Do we need the car?

A qualitative study on the disposal of bulky waste in carless households in Gothenburg

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Preface

This thesis contributes towards my bachelor's degree in Environmental Social Sciences at Gothenburg University, which will be completed in January of 2019.

I would firstly like to thank the respondents for putting aside their time and sharing their perspectives which without the thesis would not be what it is. I also want to thank Eva Thulin for the advice of what to write about in the first place, and my supervisor Katarina Haugen for her suggestions. Lastly, thank you to my classmates Louise, Linnéa A, Linnéa S and Jonas, and other friends and family for their support this semester.

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Abstract

Carlessness today can be seen to come with restrictions in mobility as the car has long played a vital role in transport, and consequently affected urban form. Of course, there are many who do live without a car, but certain activities can be proven difficult when in many cases it is predicted that one has a car. Bulky waste disposal has been identified as an example of this. In Gothenburg for example, the recycling centres are located in the outskirts of the city, perceived only accessible by car. Thus, the study aims to explore this aspect further; investigating the potential problems associated with the disposal of bulky waste in carless households in Gothenburg. A qualitative approach with six semi-structured interviews was used to seek the respondents' transport strategies and identify restrictions and solutions in these households' bulky waste disposal. Results show that walking, cycling and driving are used to get rid of bulky waste. For those who take the car present different ways of gaining access to one, also revealing the inherent time-geographical constraints. Thematic analysis of the data show restrictions and barriers in bulky waste disposal associated with *alienation*, *dependency* and *physical barriers*. Identified solutions include aspects of cost, *accessibility*, *flexibility* and an *attitudinal change*. As for disposing bulky waste being a problem for the carless, it is not perceived by most respondents, even though certain inconvenient aspects are apparent. Other vulnerable groups in society however, such as the elderly who cannot drive, could experience more of a difficulty when disposing their bulky waste.

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1 Introduction

1.1 Background

Carborne mobility has dramatically increased in the past six decades which has consequently led to urban sprawl and increased pollution and congestion in urban areas (Pacione 2009). To counteract the negative impacts solutions such as road tolls and mixed use development are suggested (Banister 2008). These measures also aim to decrease car use and promote other modes of transport (ibid), although not having a car at all could be seen as the most environmentally sustainable solution. Carlessness in today's society can be seen to come with restrictions in mobility. One will have to rely on less flexible alternatives (in terms of not being able to leave when it is convenient, needing to coordinate with others and not being able to travel door-to-door) such as public transport and carsharing. Cycling and walking are examples of just as flexible modes of transport as the car, but these are more restricted in terms of travel distance and time. As Frändberg & Vilhelmson (2010) point out though, urban planning has prioritized car use, making cyclists and pedestrians share a much smaller area. This can in turn make walking and cycling unattractive alternatives and a modal shift from the car even more difficult.

Restrictions in mobility that come with carlessness prove difficult when the household is made up of several individuals. Though a recent study of voluntary carless households in Gothenburg shows that it is possible to live a perfectly good life without a car, even for families with young children. However, the results showed that some families had trouble getting rid of their bulky waste as recycling centres are located in places only reachable by car (Lagrell 2017). This accessibility issue has been identified by an innovation project in Borås, TJAFS ("TJänsteutveckling i AvFallsSystemet"), who have started a project due to certain households having restricted ability of getting rid of bulky waste. In addition, it is argued that the current waste management system is discriminatory towards both the elderly and the disabled (Innovationsplattform Borås n.d.).

Bulky waste is not something that one needs to dispose of regularly but can be difficult to get rid of when the time comes to do so, especially when you do not have access to a car. Bulky and odd-sized waste are difficult to bring on public transport or by bike. Most of the families in Lagrell (2017)'s study solved this issue by carsharing services or got help from their relatives to dispose of this type of waste. With current urban planning strategies trying to minimise car use (Stadsbyggnadskontoret 2009, Banister 2008, Vilhelmson 2007) it could lead to an increasing trend of not owning a car as a result. This in turn would affect access to facilities planned for cars, such as a recycling centre, and pose an even greater problem in the future than it is today. Bulky waste is also often seen to be illegally dumped in the wrong places, by recycling stations for example (FTI, n.d.), and can become a burden for the overall aesthetic view of a city. It is not the least unpleasant for people living close by where bulky waste is dumped illegally and hence not socially sustainable. In an ecological perspective, fly tipping can also be harmful for the environment when thrown in the wrong place. Note that bulky waste in this thesis means the type of rubbish that cannot be thrown in household waste

or in the recycling bin. Examples of this are damaged furniture and textiles/ clothes, old mattresses, broken bikes and larger toys (Göteborgs Stad n.d. a).

As a citizen in Sweden you have the responsibility to dispose of your waste correctly (Naturvårdsverket 2018). Furthermore, it is also up to the property owners to provide the means for the tenants to dispose of their bulky waste (Göteborgs Stad n.d. b). In Gothenburg, those who do not live in rented apartments or condominiums must go to one of the six recycling centres that are located in neighbourhoods in the outskirts of the city (Göteborgs Stad n.d. c). There is also a possibility of the municipality picking up bulky waste at your residence for a fee of approximately 730 Swedish crowns (Göteborgs Stad n.d. d, see table on website for more detail) but compared to the free disposal of bulky waste at the recycling stations up to six times a year (Göteborgs Stad n.d. c) this is quite a fee. Cities in other countries, such as San Francisco, even have free bulky waste collection (Recology n.d.). Despite the regulations that are in place in Gothenburg, results in Lagrell (2017) show that getting rid of bulky waste is still a perceived problem for carless households living in both condominiums and in privately owned housing.

Gothenburg is an interesting city to conduct the study in as it wants to decrease car-dependency (Göteborgs Stad 2014). The city is promoting mixed use development and prioritising the use of public transport, cycling and travelling on foot. Gothenburg also wants to increase the density with more housing in central areas of the city (Stadsbyggnadskontoret 2009). The increased density and mixed use development will decrease the need to have a car as more housing and workplaces will be closer together (Göteborgs Stad 2014). Gothenburg is also chosen because the problem for disposing of bulky waste in carless households has been identified in this context as mentioned above.

1.2 Aim

This case study aims to investigate the potential problems carless households have with the disposal of bulky waste in Gothenburg.

1.3 Research questions

What transport strategies do carless households use to get rid of their bulky waste?

This question explores the different modes of transport that are used to get rid of bulky waste. It will come to show whether the respondents get to the recycling centre by car as it has previously been identified as a mode of transport that is needed to get there. These transport strategies can in turn indicate what could be made easier when getting rid of bulky waste for those who do not own a car.

What restrictions and solutions are identified from a carless households' perspective when disposing bulky waste?

This question investigates the different restrictions that need to be overcome when it comes to getting rid of bulky waste in a carless household as well as what kind of solutions the carless households themselves distinguish.

1.4 Limitations

Carlessness can be divided into two types: voluntary and involuntary carlessness. A voluntarily carless individual chooses to not own a car whereas an involuntarily carless individual does not (see section 2.3 *Carlessness* for further detail). The study has been narrowed down to voluntarily carless households due to the lack of resources and bias in the sampling process which resulted in all respondents being voluntarily carless (see chapter 3 *Method*). The data collected can therefore not give us an involuntary carless perspective on the matter, but the identified aspects most probably affect involuntarily carless households too. The study is also geographically delimited to the municipality of Gothenburg.

1.5 Thesis outline

The thesis is made up of six chapters. The *first* chapter introduces the background with the study's motive and research questions. Chapter *two* includes the theoretical framework and previous research related to the study. Chapter *three* goes through the study's methodical approach and the study's procedure. A short presentation of the respondents is also found here. The *fourth* chapter contains the result of the interviews and the themes that were identified in my thematic analysis. The *fifth* chapter analyses the results with the theoretical perspectives introduced in chapter *two*. Lastly, a concluding *sixth* chapter presents the study's conclusion, discussion and future research questions.

2 Theoretical framework

2.1 Introduction

This chapter aims to introduce key perspectives and terminology relating to the study as well as previous research within the subject area. I firstly introduce the term mobility and what effects car use has had on mobility patterns, urban structure and lifestyles. This is to understand that living without a car could be a difficulty in today's society. Further, the two types of carlessness are presented. Lastly, I introduce the time-geographical perspective and the activity approach, which will be used in the empirical analysis.

2.2 Mobility and the spatial effects of car use on urban form and lifestyles

The term mobility encompasses the physical movement of people and freight from one place to another (Givoni & Banister 2013). Frändberg et al. (2005) defines two types of mobility: geographical and social. Geographical mobility involves physical movement as Givoni & Banister (2013) and further distinguishes social mobility or movement. This regards the position an individual has in society and is linked to status, class and occupation. Geographical mobility does not only have to be the physical movement in space but can also be virtual (a two-way communication via information and communication technology) or via media (A one-way communication via TV or radio for example) (Frändberg et al 2005). Castree et al (2013) also includes mobility as the movement across different scales. In order for physical mobility to be realized it is dependent on transport and infrastructure (Givoni & Banister 2013). And different types of infrastructure are needed for walking, cycling, driving and travelling by public transport (Frändberg et al 2005). In terms of this study, it is the physical movement of people and bulky waste that are of interest.

The car is central to our transportation system (Givoni & Banister, 2013) and the use of slower modes of transport is decreasing (Vilhelmson 2007) and becoming less attractive (Banister 2008). The increase in car use can in Sweden can be traced back to the 1950s and is due to the increasing demands for mobility and income growth. Over a century the average Swede has gone from travelling about 1 km per day to 45 km per day (Vilhelmson 2007). This mobility trend has in turn affected land use and urban structure as well as people's daily activity patterns and lifestyles (ibid) which are introduced below.

Looking back even further on urban transportation and urban structure one can see a close relationship between the two. In the pre-industrial stage of western cities, urban areas were compact as most people walked to complete their daily activities (Pacione 2009). This can be compared with Sweden during the early 1900s (Vilhelmson 1999a in Vilhelmson 2007). Hägerstrand (1970a) explains that in this primitive stage of transport technology people had very similar distances covered over the course of one day. As industrialisation progressed, urban structure became less and less dense as new modes of transport became available. Finally in the post-industrial stage, car-ownership became universal which in turn produced cities with low density in terms of suburbs and functional decentralisation (Pacione 2009).

However, the stage of universal car-ownership has developed differences in the daily travel range between different groups within the same area (Hägerstrand 1970a). Middle aged men, for example, tend to travel further than the average Swede, resulting in an uneven distribution of travel range in different groups (Vilhelmson 2007).

On a similar note, Vilhelmson (1999a) in Vilhelmson (2007) identifies three different lifestyles characterised by either geographical *stability*, daily *commuting* or geographical *flexibility*. These have historically been established one by one as faster modes of transport have been introduced. An individual who is geographical stable adapts their life depending on their immediate surroundings. In a daily commuting lifestyle, the individual expands the distance to their activities and travels repetitively, such as commuting daily to work. With faster means of transport an individual no longer needs to live and work in the same area. A geographically flexible lifestyle encompasses travelling long distances whether it is for work or recreation. This type of lifestyle often involves the car and is today threatened by obtain a sustainable transportation system (Vilhelmson 2007).

As car use expanded it developed a new way of thinking within urban planning and America had the leading role in showing the way (Nyström & Tonell 2012). This was not odd as car numbers rose greatly in the USA. Between 1945 and 1977 the total amount of vehicles increased by 336 % (from 29.5 million to 128.6 million vehicles) (Pacione 2009). These trends were also found in Sweden. During the 1950s, for example, Sweden had the highest car density in Europe (Lundin 2008). The car was at the heart of many planning documents. Cities spread out more to decrease congestion and to make way for the car; living and working areas were separated and big commercial centres were established. Moreover, new residential areas that were being built were also made comfortable for car users. During the late sixties, for example, the residents of a new residential area in Umeå municipality were not to have further than 100 metres from the property to their car parking place (Nyström & Tonell 2012).

Car dependency and functional decentralisation are today seen as difficult processes to reverse. Solutions within transport planning are reducing the need to travel by substituting trips with information and communication technology, policy measures that promote a modal shift, changing land-use to reduce distance and increasing efficiency with technological innovation (Banister 2008). Another way of finding out how to decrease car dependency is to look at voluntarily carless households to see what policies should be put in place based on their habits (Mitra 2016). Voluntary carless households will be introduced in the next section below.

2.3 Carlessness

As mentioned in the introduction, carlessness can be divided into two types: voluntary and involuntary carlessness. The former regards individuals who have a choice not to own a car whereas the latter are those who do not have the option to own one. Based on the survey Mitra (2016) used to define involuntary from voluntary carlessness, causes of involuntary

carlessness are related to health and/or household economy. This could be because individuals cannot get a car insurance or maintain or get a car because it is too expensive (Mitra 2016). This is in line with Banisters (2013) results that shows that car use increases with income. Low income groups walk, cycle, take the bus and train more than other income groups (Banister 2013). Health reasons linked to involuntary carlessness are related to being too old or because one's health does not permit driving. Furthermore, voluntary carlessness is linked to individuals choosing not to own a car due to environmental concerns or because they do not need one (Mitra 2016).

Factors that could both be voluntary or involuntary are not being able to drive or not having a driver's licence. To explain further, the holding of a driver's licence, for example, cannot itself identify whether a person is carless by choice or not. This characteristic can present both types of carlessness, as for not being able to drive. Not having a driver's licence does not mean that a person is involuntarily carless per se as a voluntarily carless individual could just as well not have one (Mitra 2016). One could, however, assume that not having a driver's licence differ between the two groups. On the one hand, an involuntarily carless individual would not have a driver's licence because it is too expensive to get or because they do not have the possibility of getting a car after they have obtained a driver's licence. On the other hand, someone who is voluntarily carless would not own a driver's licence because they do not need a car or because they are concerned with the environmental impact. Other characteristics that cannot define the type of carlessness is the way these individuals travel. Using public transport or getting lifts from other people cannot illustrate the type of carlessness as both types can use this type of solution (Mitra 2016).

Apart from the different reasons for being carless, it is observed that the two types of carlessness also have different conditions to begin with. Involuntary carless households face physical isolation, poor access and social exclusion whereas voluntary carless households do not to the same extent (Mitra 2016). From an equality point of view, involuntary carlessness is therefore more negative than voluntary carlessness as these individuals do not have the choice to choose the car as a transport option. However, even though one is carless voluntarily, one can face isolation of certain spaces as well. As seen in Lagrell (2017), access to recycling centres for voluntary carless households are a difficulty.

Mitra (2016) studied voluntary and involuntary carlessness in California to decrease the knowledge gap of these types of households. A quantitative study was conducted comparing the two types of carless households and motorized households. The results showed that voluntary carless households have a higher income and level of education compared to involuntary carless households. Voluntary households also lived in areas with a higher network density compared to the involuntary households. As for travel distance, voluntary carless households travel shorter distances compared to both involuntary carless and motorized households. This suggests that voluntary carless households live closer to their activities and live in mixed land use areas and high-density areas (Mitra 2016).

This study will look at voluntary carlessness due to the characteristics of the respondents in the study introduced in chapter 3. It is assumed, however, that involuntarily carless households also have a problem of getting rid of their bulky waste although, to the best of my knowledge, there has been no previous study on the matter. These households probably have even more difficulty as they face a greater physical isolation than that of voluntary carless households (Mitra 2016), as stated above.

2.4 Time-geography

Time-geography was developed by Torsten Hägerstrand (1916-2004) (Ellegård & Svedin 2012). In this approach, space and time are seen together in a so-called *time-space* (Hägerstrand 1970b). Space is interpreted as something in constant movement and the inherent continuous processes are payed attention to (Åquist 2002). Hägerstrand describes the landscape as being filled with a variety of living and non-living individuals from different populations. The different individuals meet, or *touch*, in different places over time (Ellegård & Svedin 2012).

Time-geography emanates from the individual and the processes in time-space (Ellegård & Svedin 2012). The individuals' positioning and movement over the course of a day or a lifetime can be described in an *individual path* (Hägerstrand 1970b). Other general concepts in time-geography are *stations* and *projects*. Stations are the places that individuals meet to carry out certain activities. This could be a school or a place of work for example (Åquist 2002). Projects are targeted activities carried out by individuals (ibid) and pursued for an individual's livelihood and pleasure (Ellegård & Svedin 2012). Projects often need cooperation from other individuals as well as materials and require both time and space (Åquist 2002). As projects take up time and space these can in turn interfere with other individuals' projects (Hägerstrand 1993). Some of the interferences can be explained in the time-geographical constraints introduced below.

2.4.1 The constraints in time-geography

In time-space there are limits and opportunities for an individual's actions (Åquist 2002) and are divided up in to capability constraints, coupling constraints and authority constraints. *Capability constraints* limit an individual's activity due to biological factors and/or the tools that are available to him or her. The need to sleep or eat a certain number of times a day are examples of biological capability constraints. Other examples of capability constraints have to do with distance and the access to a car for example (Hägerstrand 1970a). Hägerstrand (1970a) illustrates the capability constraints with so called "daily prisms" in a two-dimensional manner depicted below (see *Figure 1*). The maximum daily prism shows the maximum distance an individual can reach over the course of a day, depending on what tools are available to him or her.

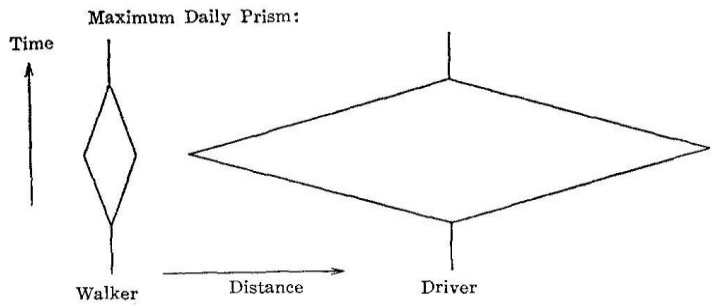

Figure 1: Daily Prisms. Adapted version from Hägerstrand (1970a) p 13.

The maximum daily distance depends what modes of transportation the individual has access to. The individual has a home base where the individual rests and keeps their belongings. This is the starting point of the prism (see *Figure 1*). Then, depending on the mode of transport or tool available to him or her, an individual will be able to travel a certain distance during the day. At the prisms widest ends the individual will not be able to go further because they have to end up at their home base at the end of the day, due to their biological constraints (Hägerstrand 1970a). This is what Hägerstrand (1970a) explains as *"existing spatially on an island"* (Hägerstrand 1970a p 13) where the individual cannot find him- or herself on the outside of the prism or the so-called island boundaries.

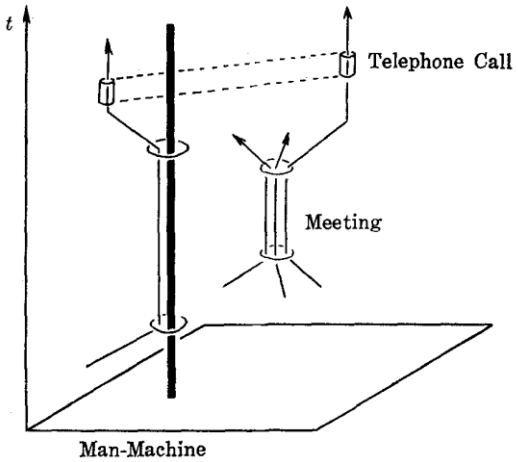

Figure 2. Bundles. Taken from Hägerstrand (1970a) p 15.

An individual has *coupling constraints* in terms of having to coordinate activities with other individuals and depend on tools and materials to produce, consume and transact. This is when *bundles* are created. Bundles are when several individuals meet to carry out an activity (Hägerstrand 1970a) and are illustrated in *Figure 2* above. The groupings of several paths can be eased by technology such as telephones meaning that the individuals do not need to be in the same place in order to create a bundle (Hägerstrand 1970a). Hägerstrand (1970a) exemplifies coupling constraints through the different hours shops and services are open. Individuals have to coordinate with these opening times to create a bundle and carry out the

activity (Hägerstrand 1970a). In reference to the present, the recycling centre is only open at certain times during the day for individuals to dispose of their bulky waste. Thus, the individual must coordinate themselves in creating a bundle to fit these opening times as the ones working at the recycling centre are not there all the time. Furthermore, if an individual gets help with disposing of their bulky waste from friends or family the individual has to coordinate with them as well. This is also a coupling constraint as individuals need to fit in with each other's schedules consequently interfering with their other projects.

Authority constraints are the third type of constraints in time-space. Certain areas, or *domains* as Hägerstrand calls them, are controlled and can only be accessed upon invitation or payment (Hägerstrand 1970a). Examples of these kinds of domains are homes, other types of properties as big as a whole nation. Rules for access can also be more or less strict (Åquist 2002) and authority constraints can vary in time; from two hours for a seat in a concert hall to permanent access to a country (Hägerstrand 1970a). Hence, they also affect the time use of individuals. As exemplified in Åquist (2002) working hours or services opening hours are set in a particular time during the day which in turn affect the time use of other activities. In reference to this thesis, an individual cannot access the recycling centre once it is closed. You also must also show an access card in order to enter them (Göteborgs stad n.d. c) which exemplifies another authority constraint.

2.5 The activity-based approach

The activity approach, with roots in time-geography analyses human interaction and spatial mobility (Vilhelmson 2007). It can be useful as it highlights individuals' different opportunities and that they live under different circumstances (Frändberg et al 2005). The activity approach observes daily life as *"a current of activities"* (Frändberg et al 2005 p 29) and mobility as the derived demand from these. In contrast to mobility as a derived demand, Mokhtarian and Salomon (2000) suggest that travel can itself be an activity. Undirected travel, as they call it, can cause excess travel due to the sense of speed, motion, control and enjoyment of beauty that travel gives. Undirected travel is also discussed in Banister (2008) who describes this as one of the two dilemmas in travel planning. Travel as a valued activity or the minimisation of travel time, i e the second dilemma, need to be taken into account when planning for sustainable mobility (Banister 2008).

In the activity-based approach, activities regard our physiological needs, institutional demands, individual responsibilities and wishes and are therefore either voluntary or involuntary (Frändberg et al 2005). As with time-geography, the activity approach holds that activities are restricted to where and when they can be done depending on capability, authority and coupling constraints of the individual in question (Vilhelmson 2007 & Hägerstrand 1970a). Activities vary depending on different divisions of labour within a household and what stage in life you are in. They are also an outcome of planning where one has often developed a routine. Depending on the type of activity, some activities are more spontaneous (e.g. having to go to the doctor) or more carefully planned (e.g. a trip abroad) (Frändberg et al 2005).

Factors affecting an individual's mobility can be divided into three groups; *the individual*, *the surroundings* and *the activities*. Age, gender, health, qualifications, an access to a car or other means of communication are examples of factors that are individualistic and depend on the individuals resources and constraints (Frändberg et al 2005). These can be related to Hägerstrand's capability constraints (1970a) in time-geography mentioned above. Other individual factors that can affect mobility are to do with the individual's needs; their wishes, values, attitudes and intentions. The social and physical surroundings also affect our mobility. Examples of social surroundings are the type of household we live in, if there are children to be responsible for and what our primary occupation is (e.g. studying or working). Physical surroundings are the built environments around us and the ways in which communication networks are built up and what regional structure there is (Frändberg et al 2005). These factors can be linked to Hägerstand's coupling and capability constraints (1970a). Lastly, the type of activity affects the individual's mobility patterns. An activity could be more or less involuntary such as going to work or school and others voluntary. The most influencing factor is whether time and place for the activity can be chosen (Frändberg et al 2005). This is similar to Hägerstrand's authority constraints, whether someone decides where and when an activity can be done or not (1970a).

3 Method

3.1 Approach

The study's aim involves a focus on the individual's own perspective and potential problems related to disposing bulky waste. Thus, a qualitative approach is used to answer the research questions in this thesis. With interviews as a tool of collecting data, the background to an individual's transport strategies and their general perspective on carlessness can be better understood than in a quantitative approach (Esaiasson et al 2012). An interview also gives the opportunity to ask follow-up questions, something that is not possible in a survey. The spontaneous questions that come up during an interview can be of importance when it comes to understand a person's reasoning to why a certain transport is used as opposed to another when traveling to the recycling centre. In a survey, it would be difficult to get these kinds of answers through predetermined questions and responses (ibid). Interviews are also recommended when looking into unexplored territory and is something that I argue is the case for this subject. When not knowing what answers to expect, a pre-coded survey would not be optimal in understanding the possibly variegated restrictions and solutions of getting rid of bulky waste (ibid). As opposed to an unstructured interview, a semi-structured interview was chosen to get replies on certain questions and topics relevant to the study with help from an interview guide (Bryman 2016). This was to be able to compare answers and data between the different interviews.

3.2 Sampling

The study explores carless households in Gothenburg and therefore these characteristics were the main criteria in the sampling process. Due to time restrictions and lack of resources, the simplest way of getting hold of carless individuals was to go via groups on Facebook. I chose "Cykla i Göteborg" (English translation: "Cycling in Gothenburg"), as my main source for respondents (see *Appendix 1* for the request). Other potential Facebook groups were sought after, such as neighbourhood groups, but the ones accessible to me were not active and/or had very few members. Several other Gothenburg-based public groups that were accessible did not allow for my type of request.

The volunteer sampling resulted in six respondents for interview out of the eleven individuals who were interested in taking part. This was mainly due to two interviewees not living within Gothenburg and two who did not respond to my follow-up message. To get a spread in the data, the rationale was to include individuals with different distances to the recycling centres and potentially get respondents going to different ones. However, it turned out that all but one respondent utilised the same recycling centre and not enough participants for further strategic sampling. Age was not a key criterion in the selection process. This would have been difficult as most of those interested taking part were between 30 and 40 years old. The six respondents are presented at the end of this chapter.

3.3 Procedure and analysis

To make the interview situation more comfortable, the respondents were offered to choose time and place after their convenience. I also told them that I would buy them a coffee and cake if we met in a café to make the interview process more attractive. An interview guide was prepared with questions relating to carless living and bulky waste (see *Appendix 2* for interview guide). The questions were held open and questions answerable with "yes" and "no" were restricted to give room for a more in-depth reasoning and perspective (Esaiasson et al 2012). The interviews were recorded so that I could have my full attention on the respondents during the interview. This also helped me to come up with follow up questions during the process. It is recommended by Bryman (2016) to transcribe the interviews as soon as possible which was done. The interviews were held and transcribed all in the course of one week.

The data were then categorised into the different transport strategies the individuals employed to get rid of their bulky waste. Other aspects were coded into themes and used to identify different types of barriers and solutions the respondents experienced when getting rid of their bulky waste. The step by step guide in Braun & Clarke (2006) was used as help through the process of analysis. I familiarised myself with the data (phase 1 in Braun & Clarke (2006)) by transcribing the recorded data and later re-reading the transcript to become familiar with the content. At the re-reading stage I started to take small notes of potential patterns that were seen, starting the second phase of generating codes according to Braun and Clarke (2006). As I knew the data, the problems with bulky waste disposal started to become clearer as I started to describe the respondents different transport strategies (see section 4.2, *Transport strategies*). This technically meant that I started Braun & Clarke's (2016) sixth phase by producing a report (Braun & Clarke 2006) before the themes were identified. The entire data set was given the same amount of attention to see the emergence of repeating patterns (Braun & Clarke 2006). An example of my coding is illustrated below (see *Table 1*). Dependence, alienation and flexibility were observed and coded accordingly. More examples and further development of reasoning are presented in the next chapter.

Table 1. Coding scheme

Code	Data extract
Dependence	*"Yes. It's only when getting rid of bulky waste* [that I feel the need of a car]. *So all the time you need to hope that a friend happens to have a car and wants to make it dirty or fill it."* Lisbeth, 66. *"No but we've, like, partly used the trolley or my friend has a bicycle trailer actually, so we have walked with that."*. Margaret, 33. *"I have parents who come visit now and then and then they always have a car and help me get rid of the rubbish"*. Mattias, 38.

Alienation	*"Now it feels more like we sneak in between…"*. Margaret, 33. *"It's tricky if you can leave bulky waste without showing that green card or not. Different people who ought to know say different things."*. Emil, 38.
Flexibility	*"The container solution suits me very badly because it's often that it has to be a certain time, you have to be there at that time otherwise it's locked before and after."*. Carina, 30. *"So it worked of course* [renting a van] *but it was a bit more, like, you needed to, like, think a bit more, plan a bit more, it doesn't become a spontaneous visit."*. Kristian, 37. *"…but there are different opening hours. And you need to go with a certain card for some strange reason and then you need to get a car and drive of course."*. Mattias, 38

The codes illustrate patterns in the data associated with different kinds of problems with the disposal of bulky waste. In phase 3, searching for themes in my data (Braun & Clarke 2006), the codes were categorized as either barriers and restrictions to bulky waste disposal or solutions that ease bulky waste disposal. This depended on the way the respondents commented on the aspect. The sub-themes in the *Solutions*-category were found in the respondents' answers to questions such as "What can be/could have been made easier?" or in aspects that were not necessarily a perceived problem by the respondents but identified as factors that could be made easier in the waste disposal process. *Barriers and restrictions* were identified from the current way the respondents got rid of their bulky waste. A thematic map has been reconstructed to clarify this phase with *Solutions* and *Barriers and restrictions* being the main themes and the sub-themes in squares (see *Figure 3* below). The bubbles in bold are the themes that are included in the analysis. The code confusion, for example, and what bulky waste is perceived to be was only used in the analysis to clarify the respondents' answers. Some codes were renamed, such as the code "expensive" becoming the theme "affordability". The codes "storage" and "infrastructure" were synthesised into one theme: "physical barriers".

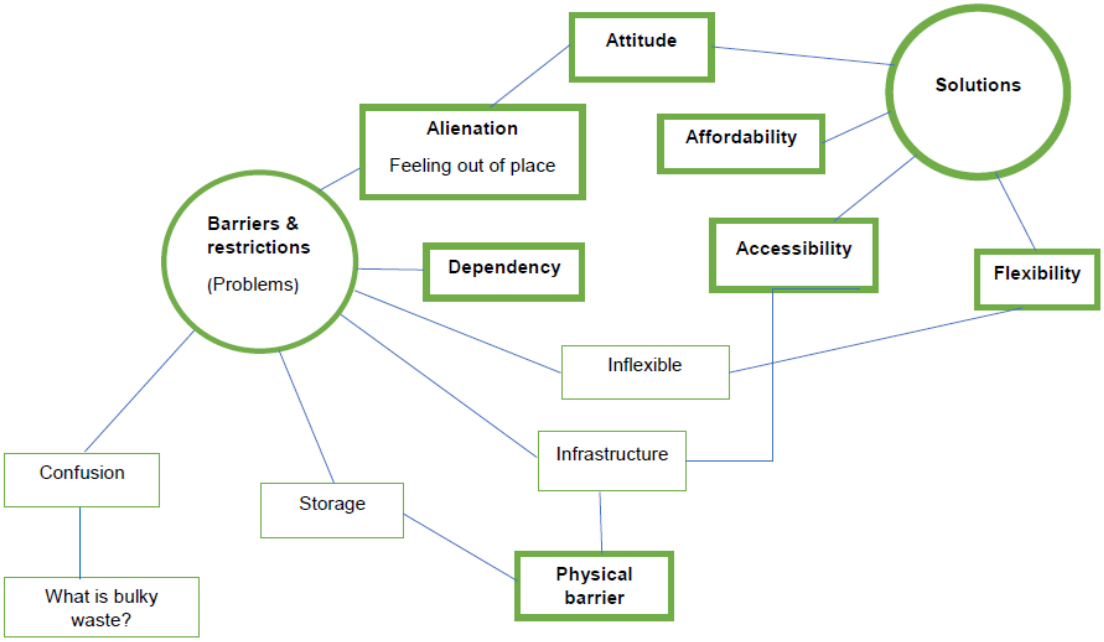

Figure 3. Thematic map.

After the themes were identified I started producing text on both the barriers and restrictions and solutions (see section 4.3, *Barriers & Restrictions* and 4.4, *Solutions*, respectively), initially skipping two phases in Braun and Clarke (2006). The reviewing of themes (phase 4) was carried out along the way of producing the text. I continuously went back to the data transcripts to make sure that the citation was not taken out of context or miscoded/misinterpreted. By re-reading the transcripts I also found new examples that related to the identified themes which is also one of the purposes Braun and Clarke (2006) recommends in doing so.

3.4 Limitations of the data

With a qualitative approach there is a focus on the individuals perspective (Bryman 2016). Taking this into account and due to the limited number of respondents, a fully representative view of car free households cannot be given. However, the results will show the potential problems with getting rid of bulky waste and the inherent restrictions, which is what the study aims to explore.

An important note is that the respondents are self-recruited and chose themselves to take part in the study. The number of people interested to take part were not enough to get a reasonable spread in age. This could be due to more individuals in the age group 30-40 years are active in the Facebook group. However, one respondent is over 60 years old and can give a picture of what the situation is for retired individuals. The data can show differences and similarities

in modal choice between the ages 30-40. Moreover, both time and resource restrictions are relevant in relation to the amount of collected data. The study had to be restricted to a limited number of interviews because of time constraints and the lack of interested respondents. More respondents may have been necessary to get a better holistic view on the matter. The use of the Facebook group will most probably have given a biased sample in some way or another; such as the respondents being very interested in cycling since it is an online community for cyclists for example. Another bias resulting from the sampling process when using the Facebook group that happened to occur were that all the respondents are voluntarily carless. Lastly, the interviews were held in Swedish and later translated in to English. I am aware that this can have an impact on the presentation of the results although they were carefully translated in order for the meaning to be the same. Overall, the data does have some potential weak points. In relation to the study's aim however, to explore potential problems with the disposal of bulky waste in carless households, the data will be able to reach some conclusions. And as previously mentioned, the principal criterion was to not own a car, which is what all the respondents have in common.

A second important aspect to reflect upon when conducting a qualitative interview is the interplay between the interviewer and the interviewee. The interviewer or interviewee could unintentionally be affecting the situation. On the one hand, the interviewer could be influencing the interviewee. As a student you may not get as proper answers as a more qualified researcher (Esaiasson et al 2012) because the researcher is taken more seriously. It could also be because of one's experience in conducting interviews and consequently getting a different outcome. Other interviewer effects that the interviewer has on the interviewee that Esaiasson et al (2012) identify are how questions are asked or only "hearing" certain aspects of an answer. These can also be related to experience. Due to my previous experience being close to nothing before conducting this research, the answers obtained might differ compared to if someone else more qualified were to have conducted the interviews. On the other hand, the interviewee could be giving answers that the interviewer wants to hear which the interviewer cannot do a lot to avoid (Esaiasson et al 2012).

Esaiasson et al (2012) explain that you most importantly must reflect on the interview situation and become conscious of the potential interviewer effects in the interview. As already mentioned, the respondents themselves got to decide where the interview was going to take place. This was for their convenience but also done consciously to minimise the power asymmetry between myself and the respondent. If the respondents are in a comfortable and familiar place, they could be more willing to answer truthfully. I also informed the respondents what the purpose for the study was and that no one would have access to the recordings apart from myself. There are however some conscious effects during the interview process that can have affected the data. In the interview with Mattias, for example, the café that was chosen was very busy at the time the interview was conducted. The loud noises in the background could have affected his thinking and willingness to discuss things in more detail which was sensed when talking about his car use in the past. Another conscious effect was that I asked permission to use the respondents first names in the thesis. This could have affected their answers somewhat knowing that they were going to be somewhat more

exposed. This did not seem as a problem for the respondents, many were very relaxed about it. Though one respondent was more precise and wanted to make sure her last name would not be used. I decided later not to use the respondents' real names for reasons of confidentiality.

3.5 Presentation of the respondents

All the respondents are voluntarily carless and some of them have never owned a car, although at least one member of the households has a driver's licence. Half of the respondents make use of a carsharing service. Members of a carsharing service get access to a car when it is booked. The benefit of this is that the individual has access to a car without having the costs of owning one themselves (Shared-Use Mobility Center 2018). The respondents have been renamed for anonymity and their characteristics are summarised in *Table 2* at the end of this section.

Margaret is 33 years old and lives in a privately-owned house with one other adult and 5 children. She lives in the neighbourhood Kortedala and has lived in the house for almost three years now. She has never owned a car herself but has a driver's license and gets around mostly on her electric bicycle. Margaret is not a member of a carsharing service as there is not one in her area. Even so, she would not become a member as she feels it is expensive and she does not like cars in general. This is because she believes they take up a lot of space in the city and due to the negative impact cars have on the environment. The only time she feels that not having a car is tough is when the weather is bad because the car is very comfortable when it is rainy and windy out. The closest recycling centre for her is about 2-3 km away.

Kristian, aged 37, lives in Bagaregården with his husband in a privately-owned house. They moved there two years ago from a condominium and are members of a carsharing service. Both have a driver's licence. On a daily basis Kristian and his husband travel by bike. They got rid of their car around the same time the congestion charge was initiated in 2013. This was because they realised that the car in effect cost them a lot and if they sold the car they could buy a house. Kristian thought that getting rid of the car would make them feel restricted in their everyday life. However, they were positively surprised that this was not the case because they can always make use of the carsharing service. The closest recycling centre is about 5 km away.

Emil is 38 years old and lives with his partner in the neighbourhood around Svingeln in a condominium. He cycles everywhere he needs to go unless his partner wants to take public transport. Emil has lived in Gothenburg for 16 years now and has a driver's license, but his partner does not. He has never owned a car himself and is now slightly afraid to drive as he has not driven for so long. The only time Emil wishes he had a car is when he and his girlfriend want to take spontaneous trips on their holiday that are only reachable by car. They have nearly always managed to go anyway because a friend who drives wants to go with them. Emil started cycling 11 years ago and has been "hooked" ever since. He chooses from

two recycling centres whenever he needs to get rid of his bulky waste. One is about 5 km away and the other is 7-8 km away.

Mattias, also aged 38, lives in Björkekärr with his two children in a condominium and has lived there for 6 years now. He has sporadically had a car in the past, mainly because it was a company car. Mattias cycles daily to work and is a member of a carsharing service. He enjoys the health benefits cycling which is one of the reasons why he does not own a car. It is also because a car is expensive and a nuisance to maintain and that he does not require one often. On the odd occasion when Mattias needs a car, he rents one which is just as convenient for him. The only disadvantage he notices of not owning a car is when him and his family want to take a spontaneous trip that is hard to reach by public transport. Mattias plans on buying a better, electric cargo bicycle to replace his current two bikes. This is so that he does not have to switch bike once he has dropped his children off at school. Mattias has the closest recycling centre about 10 km away.

Carina is 30 years old and lives with her partner in a privately-owned house in the Hisings Backa neighbourhood. They recently moved there from a condominium. Carina has never owned a car but both her and her partner have a driver's license. They are members of a carsharing service and she uses public transport daily to go to work. Carina is carless because she feels that there is no need for one in the city. It is only recently when her and her partner moved to a house that she has had feelings that a car would be handy. The car would make large purchases easier as she finds home-delivery inflexible. Though every time they look at how much a car would cost they get put off by the price and enjoy the advantages of not having to maintain the car when renting a car at a carshare. Tagene recycling centre is about 4 km away.

Lisbeth, retired and 66 years old, lives in a rented apartment in Lorensberg with a lodger around the same age. She has lived in Gothenburg almost all her life and has been car free for 11 years. She got rid of her car at the same time as her summer house because she would not have use for it anymore. Keeping the car would also have been expensive as it cost 650 Swedish crowns a month for a car parking space. Lisbeth travels by public transport and occasionally cycles in the summer if her joints permit. She lives in the city centre and has around 10 km to Alelyckan recycling centre where she goes to throw away her bulky waste.

Table 2. Presentation of the respondents.

Respondent	**Age**	**Household type**	**Neighbourhood**	**Driver's license**	**Carpool member**	**Distance to recycling centre**
Margaret	33	2 adults, 5 children	Kortedala	Yes	No	2-3 km
Kristian	37	2 adults	Bagaregården	Yes	Yes	5 km
Emil	38	2 adults	Svingeln	Yes	No	7-8 km
Mattias	38	1 adult, 2 children	Björkekärr	Yes	Yes	10 km
Carina	30	2 adults	Hisings Backa	Yes	Yes	4 km
Lisbeth	66	2 adults	Lorensberg	Yes	No	10 km

4 Results

4.1 Introduction

The chapter firstly introduces the different transport strategies, i.e. the modes of transport, that the respondents used to get rid of their bulky waste. All the respondents have different ways of getting rid of their bulky waste although the modes of transport used are car, bicycle and on foot. Margaret and Emil, who do not go to the recycling centre by car, are more creative in their way of getting rid of bulky waste (see section 4.2.2, *By bicycle and on foot*). The other four respondents normally use the car but have different ways of gaining access to one and getting rid of their bulky waste.

The subsequent two sections follow the themes identified after analysing the data. The first theme highlights the restrictions and barriers associated with bulky waste disposal in carless households. It explores the problems and limits associated with the disposal of bulky waste in terms of barriers and restrictions. The three sub-themes that have been identified are *alienation, dependency* and *physical barriers.* The theme alienation relates to the feeling of being out of place and breaking the normative behaviour. This is a type of cognitive barrier is seen in Margaret's and Emil's responses and could potentially prevent individuals from coming to the recycling centre without a car. Mattias as well expresses another type of alienation and says that he mostly wants to stay away from the recycling centre: *"I try to stay away, mostly"*, giving the notion of recycling centres being uncomfortable and not a place you want to visit. With dependency I mean that the individuals express a dependence on other individuals and rely on certain modes of transport and other tools to get rid of their bulky waste. This is a restriction as the individuals cannot do it on their own. Lastly, the theme *"physical barriers"* presents the infrastructural and physical restrictions what makes the disposal of bulky waste more difficult and inconvenient for the respondents.

The second theme are the solutions to the weaknesses identified in the current way of disposing bulky waste. In the interviews it was discussed what an improved waste management system would include. The sub-themes *flexibility*, *accessibility* and *affordability* are identified as important factors when it comes to their disposal of bulky waste. With flexibility I mean that a potentially improved waste management system should be able to adapt easily to different situations: whether you are working full time and despite where and how you live (i.e. in a condominium or a privately-owned house). It involves being able to fit in to an individual's daily schedule without the activity being too much of a burden in itself or on their other daily activities. Accessibility encompasses here a waste management system that is more available and accessible to carless individuals. This includes both improvements in infrastructure at the recycling centre and in the collection of bulky waste. Affordability relates to the cost of getting bulky waste collected at your residence as it is already free to go to the recycling centres itself. A fourth sub-theme, *attitudinal change*, is also recognized to ease a carless lifestyle and therefore indirectly also a solution to the disposal of bulky waste. In many interviews there were certain attitudes towards carlessness expressed by the respondents. Some of them were personal whereas other attitudes were feelings and pressures

from others. A change in attitude was then identified as a solution to some restrictions in a carless lifestyle which in turn can make bulky waste disposal easier as well. The attitudinal change refers to a societal shift away from the car norm.

4.2 Transport strategies

4.2.1 By car

Although three of the respondents are members of a carsharing service, only Carina's household makes use of this when getting rid of bulky waste. Kristian uses his mother's car whenever he needs to go to the recycling centre. Mattias gets help from his parents whenever they come to visit: *"I have parents who come visit now and then and then they always have a car and help me get rid of the rubbish"*, he says. He combines this transport strategy with the use of a container that the condominium provides about twice a year. Lisbeth gets help from friends who either have their own car or they rent one together. Her visits are more spontaneous compared to the other respondents: *"Yes, it's gone like so: "Now we are renting a car, do you have something that needs to go to the tip?", it's like that, you know?"*. For Kristian, on the other hand, the trips are less spontaneous. He and his husband plan ahead a lot more compared to when they used to own a car. They have increased the efficiency of their car use by combining all the errands to one renting opportunity: *"We gather everything together, so instead of using the car maybe more continuously before; we went out, did one thing and then the next day we came up with something else. Now we are a bit organised in that way."*. Carina, like Kristian, also makes sure to run all the errands when having the car. They therefore gather up bulky waste a bit longer: *"And then we've often gathered* [waste] *a little longer so that we maybe have it* [a car] *once every trimester or something like that and then we make the most of it and do many car errands at the same time."*, she says.

4.2.2 By bicycle and on foot

Emil gets rid of his bulky waste by bicycle and uses his cargo bike or his personally constructed cargo trailer: *"It's a trailer which is two metres long where you can fit a lot of rubbish on. That's what it looks like* [shows pictures of the bicycle trailer]. *Then you can have room with more than in a car. You can even take a full, a 120-bed."*. Emil has also fit an old sofa on his trailer. Margaret walks 2-3 km with a trailer or trolley full of bulky waste to the recycling centre and then travels home by public transport. It is downhill to the recycling centre making it fairly easy to walk and when they carry big things it is more inconvenient to use public transport to get there. The children sometimes accompany her by bike or on inlines. They have also fit the children in a bathtub that was to be thrown once: *"Like Elin mentioned, one time when we were throwing away a bathtub, it was just huge as well, so then it was, it really stuck out from the sides of the cargo trailer, but I mean it worked well to balance anyway, so then we put them* [the children] *in it."*.

4.3 Barriers & Restrictions

4.3.1 Alienation

The main barrier for disposing waste by bicycle and on foot are the clear signs that the recycling centre is not planned for anyone to come with these modes of transport due to the infrastructural features put in place (also see point 4.3.3). Margaret says that disposing bulky waste is a clear example of when you should have a car because of the way the recycling centre is organised: *"It's really clear here that it's obvious that you come by car.",* she says. *"There is something with the feeling that there's always a focus on the car which has to be shifted by the recycling centres or by the city."* she goes on to say due to the fact that there are no clear signs or markings of where to go when you do not come by car. Feeling unwelcome or lost can be associated with feelings of alienation when going to the recycling centre.

Margaret describes having a feeling that they sneak in when going past all the cars. She does not show the access card upon entering either which you normally have to for the municipality to keep track on you not exceeding six visits a year: *"It has to be more expressed. Now it feels more like we sneak in between because I don't think it is, as I've understood it doesn't say anywhere* [what to do when you don't come by car]*."*. Margaret is unsure if this is the right thing to do but takes the liberty in doing so because she does not take the car: *"Because it feels a bit like "at least you can get that", or whatever, when you've managed to get there another way than with the car."*. Emil has also wondered about the access card and whether you need to show it or not. *"It's tricky if you can leave bulky waste without showing that green card or not. Different people who ought to know say different things."*, he says. He then goes on to elaborate that he has made some calls. According to the municipality you still have to show the access card when coming by bicycle whereas the people on site do not require this. Margaret thinks that this should be made clearer as well so that there is no hesitation: *"With the cards it could be decided that when you come with a vehicle that requires the bar to lift then you can validate it/use it. But if you come with something smaller then you can just go past."*.

4.3.2 Dependency

Many respondents show different kinds of dependency when getting rid of bulky waste. Mattias expresses dependency on other individuals first hand when he talks about getting rid of larger items such as a sofa. It is a dependency that he would rather not have: *"Eh, it works fine but it's a dependence and I, it would be nice if there was a simpler way to get rid of it* [the bulky waste] *somehow."*. He also expresses slight annoyance of having to keep track of the different opening hours, being dependent on going to the recycling centre, needing a access card and getting a car when throwing away bulky waste is a dependency as well: *"It feels like as soon as you look up how to throw away rubbish you end up at a recycling centre, you have to go there and they have, yeah, now it's alright but there are different opening hours. And you need to go with a certain card for some strange reason and then you need to get a car and drive of course."*. The respondents also show dependency on other individuals

for equipment. Margaret, for example, depends on her friend to borrow their bicycle trailer: *"No but we've, like, partly used the trolley or my friend has a bicycle trailer actually, so we have walked with that."*. And Kristian is more or less dependent on his mother for the car if he does not use the carsharing service.

Lisbeth's dependence is less specific to the other respondents as she relies on almost anyone with a car to get rid of her bulky waste. In the email exchange before the interview she wrote: "*Someday some motorist will surely volunteer..."*. However, she does not depend on just anyone. Lisbeth mentions the potential negative outcomes with relying on other people getting rid of waste for you, particularly the ones you do not know. She would not dare to get help from someone she does not know in case they end up throwing the rubbish in nature: *"I've looked at some, in this "Help wanted, can be performed, blah blah blah"* [on Facebook] *and I've never done it, you know, but there was a guy who offered to drive for a reasonable price, he had a pickup truck. But then I thought, I need some kind of a guarantee that he doesn't go and dump it on the way to Lärjeholmen for example, you know? Because I know that there's a lot of that fly tipping in this city, so I don't want to contribute to that. I'd get anxiety."*, she laughs nervously. She also expresses that the only time that she feels in need of a car is when getting rid of bulky waste: *"So all the time you need to hope that a friend happens to have a car and wants to make it dirty or fill it."*, showing other signs of dependence as she needs permission to use her friends' car.

Lisbeth also mentions that many of her friends her age also depend on someone with a car to get rid of bulky waste. This is mostly because things could be heavy to carry or because they can no longer drive. Not only is a car needed in this case but also someone to help carry and drive: *"Many of the ones I'm thinking of now, they don't even have a driver's licence. They've, like, never needed a driver's licence so they wouldn't even be able to if needed. Or they have but it's been so long since they've driven."*, she says.

4.3.3 Physical Barriers

A clear physical barrier is the infrastructure around the recycling centres which was previously mentioned to potentially promote the sense of alienation for individuals not going by car. A distinct example is that there is no zebra crossing from the pavement to the Alelyckan recycling centre entrance. Margaret explains that the road in front of the recycling centre has a lot of traffic: *"They have built a really good, wide combined pedestrian and bicycle lane down so there's plenty of room to get there. But it* [the road] *is still very busy and it's the only way down to Kortedala. There are a lot of cars."*. Accessing the recycling centre could therefore be quite dangerous when trying to cross this road with both children and odd sized waste. Emil also remarks the lack of a crossing, as Margaret and he happen to visit the same recycling centre: *"You bike along a big road and then you need to cross it, then you're there. And there's no traffic island or anything and yeah, there isn't, you have to cross high edges and things. That's the only tricky thing there."*.

Another physical barrier is storage. Carina mentions that after moving to the house her and her partner have greater storage space compared to when they lived in the apartment. They keep what needs to be thrown in the garage until there are enough errands to run when they have the car. The same was done in their former apartment but then they stored the rubbish in the kitchen as opposed to the garage. The only difficulty that she encounters is that you cannot get rid of bulky waste immediately like any other type of waste: *"What you have is, like, a buffering problem. So right now, it's less of a problem because I can put it somewhere where I don't see it. But it's still impractical, I can't choose."*, she says. In the email exchanged before the interview, Lisbeth mentioned similar problems with storage. She wrote that she at least has a lot of space to store all the rubbish: *"At the moment I collect amounts of glass, worn out furniture, ceramics and electronics that are too big to be taken care of by the hazardous waste-car* [Swedish: "farligt avfall-bilen"]. *(I have a lot of space which is lucky.)"*.

4.4 Solutions

The general opinion from the respondents was that they do not experience too much of a problem when getting rid of bulky waste. Kristian does not think it is such a nuisance the way the system is today: *"I can't state that it's a huge problem as it is to be honest."*. Carina has a similar view. She does, however, think that for her it is not a problem due to her household being able to afford to drive. She points out that some people do not have this option: *"We have the possibility of carpooling and such, for a car, because we have a driver's licence and we can afford it, you know."*. Lisbeth, on the other hand, does think that the disposal of bulky waste is a perceived problem, a *"pet peeve"* as she calls it, and wishes for a better system such as the ones in foreign countries (see section 4.3.3, *Affordability*). For her bulky waste disposal is the only time she feels like she needs a car.

4.4.1 Flexibility

Where Carina lived previously, the condominium provided a container twice a year to get rid of bulky waste, though she did not make use of it back then. Their solution was to get rid of bulky waste by car, the same strategy as her household has today. For her, flexibility is important in case you are all booked up when the container is in place: *"The container solution suits me very badly because it's often that it has to be a certain time, you have to be there at that time otherwise it's locked before and after."*, she says. Margaret mentions the same sort of aspect but comparing it to the hazardous waste-car that makes several stops in neighbourhoods for people to hand in their hazardous waste. She has never been able to time it: *"So it's so difficult when it's only twice per year. So it doesn't feel like a very good solution anyway, not for us. We've never used it."*, she says. Lisbeth suggests that a municipal collection should be able to be booked on the internet so that bulky waste is picked up in your neighbourhood or at your doorstep at a preferred time. This could perhaps improve the inflexibility that Carina and Margaret experience. Lisbeth means that being able to make bookings on the internet should not be a difficult thing to do: *"It's like everyone else that have booking on the net. If hairdressers and health clinics can do it the municipality should manage such a thing."*.

Before his mother moved to Sweden, Kristian and his husband used to rent a van at the petrol station nearby. Being able to use his mother's car has made running errands that need a car more convenient compared to renting a van, suggesting that borrowing a car is a bit more flexible: *"So it worked of course* [renting a van] *but it was a bit more, like, you needed to, like, think a bit more, plan a bit more, it doesn't become a spontaneous visit."*, he says. He goes on to say that being able to borrow a car, compared to renting one, their car use has increased mainly because they become aware of the cost when they rented. He says: *"I find that it* [car use] *has increased a bit now, ehm because there isn't the aspect of cost. When you rent carpooling then you see how much it will cost, "OK, it's going to cost 300 crowns" so then you think again. But when it's mum's car, then it just "is there"."*, suggesting that a lower cost has increased the flexibility of getting rid of bulky waste.

4.4.2 Accessibility

As mentioned previously, Lisbeth says that it can be difficult to handle bulky waste for people her age (see *Dependency*, section 4.3.2). Considering this, accessibility is very important for her. She compares Gothenburg to the waste management systems that are in place in other countries. She thinks it would be a great idea to be able to get rid of the rubbish by putting it out on the street at certain days of the year: *"Two friends, I mean at least, and I have talked about that in some countries, there you can put big things out in the street corner on certain days and then someone will come and pick it up. And, oh, I think that that is so superb! My sister lives in Switzerland and it's like that everywhere. I have a friend that's lived in New York for quite some time and it's the same there, you know. You can just put it out and get rid of it. So good!"*, she says. Being able to do so would increase individuals' accessibility to bulky waste disposal

Emil suggests accessibility solutions by changes in the infrastructure to make it easier to get to the recycling centre by bicycle. With a bicycle trailer it is difficult to manoeuvre on the bicycle lanes and by certain tram tracks as they have boulders that narrow the passage: *"But if we're talking concrete solutions, better bicycle lanes and better bicycle passages and such, I guess. And no winding turns with a little radius, it's hard if you have a long trailer after you. And there was a certain spot on the way to the recycling centre, boulders that stood by a tram crossing, it was extremely tight to drive through there as well."*.

4.4.3 Affordability

Lisbeth suggests that a free municipal service should be put in place as opposed to the 730 Swedish crowns that it costs today for the municipality to collect bulky waste at your residence. She is appalled by the collection cost: *"No but it's ridiculous. If you want people to behave, it, the whole society would gain for it to be a basically free service, you know. There's still an environmental impact* [by driving to the recycling centre yourself and] *then you get to throw* [bulky waste] *six times a year, of course. To pay because you don't have a car then I might as well rent a car together with some friends and do that."*. Carina would not pay 730 Swedish crowns either for the municipal collection service. She had not heard of the service before it was mentioned in the interview: *"Wow, I would probably not pay for that. I*

can maybe understand why it's that expensive. But I think it feels expensive.", she says. She goes on to say, as mentioned previously, that her household can afford to rent a car and drive but that some people do not have that possibility. She reflects upon the cost for the collection service being something that she could afford but can choose not to use: *"Sure, I could afford it but I've chosen not to do it because it's not worth the money. But there are actually those who can't afford it."*. Lisbeth, for example, mentions that some of her friends would not even afford to pay 100 Swedish crowns: *"My friend is a poor pensioner and she wouldn't even be able to spend one-hundred even, extra on things like that, no."*, she says.

4.4.4 Attitudinal change

Emil explains that biking requires a certain type of mindset. This mindset he talks about is probably the reason he is determined to bike with his bulky waste to the recycling centre. With a change of attitude, people would see what cycling could achieve and more people would use the car less. *"I really got a "wow" experience when I discovered cycling."* he says. Emil also suggests that an attitudinal change needs to be put in place towards seeing cyclists as an equal mode of transport to the car: *"I think that motorists let us pass where they should, really well. But there are always some who don't do it and such. And a change in attitude that sees cycling as an equal mode of transport and that would be nice. It would make a lot of changes"*, he says. On an opposite note, Margaret has gone completely against cars as opposed to being positive about cycling which motivates her to not use the car. She says that she detests cars: *"I can really say that I hate cars. I would never, yeah, uh, it's the worst"*.

Kristian mentions that his neighbours are impressed by the fact that him and his husband live without a car. The neighbours don't understand how it is possible: *"And it's like, interesting when you talk to the neighbours. Because they don't understand, like, how you can survive without a car. And then we just say: "well it works, you know"."*. This shows that car dependency is deeply engraved in some individuals. Carina explains that there are a lot times where it is clear that you "should" have a car in the city, making her feel annoyed: *"There are many, many occasions where it is predicted that "Of course, you are an adult person with a job - you have a car"."*, she says. She goes on to describe an occasion where her and her partner were going to buy a new stereo system and needed to find directions to the shop. It highlighted the norm of having a car when the only directions on the website they could find were by car: *"It makes me a little annoyed because the environment is important to me. And I think it feels like that you're very limited and locked in, you know. It feels like people don't, they think that they don't have the option, you know, because the norm says that you have a car."*. In this example, a change in attitude away from car-dependence could possibly promote more people to use the car less often. Margaret, for example, experienced a pressure of getting a car once she had her daughter, highlighting an additional example of a car-dependent society: *"Well there was a bit of pressure I'd say, Melia is 9 so when she was born, or, I think that there usually is a pressure like that though in general. If you have children that's how it is, that the child requires a car. I feel, like, that pressure from others, or I don't know, from society like that. There is such a car norm and well, it focuses a lot on*

when you have children, so that was like "oh" [and I] *thought of maybe* [getting one] *but then I decided rather quickly to… No, it's really stressful with the car, you become, to have a baby in the back and drive, ugh! It's really bad. I don't understand why people think it's so important! It's a lot easier to take the tram because then you can take care of the child whilst traveling instead of "OK, OK, we're there in 20 minutes, just cry". It's really strange."*. Both Carina's and Margaret's stories point out that a carless lifestyle is not made visible enough in society today. An attitudinal change where carlessness could become more pronounced could make a carless lifestyle more relatable and in turn make bulky waste disposal easier for these types of households.

5 Analysis

5.1 Introduction

The first section will the discuss aspects of the time-geographical constraints and the activity approach that can be seen in the results. The obvious constraints in this respect are the coupling constraints as many respondents borrow cars from friends or family. For some respondents, however, they are not perceived as a constraint. From what is mentioned in the interview, Kristian does not see that there is a problem with the way he disposes bulky waste. For him, the restraint is undetectable. This leads us to the second section, where I discuss whether disposing bulky waste really is a problem for carless individuals.

5.2 Aspects of time-geography and the activity approach

Hägerstrand defines a capability constraint being the biological limitations or limitation of tools available to the individual (Hägerstrand 1970a). As all the individuals have a driver's licence and the health status necessary to be able to drive, the respondents do not have a capability constraint in this respect. Neither do they have a capability constraint in car access as it is possible for them all to rent a car. But the individuals do have different types access to cars. One could say that being members of a carsharing service, Carina, Kristian and Mattias have less of a restriction than Lisbeth, Emil and Margaret who are not members. Kristian also has access to a car through family and Lisbeth has access to a car through her friend relating back to the activity approach that individuals have different possibilities in mobility as they live under different circumstances (Frändberg et al 2015). Carina exemplifies this further when she describes that for her and her husband they can afford to rent a car and drive whereas some individuals do not have this option (see introduction to section 4.4, *Solutions*).

Moving on to bulky waste disposal, Margaret and Emil show us that you can manage to dispose of bulky waste without a car meaning that access to a car should not be a capability constraint for the individuals in this case. One could argue with the activity approach though that both Emil and Margaret live under certain circumstances meaning that they have different possibilities (Frändberg et al 2015) compared to the other respondents. Margaret for example lives in proximity to the recycling centre to get there on foot. She also does not want to use a car which means that she makes the effort getting rid of the bulky waste another way. Emil is passionate about cycling suggesting that he does not think it takes a lot of effort going to the recycling centre by bicycle because he simply makes it possible for him to do so. These are both examples showing individual wishes and attitude affecting mobility and transport choice (Frändberg et al 2005).

Evident capability constraints are stated in Lisbeth's interview, the retired respondent, when she talks about herself and her friends. Her friends do not have the health to drive demonstrate a biological constraint. Not being able to pay for the collection fee is indirectly a capability constraint as they do not have the tools, i.e. money, to pay for this service.

The coupling constraints are apparent in Margaret's and Kristian's transport strategies as they depend on their friends and family respectively for tools to get rid of bulky waste. For Kristian to get access to the car he first needs to make sure that his mother is not using the car. Secondly, he needs to pick a suitable time and place that suit them both for a bundle to be created and for the car to be handed over to him. The same goes for Margaret. For her to borrow the bicycle trailer she needs to plan ahead with her friend to make sure it is not being used. This can also be highlighted by the activity approach that underline that certain activities need to be planned (Frändberg et al 2005). Borrowing something from someone else can also be a type of authority constraint as you need permission to use it. Kristian's mother decides when it is suitable to borrow the car for example. Lisbeth needs permission from her friends in order to transport bulky waste in their car.

Lisbeth demonstrates a different kind of coupling constraint as she needs a car but also does not go to the recycling centre alone. As opposed to Margaret and Kristian, who do not carry out the activity with the person who has the tool, Lisbeth couples with another individual who needs to carry out the same activity. This means that more time is needed to be put aside by all the individuals involved and restricting other activities during this time. Another difference is that she does not need as much planning as her trips to the recycling centre are more spontaneous (see section 4.2.1, *By car*). This spontaneity relates to the activity approach that highlights that some activities are more spontaneous than others. Being retired, it also indicates that Lisbeth has more time on her hands for her trip to the recycling centre to be less planned. This exemplifies the activity approach in another manner by illustrating that mobility varies depending on the stage in life you are in (Frändberg et al 2005).

Coupling constraints have to do with bundles and sometimes it takes effort to make one. The complexity of a bundle is exemplified in Mattias' interview. He states that one needs to be at the recycling centre at a certain time, make sure to have a car and then drive. For someone who does not own a car this implies more effort than for someone who has a car. The opening times exemplifies to an authority constraint as well because an individual does not have access to the recycling station unless it is open. Another type of authority constraint is the need of an access card to enter the recycling centre. This authority constraint does not seem to apply to individuals who come without a car although they are still meant to show it.

5.3 Is there a problem?

As stated in the result, there is a general contentment amongst the respondents of how one can get rid of bulky waste. Even though the respondents do not explicitly say that getting rid of bulky waste is a problem there have been certain aspects of bulky waste disposal that can be troublesome. Bulky waste is stored at their home until the possibility arises to dispose of it and the dependence on other people who have cars can be inconvenient. For cyclists and pedestrians, the infrastructure is not helpful and social rules are uncertain as to whether the access cards need to be shown.

So, is it really a problem to get rid of bulky waste for carless households? Lisbeth is the only one amongst the respondents who identifies it as a problem when she expresses that getting rid of bulky waste is the time she feels in need of car. Looking at the results from Lagrell (2017), other carless families also have Lisbeth's opinion in that a car is needed for this very activity. An aspect to consider in this case, is the way the other respondents have access to and use the car. Carina, Kristian and Mattias are members of a carsharing service which probably means that they still feel comfortable using a car and do not rule out the use of a car completely. They also have greater flexibility in being able to book and take a car whenever they need. Lisbeth, on the other hand, could identify bulky waste disposal as a problem because, like Margaret and Emil, she is living a "complete" carless lifestyle whereas the remaining respondents do not particularly aim to do so. Margaret's opinion of not liking cars and Emil who talks about his "mindset" and being "hooked" ever since he started cycling clearly motivate themselves in this way to not use the car. Whereas with Kristian and Carina, the car is a comfortable solution for certain errands even though they do not use the car on a daily basis. Carina even mentions that since she moved to the house her and her partner have been thinking of getting a car because it would make things easier. Kristian says that he uses the car more often now when he and his husband can borrow his mother's car. Being voluntarily carless does not rule out using the car as a mode of transport completely, hence bulky waste disposal is not a problem for them.

In Lisbeth's case, she has a clear idea of what the solution would be: a free collection at your residence. None of the other respondents, however, mentioned this aspect which is another indication that they do not think that getting rid of bulky waste in itself is a problem. Perhaps they do not see it as an option or something they do not even consider as they currently manage to get rid of their bulky waste. Lisbeth is also older than the other respondents so in her situation, getting older, living on a pension, having friends who cannot drive any longer and being less able to handle bulky goods, could be why this is more of a perceived problem.

For the voluntarily carless, by looking at the respondents here, means that you still manage to get rid of bulky waste in one way or another. All the respondents still have a driver's licence, thus the possibility of using a car to get rid of bulky waste is still viable. Carina for example mentions that she can still afford to rent a car suggesting that money is not a problem for her. For those who are involuntarily carless on the other hand may not have it as easy. Using Mitra's (2016) definition of involuntary carlessness being a consequence of not being able to afford a driver's licence or a car, getting rid of bulky waste could indirectly also be difficult. A domicile collection costs approximately 730 Swedish crowns which an involuntarily carless individual probably cannot afford either. Naturally, there is a possibility that most of these individuals who cannot afford the fee might live in housing that has a container or a bulky waste room. Health can also get in the way of being able to get rid of bulky waste as handling it requires lifting. Lisbeth mentions the difficulty of carrying certain goods long distances. With this in mind, involuntarily carless individuals who are carless for health reasons (Mitra 2016) may not be able to manage bulky waste either. Bulky waste disposal therefore may not be a problem for all carless individuals but for those who do not have the health or the means to drive/have a car. However, it is difficult to determine whether it is a

difficulty for all involuntary carless households as they have not been investigated here. A potential disadvantaged group would be the elderly which is visible in Lisbeth's interview. This is already observed by the innovation project in Borås who have targeted this group in their project (Innovationsplattform Borås n.d.).

6 Concluding chapter

6.1 Conclusion

The aim of the study was to explore the potential problems associated with a carless household's disposal of bulky waste in Gothenburg. The two research questions that were outlined regard what transport strategies carless households apply and what restrictions and solutions that can be found in the disposal of bulky waste in these households. The answers to these questions, based on the thematic analysis of empirical data from the interviews, are presented below.

The transport strategies used by the respondents are by car, bicycle and on foot, thus showing that it is viable to go to the recycling centre without a car. However, this could be explained by the fact that these two respondents have a wish not to use car, going "all in" on the carless lifestyle and living in proximity to the recycling centre. Consequently, the aspects of the activity approach can be applied as it emphasizes that individuals have different possibilities and live under certain circumstances which in turn affect mobility. Even though half of the respondents are members of a carsharing service, only one individual uses this strategy to get rid of their bulky waste. The remaining individuals borrow a car from friends or family. For those who use the car to go to the recycling centre, there is a tendency to carry out multiple errands rather than only having the car for one activity. This way different errands are accumulated over a longer period time for it to be worthwhile renting or having the car.

The results from the interviews show that there is a general contentment overall with the way the disposal of bulky waste works today. The respondents do not have a problem with depositing it where it should go. Consequently, there are no "real" problems with disposing bulky waste. However, in the aspect of not needing the car at all to get rid of bulky waste, the current system does pose a problem. There are also some inconvenient problems associated with it which are still meaningful despite most respondents' views. Individuals accessing the recycling centre without a car sense the general car norm due to infrastructural components in the proximity to the recycling centres. This relates to the feeling of being out of place. There is also a matter of dependence on other individuals to get rid of bulky waste which can be highlighted by the coupling constraints in time-geography. The different types of access to a car affect the nature of the coupling restraints; whether it is just to get access to a car or whether help is needed throughout the whole activity of going to the recycling centre. The view on dependence is not a perceived problem by certain individuals which ties with the possibility of why bulky waste disposal is not one either. Capability constraints can also be associated to bulky waste disposal as not everyone has the means to get rid of their bulky waste on their own. Authority constraints are connected to the opening times and the need of an access card in order to enter to the recycling centre. Other findings show that physical barriers in infrastructure hinder cyclists and pedestrians to access the recycling centre safely. Storage is also observed as a physical barrier as bulky waste cannot be disposed of immediately like other household waste.

Solutions to certain aspects of bulky waste disposal have been identified. Improvements in accessibility such as being able to book a municipal collection online would help. Many respondents also express flexibility as an important aspect to get rid of bulky waste. Providing the occasional container and the hazardous waste-car are recognized as inflexible options. Also, not being able to have your bulky waste collected by your door for free as with the regular household waste is also seen as an inconvenience, compared to the price it currently costs for this service. A more accessible, flexible and affordable waste management solution is suggested to be put in place to counteract these negative aspects. Lastly, a general attitudinal change towards carlessness and cycling in society could also be a solution to ease the disposal of bulky waste for carless households, as well as promoting a carless lifestyle in general.

6.2 Discussion

As mentioned in the results, the recycling centre is a place where the car norm is apparent. The fact that there is no zebra crossing at one of the recycling centres highlights the "built-in" car norm. This is despite there being visions of wanting to minimise car use (Göteborgs Stad 2014). Even the current infrastructure for pedestrians and cyclists exhibit problems when getting rid of bulky waste by bicycle. The boulders by the tram tracks are probably put in for individuals' safety but become a barrier in situations like these. What one has to consider though is what is being transported. In this study, it is the physical movement of both the individual and the bulky waste that are of interest. Hence, the mobility is more complex than everyday movement and a possible indication to why many of the respondents use the car. This is probably also why city planners have not thought that the boulders by the tram tracks would be a problem. The transportation of a bulky object, or several of them, demands a vehicle that is big enough. In the society we live in today where the car is accessible to us it is not odd that many respondents chose this option. Even Banister (2008) points out that when planning for sustainability one cannot completely rule out car use. Consequently, the question is whether bulky waste disposal is something that should be improved so that the car does not need to be utilised.

Looking at the backgrounds to the respondents (see section 3.5, presentation of the respondents) one could discuss that the study indicates, in contrast to Mitra (2016), that there are other reasons for being voluntarily carless than the environment and not needing a car. Reasons for voluntary carlessness can be for economic reasons too although not to be confused with the economic reasons of involuntary carlessness. Not owning a car can result in having money to buy other objects, such as a house in this case. One also does not need to pay for an expensive parking space, leaving money for other expenses. Another reason for voluntary carlessness is the comfort. Not having a car means having one less thing to maintain and possibly being able to rent car if needed. Looking at the different transport strategies used when getting rid of bulky waste, voluntary carlessness could also be divided in to two types. A type of voluntary carlessness that involves not using the car at all for errands, such as Emil and Margaret, or the second type that does use the car. But this must be looked in to in more detail.

6.3 Possibilities for further research

A possibility for future research would be to apply a quantitative approach to see whether the majority of carless households get rid of their bulky waste by car or not. This will show whether this area in waste management needs to be improved for a potential future with less car ownership. Another question is whether individuals throw their bulky waste where it should be or if fly tipping is common as it was observed by one of the respondents in this study. In a qualitative questionnaire, individuals may be more open to these types of questions as you feel more anonymous. In this study the respondents were self-recruited meaning that individuals who do not do as they are supposed to may have not wanted to participate. This suggests that a more randomized selection process for respondents could be of interest.

Another aspect to explore are the views from other stakeholders responsible for waste management, such as the municipality or a representative from a condominium, to get their perspective on the question. Is bulky waste a perceived problem from their point of view and what can be done to solve it? Do the condominiums who use a container versus a bulky waste room see a difference in effectiveness? Lastly, researching the transport strategies of involuntarily carless individuals could also be interesting as it could give a different outcome to what was presented here. Moreover, a relevant aspect to explore are what specific groups in society do with their bulky waste such as people with disabilities or the elderly.

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8 Appendicies

Appendix 1

Respondent inquiry in Facebook group "Cykla i Göteborg" (eng. Cycling in Gothenburg)

Frivilliga sökes till undersökning om återvinning i bilfria hushåll.

Jag skriver under de närmaste veckorna min kandidatuppsats i kulturgeografi på Göteborgs universitet. Den berör vilka möjligheter och begränsningar som finns för individer utan bil att bli av med sina grovsopor i Göteborg. Syftet är att se vad som kan förbättras inom hanteringen av grovsopor för dessa typer av hushåll eftersom återvinningscentralerna oftast är otillgängliga utan bil.

Ditt perspektiv på frågan kan hjälpa till att bidra med information om hur hanteringen av grovsopor skulle kunna bli enklare i ett bilorienterat samhälle och på vilket sätt staden skulle kunna planera för det. Jag söker dig som kan tänka sig att ställa upp på en kort intervju om frågor kring det bilfria vardagslivet och hur du blir av med dina grovsopor. Skicka i så fall gärna iväg ett mail till gushullka@student.gu.se eller skriv ett meddelande.

Vänligen, Karolina Hull

Appendix 2

Interview guide

- Går det bra att spela in? Detta är endast för eget bruk så att jag ser till att citera rätt och har rätt information som grund för mitt arbete.

Jag skriver som sagt min kandidatuppsats i kulturgeografi i vår på Göteborgs universitet. Den berör vilka möjligheter och eventuella begränsningar det finns för hushåll utan bil att lämna grovsopor i Göteborgs kommun. Eftersom du lever utan bil är syftet med denna intervju att få en bättre inblick i en bilfri vardag och om du upplever svårigheter när du ska bli av med vissa typer av avfall. Min uppsats är en fördjupning på en masteruppsats som skrevs för ett år sedan. Den undersökte hur familjer utan bil fick ihop sin vardag. Ett av resultaten var att familjerna hade svårt att bli av med sina grovsopor för att återvinningscentralerna låg långt ifrån deras boende.

Innan vi kör igång vill jag meddela att detta är helt frivilligt och att du har möjlighet att dra dig ur när som helst under intervjuns gång, även i efterhand. Det finns inte heller några rätta eller fel svar utan vill gärna höra ditt perspektiv på frågorna.

- Finns det något du vill fråga angående det jag har nämnt?
- Går det bra att använda ditt förnamn i uppsatsen eller vill du vara anonym?

<u>Bilfri vardag</u>

- Kan du berätta lite mer om dig själv? Hur länge har du bott i Göteborg?
- Har länge har du varit utan bil? Har ni haft det någon gång?
- Hur resonerade du/ni kring det? Hur kommer det sig att du inte har det nu/inte har skaffat?
- Hur tar du dig fram dit du ska? Föredrar du något färdsätt?
- Är du medlem i någon bilpool?
- Har du körkort?
- Vilka för- och nackdelar ser du i att inte ha bil?
- Vad tycker du är svårast att göra utan bil? Kan du berätta någon gång när du önskade att du hade bil?
- Hur tycker du att det fungerar att inte ha bil i Göteborg? Finns det bra förutsättningar?

<u>Grovsopor</u>

- Hur definierar du grovsopor?
- Hur gör man med grovsopor i området där du bor? Bor du i hyresrätt eller bostadsrätt?
- Hur långt har du till närmaste ÅVC?
- Hur tycker du att det fungerar så du gör idag?
- Vad hade underlättat för dig? (Skulle det gå att underlätta mer?)

- Vad ser du för svårigheter med att slänga grovsopor? Vad är det som är svårt?
- Skulle systemet behöva ändras på något sätt?
- Finns det andra typer av avfall som är svårt att bli av med?
- Händer det att vissa dumpar grovsopor på fel plats i ditt område? Vad tycker du om det?
- Det var allt jag hade att fråga, finns det något som du vill tillägga?