

**Factors affecting the willingness to use car sharing  
service: A case study of Stavanger.**

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A case study of Stavanger.**

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*Stavanger, 15 July 2020*

Quyen Nguyen

# Abstract

Car sharing, an emerging phenomenal innovation, has received increasing attention from both academia and business in recent decades. While car sharing is considered a potential lever for the shift towards sustainable mobility, it often encounters barriers stemming from local contexts, and the lack of consumer willingness to participate in the scheme. In Stavanger, car sharing was first adopted more than ten years ago, and it remains a niche market even today. The municipality has recently been endeavoring to integrate car sharing practice into their complex of sustainable modes of transportation in climate and environmental action plans. However, there is a lack of empirical study focusing on the local factors affecting the car sharing development in Stavanger.

This thesis aims at investigating the factors influencing the willingness to adopt car sharing service in the context of Stavanger. The analysis uses the Motivation – Opportunity – Ability – Behavior framework and the data from ten in-depth interviews with customers and representatives from two companies, Bilkollektivet and Kolumbus. This case study shows that customers have relatively incomplete knowledge of car sharing, especially regarding the core meaning, operation, insurance policy, and liability. Based on the reported transportation habit, car sharing is the missing complementary choice to public transport and soft travel alternative. Noticeably, the environment incentive tends to have a weak influence on the target customer's motivation to join the scheme. Some external elements such as public transportation drawbacks, dispersed city planning, and high level of car ownership also hinder the car sharing practice.

The contributions of this thesis as an explorative research are threefold: providing an understanding of the internal and external factors impacting consumer's decision-making in term of becoming a car sharing user; making way for further empirical studies on car sharing user behavior; and giving recommendations for local providers to improve the expansion and retention of their customer base.

*Keywords: car sharing, sustainable transportation, sustainable mobility, collaborative consumption, sharing economy, customer behavior.*

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# Concept

<b>Abbreviation</b>	<b>Description</b>
<b>CS</b>	Car sharing
<b>EU</b>	European Union
<b>SDGs</b>	Sustainable Development Goals
<b>VMT</b>	Vehicle miles travelled
<b>VKT</b>	Vehicle km travelled
<b>GHG</b>	Greenhouse gas
<b>P2P</b>	Peer-to-peer
<b>B2B</b>	Business-to-business
<b>B2C</b>	Business-to-consumer
<b>SUMC</b>	Shared Use Mobility Center
<b>ICT</b>	Information and communications technology
<b>TØI</b>	Institution of Transportation (Transportøkonomisk institutt)
<b>MOAB</b>	Motivation – Opportunity – Ability – Behavior (model)

# Chapter 1: Introduction

Chapter 1 explains the research area, topic and the researcher's motivation to study car sharing with a case study in Stavanger. This section will be concluded with an outline of the remaining chapters of this thesis.

## 1.1 Problem statement

There is an urgent need for actions towards sustainable mobility (or sustainable transportation). Due to population growth, urban travel patterns are causing traffic congestion, air pollution, and vehicle-related accidents. The global number of vehicles on the road is expected to double by 2050, as reported by the World bank (Mohieldin & Vandycke, 2017). The increasing number of automobiles on the road brings out the externalities including the carbon footprint generated by vehicle manufacturing, fuel production greenhouse gas emissions, and road crashes. Every year, 1.24 million people die in road accidents, 3.5 million people die prematurely due to outdoor pollution including from transport sources, 23% of energy-related greenhouse gas emissions come from transport; and traffic congestion is a significant burden on the economy (currently accounting for 2% of GDP in Europe) (Geels, 2002).

It is undeniable that transportation has been the toughest sector to cut down emissions (Marsden & Rye, 2010). Governments all over the world have been endeavoring but failing to cut down travel demand and limit vehicles on the road, especially in metropolitans. Transport today accounts for a quarter of EU's greenhouse gas emissions, and this number continues to go up as demand grows. The European Green Deal has an ambition of a 90% reduction in these emissions by 2050 (Smith, 2016).

Sustainable transport drives sustainable development. In a report contributing to the first-ever United Nations Global Sustainable Transport Conference in 2016, the former United Nations Secretary-General, Ban Ki-moon emphasized:

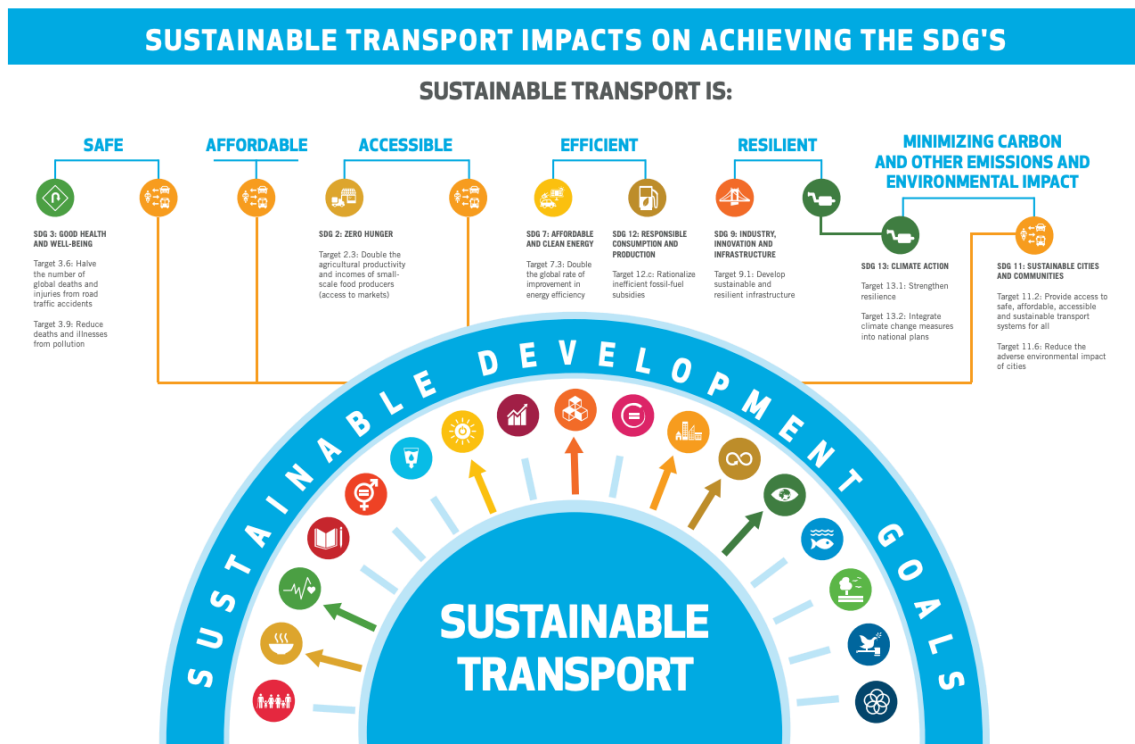
*“Sustainable transport is fundamental to progress in realizing the promise of the 2030 Agenda for Sustainable Development and in achieving the 17 Sustainable Development Goals. Sustainable transport supports inclusive growth, job creation,*

*poverty reduction, access to markets, the empowerment of women, and the wellbeing of persons with disabilities and other vulnerable groups. It is also essential to our efforts to fight climate change, reduce air pollution and improve road safety.”*

(United Nation, 2016).

Sustainable mobility strategy mainly aims at reducing car usage by, for instance, limiting trips or applying different modes of transport. And it is directly linked to urban planning. Banister (2008) argued that the sustainable mobility strategy requires actions to reduce the need to travel by car including fewer trips, shifting modal, cutting down trip lengths, and inspiring greater efficiency in the transport system. Figure 1 summarizes the impacts of sustainable transport in order to obtain the Sustainable Development Goals (SDGs) of the United Nations.

**Figure 1: Impacts of sustainable transport on achieving the SDGs**



Source: United Nations (2016)

Experts across multiple sectors have called for a transition to a more sustainable mobility system. However, there are certain impediments such as automobile dependency, the hesitance of policymakers and business leaders. According to Geels (2002), stakeholders in the automobile industry, for instance, have been preoccupied with market saturation and cost-minimization over the past decades and not prioritized climate change at a level that could have motivated the innovations contributing to a low-carbon transition. The current industry attempts to provide greener alternatives are seemingly more encouraged by hedging or reputation strategy than environmental benefits.

*In Norway*, there are approximately 2.8 million private cars registered in 2019, of which 260,692 cars are electric (Statistics Norway, 2020). The country has been leading the world with its record share of electric cars. Figure 2 shows some major steps and goals of the government on climate.

**Figure 2: Summary of Norway’s pledges and targets on climate actions**

<b>NORWAY</b>		Summary of pledges and targets
<b>PARIS AGREEMENT</b>	Ratified	Yes
	2030 unconditional target(s)	40% below 1990 by 2030 [44% below 2010 by 2030]
	2030 conditional target(s)	Carbon neutrality
	Condition(s)	As part of an ambitious global climate agreement where other developed nations also undertake ambitious commitments, Norway will adopt a binding goal of carbon neutrality no later than in 2030
<b>COPENHAGEN ACCORD</b>	2020 target(s)	30–40% below 1990 by 2020
	Condition(s)	Global and comprehensive agreement after 2012, with major emitting Parties agreeing on reductions in line with achieving the 2 degrees Celsius target
<b>KYOTO PROTOCOL (KP)</b>	Member of KP CP1 (2008–2012)	Yes
	Member of KP CP2 (2013–2020)	Yes
	KP CP1 target (below base year)	1% above 1990
	KP CP2 target (below base year)	16% below 1990
<b>LONG-TERM GOAL(S)</b>	Long-term goal(s)	Low carbon society by 2050 (under discussion) Reduction in GHG emissions by 80–95% from 1990 reference

*Source: Climateactiontracker (2019)*

The Norwegian government has a relatively powerful climate policy tool at its hand due to the substantial purchase tax imposed on new passenger cars. The Norwegian Parliament has recently also carried out a motion for all Norwegian city regions to restrain all private car usage growth and focus more on pedestrians, cyclists, and public transports (Müller-Eie, 2018). The government has also introduced a competition for all cities and counties to think smart and integrate technological development to improve public transport (Olsen, 2018). However, sustainable mobility has remained a tough challenge for Norway. Stavanger city's path to sustainable mobility and greenhouse gas emissions statement will be elaborated later in chapter 2.

### ***Why car sharing?***

Information and Communication Technological innovations have given rise to the sharing economy, making transport on-demand systems more viable and attractive. As an emerging innovative phenomenon, car sharing plays an important role in the process of shifting to more sustainable mobility. Specifically, car sharing holds the potential to change the mobility system at its core – private vehicle ownership. There is no lack of empirical evidence in academic literature with respect to the impacts of car sharing in reducing the vehicle ownership, and then cutting down the vehicle miles travelled/ Vehicle km travelled (VMT/ VKT), and greenhouse gas (GHG) emissions, which will be provided later.

However, while it has been adopted in Stavanger for the past two decades, car sharing is still not as prevalent as expected, given its potential benefits. Much of what we know about the emergence of car sharing in Norway comes from case studies in Oslo. We cannot assume that the car sharing growth in Stavanger will be in the same direction as in Oslo. For the policymakers and enterprises, there is a gap in studies focusing on car sharing market potential in Stavanger, and especially customer behavior, which is fundamental data for spreading its adoption in the region. Note that the main focus of this thesis is customer's perspectives and willingness to join car sharing programs than the nature or impacts of car sharing.

## **1.2 Research question**

The main objective of this thesis is to provide empirical evidence of customer's insight on car sharing in Stavanger and their willingness to join this scheme by conducting in-depth interviews with 8 consumers and 2 companies. It is worth mentioning that the data collected from this thesis is far from a measurement factor of the potential of the car sharing market in Stavanger. Within the thesis's scope, it is more to the anatomy of customer insight, focusing on in-depth analysis to explain their decision. The thesis might provide interesting and useful data for the local authorities and the car sharing providers to spread this practice in the future. Therefore, the main research question is stated:

### **What are the factors that influence the willingness to use car sharing service in Stavanger?**

Also, there are some addressed sub-research questions, which are:

- What is the customer's perception of car sharing in Stavanger? To what extent are they aware of its benefits and operation within the city?
- How do the customers want to be approached and convinced to use a car sharing service?
- What are the potential barriers to car sharing development in Stavanger?

## **1.3 Thesis outline**

The thesis continues as follows. Chapter 2 provides in-depth background information about car sharing including definition, classification, potential benefits, the history of this practice in Norway, and Stavanger city's roadmap to sustainable transportation and greenhouse gas emissions. Chapter 3 introduces a literature review of existing studies on car sharing users, followed by chapter 4 that discussed the theoretical framework of this thesis. Chapter 5 explains the methodological choice, along with the data collecting and processing process. Chapter 6 presents an analysis of the data collected. The researcher then will discuss and give a conclusion of the results in Chapters 7 and 8, respectively.

## Chapter 2: Background

In this chapter, the researcher will provide an overview of car sharing including definition, classification, emergence in Norway, potential benefits at three levels, and last but not least, the potential of expanding car sharing market in Stavanger. The section aims to explain why car sharing is beneficial and has the potential to be developed to a greater extent. These background data are also helpful to later analysis and discussion.

### 2.1 The sharing economy

Sharing is not a new phenomenon among humanity. Upon living in communities or unions, we people already shared our goods with families, friends, and fellows. Due to the explosion of the Internet, certain new business models have enabled consumers to borrow or lend goods from strangers with significantly decreased transaction costs (Frenken & Schor, 2017).

Among the academics and the public alike, there are currently diverse definitions of the sharing economy; therefore, it is challenging to concur a single, comprehensive definition. This field of study is controversial with “*normative, empirical, and conceptual contestation about its scope and impacts*” (Acquier, Carbone, & Massé, 2019). The sharing economy bestrides various boundaries including marketing, consumer behavior, sociology, geography, management, anthropology, innovation, and law (Acquier, Daudigeos, & Pinkse, 2017). Additionally, one of the reasons for this is the hasty development of this area (Hawlitschek et al., 2016).

Also, the definition is frequently used as an umbrella terminology for a broad spectrum of services, activities and businesses (Hamari, Sjöklint, & Ukkonen, 2016). (Acquier et al., 2017) classified existing studies into narrow and broad definitions of the sharing economy, with respect to their broadness. Table 1 summarizes several highlighted definitions collected from existing literature.



**Table 1: Some definitions of “sharing economy”**

<b>Author (year)</b>	<b>Definitions</b>
Benkler (2004)	Refers to “sharing goods” as “ <i>a class of resources or goods that are amenable to being shared within social sharing systems rather than allocated through markets</i> ” (p.356). Social sharing also constitutes an “ <i>alternative modality of production</i> ” (p.330) based on gifting and free participation among “ <i>weakly connected participants</i> ” (p.332–334).
Cockayne (2016)	“ <i>The on-demand or ‘sharing’ economy is a term that describes digital platforms that connect consumers to a service or commodity through the use of a mobile application or website</i> ” (p. 73)
Eckhardt & Bardhi (2016)	“ <i>The access economy, [...] also known as the sharing, or peer-to-peer, economy, [...] provides temporary access to consumption resources for a fee or for free without a transfer of ownership</i> ” (p. 210)
Muñoz & Cohen (2017)	“ <i>A socio-economic system enabling an intermediated set of exchanges of goods and services between individuals and organizations which aim to increase efficiency and optimization of sub-utilized resources in society.</i> ”

*Source: Own illustration*

## 2.2 Car sharing

### 2.2.1 Definition

One of the first car sharing practices can be traced back to the 1940s with a cooperative known as Sefage (Selbstfahrgemeinschaft) in Zurich, Switzerland. This early adoption of car sharing was motivated mostly by economic benefits. People that could not afford the ownership of a car can use shared ones. The concept, however, did not become prevalent until the early 1990s (S. A. Shaheen & Cohen, 2007). Today, car sharing is undoubtedly an international phenomenon that has been growing all over the world.

As an example for a broad definition of car sharing, Frenken (2013) argued that car sharing was “*a system that allows people to rent locally available cars at any time and for any duration*”. In this thesis, to clarify, car sharing refers to the scenarios where various users are granted access to cars provided by professional suppliers or mediators. Therefore, the researcher finds the below definition of car sharing by the State of Washington is the most precise and comprehensive:

*“A membership program intended to offer an alternative to car ownership under which persons or entities that become members are permitted to use vehicles from a fleet on an hourly basis.”* (Washington State Legislature, 2015)

*“The principle of carsharing is simple: individuals gain the benefit of private cars without the costs and responsibilities of ownership”* (Susan Shaheen, Sperling, & Wagner, 1998). The idea of private access without bearing the responsibilities and costs of ownership can be referred to many forms of car use, namely car sharing, carpooling, ridesharing, ride sourcing, or car clubs. Moreover, these terms “car sharing”, “carpooling”, and “car clubs” are not mutually exclusive, and under certain conditions, they are the same depending on the geographic context (C. George & Julsrud, 2018).

Meanwhile, there is potential confusion between car sharing and some other terms. When it comes to the automobiles used by multiple users, it is necessary to distinguish car sharing and ride sourcing, ride sharing. For the automobile’s access without ownership, car sharing is different from car leasing and car rental. Table 2 shows all these

distinctions. Besides, this thesis focuses mainly on formal and organized car sharing, rather than informal or private car sharing. By saying that, the research will not examine the forms of private car sharing such as co-owning automobiles between friends or family, borrowing cars occasionally from their own network, and hitchhiking or giving a lift.

**Table 2: Clarification of terminologies related to car sharing**

<b>Aspect</b>	<b>Terminology</b>	<b>Definition to distinguish</b>
Automobiles used by multiple users	Car sharing	<i>“A service that provides members with access to an automobile for short term – usually hourly – use.”</i> (Shared Use Mobility Center (SUMC), 2018)
	Ride sourcing	<i>“Platforms to connect passengers with drivers who use personal, non-commercial vehicles.”</i> (SUMC, 2018)
	Ride sharing	<i>“Adding additional passengers to a pre-existing trip... unlike ride sourcing, ride sharing drivers are not ‘for-hire’”.</i> (SUMC, 2018)
Automobiles’ access without ownership	Car leasing	An agreement that is normally valid in years and grant exclusive access and temporary ownership to a specific renter, not multiple users.
	Traditional car rental	A form of business that allows users to access an automobile in a short term, but typically on a daily basis. It is not common that users can access the same car in one day and are usually required to pick up the car at the providers’ parking lot instead of nearby platforms as car sharing.

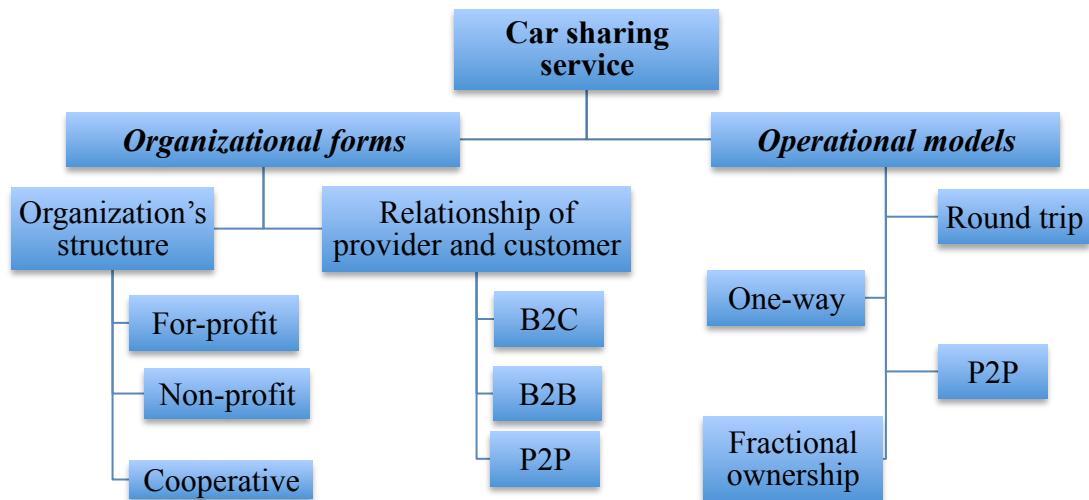
*Source: Own illustration*

Various studies agree on the locations where car sharing adoption can be successful. Car sharing is most prevalent in major urban areas where transportation alternatives to the private car are widely available ( Shaheen & Cohen, 2007). Then users can access specific vehicles by purchasing membership of an organization that owns a fleet of automobiles in a network of locations. In other words, car sharing is a complement to the alternatives to private cars. Therefore, it only makes sense that car sharing works well in metropolitan areas with a relatively high population density, good pedestrian infrastructure, and low vehicle ownership rates such as university campuses (Millard-Ball, 2005).

### 2.2.2 Models of car sharing

There exist different criteria to classify types of car sharing models, mainly based on the business model and operational model. Figure 3 summarizes the classifications of car sharing services that the researcher would explain hereafter.

**Figure 3: Classification of car sharing service**



*Source: Own illustration*

#### ***Organizational structure***

Millard-Ball et al. (2005) distinguished three main types of organizational forms of car sharing service providers, which are for-profit, non-profit and cooperative. This distinction is related to the source of capital and funding. For-profit firms are known to have access to

venture capital and various sources of start-up funding. Non-profit providers are popular among the public sector with government funding with tax-exempt interest. Meanwhile, cooperatives tend to rely mainly on their partners to contribute capital. In fact, one provider can adopt both forms. An example is Bilkollektivet in Norway, a member-owned cooperative and a non-profit entity as the profit is re-invested into the company's operation.

Some differences among these types of organizational models are also addressed. With the incentive for profit maximization, for-profit structure might not be the ideal model to aim at the environmental goals, but to expand the market share. For cooperatives and non-profit operators, it seems more natural to gain the public's trust and support regarding environment-friendly operation (Brook, 2004). However, some can argue that for-profit models still work in achieving that objective by expanding to a certain level of scales.

Furthermore, the relationship between the supplier and customer can also be a criterion to classify different types of car sharing services into three main categories, namely business-to-consumer (B2C), business-to-business (B2B) and peer-to-peer (P2P) services. The P2P model is considered as "AirBnB of car sharing service" providing the advanced technology platform that enables users to rent a car from their neighborhood. It is worth mentioning that some firms can be a mix of more than one type, for instance, a combination of B2C and B2B services.

### ***Operational models***

Another dimension to differentiate various types of car sharing services is the sharing scheme, i.e. how the vehicles are used. Martin and Shaheen (2016) categorized four different operational models of car sharing service, which are: round trip, one-way, peer-to-peer (P2P), and fractional ownership.

- ***Round trip service, also called station-based services***: This is the oldest form of car sharing service and accounts for a significant percentage in empirical research journals. Users need to pick up and drop off the cars at the same agreed location. Round trip car sharing service are common in mixed-use, residential urban areas (Shaheen & Cohen, 2013, p.14).

- **One-way service:** According to Shaheen and Micheaux (2015), one-way car sharing today can be a “free-floating” or “station-based” service. Free-floating car sharing services allow customers to pick up and return the cars anywhere within a predetermined operating area. Car2go in Germany was the first provider to adopt free-floating car sharing service in October 2008. Station-based systems, on the contrary, request customers to drop off the cars to any among their designated stations, which is less flexible but helpful in limiting car searching and allocating to specific locations. Also, one-way service is enabled by information and communications technology (ICT) advances such as smartphones and GPS systems (S. A. Shaheen, Chan, & Micheaux, 2015).

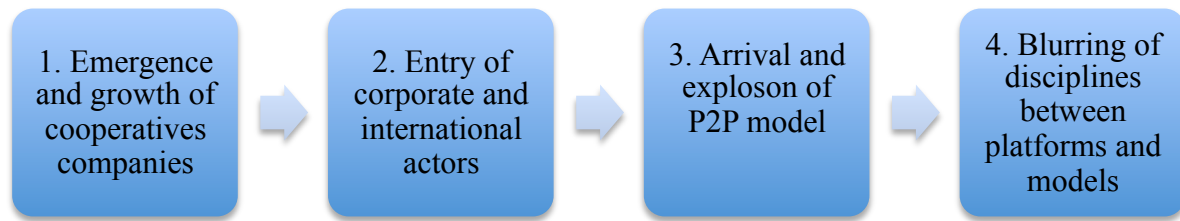
- **Peer-to-peer service:** Technological innovations also lay the foundation for P2P car sharing. The properties of P2P provide criteria for both organizational and operational differentiation. ( Shaheen & Stocker, 2015) categorized P2P service models into three sub-categories: *hybrid P2P traditional car*, *traditional P2P car sharing*, and *P2P marketplace*. Briefly, in the hybrid P2P model, the car sharing provider expands its car fleet with privately owned vehicles to avoid owning the whole fleet. Traditional P2P car sharing facilitates a platform for individual car owners to rent out their cars on a short-term basis and earn money from a share of rental fee. P2P marketplace works in similar way of P2P car sharing, but under the condition that the terms such as price, drop-off point, and conflict are settled privately.

- **Fractional ownership, or fractional leasing:** This is the lasted and least common type of car sharing service. In some studies, fractional ownership is grouped together with P2P car sharing to create a broader category of personal vehicle sharing. In Norway, the first fractional ownership or shared lease car sharing platform called Hayk was launched at Oslo in 2018 and now owns two vehicles leased by members of housing cooperatives (C. George & Julsrud, 2018).

### **2.2.3 The history of car sharing development in Norway**

Over the past two decades, car sharing has been growing in Norway, mainly in mainstream cities. The development of car sharing in the country can be described in four stages as shown in Figure 4.

**Figure 4: Four stages of car sharing's development in Norway**



*Source: Adapted from (C. George & Julsrud, 2018)*

The beginning years of the history of car sharing in Norway can be called the cooperative period. Bilkollektivet, the first formal car sharing service provider of the country, was founded in 1995 in Oslo (the capital and largest city). The name says it all, “Bilkollektivet” means “the car collective”, and the company was a member-owned cooperative. In 1996, Bildelingen and Trondheim Bilkollektivet, two similar-nature organizations, were established in Bergen and Trondheim respectively. The majority of market share was the group of users who wanted access to cars without private ownership. A minor part of the car sharing target customers was government agencies granting employees access to car usage when necessary instead of investing and maintain their own fleet of company cars. As expected, the car sharing stations were mainly located in central areas with high population and business density to endure a sufficient customer base (C. George & Julsrud, 2018).

Thereafter, new cooperate and international companies joined the market. In 2004, the fourth car sharing service supplier called Oslo bilpool entered the market. The participation of a private company marked a milestone in history of car sharing Norway, dominated by user-driven cooperatives for the past decade. Next, the global car rental company Hertz acquired Oslo bilpool in 2010 and renamed the firm to Hertz bilpool. Up to 2018, the company owned more than 150 vehicles, most of which were allocated in Oslo metropolitan neighborhood. Another highlighted trend of this period was the allocation of Hertz bilpool in the parking lot of large shopping centers around Ålesund, Stavanger, Tromsø and Hamar. The second for-profit car sharing firm, namely Move

About, started its business on Oslo center around 2018 with an impressed and unique selling point being a fleet of 100 percent battery electric vehicles. Additionally, Move About is the pioneering provider in approaching corporate client rather than individual customer. The exclusive corporate car sharing contracts constituted 80 percent of the firm's revenue (C. George & Julsrud, 2018).

George and Julsrud (2018) argued that the car sharing market marked the arrival and blooming of P2P models in 2015. Two new for-profit players Nabobil and GoMore provided Norway's first large scale formal P2P platforms, where users can search and rent vehicles from other members on a short-term basis. These two authors also stressed that firms like Nabobil and GoMore should be considered as facilitators of car sharing platform rather than service providers, and the individual owner of the vehicle was technically the provider in this case. In comparison to B2C and B2B models, P2P car sharing platforms reply to a way higher degree on technological innovations, specifically the application of smartphones and Internet access.

After the blooming of P2P car sharing platforms, the market has been observing further innovations and changes in both technology and organizational structure. In term of technological innovation, recently there has been a trend in car sharing market called "uten nøkkel" which means "without key". This function was first introduced by Nabobil allowing users to unlock the car only by using Nabobil smartphone app instead of picking up physical car key. Up to now, among the fleet of 7500 cars all over the country, Nabobil has attracted and set up 650 keyless cars in Oslo and Bergen (Nabobil, 2020).

George and Julsrud (2018) also demonstrated the signs of blurring boundaries of business model and organizational structure. For instance, P2P platforms like Nabobil and Gomore can encourage another third party to join their operation by using the app and supply the vehicles, which is close to B2C model with a broker (P2P platform). Another noteworthy example is the arrival of Avis to the market, as a result of the partnership between Avis budget group, one of the world largest car rental operators, and OBOS, Norway's largest housing cooperative. Their service called Avis Now (and later *Avis selvbetjent billette* - self-service car rental) has blurred the dividing lines between commercial and cooperative entities as well as those between car sharing and car rental car services.



**Figure 5: Nabobil’s poster to introduce “uten nokkel” (keyless car) function**



*Source: Nabobil, 2017*

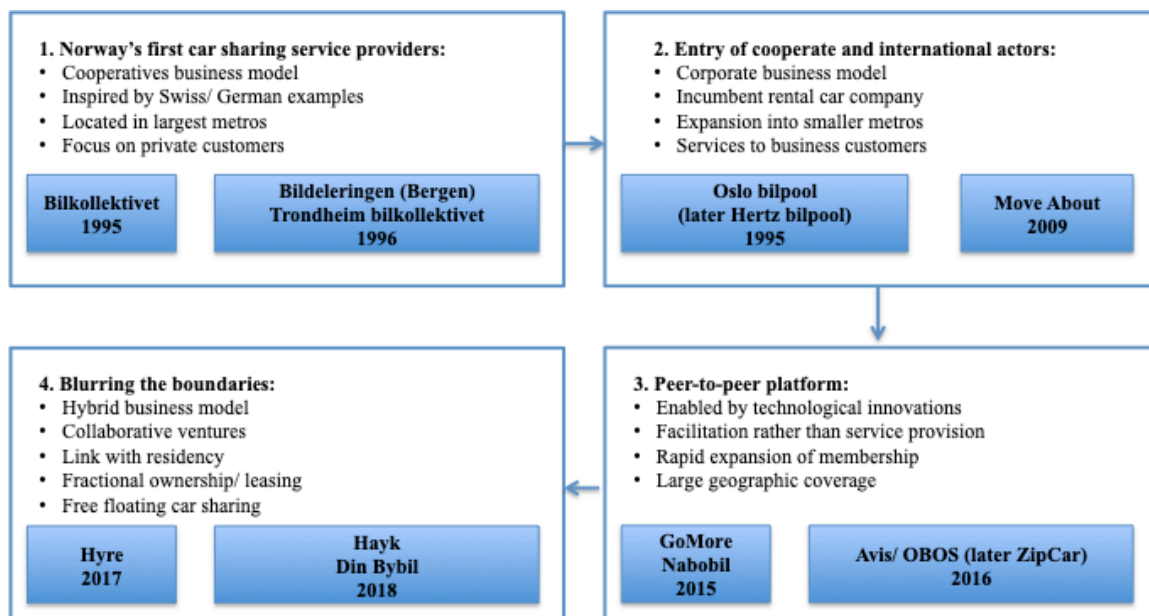
The competition in car sharing market became more vibrant with the entries of new players. In 2018, OBOS and Avis reorganized their partnership by re-launching their car sharing platform operated by Zipcar, one of the global largest car sharing companies. Then two additional startups joined the car sharing market, namely Hyre and Hayk. Hyre’s model is hybrid combining both P2P and B2P elements with over 400 cars in Oslo. All Hyre’s cars are accessible to all members through mobile app with membership verification using BankID, Norway’s leading electronic identification authentication platform (Hyre, 2020). Meanwhile, offering shared vehicles to residential cooperatives and condominiums, Hayk aims at facilitating ride sharing among neighbors, especially those commuting to work.

Within public sector, in late 2018, the Norwegian State Railways (formerly NBS) VY announced their collaboration with the Danish company GreenMobility to launch the first free-floating car sharing platform in the country. With the fleet of 250 electric cars in Oslo, this service, called Din Bybil, is claimed by VY as its attempt to invest in mobility and door-to-door services in the Nordic region (VY, 2020). In Rogaland, Kolumbus AS,

the public transportation administration and country agency, has been considering conducting a car sharing service as a subsidiary in their portfolio in Stavanger. One can take a step further to predict the new trend in car sharing market in Norwegian context, which is the participation of public actors and commonly in partnership with private cooperatives or for-profit companies.

To wrap up, according to statistics in 2018, 11 car sharing operators entered the Norwegian market and offered access of over 7,000 vehicles to more than 200,000 registered members (C. George & Julsrud, 2018). Figure 6 summarizes the big picture of the Norwegian car sharing sector from 1995 to 2018.

**Figure 6: Historical development of car sharing in Norway from 1995 to 2018**



*Source: Own illustration, adapted from (C. George & Julsrud, 2018)*

Furthermore, Table 3 provides an overview of primary car sharing operators in Norway up to now with their business model's information, approximate number of registered members and available vehicles. The data was collected from the companies' websites and existing studies.

**Table 3: An overview of car sharing service providers in Norway**

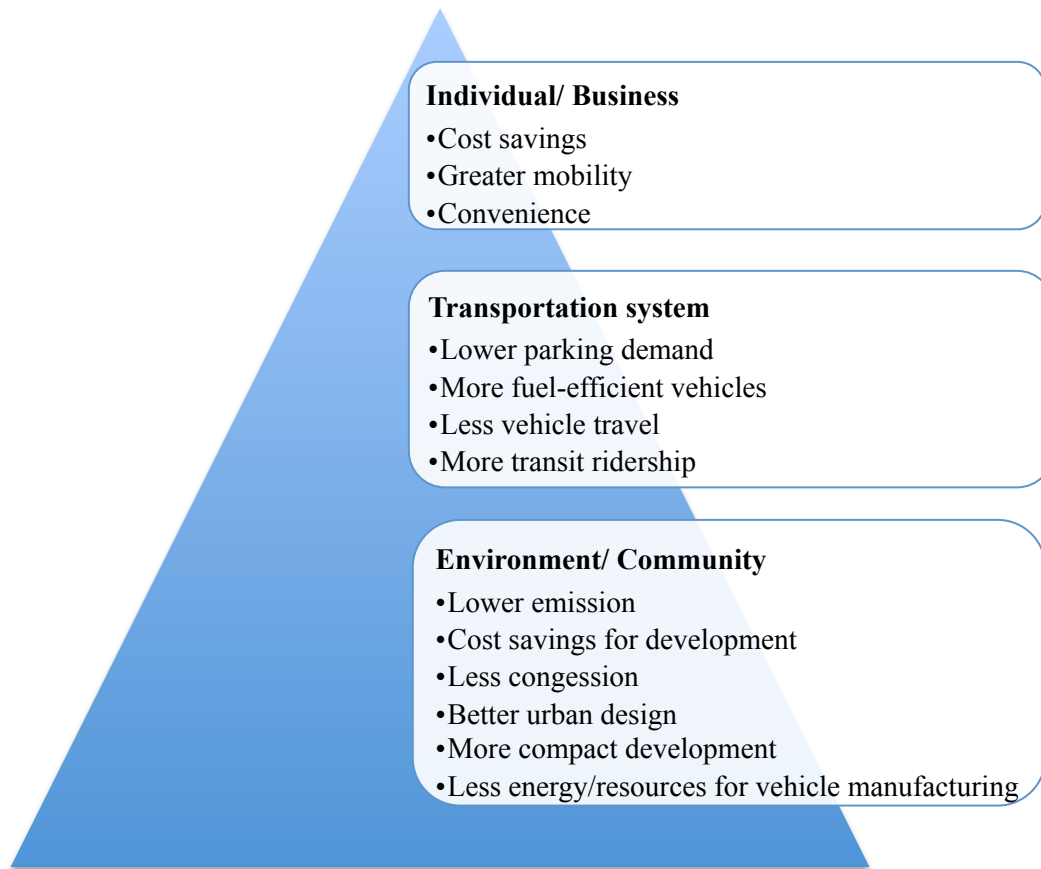
<b>Providers</b>	<b>Established year</b>	<b>Model (*)</b>	<b>Number of members</b>	<b>Number of vehicles</b>
Bilkollektivet	1995	Non-profit cooperative. B2B. Station-based.	8,000 (*)	400 (*)
Bildeleringen Bergen	1996	Cooperative. B2B. Station-based.	2,500 (**)	200 (**)
Trondheim bilkollektiv	1996	Cooperative. B2B. Station-based.	1,800 (*)	95 (*)
Hetz BilPool	2010 (2004)	B2B and B2C. Station- based.	10,000 (*)	180 (*)
Move About	2009	B2B and B2C. Station- based.	9,000 (*)	90 (*)
GoMore	2015	P2P. Ride sharing. Leasing arrangement. Station-based.	50,000 (*)	2008 (*)
Nabobil	2015	P2P. Station-based.	180,000 (*)	6,500 (*)
Zipcar	2016	Cooperation with OBOS. Station-based.	100 (*) 2 condominiums	15 (*)
Hyre	2017	B2C and P2P. Station- based.	10,000 (*)	400 (**)
Hayk	2017	Shared ownership. B2C. Station-based.	30 (*)	5 (*)
Din Bybil	2018	B2C. Free-floating.	-	250 (**)

*Source: Own illustration from various sources: (\*) (Johbraaten, 2019); (\*\*) data was collected from companies' websites, updated in Jun 2020.*

## 2.2.4 Potential effects of car sharing

The impacts of car sharing can be grouped in three categories: the individual, the transportation infrastructure, and the environment. Figure 7 demonstrates these three-layered benefits of car sharing. Further details of each category will be discussed hereinafter.

**Figure 7: Three-layered benefits of car sharing**



*Source: Own illustration, adapted from (Millard-Ball, 2005)*

**At the individual level**, car sharing service facilitates customer's greater mobility. Back to the mid-nineteenth century, when car was a luxury good and unaffordable to the majority, the first car sharing activities were constituted to simply gain the economic benefits of mobility without the cost of ownership (Susan Shaheen et al., 1998). Back then, car sharing enabled people without a car to go to different destinations, which paved the way for the benefit of greater mobility. Without the ownership, the fixed cost of owning a car

was turned to variable costs as we only pay when we need a car and can get rid of the unexpected costs such as maintenance, parking fee, etc. The costs of insurance and upkeep are among the most disliked attributes of private car ownership (Millard-Ball, 2005).

Many studies have identified the influence of car sharing on car ownership. Providing an overview of this impact on car ownership in North America, (Shaheen, Mallery, & Kingsley, 2012) argued that a range of 2.5 to 55% of the participants selling an owned vehicle and 7 to 70% of them avoided owning private cars. Accordingly, disowning a car does not necessarily mean less mobility, but rather improves mobility. The broad range of their findings was resulted from the outliers. For instance, the average of their 17 studies investigating respondents selling their car is 25%, with 10 studies only deviating 1% from the mean. Hence the effect of car sharing depends significantly on the location and execution.

Car sharing service operators, moreover, offer various choices upon the types of vehicles, allowing customers to have the flexibility to choose ones that best suits their demand for the trip. For instance, they can have a mini cooper to visit friends, a bigger car to go shopping at IKEA even with kids and rent a van to relocate or move to a new house.

To the scale of *transportation infrastructure*, the influence of car sharing can help lessen the growth of used cars and thus prevent congestion. In this thesis, the transportation infrastructure refers to all means of transportation an infrastructure used in travelling. The danger of congestion in the near future is alarming, when motorized mobility in cities has been estimated to double from 2015 to 2050 (OECD, 2017). This threatens citizen's mobility. Car sharing can contribute to resolve this by increasing cycling, walking and physical training usage (Millard-Ball, 2005).

Besides, decreased car ownership potentially leads to an increase in parking availability. This might also lead to lower demand for the parking lot, and as a result, allows different allocation for land especially in new development areas. Cars will be utilized more frequently, parking time in stationary or parking lot is better reduced. Some car sharing service operators provide their members with dedicated parking spaces, a feature considered as an attractive attribute (Millard-Ball, 2005). This help improves mobility

efficiency by releasing stress and avoiding time wasted on looking for a parking slot.

Car sharing is also frequently mentioned in multiple studies to help reduce congestion by decreasing car ownership and the number of cars present on the road. However, in real world cases, this advantage remains difficult to quantify.

To the *environmental level*, car sharing has a positive influence by cutting down the number of vehicle travelling, leading to lower emissions (Martin & Shaheen, 2016). Lower emissions result from less vehicle travel as well as the use of newer, fuel-efficient vehicles. Environment impacts of car sharing, in academia, are usually measured by determinants including:

- Vehicle holding at the household level;
- Vehicle miles travelled/ Vehicle km travelled (VMT/ VKT);
- Greenhouse gas (GHG) emissions; and
- Modal splits/ relationship between car sharing and other modes of mobility.

Among them, *vehicle holdings* and *VKT* are the most frequently used indicators. It is worth mentioning that even if car sharing can reduce VKT and related GHG emissions but fails to cut down the total number of vehicles used in society, then the carbon footprint of automobile usage and disposal would still remain. There are many other factors such as locations to be cautiously considered when it comes to the complicated relationship between vehicle holding and VKT (C. George & Julsrud, 2018).

*(i) Net VKT and induced demand:* In most studies, car sharing is commonly coupled with a decrease on VKT (Meijkamp, 1998)(Loose, 2010)(Martin, Shaheen, & Lidicker, 2010) (Nijland & van Meerkerk, 2017). On one hand, recent studies also tend to be on the same page with these findings. For example, a study of car sharing users conducted in Netherland by Nijland and van Meerkerk in 2017 reported a 15-20% decrease in kilometers for users than these numbers before adopting a car sharing service.

On the other hand, scholars also noticed that this impact of car sharing can be hard to measure due to two competing effects: reduced travel vs. induced travel. By offering

access to a car to users who did not previously own a car, car sharing service can induce travelling demand and increase the carbon emissions. However, these arising trips can offset reduced travel by the users who drop their private cars (Millard-Ball, 2005). In line with this argument, an evaluation of the STAR program in San Francisco demonstrated these two inverse impacts: vehicle holdings among members declined, yet overall car usage increased (Walb & Loudon, 1986). After 18 years, a similar study was carried out by Cervero and Tsai in same city reported a net increase of 19.5-54.3% in VKT among car sharing users as compared to non-users (Cervero, 2003). After all, it matters whether the users owned a private car before gaining the car sharing membership. Conducting a study on Philadelphia's car sharing program named PhillyCarShare, Lane (2005) found a gap between users who did or did not have access to a car before becoming a car sharing member. Accordingly, car sharing users tend to build up their VMT by approximately 48 kilometers per month. Meanwhile those who dropped their cars decreased their VMT by around 840 kilometers per month (Lane, 2005).

Briefly, it is still necessary to differentiate the car sharing users' vehicle holding status before and after joining the car sharing program. Reviewing previous literatures on the impact of car sharing, the researcher found that for the environmental impact to be net positive, the reduced travel impact must eventually outweigh the induced travel impact. It is suggested by (C. George & Julsrud, 2018) that these conditions should be satisfied: (i) the arising trips caused by induced travel demand should be lower than what their usage presumably would have been, had they owned an private automobile; and/ or (ii) the availability of car sharing is sufficient to offset a greater amount of VKT of former car owners.

**(ii) Reduced vehicle holdings:** Dealing with car sharing's impact on vehicle holdings, there is no absolute yes or no. However, several studies have been reporting a obviously positive impact of car sharing on the willingness to postpone a car purchase. The result of a discrete choice model, which was based on the data of Hangzhou "Fun Car-sharing" system (China), indicated that approximately 50% of respondents would delay their plan on car purchase after participating in car sharing (Hui, Wang, Sun, & Tang, 2019). Analyzing database of car sharing Portland, a small organization with 110 active members

and 9 vehicles, (Katzev, 1999) reported 26% of members dropping their private vehicle after one year becoming car sharing users and 53% of users postpone purchasing new vehicle.

There is also empirical evidence that the decrease in VKT tends to directly linked to vehicle holding, as in a study conducted by Cervero and Tsai (2004), 73.3% of San Francisco's City CarShare users reduced or delayed car ownership, as compared to 42.9% of non-users. (S. Shaheen & Stocker, 2015) carried out a study of car sharing among firms and identified around 2 out of 5 corporate members dropped or postponed private vehicle ownership after their membership of Zipcar. Similarly, Becker, Ciari and Axhausen (2018) found that 8% of free-floating car sharing users and 19% of station-based users in Switzerland would have purchased a car if the respective car sharing scheme did not exist.

To summarize the literature review on the environmental impact of car sharing, Table 13 (Appendix - section 3) gives an overview of relevant international studies in chronological order.

## **2.3 Overview of car sharing user**

Despite its phenomenal growth recently, car sharing remains a niche product. Meanwhile, car sharing is likely to hold certain potential to offer a far larger percentage of populations all over the world. Additionally, to obtain the adequate societal and environmental benefits of car sharing such as lessening GHG emission, pollution, and congestion, besides adopting newer and cleaner fueled cars, car sharing service businesses need to acquire a sufficient number of members. Therefore, getting to know target customers of car sharing service is fundamental in expanding and developing this market. This section reviews the relevant literature, and summaries the characteristics, demography, pattern of usage and car ownership of the car sharing users.

### **2.3.1 General characteristics and demography**

Although there have been no standard demographic indicators that apply to car sharing users across geographic contexts, many scholars do offer certain common patterns through surveys and empirical studies.



Many authors tend to agree that car sharing users are commonly more urban, affluent, well-educated and younger than the general consumers. Moreover, according to many studies, these users disproportionately come from the households that did not formerly own a private car. Specifically, Cervero and Tsai argued that San Francisco’s CityShare members were “*drawn disproportionately from professional-class residents who do not own cars and who live alone or in nontraditional households*” (2004).

According to Lane (2005), car sharing users do not seem to own private cars and are described to be highly educated and again disproportionately live in small or non-traditional households. In another dimension, car sharing is also connected to the environmental awareness and attempt to cut down the harms of automobile usage.

Environmental impacts inspired the majority of early car sharing adopters to a certain extent. As car sharing becomes popular, however, these environmental effects matter less and less to users than (Loose, 2010). This is not to say that users are no longer concerned about environmental benefits, but the most important attributes are convenience and affordability (Katzev, 1999; Lane, 2005). This point would be discussed in more details thereafter.

**Table 4: Literature’s general consensus on car sharing members’ characteristics**

<b>Characteristics</b>	<b>Typical patterns</b>	<b>Examples of studies</b>
Age	Between the ages of 25 and 45	Average age of car sharing members is mid-30s (Brook, 2004); Most of Philly's CarShare members are in their late 20s and 30s (Lane, 2005); Car sharing programs’ members are young households from 30-50 years old (Hope, 2001); The typical car-sharers in Germany and Netherlands is of medium age from 31-40 years old (Harms & Truffer, 1998); in Germany, Norway, Switzerland and Sweden are middle aged (Klintman, 1998).
Gender	Males are slightly more interested	Car sharing members are evenly divided as to gender (Brook, 2004);

		Car sharing users in Germany, Norway, Switzerland and Sweden are predominantly male (Klintman, 1998); There is a predominance of well-educated men in Norway (Berge, 1999).
Income	Upper middle class (but there are variations)	There is variation but 31% are in highest range (Robert, 2000); Incomes are nearer the median for all US car-sharing organizations (Brook, 2004); Users' income is higher than average in Gothenburg, Sweden (Polk, 2000); Meanwhile, in Germany, 20% are in low-income group; 18% belong to very high-income group (Harms & Truffer, 1998).
Education	High levels (college degrees)	Early adopters tend to have high level of education (Lane, 2005); American car sharing users are highly educated and most have a college degree (Brook, 2004); The typical car-sharers in Germany and Netherlands are well educated (Harms & Truffer, 1998); Users in Germany, Norway, Switzerland, and Sweden have higher than average formal education level (Klintman, 1998).
Household size	Smaller than average (1-2 persons)	Members are evenly divided as to marital status and home ownership (Brook, 2004); Users are generally young household (Hope, 2001); Typical user is from a small family with 1-2 persons (Harms & Truffer, 1998); Most members live in a rental apartment with a partner and/ or child (Polk, 2000).

*Source: Adapted from Millard-Ball (2005, chapter 3)*

***From previous research findings***, although conducted in different regions and contexts, some literatures have reached a consensus regarding the characteristics of car sharing

users. Table 4 demonstrates some common demographic norms of car sharing users in international literature.

Noticeably Millard-Ball (2005), based on his survey results, also classified a group of car sharing users who hold strong opinion on environmental and social concerns, with respect to the attitudinal dimension. Some examples of these groups are social activists, environment protectors, innovators, economizers, and not car status consumers.

*In Norway*, given the fact that car sharing has emerged since 1990s, the number of studies upon car sharing users remains limited. Those studies or reports were mainly conducted by researchers from the Institution of Transportation (Transportøkonomisk institutt –TØI) and are focused on the market of Oslo. The possible reasons might be that car sharing is mostly prevalent in the capital and in other cities; the database of users has been insufficient for further analysis. In term of the profile of car sharers in Norway, the researcher would like to employ a survey conducted by TØI in Oslo in 2018.

According to George & Julsrud (2018), a questionnaire was sent to total 3,130 users of three car sharing service providers including Nabobil, Bilkollektivet and Hertz bilpool. TØI's survey findings are basically in line with previous literatures on the profile of car-sharers with respect to age, income, gender and educational background. Especially, there is remarkable majority of male users using service offered by three providers. Interestingly, in the firms' customer base, members of Bilkollektivet and Hertz tend to be averagely older and have higher level of education than Nabobil's users. Besides, the modern P2P platform from Nabobil seems to attract younger group of customers, particularly 20% of its customer age being between 18-30 years old.

### **2.3.2 Pattern of use**

In 2004, carrying out a web-based survey along with focus group of 1,340 car sharing members in US and Canada, Millard-Ball (2005) examined their pattern and frequency of car sharing use, as reported in Table 5.

**Table 5: Survey findings on the pattern of car sharing use in US and Canada (2004)**

(\*) Multiple answers are permitted; therefore, percentage sum can be more than 100%.

Purpose	% Using car-sharing for this purpose		Frequency (trips per month)
	On any trip*	On last trip	
Recreation/ social	55.4%	16%	1.7
Other shopping	50.9%	16.8%	1.3
Grocery shopping	49.4%	16.2%	1.7
Personal business	44.5%	24.7%	1.6
Work-related	21.2%	12.2%	2.2
Unspecified/ other	9.5%	11.9%	2.2
To and from work	5.5%	2.1%	3.1

Sources: Millard-Ball (2005)

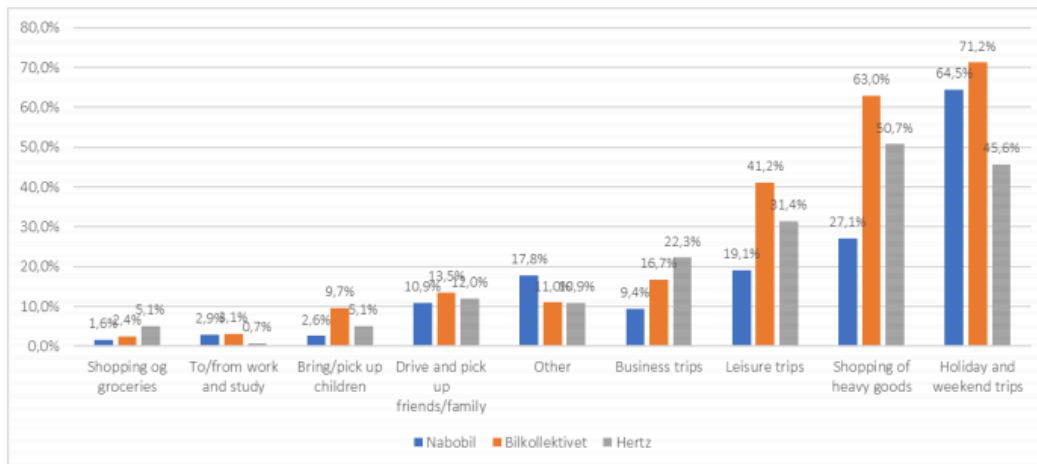
The findings of TØI's survey are reported in Table 6 (frequency of car sharing service use) and Figure 8 (the trips' purposes). To different type of car sharing models, the purpose of using car sharing service is similar, substantially for holiday and leisure trip, and also for shopping for heavy goods. It is obvious that car sharing service is not a habitual choice for everyday travel, both for the Norwegian and international users.

**Table 6: Frequency of use the last 6 months for users of Nabobil, Bilkollektivet, Hertz in Oslo, Norway (2018), percent.**

Company	More than once a week	More than once a month	Between 3-6 times	Less often
Nabobil	0.8%	4.9%	31.3%	63%
Bilkollektivet	4.9%	37.2%	37.3%	20.6%
Herzt	3.3%	23%	32.5%	41.2%
All	3.1%	22.7%	34.3%	39.9%

Source: Adapted from George & Julsrud (2018)

**Figure 8: Main purposes for using cars from Nabobil, Bilkollektivet, Hertz in Oslo, (2018), percent.**



*Source: George & Julsrud (2018). Note: Only members using the service more than 3 times in last 6 months are included.*

### 2.3.3 Car ownership and history

It is necessary to uncover the vehicle ownership of users to find out how car sharing impacts the household's number of vehicle as well as the level of driving and emissions. The survey of Millard-Ball (2005) in US and Canada reported that approximately 28% of the respondents lived in a household with an owned vehicle. Among 82.2% families with cars, the car-sharers were, at least some of the time, drivers of those cars. The author also discussed further on certain reasons why the respondents dislike the idea of owning private cars such as: cost of insurance and maintaining (38.3%), the troubles caused by car ownership (28.8%), high price of cars (15.9%), stress over parking locations and costs (9.2%), and some others (5.2%).

Particularly examining the Oslo region, TØI's survey data indicated that car sharing users tend to drop their private cars, but not always. Moreover, there is no remarkable difference of car sharing usage across three types of this service. However, of the three platforms, Bilkollektivet's customers seem to be more active and have less reliance on additional vehicles in their families.

## 2.4 Stavanger context for car sharing development

Stavanger is the administrative city of Rogaland county covering an area of approximately 71 square kilometers. With 136,138 residents (Statistics Norway, 2019), the municipality and the city is the fourth most populous in Norway. In the past years Stavanger municipality has been working to redirect its car dependency with a substantial change into the mobility paradigm that is cyclist and pedestrian-friendly and based on public transport. Then the municipality signed the urban development agreement “Byvekstavtaler” with the state and introduced the road tariffs to reduce vehicle kilometer travel VKT and lessen the congestion. The city management levels have also invested in four main public transport routes that stretch from the central to the boroughs of Stavanger (Stavanger Municipality, 2016).

**Table 7: Focus area and secondary objectives in transport sector to implement the climate and environmental action plan from 2018-2022**

No.	Focus area	Secondary objectives
1	Reducing scope of transport and changing travel habits	<ul style="list-style-type: none"> <li>• 70% of passenger transport takes place by bike, foot and public transport in 2030.</li> <li>• Streamlining commercial transport and urban logistics.</li> <li>• Reducing the negative impact of long journeys to and from Stavanger.</li> </ul>
2	Promoting renewable fuel and technology in the transport sector	<ul style="list-style-type: none"> <li>• GHG emissions from light vehicles have been reduced by 80% by 2030 and by 100% by 2040.</li> <li>• GHG emissions from heavy vehicles have been cut by 20% by 2030 and by 100% by 2040.</li> <li>• Port operations, fast boats and ferries are fossil-free by 2030.</li> </ul>

*Source: Own illustration, summarized from (Stavanger Municipality, 2018).*

According to the action plan for the climate and environmental goals in the period of 2018 – 2022 adopted by Stavanger City Council, the primary objective in 2030 is to cut down the direct GHG emissions from the transport sector by 80%, compared to 2015, and 100% by 2040. This main goal is elaborated into some secondary objectives in different focus areas, as presented in Table 7.

In the list of the measures for car-free zones, car sharing and mobility impact, the municipality also stated that they have planned to facilitate car sharing schemes such as Nabobil, Bilkollektivet, electric car sharing schemes, etc. through priority parking. The future development of electric car sharing in Stavanger will also be supported by the municipality by their participating in the scheme as a customer or contributor in other ways and considering including car sharing to be a part of other projects (Stavanger Municipality, 2018). One of these projects, prototyped and taken into account this year 2020, is “mobility point” where one can find various modes of transport, parking spaces and public transport services suiting the trip purpose. For instance, city bikes, car sharing and scooters located close to a place where many people travel around (Stavanger Municipality, 2020). If ensuring environmental-driven goals such as building the fleet of 100% electric cars, car sharing scheme would be in line with the municipality’s climate and environmental action strategy, then become a competitive alternative to owning a private car.

Currently in Stavanger, there are some formal car sharing providers including Bilkollektivet cooperative (the earliest player in the market), Nabobil (P2P model), Hyre, Flaata (B2B model), Hertz bilpool located outside IKEA Forus. From the public side, Kolumbus, a county-owned transport company is also planning to develop car sharing scheme as a subsidiary in their portfolio. They have been conducted a pilot in collaboration with Hyre Innovation park in Ullandhaug since last year, beginning with 10 shared cars, as shared by Kolumbus representatives in the interview for this thesis.

This is to say that Stavanger city holds potentiality for spreading car sharing practice in the future. Known as the Oil Capital of Norway, with the head quarter of the largest company in the Nordic region Equinor, along with multiple educational institutions for higher education, Stavanger is an international and innovative city that attracts a large

number of international workers and students each year. Young people, international worker and students are considered potential car sharing users since they do not intend to own private cars due to financial issue or not planning to stay in the city in long run, yet still have demand to drive a car when going shopping or in short trips. Moreover, according to the in-depth interview with Bilkollektivet’s representative in Stavanger, “*there are more and more business clients have demand for car sharing for cost saving and greener image*”. This argument is supported by their statistics on the significant increase in business clients (see Table 8).

**Table 8: Yearly statistics of car sharing membership and usage of Bilkollektivet in Stavanger from 2017 to 2020**

	<b>Dec 2017</b>	<b>Dec 2018</b>	<b>Dec 2019</b>	<b>May 2020</b>
<b><i>Clients</i></b>				
Private	53	97	156	191
Company	29	43	57	105
Student	0	0	8	15
<b><i>Number of cars</i></b>	<b>5</b>	<b>6</b>	<b>9</b>	<b>10</b>
<b><i>Usage</i></b>				
Km of driving	3,516	5,778	13,505	-
Reservation time	1,285	1,304	2,757	-

*Source: Own illustration, collected from Bilkollektivet through in-depth interview in 2020*

Despite the slight increase in car sharing usage (see an example of Bilkollektivet user statistics in Table 8) and an increasing number of households without a car (Statistics Norway, 2017), the main providers still focus on Oslo market instead of investing more cars and resources in Stavanger. This is because of some challenges of expanding car sharing model in Stavanger. Besides low densification compared to other cities such as Oslo, Stavanger is known to have dispersed development, high levels of automobile ownership, and affluent population. This poses some significant challenges to develop car sharing programs. Regarding city planning and land use, Stavanger was built in a polycentric structure that sets apart the commercial areas, residential area, and the public



service areas (Næss, Peters, Stefansdottir, & Strand, 2018). The urban planning of Stavanger was based on private car-dependent mobility paradigm that promoted the scattering development. For instance, Forus was developing as commercial and business area, while Ullandhaug is the center for the University of Stavanger and future home to Stavanger University Hospital. Such direction takes people away from the city center and imposes traffic management demand (Weldu, 2018). Also, it is not easy to change the travelling habit of Stavanger residents in short time from driving private, in many cases luxurious, cars into using more public transports and car sharing.

To sum up, Stavanger is an interesting context to study and develop car sharing scheme thanks to some advantages of demography, and the sharp, determining strategy of the municipality. In the combination of the available, accessible public transportation, pedestrian and cyclist-friendly urban design, car sharing will contribute significantly to curb the private car ownership in the city, then potentially cut down the VKT and GHG emissions. However, there are still paramount challenges for the companies and government to attract more car sharing users. One of the toughest obstacles is to decode customer insight and to change their travelling habits in order to make car sharing more commonplace and natural.

## **Chap 3: Literature review**

This chapter will go through previous studies that are relevant directly or indirectly to the research question. First, customer behavior towards sharing economy and collaborative consumption will be discussed. Second, more details focusing on car sharing scheme will follow and be divided into three categories: the attitude towards car sharing, external factors, individual characteristics, and situations. There are various types of used journals, such as sustainable consumption, sustainable transportation, economic psychology, or social science. Finally, a table with all the literature reviewed in this paper is provided in Table 12 (Appendix - section 2), including the information of author, year, research topic, classification, and relevant key findings.

### **3.1 Willingness to participate in sharing economy or collaborative consumption**

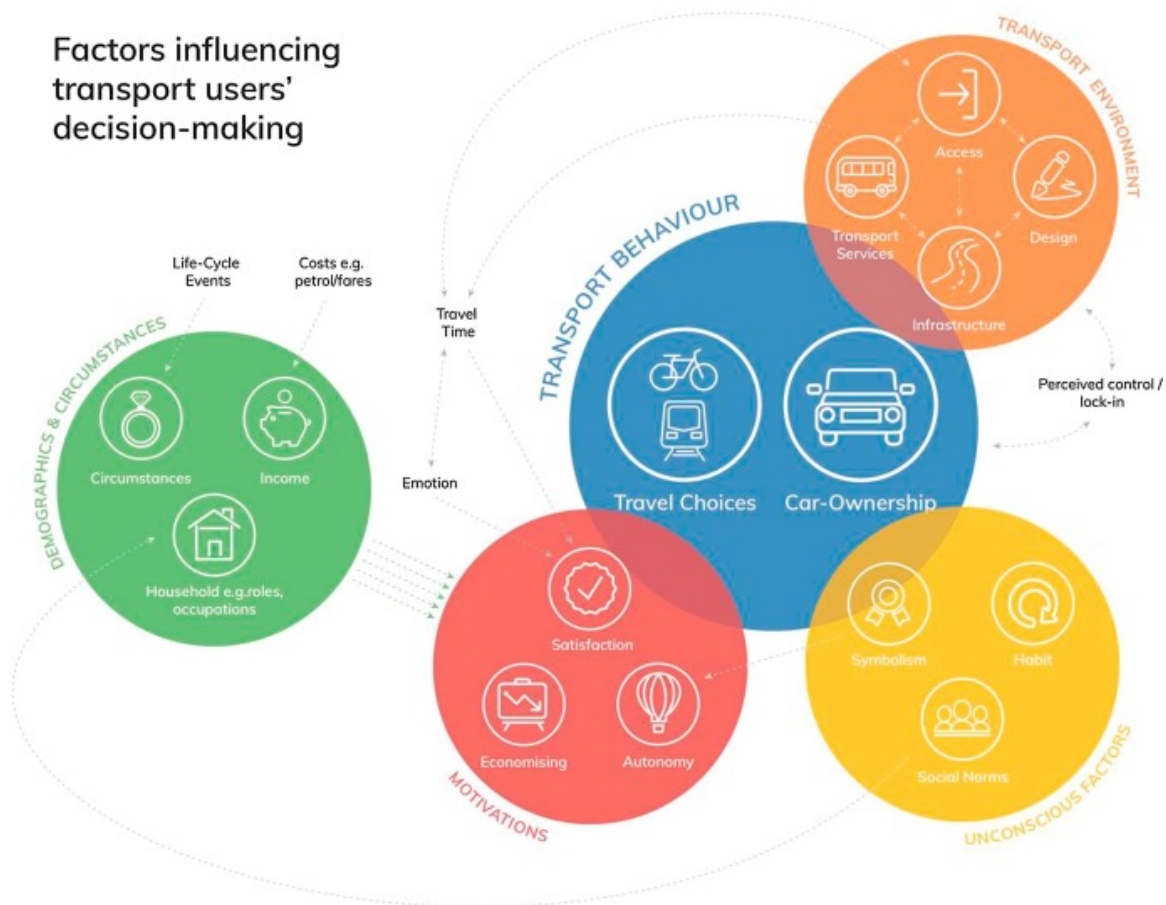
Academia has increasingly paid attention to customers' attitudes toward shifting to the sharing economy or collaborative consumption. Hamari et al. (2016) approached the motivation for participating in sharing economy in four main dimensions as follows: for (1) intrinsic motivations including enjoyment, sustainability and for (2) extrinsic motivations including economic beliefs, and reputation. Their study suggested that enjoyment was the most influential determinant in attitude formation and use decisions. Economic gain, or cost saving, certainly is the motivation for many consumers, especially those influenced by the financial crisis. The findings implicitly recommend the providers of collaborative consumption to make their offers pleasurable and enjoyable to users, in combination with financial benefits.

Aiming to examine the role of different factors of the satisfaction with a sharing option and the probability to use it again, Möhlmann (2015) identified certain attributes that have a positive impact on users' intention to join collaborative consumption. Those attributes are cost saving, familiarity, service quality, trust, and utility. Concerning the satisfaction of using the shared product or service, the author also addressed similar rational reasons including cost savings, familiarity, trust, and utility. Indeed, consumers are attracted to the fact that sharing platforms provides them cost savings and the shared product well substitutes a non-sharing option. Furthermore, the familiarity plays an important ground

probably thanks to lower costs of learning the properties of the sharing process (Hennig-Thurau, Henning, & Sattler, 2007).

Many psychological models of behavior are also applied to shed light on internal and external factors that encourage and block choices. Some commonly applied examples are the Theory of Planned Behavior (Ajzen, 1991), the Value-Belief-Norm model (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Focusing on the transition to low-carbon mobility, Whittle et al. (2019) employed social and psychological approaches to explore consumer decision-making. Reviewing relevant literature, the authors listed individuals' motivation for travel choices including autonomy, economy (both financial and time), hedonic, health, social, and environmental factors, as demonstrated in Figure 9.

**Figure 9: Factors influencing transport users' decision-making**



*Source: (Whittle et al., 2019)*

Furthermore, *“it is clear that emotional, experiential (i.e., experience-based) and social factors, as well as practical and financial aspects, shape transport choices; and that familiarity with transport technologies and modes combined with ingrained habits, are likely to act to lock-in behaviors at a psychological level, alongside physical and cultural factors that lock-in choices.”* (Whittle et al., 2019)

## **3.2 Willingness to join a car sharing scheme**

### **3.2.1 Attitude towards car sharing**

The consumer’s attitude is defined as *“an overall evaluation of an object that is based on cognitive, affective, and behavioral information”* (Maio & Haddock, 2010, p. 4). There is no lack of studies regarding the key determinants of consumer’s willingness in car sharing adoption. The findings of a study in Sweden indicated that the reasons that matter most to car sharing customers are financial and practical factors. The motivations coming next, with respect to the level of importance, are environmental impacts and the ideology, i.e., the consumers like the idea and philosophy of car sharing (Polk, 2000). According to Lane (2005), the most fundamental attributes that inspire car-sharing users are, with descending order of importance, convenience (41%), affordability (20%), personal freedom (16%), environmental benefits (10%), fewer plague (6%) and enhanced productivity (2%). The weight of these attributes might vary across the levels of income. For instance, for lower-income users, affordability matters more, meanwhile, freedom is more important to higher-income ones.

Environmental concern is an important aspect of consumers’ attitude towards car sharing activity, referring to their awareness of environmental protection through sustainable consumption choice. In respect to the environment incentive, there are diverse opinions among researchers across regions. An empirical study on the P2P car sharing market in Greece reported that the likelihood of adopting car sharing practice proportionally depends on customer’s concern for the environment (Efthymiou, Antoniou, & Waddell, 2013). Meanwhile, Harms & Truffer (1998) argued that the users’ incentives have changed over the years. The early adopters in Switzerland were mainly driven by environmental motivation. As the practice becomes popular over time, environmental awareness is still

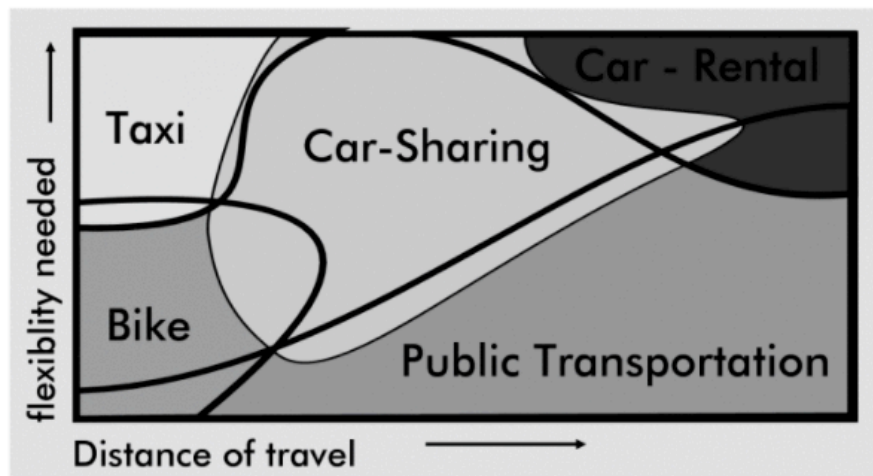
one of the most important factors yet has lost its ground to economic and practical benefits. According to a study analyzing car sharing users in Denmark, Thøgersen & Norre (1999) reported that the early adopters seem not to be particularly environmentally conscious. They added that the readiness to engage in car sharing practice also depends on its compatibility with their values; and contrary to what one might expect, in this cluster, environmental concern is seemingly not an important factor. The authors implied the need to analyze the environmental motivation in relation to other factors within a behavioral theoretical framework, rather than examining it solely.

### **3.2.2 External factors**

Kent & Dowling (2013) suggested that material, technological and infrastructural elements have to be included into performances of mobility by a practitioner. The researcher will explore some aspects of potential external factors influencing people's willingness to adopt the practice, namely the availability of alternative modes of transport, the accessibility and affordability of car sharing. In fact, the adoption of a car sharing scheme mainly depends on the availability and quality of other transportation models for daily travel habits. Thøgersen & Norre (1999) reported that the demand for car sharing is limited once the infrastructure and public transportation are satisfactory. This conclusion seems to contradict the findings of Huwer (2004), indicating that car sharing practitioners have a strong attachment to public transportation. Other authors support the idea of claiming that car sharing practice and other modes of sustainable transportation have a complementary relationship in a way. Shaheen et al. (2012) also argued that P2P car sharing held the potential to impact the transportation infrastructure by establishing interconnectivity and availability among the different transportation modes. On the other hand, many scholars agreed upon the argument that car sharing practices are dependent on higher density residential and commercial environments that support alternative transport (Bergmaier, Mason, McKenzie, Campbell, & Hobson, 2004). Car sharing is a complement to other alternatives to the private automobile and only makes sense as a part of a wider transportation package in residential areas where public transport, walking and cycling are available (Enoch & Taylor, 2006; Goldman & Gorham, 2006; Huwer, 2004). By construing the set of transport options and physical environment required to complement

car sharing, a number of infrastructural factors including high residential and commercial density, well-connected and maintained active transport environment, a mix of uses, and constrained parking for private vehicles, all lay the foundation for car sharing development (Kent & Dowling, 2013). Figure 10 suggested the relationship between car sharing and other modes of transportation, based on the flexibility needed and the distance of the trip.

**Figure 10: Relationship of car sharing and other modes of transportation**



*Source: Schwartz (1999)*

When it comes to the accessibility of car sharing, the consumers tend to expect a fleet of cars placed within a short distance of their living area or workplace. One of the potential issues that consumers have been facing is the limited accessibility of shared vehicles (Shaheen et al., 2012). Specifically, from their findings, 9 out of 18 examined operators shared their concern in terms of vehicle supply meeting demand. Also, an empirical study on P2P car sharing conducted by Lewis & Simmons (2012) reported that almost 50% of interviewees did not have access to any P2P shared car in their area, which is one of the most unappealing factors of car sharing offers.

### **3.2.3 Individual characteristics and situations**

Some individual aspects of customers can be included in the set of significant factors influencing their decision-making process towards car sharing practice, such as limited

operation, limited time and financial resources, skepticism and trust, and transportation habits (Kristensen, 2015).

Previous studies have been implications that the meanings and competences circulated within the practice of car sharing. Elements of meanings and competences can also impetus the change by integrating into performance (Kent & Dowling, 2013). There are numerous studies discussing the key changes in the meanings and competencies associated with both cars and sharing. Accordingly, the meaning linked to the car has shifted. Especially for young people, cars are losing their grip on identity approvals such as underpinning progress, freedom, youthfulness, and autonomy (Dowling & Simpson, 2013). Being progressive in today's society is turning to the use of smartphones and social media (Paterson, 2006) or the practice of alternative transport modes such as cycling (Daley & Rissel, 2011). One potential of car sharing lies in its reliance on digital technologies and futuristic images, as a connotation of both technological advancement and mobility innovations (Simpson, 2009). This explains why target customers of car sharing are mainly young people, tech savvy, and early adopter in mobility.

Besides, transferable skills also foster innovations in practice (Shove, Pantzar, & Watson, 2012). This is to say car sharing is not a common practice for everyone as it requires the consumer to mimic related form of doing and knowing. Shaheen et al. (2012) found out that the limited knowledge about insurance and liability was one of the predominant barriers to car sharing users in North America. This lack of understanding might also be a major driver of the negative perception of P2P car sharing in some case studies (Ballús-Armet, Shaheen, Clonts, & Weinzimmer, 2014). Furthermore, some researches claimed a positive correlation between educational level and willingness to join car sharing. According to Millard-Ball (2005), car sharing practitioners were found to be highly educated and also environmentally conscious.

One who wants to investigate consumer's insight on car sharing should also take their skepticism and level of trust towards this model. Consumers are naturally skeptical about new services (Shaheen et al., 2012). The decision to join car sharing depends on how customers feel about sharing, i.e., their propensity to trust or mistrust others (Thøgersen & Norre, 1999). This aspect seems to be more significant to P2P models when consumer

rents a car from another individual. Keetels (2013) concluded that potential barriers regarding sharing are mostly associated with trust issues, and in a P2P platform, the more verified identity is, the more customers are willing to rent the cars.

Transport habits are commonly explored regarding their contribution to consumer's expected behavior. Conducting an empirical study about case study in Netherland, Meijkamp (1998) argued that consumer habits play an important role in the adoption of car sharing. According to his findings, given that people do not trade-off between car sharing and private cars or between private cars and other alternatives, it is hard for them to make a deliberate decision on car sharing. Huwer (2004) also claimed that car sharing users particularly favor public transportation as their main choice of mobility.

Some recent studies also add up one point that a trigger event in customer's personal life also play an essential role in their reasoning to practice car sharing. Meijkamp (1998) suggested that very few customers actually drop their vehicles and use a car sharing service when they first hear about it. Very often, a trigger event such as change of jobs, incomes, marital status, moving to new places, selling or losing a car, etc. urges them to consider car sharing as an alternative. In agreement with this argument, Harms (2003) also concluded that users needed to experience a "disruption" in their routine or mobility abilities before shifting to car sharing practice. Interestingly, comparing the responses from studies in Seattle and Berlin, Schwieger (2004) found out that users in America are more rational, while users in Germany are more emotional when it comes to their decision to participate in a car sharing scheme.



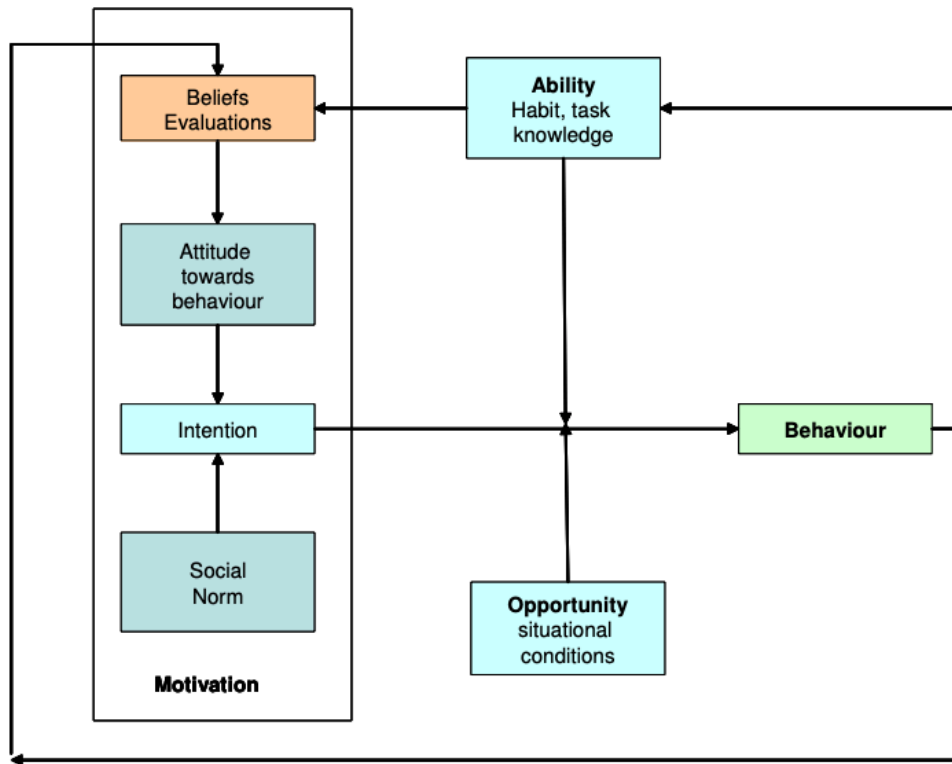
## Chapter 4: Analytical framework

The Motivation – Opportunity – Ability – Behavior (MOAB) model, proposed by Ölander & Thøgersen (1995), has been widely used to construct an integrative model for consumer behavior. The authors recognized that the consistency between attitudes and behaviors could only be predicted under volitional control conditions. They aimed to improve the predictive power by incorporating an “ability” concept and concept of facilitating conditions or “opportunity” to perform the behavior into the model in Figure 11. The feedback arrows in the figure imply that the belief or evaluation of a phenomenon usually changes due to experience. That means a change might happen after one or a few more trials, perhaps after a while when the learning process has made the task easier and enhanced the ability.

The important characteristic of the MOAB model is its endeavor to incorporate motivation, habitual and contextual factors into one single model of pro-environmental behavior. This feature is even more useful as sustainable behavior is mostly habitual behavior rather than relies on conscious decisions (Jackson, 2005). Simply put, the MOAB model is built on some prevalent theories of behavior, which will be discussed in each element hereafter, and commonly used in explaining consumer’s choice toward sustainable consumption. The MOAB model is applied in this thesis as it allows the investigation of the internal and external factors that might motivate customers to engage in a car sharing scheme (Ölander & Thøgersen, 1995). In the analysis section, the research then will elaborate on each factor to find explanations of the customer’s willingness to join car sharing.

There are certain limitations to the MOAB models. First, the model does not fully reflect the consumer’s values and beliefs. Second, there exists a gap in acknowledging and explaining the act of motivation, known as a psychological process. Third, the model has not been applied widely to innovative business models. However, after all, this theory still offers a thorough approach and comprehensive insight into consumer behavior.

**Figure 11: The motivation-Opportunity-Ability-Behaviour Model**



*Source: Ölander & Thøgersen (1995)*

## 1. Motivation

The motivation concept of the MOAB model is a simplified version of Fishbein and Ajzen's Theory of Reasoned Action, combined with other possibilities including the motivational part of Triandis's model or the insertion of Schwartz's Norm-Activation model (Jackson, 2005). Accordingly, one's intention to participate in the behavior captures the motivational factors and transforms them into a behavioral disposition (Ajzen, 2005). The factors determining intention are the attitudes towards and the social norms concerning the behavior (Ölander & Thøgersen, 1995). Thøgersen (2010) argued that consumer's motivation to take part in pro-environmental activity depends on the individual value priorities, environmental concern, attitudes towards that behavior, and internalized norms.

Internal and external conditions can impact these motivational factors. If the examined object shows motivation through any of those factors, his or her behavioral intention is enhanced (Thøgersen, 2010).

## **2. Opportunity**

The opportunity element of this model is obviously related to Triandis's model of facilitating conditions and Stern's notion of external condition. Although the two authors prefer to see opportunity as "objective preconditions for behavior", this aspect seems to have some similarities with Ajzen's concept of perceived behavioral control. There is abundant evidence for the importance of this situational factor as a prerequisite for pro-environmental behavior (Jackson, 2005; Thøgersen, 1990).

Besides motivation and ability, consumers can also be influenced by a certain number of external constraints. According to Thøgersen (2010), these contextual elements are formed by nature, the infrastructure and the availability of the alternatives, defined under the "triple A" including availability, access and affordability. In the thesis's case study, these factors would be the accessibility of car sharing programs in Stavanger, the availability of alternative modes of transport, and the customer's perceived cost of car sharing.

## **3. Ability**

The next factor is the consumer's intrinsic ability to conduct focal pro-environmental behavior. This element facilitates consumer's actions when the motivational and external conditions are satisfied. In the MOAB framework, ability indicates the individual's limited resources in connection with time and financial resources, cognitive capacity, limited knowledge about problems and solutions, and limited skills and task-specific knowledge (Thøgersen, 2010).

Thøgersen (2010) also emphasized that the environmentally conscious behavior can also be influenced by the lack of knowledge about environmental issues and personal habit. With a proper level of knowledge, the customer might not be aware of the consequences of certain behavior. Habits are hard to change in the short-term and belong to unconscious awareness causing the repeat in certain behaviors. These limitations are very much

potential in inhibiting consumers from making a change in their consumption decisions. The importance of habit, both as an independent determinant of behavior and as a mediator of intention has already been studied. Task knowledge is also an important factor, especially when involving new procedures relevant to pro-environmental behavior (Jackson, 2005). This is particularly relevant to car sharing usage, which requires the consumers to learn how to adopt new ways of planning and operating their mobility activity.

#### **4. Behavior**

It is worth mentioning that pro-environmental behavior only occurs if all of the earlier mentioned factors are met. The behavior depends on the individual consumer's motivational determinants, whether they are given the opportunities and their proficiency to act in a pro-environmental way. Especially if one or more of those factors are not sufficiently met, it is likely that the consumer is less willing to participate in the activity. If ability or opportunity is restricted, the consumer then tends to face the "attitude-behavior gap", which means their attitude and actual action are inconsistent (Thøgersen, 2010).

## Chapter 5: Methodology

The researcher will describe the methodology employed to collect and analyze the data used in this thesis. The first part is to provide the qualitative research approach and how it fits the nature of the proposed research question, followed by the design of the interviews and the process of data collection and analysis. Finally, the research will also elaborate on the issue of reliability, validity, and research ethics. The main source of qualitative data is the transcripts of 10 in-depth semi-structured interviews conducted by the researchers from March to the end of May 2020.

### 5.1 The qualitative approach and research design

The qualitative methods have been commonly applied in academia to explain certain phenomena and the relationship between various factors of a research area (Hesse-Biber & Leavy, 2010). One of the main goals of the qualitative method is to learn about individuals' experiences of places and events (Winchester & Rofe, 2016), in other words, *“attempts to uncover the nature of a person's experience with a phenomenon”* (Corbin, 1990). The qualitative approach is also usually used in interpretation and exploration, especially when there is a lack of knowledge on the subject (Noor, 2008).

Also, qualitative research is recommended by Bryman & Bell (2007) to be an appropriate method for study in business and administration. In a qualitative study, the inductive approach is of prime importance (Boeije, 2009), in which case studies are normally examined, and a social phenomenon is discovered to detect empirical patterns (Bryman & Bell, 2007). Regarding the findings, a qualitative approach is potential in obtaining the outcomes that indicate the respondents' perspectives rather than the researcher's point of view (Creswell & Poth, 2016). Given the chosen research topic and question, the researcher decided to use a qualitative approach. The thesis focuses on investigating the factors influencing a customer's decision to participate in car sharing within a particular context of the Stavanger municipality. This particular scope leads to the demand for a method with flexible yet powerful exploring tools. Therefore, the thesis, employing a qualitative approach, aims to find out what motivates customers to use car sharing, their perspective on car sharing models, and the profound reasons behind such insights.

Having recognized the lack of customer perspectives in the Stavanger context within the existing literature, the researcher would discover these experiences applying qualitative in-depth interviews. This kind of interview is employed given its certain advantages such as successfully enabling reciprocity between the interviewer and respondents, allowing the interviewers to improvise follow-up questions based on the difference in responses and encouraging individual verbal expression (Kallio, Pietilä, Johnson, & Kangasniemi, 2016). Furthermore, the semi-structured interviews allow the interpretation of responses and thorough investigation of individual thoughts, opinions, and attitudes. *“A semi-structured life-world interview attempts to understand themes of the lived daily world from the subjects’ own perspectives, [...], seeks to obtain descriptions of the interviewees’ lived world with respect to interpretation of the meaning of the describe phenomena”* (Kvale, 2008, p.11).

In this case, the main objective of the interviews should be to identify the determinant factors encouraging or inhibiting customers to adopt a car sharing service through individually customized information and detailed answers. Unlike quantitative research, this method can yield the data of the cognitive and emotional factors influencing the target customers. On the other hand, with the sub-research question to learn about supplier side’s perspectives, the research also conducted two interviews with the representatives of two relevant companies in Stavanger including Bilkollektivet, the oldest car sharing provider in Norway, and Kolumbus, a public transportation administration who is considering entering the market. Accordingly, the researcher, also interviewer, conducted eight in-depth interviews with consumers and two in-depth interviews with companies following a semi-structured interview format.

Besides customized follow-up questions, the researcher asked a list of common questions to consumer representatives, especially regarding the evaluation of determinants of motivation, in order to carry on further comparison and find out the interconnections.

## **5.2 Data collection**

In this section, the research hereby would follow and provide details on four pan-paradigmatic steps of sampling in interview-based qualitative research including: (1)

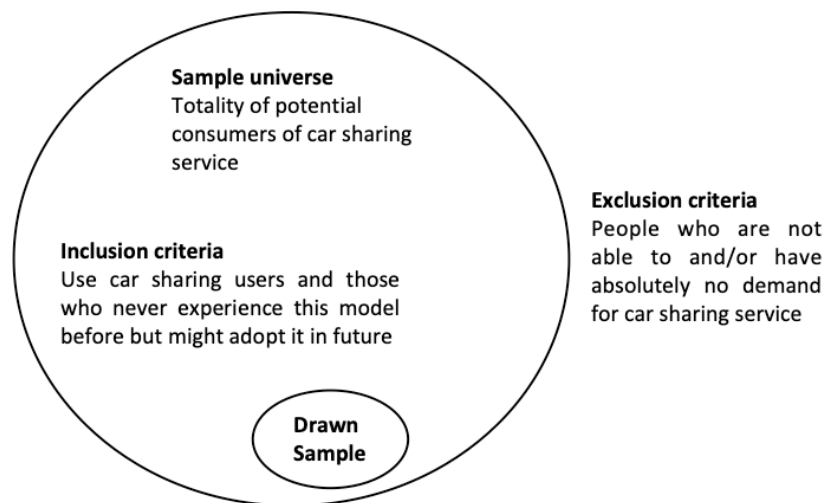
setting a sample universe, (2) deciding sample size, (3) formulating sample strategy, and (4) recruiting sample from a population (Robinson, 2014).

### 5.2.1 Sample universe

The sample universe, also called “study population” or “target population”, is “*the totality of persons from which cases may legitimately be sampled in an interview study*”. A study failing to define a sample universe or clarify beyond its study population will yield weakened credibility and coherence (Robinson, 2014). To identify the sample universe, one should make a set of the inclusion criteria and/ or a set of exclusion criteria.

In this research, the sample universe is the totality of potential consumers of car sharing service. As demonstrated in Figure 12, the inclusion criteria are specified as the responses of the group of both used car sharing users and those who never experience this model before but might be able to and will adopt it in the future. The exclusion criteria are referred to the responses of the group of people who are not able to and/or have absolutely no demand for car sharing service, such as people without driving license, having no intention of rent a car for himself/ herself or anyone in any possible occasion, or people with severe motion sickness symptom and cannot stay in a car, etc.

**Figure 12: Sample universe, inclusion/ exclusion criteria and sample**



*Source: Own demonstration, combined with Robinson (2014)*

### **5.2.2 Sample size**

There are not any fixed and specific answers for a sufficient sample size (Creswell & Poth, 2016). The number of interviewees depends on different factors including the quality of data, the scope of the study, the nature of the topic, the amount of useful information provided by each respondent, the use of shadowed data, and the study design used (Morse, 2000). According to Morse (2000), considering using semi-structured interviews, for phenomenological study, the larger amount of data obtain is, the fewer participants are needed, and then the recommended number perhaps is only 6 to 10 people. Researchers using interpretative phenomenological analysis are suggested to follow a guideline of 3-16 interviewees per single study (Robinson, 2014). It is also implied that the sampling in qualitative research is more concerned with the quality and abundance of obtained information than the number of participants (Kuzel, 1992). Accordingly, this thesis's sample size scales up to 10 participants, 8 of which are individual customers, and 2 of which are companies' representatives.

### **5.2.3 Purposive sampling strategy**

The purposive sampling technique, also known as judgment sampling, refers to the deliberate choice of informants based on the qualities those informants possess. It is a nonrandom technique that does not require underlying theories or a set number of informants. Then the researcher can decide what needs to be known and seeks for people who meet the requirements and are willing to share the information by virtue of knowledge or experience (Bernard, 2017). The ground for applying a purposive strategy is that the researcher assumes, upon their understanding of the chosen topic, that certain categories of people might have unique, different, or important perspectives on the phenomenon, then their participation in the drawn sample should be ensured (Mason, 2017).

For the consumer side, the researcher, therefore, recruited a purposive sample covering four groups as follows:

(i) *Group 1*: Residents of Stavanger who have their own car (also hold a driving license), non-user of car sharing service;



(ii) *Group 2*: Residents of Stavanger who hold a driving license but do not own their own car, non-user of car sharing service;

(iii) *Group 3*: Residents of Stavanger who have their own car (also hold a driving license), the user of car sharing service; and

(iv) *Group 4*: Residents of Stavanger who hold a driving license but do not own their own car, the user of car sharing service.

The above division is based on the researcher's knowledge of car sharing customers gained from reviewing previous literature. It is stated that there is a significant difference in mindset and behavior between people who own at least a vehicle and those do not. Meanwhile, the disparity between users and non-users will facilitate the change in the customer's mindset before and after adopting car sharing. Also, the presence of car sharing members in the drawn sample will uncover their experience with this phenomenon. Furthermore, during the process of recruiting informants, the researcher made an attempt to diversify the demographic background of the dataset regarding the nationality (local and expats), occupation with a high level of education (master student, consultant, Ph.D. candidate, engineer, etc.), and age group which ranges from 25 to 45. To sum up, Table 9 summarizes the drawn sample of this thesis by listing the interviewees from the consumer side with some variables such as gender, age, occupation, ownership of a car, and so on.

For the company's side, the researcher employed both purposive and key informant strategies. Therefore, the representatives from a non-profit corporative and a public company were chosen. These informants play key roles in their department or car sharing projects, specifically the advisor, along with the member of Strategy & Development department from Kolumbus, and company's representative of Bilkollektivet in Stavanger.

#### **5.2.4 Interviewee recruitment**

Among the list of interviewees representing the customer side, 6 of which were recruited through the researcher's network in Stavanger city, and 2 of which were approached employing snowball sampling technique, specifically asking for recommendations from

interviewed users to reach the informants in the same category. Also, the key contact of Bilkollektivet in Stavanger was provided by one of the company’s members. Finally, the contacts from Kolumbus were shared by people in the researcher’s network.

**Table 9: Overview of the sample**

For customer side (individual informants)									
Group	ID	Gender	Age	Nationality	Living area	Job	Private car owner?	Car sharing user?	No. of kid
1	1.1	Female	39	Vietnamese	Sunde	Specialist	Y(*)	N(*)	2
1	1.2	Male	35	Norwegian	Jåsund	Journalist	Y	N	0
2	2.1	Male	40	Portuguese	Hillevag	Software developer	N	N	0
2	2.2	Female	27	Vietnamese	Madla	Ph.D cand.	N	N	0
3	3.1	Male	34	Norwegian	Sola	Engineer	Y	Y	0
4	4.1	Female	38	Norwegian	City central	Ph.D cand	N	Y	3
4	4.2	Male	26	Norwegian	Madla	Student	N	Y	0
4	4.3	Male	45	Norwegian	Storhaug	Consultant	N	Y	3
For company side									
Company		Department			Position/ Role				
Kolumbus		Advisor board			Smart-city and Environmental advisor				
Kolumbus		Strategy & Development department			Representative for the department				
Bilkollektivet		Stavanger branch			Company representative in Stavanger				

*Source: Own illustration. Note: (\*) Y stands for Yes, N stands for No.*

### 5.3 Interviews

The interviews were conducted from Mar to the end of May 2020. Nine interviews were conducted online due to the Corona outbreaks, following the social distancing rules. Only one interview took place at the informant’s working office. The durations of the interviews are between 30 to 60 minutes with customer representatives, and approximately 60 to 90 minutes with company representatives. Prior to each interview, every informant

was informed in terms of the topic, the purpose, and the later usage of data collected from the dialogues. Upon their requests, few informants were sent the interview guides with tentative questions, not to send back typed answers, but to have an overview of the questionnaire and the flow.

Two separate interview guides, which can be found in the Appendix, were developed for two groups of informants: customers and companies. As the nature of semi-structured interviews, the guides are mostly for main talking points and there are spaces for open-ended questions to allow the informants to share their unique experience and extend the knowledge on this topic in existing studies. Therefore, the researchers did not follow strictly the script and sometimes asked the informant to elaborate their opinions beyond the questionnaires if needed.

Between two sets of questions, the first one was designed for informants representing the customer side, and the second one is for representatives from the company side. Noticeably, in the interview guide for target customers, there is a sub-part only for car sharing members. This subpart is to discover the level of satisfaction and their experience with car sharing service in the past. Table 10 demonstrates the flow of two interview guides.

**Table 10: Key talking points for the semi-structured interview guides for both consumer and companies**

Interviewees	Outline for questionnaire
<i>For the consumer side</i>	<ul style="list-style-type: none"> <li>• Warm-up background questions;</li> <li>• Customer’s travelling habit and their preference;</li> <li>• Their perception of car sharing regarding definition, potential impacts and operation;</li> <li>• Their intrinsic and extrinsic motivation to join or not to join car-sharing model;</li> <li>• Their preferences regarding car-sharing service;</li> <li>• Their experience and feedback after trying car-sharing service (<i>only if consumers are already car sharing members</i>).</li> </ul>

<i><b>For the supplier side</b></i>	<ul style="list-style-type: none"> <li>• Warm-up background questions;</li> <li>• Their perspective as well as motivation when planning to build car-sharing service;</li> <li>• Their strategy and plan to execute;</li> <li>• Their opinions on car sharing market and users in Stavanger;</li> <li>• The advantages and disadvantages of conducting car-sharing services in Stavanger, from supplier perspectives.</li> </ul>
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*Source: Own illustration*

#### **5.4 Data processing**

For data preparation, ten interviews were transcripts as accurately as possible by listening to the recorded audio files, and only the extremely irrelevant parts were left out. Only two out of ten interviews were conducted in Vietnamese and needed translation, and the rest were in English. Each transcription then was verified by re-listening the whole interview while reading and fine-tuning the file. Some Norwegian locations or phrases were double-checked by a native speaker to ensure accuracy.

The data coding process for qualitative study was suggested to follow three steps including: (1) reading through the data and creating a storyline; (2) categorizing the data into codes; and (3) using memos for clarification and interpretation (Stuckey, 2015). In this case, the researcher also applied these steps and created a self-made database, in which the data collected from the informant was labeled with codes and grouped into some categories of themes and concepts, for example, travelling habit, perception on car sharing, concern over environmental benefits, the order of importance of preferences of car sharing service, etc. Some data such as the users' evaluation of previously used car sharing services or the ranking of car sharing attributes will be collected and arranged in an Excel file for comparison and graphing.

#### **5.5 Reliability and validity**

It is highly important to obtain reliability and validity in any research. This thesis is no exception and the research has been endeavoring to use some relevant techniques to make

the findings as reliable and valid as possible. Table 11 gives some details of this attempt, the first and second columns of which summarized relevant recommendations on how to assure reliability and validity in case study, quantitative and qualitative studies. The third column makes clear how these techniques are used in this thesis.

**Table 11: Techniques to ensure the reliability and validity in studies**

<b>Categories</b>	<b>Techniques</b>	<b>Application in this thesis</b>
<b>Construct validity</b>	Collect data from multiple sources of evidence	Qualitative interview, literature review, document from organization's websites.
	Create evidence in data collection	All interviews were recorded and transcribed.
<b>Internal validity</b>	Display illustrations and diagrams in the data analysis section	Illustrations, tables and diagrams were presented.
	Consistency of results	All findings are aligned to the same theoretical framework.
<b>External validity</b>	Determination of scope and boundaries of research design	See Methodology chapter.
	Comparison of findings and existing literature	See Analysis chapter.
<b>Reliability</b>	Recording observations as precise as possible	
	Using a structured or semi-structured protocol for interview	See appendix for semi-structured interview guides.
	Record data mechanically	Interviews were recorded.
	Having review and examination	The thesis is graded by University of Stavanger and the

		researcher also gets feedback from supervisor.
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*Source: Own illustration, adapted from Bryman (2016) and Riege (2003)*

## **5.6 Ethics**

Using an individual data collection method, the researcher did notify the Data Protection Official for Research before the data acquisition and has been following the guidance to protect the participants' privacy. The interviewees were also fully aware that the conversations would be recorded and transcribed for the research purposes and their right to withdraw their participants in this study at any time. The interview recordings and transcriptions with personal information were stored in the researcher's computer only and no one else has access to those data. During data analysis and presentation, all personally identified information would remain anonymous.

# Chapter 6: Analysis

In this chapter, the empirical results is reported by presenting the remarkable findings that are relevant to the Motivation – Opportunity – Ability – Behavior (MOAB) model as an analytical framework. The findings will then be divided and analyzed into three main categories: **Motivation**, **Opportunity**, and **Ability**. The chapter will end by summarizing the outcomes integrated into the MOAB framework. Note that most of the responses quoted in this section are from the consumers as the main purpose is to learn the insight of customer side. The data from interviews with Bilkollektivet's and Kolumbus's representatives would be inserted in the relevant section if necessary.

## 6.1 Motivation

### 6.1.1 Attitude towards owning private car

The attitude towards private car ownership is an important determinant of customer's decision to join car sharing. Simply put, car sharing service in most case is the complementary opponents of car ownership.

#### Among non-users

Overall, there is a broad consensus among non-users that private ownership of a car is important in their daily life, due to certain reasons. When asked about the role of an owned car in household and the frequency of using this car, the informant 1.1, who has two kids, stressed:

*“I have one diesel-operated car and it is my primary vehicle for most purposes. [...] In my case, I only share the car among family members; we do not let strangers use our vehicle. [...] I use car too often, it does not even have any empty slot to share with virtually anyone else.”* (Informant 1.1)

Sharing a similar level of demand for private car usage, yet the informant 1.2's car dependency is because of the spontaneous need for mobility due to his job characteristics. In this case, he needs a car that is always available in short notice to ensure his job performance.

*“My job as a journalist, it entails a lot of driving back and forth of places. You need to be there at a certain time, and long distances so you cannot rely on public transportation. So, in order for me to do my job and in order for me to get jobs, I need to have a car.”* (Informant 1.2)

Interestingly, while both are single at the moment, informants 2.1 and 2.2 expressed different points of view on car ownership. The informant 2.2 was very keen on her plan of purchasing a car in the near future: *“I am single now. But in future, as someone with family, I would prefer having my own vehicle to decorate, to take care, like an extend part of the house. You tend to own a house, not renting one.”* This plan could imply that the informant 2.2 belongs to the group who appreciate the emotional and symbolic value provided by a car. Meanwhile, as an expats living on his own approximately ten years in Stavanger, the informant 2.1 is relatively flexible on car usage. In his opinion, the car might be necessary for households with children, so the parents can leverage the owned cars to take them to see a doctor or to kindergarten. In his case, the lack of privacy does not affect his daily routine enough to change his mind.

*“If you are single, then the car is stopped most of the time. In the beginning I did not want to buy a car because I did not know how much time I will spend in Norway. So I only take public transportation like a bus and that happened everywhere where I was.”* (Informant 2.1)

### Among users

There are two opposite groups of opinions in owning a car among car-sharers interviewed. Representing the group who prefers a private car ownership, the informant 3.1 shared the reason for his thought: *“I need to use car every day, two times per day only within the city. [...] I am not living very close to the shops and far from work place, so I prefer owning a private car.”* It might explain the reason why he is not a very active member of car sharing service, at least not for daily activities. His reason for owning a car is very much about the lifestyle and habit of travelling.

Meanwhile, the informant 4.2 show a considerable tendency to own a car in the near future but with a different reason. A car, specifically high-class sport car is his hobby and



a means of providing freedom as well as satisfaction rather than just a property.

*“I prefer owning a car, then you can go anywhere you want without having to wait for any buses and you can also enjoy silence inside a car. [...] I do not own a car now but when I start working, I would buy the car because I like expensive sport car. That is what I really care about and I want to be myself.”* (Informant 4.2)

Contrarily, both the informant 4.1 and informant 4.3 agreed that a private car does not play an important role in their household’s lifestyle. The informant 4.1 also elaborated that before deciding to drop his private car, the household already went through and considered all possible alternatives including car. The informant 4.3 made a very clear point that due to the household’s lifestyle, he prefers staying outdoor and cycling, so a private car is not an option. It is understandable that both of these informants are regularly active members of the cooperative Bilkollektivet and gained certain knowledge on car sharing model.

*“We used to own a car but sold it 2.5 years ago; we do not need it anymore since we only used it maybe twice a week.”* (Informant 4.1)

*“We do not need a car on daily basis. It is really expensive to own a car and a lot of hassle, and in our case, we use a car even less than normal.”* (Informant 4.3)

### **6.1.2 Ideological motivation**

The majority of the interviewed informants reported that they like the idea of car sharing as a part of the sharing economy, even though many of them did not have a complete overview of this model. In these cases, the researcher did explain the definition and some main existing types of car sharing services in Stavanger, then obtain positive feedback from them in general.

#### Among non-users

To the informant 2.1, car sharing is *“definitely an interesting concept”*, as stated: *“Like Airbnb, it’s a concept that people should embrace because it is good for the local economy.”* Despite confirming that car sharing does not fit his style and demand at the

moment, the informant 1.2 still acknowledged that this model is a good idea that holds potential to bring various benefits to the public. Express her favor of car sharing scheme in a stronger manner, the informant 2.2 addressed:

*“I suppose the idea is great. And it can be related to the city electric bicycle Hyde, which people can take turn to use.”* (Informant 2.2)

### Among users

As an active and knowledgeable car sharing members, the informant 4.3 understands the car sharing model quite well and shared his interesting opinion. The informant 4.1 and the informant 4.2 seem to be on the same page with him.

*“I like the non-profit aspect of Bilkollektivet. [...] However, car sharing is not really new but it is quite niche, only for the special group that cares a lot about it. Car sharing is fun for the nerds, not for everyone.”* (Informant 4.3)

*“I am very positive to car sharing in general as an idea. I think it could work for a lot of people even though there are lots of issues that need to work out.”* (Informant 4.1)

*“I like sharing economy or circular economy, so I am and will support this model.”* (Informant 4.2)

Indeed, the people who are interested in the conceptual perspectives of car sharing model might also learn more in-depth information and study about it, rather than just exploiting car sharing as a beneficial alternative to car renting, for instance. Not surprisingly, these “mobility nerds” (as used by the informant 4.3) are more familiar with the car sharing providers in town and already learned about their offers before deciding to use their services. In the remaining cases, the informants usually only know the name of one or two providers that they have memberships. Also, three of the above informants confirmed that they are early adopters, at least when it comes to mobility and car sharing.

### **6.1.3 Possible occasions to use car sharing service**

As a service, the main goal of car sharing programs is to offer customers access to car usage without having to own a car. In this section, the researcher will go through the

response of all informants to examine how car sharing can or has been offering value to customers as one of the travelling alternatives by answering these questions: (1) For all consumer, what are the possible occasions that the consumers find it necessary to use car sharing service; (2) For car sharing members, how has car sharing help their travelling routine; and (3) Do the interviewed companies' perspectives match these customer's perspectives regarding to their demand for car sharing?

#### Among non-users

Being asked to think about the possible scenarios when they need to use car sharing services, non-users provided some examples, mainly when go shopping in long distance with heavy products to handle, when moving to a new place and need a van for transporting their luggage, when travelling outside of the city on weekend or vacation. None of those are a part of their daily commuting habits, it is more to rising demand in unusual manners or to fill in the gap of the existing frequently used alternatives including bus, train, private car, bicycle, walking.

*“If there is a car sharing and we can use a van for a few hours and only having to pay for the gas and tolls, that's a potential use of the car-sharing.”* (Informant 1.2)

*“Most of the times I use the public transportation for work and also for most of my social activities. I only need a car to transport things like furniture, or when I get visitors from other countries then I will rent a car, usually to travel around.”* (Informant 2.1)

*“Only for longer distance shopping, which takes around 45 min to 1 hour, or weekend vacation with a group of friends cause bus schedule is limited and not sufficient.”* (Informant 2.2)

#### Among users

The results achieved from a group of car sharing users are the same as those of non-users. The informant 4.1 reported the highest level of frequency of using car sharing around 1-2 times per week.

*“Quite often it's the transportation of children to activities, when it's too far to go by bike. Also, my parents own a cabin, which is 3.5 hours driving from here. So we'll use car sharing to get to different places where it's difficult to go by bus.”* (Informant 4.1)

*“To go to Sola beach. It's really difficult to go there with the bus because they only go to the airport and then you have to walk and then you have to walk the rest of the way.”* (Informant 4.2)

### Companies' perspectives

It is easy to realize the match between customer and companies' perspectives on the purposes of using a car sharing service. It seems that the two companies acknowledge the situations in which their target customers need to use the service.

*“Our vision is back to the purpose of the collective that is that we want to make it possible to live in Stavanger and not own a car, have the freedom. [...] That's the reason why we have members that are women above 70 years old because they only need a car once a week to go shopping and they don't want to deal with tires and going to the service stuff.”* (Bilkollektivet's representative)

*“The benefits for the customers do obviously not have to own a car so you can use a car without owning a car, which makes car using easier, accessible even for younger customers all the way down to 18 years. [...] It fits in between some clearly defined offers that we have, so that is why it is interesting for us to investigate and get more information about the characteristic of the customers and the feasibility of this and also the profitability if there is any.”* (Kolumbus' representative)

#### **6.1.4 Economic incentive**

As expected, the informants quickly pointed out that the economic benefit was the strongest motivating force in terms of determining their mode of transportation. Six out of eight informants confirmed that the financial benefit and efficiency were their number one priority in the decision to adopt car sharing practice. The other two decided the availability of shared-car as their most important attribute, however, under a condition that the economic benefit is still guaranteed at a certain level. Basically, car sharing allows the

disowning of the car but still ensure the demand for mobility. In Norway, car ownership is expensive with high taxes, insurance, and maintained fees. Then car sharing offers customers access to cars nearby without bearing the hassle of actually processing one. For the supply side in the P2P model, the financial benefit is from the extra income earned from leasing their rarely used cars. There is no difference in customers' opinion between non-users and users.

Besides those main points, the informant 2.1 and 4.3 also revealed one of the benefits is that they can experience new and fresh cars, even expensive one (mostly in P2P platform) like Tesla, without having to own it.

*“For car sharing, if you have the app and you find the car then go to that location and pick it up. Then you can be carefree about maintenance, insurance, etc. and enjoy driving around so that’s a big benefit, that’s the pro.”* (Informant 2.1)

*“The benefit is that you don’t pay for all the extra costs just pay for the actual usage and also to have access to variety of nice cars.”* (Informant 4.3)

Also, the consumers are significantly price-conscious when it comes to a car sharing service as they expect it to be their cheaper alternative, in combination with other modes of transport, to car ownership.

*“To us, the big benefit was the economic one. We had to find a way to save money. And the car was expensive to keep, and we did save quite a bit by using car- sharing. [...] And of course, the price matters, if it becomes to so expensive then we switch back to owning a car again.”* (Informant 4.1)

*“The most important thing is that the price is low. It is the cheap service to use. I think that would be the most important factor.”* (Informant 4.2)

### **6.1.5 Environmental and societal incentive**

Car sharing can potentially benefit the environment and the infrastructure in terms of GHG emissions and VKT/VMT abatement by cutting down the number of cars on the road, congestion reduction, and saving more parking spaces for other land use plans.

Additionally, as a part of sharing economy, car sharing also contribute to sustainable consumption to avoid waste of social welfare caused by insufficient use of private cars. The researcher aims at finding out the answers for two questions: (1) to what extent do customer acknowledge the potential environmental and societal benefits of car sharing; and (2) how does this factor affect their decision regarding using car sharing service?

Not surprisingly, as Norway is one of the pioneering countries in environmental movement, all the informants are well aware of the potentiality of car sharing in protecting the environment and its role in sustainable mobility. One of the examples is the statement of the informant 2.1, who has not, but be very keen on using a car sharing service in the future: *“Yeah it's more environmental that's for sure so it's more sustainable.”*

*“Maybe less use of car. You have to plan more thoroughly what you're going to do with the car. For example, instead just doing three trips to the shop in one day then you have to plan to do everything at once.”* (Informant 3.1)

Noticeably, three informants pointed out that they are aware there is a required critical mass number of cars sharing users in order to obtain such benefits. This is in line with the perspectives of companies' representatives, in this case Bilkollektivet and Kolumbus. Given that both organizations are not private companies, the environmental and societal benefits play fundamental roles in their mission.

*“Car sharing helps reduce the amount of cars on the road. Air quality becomes better if there is enough people use car-sharing. But if there is only one company or there is a small group doing car sharing, it doesn't have that big of an effect if you cut down the traffic by three cars. If you cut the traffic daily by 300 cars, then there is a big advantage.”* (Informant 1.2)

*“I think to achieve that environmental and societal benefits in a large-scale, we need to have a lot of car shared. Maybe in the long run it could be a benefit.”* (Informant 4.1)

*“[...] still car sharing is new so not everybody is familiar with it. But as people get to know more and more car sharing, we start to see the opportunities.”* (Informant 4.2)

It was found from the literature review that there is a relatively high positive correlation between the consumer's environmental concern and their willingness to participate in car sharing. However, such a strong impact is not observed in this dataset. Although all the informants confirmed that they are positive about the environmental effect of car sharing, this attribute is not significant in their decision to join the scheme. They generally want to contribute to environmental protection, but that is not the core meaning of car sharing to them.

The informant 3.1, a user of Nabobil, reported that the reason he started to use this service is because of the referral discount code from his friend: *“Environmental benefits of carsharing not the first thing I think of.”*

The non-user informant 1.1 elaborates more on her preference: *“If I am given 3 options: (1) cheap but environmentally unfriendly, (2) more expensive and environmentally friendly, and (3) most environmentally friendly and very expensive, I will go for the 2<sup>nd</sup>. Environment is not a priority for people here, I think.”*

Besides, the informant 2.2 expressed skepticism towards her perceived environmental benefit of car sharing by questioning the environmental effect of the electric car, which seems to be overstated in her opinion.

*“I think people are turning to use electric cars, but to me it seems a click bait bandwagon by the producers, and we are not yet at the level in which we can save the world by using electric cars.”* (Informant 2.2)

The informants' responses show their concern over the environmental and societal effect of car sharing. However, it is not a strong determinant and more to a bonus. Still, the informants also imply that one of the reasons is the difficulty of measuring and proving that effect. Indeed, the environmental and societal benefits are studied to happen in a long run and only when the customer base of car sharing provider reaches a critical number.

## **6.2 Opportunity**

### **6.2.1 Accessibility of car sharing service in town**

### 6.2.1.1 *The car*

All the informant stated that the shared car per se is not really important for them, but also depends on the purpose of the trip. There are some notes regarding the car itself upon the trips.

First, it is about the type of cars. For example, if the customer wants to move to another place or help a friend to move, so they want to have a van; or when they want to shop furniture with a certain size, the vehicle needs to be big enough for their goods.

Second, the size of the car does matter in some cases. As the whole family joins, then the size of car should be large enough, as said by the informant 1.1: *“The models or engines are not important. But for a family of 5 people, the capacity must be considered, as long as the vehicle can accommodate all 5 members.”*

If it is a short trip within the city, they do not really care about the model, as long as the car can facilitate their journey well enough. In longer trips, the consumer might consider more comfortable cars.

*“If I am just going back and forth for a few kilometers then I don't care abouts model. But if I am driving from Stavanger to Bergen for instance then I want a more comfortable car.”* (Informant 3.1)

Having been the active members of Bilkollektivet for quite a long time, the informant 4.1 and 4.3 also shared their realistic experience in term of the shared car as follows. Shortly, they are more concerned about the functionality and capacity of the car than the brand and the appearance.

*“The car is more of positive add-ons. Bilkollektivet’ shared cars are quite new and are well-kept, I would say. And it's just like it's not something that matter a lot but it's been fun to ride new cars instead of older models. And they are quite easy to use as well.”* (Informant 4.1)

*“For Bilkollektivet I would like to have more choices with some other cars such as seven or nine-seater and SUVs and electric cars. [...] What I'm all preoccupied is how wide the rear seat is since we have to fit all three kids into one car. Actually, the*



*backseat of the electric car as they are having here in Stavanger is wider than the Toyota. Unless we have to bring a lot of equipments, we prefer using the electric car for our family.” (Informant 4.3)*

### **6.2.1.2 Availability**

Besides the price, the availability of the shared car nearby is also an important attribute to potential customers. The car is expected to be allocated within a reasonable location in their walking distance to pick up. It might be slightly different to a P2P model since finding a car from your surrounding neighborhood is easier than with the other models.

#### Non-users

One of the factors blocking the willingness to join car sharing to non-user informant 1.1 and informant 1.2 is their doubt on the availability of the shared vehicle nearby. Both of them do not live so close to the city center.

*“I am concerning that in Stavanger, the population density is not high enough, and then the accessibility of shared car might be rather low. Pricing and availability are equally important to me, if one fails I would not go on with other factors.” (Informant 1.1)*

The informant 2.1 seemed not to be positive about using a car sharing service frequently, especially for work travel, due to his job as a journalist: *“A requisition is that I should be able to get the car very quick when I need it. That's the most important thing. For example, if I wake up at 9:00 and I know I need a car for the job, I should be able to have it by 9:30.”* Because of the spontaneous nature of his job, he is likely to prefer having his own car over all alternatives. Especially in Stavanger city context, the scale of car sharing is still not efficient enough to cover dispersed population density, even in the future, the providers are likely to focus more on the central or densified areas.

#### Users

Regarding customers' expectations of the location of shared cars, it is seemingly easier for P2P to solve this. For station-based and free-floating models, it requires a huge amount of capital and human resources to invest in the car fleet, car density, and parking space. The informant 4.2 stated: *“The beauty of Nabobil is that I can just find a car close to my place,*

*like contact my neighbor and then you know it's much easier.”*

The current limited availability of the shared car fleet in Stavanger is also an issue to be improved in the future, according to the car sharing members.

*“But in general, I would say the availability is extremely important, it has to be as close to our house as possible.”* (Informant 4.1)

*“The biggest problem is that they are too far away from my house.”* (Informant 4.3)

The below response of the informant 3.1 marked a good point in respect of work travel demand using car sharing in Stavanger. Assuming the service price is reasonable, some informants shared that they do have demand to use car sharing to commute to work and then from work to home every day and prefer to have a fixed booking agreement instead of spending time looking for a slot everyday with uncertainty. Moreover, usually the car sharing service is hectic during peak hours and it is hard to meet the demand for work travel for everyone then. The informant 3.1 summed it up quite well.

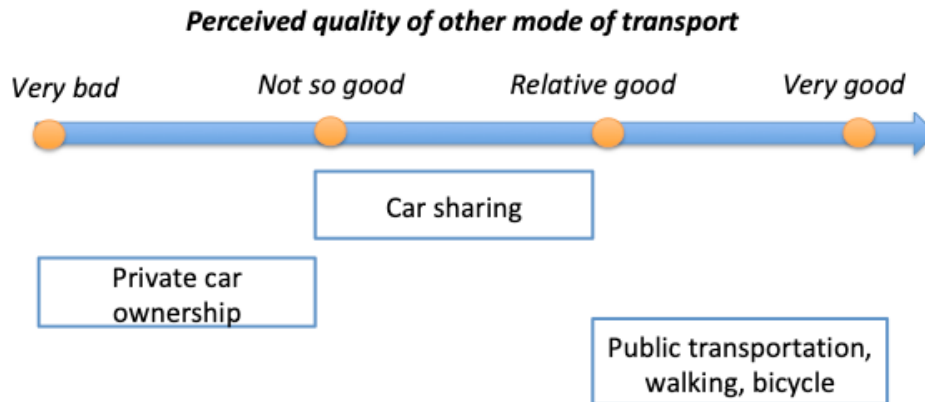
*“If I'm going to the shop, I don't want to walk halfway to the shop to pick up the car and then drive the rest. I want the car to be accessible in walking distance. If I'm going to use it for work travel, then I would like to have like a fixed booking at that time every day, don't have to book it separately.”* (Informant 3.1)

### **6.2.2 Availability of alternative modes of transport**

The personal evaluation of the alternatives to car driving including public transport, walking, cycling is also a significant element in customer's decision making process. The informants' response reflects a complicated relationship between their perceived quality of these alternatives and their willingness to use car sharing service, as captured in Figure 12. Note that: (1) the perceived quality includes the availability, performance of public transportation (for example the available route, the transit, the price of ticket, the bus schedule, etc.) and the physical environment for cyclist and pedestrian; (2) in this section, to examine the availability of the alternative to car usage only, we temporarily ignore the other factors influencing customer's choice of transport mean (such as their lifestyle, budget constraint); and (3) this perceived quality is personal based on their living location

and demand, not necessarily reflect the actual quality of these alternatives.

**Figure 13: The customer's preference for mode of transport, based on their perception on the quality of the alternatives.**



*Source: Own illustration*

It can be interpreted that car sharing potentially fills in the gap between car ownership and other options including public transport, walking, and cycling. Specifically, for those informants who find public transport dissatisfied due to their job requirements, car ownership is highly favored. For some informants, as the bus availability is good in their area, they consider public transport as their main means of commuting within the city, but might need a car sometimes and would consider a shared car. For the informant 2.1, he is strongly satisfied with the public transportation in Stavanger, hence a car is not attractive to him. Some noticeable responses are listed below.

#### Non-users

*“The bus availability in this area, but it's still not efficient enough, and definitely does not fit my demand for work travel at all. That is why I must have my own car.”* (Informant 1.2)

*“I am happy with the public transportation here. You can always sit in the bus comfortably. For me, the time for commuting is quite low and everything is very accessible with public transportation. So, a car is not necessary to me.”* (Informant 2.1)

*“It’s convenient to use bus. However, there are quite a lot of transits for me. So, I still want to have access to a car sometimes, especially when the weather is bad.”* (Informant 2.2)

### Users

*“I live in Madla, bus is good. I would say between Bergen Oslo and Stavanger, Stavanger is the worst. But still good enough here. I think if I work in Stavanger city center it would be fine to take bus. If I was working in Forus or something I would probably buy a car. If you live in Bergen or Oslo, you don’t need a car to travel within the city since the public transportation can meet your demand in most cases.”* (Informant 4.2)

### **6.2.3 Affordability: Perceived cost of car sharing**

One of the possible opportunity factors in the MOAB model discovered from the interview is consumer’s perceived cost of car sharing or their affordability. It is argued by scholars that some consumers are concerned of possible pricing and cost issues. In this section, the researcher only focusses on the pricing factors considering that other forms of costs such as time and effort spent, willingness to take risk and insecurity over insurance policy would be covered in the ability categorize.

There are some prominent opinions shared by car sharing members of Nabobil and Bilkollektivet based on their experience. The informant 4.2 stated that in general, the price of car rental could be 50% higher in comparison to the cost of a shared car he found in Nabobil, provided that the chosen car is not a luxurious or expensive one. This difference in price is the determinant factor that motivates him to choose Nabobil over other options.

From another aspect, the informant 4.1 found that car sharing is suitable for the demand on a short-term basis. If someone needs to use a car in the long term, car rental or ownership might be a better option in terms of the pricing cost. The informant 4.2 shared the same opinion and even elaborated by giving an example of his cost calculation.

*“Last summer, we needed a car for quite a long time for a month and we ended renting an ordinary rental car because if we use Bilkollektivet for a longer phase then it becomes extremely expensive. So car sharing is best option on short-term basis.”*

(Informant 4.1)

*“If I needed a car for work travel five days a week, it would probably be more effective to buy a cheap car. Let's say I rent a cheap car in Nabobil. It would be approximately 300kr per day and then you have to add 200kr for the insurance so it's 500kr per day. It is going to be 2500kr/ week, 10,000kr/ month. Meanwhile I can have my own car with half of that cost.”* (Informant 4.2)

## **6.3 Ability**

### **6.3.1 Knowledge**

#### ***6.3.1.1 Perception on car sharing model***

The researcher hereby will present some remarkable perceived definitions of car sharing from the interviews, which encourage or inhibit the informants from joining this scheme.

The informant 1.1 perceived that car sharing is not for her because *“car-sharing is either leasing, when the owners lease their vehicle on three months to a year, or co-owning a vehicle by many people; known as private sharing”*. Basically in her opinion, to join car sharing model, she needs to at least own a car and share it with many people.

Noticeably, there is a dominant tendency that except for informant 1.1 and two members of Bilkollektivet, the remaining informants are only familiar with the P2P model when asked about car sharing definition. Some examples are listed below.

*“I would think that you either are using social media or an app. There are a group of people where they put their cars out front so service and people share it and people who own a car make the car available for certain amount of time.”* (Informant 1.2)

*“People set their car available for all to use and people can go into the portal and rent the car for the time they want.”* (Informant 3.1)

Interestingly, the informant 4.1 revealed that she was more biased to the member-based model of Bilkollektivet since renting car from a formal organization gives her a secure feeling over potential plague while using the car.

*“I am most familiar with the member-based type that we are using. P2P is complicated. It's also more professional if something was going to happen then they have an organization to deal with it.”* (Informant 4.1)

### **6.3.1.2 Limited knowledge of car insurance and liability**

The majority of the interviewed customers expressed their uncertain knowledge and huge concern over the insurance policy and liability in case some plague arised when joining car sharing. For non-user, this is one of the main obstacles that restrict their participant in car sharing.

*“One thing that worries me about car-sharing is the legal aspect. That would make me skeptical for having my car participated in a car-sharing scheme.”* (Informant 1.2)

Specially, the informant 2.1 responded that he felt more comfortable using a car rental service since they seemed to have a protocol to solve the potential plague and he was clear about their policy.

*“If something happens, how it would be solved with the insurance. Maybe the person that is renting the car they have their own insurance, but will that be aggregated into their insurance? It is not clear to me. So I'll go with a company where everything is already talked about.”* (Informant 2.1)

As a Nabobil user, the informant 4.2 brought up his confusion concerning the insurance fee policy of Nabobil: the same fee for every type of car.

*“I think in general that Nabobil insurance policies is a bit expensive because even if you rent a cheap car then you still have to pay the same price for insurance and that doesn't really make sense. If you have a cheap car it should be a cheaper insurance. If you have a very expensive car it should it can be expensive insurance but Nabobil charges the same insurance, no matter the car.”* (Informant 4.2)

### **6.3.1.3 Ability in planning and financing**

Apart from car ownership, car sharing is more of a deliberative practice that requires scheduling and organizing skills. A private car grants the owners ready and exclusive

access that allows more accustomed and spontaneous use. Having a private car helps the consumers avoid unpleasant experiences when their chance to get a car is uncertain, depending on other users and the availability of their desired vehicle at a certain distance. For instance, while a private car owner can decide at short notice to go shopping or meeting up friends, a car sharing user would have to look for and book the car and stick to the reserved time slot. Hence, to adopt car sharing practice, one actually needs to invest time and effort to schedule and organize activities in accordance with vehicle availability. An active car sharing member, informant 4.1, stated: *“I think using the car sharing service system is a learning process. You have to invest a bit of time in the beginning in finding out the way to use the system effectively and so on. If you are not willing to do that then it does not work.”* (Informant 4.1)

Another type of planning associated with car sharing involves financing skills. Briefly, car sharing practice helps reduce the financial planning in some respects (payment per actual usage and/ or membership fee only once) but also increases it in other ways (household budgeting).

Some of the informants reported that car sharing service would be useful in releasing them from the hassle of owning a car including dealing with insurance, parking, toll money, and maintenance fee. With car sharing, the insurance is built in the renting fee, which makes the planning simpler and easier. On the other hand, some argued that this kind of service requires their investment of time and effort in planning every month or before any trip to optimize the cost and utility.

*“For my family, I need to do some calculation on the amount payable per month. If it is higher or equal with my current expenses, I will still go for private use instead.”* (Informant 1.1)

*“Maybe the most important factor is how the fee is calculated, whether by distance or by time used. [...] I have to weigh among options, whether I should rent a car for 3000kr or I would use bus service, which is cheaper.”* (Informant 2.2)

### **6.3.2 The trust of stewardship in car sharing**

One potential factor influencing customer's decision making in terms of car sharing adoption involves trust issue towards the management of this service. During the interviews, this issue came up very frequently, especially with the non-user group, accounting for their reluctance to join car sharing.

Two informants also pointed out that except for the pricing factor, they mainly prefer renting service from a company since the stewardship seems to be professionally performed. The informant 2.1 also gave a specific scenario when they possibly rent a car from an individual supplier in the Nabobil platform. If there were some unexpected plagues causing damage to the car, he would want to have an aligned solution with a clear-cut agreement on liability rather than being stuck with potential guilty feeling toward the owner. Also, this informant added his opinion concerning the management of the vehicle fleet, which is in line with the responses from the informant 2.2 and 4.2:

*“Before passing the car to another customer, it's hard for the company to check the inside engine thoroughly. Well, I guess if nobody does it, there can be some potential problems then.”* (Informant 2.1)

*“It is important that the car is well-kept, reliable, and safe to use.”* (Informant 4.2)

*“However, given the fact that many people may use the same vehicle, hygiene is of some concern to me, like garbage leftover after a ride by certain people or if someone is sick, having a fever.”* (Informant 2.2)

On the other hand, the informant 1.1 expressed her favor of service provided and managed by public authorities, over private organizations: *“I prefer a service run by the government. Definitely.”*

### **6.3.3 Transportation habit**

The transport habit depends on many factors such as income level, living location, personal preference, and the weather. Noticeably, this habitual aspect will change through the life stage and trigger event. As shared by the informant 2.2: *“Given the weather in*



Norway, driving a car is also more cozy and comfy. In near future, I am planning to purchase a car when ready financially.” With the same financial obstacle at the moment, the informant 4.2 also confirmed that his main mode of transport is the bus. Also determining bus as the main way of commuting, but the ground of the informant 2.1’s travelling habit is due to his preference rather than cost saving, stated as below.

*“I live in Hillevag. The bus availability in my area is quite good. When I bought the flat, the proximity to the bus station was taken into consideration. In this place the supermarkets, the gym, the dance school that are very close to the bus stations in my walking distance.”* (Informant 2.1)

As a car sharing members, the informant 4.3 favors cycling over all mode of transport for the whole family.

*“Because it's quick no packing problems, it's a little bit of exercise and fresh air, and you get much closer contact with other people. And you don't occupy a lot of space in the city as a car is. We like the outdoors quite a lot so we go for like weekend trips that's what we mostly use the car for, weekend trip or Easter or winter holiday.”* (Informant 4.3)

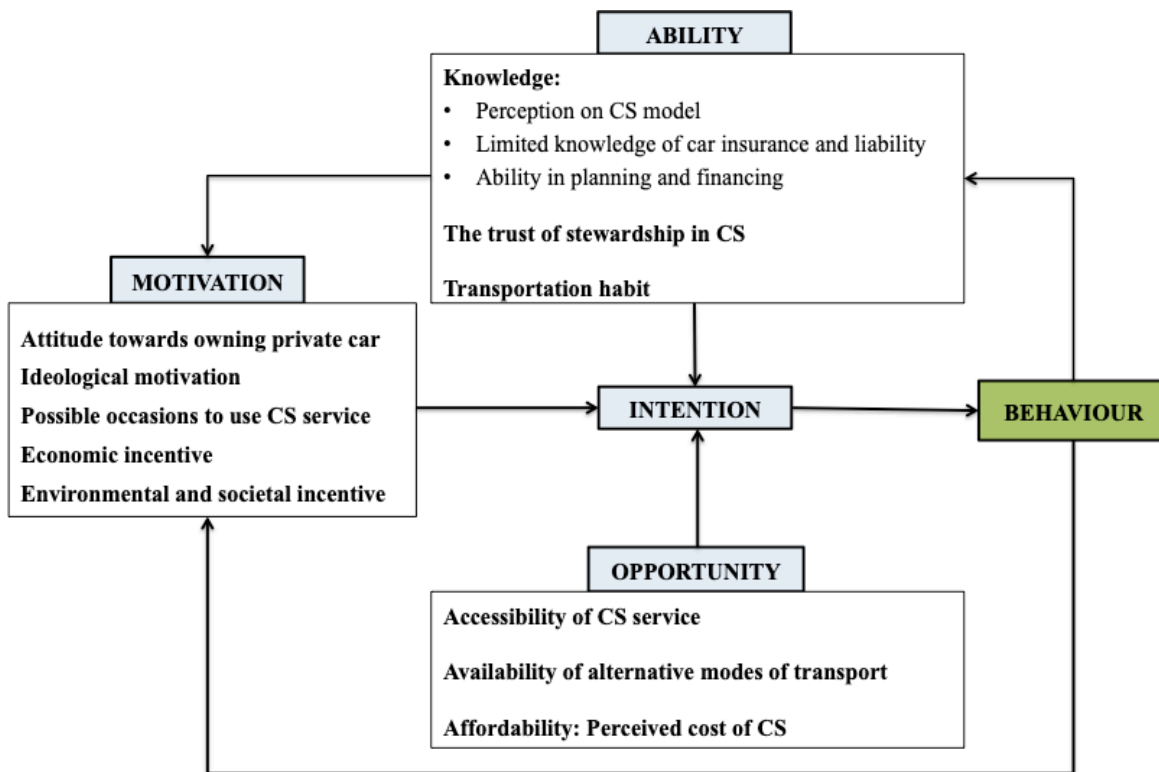
To the three above informants, they advocate using public transportation along with soft travel alternatives i.e. cycling and walking. Then the car sharing service will be considered when their demand cannot be serviced by those modes of transport and must compete against car rental offers.

One of the remarkable elements of this section is the role of a trigger event in the consumer’s decision making. This can be a game changer in their decision. Also, as reported by multiple literature works, many car sharing users started their membership due to a trigger event. The case of the informant 4.1 would be relevant.

*“When I quit my job three years ago, we were going to live on one income and sold our car. The children walk to school. My husband and I we go by bikes. [...] We have had a bus - a monthly bus ticket that covers the whole family to use sometimes but not for long distances. That was when we started joining car sharing.”* (Informant 4.1)

**To sum up**, Figure 14 summarizes all components of the MOAB model applied to explain the factors influencing customer’s decision-making regarding using a car sharing service. In the Figure, the arrows (from Behavior directly to Motivation and from Behavior to Motivation through Ability) imply that the evaluation of car sharing experience might change after trials and experiences. Also, improvement in the ability to utilize the activity, gained through the learning process, will affect the attitude and perception of car sharing too.

**Figure 14: Overview of the findings**



*Source: Own illustration. Note: CS = “car sharing”.*

## Chapter 7: Discussion

In the previous chapter, the MOAB framework was used to analyze the results obtained from the interviews. This chapter's objectives are to reflect on methodologies used and provide an in-depth analysis of the findings. It includes reflection on important aspects and discusses the limitations encountered as well as suggestions for future research.

### 7.1 The need for comprehensive understanding of car sharing

It is worth noting from the interviews that the awareness of car sharing is not widespread enough in terms of the definition, operation, insurance policy, technological improvement and even the potential benefits. The limited knowledge about the problem and solution might be a barrier blocking the customers to car sharing practice that is actually improved continuously thanks to technological advancement. Also, the lack of knowledge about a phenomenon also negatively affects the trust placed on this product or service. Consumers are naturally skeptical about new offers that they are not familiar with. Studies have reported that the perceived value, which means customer's subjective evaluation of the utility of a service, of car sharing is a crucial predictor of passenger loyalty. In general, customers make purchase decisions based on perceived value (Ma et al., 2020). Customer perceived value also plays a decisive role in their reusing of shared cars (Blackwell, Szeinbach, Barnes, Garner, & Bush, 1999).

In this thesis's dataset, five out of eight individuals informants either not know what car sharing really is or only acknowledge a P2P model. Most of the interviewed customers also have limited knowledge about the insurance policy and liability of car sharing operation. This is one of the main barriers preventing them from carrying out the car sharing practice. It is also evident from the result that the members of the cooperative Bilkollektivet tend to have more overview and also in-depth information about the car sharing model. Meanwhile, non-users and Nabobil members only consider car sharing as a platform for people to lease out their cars or rent them from the neighborhood. As a result, they are unable to fully acknowledge the benefits of car sharing to the whole society and as a part of sustainable transportation solutions.

The results are in line with various findings mentioned in the literature review regarding the blocking effect of customer's limited knowledge about car sharing operation on their participation in this practice. Accordingly, the initial customers, especially for B2C and cooperative users, are mainly early adopters who are willing to invest time and effort in learning the model and related matters. In Stavanger context, it seems that car sharing remains a niche market, even though this concept and model is not new. From the results, the author would argue that the awareness of car sharing as a sustainable travel alternative is not sufficiently commonplace. Moreover, the P2P platform seems to be dominant in gaining public awareness, compared to conventional models. However, the entry of government car sharing providers into the market might potentially be a game changer in this aspect as there is a positive sign that some informants express that they favor an authorized service.

## **7.2 The significance of environmental incentive**

Although perceiving car sharing as a sustainable travel alternative, consumers, in fact, are triggered by the fact that this practice helps them to save costs and is a good substitution to non-sharing options such as car renting. In this observed sample, the environmental incentive is shown to have a weak influence in terms of recruiting new car sharing users.

As mentioned in the analysis chapter, while the majority of the informants confirmed that economic benefit gained from car sharing is the strongest encouraging force to join this scheme, none of them considered the environmental incentive as the deciding factor of becoming a car sharing practitioner. On the other hand, many informants expressed their concern relating to sustainable lifestyle and willingness to go with an environment-friendly alternative if its price is reasonable. However, there seem to be a missing link between their environmental awareness and car sharing context, due to two observed reasons: (1) environmental benefits of car sharing is hard to prove and quantify; (2) in customer's perception, for these potential benefits to actually happen, the critical mass number of users is required, meanwhile car sharing is still a niche segment in Stavanger.

Among eight individual informants, there is one stating that he has stayed a loyal member since car sharing fits his family's active and sustainable lifestyle. Given those

observations, the author would argue that within the Stavanger context, the significance level of environment might change once car sharing becomes more popular practice among populations. Then the sustainable benefits would seem more obtainable and convincing to consumers. Furthermore, in the decision making process, the customer's motivation tends to be dominated by economic incentives, while the environmental drive is a weak element. However, this sustainable motivation might have stronger influence in the retention of users and the repeat of this practice, as also suggested by George (2017). That means nobody would become car sharing users because of the environmental effect, but if they are experienced with car sharing, then the environmental meaning may help retain them as car sharing users.

From the existing literature, the role of environmental factors is undeniable yet varies across locations. This thesis's dataset shows the same result as study conducted by Thøgersen & Norre (1999) which indicated that the early adopters were more environmentally conscious. However, this incentive is not a strong determinant. Investigating the role of sustainability in car sharing from consumer perspective, Hartl, Sabitzer, Hofmann, & Penz (2018) argued that sustainable impact is rather perceived as a positive side effect of this practice. These authors also stated that sustainable concerns seem more important with P2P services than with B2C services. This finding contradicts this thesis's result as the users of Nabobil (P2P platform) only focus on the economic benefits and convenience, while users of Bilkollektivet show more concern over the operation and societal benefit of car sharing practice.

To sum up, it is interesting to point out that the influence of environmental incentives on customers' readiness to join a car sharing model is not as strong as expected. However, this variable might change when it comes to retaining experienced users or attracting pro-environment customers and early adopters. This also implies the need for action to make the car sharing environmental impact more convincing and associate this practice with greener, more sustainable lifestyle and image, hence more appealing to those who care about the environment.

### **7.3 The role of car sharing in a sustainable transportation system**

There is a broad consensus among researchers that car sharing should not be treated as a panacea for travel choice, particularly in urban areas. As Kolumbus representative stated in the interview, this practice is a complementary choice to public transport and soft travel alternative i.e., walking and cycling. From a sustainable transportation perspective, although its environmental benefits have remained unclear, car sharing is still seen as the missing link in sustainable transportation, combining the flexibility, mobility, and accessibility of private cars with the economics and sustainability of public transportation (Britton, 2000).

Both interviewed representatives from the customer and supply side agree on the gap of the current transportation network that car sharing can fulfill, i.e., the occasions that car sharing service is needed such as heavy stuff shopping, moving to a new place, transporting big furniture, and short hiking trip. This finding is very close to various studies concluding that car sharing is a complement to other alternatives to the private vehicle and only makes sense as a part of wider transportation package in which public transportation, walking and cycling are facilitated (Enoch & Taylor, 2006; Goldman & Gorham, 2006; Huwer, 2004).

On the other hand, it is also evident that even though many interviewees admitted they would want to use a shared car to commute to work, none of them could see the possibility that individual car sharing membership can meet this demand due to the cost and availability of shared vehicle nearby in such peak hours. This refers to the potential for companies to consider their own car sharing scheme for employees using B2B car sharing service. In fact, according to statistics from Bilkollektivet (see the Background chapter, section 3), the market for B2B car sharing in Stavanger has been growing; and even the government authorities are encouraged to adopt car sharing practice as well (Stavanger Municipality, 2018).

From these above findings, some challenges are addressed for car sharing's further development in the Stavanger context. Although the municipality has been working on redirecting the transport system towards sustainable mobility infrastructure, there is still a

long way to go due to the high level of car ownership and limitation caused by dispersed city planning. In a medium-sized dispersed city region, the car is often preferred compared to other modes of transportation, with the convenience of the car rises while the efficiency of public transportation and cycling goes down (Müller-Eie, 2018). The results of the interviews somehow indicate that most of the respondents still prefer to own a private car as it meets their daily demand for commuting in this dispersed city region. In general, car ownership has been remaining favorable in the Stavanger context. From previously conducted studies, negative financial measurements (such as high taxation of car ownership, road toll, parking fee) and positive monetary measurements (such as discounted bus ticket) tend to be less effective in an affluent community like the Stavanger population (Asensio, 2002; Muller-Eie, 2012). Additionally, some studies suggested that habits are underestimated given the fact that habitual behavior mediates some of the rational decision making process (Schwanen, Banister, & Anable, 2012; Verplanken, 2012). As mentioned by some informants, the social and cultural meaning of the car as a symbol of freedom, or personal identity or social status might also affect the desire of owning one.

Another highlight from the findings is the necessity of enhancing the availability of shared vehicles as well as complementary alternatives including public transport, walking and cycling environment. As mentioned by Kent & Dowling (2013), a set of related factors, namely high residential and commercial density, well-connected and well-maintained physical environment, restricted parking for private vehicles, etc., would pave the way for car sharing further adoption. In the suggested MOAB model, these external factors contribute to foster the development of car sharing. They are, however, seen as a critical barrier to the transition into sustainable mobility as it is challenging and takes time to change.

#### **7.4 User recommendations**

Over the interviews with customers, some informants gave recommendations that are claimed to make car sharing offers more appealing. Also, some suggestions for approaching target users from the customer perspectives are also mentioned.

## Pricing

As mentioned earlier in the analysis part, the informant 4.2 suggested that it would be more reasonable for the P2P car sharing platform like Nabobil to consider customizing the insurance fee based on the value or price range of the shared car instead of charging the same fee for every case. Also having unpleasant experience regarding the insurance fee option, according to the informant 4.3, he would be more satisfied if Bilkollektivet adds the function of memorizing and repeating the customer's preferred choice: *"It is really a hassle that we have to remember to not have the extra insurance every time."*

Furthermore, some informants also suggest that the renting fee of electric cars should be cheaper than the other types to be in line with the sustainable goal of non-emission vehicles. This improvement will encourage the consumer to use electric vehicles more frequently. The informant 4.3 stated: *"I wonder why the electric cars are so expensive per kilometer compared to the other ones. It is supposed that the cost of running an electric car is lower."*

## Fleet of car

The recommendations regarding the availability and allocation of mainly came from the users of Bilkollektivet as it is the only B2C provider observed in the dataset. Specifically, the informant 4.1 addressed the importance of enriching the fleet of cars in terms of quantity and coverage in different residential areas. The informant 4.3 also recommended B2C car sharing operators to place more shared vehicles in major areas with high residential and commercial density to cover the mixed uses of car sharing.

*"They need to provide cars at different pickup points in order for it to be a good service. [...] It is definitely the most important aspect I think."* (Informant 4.1)

*"I would suggest focusing on some major areas and making sure they make a good offer wherever there are businesses and some people living in closely where you can have like the mixed usage."* (Informant 4.3)



### How to approach potential customers

When being asked about the effective way of approaching target customers, from their perspective, some informants agreed that the marketing message should be direct and focuses on the practical benefits such as cost saving, great mobility convenience, or addressing the core of car sharing meaning. This point is particularly relevant to the study which indicated the role of familiarity in encouraging customers to join collaborative consumption (Hennig-Thurau et al., 2007). Accordingly, the providers are suggested to make the learning process of using car sharing service as easy and simple as possible, to reduce the cost (in this case is time and effort) of customer's transition.

According to the informant 4.2: *“There is a saying that Norwegians buy the same milk and eggs the day they're born until they die. I think providers have to put a lot of resources into good marketing and try to convince Norwegians that they can offer either really good cars or very cheap price or great convenience.”* The informant 4.3 also suggested that the providers should demonstrate how the car sharing model works and leveraging search engine marketing like Google Ads.

Furthermore, from his experience, the informant 3.1 admitted that the referral discount code (from Nabobil in his case) worked well in terms of attracting new users. Customers having invite code from friends will get a discount in their first use of service, for instance. Instant economic benefits will be appealing to motivate target customers to become car sharing members.

### **7.5 Insight from car sharing provider**

This section aims at analyzing the insight on car sharing service in Stavanger context from the provider's perspective. The data used was collected from the interview with representatives from Bilkollektivet and Kolumbus. Although Kolumbus cannot be seen as a car sharing provider as they are still considering the implementation of a car sharing offer, their information could be insightful and relevant to some aspects of the MOAB framework. The inputs from the provider (and potential provider) side will be inserted in response to the customer's insight to have a comparison between both side's perspectives on relevant aspects. It is worth mentioning the interviews of consumers and companies are

conducted independently and the companies' representatives were not provided the answers of customers. The purpose is to find out if there is any gap or mismatch in their perceptions and expectations.

### **7.5.1 Motivation**

There is no difference between the perceptions of consumers and providers regarding the potential benefits and the possible purposes of using car sharing service. Both Bilkollektivet and Kolumbus's representatives quickly pointed out that the customers could benefit from car sharing offers economically. They can be granted access to a car without owning it. Car sharing releases users from the cost and hassle of car ownership. Furthermore, the representatives also agreed on the possible scenarios in which consumers might prefer car to other alternatives such as leisure activities, hiking trips, shopping for large items, and spontaneous trip in long distances.

Kolumbus's representatives emphasized that car sharing offered its users the flexibility and convenience. They also stated: *"It fits in between some clearly defined offers that we currently have, so that it is interesting for us to investigate and get more information about the characteristics of the customers and the feasibility of this model (in Stavanger) and the profitability if any."* Meanwhile, Bilkollektivet's representative added their awareness of potential segments for business clients: *"There are also some companies using car sharing to make the company's practice more environment-friendly."*

Additionally, the informants from both companies are fully aware of the potential influence of car sharing on the transportation infrastructure and environment. They named some of these benefits such as the reduction in car usage, the increase in available space for other land use, and less congestion. Noticeably, Kolumbus's representatives argued that the benefits of car sharing were not immediate and viable like the car ownership.

*"Car sharing benefits are in long-term, they are not so apparent necessarily. We kind of need to get people to understand that."* (Kolumbus's representatives)

Besides, Kolumbus's representatives also expressed their consideration on the necessity for the company, as a public transport authority, to *"use taxpayer's money to subsidize a*

*car sharing activity [...] if this model suits the county's strategy [...] and the market is not doing so in an adequate way*". It is fair to say that for both companies, in which one is a non-profit cooperative and one is a public authority, the main drive for them to carry out car sharing service lies on the benefits offered to customers and society, rather than to make a profit.

### **7.5.2 Ability**

Regarding the perception of car sharing users, Bilkollektivet stated that: "*They are actually owners, they co-own all the cars.*" This is the core concept of the cooperative model and their operation involves around this meaning. Compared to the customer's perceived meaning of car sharing, only Bilkollektivet's active members shared the same understanding. The other informants mostly associate the car sharing service with P2P platforms. On the other hand, Kolumbus's representatives portrayed their prime segment as a group of young customers above 18 years old holding a driving license. This argument is in line with findings from existing literature and also the criteria for this thesis's criteria for respondent recruitment. Accordingly, target customers of car sharing service are young populations with a certain ability to adopt this practice, at least being competent to drive a car in Norway.

It is worth noting that both companies' representatives shared their concern about the transportation habit of customers in Stavanger, which may restrict their willingness to join car sharing activity. According to Bilkollektivet's representative, Stavanger population is generally well off and prefer driving their own cars. The car still holds its cultural meaning as a symbol of economic and social status. On the other hand, he pointed a positive sign that the number of cyclists in this city is rising. Sharing the same point of view, Kolumbus's representatives also address the need for changing people's old habits of owning private cars. In short, both companies acknowledge that the barrier to car sharing adoption may lie in the customer's old habit of choosing private cars over other sustainable alternative modes of transportation. From the results gained from the interviews with customers, this barrier seems to be challenging in the Stavanger context.

### 7.5.3 Opportunity

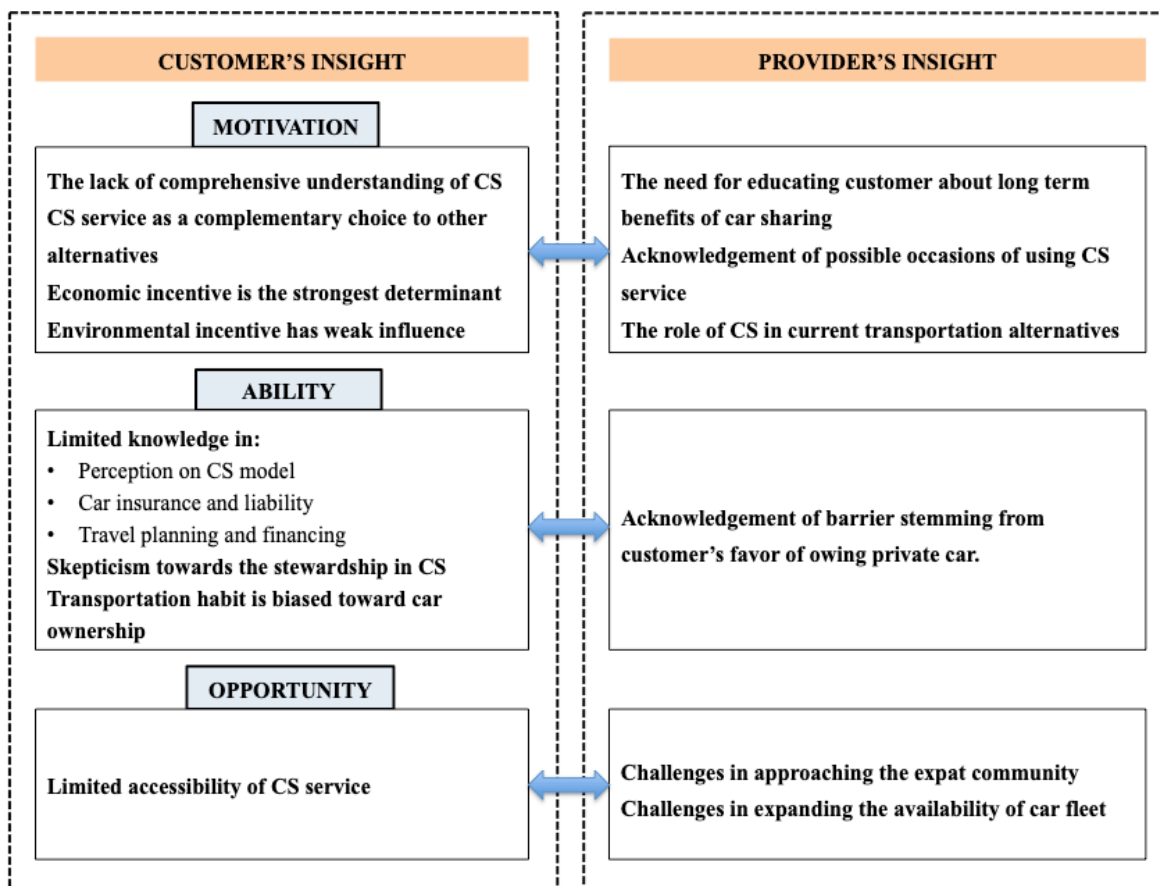
In this section, the opinions of the companies' representative will be discussed in terms of the accessibility of car sharing service and the availability of alternative modes of transport in Stavanger.

Regarding the accessibility of car sharing service, Bilkollektivet's representative named some challenges for them to expand their offers within the city. Firstly, to gain customer's trust toward the popularity of car sharing, they need to reach a critical mass of memberships. This requires further investment in capital and human resource. Secondly, according to this representative: *"The city planning has been based on private car usage and particularly spread out. [...] It is challenging to find a spot to locate the shared cars which need to meet the mixed-use demand."* Secondly, this informant also expressed the company's intention to make the offer accessible to the expat community but has not been able to reach them. The Norwegian name and language used in their website might be a barrier for international users in Stavanger to experience the company's service. When it comes to the potential of the market, Bilkollektivet's representative recognized that they did not have a direct competitor in Stavanger in the B2C segment, which could be seen as their advantage. He also shared about the possible opportunity to cooperate with other stakeholders to expand their market segment, for example, providing a shared vehicle to the new project of housing companies. Being aware of customer expectations on the availability of shared cars nearby, the company has managed to move the cars around the city, based on the number of bookings. Obviously, the relationship between user and provider is not static, but co-evolutionary, as reported by George (2017). Accordingly, the providers respond to how users engage in their service. In the thesis's results, the informant 4.1 also stated that after many years of using Bilkollektivet's service, she acknowledged their improvements over time.

On the other hand, Kolumbus's representatives provided some insightful information about the availability of alternative modes of transport. In their opinion, the population density in Stavanger is dispersed, leading to the difficulty in creating an efficient public transport. The distance between commercial and residential areas are quite big. Hence soft travel alternatives such as cycling and walking might not be a good choice in many cases.

Moreover, the population size can also be a challenge, as these representatives stated: *“It is easier to obtain a critical mass if we have a bigger market size.”* They also mentioned two main challenges for car sharing adoption in the Stavanger context including the relevance and the pricing strategy. According to the representatives, for relevance, one company should place their cars where they can reach as many customers as possible. For the pricing strategy, the car sharing offers need to be reasonable enough to compete with other alternatives such as taxi, public transport, and car renting service. Also, for Kolumbus to subsidize car sharing into their portfolio of mobility choices, they need to see the ground in which *“the pricing for this service is too high to be exploited by private companies but the economic utility for the society is still higher than the cost”* (Kolumbus’s representatives). To sum up, the key findings related to customer insight and provider insight will be provide in Figure 15.

**Figure 15: Summary of key findings of customer insight and provider insight**



Source: Own illustration

## 7.6 Limitation

Firstly, the sample size is relatively small since the thesis should be seen as an exploratory study to provide some in-depth insights that would lay the foundation for further empirical research on car sharing in the Stavanger. It is also worth noting here that the informants chosen are not a representative sample. Hence the interview results do not reflect the tendency of the general population. Also some results should rather be considered as suggested determinants for further research than final conclusion.

Secondly, the objective of this study is to investigate the willingness to use car sharing service from the perspective of car renter. Therefore, the insight of car owner in P2P model is not inclusive. The location of this thesis is also restricted within Stavanger city, which means that the results might be different from customer's insight in other cities and regions.

Thirdly, the sample of this thesis only involves users of a P2P platform (Nabobil) and a cooperative (Bilkollektivet). Given the lack of representative users of the B2C profit-companies such as Hyra, this could potentially lead to certain limitations of the findings.

Fourthly, as mentioned earlier in the Analytical framework chapter, the MOAB model holds certain limitations, specifically the restricted reflection on customer's values and beliefs and the gap in acknowledging and explaining the act of motivation. This is to say that future research would benefit from including the MOAB model with another psychological theory. In this thesis, the author decided to use MOAB and consider this disadvantage as a trade-off in order to fully capture both internal and external factors influencing customer's intention and behavior.

Lastly, there is certain restriction in interview recruitment and data collecting process due to the Covid-19 outbreak. As a matter of fact, some of the targeted informants (both customer and provider side) refused to participate in the interview. Moreover, due to the social distancing regulation, the interviews were mostly conducted online via a social platform. This, along with Internet connection problems, sometimes caused difficulty for the interviewer to have bonding and interaction with the informant, which is an important

factor for the success of in-depth semi-structured interviews. Due to this issue, the quality of the collected data is somehow negatively affected.

## Chapter 8: Conclusion

This chapter begins with a summary of findings in accordance with the earlier stated research questions, followed by a description of the theoretical and practical implications of the findings for the car sharing operators.

### 8.1 Summary of findings

As an emerging innovative phenomenon, car sharing plays an important role in the transition to more sustainable mobility in urban areas, given its potential benefits to the individuals, the environment, and the transportation infrastructure. In particular, the widespread adoption of car sharing is also an objective of Stavanger municipality's climate and environmental action plan from 2018-2022 (Stavanger Municipality, 2018). In spite of its phenomenal growth recently, car sharing remains a niche product in the Stavanger market. It is crucial to learn more about the insight of target customers in order to expand the car sharing practice among the city's population.

A minimal number of studies have been focused on car sharing user behavior in Norway and Stavanger city. Therefore, as an explorative study, this thesis has examined several factors affecting the customer's willingness to become car sharing practitioners in Stavanger. The thesis uses the Motivation-Opportunity-Ability-Behavior model to combine both internal and external factors. The analyzed data were collected from in-depth interviews with customers, along with information gained from interviews with representatives of Bilkollektivet and Kolumbus. A summary of the findings for the addressed research questions will be provided hereafter.

*The primary research question: What factors influence a customer's willingness to use car sharing services in Stavanger?*

The consumer's decision-making process is influenced by various internal and external factors, grouped into three categories: motivation, ability, and opportunity, as demonstrated in Figure 14 (Chapter 6). The motivational factors include their attitude towards owning a private car, ideological motivation, the perceived purposes of using car sharing, as well as the set of economic, environmental, and societal incentives. The ability



factors involve the customer's perception of the car sharing model, the knowledge of car insurance and liability, the ability to plan and finance, the transportation habit, and their trust in stewardship in the car sharing service. The opportunity element consists of the accessibility of car sharing service, the availability of alternative modes of transport, and the perceived cost of car sharing offer. Each mentioned factor should be investigated in relation to the others in the entire model instead of being examined solely. Furthermore, the findings also indicate that the ability and motivation factors may change after the potential customer becomes a car sharing member or gains more experience in using this practice.

As expected, this study finds that economic benefit is the most influential motivational force in terms of using a car sharing service. Given its flexibility and convenience, car sharing is considered a proper choice of transport that fills in the gap of the other alternatives, including private cars, public transport, and soft travel alternative. Contrary to what one might predict, the environmental incentive in this dataset is not a critical determinant regarding recruiting new car sharing users.

*Sub-questions 1: What is the customer's perception of car sharing in Stavanger? To what extent are they aware of its benefits and operation within the city?*

Section 6.3 (Chapter 6) and further discussion in section 7.1 (Chapter 7) shed light on this sub question. Basically, the awareness of car sharing involving its concept, types of models, and the operation is not sufficiently common. Many of the informants only acknowledge a P2P model. The participants could quickly point out the potential benefits of car sharing to individual customers, the society, and the environment. However, in their perception, car sharing practice is associated with blurred lines of liability and insurance if any unexpected incident happens, which is the main reason why they do not use the service.

*Sub question 2: How do the customers want to be approached and convinced to use a car sharing service?*

The section "user recommendation," section 7.4 (Chapter 7), has answered this question thoroughly. Simply put, the customers prefer direct marketing messages from car sharing

providers, which should address the core benefits, functional as well as practical advantages, and be specific on the way it works. Furthermore, instant monetary benefits such as new user discount could be effective in attracting new customers.

*Sub question 3: What are the potential barriers to car sharing development in Stavanger?*

Besides the aforementioned factors in answer to the primary question, this study also highlights some primary barriers that may inhibit customer's readiness to become car sharing practitioners in the Stavanger context. Firstly, the level of private car ownership is still high in Stavanger due to several reasons: (1) the dispersed population and city planning along with the long distance between residential and commercial areas; (2) the affluent community; and (3) the cultural meaning and habit of driving a private car. Secondly, the limited availability of shared vehicles and car sharing providers in Stavanger is both a potential and a challenge for new suppliers. The more available car sharing service is, the more effective opportunity factors (in MOAB model) could foster the adoption of this practice. Lastly, public transportation drawbacks and limited physical environments for soft travel alternatives such as walking and cycling also potentially hinder the willingness to join a car sharing scheme.

## **8.2 Implications**

### **8.2.1 Theoretical implications**

This thesis has several theoretical implications. First, the explorative research recommends some fundamental attributes for further research to investigate customer behavior regarding car sharing adoption. These attributes are organized and discussed based on the MOAB framework. The author also suggests that it would be useful if future studies could include more psychological theory into the chosen model to have a deeper understanding of consumer's value and belief as well as their act of motivation. During the analysis and discussion part, the findings also address some potential directions for further research such as the role of environmental incentive in recruitment and retention car sharing of users, the impact of the meaning of car, and the habitual unconscious behavior of consumers in Stavanger. Furthermore, it would be helpful to conduct the empirical studies that compare car sharing target customer's insight and behavior in different

contexts and locations, for instance between Oslo and Stavanger. This approach may shed light on the impact of external and cultural factors on sustainable mobility choice.

Secondly, the MOAB framework also implies the relationship between its elements. This implication provides some interesting findings on customer's decision-making and the learning process of adopting a new service. As earlier mentioned, the arrows in Figure 11 refer to the effect of behavior element on ability and motivation factors. That means there might be a difference in customer's motivation and ability to use a car sharing service before and after their experience with this practice.

Lastly, the chosen analytical framework MOAB model also implies that sustainable behavior only happens if all the included factors are met to a certain degree. As explained by Thøgersen (2010), if one or more factors are not satisfied, the consumer is predicted to be less willing to join the activity. Especially, if the opportunity and ability factors are restricted, there will be a high chance of the attitude-behavior gap. It is common in real work cases that the consumers are sometimes inconsistent in their attitude and actual behavior. This implication might be a potential direction for further investigation in this gap.

### **8.2.2 Practical implications**

Besides some specific user's recommendations discussed in section 7.4 (Chapter 7), there are some additional implications for the car sharing suppliers. It is evident in the results that limited knowledge of car sharing practices and the perceived cost of car sharing in terms of money and effort are the main barriers for users. Therefore, the car sharing providers should provide a more comprehensive understanding of the car sharing concept and operation, especially regarding liability and insurance policy. The design of car sharing offers and interfaces (such as website, mobile application, and booking policy) should be simple, straight-forward, and familiar to the consumers to learn. The availability of shared vehicles also plays a vital role in recruiting new users, helping them recognize car sharing as a popular practice.

Furthermore, car sharing operators should exploit the scenarios in which a car is superior to public transportation in their marketing. From the customer responses regarding

possible occasions of using car sharing, the providers should leverage opportunities to collaborate with other stakeholders to expand their offers. For example, one informant gave positive feedback on the existing offer of Herzt bilpool located outside IKEA where people have demand for transporting heavy furniture purchased. The author would suggest that similar practices for this kind of partnership could be established near hiking destinations, university campuses, and student houses.

Referral marketing can be a useful tool for providers to approach and recruit new customers for two reasons: instant benefits attract new people to join the new scheme, and the new users tend to rely on their surrounding people's reviews when trying new model such as car sharing.

Finally, to encourage customers to adopt this kind of sustainable consumption, it is important to make the car sharing service appear as a popular and environment-friendly lifestyle and not limited to just a short-term car renting service. In other words, the providers are suggested to leverage the conceptual meaning and green image of car sharing to inspire their target customers.

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# Appendix

## 1. Interview guide:

### 1.1 Interview guide for non-users

1. How old are you?
2. What is your nationality? How long have you been in Stavanger?
3. What is your occupation (for example: office worker, non-office job, student, household etc.)?
4. Are you married? How many kids do you have?
5. Do you own a car? And what is fuel of your car (diesel, gasoline, hybrid, or electric)? 6. How often do you use a car when commuting within the city or travelling outside the city?
7. How is the bus availability in your living area? Do you prefer to commute by car or by bus?
8. Please share your thoughts on car sharing model, what do you know about this model?
9. What do you think about the benefits of car sharing service? (To the consumer or individual level, and then to the community and society level)?
10. What do you think about your possible purpose when using car sharing service (for example: work, leisure, personal activity, or shopping)?
11. What can you imagine the application of car sharing model in Stavanger would affect your personal life, shopping and travelling habit (positive and negative effect)?
12. Have you ever heard about any existing car sharing company? What do you think about their offers?
13. Let's think about the scenario in which the car sharing service is offered in Stavanger. What do you expect their offers to be? Can you rank your preferences in descending order (which one is most important)?

14. What do you think about advantages and disadvantages for a car sharing company to offer their service in Stavanger? Any suggestion to make it work from user's perspective?

15. If most or all of your preferences for a car are satisfied in car sharing service, will you be willing to use this service (drop your car/ switching from bus to use this service)? When and how often will you try this service if any?

## **1.2 Interview guide for car sharing users**

1. How old are you?

2. What is your nationality? How long have you been in Stavanger?

3. What is your occupation (for example: office worker, non-office job, student, household etc.)?

4. Are you married? How many kids do you have?

5. Do you own a car? And what is fuel of your car (diesel, gasoline, hybrid, or electric)? 6. How often do you use a car when commuting within the city or travelling outside the city?

7. How is the bus availability in your living area? Do you prefer to commute by car or by bus?

8. Please share your thoughts on car sharing model, what do you know about this model?

9. What do you think about the benefits of car sharing service? (To the consumer or individual level, and then to the community and society level)?

10. What do you think about your possible purpose when using car sharing service (for example: work, leisure, personal activity, or shopping)?

11. What can you imagine the application of car sharing model in Stavanger would affect your personal life, shopping and travelling habit (positive and negative effect)?

12. Have you ever heard about any existing car sharing company? What do you think about their offers?



13. Let's think about the scenario in which the car sharing service is offered in Stavanger. What do you expect their offers to be? Can you rank your preferences in descending order (which one is most important)?

14. If most or all of your preferences for a car are satisfied in car sharing service, will you be willing to use this service (drop your car/ switching from bus to use this service)? When and how often will you try car sharing service if any?

15. Which supplier did you choose for your past experience with car sharing? In general, are you happy with the experience? If you are to rate your level of satisfaction from 1-5 scale, what will you rate?

16. Can you please give us feedback on those factors? If you are to rate these factors from 1-5 scale, what will you rate for each factor?

- Vehicle: speed, design, comfort, noise, and cleanness
- Renting & insurance fee
- Charging, parking: renting, charging options availability, and driving range per charging
- Operation system: booking and payment

17. Do you have any suggestion for the existing car sharing supplier for their improvement?

18. If there is new car sharing supplier or if Stavanger municipality offer car sharing model, are you willing to give it a try and why?

19. What do you think about advantages and disadvantages for a car sharing company to offer their service in Stavanger? Any suggestion to make it work from user's perspective?

### **1.3 Interview guide for companies**

1. What is your organization's name? How long have you been working here in the company, and been participating in the car sharing project?

2. What is your role in the organization, and in the car sharing project?

3. Can you walk us through your organization's strategy, vision and milestones on car-sharing model? What are the outcomes so far? Which stage are you on currently?
4. Can you describe your organization's car sharing offers (if any)?
5. What are your organization's motivation and goals to carry on car sharing project/business unit?
6. What do you think about the benefits of car-sharing service to the consumer or individual level?
7. What do you think about the benefits of car-sharing service to the community and society level?
8. Do you think that car sharing model will fit the demographic properties of Stavanger? What are the advantages and disadvantages?
9. What do you think about consumer's possible purpose when using car sharing service (for example: work, leisure, personal activity, or shopping)?
10. What do you think about customer's preferences/ expectation on car sharing service? And what have your organizations been doing to meet their demand? Any obstacles?
11. What have you been doing to study and evaluate the market? What do you think about the demand or potentiality of car sharing market in Stavanger?
12. Have your organization already had car sharing customer database? If yes, what is your take-away from analyzing the data?
13. What do you think about all stakeholders in car sharing models? Who are they and how can we involve them into the model effectively? Do you have any expectation on other stakeholders (for example: consumer, competitor, government, etc.) in the model?

## 2. Table of literature review summary (owned illustration)

**Table 12: Overview of literature review**

#	Author, year	Place	Research topic	Classification	Research area	Relevant findings
1	Ajzen, 1991	-	The theory of planned behavior	Conceptual	Outside economics	The theory of planned behavior model
2	Stern et al., 1999	-	A value-belief-norm theory: The case of environmentalism	Conceptual & empirical	Outside economics	A value-belief-norm model
3	Maio & Haddock, 2010	-	The Psychology of Attitudes and Attitude Change	Conceptual	Outside economics	Definition of customer's attitude
4	Hamari et al., 2016	-	Why people participate in collaborative consumption	Conceptual	Economics	Four dimensions of motivation: enjoyment, sustainability, economic beliefs, and reputation.
5	Möhlmann, 2015	-	Determinants to explain the satisfaction with a sharing option	Empirical	Economics	Positive determinants: cost saving, familiarity, service quality, trust and utility.
6	Whittle et al., 2019	-	User decision-making in transitions to shared or reduced mobility	Empirical	Economics	Individuals' motivation factors including autonomy, economy (both financial and time), hedonic, health, social and environmental factors.
7	Harms & Truffer, 1998	Switzerland	The Emergence of a Nationwide Car sharing Co-operative in Switzerland	Empirical	Economics	Users' incentives have changed over years. Environmental incentive becomes less strong.
8	Polk, 2000	Sweden	Carsharing in Sweden: A Case Study in Göteborg	Empirical	Economics	The strongest determinants to car sharing users are financial and practical factors, then environmental impacts and ideology.
9	Schwieger, 2004	Seattle & Berlin	International developments towards improved car-	Empirical	Economics	Users in America are more rational; users in Germany are more emotional regarding

			sharing services			their decision in car sharing participation.
10	Lane, 2005	Philadelphia	First-Year Social and Mobility Impacts of Carsharing in Philadelphia	Empirical	Economics	The most fundamental attributes are convenience, affordability, personal freedom, environmental benefits, fewer plague and enhanced productivity.
11	Brook, 2004	US	Carsharing—start up issues and new operational models	Empirical	Economics	Trigger event in personal life also play essential role in the reasoning to practice car sharing.
12	Harms, 2003	Germany	From routine choice to rational decision making between mobility alternatives	Empirical	Economics	Users need to experience a “disruption” in their routine or mobility abilities before shifting to car sharing practice.
13	Hennig-Thurau et al., 2007	Germany	Consumer File Sharing of Motion Pictures	Empirical	Economics	The familiarity plays an important ground in motion picture file sharing
14	Kent & Dowling, 2013	-	Puncturing automobility? Carsharing practices	Conceptual	Economics	Elements of meanings and competences have influence on customer insight. Where can car sharing succeed?
15	Millard-Ball, 2005	US	Car-sharing: Where and how it succeeds	Empirical	Economics	Car sharing practitioners were found to be highly educated and also environmentally conscious.
16	Dowling & Simpson, 2013	Australia	‘Shift—the way you move’: reconstituting automobility	Empirical	Economics	Cars are losing their grip on identity approvals such as underpinning progress, freedom, youthfulness and autonomy. Carsharing is no panacea, and its political, socio-ecological and economic logics are the focus of our

						ongoing research.
17	Simpson, 2009	-	Cars, climate and subjectivity: car sharing and resisting hegemonic automobile culture	Conceptual	Economics	Car sharing relies on digital technologies and futuristic images, as a connotation of both technological advancement and mobility innovations.
18	Efthymiou et al., 2013	Greece	Factors affecting the adoption of vehicle sharing systems by young drivers	Empirical	Economics	The likelihood of adopting car sharing practice proportionally depends on customer's concern for the environment.
19	Thøgersen & Norre, 1999	Denmark	A brief history and an analysis of the early adoption of car sharing in Denmark	Empirical	Economics	The early adopters seem to not be particularly environmentally conscious. Demand for car sharing is limited once the infrastructure and public transportation are satisfactory. The decision to join car sharing depends on how customers feel about sharing, i.e. their propensity to trust or mistrust others.
20	Huwer, 2004	Germany	Public transport and car-sharing: benefits and effects of combined services	Empirical	Economics	Car sharing practitioners have strong attachment to public transportation.
21	Shaheen et al. (2012)	US	Personal vehicle sharing services in North America	Empirical	Economics	P2P car sharing held the potential to impact the transportation infrastructure. P2P users face the limited variety of cars. Limited knowledge about insurance and liability was one of predominant barriers to car sharing users.
22	Bergmaier	-	Car sharing: an	Conceptual	Economics	Car sharing is a

	et al., 2014		overview			complement to other alternatives to the private automobile.
23	Lewis & Simmons, 2012	-	P2P car sharing service design: informing user experience development (master thesis)	Empirical	Economics	50% of interviewees did not have access to any P2P shared car in their area.
24	Paterson, 2006		Automobile politics	Conceptual	Economics	Being progressive in today's society is turning to the use of smartphones and social media.
25	Daley & Rissel, 2011	Australia	Perspectives and images of cycling as a barrier or facilitator of cycling	Empirical	Economics	Being progressive in today's society is turning to the practice of alternative transport mode such as cycling.
26	Shove et al., 2012	-	The dynamics of social practice: Everyday life and how it changes	Conceptual	Outside Economics	Transferable skills also foster innovations in practice.
27	Ballús-Armet et al, 2014	California	P2P carsharing: public perception and market characteristics	Empirical	Economics	Limited knowledge about insurance and liability might also be major driver of negative perception of P2P car sharing.
28	Keetels, 2013	Netherlands	Collaborative Consumption: The influence of trust on sustainable P2P systems	Empirical	Economics	Potential barriers regarding to sharing are mostly associated with trust issues.
29	Meijkamp, 1998	Netherlands	Changing consumer behaviour through eco-efficient services: case study in the Netherlands	Empirical	Economics	Consumer habit plays important role in the adoption of car sharing. Very few customers actually drop their vehicle and use car sharing service when they first hear about its.

### 3. Relevant literature on the environmental impact of car sharing

**Table 13: Relevant literature on the environmental impact of car sharing**

Author, year	Location	Vehicle holding	VKT/ GHG emissions
Walb & Loudon, (1986)	San Francisco, California	Decrease in car ownership but car usage increases.	
(Hui, Wang, Sun, & Tang, 2019)	Netherlands		33% reduction in VKT for car sharing users.
(Cervero, 2003)	San Francisco, California		Car sharing users' net VMT was 19.5-54.3% higher than non-users.
(Cervero & Tsai, 2004)	San Francisco, California	Almost three-quarters of members reduced or delay car ownership. Nearly 30% of them get rid of one or more cars.	Average VKT fell by 47% for members, but increase by around 73% for nonmembers. In 2 years, members' average daily transportation-related CO2 emissions fell by an estimated 0.75 lb compared with an estimated 0.25 lb increase with nonmembers.
(Briceno, Peters, Solli, & Hertwich, 2005)	Norway		If money saved from car sharing is used on a distributed set of consumables, the carbon impact is marginal, however if spent on air travel, carbon impact of car sharing diminishes.
Lane (2005)	Philadelphia, Pennsylvania	Each PhillyCarShare vehicle replaced an average of 23 private vehicles.	The average monthly VMT increase of members gaining access to a car was limited to 29.9 miles, whereas the monthly VMT decrease of members who gave up a car appeared to be up to 522 miles.
Martin, Shaheen, & Lidicker	North America	Each shared vehicle of car sharing took 9 to 13 vehicles off the road.	The average fuel economy of car sharing vehicles used most often by respondents is 10

(2010)			mi/gal more efficient than the average vehicle shed by respondents.
Loose (2010)	Europe		15-20% decrease in CO <sub>2</sub> emission.
(Indebetou & Börefelt, 2014)	Gothenburg, Malmoe and Stockholm	Number of households without cars increased from 60-90%.	Average reduction per person was 150 – 170 VKT.  Total reduction in CO <sub>2</sub> per year was 3,200 tons (for all cities) or 420 kg per active members per year.
Nijland & van Meerkerk (2017)	Netherlands	Car sharers own 30% less cars than prior to car sharing. Car sharers drive 15% to 20% fewer car kilometers than prior to car sharing.	Car sharers emit between 13% and 18% less CO <sub>2</sub> emissions related to car ownership and car use.
Becker, Ciari, & Axhausen (2018)	Basel, Switzerland	8% of free-floating car sharing users and 19% of station-based users in would have purchased a car if the respective car sharing scheme did not exist.	
Hui et al. (2019)	Hangzhou, China	50% of respondents will delay their plan on car purchase after participating in car sharing scheme.	

*Source: Own illustration.*