

Accessibility strategies beyond private, motorized automobility – informing sustainability?

A study of carless families with young
children in Gothenburg

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Preface

This thesis is written within the master's program in Geography and Sustainable urban regions at the university of Gothenburg in the spring of 2017. My interest in mobility and accessibility in everyday life was raised during the program along with a fascination for the mind challenging, holistic perspective of Hägerstrand's time-geography.

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Abstract

In the face of major sustainability challenges posed by social exclusion and ecologic degradation there is a pressing need to change mobility practices as well as the physical structures that condition mobility. The overarching aim of this study is to expand knowledge about everyday accessibility strategies beyond private automobility, to inform social as well as ecological sustainability in community and transport planning. A time-geographical approach to accessibility is used to view everyday life as a context of interwoven activities that serve to fulfill a multitude of projects. Departing from the time-geographical notion of manoeuvre space as the ability to acquire opportunities within one's geographical reach, accessibility is defined as overcoming time-space constraints through a variation of strategies. Apart from mobility, geographical proximity and other strategies that reduce the need to be mobile is considered as well as the resources this require.

The study focuses empirically on families with small children as a group with a large share of time-bound activities and specific accessibility needs to make ends meet. It is based on eight semi-structured, in-depth interviews with voluntarily carless parents residing in semi-central parts of Gothenburg. The accessibility strategies applied by the families are generally aimed at enabling flexibility and coordination of activities so that the opportunities available within their geographic reach can be acquired. Most of the families in the study apply a combination of modes that include car travel at occasions outside their daily routines. The bicycle is an important mode of transport to organize fixed daily activities as it allows flexibility. Public transportation is used for short leisure trips and mainly when several family members are involved, such as day trips or attending to regular, fixed leisure activities. However, it has constraining effects through its reach and time tables. When the families need to get outside the tempo-spatial reach of public transport and overcome the capacity constraints set by the bicycle and their own bodies, most of them apply car based mobility. Car based mobility is also applied when the families need to conform to the highly mobile society. Geographic proximity appear as a fundamental aspect and fundamental priority in the daily life of the respondents, enabling voluntarily carless life. The strategies based on ICT and social relations as resources function in different ways to create further space for temporal and spatial flexibility through coordination, planning and relief of mobility needs.

The conclusions of the study are that 1) strategies that favor geographical proximity, flexibility and coordination of activities reduces the need for high speed mobility, 2) Voluntarily carless life demands resources and may be temporary due to transitions over the life course, and 3) perceived constraints from carlessness to a large extent arise from norms and expectations associated with automobility.

The study shows that it is indeed possible to live a carless life without unacceptable constraints to opportunities in daily life. However, such relatively non-constraining carlessness is evidently contingent on personal conditions and access to resources.

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1. Introduction

1.1 Background and study motivation

This thesis delves into how everyday life can be organized without having access to a private car. It focuses empirically on families with small children that do not hold private ownership to cars. They are a group with a large share of time-bound activities and specific accessibility needs to make ends meet, and through their carlessness they can serve as examples of how sustainable mobility can be achieved. In varying degrees through stages of the life course, everyday life entails the need to be in place for work or education, attending public services, making purchases, maintaining social relationships and engaging in leisure activities. This makes the act of moving between places necessary for linking these activities together. In modern society, this has increasingly been achieved through high speed mobility, and the role of the car in everyday mobility culture is generally one of hegemony (Sattlegger & Rau, 2016). Due to the increased capacities to move fast and reach distance locations within reasonable time, urban sprawl and increased distances of everyday life activities are strong ongoing processes. Hence the spatial structure of contemporary cities is highly adapted to carbon intensive and space consuming high speed mobility through private automobility. As ways of exercising mobility in this way have shaped the urban landscape, the physical shape of cities continues to structure mobility. This process contributes to the forming of common social meanings about mobility as important and desirable (Sattlegger & Rau, 2016), thus maintaining the hegemony. It leads to a large degree of mobility dependency in contemporary lifestyles (Vilhelmson, 2007), rooted in norms and values as well as in physical urban structures.

In the face of major sustainability challenges posed by social exclusion and ecologic degradation there is a pressing need to change mobility practices as well as the physical structures that condition mobility. These practices and structures have consequences that can be seen in all geographic scales, from the global level and down to the very localities of neighborhoods. Transports cause a quarter of global carbon emissions, and to date the emissions reductions achieved by increased efficiency and technical improvements in the transport system have been outweighed by travel increases (Givoni & Banister, 2013). While long distance air travel is indeed a heavy contributor to climate change, the shorter travels of everyday life has an overwhelming share and are highly relevant to address due to the high potential of reducing them. In the EU27, short distance city travel (up to 150 km) accounts for 80 per cent of travelled distances (Givoni & Banister, 2013). This bulk of trips can be considered a low hanging fruit in the struggle to reduce carbon emissions, as the urban context offers opportunities for low carbon alternatives. These alternatives, presented as non-motorized and public modes of transport, also address the local environmental issues of noise, congestion and local emissions from traffic.

Alternatives to the car based society also favor visions of more vibrant, green and inclusive cities and the somewhat neglected need for social urban sustainability. Societal dependence on high speed mobility entails that the car as a mobility resource is important for individuals

to avoid social exclusion, and a policy tension has been noted between initiatives for social and ecological sustainability (Markovich, 2013). However crucial it is to reduce car based mobility, it is probably more feasible for some parts of the population than for others. Mattioli (2014) distinguishes between a micro-social and a macro-social understanding of the theoretical concept of car dependence. According to this distinction, the micro-social understanding refers to individuals that rely on the car because of either constraints or attitudinal factors. The macro-social understanding on the other hand refers to societal car reliance, a structural process of increasing car reliance with the population in whole. Mattioli means that this structural process is self-reinforcing and as such “explains resistance to change” (2014:380). Mattioli’s (2014) reasoning boils down to that higher societal car dependence is associated with higher degrees of transport disadvantage due to car deprivation as well as due to enforced car ownership. This is a strong motive for the importance of enabling alternatives to car based mobility to strengthen social sustainability.

In Sweden, the average commuting time is 32 minutes one way (Trafikanalys, 2015). The national travel survey for the years of 2011-2014 reveals that a majority of trips for all purposes are made by car, as much as 65 per cent of the travelled distance. It also shows that this pattern is gendered; as men drive on average 31,4 km per day, the equivalent number for women is 13,7 km (Trafikanalys, 2015). These gendered mobilities also contribute to increase gender inequalities on the labor market following political ambitions of regional enlargement as it indicate that men have a further geographical reach and access to more jobs than women do (Gil Solá, 2013). Put into context, this picture can be further nuanced; while the numbers show a pattern for the country in total, the situation is quite different in the larger cities where the built environment is denser and the supply of public transport is more developed. Here, half of the travelled time is made by car for men, and only a quarter for women who mainly travel with public transport, walking or cycling (Fredberg, 2012). This indicates that in an urban context with the opportunities it presents in terms of access to public transport, shorter distances and diversity of work and education opportunities, there is potential for practices that go beyond private, motorized automobility. Apart from reducing the environmental effects of mobility it can also contribute to social sustainability. This motivates a further exploration of such mobility practices and accessibility strategies that substitute for mobility, as well as an inquiry into what consequences carlessness has for the organization of daily life.

1.3 Aim, research questions and clarification of central concepts

The overarching aim of the study is to expand knowledge about everyday accessibility strategies beyond private automobility, to inform social as well as ecological sustainability in community and transport planning. A point of departure is the basic assumption that high speed mobility is only one way of acquiring the opportunities necessary to organize everyday life, and that alternative accessibility strategies can be applied to substitute for mobility. A time-geographic approach to person-based accessibility as the overcoming of time-space constraints is applied to understand how families without private cars organize everyday life. This means investigating the time-space constraints entailed by the absence of a private car,

and what strategies parents engage in to cope with constraints. The first research question that is asked to achieve this objective is:

1. *What accessibility strategies do families apply in the organization of everyday life, and what resources do the strategies require?*

This question entails a straightforward investigation into the mobility practices families use, but also strategies that serve to reduce the need to be mobile. In part this entails geographical proximity in the spatial organization of activities. It also means virtual accessibility through Information and Communications Technology (ICT), and support from social relations to relieve mobility requirements. The second question is of a more explorative nature and serves to guide an inquiry into the barriers to practice non-car mobility:

2. *What are the consequences of carlessness on the maneuver space of the households?*

Making these questions useful and comprehensible requires an initial clarification of the use of some central concepts in the thesis: *Accessibility strategies* imply ways of reaching and organizing the activities that everyday life consists of. Such strategies can be actual ways of getting around such as choice of transport modes and ways of using them, this is what is meant by *mobility practices*. Reduced to mobility as strategy, accessibility can in a simplified manner be said to be increased by speed, but spatial accessibility might as well be achieved by *geographical proximity*, that is choosing activities that are close. This study also investigates accessibility strategies that are not spatial but serve to reduce the need for mobility. Such strategies are operationalized as relying on the support from social relations or applying virtual accessibility using ICT.

The notion of *maneuver space* is central to the second research question. It originates from time-geography but importantly differs from action space as temporally contingent, geographic reach. Maneuver space here, refers to the ability of an individual to take part in activities and fulfill the projects she takes on. The limits to maneuver space in this sense are partly material and defined by geographic reach, but they are also moral and defined by personal or societal values (Vilhelmson, 1997:20), or powered and defined by norms and expectations. To sum up, the relation between these notions is that the accessibility strategies that families in the study apply, of which mobility practices are one category, serve to maintain or increase their maneuver space which only partially is determined by geographic reach. These concepts will be further developed in the theoretical framework (chapter 3).

1.4 Delimitations

The study is focused on families that are voluntarily carless, i.e. they have more or less actively chosen not to own a car. The conditions for these families differ from those of involuntarily carless families, as being carless by choice do not entail transport disadvantage to the same extent as being carless by constraint (Mattioli, 2014; Mitra, 2016). Instead of delving into the consequences of such a transport disadvantage, the respondents in the study

represent examples of how accessibility can be achieved beyond private, motorized automobility. The contextual interest lies with everyday life as the daily weave of activities that we all partake in organizing. It is an attempt to systematically understand the complexity of this context and what it means for mobility practices. Therefore, the emphasis is on routine activities rather than decisions about for instance the occasional longer journey. Furthermore, it is a case study geographically limited to the city of Gothenburg (see further geographical context, 4.5).

1.5 Thesis outline

The thesis consists of seven chapters of which this *first* has introduced the societal and theoretic relevance of the research problem as well as its aim and guiding research questions. The *second* chapter is a brief overview of earlier research on carlessness, its variations and implications in everyday life and the identified knowledge gap that motivates the study. The *third* chapter presents the theoretical framework that the thesis is based on. It rests on a time-geographic approach to the meaning of time and space for individual appropriation of opportunities, and the constraints and resources that define maneuver space. Chapter *four* presents methods and data that underlie the study, its procedure for gathering empirical data and analyzing it. It also introduces the respondents that have contributed to the study, including their everyday contexts. Chapter *five* contains the results of the study. The findings have guided the setup of this chapter, which is largely structured around fixed and flexible activities as well as potential life-course transitions that may affect accessibility strategies. The analysis in chapter *six* builds on the results and feeds back into the research questions concerning accessibility strategies and consequences for maneuver space. In the concluding discussion, chapter *seven*, the main conclusions from the study is presented and followed by reflections on the findings and its implications for urban planning. The concluding discussion is followed by suggestions on further research.

2. Previous research on car use and carless mobility in everyday life

Research on everyday mobility beyond the car is a growing field, spurred by the need for a transition towards a less car-dependent society. It reveals that the conditions for non-car mobility are contextual, geographically in relation to the degree of car dependency in physical urban structure, but also in relation to a variety of socio-economic aspects, what life stage individuals are in and the resources they possess. McLaren (2016) has explored complexity of mobility practices among parents in varying urban contexts in Vancouver, and the meaning of this complexity to possibilities for a transition to more sustainable and equitable everyday mobility. The study reveals large variability in modal choices, ranging from car-dependency to multimodality (relying on a combination of transportation modes including the car) and altermodality (mobility beyond the car). McLaren establishes that “parents and cars can be delinked” (2016:223), but this is most evident for families living in a dense urban context, and in other contexts altermodality is associated with transport disadvantage. McLaren identifies a knowledge gap in what the conditions for non-car mobility are for urban families.

A crucial determinant for choice of transport mode is car ownership (Mattioli, 2014). Several studies have investigated what causal effect car ownership has on travel behavior on an aggregate level (eg. Van Acker & Witlox, 2010). However, efforts have recently been made to contextualize *carlessness* which implies the state of not owning a car rather than not having access to one (Mattioli, 2014; Mitra, 2016; Sattlegger & Rau, 2016). Carlessness can be an expression of protest or resistance to automobility, but it might as well be a consequence of social disadvantage (McLaren, 2016). Hence, being carless by choice or by constraint implies different consequences for mobility, since causes of carlessness are also related to residential environment and determinants of social exclusion (Mitra, 2016). Mitra (2016) states that understanding characteristics of voluntarily carless households can inform policy for reducing car dependency, while understanding characteristics of involuntarily carless households can help understanding the structuring factors of social exclusion. Mitra’s study suggests that involuntarily carless households are less mobile than voluntarily carless households. Naturally, choosing to be carless requires the ability to make that choice, which is enabled by sufficient accessibility and affordability of alternatives. This conforms to Mattioli’s (2014) study of car dependence and social exclusion in Great Britain, which suggests that the mobility gap between households with and without car ownership is smaller in denser areas, because those without a car have more alternatives to choose from. To the nexus of car ownership and social exclusion, Mattioli also adds the aspect of enforced car ownership when low-income households are forced to own a car because no alternatives are available.

Schwanen (2016) problematizes the major influence of automobility over urban form and politics, and emphasizes the overwhelming capacity of automobility to endure through “the configurations of practices, institutions and materialities that are centered around the private car” (p.155). In Schwanen’s (2016) view, mainstream policy approaches to encourage non-car mobility builds on the same ideas and methods that have been used to bring automobility into hegemony; it is based on a view of travel time as dead time and high speed mobility as ideal.

This view of mobility can be questioned through an exploration of lifestyles that do not include the private car, and what they mean for everyday life as a whole.

A prerequisite for planning for sustainable accessibility is to know what the organization of everyday life requires considering its context, and what the conditions are for practicing sustainable mobility. Barriers and conditions in everyday life for changing travel modes into less motorized, more collective ones have been hypothetically investigated in the Gothenburg region by Berg and Karresand (2015). Building on a national time use study and an activity based approach they investigate the conditions for car-owning families in the Gothenburg area, residing in semi-urban areas, to increase the share of public and non-motorized transport. They suggest improvements of public transport, better parking facilities for cars and bikes at commuting stations, location of services near housing and public transport junctions. It also suggests worktime flexibility as an important driver of non-car mobility (Berg & Karresand, 2015). These are suggestions that support a transition from car dependence towards multimodality rather than altermodality. However, actual strategies applied and resources required to substitute for high speed mobility among households without the private car as a mobility resource remain to be explored. Such a study is relevant both for informing ecological sustainability as it implies low-carbon mobility, *and* to deal with social exclusion for those who do not own a car. As car owning stimulates actual car use, and living in high density neighborhoods is associated with both lower car ownership *and* less car use (Van Acker & Witlox, 2010), carless residents in urban settings can be assumed to apply low carbon mobility practices to a larger extent.

3. Theoretical framework

3.1 Introduction: The time-geographic approach

Considering prevailing sustainability challenges and the need to change mobility patterns as well as the way cities are structured, there is a need to investigate how everyday life can be organized in accordance with this. For this purpose, a theoretical motive for the thesis is to problematize the idea of high speed mobility as the dominant way of increasing access to opportunities. Instead, strategies that enable individuals to acquire the opportunities available within their geographical reach will be explored.

Time-geography seeks to connect the notions of time and space for a systemic understanding of the relations between humans and the material world with its technological and environmental systems. To Hägerstrand, the originator of time-geography, it is a framework for empirical exploration as well as a theoretic model (Hägerstrand, 1991). He stated that in studying movement involving people, it is impossible to separate movement in space from the flow of time (Hägerstrand, 1991). Hence time geography has methodologically been used to study the use of time and space by individuals. One of Hägerstrands most prominent statements is that in studying flows of movement in for instance transport, it is necessary to consider people (Hägerstrand, 1970). Yet, a critique of traditional time-geography has been that it fails to account for contextuality in that the individual is treated as a “non-sexed body, structuring itself in non-defined (public) spaces and juggling with technology” (Scholten Friberg & Sandén, 2010:587, parenthesis in original). However, Scholten et al. (2010) argue that time-geography is useful for this very purpose, to bring the aspects of everyday life together in time and space to allow contextualized analysis. It can help identifying the constraints that enclose opportunities, the dominance of certain projects over others and aspects of power that imbue the struggle for access to space and time (Scholten et al. 2010:587).

The time-geographical approach to accessibility is used in this study to view everyday life as a context of interwoven activities that serve to fulfill a multitude of projects. The approach is highly suitable for the purpose as it helps identify constraints and resources that define the opportunities at the disposal of people to carry through what lies in their desires, needs and wishes. It also helps shifting perspectives from the independent individual to the family as a bundle of mutual relations where interdependencies, negotiations and expectations shape common activity patterns.

This chapter will introduce the time-geographic frame of thought and central notions such as activities, constraints, resources and the shaping of maneuver space. Building on this, the approach to accessibility as overcoming time-space constraints through a variation of strategies is introduced. A point of departure is that high speed mobility can be contested as a main strategy to increase accessibility, as such enabling voluntary carlessness.

3.2 The projects and activities of everyday life – linked by mobility

Everyday life as a constant flow of events may seem too ordinary and mundane to be of academic interest, but it is highly relevant as society is ultimately produced through the everyday aspirations of individuals and groups of individuals (Ellegård, 2001:43). It implies the organization of individuals in interdependence, whether they are part of the same family or merely need to share common public spaces. It should be noted that apart from daily routine activities, leisure activities is included in the notion of everyday life to allow for a holistic perspective on the lives of the families. It is also relevant as a major share of mobility in Sweden is associated with free-time activities for leisure, sports, hobbies, social relations and such (Vilhelmson, 2007).

The time-geographic notions of *projects* and *activities* are helpful for understanding the structuring of everyday life and the need for accessibility that it entails. In this frame of thought, the aspirations of people are viewed as a range of targeted projects. These projects can be defined at all levels of scope, ranging from the lifelong quests of professional careers or self-development to the project of raising a child, renovating a house or just buying groceries for a meal. These examples illustrate that some projects can be part of others, and that individual projects can be part of organizational ones where people cooperate to reach common targets (Ellegård, 2001:55). The endeavor to carry projects through is constituted by an amount of separate actions, these are the *activities* that structure everyday life (Ellegård and Nordell, 1997:34). Hence, studying everyday life in a time-geographical sense means studying the activities individuals engage in and their extent through time and space. Some activities may take place at the same location, hence demanding movement only in time, while many require movement between places. This actualizes the time geographical principle of the *indivisibility of the individual*, which implies that as the individual always needs to be somewhere in space at any point in time, she cannot be at more than one place (Ellegård & Nordell, 1997:29). Hence, although activities connect to each other, indivisibility implies that only one activity can be performed at a time. Nevertheless, the same activity can be part of several projects (Ellegård & Wihlborg, 2001). For instance, taking my bike to work can simultaneously be part of the project of realizing my professional career *and* that of exercising my body for fitness and wellbeing or identifying myself with a sustainable lifestyle.

3.3 The activity-based approach and degrees of fixity in activities

Building on time-geography and the fulfilment of projects is the activity-based approach to mobility and transport planning. It is relevant theoretically to understand mobility practices as well as in a planning perspective due to the needs of moving from a “predict and provide”-approach where infrastructure for motorized travel is provided in accordance with expected increases in car traffic, towards goal oriented planning for a more sustainable transport system that is purposeful and effective. Such a shift is necessary to curb the increasing demand for high speed mobility.

The core of the activity based approach is that human transport needs are induced by the everyday activities they engage in (Ellegård & Svedin, 2012). It implies the idea that people’s

movement is not conducted aimlessly for the sake of moving, but is part of the realization of activities (Neutens et al., 2010). Ellegård and Svedin describes this clearly: “Movements between places (...) are seen as links, binding activities together into a sequence that has meaning for the individual” (2012:24). It should also be noted that while activity patterns shape mobility, this causal relationship is mutually influencing as individuals organize their lives with respect to mobility resources (Gil Solá, 2013). For instance, high speed travel enables spatially extensive activity patterns (Vilhelmson, 1997), a driver for urban sprawl and further demands for high speed mobility to move between activities.

The circumstances under which activities are to be performed has significant meaning for the possibility of organizing them without high speed mobility. One such circumstance is the degree of fixity that can be defined as the extent to which an activity must happen at a given time or place (Vilhelmson, 1997). A doctor or a nurse for instance must appear for work the time her shift starts and on the section of the hospital where she is scheduled, there is no flexibility. Such a required activity to be performed in a specific place fits into field 1 in the table below (table 1). If she needs to go shopping for groceries on her way home on the other hand, there is nothing that determines what store she should visit, even though aspects of convenience might affect her choice. This activity is required or necessary, but the place is optional to a degree (field 2, table 1). When she wants to go jogging there is a high degree of flexibility in both time and space (field 4, table 1).

Table 1: Classification of activities according to time and place requirements, where (1) is completely fixed and (4) is completely flexible.

	Fixed	Flexible
Fixed	Activity required; specific place (1)	Activity required; optional place (2)
Flexible	Activity optional; specific place (3)	Activity optional; optional place (4)

Source: Vilhelmson, 1999.

The prefix *degree* of fixity is important as it denotes the floating scale between flexibility and fixity in activities, depending not only on the nature of the activity but the context of activity participation. To the type and characteristics of an activity, this adds personal, household and geographical background of the individuals engaged as determinants for degree of fixity (Schwanen, Kwan & Ren, 2008). An essential contextual aspect for the degree of fixity in activities is the composition of a household, as families with children perceive a larger degree of fixity in activities than single households (Schwanen, Kwan & Ren, 2008; Vilhelmson, 2007). Analysis made by Vilhelmson (2007) indicate that car use increases with the flexibility

of activities, and that flexibility is larger with activities that takes place on weekends than during the routine activities of daily life that tend to be more fixed.

3.4 Time-space constraints and resources as limits to maneuver space

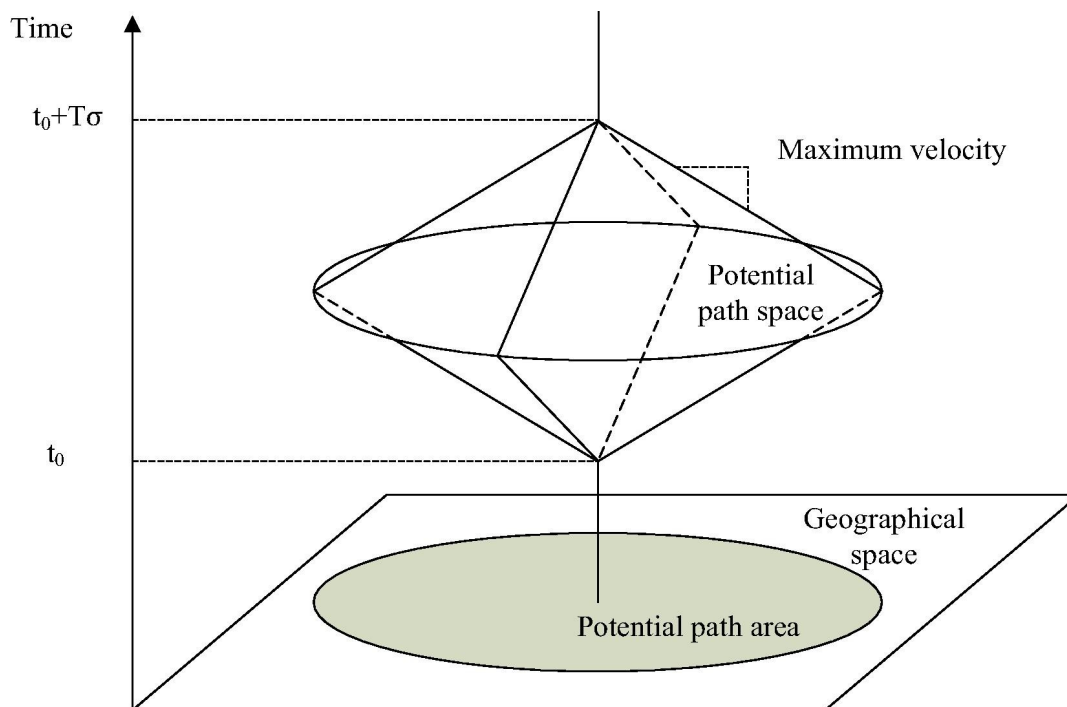
Possibilities of reaching project targets are framed by tempo-spatial constraints hence subjected to individual conditions and the resources at hand to perform activities.

Time geography departs from the idea that space and time are resources for human movement, and that various conditions imply constraints that restrict and form the opportunities for engaging in activities (Neutens et al., 2010). Another time-geographic notion that is central to the emergence of constraints is the *principle of return* (Scholten et al., 2010). This principle implies that each individual has some form of home base that she must return to, and that this limits the possible radius for movement given the other constraints. This makes what Hägerstrand calls an island, where daily life must exist spatially, and the means of transportation at the disposal of the individual determine the size of this island (Hägerstrand, 1970).

Hägerstrand (1970) identified three main types of constraints that define the action space of an individual. These are capability constraints, coupling constraints and authority constraints. *Capability constraints* are determined by the biological construction of the individual or the tools at her disposal. They relate to the need for sleeping and eating but also to the ability to move and communicate. Hence, apart from the human body, these constraints are largely determined by the capacity of the tools the individual possess (Åquist, 2002). *Coupling constraints* are defined by “the range of the voice and the eye as combined instruments of communication” (Hägerstrand, 1970:12). These instruments of communication are ways of coordinating the interplay with other individuals, tools and materials for the pursuing of projects. As such, it refers to the need for coordination of social and material relations (Berg & Karresand, 2015). The development of Information and Communications Technology (ICT) has changed the context of coupling constraints, as was acknowledged by Hägerstrand (1970). ICT seems to weaken constraints in some respects, but they are by no means eradicated and the interplay is complex (as is further developed in 3.6.3). *Authority constraints*, also termed steering constraints, basically consist of external aspects that individuals must adjust to, such as laws, institutions and opening hours. But importantly, authority constraints are also shaped by power relations that steer access to space. In this view, space is ordered in a hierarchy of domains that are controlled by individuals and organizations (Åquist, 2002). Consequently, those in power of superior domains can use the hierarchy to restrict opportunities in subordinate domains (Hägerstrand, 1970). More recent developments of time-geography also acknowledge institutional and societal context as productive of authority constraints, “including the laws, rules, norms and other regulations which imply that specific areas are only accessible at specific times for specific people to conduct specific activities” (Neutens et al., 2010:27). The very tangible fact that contemporary cities are physically structured after the car as a tool for mobility and overcoming of time-space constraints is an example of how dominant domains claim space at the cost of superior ones.

From the island, shaped by the principle of return, Hägerstrand (1970) describes a prism of opportunities extended in time and space as far as individual constraints allow. Within this prism the path of the individual is largely ruled by coupling constraints that binds the individual to join with other individuals, tools or material (Hägerstrand, 1970). In the time-geographic tradition of visualizing time-budgets as prism figures, action space is illustrated as the possible spatial reach given certain mobility resources, often represented by the maximum speed (velocity) allowed by the mobility resources. Such an illustration is exemplified in figure 1 (Miller, 2005).

Figure 1: Space-time prism where geographical reach is shown as a function of travel speed or maximum velocity through the mobility resources at hand.



Source: Miller, 2005

Efforts are made to develop time-geography and the related concepts to incorporate the gendering of time-space constraints (Scholten, Friberg & Sandén, 2010; Gil Solá, 2013). Doing this is essentially about contextualizing humans struggling over time and space and a key is to acknowledge and visualize powered relations active in the shaping of constraints (Scholten et al., 2010). For instance, gender roles that ascribe certain activities to certain individuals can be categorized as an authority constraint (Schwanen & Kwan, 2008). Considering the activity based approach, Scholten et al. (2010) means that “what is interesting from a gender perspective is access to the necessary resources to carry projects through. This is why the concept of restrictions is central” (p. 589). In addition, carrying projects through

requires the cooperation of these resources with knowledge, skills and control (Scholten et al., 2010).

In this thesis (as was clarified in the introducing chapter), the term maneuver space is used to account for opportunities enclosed by norms, values and expectations as well as geographic reach. What activities people engage in is contingent on a variety of contextual conditions. These are determined by aspects such as gender, age and class, but also by household composition and stage in life (Jones in Vilhelmson, 1997:17). This affects which activities we have the possibility of engaging in, but the context also decides obligations as to what activities we are expected or even forced to partake in (Vilhelmson, 1997:17). According to the activity based approach, constraints and resources related to mobility shape the individual's ability to take part in activities hence fulfilling projects (Gil Solá, 2013). As such they define the borders of our maneuver space, where activity patterns hence projects can be realized. The borders can be material but they can also be moral, defined by values (Vilhelmson, 1997), or powered and defined by norms and expectations.

3.5 Accessibility from a time-geographic perspective

Accessibility is an everyday word and a multilayered concept, and it has different meanings depending on the context in which it is used and what the purpose is. Therefore, it is necessary to unravel the meaning of the notion as it is used in this thesis. A usual and basic definition of accessibility is that it is about the ability to reach, and it often implies a component of distance or impedance (Haugen, 2012), of which the latter may alternately be explained as resistance or friction. The ability to reach is conditioned by constraints that can be derived to urban structure and the transport system at hand. This is what determines place-based accessibility which departs from a place and measures the alternative possibilities of reaching other places. In this line of thinking, Naess (2008:175) speaks of “friction of distance” as a “function of time, economic expenses and inconveniences involved” in travelling between places. Traditionally, conceptions on accessibility in transport research is often based on overcoming this distance through mobility and increasingly high speed mobility (Gil Solá, Vilhelmson & Andersson, submitted). Of greater relevance and interest for this study however, is the notion of person-based accessibility which relates to the ability of *individuals* to reach places (Haugen, 2012), place-based accessibility considered. In addition to the accessibility from specific locations of individual importance, for instance the home or the workplace (Neutens et al., 2010; Gil Solá, 2013), person-based accessibility refers to individual conditions, such as the need to coordinate activities with others, responsibilities, physical abilities, time availability, social norms and cultural aspects (Haugen 2012). All which can be related to the time geographic space-time constraints. Consequently, the person-based notion of accessibility is intertwined with elements of individual constraints and access to resources in the material sense as well as considering knowledge, skills and social relations (Haugen, 2012; Colleoni, 2011). Furthermore, given the overarching aim of the thesis to inform sustainability in urban planning, the notion of *sustainable accessibility* as emphasizing proximity rather than speed (Gil Solá, Vilhelmson & Andersson, submitted) guides the interpretation of accessibility strategies.

3.6 Accessibility strategies and resources: Contesting speed

3.6.1 Introduction

Accessibility strategies is understood in this thesis through a time-geographic perspective as the ways individuals overcome or adjust to time-space constraints in the organization of everyday life. In other words, they are strategies for adapting to constraints in order to maintain maneuver space and enable the organization of everyday life. This definition departs from the assertion that mobility is only one strategy to achieve accessibility and that it can be substituted with other accessibility strategies. The term *strategy* here refers to coordinate sets of decisions and practices that individuals engage in. The individual is seen in the context of the family, as a member of the household. It should be clarified here, as Jarvis does in her work on household strategies in the coordination of home and work, that strategies do not imply “strategic and goal-oriented action” (Jarvis, 1999:228), but is rather something emerging dynamically from everyday negotiations and decisions in the household. Jones et al. (in Vilhelmson, 1997:22-23) suggest a set of possible consequences for how activity patterns may change due to reduced mobility.

- Changed durability and/or frequency of activities.
- Activity and trip coordination (performing activities in conjunction with each other).
- Redistribution of trips and tasks between the members of the household.
- Changed localization of activities.
- Change of travel modes.
- Change of communication channels.
- Ceased participation in certain activities and possible participation in new activities.

Intrinsically these strategies entail changed mobility practices and adjusted ways of organizing everyday activities. They are described as strategies for coping with imposed constraints such as extensive policy changes to reduce mobility. However, they may as well be viewed as intentional strategies to enable voluntary carlessness. A further assumption underlying the study is that strategies require different forms of resources. As definers of maneuver space, the notion of resources and constraints are deeply intertwined as access to resources determine constraints. Hence, accessibility strategies as strategies that can be applied to overcome time-space constraints, and the resources needed to apply the strategies, will further be discussed.

3.6.2 Accessibility by speed: Mobility as dominant strategy

Departing from the activity-based approach should not be understood as reducing mobility to an instrument for activity performance. Rather, mobility is considered a meaningful part of a larger whole; the quest of fulfilling projects. In fact, mobility might as well be an activity itself as illustrated by the examples above, performed for instance to fulfill the project of exercise. This makes the context of everyday life highly relevant to study in order to understand mobility practices as accessibility strategies. Simply stated, mobility can be

defined as “the movement of people from one place to another in the course of everyday life” (Hanson, 2010:7). A further development of the term distinguishes mobility from movement by considering mobility as socially produced motion or the act of movement imbued with meaning and power (Cresswell, 2006). Acknowledging meaning and power in relation to mobility in this way is necessary to understand the driving forces of the highly mobile society and its implications. Mobility can be seen as socially productive of time and space (Cresswell, 2006) in the sense that the modes and speeds of travel and the reasons for movement is active in shaping the conditions for mobility, for instance the physical structure of cities. It is part of a structuring process where the social and the technological are both cause and effect of each other (Schwanen & Kwan, 2008).

Automobility most often refers to car based mobility but essentially comes from the combination of the words autonomy and mobility – autonomous mobility (Featherstone, 2004). Though it originates from a term for the autonomous vehicle, the automobile untied from horses or rails and with its own engine, it also defines the individuality of car based mobility, being able to go where ever and whenever one wants (Featherstone, 2004). The freedom of such autonomous mobility echoes into time-geographic conceptualizations where the prism or geographic action space of the public transport passenger is smaller than the individual traveler (Ellegård & Svedin, 2012). The passenger need to adjust to time tables and spatial extent of buses, trams and trains, whilst the car-borne traveler need not.

Mobility practices vary largely between individuals, depending in part on needs and choices but to a great deal on the resources at our disposal due to assets, personal functionality and the opportunities given by system and means of transportation. In time-geography, speed is traditionally regarded as a means of expanding a person’s “time-space budget” and thereby a way of increasing the amount of opportunities within reach (Neutens et al., 2010), the individual action space. In this thesis, the act of movement or physical mobility is considered an aspect of individual accessibility, or rather a strategy to achieve accessibility and one that requires certain resources and entails power in the prevailing paradigm. Haugen (2012) distinguishes between accessibility by mobility and accessibility by proximity, and notes that the possibility to achieve accessibility through mobility is dependent on the absence of spatial and temporal limitations and access to mobility resources. In this view, if mobility by the individual is limited, she is subordinate to accessibility by proximity which means nearness in space. It should be noted however, and has been so (Hanson, 2010), that mobility can but must not be empowering - it might as well be enforced - and that immobility may as well mean empowerment as disempowerment. Following this remark, I will include further accessibility strategies that are applied by individuals as alternatives to mobility. Two such strategies that are suggested by scholars are virtual accessibility through ICT and drawing on support from social relations (Schwanen, Kwan, & Ren, 2008; Neutens et al., 2010).

3.6.3 Accessibility by proximity: Reducing the need to be mobile

Sustainable accessibility can be defined as the ability to reach through other strategies than high speed, long distance car transportation, and from a planning perspective it emphasizes geographical proximity over speed (Gil Solá, Vilhelmson & Larsson, submitted). As such,

sustainable accessibility strategies can be said to imply choosing activities by proximity rather than relying on high speed mobility. However, further strategies can be applied to reduce the need to be mobile. These strategies rely on certain resources and function through allowing coordination of activities and outsourcing of mobility to others. Two kinds of resources that enable such strategies are investigated in this study: Virtual accessibility through ICT and drawing on support from social relations.

Hägerstrand (1970) acknowledged the possibility that coupling constraints might change due to technical development, which we can see in today's Internet and Communications Technique (ICT). ICT seems to weaken constraints in some respects, but they are by no means eradicated and the interplay is complex. The extreme growth of the use of ICT has implications for accessibility and how it is considered. As ICT is agreed to have the potential of relaxing time-space constraints and as such enhancing accessibility, the causations are complex and somewhat contradictory, and the extent of the relaxation is disputed (Schwanen & Kwan, 2008). ICT disconnects some activities from spatial locations or temporal restrictions such as opening hours, reducing constraints for some activities (Neutens et al., 2010). As such, it has been said to enhance the accessibility for people to opportunities by reducing physical distance "to nothing" (Muhammad, 2006:69). Meanwhile, the use of ICT also has the effect of creating large social networks which tend to entail longer trips to maintain relations (Neutens et al., 2010).

The conceptualization of accessibility as achieved by either proximity or mobility (Haugen, 2012) indicates the idea of accessibility as structured by physical distance (Muhammad, 2006). The development of ICT can be said to have created a further space for accessing opportunities, namely virtual space, which is used in a massive scale for the purposes of work, consumption, education and social networking to name a few (Muhammad, 2006). It is natural to assume that these possibilities would reduce the need for mobility. However, it seems that people use the time saved through ICT for other purposes requiring movement (Muhammad, 2006) and that given the opportunity, people tend to choose more distant alternatives even as proximity is increasing to services, amenities and recreational opportunities (Haugen, 2012).

Social networks may condition accessibility in several ways, and they make up constraints as well as accessibility resources for the individual. As stated by Church, Frost, and Sullivan (2000), interaction between household members, friends and relatives determines individual accessibility in conjunction with other aspects. Social relations are suggested in the literature as a means to relax time-space constraints (Schwanen et al., 2008; Neutens et al., 2010; Berg & Karresand, 2015). Neutens et al. (2010) identify social relations as an aspect of accessibility that needs further exploration. On the one hand they mean that, as processes of negotiation and compromises are required in order to achieve timing and synchronization with groups of people, social networks may as well impose time-space constraints on the individual. On the other hand, they also point to that the members of an individual's social network might reduce constraints for the individual through taking over tasks such as taking care of children or driving them to activities. Naturally this also means dependency on time-

use patterns and residency locations of social network members (Neutens et al., 2010). While social relations are something that many value as important to have geographically close, Haugen's study indicate a "proximity deficit" in Sweden in relation to this resource as many live further from their relatives than they would wish (Haugen, 2012:76). Haugen's analysis is that this can make it difficult for people to get support from their social relations in everyday life.

4. Method and data

4.1 Scientific approach

The study aims to investigate everyday accessibility strategies and mobility practices among families without private cars. Given the ambition to explore these practices with a certain group relative to their specific conditions, great care is taken to contextualize the findings as to handle the interplay between urban structure and everyday life. Hence, a qualitative approach is applied, as it enables answers to questions of how and why, rather than describing extensive patterns and the broader effects of these (Røe, 2000).

Røe (2000) calls for a development of qualitative approaches to transport geography and intra-urban travel specifically. His arguments are that as quantitative approaches are necessary to understand effects on an aggregate level, they must be supplemented with interpretative and qualitative research that seeks explanations and reveals the meaning and motives of everyday mobility. The context where everyday practices take place can only be understood if regarded and interpreted as they are. This also requires the acknowledgement that urban contexts have different meanings for different individuals or groups of individuals. Røe specifically emphasizes the aspects of travel constraints for specific groups of people as important subjects for qualitative investigation, and suggests individuals or households as units, rather than places or zones (Røe, 2000). To understand the perception of constraints and maneuver space among the carless families, this study builds on abductive reasoning that sees the context through the worldview of the respondents (Bryman, 2016:394). The time-geographic framework is used to map how individuals and groups of individuals organize everyday life. The approach helps linking the uniqueness of the individual to the general, identifying features that are common for the daily lives of several people (Ellegård & Nordell, 1997:15). In fact, the individual and her context is central in time-geography, building on the idea that all aggregate societal structures have a bearing on individual decisions and actions (Ellegård & Nordell, 1997:28-29).

4.2 Procedure and analysis

The study is empirically based on eight semi-structured, in-depth interviews with parents residing in Gothenburg, all made during the period of one month. The interviews were guided by a standardized set of questions (appendix 2) that allowed for the conversation to evolve around the reflections of each respondent. The questions were thematically structured in topics to cover the purpose of the study; mobility practices, social relations, proximity preferences and more general questions about not owning a car. The interviews were all recorded, allowing for my full attention during the interview. In order not to lose sight of context, notes were taken after the interviews that summarized specific characteristics of the respondents context that might have influenced the answers. Furthermore, notes were taken on how the interview went and if power relations were sensed to manifest themselves in the interview situation.

In the process of continuously transcribing the interviews, reflections upon patterns were made, beginning the analysis at an early stage. In the next step, NVivo software was used to code the transcriptions into thematic categories guided by the research questions to reveal patterns of everyday organization and recurring reflections and strategies. Initially the coding was focused on the themes mobility practices, other accessibility strategies and constraints, but as the analysis proceeded, additional themes and sub-categories emerged from the material (see table 2).

Table 2: Coding themes, sub-categories and example quotes. The quotes presented here illustrate the intermingling of themes.

Main themes	Sub-categories	Example quotes
Mobility practices (initial category)	Car-clubs, renting, car pooling Bicycle Public transport Walking	Karin: “[...] so we joined the car club so that I could practice driving.” Anders: ”In comparison with public transports, you’re more flexible [on the bicycle], and the exercise is a bonus of course.”
Accessibility strategies (initial category)	Proximity ICT/virtual accessibility Home delivery Social relations Flexibility (time and space) Planning and coordination	Petra: “Well, I would say that we value [nearness] very high. To avoid needing a car but also because it feels free.” Henrik: “We buy almost everything on the internet nowadays when it comes to food.”
Time-space constraints (initial category)	Capacity Coupling Authority	Eeva: “It is almost impossible to have a summer house or even rent a summer house if you don’t have a car.” Viktor: “You don’t need to get many meters away from home to be forced to cycle in the street, and you worry as a parent when your children do that, naturally.”
Emotions, norms, values	-	Eeva: “I also feel like we just have to get out of this car dependency as a society. It needs to be possible.” Amanda: “I really don’t like that car-dependency, I really like to be able to get around by myself.”
Children	-	Henrik: ”We used to take long walks in the city like that, with one in the stroller and one on a balance bike or so.” Amanda: “My kids don’t like to go by car.”

As themes and sub-categories emerged in the material, it became evident that they relate strongly to each other, representing different aspects of the same themes. These

interrelationships contributed to the analysis and helped defining the notion of maneuver space as used in the thesis. The process of analyzing the material was indeed a process of interpretation as Crang (2003) highlights, beginning during the phase of gathering data and proceeding into the final stages of thesis writing. Coding the material meant cutting respondents' narratives into themes to make them comparable, which meant in a way de-contextualizing fragments for the purpose of making sense of them (Crang, 2003). To maintain contextual awareness, relevant characteristics and circumstances of each respondent are presented below in the sampling section as well as in the presentation of the material.

4.3 Sampling

The central selection criteria for the study are adults in cohabiting families with young children and without car ownership, residing in the central parts of Gothenburg. The reasons for choosing families with young children as study objects are several. From the time geographic perspective, they are interesting as they make up bundles of individuals whose activities are clearly intertwined (Ellegård & Wihlborg, 2001:18). The individuals in a family are interdependent while also depending on other agents (Ellegård & Wihlborg, 2001:18), be it friends and relatives or institutions such as schools, preschools and workplaces, for the fulfillment of their projects. Considering these dependencies, it can be assumed that parents of small children generally are subject to a larger degree of constraints than adult individuals without children.

The task of finding respondents for the study was a rather challenging one given the short time-frame of a master's thesis. The specific requirements for the sampling – families with young children and without private cars – implies a rather dispersed population. Therefore, it should be acknowledged that the sampling method and the final sample has affected the research process and what questions the study is able to answer. Aiming to reveal constraints as effect of urban form and achieve a variety of voluntarily and involuntarily carless respondents, efforts were initially made to reach respondents from the same area of residency. For this purpose, a semi-central neighborhood with rented apartments of varying sizes was identified. 220 selection questionnaires were distributed among those apartments that was known to be large and therefore likely to be family residencies. However, no answers were received which was probably due to a limited or non-existent representation of the population in the area. The sampling method that was subsequently applied was more convenient in character however yet purposeful. A request was made to a Facebook group for cyclists in Gothenburg, consisting of about 3000 members. 17 persons replied with their interest to the request, from these the sample was made continuously to achieve as wide geographical variety as possible. One respondent was contacted through a carpooling organization and further one was reached through personal contacts. Criteria for the sample was that the respondents should have a minimum of two children below their teens and not own a car. In the end of the interview period, insights into the possible temporariness of carlessness motivated a last interview with a parent of somewhat older children. Another respondent was chosen because the family recently sold their car hence could contribute with aspects of the

decision-making process towards carlessness. Efforts were also made to achieve an even gender distribution.

Convenience sampling through choosing respondents that are easy to access can be problematic if the respondents cannot comment on relevant issues (Baxter & Eyles, 1997). However, the sampling method finally applied is considered purposeful as it has resulted in a group of respondents able to contribute with information relevant for the study (Baxter & Eyles, 1997). As such the empirical data gathered allow for important insights into practices, strategies and constraints in everyday life of voluntarily carless families.

4.4 Presentation of respondents

The respondents of the study, four women and four men in the age range 30 to 45 years, all have children and live in nuclear families with their partners in semi-central parts of Gothenburg. They all claim to voluntarily have chosen not to own a car. This section presents the respondents and their context as for family composition, residency and school/preschool setting. All names are changed for anonymity.

1. Eeva

Lives with her husband and two children, 6 and 8 years of age. The family moved to Sweden from another European country, one and a half years ago at the time of the interview, because Eeva was employed within the academy. Eeva's husband works as a consultant and goes there for about a week each month. They rent a townhouse close to the private school where their children would go. Recently the school was forced to close down and the oldest daughter now attends a public school close to home. Eeva is the only one in the household with a driver's license. She mainly uses public transport but plan to start biking when the weather is better. Her husband works at home and mainly bikes.

2. Viktor

Lives with his wife and three children, 8, 10 and 12 years of age, in a condominium. Viktor works in IT, he and his wife both work in central parts of the city. All three children go to the same school close to home. Neither Viktor nor his wife has a driver's license, and Viktor describes them as "a biking family", they all cycle year round. Viktor has started taking driving lessons so that they will have a driver's license in the family, even though they don't want to own a car. Both Viktor and his wife have their relatives in the region, and some in Gothenburg.

3. Amanda

Amanda lives with her husband and two children, 2 and 5 years of age, in a condominium. At the time of the interview the family recently sold the car that they had for a few years, and as such Amanda differs from the other respondents. Her reflections consider how they have done during the past weeks but also how she reasons that they may solve different activities henceforth. Amanda cycles to work year-round, while her husband alternates between public transport and cycling, and they both have a relatively short distance to work. They are both

engineers and Amanda works with traffic planning. Amanda is originally from a town 150 kilometers from Gothenburg and her parents live in the home town. Her sister recently moved from Gothenburg but her two brothers live there. Amanda's husband moved to Sweden from another European country in adulthood and his relatives all live in that country.

4. Anders

Lives with his wife and two children, 4 and 6 years of age, in a condominium. Anders works with traffic planning and his wife as a coordinator within a public organization. Anders bikes to work year-round while his wife alternates between cycling and public transport. The children attend preschool and school close to home. Anders parents live in a small town in the region, his wife is originally from a city in another region and has her relatives there.

5. Karin

Karin lives with her husband and their two children, 9 and 15 years of age, in a rented apartment. Karin works as a personal assistant at two different work places and her husband is a researcher at a large company located in an adjacent municipality. The children go to different schools, the youngest close to home and the oldest further away. Both Karin and her husband alternate between cycling and public transport, but Karin uses the bicycle the most and sometimes walks to work. She has scheduled, irregular working hours. Karin's relatives live in Gothenburg while her husband is from a town in another region.

6. Henrik

Henrik lives with his wife and three children, 2, 4 and 6 years of age, in a condominium. They recently moved back to Gothenburg after a few years in a neighboring country. Henrik is a researcher within the academy and his wife works in a company located close to where they live. All their children go to the same preschool right next to where they live. Henrik cycles to work year-round while his wife usually walks. Both Henrik and his wife are from Gothenburg and all their relatives live in the city or in adjacent municipalities.

7. Folke

Folke lives with his wife and their two children, 2 and 5 years of age, in a condominium where they recently moved from a rented apartment in the same area. Folke works as an IT-consultant and his wife works at a municipal unit in another part of the city. The children attend preschool close to home. They both cycle to work year-round. Folke grew up in Gothenburg and his mother lives nearby, his wife is originally from a city in another region and her mother lives there. None of them have any siblings.

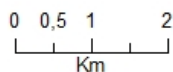
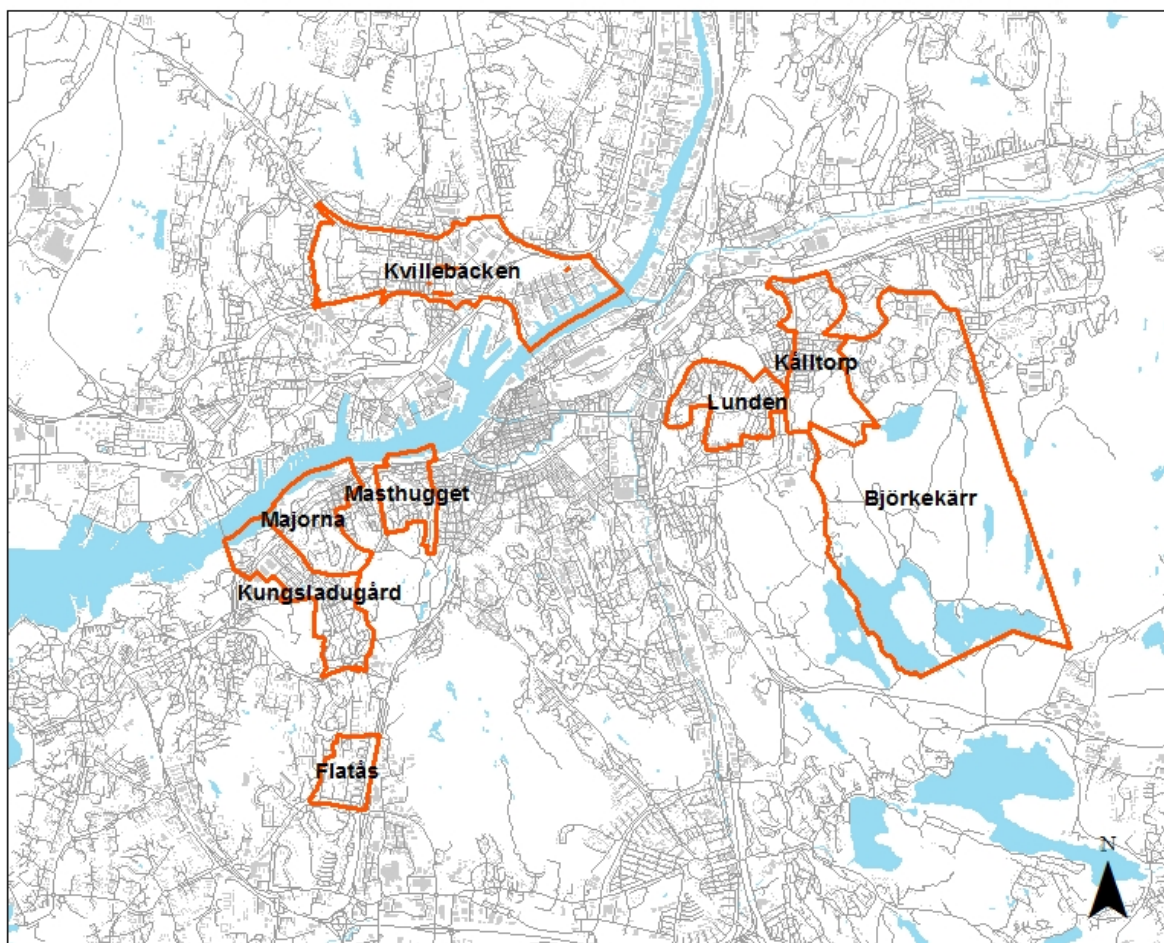
8. Petra

Lives with her husband and two children, 5 and 8 years of age, in a condominium. Petra and her husband both cycle to work year-round. Petra is a consultant in traffic management and her husband works in a centrally located IT-company. The children go to school and preschool close to home. Both adults are originally from the region where their relatives still live.

4.5 Geographical context

The respondents of the study all live in semi-central parts of Gothenburg with direct access to public transport and infrastructure for non-motorized modes. To guarantee anonymity for the respondents, specific locations for their residences and work places are not presented. To give the reader a sense of the geographical context and extension of distances, the home districts of the respondents are shown in the map of Gothenburg below (figure 2).

Figure 2: Map of Gothenburg with the home districts of the respondents marked. The city center is located between the districts, along the river.



Geodata: © Lantmäteriet

4.6 Limitations of the data

As described above, the respondents are all voluntarily carless which implies that the study does not allow for a comparison between the strategies and constraints of voluntarily and involuntarily carless families. Neither does it allow for conclusions on the consequences of

urban form of a specific neighborhood, even though the respondents all live in semi-central parts of the city with similar density levels. The study focuses instead on voluntary carlessness, which never the less allows for an investigation in the role of urban form, but beyond a specific place and departing from the perceptions of the respondents. The study is adapted to these delimitations through the focus of voluntary carlessness and person based accessibility.

Letting the respondents fill in a time diary for a few days would give a more detailed picture of actual constraints and strategies during the course of the day. If several family members would have done this it would also have allowed for a holistic view of interdependencies and roles within the family. For feasibility of the study within the time-frame however, this was not performed. The chosen method is deemed appropriate for the purpose of revealing the context of carlessness and the strategies applied by the families.

Supported by recent statistics on travel behavior in Sweden and the lower carbon intensity of women's travel (Kronsell, Smidfelt and Winslott Hiselius, 2015), such mobility practices can be labeled as feminine. However, rather than investigating women's mobility behavior as such, this study focuses on accessibility strategies that go beyond high speed mobility and private automobility.

5. Results

5.1 Chapter introduction

This chapter presents the empirical material resulting from the interview study, analyzed using the theoretical framework introduced in chapter 3. Section 5.2 frames the contextual conditions of the respondents through describing the motives of carlessness, as well as the variations in actual carlessness that can be discerned between the families beyond car owning itself as a variable.

The stories the respondents tell shows that different types of activities during the routine of daily life and beyond, implies different conditions considering application of strategies as well as perceived restrictions. An important factor for that variation is the degree of tempo-spatial fixity as defined by Vilhelmson (1999). Therefore, this chapter is structured as far as possible with regards to fixed and flexible activities, although naturally few activities are neither completely fixed nor completely flexible. Daily activities related to work, school, preschool and routine leisure activities count as fixed activities (5.3). Activities related to the material flows of the household, shopping or discarding objects, and more spontaneous or irregular leisure activities are termed flexible activities (5.4). In fact, there are no fixed boundaries between activities; they are coordinated and sometimes part of the same projects, which is why they overlap in the analysis. The structural separation of fixed and flexible activities however helps the understanding of what define constraints and enable accessibility strategies and consequently how the families' maneuver space is defined.

The interview material also reveals perspectives on larger projects in life, in the meaning values and goals that activities are aimed to realize. These narratives, presented in section 5.5, are important since they contribute with context and illustrate prerequisites and motives of the respondents as well as the meaning of constraints in a larger perspective. As such they help defining consequences of maneuver space rather than mere geographical extension of daily activity patterns (Vilhelmson, 1997). This section deals with longer time perspectives on accessibility strategies and how they might change with life stage transitions. It also deals with emotions and ways of relating to automobility and a car-based society.

Table 3: Distances from the home to workplaces, schools and preschools, including modes of transport to work for the respondents and their partners.

	Approximate distances between the residency and locations for fixed daily activities (respondent and partner)	Transport modes used for the work trip (respondent and partner)
<i>Karin</i>	Workplace: 1 km and 9 km	Cycling, walking, public transport
	Partner's workplace: 11,5 km	Public transport
	School: 1 and 2 km respectively in two directions	
<i>Anders</i>	Workplace: 6,5 km	Cycling
	Partner's workplace: 4 km	Cycling and public transport
	School and preschool: 500 m in two directions	
<i>Petra</i>	Workplace: 4 km	Cycling
	Partner's workplace: 3 km	Cycling
	School and preschool: 500 m	
<i>Folke</i>	Workplace: 7 km	Cycling
	Partner's workplace: 11,5 km	Cycling
	School and preschool: 500 m	
<i>Henrik</i>	Workplace: 4 km	Cycling
	Partner's workplace: 1 km	Walking
	Preschool: 100 m	
<i>Viktor</i>	Workplace: 10 km	Cycling
	Partner's workplace: 6,5 km	Cycling
	School: 500 m	
<i>Amanda</i>	Workplace: 6,5 km	Cycling
	Partner's workplace: 4 km	Cycling and public transport
	Preschool: Unknown	
<i>Eeva</i>	Workplace: 8 km	Public transport
	Partner's workplace: Works from home, occasionally abroad	-
	School and preschool: 500 m and 1 km respectively in two directions	

5.2 The context of being carless

5.2.1 Introduction

This section serves to give a wider contextual presentation of the families' carlessness. Three such aspects emerge from the material that are relevant as they appear to affect the strategies families apply and consequences from carlessness for their maneuver space. The first is the main causes for their carlessness, the second is degrees of access to cars beyond ownership and the third is emotions that arise in relation to norms that enclose the car based society.

5.2.2 Causes of carlessness

The respondents all express that they have actively chosen not to own a car or that the need to have one has not arisen in their life, largely due to active choices making carless life manageable. They all have in common that the motivation is not economic in the sense that they could not afford a car if they would need one, which is why they are defined as voluntarily carless. In some cases however, it is a matter of priority, as for instance through choosing to work part time over working full time to afford a car. Due to the interplay of several driving causes it is difficult, even for the respondents themselves, to identify one actual reason for not having a car. Naturally this is because several driving causes interplay. Among those who express that the need for a car has not arisen, long term habits underlie carlessness. Neither Viktor nor his wife has a drivers' license. Henrik and Karin got their driver's licenses recently, but without planning to buy cars. Eeva's husband does not have a driver's license, and his parents does not have a car either. Apart from Amanda, whose family recently sold their car, none of the respondents claim to have owned a car more than temporary earlier in life.

Mainly, two lines of reasoning recur among the respondents considering why they are carless. One is that car owning appears to them as burdensome and something they prioritize to avoid as a part of their lives. The respondents think it seems difficult and expensive and implies a large burden of responsibility.

Folke: For me it's not a sacrifice, I don't want a car. I don't want to. I don't want to wash it, I don't want to park it, I don't want to make sure no junkie smashes the window or steals the radio or whatever it might be. I just don't want to. I don't want to go to the vehicle inspection and deal with all those things.

Viktor: It's not me whining over the cars at my workplace, It's all the car owners. The cars break and there are traffic jams and it seems very hard.

Eeva: I feel it's quite nice not to have a car and not having to bother about the car because I think there are also a lot of things that you have to do when you have a car. You have to take care of it and you become dependent on it.

For Amanda's family, technical problems with the car was the main reason for them to get rid of it. She explains that their car has been a major source of conflicts between her and her

husband, since none of them has been wanting to deal with the car problems. She emphasizes, as well as several of the other respondents, that they save a lot of money not having a car, money which they can use for other things that reduces the need for a car. For instance, they can shop a little costlier on the Internet, take a taxi when they need to or rent a car during vacations. Henrik, who can borrow his parents' car to get to swimming school in another part of the city with his oldest child, still prefers public transport because he perceives it as more of a struggle to use the car:

Henrik: My parents thought we should borrow their car to go to swimming school at eight in the morning, but that's not easier. OK, so then I need to get to them, fetch the car, drive it home, the trip itself might be a little faster if there is a parking lot, and then I need to pay for the parking lot. Instead, we take the tram and sit there reading Bamse comics. How is that not the best solution by far?

The other line of reasoning that recurs around being carless has to do with values that the respondents express. Several of them reveal moral convictions around the choice to be carless. They depart from environmental and ethical values, and a general resistance to car society as well as the lifestyle it is associated with.

Eeva: I think it's just wrong that we are so car dependent as a society, that you cannot live your life without having a car. Because it's very harmful in many ways, environmentally but also, I don't like this lifestyle of always driving somewhere. It seems so horrible to me.

Folke: Well, in total I think it's an environmental and ethical issue. Because the more we drive, the more we build our world to work for cars but not for humans. And then, it's a struggle to do it in some other way. So that's why I think we need to change our way of life, we cannot drive around in cars everywhere.

Folke also point to the considerable amount of urban space that cars claim:

Folke: I think the average is that a car stands still for 95 percent of its lifetime. Just a large metal thing where there could be anything, trees, playgrounds, cultural expressions...

The fact that the car claims space in the physical urban structure, is something that several respondents reflect on. Henrik and Anders talks about the functionally mixed city as an ideal, where density enables less car dependence.

5.2.3 Variations in actual carlessness

Although the families do not own cars, they have access to cars to varying extent through renting, borrowing, partaking in commercial or cooperative car clubs or car-pooling with others. These alternatives are the most important when it comes to going on vacations or longer day trips, in relation to the children's leisure activities or to transport large objects.

Five of the families partake in car clubs, and of the others one earlier has but did not seek out a new car club after moving. Several respondents mention renting a car as more economically suitable for long trips because the fee for using car club cars is charged per hour. The benefit of using a car at these occasions is the opportunity to get around and visit places that are beyond the reach of public transport. Actual access to cars as mobility resources is presented in table 4.

Table 4: Car access and driving competence in the respondents' households.

Respondent	Car access	Driver's license in the family
<i>Eeva</i>	-	One
<i>Viktor</i>	Relatives with cars in the city	None
<i>Henrik</i>	Relatives with cars in the city	One (recently acquired)
<i>Folke</i>	Car club	Two (one uncomfortable with driving)
<i>Petra</i>	Car club	Two
<i>Amanda</i>	Car club	Two
<i>Anders</i>	Car club	Two
<i>Karin</i>	Car club and relatives with car in the city	Two (one recently acquired)

Only two of the families, Eeva's and Viktor's, neither rent or borrow cars nor partake in a car club, but only use a car when they get rides from others. Neither Viktor nor his wife has a drivers' license and when they visit the family summer house where public transport does not reach, they get picked up by relatives. At occasions when they have needed to visit a hospital acutely they have taken a taxi. In Eeva's family she is the only one with a drivers' license, but they solve most errands without a car. She mentions taxi to transport larger objects, or borrowing a car occasionally.

Most of the respondents who partake in car clubs think that it works well, but Folke and Petra who both are members of cooperative car clubs, express problematic aspects of this organizational form of car sharing. Folke thinks that the user base have outgrown the cooperative form and that car sharing should be administered by the municipality. Petra's family is about to switch to a commercial car club because they don't feel that the cooperative works well:

Petra: [...] we are in the [local] cooperative car club. Unfortunately, we think we might stop with that, and instead join [commercial car club]. It's a bit of a shame but I don't think it works very well to be in a cooperative.

EL: Is it too much work?

Petra: No, it's more that no one wants to do the work, including us. [...] more work is needed than people are prepared to do. It's messy and annoying and unstructured. And

I am not prepared at all to join the board and save it or change anything so then you can either accept it or walk away.

5.2.4 Emotions and the automobility norm

Experiences are described by the respondents that emerge from being outside a dominant norm materially manifest in the urban structure as well as in expectations on their mobility capacity. These experiences are partly of a positive nature, as when Viktor describes emotions of freedom and presence in relation to the cycling experience:

Viktor: If you go by car you'll be sitting on a road that may be bordered by high rails and noise protection walls and the speed is high and you must concentrate on traffic in another way. I feel I have almost esoteric experiences biking over the Göta älv bridge in the morning and it's either a beautiful summer's morning or ten minus degrees and brilliant, beautiful winter weather. That's really nice. I don't think many car drivers see that, if they don't stop in the middle of the bridge.

However, expressed emotions in relation to the automobility norm is often more negatively perceived. Viktor and Petra both speak of the children's situation in traffic as a source of stress and worry:

Viktor: You don't need to get many meters away from home to be forced to cycle in the street, and you worry as a parent when your children do that, naturally.

Petra: [...] just look at the traffic environment, it's insane that you need to tell the kids all the time not to walk into the street, so that people should be able to drive. So that grown up, fully functional people should be able to drive their cars five kilometers, I need to keep an extra eye on my kids. They can't be out walking by themselves because thirty-five-year-old men should be able to drive wherever they want in their cars. It's completely insane! It's insane that we consistently value healthy adults over the safety of children.

Petra's and Viktor's perceptions of the traffic environment are derived from the fact that they have to relate to car traffic in spite of not driving themselves. It can be related to Eeva's reflection that her family, being carless, need to live near public transports hence near traffic. Her reflection is an expression of constrained maneuver space considering choice of residency that indicate how proximity as priority may be a constraining adjustment as well as it is an active strategy:

Eeva: There is a big street close to us and we hear the noise and we have to choose to live there because we don't have a car. Why do I have to all the time see and hear other people driving in their cars. [...] This is often the case that the ones that have a car they can choose to live in quiet surroundings, and the ones that don't, they don't have so much choice, they have to live close to good public transport connections and then there is lots of traffic.

Folke and Henrik express strong emotions of discomfort associated with moving in car dominated environment as a pedestrian or cyclist:

Henrik: And once you get there [to external shopping centers] you feel... I mean they are awful places to be in weather you have a car or not, but walking by foot in a place like that is horrible, and I would never cycle there because it's really built for motorists. But if you are a motorist it's very smooth. I feel like the whole of Gothenburg is structurally biased to the advantage of motorists. [...] you get this feeling of humiliation in some areas and situations because you don't have a car.

Folke: I think, the feeling of finding oneself as a pedestrian in a car oriented environment, is bloody unpleasant. I feel like a lower class human being. I feel like I don't have the right to be there somehow. That goes for the industrial areas around here to, if you are to get to a construction store by public transport. It's very unpleasant, because you always need to get off six hundred meters from the place and then it's "vroom, vroom".

These statements suggest that norms as they are materialized and experienced can limit perceived maneuver space. Apart from the emotions these respondents experience in relation to the dominance of automobility, these statements exemplify frustrations with the larger urban structure and the localization of commercial services in distant locations.

5.3 Fixed everyday activities

5.3.1 Introduction

Fixed everyday activities are the routine activities that make up daily life and that to a large extent, often due to authority constraints, need to happen on specific times and in specific places (Vilhelmson, 1997). In this presentation, this means work, school and preschool for the family members, places they are expected to attend at certain times. In accordance with the time-geographic principle of return (Scholten et al., 2010) this also includes the home as a place where the members of the family return daily.

5.3.2 The bicycle enables flexibility and control over time

Dealing with the constraints that fixed activities give rise to, which is mainly authority constraints, creating flexibility is an important strategy that the respondents apply to increase their maneuver space. For that reason, several of them express an aversion towards using public transport travelling to and from work; because it takes time, is difficult and implies stressful transfers with small time margins. Eeva and Karin are the only ones who use public transport for their work trip with some regularity. Eeva has a direct tram route between her daughter's preschool and the workplace which she uses, but she intends to start cycling as soon as the weather gets better, not because it is faster but because she perceives it as more

flexible. Karin on the other hand needs to use public transport occasionally because her work situation requires that she does.

Most of the respondents cycle year-round to and from work and some also do it in conjunction with other activities but mainly when they travel alone. Overall, the bicycle seems to be perceived as an important means to allow for flexibility and freedom, it gives the respondents a feeling of controlling their own time that public transport does not allow. Petra's family have an electric bike that she and her husband use when the time schedule is more tight than usual. Karin, who have fixed working hours and a schedule to adjust to, opts public transport out for her bicycle when she can to avoid stressful transfers:

Karin: When I cycle to work in [area] it's half an hour faster and I don't need to be nervous that the transfers won't work.

Anders, Henrik, Petra and Eeva all mention flexibility and/or predictability as an important advantage with cycling. Apart from that it gives them exercise, they seem to prefer the bicycle over public transportation because it gives them control over time. Henrik has put winter tires on his bike to be able to cycle year-round and as such extend the flexibility and time control that the bike offers:

Henrik: The reason that I started winter cycling now was mainly to be able to predict the time it takes to get from door to door. Because if I was to be in the situation where the road is slippery and it's raining [and I cannot cycle], it would increase my travel time to and from work with... two hundred percent, it would go from twelve minutes from door to door by bike to... if I was to use public transport it would take, apart from watching the time table it would take half an hour.

EL: Is that the main reason why you cycle, that it is temporally flexible?

Henrik: Exactly, to know how much time my work trip takes. Because if you're collecting the kids from preschool, and you're standing there at ten past four and realize that I cannot cycle, then I would be late. Then I would be fifteen minutes late for preschool to collect them. But with the bike I feel that I have the control over how long it takes. So, if I'm late it's my own fault.

The bicycle can also create spatial flexibility to enable the coordination of several activities. Eeva, who travels by public transport but plans to start cycling, considers this an opportunity for instance to exercise on her way home from work:

Eeva: [...] when I know I am going to do some sports it is more practical to go by bike so I can just go directly there, and then just go directly home without having to go back and forth to bus stops.

The fact that the bicycle is the most important mode between the fixed daily activities means that the restrictions of the own body creates more palpable capacity constraints. Using a non-motorized transport mode, the body needs to function as a motor, hence coping physically becomes a prerequisite. Folke gives an illustrative narrative of how he and his wife, before they changed preschool, cycled with their children in a cycle trailer:

Folke: [...] it was kind of exhausting, and that was one of the reasons why we switched preschools. We really liked the preschool but it was just too much to do that every morning, I felt a lot of stress around taking them there, I was often tired and annoyed when we arrived and it's heavy. [The two children] together weighs over 40 kilos, plus a trailer that weighs ten to fifteen kilos, so you pull almost 60 kilos plus yourself and the bike. It's pretty heavy in the uphill. I felt like it worked for a short period. And also, [the oldest child] is starting school in the fall and so [since we switched preschools] she gets closer to school.

Henrik testifies about a similar experience, even though geographical proximity was not the only reason why they later switched preschools:

Henrik: I was the one to collect them most often and getting up the first hill and then down the hill and then up again on the hill where we live... That could take a whole lot of time with tired children. So it was often a struggle to get home. And then I had my bike, and then you have the stroller and two [kids] that are walking and that you cannot help.

The coordination of material objects for the children's mobility also gives rise to coupling constraints for their parents. For Folke, it was coordinating the above-mentioned bicycle trailer that created constraints because cycle parking facilities in the house where they live are not designed for such mobility tools:

Folke: So, we had the bike in one room and the trailer in another room with an indoor corridor in between, so every morning out and get the trailer, through two doors that need to be set up, and then squeeze the trailer through a door that is really too narrow so you have to take one wheel off to get it out. And then hook it on [to the bike] and you know, all of that...

Eeva shares a situation that occurs sometimes when her husband is out of the country for work, and her coupling constraints increase when she needs to organize the children's day alone:

Eeva: Sometimes when my husband has been away, especially when the kids are in different places, the oldest daughter's friend [...], her parents have taken my daughter after school sometimes to their home. But there is a problem, even though they don't live very far away, only like two kilometers, when she is there without a bicycle it's almost impossible for me to get her. The bus doesn't help a lot because it doesn't go

practically with the bus routes. Then I always need to ask them to bring her home and it feels like asking too much.

This is a situation that arises as a consequence of that she needs to relate to that others are more mobile and have organized their lives in accordance with that. Here, the absence of a car is obviously what makes the situation constraining.

5.3.3 Spatial proximity and temporal flexibility relaxes constraints

The families also make decisions that have long term consequences for how they are able to organize their daily life as to relax the constraints around fixed activities. Choices that allow for geographical proximity between activities is important, and several respondents consider proximity as a crucial factor for choice of work, school, preschool and leisure activities. Folke's and Henrik's families both switched preschools to one that is closer to home. Several respondents express that they would not take a job that would require car ownership:

Anders: [...] I don't think I would take a job that [required that we had a car].

Petra: [...] I applied for some job in Borås before starting here and then I felt that I don't want to commute by car to Borås and the bus connection is so bad.

Amanda: [My husband] actively dismissed job ads that are far away. And I wouldn't take a job anywhere either but I really like to go by train so I could commute that way. But I really don't like to go by car and driving so I don't think I would take a job that required that. I don't want that in my life on a daily basis.

Furthermore, virtual accessibility through ICT such as computers, mobile phones and the internet are important resources to enable flexibility in the work situation, for instance through working from home when it is necessary. Even if many prefer not to bring work home, most respondents have that opportunity if a child is sick or the work day is easier organized through working out of office. Also, most respondents have more or less flexible working hours. Eeva, who are alone with her children for periods when her husband is away for work, benefits greatly from the total flexibility she has in her work:

Eeva: [...] when my husband is away I usually take some days when I work from home.

Eeva: Usually I always take my laptop with me so I can be flexible and choose to stay home if something happens.

Moreover, in Viktor's, Anders's, Amanda's, Folke's and Petra's families both adults work part-time or have done until very recently. Karin is the only of the respondents who completely lacks flexibility in her work, which makes her daily routine vulnerable to factors she cannot control, such as public transport delays or a punctured bicycle tire. On the other

hand, her husband has more flexibility in his working hours which helps relieving Karin's constraints.

5.3.4 Fixed leisure activities require mobility

Fixed leisure activities often imply coupling constraints in terms of determined hours to be in specific places. Three approaches to these activities appear among the respondents that can be seen as different ways of relating to mobility norms. The first is to make sure to live up to the mobility expectations through renting or borrowing a car, using a car club or asking other participants for rides. The second is to limit the activities to what is available in the geographical proximity, and the third is to simply opt that kind of activity out.

The need for mobility seems to be the most urgent in relation to the children's leisure activities, often team sports, where expectations of mobility can be high and where the wish to be norm breaking is the least. Expectations do not appear so much in the regular activities, to them the families often use public transport if the distance is too large for walking or cycling. However, extra activities on geographically scattered places occur, such as matches or scout excursions. Viktor's children play handball and they have gotten rides with other families to go to matches. Anders, who coaches the soccer team of his oldest son, uses the car club the family are in to organize match events. Since several families whose children are in the soccer team are carless, Anders has been able to drive their children as well. Eeva's oldest child also plays soccer, the practices are at a walking distance from home, but they ask other families for rides when matches occur:

Eeva: [...] we need to try to get the other parents to take us sometimes. Not to the training which is very close, but when they have a match it can be really far away, even though it is in the city it could take like two hours to get there by public transport and it can be eight o'clock on a Sunday morning. But there is always someone going there by car so it's usually possible.

Several respondents express a sense of being inconvenient in these contexts, because they do not own cars. They solve it through taking rides with others but often feel like free riders. Karin, who is in the scouts with her daughter, says that they have had to "beg" a lot for rides but now use the cars from the car club to escape that. As such she has adjusted to mobility expectations to avoid the experience of being outside the norm.

Some respondents adapt the family's leisure activities to what is available nearby or easy to get to by public transport. Karin herself switched gyms and now goes to one that is closer, even though she does not find it as nice. She thinks that if you have a car you do not have to make those kinds of choices. She also switched scout clubs after having her first child to one that is geographically closer to be able to keep participating and moreover, bring her children into the scouts. Anders also describes how his family adapt their choice of leisure activities in order to avoid car reliance:

EL (control question): So, you don't have that many hours to keep?

Anders: No, we don't, no exactly, and then I... I mean it's a question of attitude as well. It's that we, or mainly I, don't want us to be car reliant either. I think there are enough activities nearby for the children. So, you can choose something that is reasonably close.

Several of the respondents who have small children say they will choose activities after what is available nearby when the children come to the age when that is in question. They also speak of avoiding activities that requires driving to the extent possible. Eeva has been looking for a judo club for her youngest child but found that there is none close enough for the child to join. The respondents whose children are a bit older both tells me about actively opting out activities because they don't have a car:

Viktor: There are certain activities that are hard to realize. One of the boys went to ice skating school this fall and he wanted to continue with hockey, but hockey is a typical sport that is very hard to realize without a car. So, we had to paus that. I don't even know if it ever will happen.

Karin: [...] I think my son might have been playing indoor bandy, but we opted that out because there wasn't any club near us. When he didn't want to play soccer anymore we looked at it because my husband plays indoor bandy and thinks it's fun. So, the son would have liked to do that, but it could also be that he said so because he knew that there is no club so he would be let of the hook, you never really know [laughter].

5.4 Flexible activities: Leisure and flows of material

5.4.1 Introduction

The notion of flexible activities refers to activities that must not happen at a specific time and place. Naturally this could apply to an infinite number of activities from an individual perspective. However, the interest in this thesis lies with the family as a whole, and therefore the flexible activities are divided in two categories: One is activities that are connected to the material flows of the household, such as shopping for food or other produce, and discarding objects. It also includes ambitions to minimize material flows that can be associated with carlessness. The other category, called flexible leisure activities, consists of the more spontaneous activities that the family members do together, such as day trips, vacations or visiting friends and relatives.

5.4.2 Organizing material flows

Organizing household material flows implies activities that must be performed but that are flexible in time and space, that is, when and where to be performed. Since these activities often involve objects that are heavy and/or many, carlessness can be constraining as the human body, however healthy and functioning, do not always suffice as a mobility tool. Three

strategies appear as especially important organizing these flows: Coordinating errands, renting or borrowing a car (or using car clubs) for the purpose or reducing the need to be mobile through ordering products with home delivery. Beyond these, many of the respondents also have the expressed ambition to minimize their consumption.

Several respondents describe how they coordinate errands to avoid these trips as far as possible. This means trip chaining through making several errands in conjunction with each other and in conjunction with the work trip. Eeva reflects on differences she perceives in how people do this depending on whether they own a car or not:

Eeva: I have the feeling that people who have a car, or several cars in the family, they don't plan that much. When they have some kind of need, they just immediately take the car and drive somewhere and do it. But we plan for example what day does the grocery shopping need to be done, so we plan in advance and have an overview. [...] I think we need to combine things more than if we had a car but I don't feel it's a problem, I also feel that I wouldn't like to go do things all the time like that and travel to separate places for every single thing. I think it's nicer to combine and it's more efficient somehow.

Since flexibility in the sense of being able to move freely between activities facilitates making errands in conjunction with the work trip, the bicycle is an important resource for this purpose. A few respondents talk about this, and Viktor's statement is a clear example:

EL: Do you make errands in conjunction with your [work] trip?

Viktor: Yes, almost daily actually, if it comes to going to the pharmacy or returning books to the library or shopping for vegetables, I do that.

EL: Does that make you go by public transport sometimes?

Viktor: No, what we cannot take on the bike we solve through food home delivery instead.

The bicycle is also a tool to transport produce, relieving capacity constraints of the body. Some use carrier bags or a cycle trailer when they shop for groceries, and trailers are also used for transporting larger objects. Karin's description illustrates how the bike can be a resource to soften bodily capacity constraints while transporting groceries:

Karin: I cycle to and from [the food store] near [the workplace close to home], then my bike is like a trolley, so I hang everything on it.

To reduce the necessity of mobility in the organization of material flows, food home delivery is a frequent strategy among the respondents. In fact, organizing material flows is the project for which ICT seems to be the most useful in facilitating carless life. It is used for ordering

groceries and large objects that are hard to transport without a car. All families have ordered groceries from the internet and half of them do it regularly. Several respondents point out that they can afford it because they do not have the expenses car-owning implies. Several also mention heavier groceries as practical to order for home delivery, and explicitly appreciate that someone else carries the produce into their home.

Thanks to the opportunity of home delivery via the Internet, none of the respondents express any significant hardship getting new furniture home. Discarding large objects on the other hand appears to be more of a problem. Henrik and Eeva, who both recently moved to Gothenburg from other European cities with their families, note that this is harder in Gothenburg as recycling centers are located in places that are hard to reach without a car. Most get help from families, borrow cars or use car clubs to discard things to recycling centers. Some mention forums on the internet for giving away or selling objects, which means that others come and get them.

5.4.3 Flexible leisure activities

These are the kind of free time activities that are more or less flexible in time and space, and that are performed by the families when it suits them. Nevertheless, they are not exempt from constraints but access to mobility resources and the need for coordination of objects, relations, time tables and accommodation affects the families' maneuver space for these activities. The absence of the private car as a mobility resource is a capacity constraint itself, and it is evident that the families to varying degrees adapt their activities to what is possible for them to reach.

Public transport is important when the families visit friends and relatives or make day trips. In these cases, the reach and time tables of public transport shape the activity pattern and affects what is possible for them to do. Without any form of car access, it is hard to stretch these constraints and move outside the reach of public transport. Several respondents mention outdoor activities in nature as hard to do without a car. For Henrik, whose family recently moved home to Gothenburg from Oslo, this is in contrast to life in Oslo where it was easier for them to reach green surroundings by public transport. This is something Amanda also reflect on considering what will be harder for her and her family to do now that they are carless. Henrik and Viktor both have access to summer cottages with their relatives but cannot get there by themselves without a car, someone needs to pick them up. Petra summarizes how carlessness affects activities for her whole family.

Petra: So sure, we adapt where we go for daytrips and activities, and the children's activities will also be adapted to what is available as long as we are in charge.

Considering longer trips or vacations where public transport does not reach, practices vary. Some avoid such activities, and some rent cars during vacations. It is few who mention going abroad by plane but most prefer to travel regionally. Petra's family choose to go for vacation to places where they can go by train and as such adapt their activities to the given constraints. Folke's family has tried to go on vacation by public transport, but perceived it to be too burdensome as they needed to carry many things and the supply of public transports was less

in the rural places where they went. Coupling constraints caused by the need to organize objects such as baggage, strollers or children's car seats that need to be transported, is an aspect that makes some families rent or borrow cars when they are travelling far. Petra describes how carlessness requires organization of things and modes that can be burdening and makes the family avoid such activities.

Petra: You know, you need to plan it in advance and then we need to book a car [through the car club] and then it's the whole day and then when we get home, well if we take the bus you're totally wasted when you get home. It's a completely different thing, you realize that mainly when you use a car [through the car club]. It's awfully smooth, that's undeniable. It's awfully smooth, that very ride. It's extremely smooth and then, we don't even have a car outside our door. If we had that too, like in a detached house with all the car seats in the car, just ready to go, I realize that's super comfortable.

Apart from the purpose of getting away on vacation or a day trip together as a family, the projects of maintaining social relations gives rise to activities where carlessness can be limiting. For Viktor and Eeva, the least car using respondents in the study, the mobility of others is important for these projects:

Viktor: Sometimes we go by public transport, sometimes we go by bike, and most often I would say that people come to our home.

Eeva: [...] often, the ones that have a car come to visit us much more than we go to visit them and of course, if I can meet people in the city that's no problem. Often that is easier for me than it is for them because they live in places where you can only get by car but they don't want to come by car to the city centre and the buses go so seldom. For me it's no problem to get home or to get to the city but for them it might be a bigger problem.

But the mobility of others can also limit the ability to maintain relations, if the carless family is unable to conform to the extent and speed of this mobility. Amanda specifically reflects on how her family will solve their participation in an event with her relatives that takes place in the country side outside a town in another region where her grandmother lives. Petra describes how the social network of her family is actually shaped, as a consequence of their carlessness but also due to the mobility- and accessibility practices that other families set their lives to:

Petra: I would say that it partly affects who we socialize with, because it's so awfully messy to, like, take the bus to [town outside Gothenburg]. It's a project to do that, so you don't do it as often. If we had a car we could have just put the kids in the car and then go for like fifteen minutes, super smooth. With the bus it takes like an hour of riding and transfers and waiting and... all of that. So I think it affects quite a lot where we go and what we do and perhaps when we do it.

What Petra describes is part of a process where many of the family's acquaintances move to peripheral areas to live in detached houses. It gives rise to authority constraints in relation to car owning and high speed mobility as a norm, as carless families perceive demands on them to adapt to dominant mobility practices. Furthermore, the carless families are not immune to the middle-class life course ideals that underlie this process. Regarded from a longer-term perspective this may contribute to changing mobility practices applied by these families, which is further discussed in the next section.

5.5 Strategies from a long-term perspective: Life stage transitions and the temporariness of carless life

5.5.1 Introduction

Apart from their current contexts, the narratives shared by the respondents also include reflections on what the future may hold and changes that might change their mobility practices. This reasoning can be linked to the time-geographic idea of projects as the overarching frame of activities that humans engage in. While projects can be of a much smaller scope, such as that of preparing a meal, the projects that are referred to here relate to the lives of the families in the long term. In several cases, these reflections indicate that a private car might become necessary later in life. The drivers for this can be sorted in two themes: One has to do with the families' residencies and future needs mainly of larger living space. The second theme relates to potential life-cycle transitions that entail changed activity patterns.

5.5.2 Outgrowing the residency entails new considerations

Spatial proximity is important for all respondents, and it evidently is a priority for them in daily life. In a short-time perspective, it is partly an adjustment to constraints; they limit their activities to a geographic extent allowed by their mobility resources to be able to organize activities. In the long run however, spatial proximity seems to be a strategy applied by the families through active choices based on how they want to live their lives.

All the respondents live in three or four room apartments, except for Eeva whose family rents a town house. Spatial proximity in relation to places that are central to daily activities are a conscious priority for many of the respondents considering the location of residency, as far as it is a choice for them to make:

Henrik: Well, the idea when we moved back [to Gothenburg] was that we wanted something twenty minutes by bike from work, at a maximum. That was our ideal. And that leaves a certain radius of where to look for an apartment.

Petra: If we would have lived in the countryside, we couldn't have been without a car. Now we have chosen to live [centrally] largely because we don't want to have a car. And it works fine, when you have grocery stores this close.

Viktor: We consciously settled down in a part of the city where we have close to relatives. Siblings and such.

However, other needs in the offing may compete with that priority. Two respondents recently moved to larger apartments close to their old residencies, and the other five reflects that their apartments are or will be too small in the future, even though one of them claims that this will not necessarily be a problem. The prevailing situation on the housing market, implies that those who own their apartments today might be able to buy another residency, but if they want a much larger apartment or a detached house, they may be forced to move to more peripheral areas where it is harder to organize daily life without a private car. The availability of larger residencies at reasonable prices for families is a recurring subject in the interviews, considering personal needs as well as in general terms:

Henrik: I think in Gothenburg, many choose or are forced to choose the car dependent life when they have children. Maybe not when the children are small but sometime between they are born and when they start going to school, they choose to move to an adjacent municipality. And I think what drives that decision is mainly the availability of spacious residencies suitable for families. We would like to have it bigger... or not bigger...but we have four rooms and three children so some time... but for now we all sleep in the same room and are happy with that... But if you had teenagers that want their own rooms, then there's a problem.

Viktor: Well, we would have liked an additional room. We have four rooms and there are five of us so two of the children share a room and I guess that works for now, I don't know what will happen later on if we will be able to move somehow. The situation in the housing market is a bit sweaty, one might say.

Anders' story illustrates that priorities considering residency and geographical proximity can be an issue of negotiation within the family. It makes the presence of several projects in the same family obvious, where one might come to dominate.

EL: Is having things close [to where you live] important for you?

Anders: Well for me it is. But I think our preferences are a bit different. I think having things close is important. We live in three rooms now, so eventually we would like to have another room. I guess the children can live together a few more years. But then we have this different... because like... I prioritize closeness but my wife would really love... I mean the minimum requirement for our next residency is like a balcony and preferably a large one, and we'd like a terrace or a small garden plot somewhere. But that's hard to find nearby, and it's so expensive to.

Even though owning a car is far from desirable for Anders, he expresses that it might become necessary through this negotiation situation:

EL: Do you think it could come to that for you that you would have to buy a car to have more to choose from in terms of residency, or do you feel that's not an option?

Anders: [...] for me it's a less good option anyhow. At the same time, well, it could be a practical reality but, well, I mean I still think... we'll have to keep our eyes open and hope that the market calms down.

Viktor too makes this consideration of scenarios, although negotiations between him and his wife are not evident in his reasoning:

Viktor (about what could make the family buy a car): ... if we were to move somewhere where we would depend on the car. At the same time we don't want that. I think we'd rather live small than become car dependent. And often then, people have two cars to make it work, and I don't want that.

Living near is associated with identity for several respondents, who express appreciation for the functionally mixed urban environment. However, some reflections imply that other ideas of what life should be like compete with this conviction. Amanda describes a process from identifying herself as a rural person living close to nature, to accepting the urban identity and appreciating the advantages of it, mainly the escape of car dependence thanks to spatial proximity. But she also tells me that she dreams of living in the countryside when her children have grown up, which illustrates how new stages in life have the potential to mean new activity patterns and new mobility practices. Folke also expresses ambivalence considering carless life on one hand, with less responsibility for property and things, and on the other hand the possibility of more space and his own space for hobbies. This ambivalence is present with several of the respondents. It implies that, although there is a strong conviction of wanting to live carless and that it is the morally right thing, other projects that are more in resonance with prevailing norms and expectations can come to dominate more with time may conflict with that.

5.5.3 Prospects of needing a car: Safety and reduced bodily function

The reliance on proximity and bodily function for the organization of activities and projects in daily life entails a sort of vulnerability as it is sensitive to external changes. As put by Eeva: "Little changes that you cannot yourself affect mix up the whole thing". Amanda and Petra both ponder on how the needs of their children may change with time:

Amanda: Maybe you'll need a car when the children's needs become less local. If you want to be able to go and collect them late at night in strange places or so, then you might want that car standing outside your house more. Everybody says that families with small children must have a car, but I think that's nonsense.

Petra: I think of when the kids start being out drinking booze. I wonder a bit how we will do that. It's not sure they will, I don't know that, but sometimes I think that's one

of the things I would like to be able to do for them. Like ok, I'll come and get you at three in the morning, you can call me and I'll come.

This reasoning ties on to the car as a source of safety, being able to reach your kin when it's needed. Petra also reflects on how they will be able to practice driving with their children when they get older. Furthermore, several mention thoughts about the bodily functionality of family members when asked about what might get them to buy a car:

Eeva: [...] maybe if one family member would get really, really sick or seriously injured, then I would be forced to do it in order to take care of them.

Henrik: [...] I'm thinking it easy to live car free as long as everyone's got their health. I you had a handicap for example, maybe you would feel that you had to have a car.

For Viktor, the prospect of reduced physical functionality is an actual possibility for the future:

Viktor: Well, I'm a chronic, I have multiple sclerosis since quite many years. If I was to be substantially worse, so that I can't cycle anymore, then maybe [we would need to get a car]. Just not to be isolated at home I mean.

5.6 Chapter summary

This chapter has presented the contextual aspects of the families' carlessness and how the respondents relate to automobility as a dominant norm. Accessibility strategies, including mobility practices, are accounted for in relation to the degree of fixity in the activities they serve to fulfill. Also, a long-term perspective is applied to choices and strategies as well as to prospected life stage transitions that might obstruct voluntary carlessness.

6. Analysis

6.1 introduction

This chapter feeds back to the research questions on the accessibility strategies the families apply, the resources they require and what consequences carlessness has for the families' maneuver space.

6.2 What accessibility strategies and resources do the families use?

6.2.1 Introduction

The first research question guiding this study considers the accessibility strategies applied by voluntarily carless families to substitute for the routine high speed mobility that the private car allows. It also asks for the resources required to apply these strategies. The notion of accessibility strategies refers to the decisions and practices that the members of the household continually apply to manage time-space constraints and coordinate the activities of daily life. The strategies that arise from the material can be divided into *mobility practices* on one hand, and *strategies aimed at reducing the need to be mobile* on the other. Carrying the study out, the degree of temporal and spatial fixity of the activities (Vilhelmson, 1997) as well as their necessity have proven to be of importance for what kind of strategy is applicable. Generally however, the strategies are aimed at enabling flexibility and coordination of activities so that the opportunities available within reach of the carless families can be acquired by them. By and large, the strategies applied by the families has functions similar to the adaptations to reduced mobility that Jones et al. suggest (1990, in Vilhelmson, 1997). However, as Jones et al. describe possible adaptations to constraints, the strategies found in this study are applied to manage a chosen situation. This is illustrated with examples in table 5.

Table 5: Adaptations to constraints from reduced mobility and active strategies applied by carless families:

Suggested adaptations to reduced mobility (Jones et al., 1990; in Vilhelmson, 1997):	Example strategies applied by voluntarily carless families:
Changed durability and/or frequency of activities.	Flexible working hours. Part time working.
Activity and trip coordination (performing activities in conjunction with each other).	Using the bicycle as flexible, autonomous mode of transport. Running errands on the way from work (trip chaining).
Redistribution of trips and tasks between the members of the household.	Overall planning of everyday activities to divide the workload between spouses (taking children to and from activities, grocery shopping).
Changed localization of activities.	Prioritizing geographic proximity in the choice of work and other activities as well as residential location.
Change of travel modes.	Adjusting travel mode to the degree of fixity or coupling constraints in relation to activities.
Change of communication channels.	Using ICT to work from home. Ordering groceries and other products for home delivery on the Internet.
Ceased participation in certain activities and possible participation in new activities.	Opting out activities that are not available within geographic reach.

As table 5 illustrate, the strategies found in this study fill similar functions as adaptations induced by constraints that Jones et al. suggest (1990). The examples indicate that certain resources and circumstances enable these strategies (further exemplified in table 6 below).

6.2.2 Mobility practices

The mobility practices that are the most important for the respondents, and that in various ways replace the private car, is cycling, public transport and different forms of car sharing. Walking is mentioned in relation to leaving and collecting children from preschools and schools, as well as in the transition between other modes. There are variations in how and when the respondents apply these different mobility practices, which illustrate the complexity of mobility practices and degrees of mobility even beyond private automobility.

A few of the respondents do not consider themselves entirely carless, since they have good access to car clubs that they use regularly and rent cars during vacations. This variation of carlessness partly interact with the extent to which the families adjust activities, and

particularly flexible activities, to their mobility capacity. The material reveals that there is no exact distinction between automobility and carless mobility, but the full picture is complex and implies various forms and degrees of mobility. The notions of multimodality and altermodality (McLaren, 2016) are well applicable here. Most of the families in the study are multimodal in the sense that they apply a combination of modes that include car travel at occasions outside their daily routines. They have access to the car as a mobility resource although they do not own one, and they use it to varying extent. Two of the families can be described as altermodal as they do not use cars at all, and it is in these cases where the mobility of others most obviously replace their own.

Overall, the different mobility practices can be said to have different functions relative to the degree of fixity of activities: The bicycle is important as it allows flexibility in relation to fixed daily activities such as work, school and preschool, as well as the home as a place for daily return (Scholten et al., 2010). The bicycle also facilitates coordination of errands with trips between these activities. In total the bicycle seems to have functions for the respondents that are often ascribed to the car through automobility (Featherstone, 2004); it enables autonomus mobility in terms of individualized travel. In practice, it enables freedom of choice, flexibility and tempo-spatial control over the journey. As such, the bicycle is an important mobility resource for the respondents as it allows them to organize daily life and effectively acquire the opportunities within their geographical reach.

Public transport is used for short leisure trips and mainly when several family members are involved, such as day trips or attending to regular, fixed leisure activities. The respondents use public transport to a larger extent when they have less authority constraints to adjust to in terms of temporal fixity. However, it has constraining effects through its reach: When the families need to get to places outside the public transport network, other practices need to be applied, and if not those activities must be opted out. Also, coupling constraints due to the temporal organization of public transport has a limiting effect on the possibility of coordinating activities.

When the families need to get outside the tempo-spatial reach of public transport and overcome the capacity constraints set by the bicycle and their own bodies, most of them apply car based mobility. This confirms findings of correlations with increased car use and increased flexibility in activities (Vilhelmson, 2007). It is most common in relation to highly flexible activities, such as vacations, or to activities with large requirements for coordination of material objects. Car based mobility is also applied when the families need to conform to the highly mobile society in different ways, to visit friends and relatives in distant places or in relation to the children's leisure activities, for instance when sports events take place geographically far off. At these occasions, most families can access a car somehow, or get rides from others. However, it happens that such activities are avoided. It should be added also, that to the extent that car based mobility is an option, it is rarely associated with freedom but rather as a necessary evil. The children do not like to be tightened with seat belts and several adults are uncomfortable with driving which makes them prefer other modes. The experience of car dependence and car dependent places is associated with discomfort for

several respondents. These appear as examples of how values and personal relations to norms contribute to the shaping of maneuver space.

6.2.3 Reducing the need to be mobile

In addition to mobility practices, the families apply accessibility strategies aimed at reducing the need to be mobile. Apart from reducing distances and avoiding trips, they generally serve to further allow flexibility and coordination in relation to activities. Building on earlier research (Gil Solá, Vilhelmson & Larsson, submitted; Haugen, 2012; Schwanen, Kwan & Ren, 2008; Neutens et al., 2010), the study specifically explored geographical proximity, virtual accessibility through ICT and support from social relations as strategies based on certain resources. Geographic proximity appear as a fundamental aspect and priority in the daily life of the respondents, enabling voluntarily carless life. This priority guides choices considering schools, preschools, regular leisure activities and work as far as possible. Apart from the fact that geographical proximity reduces the distances that family members need to move daily, it contributes to enable the bicycle as a flexible, individualized mode of transport. Geographical proximity also contributes to enabling planned coordination of several activities and errands.

The strategies based on ICT and social relations as resources function in different ways to create further space for temporal and spatial flexibility through coordination, planning and relief. They reduce the need to move fast and far, outside the geographical area of daily routine. Internet and mobile phones are important resources for the families' daily organization. That does not make them unique for their time in any way, which several respondents note. Many functions and services would probably be useful for them even if they had cars. However, there are areas of use where ICT evidently help them make errands without having to move, mainly through ordering consumer goods such as groceries and clothing as well as larger objects such as furniture. Furthermore, ICT facilitates trip planning through mobile applications for public transports and GPS. In that way, ICT can replace the car as an accessibility resource for certain activities, through allowing freedom of choice without requiring the opportunity to go anywhere, anytime. Nothing suggests that ICT replaces mobility to maintain social relations. It is used to keep in touch with geographically distant relations as a complement rather than a substitute for physical encounters.

Several respondents express that they would want more geographical proximity to their relatives which is in accordance with earlier findings considering a proximity deficit in relation to social relations (Haugen, 2012). Of those who have parents and siblings living in the region, few claim to see them regularly in everyday life. Even so, social relations occur as a resource for accessibility strategies in three ways with the respondents. The first is getting help with the children, however the only one who has this resource fully available is Folke whose mother collect their children from the preschool regularly. For the other families, this resource occurs only sporadically or have done so in the past. The second is borrowing a car or getting rides from others, which mainly occurs in conjunction with routine leisure activities. The third form of social relations as accessibility resource is that the mobility of

others compensates for own low mobility, as when the family gets fetched by car or when the location of social events is adapted to the mobility of the carless family.

Table 6: Accessibility resources defined in relation to constraints.

<i>Capacity resources</i>	Bodily functionality to enable the use of non-motorized and collective transport modes. Knowledge of how to use public transports, cycling opportunities and ICT-services that can reduce the need to be mobile. Knowledge of service and activities that are available geographically near. Economic resources to choose residency and work place as well as to be able to work part time.
<i>Coupling resources</i>	The possibility of sharing responsibility and work between two adults in the household. Access to other social relations that can substitute or relief the need to be mobile.
<i>Authority resources</i>	Opportunity for flexible working hours. Opportunity to work from home or other places.

The accessibility strategies that families apply show that a diversity of conditions and resources matter for carlessness not to reduce the maneuver space of the families. Departing from the definition of accessibility as the overcoming of time-space constraints, such resources can be described in relation to the constraints they help relaxing (see table 6).

6.3 What are the consequences of carlessness for the families' maneuver space?

Unlike the space-time prism (figure 1; Miller, 2005) that is largely a function of the speed with which the individual travel through time and space, the maneuver space cannot be drawn in a graph or map no matter how advanced the equation. It is shaped by values, life-goals and priorities as much as by mobility resources and urban form (Vilhelmson, 1997). Therefore, the maneuver space and the ways in which it may be constrained must be regarded as largely subjective as well as accessibility may be (Haugen, 2012). The accessibility strategies that families apply may emerge as adaptation to restrictions as well as through active choices, and this is a continuous matter of consideration in the process of analysis. However, the focus on voluntary carlessness in this study entails that being carless and the priorities made to facilitate it is compatible with a larger lifestyle project for the respondents. Geographical proximity for instance, is a priority with these families in choices considering residency, workplace and childcare as far as it is possible. These are long term choices that enable less constraining carlessness. Simultaneously, the need to favor proximity also entails opting many opportunities out, which may be more of a sacrifice for some family members than others. Hence, it is reasonable to believe that due to the continuous negotiations and decisions on long and short term that family life consists of and that shape ongoing accessibility strategies, consequences for maneuver space differ between family members.

Viewing the family as a whole, which is the approach in this study, it is indisputable that carlessness has consequences for their maneuver space. The need to adjust to the reach of collective and non-motorized modes of transport in fact structures the activities that the families engage in, particularly when it comes to leisure activities and socialization.

Considering the necessary priority of geographical proximity it is reasonable to believe that it may for instance imply less priority for quality of services related to health and childcare in times of deregulation and freedom of choice in public services. Furthermore, many of the constraints that families perceive arise relative to the norms and expectations that enclose car society. This is manifest most palpably in the context of children's leisure activities, in relation others that have cars and when the organization of material objects is required.

Taking potential consequences into account reveals a vulnerability of the families' maneuver space due to the resources it is built on (table 6) and without which it would be much more limited. The fact that coordination and flexibility are such important overall strategies for the families, indicate that without the opportunity to apply these strategies, the consequences for maneuver space would be larger. This is evident for Karin, who lacks both temporal and spatial flexibility in her work, and has problems coordinating errands with her work trip when she needs to use public transport. For her, the constraints caused by public transport time tables is a source of stress. Another important resource that supports carless maneuver space is the physical functionality of the own body, since it is a prerequisite for using non-motorized mobility and to a certain extent public transportation modes. Hence the bodily capacity constraints are more palpable and defining of maneuver space without continuous access to the car as a mobility resource. Furthermore, all respondents are part of nuclear families and have partners to share responsibilities with. Without this resource, coupling constraints would surely increase which can be illustrated by Eeva's example; when her husband is abroad for work, she has trouble collecting her children in different places.

Finally, the experience of being outside the norm that car society constitutes has consequences that take different expressions for the respondents. Two of them speak quite similarly of strong feelings of discomfort and humiliation when they find themselves walking or cycling in car based environments. Several are bothered by asking for help or rides and partly avoid activities to escape that. Furthermore, situations when the families need to conform to the norm of high speed mobility can be burdensome. Norms as authority constraints (Neutens et al., 2010; Scholten et al., 2010) is evident here, and the automobility norm seems to form a power domain (Hägerstrand, 1970) that is superior to that of non-motorists and rather palpable to the respondents. It can be seen in the material that the respondents differ in how they relate to norms. While some adjust through car clubs and rental cars, some persist as altermodal. However, on a general level many speak in positive terms of breaking norms, as being morally invigorating and in harmony with their identity. When it comes to the children, the resistance to breaking norms is larger, which is manifest in reflections on the future and the potentially increased mobility needs of the children. It is perceived as more problematic to limit the maneuver space of the children than it is to limit one's own.

7. Concluding discussion

7.1 Introduction

This final chapter presents the main conclusions from the study, with a discussion that draws on the overarching aim – to increase the knowledge about conditions for carless life and what it may mean for societal policy and planning for urban regions. The conclusions relate to the research questions and as such the meaning of accessibility strategies the families apply and the implications for their maneuver space. The chapter closes with some suggestions on further research that arise from the study.

7.2 Main conclusions

7.2.1 Proximity, flexibility and coordination reduces the need for speed

The time-geographic principle of return implies that an individual must always return to the home as a point of departure. According to Hägerstrand (1970) this means that the mobility resources at the disposal of the individual determines the size of the geographical “island” where she must spatially exist. This is her geographical action space. Building on this line of reasoning, speed has often been interpreted as a decisive factor of individual access to opportunities (eg. Miller, 1991); the greater the speed, the more opportunities will be within reach for the individual. The accessibility strategies applied by the carless respondents of this study to organize everyday life, suggests that they can substitute for high speed mobility to a certain extent. It is partly due to the priority of geographical proximity in the choice of central daily activities meaning that more opportunities exist within the reach allowed by the families’ mobility resources. It is also largely due to coordination of activities and tempo-spatial flexibility that enables the families to acquire the opportunities within their geographical reach. Furthermore, strategies that reduce the need to be mobile, such as ordering groceries for home delivery or having the mobility of others replaces one’s own, release time for the families to prioritize other activities. The strategies applied by the families enable them to increase or maintain their maneuver space without expanding the geographical extent of their action space.

7.2.2 Voluntarily carless life demands resources and may be temporary

The study confirms that living without a car is possible for families with children, but it also shows that certain circumstances and resources are needed if everyday life is not to be substantially constrained by carlessness (see tables 5 and 6 for illustrations). The strategies applied by the families are enabled by the way their lives are set up, partly through active choices but also due to less controllable circumstances. They all live relatively central with reasonable distances for walking or cycling to work, schools and preschools. They have resources that allow them to soften constraints, knowledge about services and transport modes, and the bodily function that enables non-motorized mobility. These circumstances and resources may be what makes the difference between voluntary and involuntary carlessness considering consequences for opportunities (Mitra, 2016) and also part of the reason why the mobility gap between carless and car owning families have shown to be smaller in denser

urban areas (Mattioli, 2014). Furthermore, while reasoning about the future other situations appear, related to projects that may come to dominate. It is partly due to negotiations between partners, and partly due to other priorities following new life cycles, such as when the children get older. A potential reality for several respondents is that they may be forced to move to have more space. Because of lack of large apartments in central areas this may imply car dependence and the need to own a car to organize daily life. As such, carlessness may prove to be temporary rather than a long-term lifestyle.

7.2.3 Perceived constraints from carlessness arise from norms and expectations associated with automobility

It is natural that the limited mobility capacity per se gives rise to constraints in everyday life. However, with the respondents in this study, perceived constraints from carlessness appears to be at least as much a consequence of norms and expectations associated with automobility. This is evident in relation to other people that have cars, due to expectations on high speed mobility in the organization of activities and the norms it causes. This form of constraint is also perceived while moving in the urban environment as a non-motorist. It is manifest through emotions of insecurity, disadvantage and even humiliation. These emotions along with values and moral convictions seem to contribute to limiting the maneuver space of the carless families as much as do urban form and actual distances.

7.3 Discussion

7.3.1 The importance of individual circumstances

The study shows that it is indeed possible to live a carless life without unacceptable constraints to opportunities in daily life. However, such relatively non-constraining carlessness is evidently contingent on personal conditions and access to resources. The sampling procedure for the study has resulted in respondents that are able to cycle and prefer it, and they all live centrally enough to use this mode for their daily activities. Furthermore, they seem to have tolerance for being non-normative also in other aspects than carlessness, considering for instance working part-time or eating vegetarian food. This tolerance is significant as a smooth carless existence with both adults in the family working requires a large degree of planning and flexibility. Most of the respondents also express an ambition in the family to share the workload related to the household, such as taking children to and from schools and preschools, running errands and cooking. Such gender equal contracts in the household has been connected to flexibility and ability to re-organize everyday life (Gil Solá, 2016). However, it should also be acknowledged that the picture drawn of household strategies and preferences builds on the narratives from one part of these households, which entails that the perception of household organization and carless life may be something else for the other spouses.

As it may be easier to conform to norms and prevalent ways of organizing life, it seems that the respondents have a strong personal momentum to opt high speed mobility out. As this may be what makes the organization of carless life possible for them, it also shows that

carlessness needs to be easier if more people is to choose it voluntarily. This leads back to the importance of sustainable accessibility in urban planning which is further discussed below.

7.3.2 Implications for urban planning and sustainability

The study is informative in the planning of less car depending urban regions in such a way that it reveals potential solutions in the organization of everyday life without private cars. This is important knowledge in times of extensive urban growth to minimize the risk of building further unsustainable cities. Theoretically, the findings motivate a shift from the notions of speed and geographical reach as dominant determinants of person-based accessibility, towards a development of the time-geographic idea of maneuver space. Such a development has the potential of making a more comprehensive contribution to the planning of more sustainable societies. This is relevant to enable a diversity of solutions in urban planning as well as uncovering the barriers to sustainable accessibility inherent in norms and societal expectations on high speed mobility.

Temporal and spatial flexibility in combination with coordination of activities are important strategies applied by the families to acquire the opportunities within the reach allowed by their mobility. Their utilization of the bicycle as a mobility resource indicates the importance of individualized, flexible mobility even in a less car based society. It allows people to acquire opportunities and use their time in ways suitable for their own needs. The families' engagement in car sharing also illustrate how the car may function as complement in necessary situations, without the requirement of private ownership. The study also shows that geographical proximity is important, but that proximity needs to be in accordance with needs and that these needs vary over the life course. In sum, this indicates the significance of appropriate mixing of functions and flexibility in the housing market when densification is used as a comprehensive strategy in urban planning. Furthermore, mixing residencies of different sizes enables for families to remain in central or semi-central areas and as such avoid car dependence.

The opportunity to avoid burdensome car dependency or enforced car owning, demands resources and the ability to choose; location of residency and workplace, possibility of part-time and flexible work, bodily function, economic and capacity resources. This motivates the significance of policy measures beyond physical urban planning to enable a less car dependent and socially inclusive society, such as capacity strengthening measures to increase the knowledge of alternatives to car dependence but also subsidies for services and increased flexibility in work life to reduce the need for mobility. It is also important to note that for those who cannot apply spatial proximity as accessibility strategy, high speed mobility is still an important everyday strategy, which nevertheless could be more collectively organized than it is at present.

7.4 Questions for further research

The study raises a number questions for further research that can develop knowledge of carless mobility and by extension develop the notion of sustainable accessibility through

clarifying its practical implications. Building on the conclusion that carlessness requires resources not to be overwhelmingly constraining and burdensome, a contextual comparison of voluntary and involuntary carlessness would be valuable to increase the understanding of social exclusion as a consequence of transport disadvantage.

In the light of densification as a widespread approach in urban planning to increase accessibility by spatial proximity, a contextualized exploration of what functions and activities various groups need to access through daily life is highly relevant. Such a study could reveal what it is that people need to have near in order to reduce the necessity of high speed mobility. It could also increase knowledge of what other functions than proximity can facilitate increased shared and non-motorized mobility, such as flexibility in housing and variations in the urban form.

Furthermore, other methodological approaches would reveal other aspects of carlessness and allow for a larger perspective. The indicated temporariness of carlessness that appears from the respondents' reasoning about the future raises the question of which aspects cause families to obtain cars. To widen the time perspective on negotiations and decisions that induce car ownership and increased mobility, a biographical study on changes during the life course might be fruitful to reveal what drives families away from voluntary carlessness. Also, a time diary approach would help clarifying how maneuver space may be limited by carlessness and in what way different strategies help maintaining it.

Finally, in earlier studies the car as a mobility resource has shown to be a powering aspect within households as it tends to reinforce traditional gender contracts. This has the effect of increasing male mobility while women tend to have smaller, more complex activity patterns and a larger responsibility for the home (Gil Solá, 2013). As this study shows that carlessness requires flexibility and willingness to resist societal norms, a possible question to explore is whether the absence of this resource in a household may have the effect of supporting gender equality, and whether this effect in the long run might spill over on decisions on urban form.

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Appendix 1, Facebook request for respondents

Respondentförfrågan på Facebook – gruppen Cykla i Göteborg

Barnfamilj utan bil? Berätta om din vardag!

Jag gör under våren en undersökning om hur vardagen ser ut för barnfamiljer utan bil. Syftet är att ge en bild av förutsättningarna för att leva utan bil i staden. Jag skulle därför vilja komma i kontakt med dig som har barn men som inte har bil, för en intervju under de kommande veckorna.

Hur ser vardagen ut för barnfamiljer utan bil? Vilka behov har de av att resa och hur funkar det att vara utan bil? Vad skulle underlätta? Vare sig din familj har valt att inte ha bil eller inte har möjlighet att ha bil, så kan din berättelse bidra med viktig kunskap för hur staden kan planeras för mindre miljöpåverkan och allas möjlighet att delta i samhället.

Du som kan tänka dig att ställa upp, skicka gärna ett meddelande till mig eller maila guslagre@student.gu.se!

Ellen Lagrell, masterstudent i kulturgeografi vid Göteborgs universitet

Appendix 2, interview guide

Intervjuguide

- Syftet med intervjun är att prata om hur vardagen fungerar utan bil. Anledningen till att jag vill prata med just barnfamiljer är att det är en tid i livet som sätter extra krav på samordning och att det är i samband med att man får barn som många skaffar bil.
- Vi kommer först att prata om hur er vardag ser ut och hur ni organiserar den som familj. Sedan går vi in lite mer på det här med att vara utan bil, vad det innebär. Vi pratar generellt om hela familjens vardag men när jag ställer frågor om hur du upplever olika saker så kan du svara ur eget perspektiv.
- En del av frågorna är ganska öppna så ta dig tid att fundera så kommer jag att komplettera med följdfrågor.
- Jag inleder med några frågor om hur eran vardag ser ut.

Inledande frågor om vardagen:

Familjekonstellation och boende

Vad arbetar du med (el. annan sysselsättning)?

Antal timmar i veckan?

Vad arbetar din partner med (el. annan sysselsättning)?

Antal timmar i veckan?

Din sysselsättning: Plats/avstånd från

hemmet _____ Arbetstider _____

Flexibilitet? _____

Partners sysselsättning: Plats/avstånd från

hemmet _____ Arbetstider _____

Flexibilitet? _____

Förskola/skola? Avstånd från hemmet _____ km.

Vanliga tider för lämning och hämtning _____

Skulle du kunna börja med att berätta lite om hur en vanlig vardag ser ut för er? (Bakgrund till arbetsfördelning)

→ Vilka ytterligare tider och platser har ni att förhålla er till? Fritidsaktiviteter och hobbies?

Huvudfråga	Ev. följdfråga	Exemplifierat/motfråga
<i>Resor i vardagen</i>		
1. Vilket är ditt huvudsakliga färdmedel till arbetet/skolan?	Din partner? Varför just dessa färdmedel?	
2. Brukar du utträta ärenden under resan	Hur påverkar det resan och val av färdmedel?	
3. Har du (och/eller din partner) flexibla arbetstider?	Möjlighet att arbeta på distans? I hur hög utsträckning utnyttjas det?	Om du arbetar hemifrån, vilken typ av arbetsuppgifter gör du då? Möten?
4. Hur reser ni när ni ska träffa släkt och vänner?	Färdmedel? Hur tycker du att det fungerar?	
5. Hur reser ni annars på fritiden?	Färdmedel	Hobbies och fritidsaktiviteter? (Semester?) Används bilpool eller bilhyra?
6. Hur gör ni när ni handlar mat?	Var någonstans? Hur ofta?	Storhandlar/småhandlar? Internethandlar? Skulle det se annorlunda ut om ni hade bil?
7. Hur gör ni om ni behöver frakta större föremål?		T ex köpa/sälja möbler? Göra er av med möbler?
8. <i>Sammanfattande om resor:</i> Har det blivit så att ni delat upp olika resor/ärenden inom hushållet, att du gör vissa och din partner andra?	Hur blev det så (praktiska eller andra skäl)? Hur upplever du att det fungerar?	Tror du att den uppdelningen skulle se annorlunda ut om ni hade bil?
<i>Sociala relationer</i>		
9. Har ni släktingar i närheten?		Föräldrar Syskon Andra släktingar
10. Har ni hjälp av släkt och vänner/bekanta för att få ihop vardagen?	Är det någon av er vuxna i familjen som tar det huvudsakliga ansvaret för att samordna sådan hjälp?	Hämta och lämna barn på förskola/skola? Skjutsa till fritidsaktiviteter?

		Låna bil, bli skjutsad eller få hjälp med frakt?
<i>Närhet</i>		
11. Är det viktigt för dig att ha nära till aktiviteter i din vardag?	Är det något som är särskilt viktigt att ha nära?	Har det avgjort några val för er? T ex boendet, förskola, skola, arbetsplats, fritidsaktiviteter, var ni handlar?
12. Hur kommer det sig att ni bor just här?	Är ni nöjda med boendet? <u>Är det något ni skulle vilja ändra på, i så fall vad?</u>	
<i>Vardag utan bil</i>		
13. Hur kommer det sig att ni inte har bil?	<u>Upplever du att ni har valt det eller har det känts som ett påtvingat beslut?</u> Om de har valt det: Är det någon särskild faktor som möjliggör att ni inte har bil (boende, närhet till arbete/skola/släktingar/vänner)?	Ser ni likadant på detta inom familjen?
14. Hur länge har ni varit utan bil?	<u>Aldrig haft bil</u> eller gjort sig av med den av någon anledning? Om <u>ni haft bil tidigare</u> , hur upplevde ni förändringen?	
15. Upplever du det som en begränsning i vardagen att ni inte har bil?	Gör det vardagen krångligare på något sätt? Skulle du säga att ni anpassar livet efter detta i hög utsträckning?	Finns det saker ni skulle vilja göra som ni inte gör för att ni inte har bil (t ex utflykter, besök hos släkt och vänner, storhandling)
16. Vad skulle underlätta livet utan bil?		Staden, boendesituationen Förväntningar från arbete/socialt
17. Vad är fördelarna med att inte äga bil?		
18. Vad skulle göra att ni skaffade bil?		Ändrade livsförhållanden?

		Större inkomst? Om någon av er till exempel fick arbete långt bort?
19. <i>Sammanfattande om IKT:</i> Du har ju nämnt... (handla/distansarbete), finns det andra tillfällen då du/ni använder internet och mobilen för att organisera vardagen?	skulle du säga att internet och mobilen är viktiga hjälpmedel i vardagen? Kan det ersätta bilägande?	Sociala relationer?
20. Är det något mer du vill tillägga som jag inte tagit upp?		