture, "attitude campaigns" might not be the best course of action. As established, there is a great agreement, both in previous research and found in this report, that it's the infrastructure, the materials, that needs to be improved that should be prioritized. Accessibility, cohesiveness, and the design of spaces and places are a few key factors that have demonstrated a good solution. As we can see in this study's analysis 1, the physical characteristics of Lørenskog station, which have a clear design and infrastructure geared toward safe and accessible parking, have been shown to have an impact on the general attitudes gleaned from the survey. The material is a fundamental requirement that must be in place in order to enhance the meanings, which in turn improve and enhance the connections between the utility cycling practice and the stations.

Most people have encountered a cyclist while driving their own car, and since many people have "horror" stories about stubborn cyclists in traffic, the high percentage of car ownership may be a contributing factor to the negative attitudes people have toward cyclists. This gives the majority of the population a negative image of the cyclist, and this in turn constructs a general attitude that may not reflect reality.

The governing and local cycling policies in illustrates that the there is lack of a good intention when formulation overall plans to increase the cycle share, there seems to be an absence of implementation of measures. The prioritization of the measures get lost along the way.

In the efforts to promote and normalize cycling, newer perspectives such as so-called Social Practice Theory can be particularly relevant because it seeks to incorporate both material structure and contexts of meaning in order to understand how social practices - such as cycling - can be understood and changed.

### 7.3 Competencies of Practice theory

The third element of practice theory is the competencies the travelers have containing the practice of bicycling. A change in materiality enhancement changes the required competencies and makes cycling accessible for people with less physical abilities. With the different competencies the travelers have different expertise and knowledge regarding bicycle infrastructure, bicycle safety and bicycle culture.

Knowing the locations of fast, convenient, and safe bicycle paths is essential. As there are few signs that are a part of a larger national route system, one must have a personal interest in finding the best cycle paths. The readability of where one can cycle as a novice cyclist can be challenging, and this in turn can affect the effectiveness of the mode, when it's hard to understand where to cycle when a cycle path abruptly ends.

Additionally, when choosing a mode of transportation, it is essential to have the knowledge of where and how to park at various locations. The cycle parking available at the different stations varies. The survey found that there was a lot of knowledge about these topics, but this could be because the station is well known to travelers, which raises the question of how it would be in a new location.

Childhood is when most people learn the majority of their cycling knowledge. The fundamental skills of traffic rule knowledge and traffic navigation lay the groundwork for practice-related safety. Cycling as a child and meaning, safety, as in regard to the safety, and knowledge learned at a young age, as described in Chapter 1.2 *The Norwegian cyclist*, the biggest safety issues are the lack of maintenance of the infrastructure. The low level of accidents involving other traffic groups may be due to the knowledge learned at a young age, and well known from the primary school age. However, because of the lack of infrastructure, the cyclist is forced to be a menace of traffic because one has to change positions and make fast decisions to make the cycling trip as efficient as possible.

*Although the travelers are confident in their cycling skills, they are also unaware of the effects that cycling has on them. The information gathered indicates that a significant portion of travelers own bicycles, despite riding them infrequently. Even though cycling is a practice that requires high levels of competency, there cannot be improvement in cycling practice without the interconnection of competencies, materials, and meaning.*

Throughout this chapter we have described the cyclist as a *menace* cyclist. This is due to the historical and cultural attitudes towards the typical Norwegian cyclist. However, looking at them through the competency lens, we can see that there requires a lot of important knowledge and skills to maneuver through a unhospitable urban environment. This can seem daunting for the un-experienced, and therefore be a barrier.

#### 7.4 The interconnectedness of the three elements

Practice theory has significant utility as a model of social life making it possible to understand practices as utility bicycling. There has been a low modal share of utility bicycling in Norway despite the efforts and goals of increasing the amount of bicyclist to 16% of all travelers (Sørensen et al., 2013) There is an integral need to understand the factors that encourage or hinders the increment of utility bicycling. The application of practice theory was useful in understanding the interconnectedness of the three elements and how that shapes the practice of utility bicycling

To change a practice in relation to Shove's three elements, one can either strengthen or weaken the links that connect them. A sense of safety and security can be reinforced by providing bicycle lanes and other infrastructure (materiality) that is visibly separated from traffic, which furthers the idea that cycling is a healthy and environmentally friendly activity. This might then inspire more people to develop the skills necessary for cycling safely and confidently. In order to challenge or modify the practice, it is necessary to weaken the ties between materiality, meaning, and competence. For example, introducing a congestion charge for cars (materiality) may lead to a shift in the meaning of transportation, making cycling and public transportation more attractive alternatives. This may encourage more people to acquire the competence needed to cycle or use public transportation effectively.

The three components can be linked together or dissociated from one another to challenge current practices, alter them, and develop new, more sustainable ones. However, to do this effectively, one must have a thorough understanding of the relationships between the components and how environmental, social, and economic factors influence them. To ensure that changes are effective and inclusive, it also calls for cooperation between various stakeholders, including policymakers, members of the community. It is important to note that changing a practice like utility cycling will require a multi-faceted approach that takes into

account local context, cultural values, and individual preferences. It will also require sustained effort and collaboration between different stakeholders, including policymakers, community members, and advocacy groups. By understanding the three elements of Shove's practice theory and working to address each of them, it is possible to create a more supportive environment for utility cycling and encourage more people to adopt this practice.

For a practice like utility cycling to change, it is crucial to consider the three elements of Shove's practice theory and how they interact. The three components are interconnected and mutually supportive in ways that support specific practices, according to Shove's practice theory. Making or breaking these links can have a significant impact on how practices are performed and sustained over time.

Chapter

8



Conclusion

## 8. Conclusion

As is well known, the national goal to increase the cycling share from five to eight per cent by 2023, which presupposes that the cycling share in the larger cities increases to 15-20 per cent. As also discovered in this thesis there is still a long way to go to reach this goal and be on heights with other established cycling cities like Copenhagen with a share at close to 40 %. Providing a new view to this challenge, through the social practice lens, we mapped out how travelers' behaviors and attitudes are towards the practice of cycling and what factors improve practices of cycling to train stations.

As we have seen through the analysis at the stations, there is massive agreement that it is the material such as the bicycling infrastructure, the facilities, the bicycle paths, and other areas reserved for the bicycle and cyclists, that can increase the number of bicycles. These components alone are not sufficient in order to increase utility bicycle use.

In the efforts to promote and normalize cycling, Social Practice Theory is relevant because it seeks to incorporate both *materials*, *meanings*, and *competencies* in order to understand how social practices can be understood and changed. Rather than focusing on individual attitudes or characteristics on the one hand or equipment and infrastructure on the other, it is the interconnectedness between these elements that creates a practice. And it is the practice that becomes the unit of analysis, while travelers appear as bearers of the practice (As described through chapter 3.2).

For cycling as a social practice, the material element will consist of both the cycling infrastructure and the equipment, while what we otherwise call 'cycling culture' will include both the meaning element and competence element, basic cycling skills and handling of norms and rules and interaction in traffic. As found there doesn't seem to be a challenge with the know-how in regard to cycling, however travelers' competencies seem to be challenged when it comes to traversing the different and incoherent infrastructure available, making for what we have termed as a menace cyclist. This in turn have a strong effect on the meanings that one has to be a fit, fast and strong cyclist, meaning it is not viewed at as a mode for all.

In order to achieve this scale-up and bring out a large enough critical mass of cyclists, many will advocate that it is first and foremost cycling culture that needs to change – our norms, attitudes and values related to cycling. We must get cycling from belonging almost to a niche culture to becoming a mass culture. Additionally, there must be acquired knowledge surrounding, first and foremost, efficiency to be more adapted to peoples' everyday life. In addition to the overall benefits for society which include cycling being environmentally friendly, economical, and beneficial for health on the national scale.

For a practice like utility cycling to change, the three elements of Social practice theory should be interconnected and mutually supportive in ways that support specific practices, Making or breaking these connections can have a significant impact on how practices are performed and sustained over time.



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