Looking for Opportunities for Sustainable ‘Smart’ Mobility: The Case of Self Driving Cars vs. ‘Ride Sharing’

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Supervisor: Elisabeth Ekener
Subject Reviewer: Åsa Gren
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Abstract:

Sweden is aiming for a sustainable development through achieving the Sustainable Development Goals by 2030. To do so, new mobility habits among Sweden’s inhabitants must be realized; public transport and car sharing have to be prioritised over private car ownership in which people travel alone. As the Swedish government aims to meet these needs, the commercialisation of autonomous vehicles is awaited along with digitalisation. Digitalisation cross-breeds with a roll out of self driving cars is by some expected to boost the roll out of Mobility as a Service in the shape of a door to door solution within transportation. This can potentially create a decline of today’s ride sharing services, largely made up by the mass transit-system and ride-pooling. The use of mass transit systems and large pooled rides has the biggest potential to reduce congestion and CO2-emissions or energy use per traveller, provided the passengers are going in the same direction. As a self driving door to door solution can cause shifts in the demand for transportation, this study aims to understand the pathway needed to make ride sharing the preferred choice of motorised transportation among travellers in urban areas in Sweden by 2030 – in the light of the potential Self Driving door to door roll out, as well as the achievement of the SDGs. To meet the aim, the transition theory Multi-Level Perspective and Strategic Niche Management is used, together with semi-structures interviews with central stakeholders of ride sharing. The result shows that mobilisation processes through communication, envisioning and education are needed, together with innovation promoting sustainable behaviours, such as digital means for a faster democratic process. With regards to innovation processes, the result shows that the use of interdisciplinarity and promotion of perspectives deriving from the humanities within in learning and envisioning practices in Sweden are needed. Both within the Swedish educational system, but also at conferences. The results also show a need for economic schemes and steering policies for the promotion of ride sharing.

Keywords: Sustainable Development, Self Driving Cars, Ride Sharing, Socio-technical transition, Multi-Level Perspective, Strategic Niche Management

Hanna Bökmark, Department of Earth Sciences, Uppsala University, Villavägen 16, SE- 752 36 Uppsala, Sweden
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Summary:

Sweden is aiming for a sustainable development through achieving the Sustainable Development Goals by 2030. To do so, new mobility habits among Sweden’s inhabitants must be realized; public transport and car sharing have to be prioritised over private car ownership in which people travel alone, which is typical to the current transportation culture in Sweden. As the Swedish government aims to meet the need of sustainable development, the commercialisation of self driving cars is awaited along with progress within digitalisation. Digitalisation cross-bred with a roll out of self driving cars is by some researchers expected to boost the roll out of Mobility as a Service in the shape of a door to door solution. This can potentially create a decline of today’s ride sharing services largely made up by the mass transit-system and ride-pooling. The use of mass transit systems and large pooled rides have the biggest potential to reduce congestion and CO2-emissions or energy use per traveller, provided the passengers are going in the same direction in urban areas. As a self driving door to door solution can cause shifts in the demand for transportation, this study aims to understand the pathway needed to make ride sharing become the preferred use of motorised transportation among travellers in urban areas in Sweden by 2030 in the light of the potential self driving door to door roll out, as well as the achievement of the SDGs. To meet the aim, a theory suggesting that innovation for sustainability, managed in a controlled manner, while paired with stakeholder interaction is used to guide and analyse the data collected. The data was collected through interviews with ride sharing stakeholders in Sweden. The result shows that critical communication processes, future-envisioning activities and education are needed, together with innovation promoting sustainable behaviours, such as digital means for faster a democratic process. With regards to innovation processes, the result shows that the use of interdisciplinarity and promotion of perspectives deriving from the humanities within in learning and envisioning practices in Sweden are needed. Both within the Swedish educational system, but also at conferences. The results also show a need for economic schemes and steering policies for the promotion of ride sharing.

Keywords: Sustainable Development, Self Driving Cars, Ride Sharing, Transition, Innovation, Policy

Hanna Bökmark, Department of Earth Sciences, Uppsala University, Villavägen 16, SE- 752 36 Uppsala, Sweden
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## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AV</td>
<td>Autonomous Vehicle</td>
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<td>D2D</td>
<td>Door to Door</td>
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<td>MaaS</td>
<td>Mobility as a Service</td>
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<td>MLP</td>
<td>Multi-Level Perspective</td>
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<td>SDC</td>
<td>Self Driving Car</td>
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<td>SDG</td>
<td>Sustainable Development Goals</td>
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<td>SNM</td>
<td>Strategic Niche Management</td>
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<tr>
<td>V2I</td>
<td>Vehicle to Infrastructure</td>
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<tr>
<td>V2P</td>
<td>Vehicle to Person</td>
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<td>V2V</td>
<td>Vehicle to Vehicle</td>
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1 Introduction

The global community, including Sweden, is aiming for a sustainable development through achieving the 17 internationally agreed upon Sustainable Development Goals (SDGs) by 2030 (Finansdepartementet 2019). According to O’Neill et al. (2017) and van Vuuren et al., (2017) in a society where all the SDGs are met, people will have to change their mobility habits from today. Mobility refers to humans’ movement within a system, which here is made up by the Swedish urban areas. In a society where all SDGs are met, the use of public transport and car sharing have to be prioritised over private car ownership, wherein people travel alone (O’Neill et al. 2017; van Vuuren et al. 2017). This attitude is shared by the Swedish government, which argues that “to implement the agenda [the SDGs], many behavioural patterns need to change, for example within transportation […]” (Finansdepartementet 2019 s. 107). Sweden’s Traffic Agency further suggests that more sustainable transportation modes must and will be prioritised by smart urban planning in dense areas, and that priorities therefore will be given to pedestrians, bicycles and public transportation over cars by 2030, to change mobility behaviours (Krafft et al. 2018 s. 10). As the Swedish government aims to meet the needs of sustainable development by promoting walking, biking and use of mass transit, the commercialisation of fully or close-to-fully autonomous vehicles is awaited (SoU 2018:16 2018).

Alongside current expectations of the Self driving car (SDC) roll-out, digitalisation is taking off. Digitalisation offers new business opportunities and is believed to expand further in the future. Digitalisation can also be expected to create new virtual spaces and venues which may limit the need for traveling in the future (SoU 2018:16 2018). It is believed that digitalisation lead to a decline in car ownership, as it will increase the availability of transportation services (often referred to as Mobility as a Service, MaaS, by agencies) which can be compared with today’s Uber-app-service (SoU 2018:16 2018).

Digitalisation cross-bread with a roll out of SDC is by some expected to boost the roll out of MaaS in the shape of a Door to door (D2D) solution within transportation (SoU 2018:16 2018). Such a roll out can potentially create a decline of the use of today’s shared services which are made up by the mass transit-system and ride-pooling by taxi, Uber and private car (Jin et al. 2018). This anticipated trend is likely to be due to the Self Driving D2D’s expected convenience, efficiency and affordability which today’s mass-transit and ride-sharing are not associated with, as they to some extent require travel coordination and waiting time (Thomopoulos & Givoni 2015; SoU 2018:16 2018).

The use of mass transit systems and pooled rides has the biggest potential to reduce congestion and CO2-emissions or energy use per traveller, as the energy used to power the vehicle is divided among those traveling.; provided the passengers are going the same direction (Bahamonde-Birke et al. 2018; Santos 2018; Taiebat et al. 2018). Ride sharing is exemplified and defined by Santos (2018) as a mode where “on-demand private cars, vans, buses and other vehicles […] are shared by passengers going in the same direction”, in a digitalised future. The more people the vehicle can serve, the more beneficial its use is (Jin et al. 2018). Bahamonde-Birke et al. (2018) raises concern over how Self Driving D2D can cause shifts in the demand for transportation due to its appeal and increase on the expense of non-motorised transportation, mass transits and pooled rides in general. It is feared that self-driving technology has the potential to trigger a vicious cycle wherein if necessary legitimate interventions are not put in place, urban areas will experience an increase in congestion and air pollution (Thomopoulos & Givoni 2015; Bahamonde-Birke et al. 2018; Santos 2018).

What the future exactly has in store for transportation, SDC and how it will be used is still uncertain. In order to achieve the objectives set by the Swedish government and its traffic agency alongside the technical development in automatization, a distinct cultural transition leading to new norms and preferences within urban transportation, is arguably needed (Fraedrich et al. 2015). According to Dekker and Woods (1999), it is important to analyse future expectations. Although the future is uncertain, such research creates opportunities to influence the path of development. Therefore, the focus of this paper is how preferences for efficiency and convenience can shift towards a preference for less convenient options, despite ongoing technological development. It is, however, beyond the scope
of this paper to gain an understanding of how large body mass transit systems will be preferred over smaller shared vehicles, in the future.

1.1 Aim

The aim of this study is to gain an understanding of a potential actions making ride sharing become the preferred choice of motorised transport among travellers in urban areas of Sweden by 2030, despite its convenience-related disbenefits, in the light of the potential Self Driving D2D roll out, as well as the achievement of the SDGs.

1.2 Research Questions

To meet the aim of this study, the following research questions will be considered:

RQ1: “What is ride sharing expected to look like in urban areas in Sweden by 2030, in the light of the potential self driving car and door to door-roll out, as well as the achievement of SDGs?”

RQ2: “What are potential barriers and/or enablers to make shared rides preferred despite their convenience-related disbenefits, in urban areas of Sweden by 2030, in the light of the potential self driving car and door to door-roll out, as well as the achievement of SDGs?”

RQ3: “What steps could societal actors take in order to make ride sharing the preferred choice of transport, among travellers in urban areas in Sweden by 2030, in the light of the potential self driving car and door to door-roll out, as well as the achievement of SDGs?”
2 Background

2.1 The Technology of a Self Driving Car

The concept of the SDC has many names and is it called Autonomous Vehicle (AVs) in literature. Although often assumed as such, a SDC is not per se a connected vehicle. Self-driving technology and digitalisation are different from each other and therefore can exist separately. As they have strong complementary attributes, they are and will likely continue to be integrated into the same car (Taiebat et al. 2018).

The connectivity of a car refers to the vehicle’s capacity to interact with its surroundings. Hence, it must not be steered by a human, while it drives in the automatic mode on a route. This capacity is achieved through various communications: vehicle-to-vehicle (V2V), vehicle-to-person (V2P) and vehicle-to-infrastructure (V2I). Automation, in comparison to automatization in a vehicle refers to technologies that are integrated into vehicles available on the market today. These are for example cruise control, active lane-keep assistance and automatic emergency breaking. A fully automated vehicle can navigate itself by sensing its surrounding through its connectivity, and need no human intervention (Taiebat et al. 2018).

The degree to which a SDC is autonomous can be ranked from one to five on the SAE-scale. Fully and close to fully automated cars correspond to a SAE-level five and four. Today, cars such as Waymos and Volvo’s Drive Me correspond to a level four-car. As mentioned in the introduction, it is currently uncertain if a pure level five-car will ever be invented, as per definition it means that the car must be able to drive without any human intervention at anytime and anywhere in the world (SoU 2018:16 2018).

Today’s level four car is equipped with radar sensors, cameras ultralight sensors and a LiDAR-system; an optical instrument measuring the distance between the car and other objects with laser beams. The car is also equipped with a GPS, sensors for weather, sensors connected with the wheels, and a black box (SoU 2018:16 2018).

2.2 Risks & Benefits of the Self Driving Cars with Door to Door-Service

2.2.1 Societal Benefits Linked to the Self Driving Car

There are several suggested benefits to the roll out of SDC and associated D2D. For example, they have the potential to be significantly safer than a human-driven car (Fagnant & Kockelman 2015). SDC can potentially reduce the fuel or energy consumption and emissions, due to smarter breaking and acceleration decisions from V2V- and V2I-communication. SDC with D2D-service can meet the mobility needs of a wide spectrum of Swedish society. They can provide transport for those who are too young to drive, those without a license, the elderly and those with physical disabilities. This is especially true if the service is affordable. Affordability is expected to increase as human service costs could in the future be deducted from the travel fare. Hence, they may have the potential to reduce inequality within mobility (Fagnant & Kockelman 2015; Thomopoulos & Givoni 2015; Schreurs & Steuwer 2016; Bahamonde-Birke et al. 2018; Litman 2018) if ticketing or transport ordering are equally accessible (Thomopoulos & Givoni 2015). This could help to achieve social sustainability indicators (UN n.d.).

Moreover, due to the optimization of driving, those using SDC could spend less time traveling than those using other modes of transport. What is more, being a car passenger rather than a driver enables commuters the opportunity to use their time spent traveling in a desired and way (Fagnant & Kockelman 2015; Schreurs & Steuwer 2016; Bahamonde-Birke et al. 2018; Litman 2018). Such benefits can according to Bahamonde-Birke et al (2018) pave the way for tailored mobility experiences which ultimately could lead to an increased demand for car transportation at the expense of mass transit. It is also suggested that robotic capacity can increase vehicle costs, hence making its service expensive. Accordingly, SDC will not be affordable for a diverse customer base, and have limited success on the
market (Litman 2018). Such contradicting benefits and drawbacks confirm the uncertainties regarding the future for the transportation sector.

2.2.2 The Appeal of the Self Driving Car

Whether SDCs will contribute to fewer emissions, less energy use, and reduced congestion, is not solely dependent on the technology: it is contingent on how it is used. Although SDCs could be “greener” and “smarter” than today’s non-autonomous car, their expected appeal, cost and accessibility could lead to an increased use, on the expense of ride sharing by mass transit or cars (Bahamonde-Birke et al. 2018; Jin et al. 2018). Findings from a case study aiming to understand car owners’ expectations of SDC in Los Angeles, by a representative of Volvo Car Group, revealed a varied set of expectations.

Comfort would seemingly play a central role in the future use of SDC. The respondents claimed they would use the time in the SDC to relax and unwind, which was important as all of the study’s participants were in need of relaxation on a daily basis (Pettersson 2017 s. 3). The attraction of SDCs in this case hence lay in the expected efficiency of “being able to simultaneously travel and work or relax” (Pettersson 2017 s. 6). The participants expressed that SDC would provide a range of benefits, such as safety, comfort, being social in the car, emotion and energy management, freedom, being a part of a new era, relaxation, novelty, time management and efficiency. They expressed that SDCs could create “a better bridge between work and home life in the long run” (Pettersson 2017 s. 6). For a majority of the informants, cars played a central role in the fulfilment of daily needs and the “need for speed” (Fraedrich et al. 2015 s. 4). Although having a different geographical scope to this study, the aforementioned research presents general expectations and attractions of SDC which can be applicable to the Swedish market.

2.2.3 Societal Risks Linked to the Self Driving Car

There are various risks link to SDC. They comprise system failure; reduced security and privacy issues due to hacking; increased travel distances due to the convenience of traveling, leading to congestion, sprawl, more pollution and energy use; reduction in attention given to other mobility options such as rail mounted options in urban areas or buses by societal actors; reduced opportunities for those employed as drivers; increased infrastructure costs; and reduced financial support for other mobility options (Thomopoulos & Givoni 2015; Kristoffersson et al. 2017; Bahamonde-Birke et al. 2018; Litman 2018; Cohen & Cavoli 2019; Legacy et al. 2019). Several of these risks directly link to the quest for a cleaner environment in urban areas, which strive for less pollution and congestion (Krafft et al. 2018).

2.3 Ride sharing in Urban Sweden - Current Use and Attitudes

2.3.1 The Growing Popularity of Ride Sharing

Opening sentence about how public transport uptake is growing and the gov wants to further encourage this? The Swedish government aims to diminish car use in dense urban areas. Alongside its SDG commitments, the government will work towards this objective by using smart urban planning to give priority to pedestrians, bicycles and public transportation over cars (Krafft et al. 2018). In the past years, the use of public transportation has been increasing. Several agencies and interest-bodies mapping the use of and attitudes towards sharing rides through the use of public transportation, have shown that the use of public transportation is gaining popularity in Stockholm and Gothenburg. The popularity of traveling with public transportation in and to the urban centres has been increasing over the past years: In Stockholm, car rides to the city centre have decreased significantly since 2004, while the use of public transportation in the same period has increased significantly. There are almost three times as many trips using public transportation than with car towards Stockholm city centre from its urban surroundings (Miljöförvaltningen Stockholm & Trafikkontoret Stockholm 2018). Similar increases are seen in other parts of Sweden. In Gothenburg, public transportation usage increased by 7 % between 2015 and 2016 (Göteborgsregionens kommunalförbund et al. 2016).
The increase of ride sharing through public transportation in Gothenburg is likely a result of the so called “Västsvenska paketet” and road tolls when entering the denser part of the urban area, according to (Göteborgsregionens kommunalförbund et al. 2016). Västsvenska paketet has scaled up the expansion of infrastructure connected to public transportation making it more available and convenient. This scheme includes park-and-go stations in suburban and semi-rural areas which enable commuters to park their private vehicle and use public transport for the rest of their journey into the city centre. 90% of those using the park-and-go solution travel to the park-and-go lot privately in a car and then switch to a train. Prior to the park-and-go solution, half of these commuters travelled by car all the way to the city centre. A third of these 90% stated that they would return to this behaviour if the car parking facility were to for some reason disappear (Göteborgsregionens kommunalförbund et al. 2016). Those not using the park-and-go solution reportedly admitted that, while it would be more environmentally beneficial to do so, “it takes too long time in comparison to just driving yourself” (Göteborgsregionens kommunalförbund et al. 2016 s. 9).

A majority of the respondents in the greater area of Gothenburg, felt that fewer cars in a city-centre would make the city more attractive and that public transportation therefore should be prioritized over private car use – in the future. Although a third of those living in central Gothenburg claims that private car ownership is ‘out of fashion’, a sixth of respondents still felt dependent on their private vehicle to fulfill their daily needs (Västrafik 2018).

### 2.3.2 Motivational Factors to the Use of Mean of Transportation

Efficiency and time saving are often the factor to the choice of transportation (Västrafik n.d.). The most important aspects determining the use of the public transportation are reportedly price, frequency, availability and reliability. Other key reasons for commuters to use public transportation were to avoid having to find parking spaces and environmental concerns (Svensk kollektivtrafik & CMA Research 2017; Västrafik 2018). 80% of all respondents to Västrafik’s survey claimed that time-efficiency determines how they choose to travel to their destination (Västrafik 2018). The key reason to refrain public transportation is often a preference for driving (Svensk kollektivtrafik & CMA Research 2017). Over 80% of the respondents to Västrafik’s survey felt that the environment is a more important issue for the future transport rather than now (Västrafik 2018).

While the above discusses research conducted in Gothenburg, there is seemingly a growing interest in and use of public transport amongst Swedish commuters when traveling to and within urban areas. As the mass transit system expands owing to allocation of funds, public transport becomes increasingly convenient, making it grow in popularity. The question remains whether sharing rides through a public transport system or through another ride sharing scheme can and will continue to compete with a self driving D2D-service.

### 2.4 Cars, Mobility and its Social Meaning

The car is not just a means of transportation; it is an object deeply embedded in our society. The car has both social and economic meanings that go well beyond its functionality. Car use and ownership, is a cultural institution of modernity claimed to have been founded in Western societies (Fraedrich et al. 2015).

According to Fraedrich et al. (2015), the car is a part of a nested system characterized by regulations, institutions, politics and practices that dedicated to the car. These ensure reproduces and market the use of the car. The car is also an ideological and discursive formation that is incarnating ideals of freedom, privacy, movement and progress. It offers possibilities of experiences “while blurring the boundaries between human and machine, nature and culture” (Fraedrich et al. 2015 s. 4). It has a significant influence over how humans interact with the surrounding landscape and environment, due to the simple fact that cars are the ‘key’ to our mobility (Taiebat et al. 2018).

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1 The “package of West Sweden” involves earmarked funds for expansion of infrastructure.
While the car has been “ruling the mobile world” for over a century, it is suggested that its ‘golden era’ now has reached its culmination (Fraedrich et al. 2015). The direction of car development is not entirely clear: some argue that cars are not yet losing its predominance in western societies. Instead, the culmination of car use is mostly seen within restricted socio-economic groups and specific geographical areas, rather than in western societies at large (Fraedrich et al. 2015). The reproduction of the ideology and discourse of freedom, privacy, movement and progress through the development of SDC therefore cause a risk to the achievement of less pollution, congestion and energy use, if it is not handled (Bahamonde-Birke et al. 2018).

Road tolls, smart urban planning and expansion of mass transit systems in Stockholm and Gothenburg are arguably all examples of processes or means of control, promoting new behavioural norms. New norms have a hard time of breaking through a ‘shield’ of an ingrained transportation culture. To promote new norms of transportation use and its success in the near future, the paradigm must be transformed (Isaksson & Richardson 2009; Fraedrich et al. 2015; Hysing 2015).

2.5 Today’s Sweden: The Quest for Sustainable Development & Technological Progress

Sweden is pursuing a sustainable development through achieving the 17 internationally agreed upon Sustainable Development Goals (SDGs) by 2030. Among the goals, the decrease of pollution in urban areas is listed (UN n.d.). The Intergovernmental Panel on Climate Change’s scenario called “Sustainability – Taking the Green Road” is describing a future society where the 17 SDGs are met, or that there is a serious attempts to meet them (O’Neill et al. 2017; van Vuuren et al. 2017). The scenario, according to O’Neill et al (2017) and van Vuuren et al (2017) emphasises a preference for public and shared transportation, lower tendency for material consumption and energy use, and an improving environment. Although not providing deeper insight into how inhabitants of such a scenario ought to travel, sharing transportation is according to the authors desirable over private car ownership (O’Neill et al. 2017; van Vuuren et al. 2017).

2.5.1 Implementation of Sustainable Policies: A Potential Risky Business

Living in a democracy, societal actors’ power to act and implement regulation is largely limited to public opinion. To successfully implement measures which may be favourable from an environmental perspective but may be highly unpopular, they must gain legitimacy (Isaksson & Richardson 2009; Hysing 2015).

According to Isaksson & Richardson (2009), the implementation of Stockholm’s road tolls was “risky” due to its lack of legitimization. The political tactic to gain its legitimacy which ultimately led to its final instalment was based on the use of citizen’s referendum to give them a sense of empowerment. Involving citizens in the planning process and incorporating their perspectives is reportedly also beneficial (Isaksson & Richardson 2009; Härsman & Quigley 2010; Hysing 2015). While a referendum was used in Stockholm, in the case of the instalment of road tolls in Gothenburg, a broad political acceptance from a wide range of political parties enabled the tactic of “forcing the citizens to swallow bitter medicine” (Hysing 2015 s. 7). These tactics are in line with the Swedish consensual tradition of traffic policy and urban planning and are therefore enablers to implementation (Isaksson & Richardson 2009; Hysing 2015). However, in the case of Gothenburg it backfired by a decreasing trust for local politicians, although the road tolls gained legitimacy over time (Hysing 2015). Thus, the quest for sustainable development might not be realised without friction. While a policy may be unpopular, contextual sensitivity may serve as an enabler for its successful implementation.

2.5.2 The Technological Progress

Although SDCs are not yet launched for public use, there is already data suggesting that the era of car ownership is on a decline in the western world (Thomopoulos & Givoni 2015). SDCs are a current technological fix that the industry, academic and the public sector are addressing and preparing for
(Fraedrich et al. 2015). Enabled by the simultaneous progress in digitalisation, adaption of the Swedish legal system and continuous legitimacy for the liberal economic structure, as early as 2030 could see the launch of, cars or pods able to provide D2D on the Swedish market (Martin 2016; SoU 2018:16 2018).
3 Theoretical framework: Multi-Level Perspective and Strategic Niche Management

The chapter will theorize and describe the nature of socio-technical systems, which in this study are made up by the car-culture. After that, the operational branch of the theory: what can be done to transform the culture, with reference to research question, will be presented. The theory used and its associated author, Geels, is predominant within transition theory.

3.1 Transition Theories: An Overview

There are a number of transition theories used. The term transition refers to the process of change wherein one system transforms into a new via disruptive activities. It is an interplay of aspects changing at different levels, which leads to this fundamental change. Depending on the problem at hand, transition researchers use different approaches: not seldom of a socio-technical-, socio-institutional- and/or socio-ecological nature. When aiming to understand the role of technology in a social context and how this role may be transformed, the socio-technical is often used. The socio-institutional approach is often used when aiming to understand institutional change, such as political power shifting from centralized monopolies to decentralised networks, and socio-ecological when studying for example ecological adaptive cycles (Loorbach et al. 2017).

Due to the nature of this thesis, a socio-technical approach will be used. Under the umbrella of the socio-technical approaches, the two main analytical approaches are the Multi-Level Perspective (MLP) and technological Innovations Systems framework (TIS). While TIS seeks to understand mechanisms for innovation by offering a stakeholder framework, the MLP rather put emphasis on the path to reaching a desired state along a time line (Loorbach et al. 2017). The MLP is arguably the most suitable approach to apply onto the case of this paper, with regards to time aspect to the problem statement. TIS can suggestively be used if seeking to understand the current conditions for launching a ride sharing service (Fraedrich et al. 2015; Loorbach et al. 2017).

3.2 Multi-Level Perspective

The MLP is a theoretical model that can be applied to explore socio-technical developments. The theory is used to explain socio-technical cultures and their associated norms over time, by observing the so-called micro-level “Niche”, meso-level “Regime” and macro-level “Landscape” (Geels 2002). MLP will now be defined on the basis of Geels (2002):

The theoretical foundation of MLP stems from sociology of technology wherein technology in and of itself “has no power and does nothing”: only so when associated with social structures and human agency (Geels 2002 s. 1257). The sociotechnical regime is situated in a so-called landscape, which is made up of external factors to which the regime must relate. As the regime streamlines, it facilitates technological progress within the boundaries of its socio-technical culture and the landscape. “Incubation rooms” also called Niches, facilitate novelties. The niches, under the right circumstances, if promoted and protected by actors on meso and macro-level, can grow to become a part of the regime. A novelty can rise and create a change within the regime if the micro, meso and macro levels “are aligned” and allow it per their interest (Geels 2002).

A socio-technical regime has seven dimensions. It is made up of technology, user and application domains (markets), the symbolic meaning of the technology, infrastructure, industry structure, policy and techno-scientific knowledge (see figure 1) (Geels 2002). The interaction between these dimensions creates the social and economic meaning of the car that goes beyond its technicality. As, or if, a novelty gradually gains ground, it moves up from the niche level, towards being part of the regime. A technological transition, which is a state where the regime changes, happens as a novelty is ‘piercing’ the regime, while the regime is also under pressure from the landscape. To ensure this development, Strategic Niche Management is used. The pressure from the landscape creates a ‘window of opportunity’
for the novelty, which then must be able answer to this pressure, which can be exemplified by public opinion (Geels 2002). In sum, MLP theorizes how socio-technical transition takes place which this study aims to gain an understanding of, by asking what societal actors could do in order to make ride sharing the preferred choice of transportation in research question three (Fraedrich et al. 2015).

3.2.1 Shortcomings of the Multi-Level Perspective

There is intrinsic bias in the MLP-model, which can greatly impact movements across micro, meso and macro-levels. Current power relations between policy makers and incumbents, as well as the alliance between policy makers and business, are examples of the make-up of the current hegemony (Geels 2010, 2014). The hegemonic structure, which is made up by micro-, meso- and macro relationships, uses its power to resist transition and instead reproduce its hegemonic status. The power used to achieve this is either: instrumental, such as using resources such as money, access to media, authority. It can also be discursive, such as agenda setting and steering in which manner a topic is discussed and framed: in a diagnostic portraying-, prognostic framing ‘what is a solution’-, or a motivational ‘what can be done’ manner (Geels 2014). It can also be based on institutional power, which is found in the political culture and governance structures. These circumstances make it difficult for any actor to achieve something that is not a part of the already established culture of the current hegemony (Geels 2014).
Further, according to Loorbach et al. (2017), the MLP employs more of an explorative perspective through the Strategic Niche Management (SNM) to understand the operational part of transition, which will be described below in 3.3. TIS, instead employs more of an evaluative perspective onto its case. With this said, the MLP and SNM is limited to its exploratory nature, and give little attention to evaluation of innovation (Loorbach et al. 2017).

3.3 Strategic Niche Management

SNM is the operative approach to the MLP. It was developed in order to find ways of managing the challenges of nurturing a transition towards sustainability. SNM suggests that by nurturing and promoting novelties developed in niches, these can later contribute to a regime shift. Enabling and showcase experiments is a central part of successful SNM. Exposing a new technology to the market will facilitate learning experiences among the public, the articulation of new visions and desires, new social networks between new stakeholders, and legitimise a continued nurturing of the novelties. SNM assumes that technological diversity on a niche level is fruitful as it enables network development and learning. Too much diversity among niches can, on the other hand, hamper a desired outcome, such as sustainability, as it can prevent aligned commitment and instead cause distraction. The number and type of niches and which to foster and protect is a constant dilemma for any actors aiming to facilitate transition (Schot & Geels 2008; Nill & Kemp 2009).

3.3.1 Bottom-up and Top-down Strategic Niche Management

Beside SNM, there are competing approaches to manage transitions with similarities to the MLP-approach. Among them are transition management and time strategies. Transition management focuses on system innovation through a process of variation of governance and selection of systems, rather than planning within the boundaries of the system. Various transition paths are explored at the same time and put up against each other, in order to avoid any lock-ins to a certain path. Transition management put focus on long-term thinking, co-evolution, use of visions, transition experiments and cycles of learning and adaptation (Nill & Kemp 2009).

Time strategies is a strategic approach which assumes that the status of the socio-technological system varies over time. Environmental innovation and environmentally friendly policies are dependent on underlying technological-economic dynamics. When an unstable situation occurs in the regime due to external or internal issues, a window of opportunity for environmental innovation occurs. To exploit this window of opportunity with for example political interventions, is central for the time strategies approach in order to foster transition (Nill & Kemp 2009). SNM, which previously has been critiqued for focusing too heavily on bottom-up processes, has lately come to embrace these approaches advocated by followers of Transition Management and Time Strategies, which has been advocating for top-down processes (Nill & Kemp 2009).

Recently, SNM-work primarily focusing on bottom-up processes has been diversified after criticism for analytical insufficiency\(^2\). It now gives greater attention to top-down measures\(^3\). It suggests that it not enough to solely rely on strategic management of niches from a bottom-up perspective, but instead it should be combined with top-down pressure. SNM argues that all niches should be linked to policy processes, and cultural and institutional reproduction on all levels, including regime and landscape (Nill & Kemp 2009).

Geels and Schot (2007) argue that a transition pathway for regime transformation, requires (inter)actions by regime stakeholders, such as researchers and engineers, or other actors with self-interests in the regime, as well as social movements, activists and entrepreneurs. Their actions and protests against current regime, may change the landscape by mobilising public opinion, hence placing the regime under pressure (Geels & Schot 2007). This process goes under the name “mobilisation” (see footnote 4). It is further argued by Schot and Geels (2008) that internal stakeholders of the regime, which can be

\(^2\) see arrows indicating niches in figure 1 for reference

\(^3\) see dashed two-way between landscape and regime in figure 1 for reference
exemplified as regime professionals, when aiming to promote transition through SNM, ought to consider a number of management dilemmas.

Management dilemmas explain how niches must be handled in order to maximise their chances to pierce the regime and have a transformative impact on it. Those dilemmas are: (1) the creation of expectations and visions for the future among the public: they shall be flexible but also goal-oriented towards sustainable development when the going gets tough; (2) they shall facilitate inclusive co-learning among the masses but without too much variety as it dilutes resources and prevent streamlining for sustainable development; (3) use a bricolage strategy, which means to use existing social, network-related and institutional resources for new purposes, but consider risks of failure to reach the goal of sustainable development; (4) work with established incumbents but also strive for working with radical thinkers; (5) protect novelties but not for too long as that can limit exposure and development. Lastly, (6) they shall wait for cracks in the regime and then stimulate niche-novelties but also actively crack the regime by speaking up, as also argued by Time Strategists (Schot & Geels 2008).

Hence, SNM directly theorizes research question 3, which asks what societal actors could do in order to make ride sharing the preferred choice of transportation, where research question one and two makes up its foundation.

3.4 MLP, SNM and the Transportation-Regime: An Example

MLP has earlier been applied to the case of the transportation regime’s “low-carbon” transition (Geels 2012). Geels (2012) explains that niches marketed as ‘green’ have emerged over the last decade and that these clearly have been deviating from the established transportation regime. The success of the niches has been able to transform the transportation regime into a state where the regime now also consists of new ‘green’ elements responding to the quest for sustainable development. According to Geels (2012) the niches which to date are transforming the Western transportation regime, are for example new ticket schemes making it easier to travel by public transportation. Other niches are park-and-ride solutions for public transportation and train-taxi schemes, where the fare gets lowered per rider joining the taxi (Geels 2012). Although the source is dated 2012 and development within the sector have taken place, its deemed to still be of relevance.

Niches within (1) intermodal travel, (2) demand-oriented travel and (3) public transport can according to Geels (2012) fulfil the current needs of travel, hence be a part of a sustainable solution which promotes ride sharing. Also, (4) sustainable urban planning and clustering of important destinations, are niches transforming the regime. These are examples of cultural and socio-spatial innovations. Lastly, (5) Innovation within information and communication technology reducing the need of traveling over all, is also of importance (Geels 2012).

Although the landscape, here made up by Western societies, are characterised by concern for climate change and peak oil, there is also strong characteristics of the preference of ownership, speed and time saving, macro-economic growth, physical distinctions between home, work and other destinations and mobility because of globalization among other traits (Geels 2012). The latter aspects are stabilising the current transportation regime, and do not create enough window of opportunity for ‘green’ and radically new novelties to alter the regime. There are however cracks appearing in the regime, suggesting it is weaker than it used to be, although it is still dominant, and arguably still so up to this date. The cracks are, according to Geels (2012), seemingly due to fading commitment from policy makers to promote the automotive-mobility regime, as well as general environmental awareness.

Geels (2012) suggests that transition policy for a shift of the transportation regime should follow a two-way strategy consisting of a bottom-up perspective of stimulation of niche innovations and top-down perspective by putting pressure on the regime through political and/or economic instruments. The instruments should preferably be a result from cooperation between political actors and the industry (Geels 2012).
4 Method

The method is chosen on the basis of its ability to generate data on what societal actors could do in order to make ride sharing the preferred use of transportation, with reference to the SNM-approach. Due to the study’s futuristic nature, quantified data is not available.

4.1 Qualitative Approach

The case study will use qualitative methods to collect the data on the roll out of Self Driving Cars and associated D2D in Sweden. A qualitative method of collecting data is deemed suitable with regards to the aim of the study and its research questions. It is central for qualitative studies to gain an understanding of how the individuals in a specific environment interpret their surroundings and reality (Bryman & Nilsson 2011).

A qualitative study usually has an inductive approach to the relationship to theory and empirical findings, while a quantitative study rather has a deductive approach (Bryman & Nilsson 2011). The inductive approach allows the researcher to study an object without having the observation of the object anchored in theory on beforehand. By the gathered information, a theory to explain the observation can be formulated. The deductive approach on the other hand allows the researcher to apply a theoretical framework onto the gathered material (Bryman & Nilsson 2011).

With reference to the existence of generic theories describing how to realise socio-technical transitions, this paper will apply the theoretical framework onto the case-specific data, which will be conducted by semi structured interviews. With the help of a content analysis of the data, the data can be systematically organised in accordance to the theoretical approach applied onto the material. In this way, the collected data describing a pathway to a future where ride sharing is the preferred use of transportation un urban areas in Sweden 2030 can be anchored theoretically and understood in a scientific context (Esaiasson et al. 2012).

4.2 Collection of Data

4.2.1 Semi-Structured Interviews

Semi-structured interviews were used as the primarily method of data collection. The method is commonly used within qualitative research. In interviews it is central to understand the interviewee’s personal experience and perspective of the complex surrounding. In line with the semi-structured characteristics, the interview shall be flexible but carefully formulated in order to secure that the data needed to answer the research questions, will be collected. The respondents are allowed to answer the questions in a free manner, and it is common that the interview deviates from the set-up themes in the interview protocol. Prior to the interviews, a protocol will be formulated in order to secure that all themes that is necessary are gone through and covered (Bryman & Nilsson 2011).

4.2.2 Selection of Respondents

The selection of respondents, in qualitative research and especially in case studies, is often done intentionally. To do so intentionally increases the chances that respondents can generate the data needed (Esaiasson et al. 2012). This is called the ‘centrality principle’ and is applied to this case. This means, in this case, that any respondents must be well acquainted in the topic and be a central stakeholders in the sense of having self interest in achieving the goal of ride-sharing as the preferred use of transportation in urban areas in Sweden by 2030, or that they have academic insight in the topic (Esaiasson et al. 2012).

Due to the limited time at hand, only a limited number of respondents can be accounted for. Each informant makes up an analytical unit and the empirical data generated from the informant cannot be generalized (Esaiasson et al. 2012). The professional and academic background are diverse in order to grasp a holistic picture of the pathway to transition and also to increase result oriented validity, a diverse
set of and respondents with competence was selected (Dekker & Woods 1999). Due to the ‘centrality principle’ and limited time frame, diversity with regards to the respondents’ socio-economic background, gender and age could not be accounted for which may impact the result. The interviews took place during spring 2019 and were on average one hour long. Three took place over skype, and three in person, in an interview setting. The selection process was based on research, as well as the snowball effect where informants recommended other informants. As with qualitative research there is an inherent risk for the author’s influence over the interview sessions where the respondents may answer what they think that the author want to hear (Bryman & Nilsson 2011). This paper offers a first take on this topic and invites other researchers to apply competing theories (see footnote 2 and 3.2.1), as well as interview other informants.

Table 1. Selection of respondents interviewed for this thesis.

| No. | Organisation                          | Role                                                                 | Informant Reference |
|-----|--------------------------------------|                                                                     |                    |
| 1   | Public-transportation enterprise Västrafik | Strategist                                                         | VT                 |
| 2   | Sweden’s Traffic Agency               | Strategist within urban development, automatization and transport economist | TA                 |
| 3   | Lund University                       | PhD student working in the field of future transportation systems with background in geography | GL                 |
| 4   | ITRL Kungliga Tekniska högskolan     | PhD student working in the field of self driving vehicles and its effects on society | IK                 |
| 5   | Organisation Gröna bilister (Green motorists) | Consultant with behavioural expertise                                   | GB                 |
| 6   | UbiGO                                 | Entrepreneur within shared cars and rides                           | UG                 |

4.3 Processing and Analysis of Interview Data

4.3.1 Transcription

The interviews were recorded, transcribed and concluded and then presented in the result section. To increase the validity, the transcribed material was shared with the informants. The material was then dismantled in accordance to a color-coding scheme set up for this paper. Each operational question, presented below, was assigned a colour. While reading the material it was noted when the text answers to the operationalized question, and how it does so. By presenting and motivating the text’s link to the operationalized question, the interpretative process done by the author can be followed and be brought into light. By systematically organizing the material and its content in accordance to the theoretical approach, the case specific processes and innovations for transition can be concluded. The results are then finally presented and discussed under the result and discussion section (Esaiasson et al. 2012).

4.3.2 The Conceptual Framework for Transition

With reference to generic theories describing the realisation of socio-technical transitions, the case specific semi-structured interview data could be systematically analysed and organised in accordance with a conceptual framework for transition. See section 3 for a detailed description of the applied theoretical framework (Bryman & Nilsson 2011).

Based on the insights gained from SNM-approach, below in table 4 is a synthesized conclusion of the bottom-up and top-down processes required in SNM for a regime transition. Via a qualitative approach, SNM is translated into ten analytical questions, listed in the column “Operationalization of themed processes/innovation”, which was applied onto the data generated through the interviews. This will
enable the content analysis of the material. “Themes for Transition”-column contains the themes for transition as given by Schot and Geels (2008), Geels and Schot (2007) and (Geels 2012). In “Themed Processes/Innovation for Transition”-column, the themes are exemplified by the processes and innovations as given by the same.

The interviews was conducted around the themes of each research question: “What is ride sharing expected to look like”, “What are potential barriers and/or enablers to make shared rides preferred” and “What could societal actors take in order to make ride sharing the preferred choice of transport”. The third research question is directly linked to the aim of this study, hence is subject to the analytical questions listed.

Table 2. Based on: (Geels & Schot 2007; Schot & Geels 2008; Geels 2012).

<table>
<thead>
<tr>
<th>Themes for Transition</th>
<th>Nature of theme</th>
<th>Themed Processes/Innovation for Transition (impacted by model bias)</th>
<th>Operationalization of themed processes/innovation: questions for the material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niches for transition: (Geels 2012)</td>
<td>Bottom-up (BU) (Geels 2012)</td>
<td>• Intermodal travel innovation • Public transportation innovation • Demand oriented travel innovation • Cultural and socio-spatial innovations • Information and communication technologies (Geels 2012)</td>
<td>• Are intermodal travel-, public transportation-, demand oriented travel-, cultural and socio-spatial- innovations, and/or information and communication technologies mentioned by the informant as innovation of transition mechanisms? • If so, how?</td>
</tr>
<tr>
<td>Required top-down process: Mobilisation process (Schot &amp; Geels, 2008):</td>
<td>Top-down (TD) (Geels &amp; Schot, 2007)</td>
<td>• In absence or lack of critical (inter)action by regime-actors and outside groups, such as activists, promotion of such (inter)action is needed and shall be promoted (Geels &amp; Schot 2007)</td>
<td>• How is critical (inter)action by regime actors and outside groups mentioned as a transition mechanism?</td>
</tr>
<tr>
<td>Dilemmas of Managing Niches (Schot &amp; Geels, 2008):</td>
<td>BU (Schot &amp; Geels 2008)</td>
<td>• Flexible but goal-oriented envisioning of future mobility and transportation presented by actors such as regime-stakeholders to the population of Sweden (Schot &amp; Geels 2008)</td>
<td>• How are envisioning-practices for the promotion of ride sharing mentioned as a transition mechanism?</td>
</tr>
<tr>
<td>Learning:</td>
<td>BU</td>
<td>• Pluralistic but goal-oriented co-learning processes for sustainable</td>
<td>• How are co-learning processes for sustainable development using educational means in</td>
</tr>
<tr>
<td>Schot &amp; Geels (2008)</td>
<td>Schot &amp; Geels (2008)</td>
<td>Development using educational means in the educational system in Sweden (Schot &amp; Geels 2008)</td>
<td>the educational system in Sweden, mentioned as a transition mechanism?</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BU (Schot &amp; Geels 2008)</td>
<td>• Use of existing social, network-related and institutional resources for new purposes, called bricolage strategy, without major failure and misalignments from goal (Schot &amp; Geels 2008)</td>
<td>• How is the use of institutional resources for new purposes mentioned as a transition mechanism?</td>
<td></td>
</tr>
<tr>
<td>Network: Schot &amp; Geels (2008)</td>
<td>BU (Schot &amp; Geels 2008)</td>
<td>• Work with established incumbents that are also radical enough [hence may not be established] to facilitate change (Schot &amp; Geels 2008)</td>
<td>• How is working with radical incumbents mentioned as a transition mechanism?</td>
</tr>
<tr>
<td>Protection: Schot &amp; Geels, 2008</td>
<td>BU (Schot &amp; Geels, 2008)</td>
<td>• Protect novelties but also expose to market for its own development [To not create a white elephant] (Schot &amp; Geels 2008)</td>
<td>• How is protection of novelties mentioned as a transition mechanism?</td>
</tr>
<tr>
<td>Niche-Regime Interaction: Schot &amp; Geels (2008)</td>
<td>TD (Schot &amp; Geels 2008)</td>
<td>• Wait for cracks in regime top-down to occur, but also facilitate cracks through impact-oriented work, using economic instruments and mobilisation (Schot &amp; Geels 2008)</td>
<td>• How are the wait for window of opportunity and impact-oriented work mentioned as a transition mechanism?</td>
</tr>
</tbody>
</table>

### 4.4 Research Limitations – Validity and Reliability

Validity centres around the idea that what is investigated by the researcher is meant to be investigated throughout the whole research process. To ensure validity in this study, triangulation is used as far as it is reasonable. This is achieved by using a diverse set of respondents. The validity is also increasing by selecting informants that can provide relevant information. A systematic transition between the theory and operationalisation is also a tool to ensure validity. By striving for the absence of systematic as well as unsystematic errors, which results in increasing reliability, result oriented validity can be maximised. To increase reliability the interview data was shared with the informants (Dekker & Woods 1999; Esaiasson et al. 2012).

To study a future socio-technological system which is not launched yet, can be associated with the difficulty to reassure the validity of the results generated. There are reasons to use applicable scientific methods to anticipate future systems, although the result-oriented validity may be halting. To work with scenarios of the future, and to anticipate what may hinder reaching a desired goal, creates opportunities to influence future pathways forward (Dekker & Woods 1999). Often future studies ask questions like *What will happen?*, *What can happen?* and *How can a specific target be met?* in order to brainstorm potential pathways (Börjeson et al. 2006). Hence, by studying the risks of the roll out of SDC with D2D the role of the SDCs may be impacted (Dekker & Woods 1999; Börjeson et al. 2006).
5 Results

Below each first order sub-heading follow a summary from the conducted interview, which are followed by the full results. The full results have in each case been shared with the informants to maximize the validity of this paper. Research question three, laid out in 5.3 is followed by the content analysis based in the analytical question listed in 4.3.2. Data collected to answer research question one and two is not subject to the content analysis, as these question makes up the foundation to research question three.

5.1 What Is Ride Sharing Expected to Look Like in Urban Areas in Sweden by 2030

Expectations for 2030 indicates that behaviours around transportation and its use, largely will be similar as today. The physical attributes of ride sharing, may or may not be different from today – the respondents were not in consensus.

In sum, the majority of the respondents believe that there will be no or little change regarding the factors motivating use of mean of transportation between today and 2030. Efficiency, price and time will motivate the choice of transportation. The environmental discourse may be of more importance than today as a factor but likely not dominant. Hence, people may not change their habits for the environment solely.

One informant believes that the SDC will be a part of our city scape by 2030, while another believe it will not due to the difficulties to develop the self-driving technique and the institutional adaptation that is needed. It may be that the public transportation’s unofficial monopoly on ride sharing is under scrutiny and debated in 2030. Intermodal traveling will likely be available and will likely be popular, and will incentivize people to use ride sharing, as it incentivizes the population to not own a car.

It is also suggested that price will play an even smaller role in 2030’s Sweden as it will be integrated in other services or products, such as in your rent, house loan, food purchase or insurance, or that the price is so significantly low due to advancement within solar energy. Mobility as a part of rent is recently launched in the cooperative Viva in Gothenburg and this may be more common.

5.1.1 Results from Conducted Interviews

Below is result of each interview organised by informant as indicated to the left, in relation to the first research question stated in the title 5.1.

Table 3. What ride sharing is expected to look like in urban areas in Sweden by 2030 according to the interview respondents.

| TA | There are many speculations about what will happen in the future. There are many versions on what the future will entail and whether or not there will self driving vehicles on the streets. It is hard to tell what ride sharing in the future will look like. People seemingly want to have- and travel with their own means of transportation, as the society is very ‘individual oriented’. As long as the car industry is telling the story by marketing, people will continue to strive to travel as efficient as they can. If it is more efficient to travel alone in a car than in a shared mode, or even by bike, then they will. Things will not change from today as long as people are not exposed to new positive experiences challenging the status quo. Hence, ride sharing will be preferred and have an increased demand only when it’s the most efficient option. |
| GL | People will, also in 2030, tend to choose the option that is perceived as the most time and cost-efficient as possible. Ride sharing as a concept might be a part of intermodal traveling in the future, where you use different means of transportation depending on where you are going. |
Although it may be so that people in general will consider environmental issues more and more in their daily lives, it is not very likely they will choose the mode of transportation solely upon that. There must be another benefit connected to it, such as an economic incentive.

To increase the demand for ride sharing services by 2030, incentives must be put in place, otherwise people will likely tend to opt for the option being the most efficient. This can, however, in an urban setting, be to use a bike. To bike is not to use ride sharing, but it is an environmentally friendly mode of transportation.

| GB   | There are quite big question marks about how the transportation culture will look in the future. Time efficiency will always be an important factor behind people’s choice of mode of transportation. The price as a factor to the choice of mode of transportation will be less and less central however, as we will pay for the trip itself less and less. Mobility will rather be integrated in another service – maybe it will be included in your rent, house loan or food expenditure at the grocery store. Examples of the cooperative Viva in Gothenburg were mobility is a payed through the rent will be more common. This can increase the chances for people using any means of transportation but the private car more extensively.

In terms of ride sharing, the future will likely develop into a state where the public transportation will be experience competition from other types of owners that can provide car sharing, such as fleet owners. The industry realizes that sharing vehicles and rides is going to be demanded. Although the competition between the two different actors will probably be more serious beyond 2030, it may be more recognized as an upcoming issue and debate in 2030. To own a vehicle will decrease – the car industry has already started the transition into becoming mobility suppliers. Look at Volvo M, Mercedes and BMW.

2030, things will be not that different from today. Today the public transportation sector is open for competition. Due to that the competitors have not been ‘let in’ into the traffic system successfully, in that sense that it cannot use the infrastructure in place, they have not been competitive. Car-pooling has never really been commercially successful either when actors have tried to promote it through apps and alike.

| VT   | In 2030 things will be similar to today.

| UG   | In the future the environmental factor will be more important than it is today. The most influential factor to how transportation will be used in 2030 is a potential price drop as energy generated from solar panels will be cheap and car batteries better.

In 2030, self driving cars will likely be a part of our city scape. The acceptance to share rides will be growing as ‘shared economy’ is being normalized and as we feel safe to share ride with others. The safety aspect will have to be handled. More and more people will start to use intermodal transportation services instead of owning a vehicle by 2030, due to its convenience. Therefore, they will start using shared rides more, simply because their own car is not ‘there’ reminding them it should be used.

| IK   | There are four trends we can see now. Automatization is one of them. Electrification and digitalization are two more. The development we see is not a game changer, it is rather an evolution that has been going on the past 300 years. The hype of automatization has started to revert now as it is becoming evident that it is not that easy to develop such technique as anticipated. A driver does so much more beyond driving.

For the technique to work, it must be able to interpret language or handle a situation where one of the passengers need to stop. Although a vehicle works autonomous 99% of the time, the 1 % where it is not, will still require that the passenger gets a driver’s license. The transportation system of 2030 will therefore be like today. It is shown in opinion polls that 50 % of the respondents fear the self-driving technique. It may be the younger generation that will use this technique.

By 2030 part-automatization will likely be a reality. To use the autonomous setting will probably be used in rural areas rather than in urban. Although it is sometimes argued that it is only the judiciary system standing in the way of a roll out of self- driving technology, I believe there is much more to it than that. Many other institutions must be adapted for the roll out to be successful.

It can be seen that ride sharing is experiencing a negative trend today, the use of public transportation is increasing among certain groups but from an overall perspective, ride sharing is decreasing as we have
more purchase power and therefore buy vehicles. Carpooling is used by 1% of the Swedes, and they will likely not start pooling with self driving cars. Perhaps it makes more sense to nudge people into using the mass transit systems. 2030 will be similar to today and ride sharing will be done through the use of mass transit systems. The use of ride sharing may still be experiencing a decline.

5.2 Barriers and Enablers for Making Shared Rides Preferred in Urban Areas in Sweden by 2030

In summary, some measures may be both barriers as well as enablers. Such are policies. They can both make people angry without changing their behaviours, or they can be successful and promote change. People are believed to want to do the right thing. The current physical and institutional landscape is described as a major barrier due to its catering to the car industry, but that enabling factors are staring to emerge as space in city centres are becoming an issue. The Swedish culture is according to the responses does not work in favour of ‘sharing’ due to individualism and self-fulfilment, but that the ‘good parenthood’ aspect within the culture may be a trigger for change.

5.2.1 Barriers: Results from Conducted Interviews

Below is result of each interview organised by informant as indicated to the left in relation to the second research question stated in the title 5.2.

Table 4. Result for barriers for making ride sharing the preferred use of transportation in urban areas in Sweden by 2030.

<table>
<thead>
<tr>
<th>TA</th>
<th>Knowing we are living in a democracy and that the democratic values must be prioritized, the development of our society is decided by the people through representative democracy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The history of urban planning and automotive industry impacting our daily lives today is a great barrier. Our society is built for the private car and its use. As soon as one has an errand outside the immediate city center, it may be talking against using public transportation or any other mode of shared rides due to inconvenience and time consumption. The fact that we have constructed a society over the past 100 years that focus on the car, which has an immense capacity that we are not even using, makes it hard to break free.</td>
<td></td>
</tr>
<tr>
<td>We will not be able to get over the culture self-fulfilment and individualism over a night, and it is this culture in Sweden that is a main barrier to changed behaviours. Ride sharing, nor walking or biking, is today, not a part of our story line telling us how to live successfully. We have the idea that we need the possibility to travel spontaneously, maybe to go grocery shopping or to get rid of a frying pan which must be discarded at a waste facility not seldom located far from urban centres. Such things also create barriers to a shift in the culture of mobility. We do not want to spend travel time nor time-consuming coordination to take care of these every day businesses.</td>
<td></td>
</tr>
<tr>
<td>A barrier is that the transportation sector is very business oriented and that that industry in producing two-ton heavy vehicles which they market as the best solution for transportation and mobility. This solution is linear to our culture.</td>
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<td>The car is marketed as the desired solution to us. Ride sharing, nor walking or biking, is today, not a part of our story line telling us how to live successfully. We have the idea that we need the possibility to travel spontaneously, maybe to go grocery shopping or to get rid of a frying pan which must be discarded at a waste facility not seldom located far from urban centres. Such things also create barriers to a shift in the culture of mobility.</td>
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<td>We will not be able to get over the culture self-fulfilment and individualism over a night, and it is this culture in Sweden that is a main barrier to changed behaviours. A barrier is that the transportation sector is very business oriented and that that industry in producing two-ton heavy vehicles which they market</td>
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as the best solution for transportation and mobility. This solution is linear to our culture. […] We do not need the capacity a car can provide to transport a person in its daily commute between A and B. But this is what is marketed as the desired solution to us… ride sharing, nor walking or biking, is today, not a part of our story line [marketed] telling us how to live successfully.

We have the idea that we need the possibility to travel spontaneously, maybe to go grocery shopping or to get rid of a frying pan which must be discarded at a waste facility not seldom located far from urban centres.

You can force people to choose ‘the right thing’ with taxes. We did so before and it turned out to be a catastrophe – it was not successful.

**VT** The lack of working business models that makes it successful to run a business in ‘sharing’ and intermodally, across companies.

**GB** The biggest barrier to increase ride sharing is that it is too easy to not engage in ride sharing. There are many incentives to travel alone in a car. It’s the simplicity of traveling alone that makes people do it.

People’s tendency to opt for affordable solutions can be an enabler. To implement economic incentives could be a factor to change, but it is not given. It could be that the price of traveling alone or to travel with a car, is increasing through tax or price schemes such as tolls. This might just make people really angry rather than they would change their behaviour and ultimately backfire. Perhaps to work with ‘carrots’ are more important. There must be benefits for ‘ride-sharers’ so it creates a positive experience.”

The relatively strong marketing machinery within the car industry pose as a barrier – it reproduces a ‘car culture’.

The democratic system we have in Sweden does not promote fast changes. Long assessments drag out the time. It can pose as a problem that people of Sweden will vote for political parties that does not want to be ‘green’ but rather has a nostalgic and anti-environmental rhetoric. This influences how public actors ultimately can and will act.

**GL** The biggest barrier to increase ride sharing is that it is too easy to not engage in ride sharing. There are many incentives to travel alone in a car. It’s the simplicity of traveling alone that makes people do it.

**UG** Difficult, inconvenient, expensive and flawed business models which enables successful advancement of shared services are barriers.

In Sweden today, it is an issue that one the one hand, people ought to not own a private car, which can be solved by that a real estate developer signs a 5-10 year worth contract with a car pooling company, in order to provide intermodal mobility with the rent. The municipality, which needs to make sure that the developer has a long-term strategy in order to ensure cars will not be found on the municipality’s land in the absent of a car park, is likely in favour of a long-term agreement. Although this is an example of a solution that could incentivize intermodal traveling, the car-pooling company that secured a long-term deal will lose its incentives to provide the costumers with a great service.

**IK** Barriers to an increased use of shared services by 2030 is that things will be like today and the same barriers applies. The barriers are cultural in that sense that we will be in the same paradigm and structure then which will incentivize us to buy private vehicles.

Another barrier to an increase use of ride sharing is that the cost is different. A company providing the shared service will make its user pay the full price, meaning that one will pay for the fuel, life cycle costs, the ride and the company’s profit. People owning a vehicle rarely think about these additional costs on top of the fuel. Hence, there is a perception that owning a car and riding with it, is cheaper.

It is also shown in a survey that people are not ready to pay extra for the self-driving technique. So, we will likely not see that self-driving technique will be successful on the car market. Rather within freight or services paid by companies, such as business travels.
Another barrier is that the societal structures will stand for another couple of years. The cities are where they are, and the infrastructure is where it is. It takes a long time for people to change behaviours and mobility patterns.

5.2.2 Enablers: Results from Conducted Interviews

Below is result of each interview organised by informant as indicated to the left in relation to the second research question stated in the title 5.2.

Table 5. Result for enablers for making ride sharing the preferred use of transportation in urban areas in Sweden by 2030.

| TA       | Economic incentives can be an enabler. The use of economically steering policies is however not always working. We have the experience of implementing premiums for those buying ethanol cars. It did not work out well. Economic incentive may not be the given enabler to this issue. An enabler is that people want to do the right thing. They have built the society and want to use it from the perspective of their personal needs. It is often talked about ‘Smart Cities’. People likely would like to be connected to the ‘smartness’ which is shown in connection to the ‘Smart City’ discourse.
| GL       | Time and money savings will be an enabler. The environmental benefits the costumer may experience in its choice of transportation mode will rather be an ‘extra’ that comes in the same ‘package’. To promote the use of ride sharing through the use of busses can be done by creating bus-lanes which makes the commute which such vehicle more favorable. This could alter how people relate to their geographical context and such a shift can be an enabler to change.
| VT       | Responsiveness to regulation and legislation among the public. Regulation can change behavior.
| GB       | The lack of space in urban areas is an enabler. That can motivate legislation forbidding traffic in spaces. It is upcoming in Europe. The climate goals are also an enabler as it puts transportation on the political agenda. People’s tendency to opt for affordable solutions can be an enabler. To work with ‘carrots’ are more important than ‘sticks’. There must be benefits for ‘ride-sharers’ so it creates a positive experience. Tendency for wanting to be a good parent: Nobody wants to be a bad parent – can one link the discourse of traveling alone to bad parenthood to changed behaviors? Pier pressure and norm formation around good parenthood an ‘bad’ mobility habits could work as a way to create new norms, as was experienced through the anti-smoking campaigns
| UG       | Functional boundaries set by politicians can serve as an enabler, as that gives us the space to develop solutions to issues. People are enlightened and want to be enlightened and ‘do the right thing’, that is also an enabler. We must make sure that the ‘right thing’ is attractive for them.
| IK       | Knowing there is nothing in particular in today’s society that really that ‘speaks for a transition’ wherein ride sharing becomes more used, urban planning can work as an enabler.
5.3 What Societal Actors Could Do in Order to Make Ride Sharing the Preferred Use of Transportation

The summary of the answers given are analysed and is therefore social scientifically concluded below in 5.3.1. Below is result of each interview organised by informant in relation to the second research question stated in the title 5.3. The content was shared with the informants.

5.3.1 Results from Conducted Interviews

Table 6. What societal actors could do in order to make ride sharing the preferred use of transportation.

| TA | There are no specific actors that solely plays an extra important role in the creation of a normative future. It is rather interaction between actors that are central to the development. Academia, the industry, and public agency for example. To write reports on the environmental issues will not change anything. The forums that has an impact non peoples’ lives are seemingly mass media. Hence, a new story line depicting another lifestyle with other mobility culture must be communicated. By working with vision building and interaction, we can also start showing qualities that has been lost due to the car culture – such as clean air. You cannot make people change their behaviour by telling them how bad their current behaviour is, you must promote a solution that can be desirable to them. By interaction through citizen’s dialogue and discus the future, by using envisioning, new political demands could emerge. To communicate visions is rarely seen in Sweden. Envisioning of the future through dialogue could have the potential to further develop the now hegemonic cultural trace of self-fulfilment in Sweden, and make mutual reliance seen as something valuable and normative. This can enable an acceptance for the sharing economy. These forums where anyone can join should be installed in Sweden. These forums ought to settle with the culture of self fulfillment too. To which extent do we want to be individual-centered and on which expense. More mutual reliance, dependence and reassurance could be desirable for us as humans and Swedes. A new story line ought to put the human in the centre rather than the industry. Vehicles can also be designed to, instead of taking you somewhere, bring you things. Vehicles can be designed to store food, hence come and leave your groceries at your place, rather than taking you to the store in a shared ride. Or a car can be designed to come and pick up your cans which will go to pant or provide you with the medicine you need. Then you do not need to travel as much. Real estate developers are important as they can start providing mobility through rent. The young generation can have an impact on their parents into behavioural change which parents cannot argue against. Hence, we need to educate our children and promote societal engagement. |
| GL | The actors that of importance can be divided into two fractions. On one side there are actors that is promoting technological change and advancement, the industry, and on the other side you have actors trying to influence how any technology is used, public agencies. The role of the regions in Sweden as a strategic innovation partner can be used as a networking and protection facilitator. They can promote innovators and facilitate a landscape favourable to them (GL). The municipalities in Sweden has a lot of power over the physical planning. Make sure to build the environment that we need. Gothenburg has a lot going on in that sense. In Gothenburg they have projects, where park-and-go solutions are developed, in order to stimulate the use of intermodal commuting. Compare this to Malmö, where this is not yet realized. |
Concerning innovation and the conditions to foster desired innovation, strategic innovation programs are important. On regional level, the regions are working to promote the regional trade and industry. They usually promote what they have but they also have to have strategies for a structural change and development. The region usually has a strategy for mobility.

What is needed is to create a demand for the normative innovation, which in this case if a sustainable mode of transportation. If an urban developer makes no parking spaces, the demand for something else will increase. By letting the urban planner be led by certain goals this can be realised.

At the same time, a strategic innovation program will foster the development of an alternative to the ‘old’ mode of transportation. In Norway the demand for electricity driven cars rose after that cars using other fuels were taxed heavier while the infrastructure catering to electricity driven cars was expanded. It seemingly worked there.

It can be an idea to make the economic benefit of riding together be so great it outcompetes other ways.

To provide carrots can be to implement schemes incentivising employers to provide the employees with mobility instead of only a car. To provide mobility could be to offer discounted tickets for public transportation or anything alike. To provide mobility can ultimately enable people to gain new transportation experiences.

Knowing that the car industry is marketing their product heavily, look at DN Motor for example there must be a stronger actor marketing another type of mobility. The public transportation is not marketing their service constituting of ride sharing in a manner that can compete with the appeal of the car – and this need to be changed. Perhaps it can be communicating ride sharing as better parenthood.

Risk capitalists and big investors, among them our big pension funds, can be very important here too. If they started to invest in new companies, things will start to move. An idea can be to provide very very beneficial economic incentives to use ride sharing when you need to use a motorised vehicle.

Actors within the public sector, such as the municipality, government, members of parliament and the regions have to dare to think ‘new’. They can possibly be those actors that will try to cling onto the ‘old’ ways of doing things the longest. To remedy that, another kind of democracy, more of a direct one, could be interesting. To digitalize the voting system can be important.

The private sector is faster than the public and they are, for now, working faster to meet the needs of the public, which they perceive to be sustainable solutions. It is the public sector which brought the climate goals onto the table, but now it is more the private sector which is acting fast upon them. The private and the public must work side by side, and preferably in the pace of the private sector, but towards the right goal, which the private sector only has as long as it perceives its customers demanding it.

If people want their privacy, the interior design of a vehicle can be of importance. A design that allows the space in a car to be split into a few private parts.

To wait for the right time to launch a solution to maximise its chances to be welcomed at the market exemplifies as the ‘waiting’ aspect of the theme. This was suggested by (VT)

There is no given actor that has more importance than others. Right timing of launching new solutions is important. If a launch is timed, then the costumers perceive that they get what they demand, hence it will catch popularity.

To be able to plan a trip on only one website or app can incentivize the customer to use intermodal transportation. If it is too complicated to plan a trip because you have to use several travel-planning devices, it will not sell. New business models would be beneficial.

The practicing of visions creates a new set of expectations and they should preferably be held in a by the interdisciplinary setting. We also must work with visions and positive thinking.
We need to talk more about what is of importance to people and what really matters to us [...] a lack of skills from the humanities can make it harder to ensure the heart is with us. We need to have more conversations on what is important for humans. Those conversations ought to start earlier in life. In our case in Sweden, we could add more hours of philosophy and courses that talks about ‘who you are’ in order to foster and develop such skills and insights. We do not only need technical solutions to be successful, we need love, company, social relations, human rights.

It is exemplified that at conferences today on artificial intelligence philosophical aspects are often included. They ask themselves what is ethical. Also, in conferences on SDC the ethical perspective is dealt with in terms of what the vehicle should choose to do in a specific situation. What is missing however, is this philosophical conversation with regards to what we actually need and want, and whether it is okay to realise that. Technical solutions ought to be viewed in a larger context, which often is lost.

The educational system is important. There is a lot of technicians that tries to solve societal issues. Whilst engineers are great at being logical and analytical, they sometimes have a lack of social and empathetic skills. We should recognize and celebrate our differences. As an engineer myself, I can feel that as we do get a problem-solving skill that is great but that ‘the heart’ does not always follow. If we learn these things, chances are that we will live more sustainably.

| IK | Economic incentives by implementing means of control is the key to change behaviors. By implementing policies, taxes or road tolls, one can create a demand for new solutions, which could be ride sharing services due to an increased cost of using the opposite. People arguably need ‘Visions on how to deal with the puzzle of life’ |

5.3.2 Analysis: What Societal Actors Could Do in Order to Make Ride Sharing the Preferred Choice of Transportation

The data generated was interpreted on the basis of the analytical questions listed in the conceptual framework, the suggested actions for transition are analysed and organised by its nature below. The bold headings in italic correspond to the SNM-themes listed the conceptual framework in Table 2, chapter 4.3.2, which are based on Geels and Schot (2007), Schot and Geels (2008) and Geels (2012). A summary of the analysis is given below in 5.4.1.

Processes for Mobilisation

Mobilisation is defined as the process where critical (inter)action by regime-actors and outside groups are allowed, which may lead to the influence of the public (Geels & Schot 2007) as outlined in the table 4.3.2.

The car industry is marketing its product heavily in comparison to the marketing of ride sharing (GB, Table 6). The expressed need for an alternative marketing, as well as communicative action to strengthen the status of ride sharing, as suggested by TA and GB, Table 6, is here interpreted as a needed mobilisation process, as it consists of an action by outsiders. Such mobilising communication activities could consist of envisioning activities (TA, Table 6), or critical statements released by regime actors and/or outsiders on the disbenefits of undesired mobility behaviours (GB, Table 6). By recognizing there is a ‘good-parenthood’ culture in Sweden, to use such framing of the issue in statements can be interpreted as a mean of mobilisation using communication (GB, Table 6). This could be done by insiders a well as outsiders.

Although envisioning itself as a management process for niche management, envisioning may have mobilising characteristics due to its communicative nature potentially involving a range of actors – outsiders and critical insiders. Envisioning for the future could have the potential to further develop the now hegemonic cultural trace of self-fulfilment in Sweden, as suggested by TA, and make mutual reliance seen as something valuable and normative. It can create a new storyline where industry is not central (TA, Table 6). Envisioning can enable an acceptance for the sharing economy (UG, Table 6).
As the processes includes regime actors such as the governmental agencies, regions, ride sharing companies and academic professionals, as well as outsiders such as politicians, activists but also ordinary citizens, it can arguably be viewed as action linear to the Swedish consensus culture which may have positive impact on policies implemented by its enabling nature in Sweden (Isaksson & Richardson 2009; Hysing 2015).

The use of communication within an educational setting, educating, by using questioning and reflecting academic disciplines to scrutinise the societal structure, can arguably also be interpreted as a process of mobilisation. Education is a way to provide new insight and knowledge, and according to UG, Table 6, critical thinking and deeper reflection is often lost within today’s conferences and dialogues on societal development and innovation:

“in conferences today on artificial intelligence philosophical aspects are often included now a days. They ask themselves what is ethical. Also, in conferences on SDC the ethical perspective is dealt with in terms of what the vehicle should choose to do in a specific situation [who to kill in an accident]. What is missing however, is this philosophical conversation with regards to what we actually need and want [from engineering], and whether it is okay to realise that. Technical solutions [such as within transportation] ought to be viewed in a larger context, which often is lost” (UG, Table 6).

By mainstreaming critical perspectives which suggestively is found within humanities, and either include it within engineering or involve other representatives from other disciplines more in decision making, it can arguably become a mean for mobilisation. This can be exemplified by how outsiders are encouraged to ‘infiltrate’ the current regime. It is argued that we have too few hours of education in humanities, and/or alike subjects where you are encouraged to think about who you are and what is of importance for you, in school (UG, Table 6). It is also expressed that it is introduced too late in the Swedish school system (UG, Table 6). A more pluralistic education could arguably result in promotion for a development of new business models and a broader legitimisation of its use. The use of new and updated versions of business models is according to VT and UG, Table 4, a barrier today.

GB and TA suggest that children have an impact on their parents. By strategically educating children toward a certain goal, it can help mobilise both children and parents (TA, Table 5 and 6), as experienced through the bike helmet example (Table 5).

**Niches for transition**

Niches are defined as space for innovation creating innovation for transition which are exemplified by Geels (2012) as outlined in table 4.3.2.

**Cultural and socio-spatial Innovations**

As mentioned by several of the respondents, TA and UG, Table 6, there is an absence of space where envisioning and dialogue for alternative futures can take place. Although mass media is suggested to have a great impact on people’s lifestyles, mass media is rarely used as a forum for envisioning alternative futures in regard to sustainability (TA, Table 6). Acknowledging the need for this top-down process as well as the need for such a space, the latter is here interpreted as a request for a cultural and socio-spatial innovation. It may be a physical space such as a town hall or a virtual space. If virtual it may also fall under the category of innovation within information and communication. Also, in this case, an innovation cannot trigger transition, nor in itself make people use it (Geels 2002). Mobilisation in itself, can in this case be an important enabler for its use, as well as the use of the waiting mechanism, suggested under niche-regime interaction.

With reference to the dominating current cultural and socio-spatial structure which are interpreted to be made up by the perceived barrier of history of urban planning catering to the car industry, new modes of urban planning could be of importance (GL, VT, IK, Table 4). The new ideas needed within the practice and discipline of urban planning can constitute an ‘innovation niche’ wherein new solutions will emerge and later be materialised (GL & TA, Table 6). New norms around instalment for exclusive lanes, or even new types of lanes, for shared vehicles, dense development, prohibition of vehicles
altogether in selected spaces can arguably be exemplified of this (IK, GL, Table 6). This can create a demand for new solutions within mobility and transportation (GL, Table 6).

Although the examples given can be interpreted as result of a policy-related matters rather than innovation, it is worth noting that innovation which are developed as a result of a policy, likely will be the measure to meet needs of mobility. If the innovation can justify or enable a policy requiring dense development, instalment of lanes and alike, it arguably falls under this category.

Property developers, developing ‘non-conventional’ real estate without parking, such as Viva in Gothenburg (GB, UG, Table 6) is arguably dependent on alternative modes of transportation sold together with the rent. Although intermodal transportation is not falling under this niche, a developer using an alternative business model for launching this type of housing, can arguably be regarded as a user of a socio-spatial innovation, made up by the business model as the business model creates new cultural and socio-spatial relationships (UG, Table 6).

**Information and communication technologies**

The need for digitalization of the Swedish democratic system, providing a faster democratic pace and directness, can be compared to Geels’s (2012) innovation within information and communication technology. If successfully used, and the voting are having sustainable intentions, its speed could be regarded as a potential enabler for faster societal processes (GB, Table 5). Also, in this case, the technology cannot guarantee change of use or societal development (Geels, 2002). Any virtual space used for communication and envisioning practices may fall under this category.

**Intermodal traveling, public transportation and demand-oriented travel**

As this paper assumes that that there is a great chance for travel on demand will be a part of the future of transportation due to digitalization, the development of cars is interpreted as a form of innovation within demand-oriented travel. Intermodal traveling is interpreted as either constituting of new means of transportation or ticket schemes, or business models allowing intermodal traveling. Public transportation is interpreted as a form of a shared vehicle which in the future may not be distinguishable from demand-oriented travel.

Cars could suggestively be designed differently in the future; instead of providing humans with mobility, it could be providing the matter humans demand. Such as groceries, medicine or pick up our cans when we want to recycle those (TA, Table 6). Whether this solution would result in a situation wherein the vehicle is used to its maximum capacity, and serve many households during its route, is unknown. Assuming motorised vehicles, not counting trucks, are foremost transporting people, its interior design to cater to those whom will share it, can be developed (TA & GB, Table 6). As suggested by VT, new business models could be central to enable and use intermodal traveling. In line with Geels (2002) argument, a technicality cannot bring transformation on its own, rather it is the social agency associated with it, hence such shifts in design may not create a desired result.

As suggested by UG, Table 5, functional boundaries serve as an enabler for the emergence of solutions, innovation cross bread with niche-regime interaction could suggestively spur a rapid niche development.

**Dilemmas of Niche Management**

**Learning and Expectations & Visions**

Using envisioning while showcasing new innovation to create new expectations ought to be flexible but goal-oriented envisioning on future mobility and transportation, presented by actors such as regime-stakeholders (Schot & Geels 2008). Learning for transition on the other hand ought to be pluralistic but goal-oriented co-learning processes for sustainable development, using educational means within the educational system. This could be done together with the use of the existing social, network-related and institutional resources for new purposes, which is called bricolage strategy, without major failure and misalignments from goal (Schot & Geels 2008). The latter was never mentioned, according to the interpretation of the material.
The practicing of envisions wherein innovations for transitions are used, creates a new set of expectations if carried out correctly, if inclusive and represented by an interdisciplinary group, chances are greater to be of a sustainable character (UG, TA, Table 6). Although envisioning and expectation-building can be done in a free manner, it is of importance to have control of what is communicated as deviation from the goal is not desired. This was arguably supported, with reference to the expressed need for representation of humanities specially, at conferences and education (UG, Table 6).

The suggestion given on the expansion of the curriculum, could suggestively also be a way of steering and taking control of the vision building and learning experiences. Inclusion of humanities within the educational system is also interpreted as a learning mechanism due to its obvious educational nature. The co-learning aspect is arguably realized as discussion and other interactive means of teaching and learning is used. Co-learning was not explicitly brought up within an educational setting, but co-learning can be experienced by participating in debate and envisioning practices taking place outside the official educational system due to exposure of new perspectives, which was mentioned (UG, TA, Table 6).

_Networking and Protection_

To use networking for transition implies that the government establishes relationships and works with incumbents that are also radical enough to create transition, which in itself may suggest they are not established (Schot & Geels, 2008). It is also suggested that protection of goal-oriented novelties, must be handled but, that enough exposure must be considered, in order for its maximal development.

The role of the regions in Sweden as a strategic innovation facilitator is interpreted to fall under this category. By using promotion, facilitation of a landscape favourable to desired innovators, such can be realised (GL, Table 6). Here is arguably the mechanism of mobilisation applicable as the region also falls under a democratic regime, and therefore also is dependent on popular vote. It is however not specified how the region will manage the innovation; that it ought to use networking and protection. However, according to the data collected, it is seemingly the actor which has the capacity to facilitate networking and protection through strategic innovation programs.

_Niche-Regime Interaction_

Niche-Regime is defined as the process where one waits for cracks in regime top-down to occur, but also facilitate cracks through impact-oriented work, using economic instruments and mobilisation (Schot & Geels 2008) as outlined in the table above. To wait for the right time to launch a solution to maximise its chances to be welcomed at the market, exemplifies the ‘waiting’-aspect of the definition. This was suggested by VT, Table 6, as a mechanism for change.

To mobilise through critical interaction as described previously, arguably falls under niche-regime interaction. Further, the implementation of economically steering policies, such as road tolls or other tax schemes which is both suggested and also warned against, can make up processes to crack the regime if it is successful. As it becomes less economically beneficial to travel independently in a vehicle due to such implementations, people may start demanding new solutions (GL, Table 6). There is a potential risk that the use of ‘economic sticks’ could have a reversed effect, if it lacks legitimacy (Isaksson & Richardson 2009; Hysing 2015).

The use of ‘carrots’ could be safer to use as suggested by GB, Table 6. The balance between regulation and legitimacy have to be regarded, as indicated by TA and GB, Table 6. The goal can also be realised by letting urban planners be led by environmental principles (GL, IK, Table 6). To control urban planning to ultimately control the use of transportation, can theoretically also backfire, with reference to the “risky” realisation of the Stockholm road tolls (Isaksson & Richardson 2009).

To provide ‘carrots’ can be exemplified by the implementation of economic schemes incentivising employers in Sweden to provide employees and staff with mobility solutions instead of a private car (GB, Table 6). Provision of such could be to offer subsidised tickets for public transportation or intermodal traveling when launched. A tax subvention enabling such development could be funded by taxation private vehicle use or road tolls, which risk being unsuccessful, or funded by another income. Regardless of its funding, which must be carefully considered, it can provide a clientele otherwise prone to travel by car, new transportation experiences, hence create an environment for learning and
envisioning. New positive experiences can arguably increase the demand for new solutions (TA & GB, Table 6 and 5).

A suggested digitalisation for faster and more direct democracy in Sweden is interpreted to also make up a mechanism to crack the regime, although not of an economic character. If, as assumed, a digitalised democracy will empower people and speed up the democratic processes, it may also put pressure on the regime (GB, Table 6). This development is arguably dependent on political intentions among the public, which may or may not be ‘green’ (GB, Table 6). If the younger generation tend to be more ‘green’ than older generations, it may be successful. The technology in itself, in line with Geels (2002) argument, cannot solely change the system.

By letting monetary resources from big investors be moved to support sustainable innovation, the landscape for the niches are changing. Hence this action is interpreted as a Niche-Regime interaction (GB, Table 6). If the investors however, place resources within sustainable innovation motivated by the favourable returns, it is rather seen as an action linear to the current yield-motivated culture (Martin 2016).

5.3.3 Summary of Analysis

With regards to the aim of this paper; the following points are the opportunities identified for creating a pathway to ride sharing as the preferred choice. The points below answers to research question three “What action could societal actors take in order to make ride sharing the preferred choice of transport”.

**Actions in processes for Mobilisation**

- Mobilisation through marketing of ride sharing, inclusive and interdisciplinary envisioning activities and critical communication using ‘good parenthood’-framework by regime actors and outsiders (Table 6).

- Mobilisation through curriculum expansion including disciplines and perspectives deriving from humanities more and earlier in the Swedish school system. This can promote development of new business models, legitimise the use of such as well as promote sustainable lifestyles (Table 6).

- Mobilisation through inclusion of perspectives deriving from the humanities at conferences on development, especially on technological development (Table 6).

**Actions in Niches for Transition**

- Creation of a space for communicative and envisioning activities using cultural and socio-spatial innovation, and/or innovation within information and communication, where it is needed (Table 6).

- Creation of new modes of urban planning; innovation justifying e.g. special lanes, density and prohibition for cars all together. Also new modes of housing and real estate development and business model allowing such (Table 6).

- Creation of digital means to speed up the democratic process through innovation within information and communication, hence put pressure on the regime (Table 6).

- Creation of new types of cars with new aims and with new interior designs to impact mobility behaviours (Table 6).

- Creation of business model promoting the use of intermodal traveling (Table 6).
**Actions in handling dilemmas of Niche Management**

- Use of interdisciplinarity and promotion of perspectives deriving from the humanities to secure goal-oriented learning and envisioning practices in Sweden, within and outside the Swedish educational system, using for forums and conferences, for example (Table 6).

- Use of regions in Sweden as a strategic innovation facilitator which may promote and create a favourable landscape for sustainable innovation through networking and protection (Table 6).

- Wait for the right time to launch innovation to make sure it is welcomed at the market (Table 6).

- Implementation of economic steering policies, functional boundaries, which will steer the innovation and behaviours towards a desired goal. Consider the legitimacy of policy (Table 6).

- Implementation of economic schemes incentivising employers to provide employees with mobility instead of private cars. This may create new experiences among a clientele used to travel alone by car (Table 6).

- Making of urban planners be guided by sustainability goals and new modes of urban planning when developing space; and steer monetary resources from large investors to desired investments. Consider the legitimacy of policy (Table 6).

The suggestions listed above build on the respondents’ expectations of how ride sharing will look like in 2030 in urban areas in Sweden which was asked through **research question one** “What is ride sharing expected to look like: The expectations of its physical nature varied, but that the motivation of its use was expected to be on the basis of similar factors as today: efficiency and convenience. Ride sharing may be performed by intermodal transportation and the public transportation may experience competition from the private sector (Table 3).

The suggestions listed also built on the informants’ experienced barriers and enabler for ride sharing in Sweden in urban areas 2030, which was asked through **research question two** “What are potential barriers and/or enablers to make shared rides preferred”: The experiences barriers are made up by the current car culture and the current physical landscape of our cities catering to car use, as well as the current institutional and democratic structures. The experienced enablers were on the other hand the younger generation, functional boundaries such as policies, culture of wanting to do good, innovation and also the physical landscape of our crowded cities which cannot host a large number of cars (Table 4 and 5).
6 Discussion

6.1 Generation Bias: How the Age of an Informant may Impact Results

The selection of respondents of this thesis was made on the basis of the centrality principle as previously laid out. With the informants’ reference to the younger generation as an enabler of transition and data collected by SiFo, it may be worth noting the younger generation’s contrasting character in relation to this study.

SiFo suggests that the climate is the most important question for the younger generation. Hence, there may be reasons to believe that the population of 16-25 years of age today, will impact the Swedish culture of 2030 (WWF 2017). According to the poll, 94 % felt that it is important to adopt an climate friendly lifestyle, while 31 % feels that they want to take on the task of reducing emissions on a personal level (WWF 2017). Since the autumn of 2018, school strikes have been taking place around the world to show dissatisfaction regarding how climate change is handled by politicians (FridaysForFuture 2018).

The general belief among the respondents suggests that the use of transportation will be motivated on the basis of similar factors as today, which largely are made up by efficiency and convenience. As the today’s young adults arguably will be making out a more buoyant clientele 2030 which may have a larger impact on the society as a whole, the culture could arguably, in contrast to the respondent’s belief, be changing. Hence, young adult respondents, may have provided a different result due to their own increasing interest of employing a sustainable lifestyle. It can neither be excluded that respondents of the younger generation would see suggest contrasting barriers, enablers and solutions which are based on their expectations (Table 3, 4 and 5).

The result of this thesis ought, at best, to be understood as an indication by a small but diverse group interviewed. Hence, this paper cannot claim to offer a generalizable conclusion. The result of this paper is fully dependent on the informants’ interpretations of the society, which can be influenced by ideology, life experience or academic background, among others. As mentioned, this paper offers a first take on this topic, and accordingly invites others to apply competing theories, as well as interview other respondents.

6.2 The Role of Power Structures: Monetary, Institutional and Discursive

Although provided with opportunities for creating a pathway to ride sharing as the preferred choice, as previously laid out as a shortcoming of the approach is the inability to consider power structures as a barrier or enabler (Geels 2010, 2014). With reference to the actions in processes for mobilisation in 5.3.3, actors’ ability to impact the process, arguably needs to be considered.

6.2.1 Potential Impacts on Mobilisation

To access media and authority; hence, to impact the agenda setting and the steering of how a topic is discussed and framed: either in a diagnostic portraying-, prognostic framing “what is a solution”-, or in a motivational “what can be done”-manner, ultimately impacts behaviours (Geels 2010). According to Anshelm and Hultman (2015), the portrayal of climate change and environmental issues in Swedish mass media is characterised by an apocalyptic framing of climate change, while it is simultaneously presented together with conservative action. The apocalyptic framing through “its comic presentation” is framed as “governable by humans” and planetary engineering while offering assurance “that the industrial capitalist world’s ecological system can handle climate change” (Anshelm & Hultman 2015 s. 192). This medial tactic may be explanatory to the experienced absent of medial forums for envisioning alternative futures by respondents of this paper (TA, Table 6). Economic interests or lack thereof, funding or withholding resources from media channels and forums, may also be an explanatory factor to the current terrain of institutions wherein discourses and co-learning experiences are formed.
The seemingly ‘avoidant’ framing of climate change in for example medial channels, wherein cultural and social confrontation is rare, is according to Anshelm & Hultman (2015) stabilising the current culture in Sweden. With this said, any mobilisation processes will likely be a subject under discursive and monetary power structures. This suggests that there may be immense barriers, or enablers, to the implementation of the pathway suggested. There could arguably be reasons to evaluate the likelihood of successful realisation of the actions suggested.

6.2.2 Potential Impacts on Actions in Niches for Transition

In terms of actions in niches for transition, a similar problem can arguably be observed. As an example, business models are both considered a barrier for transition (UG, VT, Table 4) and is also a sought-after solution for transition as an action in niches for transition (UG, VT, Table 6). Martin et al. (2015) shows through a case study that an organisation can be pressured into becoming more commercially oriented. The organisation studied by Martin et al. (2015) is an online, free reuse and non-profit grassroot organisation Its initial aim was to enact the principle of ecological economics by responding to its ecological values while generating solutions for a sustainable development. Over time it was found that the organisation has given way to goals of stabilising the organisation itself on the expense of goals relating to external environmental impacts. It is suggested by Martin et al. (2015) that the pressure is arising from investors having profit driven agendas and the government’s requirements of making the organisation adapt to its policies, is making it difficult for the organisation in Martin et al’s (2015) study, to continue the initial business. The fast development within digitalisation makes organisation “look dated” quickly, and therefore need recruitment of staff with developer skills which in itself require funding from profit (Martin et al. 2015).

This insight confirms the issue raised by UG and VT, Table 4 and 6, as disruptive business models may face hardship. These insights arguably reflect Geels (2010) argumentation on power structures as barriers while also suggest that the realisation of new types of businesses using “other” business models may be a direct subject to monetary and institutional power structures. It arguably often comes down to a cost-benefit analysis, wherein actors adapt to secure financial stability and relative benefit. Also, the benefit of ‘doing good’ if not too costly. This is arguably also a cause for commuters to switch behavioural patterns in accordance to economically steering policies, which was suggested to be an enabler (Härsmann & Quigley 2010). Hence, also in this case the example by Martin et al (2015) shows that that there may be immense barriers, or even enablers, to any realisation of the actions in niches for transition suggested. Also, in this case, it could arguably be fruitful to evaluate the likelihood of any actions to be success, suggestively by using a TIS-framework.

The same logic is arguably also observable in the case of actions in handling dilemmas of niche management, wherein the use of interdisciplinarity and perspectives deriving from the humanities, are suggested, among others.

6.2.3 Potential Impacts on Dilemmas of Niche Management

Geels’ (2002) central theoretical argument states that technology is powerless and does nothing, but only when associated with human agency. Poli (2011) argues that “we wrongly use technology and engineering in order to comprehend and solve crucial social and administrative problems”. Especially so when dealing with urban transportations and its environmental consequences (Poli 2011). Poli (2011) states that officials must manage the services used within planning and decision making better, and that social scientists and humanists “should play a leading role in mobility and transportation policies – a field currently monopolized by technicians” (Poli 2011). Poli (2011) further continues:

“Technicians and engineers are trained to solve problems, not to identify and set them […] it is necessary to distinguish between those who choose and set the problems and those who are responsible for practically solving them [engineers]."
As this insight is theorised by Geels (2002), exemplified by Poli (2011) and UG highlighting the importance of the humanities, both for mobilisation purposes but also for handling niche dilemmas, there are arguably reasons to consider the uneven ‘division of labour’.

Spracklen (2016) suggests that the technical- and natural scientific advantage in terms of funding and reputation within academia, is remaining from the cold war era. Then was claimed to make nation-states “build stronger economies and futures” (Spracklen 2016 s. 19). The popularity and status of the natural and technical sciences, leading to its favourable position on the labour market, is centred around the natural and technical sciences’ commitment in making impacts on industrial profit and policy. The praising rhetoric surrounding the natural and technical sciences, which in itself may serve as a mobilisation process favouring these, are communicated by governments and popular culture. The communication therefore ought, according to Spracklen (2016), to be understood in the light of a neoliberal culture found in the global north. Although the social sciences, not including the business-oriented disciplines, will not offer solutions to problems ultimately generating revenue for corporations, they instead have a ‘moral case’ (Spracklen 2016). As put by Poli (2011), Geels (2002) as well as informants of this study, there are reasons to appreciating the social sciences ability to train students in critical thinking and analysis, which, according to Spracklen (2016, 3) is vital if “humans are to live a freely communicative and moral life in a world dominated by hegemonic power, whether that power is built into belief systems, gender orders, popular culture, social classes or political constitutions”.

The devaluation of the social sciences, often formulated by stakeholders of the natural and technical sciences, ought to be replaced by appreciation for what it is offering. The strengthening of the social sciences’ role in society may arguably lead to an increased involvement of representatives from the humanities in the societal development as suggested by Poli (2011). Media and other communicative channels here play a role to produce a more equal discourse around the two, although such discursive transition may also be subject to power structures (Spracklen 2016). The climate change debate can arguably be used as a platform to promote such a discursive transition.

Handling of dilemmas of niche management, alike mobilisation processes and actions in niches for transition, are arguably enabled or hindered by power structures. Underlying economic interests and discursive reproduction creating status can arguably be contributing to the modest recognition and use of the humanities and social sciences within conferences, societal development and the transportation sector and the sector of urban development.

Although power structures were not explicitly mentioned as an enabler, nor barrier by most of the informants in the results, the examples laid out arguably show that power structures are to be accounted for in the pathway to desired goal (Geels 2010, 2014; Härsman & Quigley 2010; Poli 2011; Anshelm & Hultman 2015; Martin et al. 2015; Spracklen 2016). Hence, these insights could complement the explicitly stated result as well as highlight the role of power structures as suggested by Geels (2010, 2014) in the theory section. It is arguably of importance to include the concept of power structures in the conversation of our future, what we desire and the pathway there.

6.3 The Being of the Self Driving Cars

The “being” of the SDC is unknown (Kristoffersson et al. 2017). How it will look like and when or if it will be rolled out cannot be stated. There are, however, sources suggesting SDCs are on their way as exemplified in the background chapter (Fraedrich et al. 2015; Bahamonde-Birke et al. 2018; SoU 2018:16 2018). Knowing that the informants of this paper may have different perspectives on the potential roll out of the SDC, their expressed barriers, enablers and lastly solutions to the issue at stake, may be heavily dependent on the answers given to the first research question. Hence, the data collected arguably, to some extent, reflect optimism or pessimism towards the potential roll out. As already suggested, the result may look different with other informants (Table 3).

This study works preventative to the risks identified and stated in the background section, that may or may not be realized by 2030, nor ever (Thomopoulos & Givoni 2015; Kristoffersson et al. 2017;
Pettersson 2017; Bahamonde-Birke et al. 2018; Litman 2018; Cohen & Cavoli 2019; Legacy et al. 2019). This paper hopes to start a conversation on the potential misalignments between the technological development and the achievements of the SDGs, and what can be done to close the discrepancy.
7 Conclusion and Suggestions for Further Research

Sweden is aiming to achieve the SDGs by 2030 and in a society where those are met, mobility habits much have been changed compared to today (UN n.d.; O’Neill et al. 2017; van Vuuren et al. 2017; Finansdepartementet 2019) The Swedish government aims to meet the needs of sustainable development by promoting walking, biking and use of mass transit, as the commercialisation of SDCs is awaited (SoU 2018:16 2018). Digitalisation cross-bred with a roll out of SDC is by some expected to boost the roll out of self driving D2D solution which potentially can create a decline of today’s ride sharing service which is made up by the mass transit-system and ride-pooling (Jin et al. 2018). This is likely to be due to the expected convenience, efficiency and affordability of the self driving D2D, which the mass-transit and ride-pooling of today are not associated with (Thomopoulos & Givoni 2015; SoU 2018:16 2018). The use of mass transit systems and pooled rides, especially when serving many people at the same time, has the biggest potential to reduce congestion and CO2-emissions or energy use per traveller (Bahamonde-Birke et al. 2018; Santos 2018; Taiebat et al. 2018). Hence, concern is raised over how self driving D2D can cause shifts in the demand for transportation due to its appeal and grow on the expense of non-motorised transportation, mass transits and pooled rides in general (Thomopoulos & Givoni 2015; Bahamonde-Birke et al. 2018; Santos 2018). Therefore, the aim of this study was to gain an understanding of necessary actions to make ride sharing become the preferred choice of motorised transportation among travellers in urban areas in Sweden by 2030, despite its convenience-related disbenefits – in the light of the potential self driving D2D roll out, as well as the achievement of the SDGs.

The result to research question three “What could societal actors take in order to make ride sharing the preferred choice of transport”, showed that mobilisation processes of communication, envisioning and education is needed, together with innovation promoting sustainable behaviours, such as digital means for faster democratic processes. Management dilemmas with regards to the niche-innovation processes are the use of interdisciplinarity and promotion of perspectives deriving from the humanities to secure goal-oriented learning and envisioning practices in Sweden. Both within and outside the Swedish educational system. Also, economic schemes and steering policies are suggested to be needed (Table 6).

The result to research question one “What is ride sharing expected to look like”, showed that the motivation to transportation use is expected to be on the basis of similar factors as today: efficiency and convenience (Table 3). Ride sharing may take the physical attribute of an intermodal transportation system and the public transportation may experience competition from the private sector. The result ought, at best, to be understood as an indication given by the small but diverse pool of informants who may not represent the perspectives of young adults of today, which in 2030 may be of a more impactful clientele in Sweden. This generation may have other expectations of the future and what ride sharing may look like. Hence request other measures than those stated, based on their environmental interest as reported by SiFo (WWF 2017).

It was also found, through research question two “What are potential barriers and/or enablers to make shared rides preferred”, that the barriers and enablers listed by the informants of this paper can, in accordance with Geels (2010) argumentation, be regarded in the light of monetary, institutional and discursive power structures (Table 4 and 5). Barriers listed in this study was, among other, inadequate business models and lack of envisioning in current medial channels (Table 4). Also, Geels’ (2002) central theoretical argument claiming that technology is powerless and does nothing, but only when associated with human agency, is reflected in the expressed importance of the humanities within education, conferences and urban development. This can be compared with Poli (2011) arguing that “we wrongly use technology and engineering in order to comprehend and solve crucial social and administrative problems”.

It is noteworthy that the use of self-driving D2D may be growing in popularity at the expense of mass transit systems (Bahamonde-Birke et al. 2018). The question remains, whether society will experience a future problem in which passengers will opt for a smaller shared ride, instead of using a larger vehicle. This is arguably true if the public mass transit system is to face competition from the car industry providing mobility service in the future, such as Volvo M, as suggested by GB. Table 3 (Jin et al. 2018).
This theme, if researched in the future, could provide critical perspectives into future transport scenarios and their associated potential challenges.

With reference to the risks and benefits listed in the background, it could be of relevance to conduct a literature study to map out the dominant understanding of SDC and D2D’s relationship to sustainable development within academia. This paper has demonstrated that self-driving D2D could meet criteria within social sustainability which arguably could motivate and market its existence (Thomopoulos & Givoni 2015). It can further be suggested that a TIS analysis may be conducted to find out how far the SDC is from the Swedish market (Loorbach et al. 2017).

This paper has by its unique nature complemented the limited research at hand on the future vehicle-and transportation system in Sweden, in relation to the achievement of the SDGs. It hopes to contribute to a conversation involving professionals within the technological development, as well as professionals within in policy making. Such conversation is believed to spur a transition to a sustainable development, built on pluralistic cooperation across disciplines – which is arguably missing today.
8 Acknowledgements

I would like to direct the warmest thanks to my supervisor Elisabeth Ekener for giving me all the valuable feedback. Without this guidance, this thesis would never have been “born”! Also, the warmest of thanks to my subject reviewer Åsa Gren for all the invaluable input and encouragement.

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Thank you Mattias Höjer for brainstorming and inspiring me. Also, thank you Anna Lindén, Fores, for helping me out.

I send endless of love to my study group whom I have been meeting at the geo library every day. All the support, backrubs, laughter, conversations and candy meant a lot to me. I cannot imagine going through this without your company. Camilla, your feedback was gold.

Thank you Cyril for you being you. Tu es le meilleur.

Thank you family and Ida for being cute on whatsapp.
9 References


Hej, jag är Hanna Bökmark och jag är student på Uppsala universitet. Jag studerar master i hållbar utveckling och skriver nu masteruppsats. Jag är intresserad av att veta hur ‘ride sharing’, dvs samåkning:

- det vill säga när olika parter reser i samma fordon förutsatt att de har en liknande res-tur framför sig,

kan bli normen:

- Det vill säga, det som anses vara ”det normala och mest acceptabla valet” i ”normala fall”: ’preferred’ på engelska, bland resenärer i urbana områden tills 2030.

- Med urbana områden menar jag städer och tätorter och närliggande förorter, det är inte landsbygden.

Min frågeställning grundar sig i att i en statlig rapport från våren 2018, förutsår att självkörande bilar och dörr till dörr kan komma att bli en del av vår urbana stadsbild på sikt - från (om än väldigt tidigt) 2030 och framåt, enligt den mest ”optimistiska analysen”. 2030 ska Sverige också, ifrån rent formellt också reducera negativa miljoeffekter i linje med the SDGs.

Det är förutspått att utrullningen av själv körande bilar och dörr till dörr kan vara fördelaktigt från ett miljöperspektiv, p.g.a. färre bilar i omlopp, genom s.k. ’car sharing’.

- Car sharing = man delar på en bils tillgänglighet, typ taxi/uber.

Samtidigt varnar forskare för risker med denna utveckling från ett miljöperspektiv, då det kan finnas en risk att människor, som idag gärna reser så tidseffektivt som möjligt, börjar resa ännu mer med just en Själv Körande Bil och dörr till dörr, då tiden i fordonet kan användas på produktiva sätt. Detta under förutsättningen att det upplevs prisvärt (vilket man tror det kommer bli).

Från ett miljöperspektiv är det inte fördelaktigt om användningen om självkörande taxi-service där människor reser ensamma, används mer på bekostnad kollektivt resande eller genom samåkning. Kollektivt resande och samåkning kräver en viss resekoordination.

Det kan vara problematiskt att försöka få människor börja resa genom ‘ride sharing’ samtidigt som bekväma alternativ utvecklas, marknadsför och senare troligtvis lanseras.

Genom att intervjuar er experter på området om ”framtidens transporter” försöker jag bena ut hur samåkning/kollektivt resande ändå kan bli normen tills 2030 i urbana områden.

Jag undrar om det är okej att jag spelar in? Om ja, kommer jag behöva fråga igen när jag väl spelar in.
Vad du säger kommer vara konfidentiellt, och bara jag kommer att lyssna på inspelningen transkribera och hantera det materialet.
Du har alla rättigheter att vara anonym och jag kan koda din identitet med exempelvis ”forskare inom transportområdet med bakgrund i samhällsvetenskap” eller dyligt.
Du får dra dig ur när som helst och då raderar jag allt material på direkt.

- Du har rätt att vara anonym, skulle du vilja det?
Du får dra dig ur när som helst och jag kommer då radera allt.
Jag skickar också min transkribering för dig att kika igenom så det känns OK för dig.

<table>
<thead>
<tr>
<th>Themes</th>
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<td>sharing a vehicle as with today’s public transportation and carpooling [samåkning].</td>
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<td><strong>Door to door-service:</strong></td>
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<td>Taxi-like-service (a car sharing-solution).</td>
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<td><strong>Societal Actors:</strong></td>
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<td>e.g. Policy makers, public and private actors and/or interest groups</td>
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<tr>
<td><strong>Introduction</strong></td>
<td>1</td>
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<td>2</td>
<td>Vad arbetar du med?</td>
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<td>3</td>
<td>Arbetar din organisation med att öka samåkning?</td>
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<td></td>
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<td>- Om så, hur då? (link to Q3)</td>
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<td>- Har organisationen ett satt mål vad gäller samåkning?</td>
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<td>- Om så, hur ser det ut?</td>
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<td>Arbetar ni med de potentiella miljörelaterade risker som upplevs finnas enligt ett flertal forskare, med själv körande bilar och dörr till dörr service?</td>
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<td>- Om så, hur då?</td>
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<td>5</td>
<td>Har du någon spontan känsla kring detta med utrullningen av självkörande bilar och potentiellt dörr till dörr service?</td>
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<td>(RQ1): What transportation-use is expected to look like in non-rural areas in Sweden by 2030, in the light of the awaited Self Driving Car and the potential door to door-roll out?</td>
<td>Hur kan den beskrivas?</td>
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<td>Vilken typ av transportlösning tror du kommer efterfrågas för ”vardagligt resande”? Hur tror du att folk kommer vilja resa i urbana områden i Sverige 2030?</td>
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<td>… med tanke på industriens påtalade utrullning av själv körande bilar, bil-delning men också pågående strävan mot hållbar utveckling (mindre trängsel, utsläpp, energianvändning)</td>
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<td>Vad tror du opinionen om transport och mobilitet kommer vara influerad av 2030?</td>
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<td>… med tanke på industriens påtalade utrullning av själv körande bilar, bil-delning men också pågående strävan mot hållbar utveckling (mindre trängsel, utsläpp, energianvändning)</td>
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<td>Hur tror du attityden kring själv körande bilar och potentiell dörr till dörr-service i urbana områden 2030 kommer se ut?</td>
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<td>… Då med tanke på industriens påtalade utrullning av själv körande bilar, bil-delning men också pågående strävan mot hållbar utveckling (mindre trängsel, utsläpp, energianvändning)</td>
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<td>(RQ2): “Expected barriers and/or enablers to make shared rides preferred despite its convenience-related disbenefits, in non-rural areas in Sweden by 2030, in the light of the awaited Self Driving Car…</td>
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<td>Vilka möjliggörare ser du för en fortsatt, eller än mer, ökande användning av ’ride sharing’ i urbana områden i Sverige 2030? …Också då i ljuset av…</td>
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<td>Question</td>
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| 10 | Vilka hinder ser du för en fortsatt, eller än mer, ökande användning av ’ride sharing’ i urbana områden i Sverige 2030?  
| | …Också då i ljuset av… |
| 11 | (Om) Du nämnde xx som ett hinder för en fortsatt, eller än mer, ökande användning av ’ride sharing’ tills 2030, hur tror du detta skulle kunna hanteras?  
| | Vad behövs?  
| | Vilken aktör tycker du är viktigast i hanteringen av ’problemet’?  
| | Hur kommer det sig?  
| | Vad kan de göra?  
| | Hur kan de göra det?  |
| 12 | Vad mer behövs för en fortsatt, eller än mer, ökande användning av ’ride sharing’ tills 2030?  
| | What is (else) needed in order to make ride sharing - in the light of the Self Driving Car- and potential “door-to-door” service-roll out?  
| 13 | Vilka andra aktörer tycker du är viktiga för en fortsatt, eller än mer, ökande användning av ’ride sharing’ tills 2030?  
| | What is (else) needed in order to make ride sharing - in the light of the Self Driving Car- and potential “door-to-door” service-roll out  
| | Hur kommer det sig?  
| | Vad kan de göra?  
| | Hur kan de göra det?  |