The accessibility paradox
Everyday geographies of proximity, distance and mobility

Katarina Haugen
Preface

In a way, the preface is the most important part of a thesis, since it is the one thing ‘everyone’ actually reads. On a more serious note, the preface provides an opportunity to thank the people who have in different ways been part of the process leading up to this point. Although my initial plan was to keep the preface short and snappy and to adhere to the ‘none mentioned, none forgotten’ principle, this has proven very hard to do because the contributions of so many people simply have to be acknowledged. And to those of you who are not explicitly mentioned, rest assured that you are not forgotten.

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1. Introduction

Proximity. Distance. Mobility. Location. Not only are these basic concepts crucial in geographical inquiry; they are also highlighted in many other contexts where they have a tangible impact on people’s everyday lives. Daily life entails visiting places other than our homes – commuting to work, dropping children off at school, running service errands, engaging in leisure activities or social visits. Since most of these activities require our presence at certain places, accessibility to these places and activities is clearly a key issue.

This thesis is concerned with geographical accessibility in terms of proximity, distance and mobility from our homes to locations where different ‘amenities’ – work, schools, service functions, leisure facilities and social relations – are available. Accessibility is not only of key relevance at the level of individuals – through its importance for managing the activities of daily life and the utilization of resources as well as a dimension of life quality – it is also a crucial aspect of the functioning of society more generally in terms of welfare and social policy and in the planning and development of cities and regions, including localization policy, for instance.

The importance of accessibility is also expressed in recurring concerns and debate that accessibility to key amenities is developing negatively in certain places – rural areas in particular – with problematic consequences for those affected. These concerns and the associated efforts to counteract and ameliorate a negative development of accessibility leave no room for doubt that accessibility matters a great deal at both the micro and the macro levels, and as such constitutes an important topic of empirical research.

One of the ways accessibility is strongly linked to broad societal and policy issues is through its connection to sustainability. Patterns and issues related to transportation, mobility behaviour and spatial structure and development – all aspects of accessibility – play a pivotal role in attempts to steer the development of society in a more sustainable direction. However, there is also potential for conflicts of aims with regard to the different aspects of sustainability, if for instance the preferences, lifestyle patterns and behaviour of individuals, which may be seen as aspects pertaining to social sustainability, produce patterns of destination choice and mobility which are at odds with the ecological sustainability of society, for instance because of car dependency based on fossil fuel sources.

Geographical accessibility from home to desired amenities can be attained in two main ways: ‘accessibility-by-proximity’ or ‘accessibility-by-mobility’ (Figure 1). The location of our home vis-à-vis other places where we need or wish to go is an important prerequisite for accessibility to daily activities. Things that are located nearby are more accessible than those located at a distance, ceteris paribus. However, this does not necessarily imply that activity sites always need to be located in the close residential vicinity, since mo-
bility – i.e., the ability to travel beyond the local residential surroundings – is also a key aspect of accessibility. Reaching amenities is not just a matter of having them close by, but is also largely one of mobility, i.e., bridging the distance that separates us from them. However, this presupposes the absence of space-time constraints and the presence of mobility resources which enable the widening of geographical activity spaces beyond the local residential environment (Hägerstrand 1970). If such resources are lacking, the potential for accessibility may become severely circumscribed. If accessibility-by-mobility is thus limited, one must resort to accessibility-by-proximity.

In Sweden and internationally, development trends, which have long time pointed towards seemingly ever-increasing levels of personal mobility (e.g., Metz 2010; Banister 2011), also suggest that contemporary accessibility is to a large – and increasing – extent an issue of mobility, perhaps more so than of proximity. And yet, despite the increasing significance of daily mobility, the local geographical context retains its importance in most domains of life (Holloway & Hubbard 2001; Marchetti 2011). Indeed, even in the contemporary high-mobility regime, there is still a persistent value in living in geographical proximity to the places that matter most in everyday life. The advantages of proximity to, e.g., work, schools, service, leisure and cultural facilities and social relations is an oft-mentioned issue when people discuss the considerations underlying their choice of residential location, and this is also reflected in the intuitive attractiveness of slogans along the lines of ‘close to everything’, often used in the marketing strategies of actors such as real estate agents, housing developers and local politicians in towns and municipalities, who thereby hope to attract presumptive customers or residents.

Accessibility considerations are usually part and parcel of the residential location decisions of individuals and households. Therefore, this constitutes an important aspect of the background to the issues explored in the thesis, which takes the current residential location of individuals as a point of departure in the study of accessibility. However, people may hold different and incompatible accessibility-related residential preferences and attempting to reconcile them may turn out to be difficult, especially in households consisting of several people who may have different needs and preferences with regard to accessibility and residential qualities. For instance, dreams of quietness and beautiful natural scenery on one’s doorstep may clash with wishes for proximity to a city’s abundance of amenities, and people may attempt to attain, for instance, both rural and urban qualities in their choice of housing (Vartiainen 1989). It follows that trade-offs and prioritizing between different residential preferences are often necessary, and some qualities may have to be forsaken. However, these trade-offs may also result in satisfactory compromises, for instance when local pockets of low-density living environments with limited local access to, e.g., various services are embedded in a
dense regional structure offering an abundance of opportunities for those willing and able to be mobile.

Clearly, the choice of residential location generates important prerequisites for accessibility and destination choice in everyday life, since it comes with a ‘package’ of certain spatial relations to other places, some which we visit on a daily basis and others less frequently. Moreover, through its importance for accessibility, the location of our home effectively links together two different but interrelated forms of mobility: permanent or semi-permanent migration on the one hand, and daily mobility on the other. While restrictions on accessibility in daily life are relatively fixed in the short run, from a longer time perspective these conditions may change through events such as migration. Since residential relocation entails swapping one package of spatial relations for another, it has the potential of drastically changing one’s accessibility conditions, including the extent to which accessibility can be attained by means of proximity or mobility, respectively. A less radical strategy, which may for instance be a solution in response to changes in one’s daily activity schedule, is to increase one’s daily geographical range while maintaining the same residential location. Thus, both these forms of mobility – i.e., migration or residential adjustment on the one hand and daily mobility on the other – are highly relevant from an accessibility point of view and represent mobility strategies that may alter individuals’ accessibility conditions in different ways. Again, proximity, or what is available locally, is not the sole determinant of accessibility. Rather, accessibility in everyday life is a complex matter which depends largely on not only proximity but also mobility.

1.1. Aim

The overall aim of the thesis is to explore the importance for individual accessibility of proximity on the one hand and mobility on the other, and the relationship between the two. From this aim, the following research questions are specified:

- Which amenities do individuals consider important to live in proximity to, and how do these preferences correspond to actual settlement patterns?
- Has proximity to amenities from people’s homes increased or decreased over time, and what is the main explanation for these changes?
- What is the importance of proximity in actual destination choices?
- How is the extent of spatial access to amenities, locally and regionally, related to trip length?
The aim is pursued through three empirical studies, each exploring a different facet of the role of proximity and mobility in everyday life accessibility. The three papers have different foci – preferences, changes over time, and travel, respectively – but share an overarching theme: a focus on geographical accessibility from the point of view of individuals and their homes.

1.2. Key concepts and theoretical delimitations

The thesis revolves around the central concepts of accessibility, proximity, distance and mobility. Since these concepts – the accessibility concept in particular – may take on different meanings in the literature and are operationalized in different ways in the attached papers, a broad definition of what they imply in the overall context of the thesis is in order.

Accessibility is seen as the potential for reaching locations where amenities, i.e., employment, education, service, leisure activities and social contacts, are available. This definition follows the ‘ability to reach’ views of accessibility which are commonplace in the literature (e.g., Niles & Hanson 2003; Farrington & Farrington 2005). Accessibility is seen as an outcome of either locational accessibility; i.e., proximity (or for that matter its counterpart, distance) – or distance-bridging accessibility; i.e., mobility. Figure 1 is a simple representation of these two spatial (or, alternatively, geographical) dimensions of the accessibility concept which are at the centre of attention throughout the thesis: accessibility-by-proximity and accessibility-by-mobility.

The proximity and mobility dimensions are both key geographical constituents of accessibility. Either one or the other is necessary in order for individuals to be physically present at amenity locations. This presence, in turn, is implicitly assumed to be synonymous with having actual access to the amenities in question. However, it should be acknowledged without further ado that this is a simplification, because potential restrictions that influence de facto access are not explicitly taken into account in the empirical studies of the thesis. Thus, while ‘access requires more than proximity...
and/or mobility’ (Hanson 2000, p. 270), in the thesis accessibility is understood and defined as largely dependent on the basic spatial relation (Rene LAND 2000) between places of origin – in this case the location of the home – and amenity destinations, which may be reached by way of either accessibility-by-proximity or accessibility-by-mobility.

Measures of proximity and distance are used as straightforward representations of the physical spatial separation between locations. In the context of the thesis, these locations are individuals’ residential locations and the location of different amenity destinations (Table 4). If origin and destination are located near each other (i.e., if the friction of distance is low), then accessibility may in principle be achieved by means of sheer proximity. In cases where there is a more substantial distance between origin and destination, mobility (which may be either physical or virtual, although the focus of the thesis is on physical mobility1) is necessary to bridge the distance.

No specific assumptions are made concerning the ‘boundaries’ of when the spatial separation between locations becomes sufficiently large as to render accessibility-by-proximity insufficient and hence accessibility-by-mobility necessary. Such boundaries are of course not absolute, and the ‘switch’ between these different ways of attaining accessibility is more accurately represented as a continuum. In addition, all resource utilization in the surrounding environment may be argued to require some degree of mobility. Even if the distance to be covered is miniscule, it is still a distance that needs to be covered to reach amenity locations, and may be perceived very differently depending on varying individual characteristics and abilities.

While the operationalization of accessibility in the thesis implicitly assumes that geographical accessibility entails not only potential but also de facto access, this assumption is not made from a theoretical standpoint. On the contrary, the role that, e.g., non-spatial factors such as different kinds of individual resources and space-time as well as social restrictions play in actual access (e.g., Farrington 2007) should be stressed. Accessibility clearly depends on many factors which are not explicitly accounted for in the operationalizations employed in the thesis and which may modify the role of the spatial dimensions.

Accessibility depends heavily on individual resources and restrictions (e.g., Hägerstrand 1970). Lack of access to mobility resources, the potential impact of time-space constraints, the relevance of opening hours and qualifi-

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1 Mobility, i.e., ‘the ability of a person to overcome the friction of distance through space-adjusting technologies’ (Adams 1995 cited in Kwan 2002, p. 475) may occur in physical or ‘corporeal’ as well as virtual forms (Urry 2002). While ICT (information and communications technologies) has developed into an important component of accessibility, it has not downplayed the importance of the physical side of accessibility. On the contrary, spatial arrangements and configurations between origins and amenity destinations remain important (Hanson 2000; Janelle & Hodge 2000), and despite having access to technological means that may substitute for travel, people instead travel more (Urry 2003 cited in Farrington 2007).
cation requirements as well as other factors may restrain de facto access to resources, even though the location is otherwise expected to be spatially accessible. These circumstances are only empirically accounted for in the thesis to a minor extent, but nevertheless constitute key theoretical points of departure.

In the thesis, spatial separation is measured either in terms of Euclidean distance or as subjectively perceived and self-reported by individuals. Nearness and farness are relative concepts that are interpreted subjectively. While distance and proximity are conceptual opposites, there are no absolute boundaries that determine whether something is near or far. For instance, it should be recognized that different individuals may have different perceptions of nearness and farness, and the same distance may be interpreted differently by different individuals (e.g., Wiberg 1983; Witlox 2007). What is regarded as near or far – and what constitutes an acceptable distance – is also likely to vary depending on, for instance, the type of amenity in question and the importance ascribed to it by the individual. Any formal operationalization of what is to be regarded as near or far is therefore bound to be arbitrary to some degree.

The argument pursued throughout the thesis is that proximity (or distance) and mobility are of key importance because they constitute the main spatial dimensions of accessibility, and accessibility is largely a spatial issue. However, as mentioned, it is also important to emphasize that the spatial dimensions of accessibility addressed in the thesis are nevertheless a partial and delimited representation of the accessibility concept, which can be defined and operationalized in many different ways and also encompasses non-spatial aspects.

1.3. Sub-disciplinary position and relevance
The topics addressed in the thesis may be characterized as belonging to different geographic sub-disciplines; or rather, they sit at their intersection. There are connections to population geography as regards migration, residential choice and population distribution; to spatial and urban planning through a focus on the development of spatial structure and localization patterns; to geographies of daily mobility and transport geography; and to behavioural geography through an emphasis on individual choice and travel behaviour. As discussed above, there are also clear intersections between different forms of geographic mobility – daily and permanent mobility – since permanent residential choices form the preconditions for daily mobility patterns as well as tying into the issue of immobility. The thesis brings

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2 In addition, as pointed out by Miller (2004), the concept of nearness is applicable not only to space but also to time, and travel time may be regarded as more important than travel distance in many cases (e.g., MacEachran 1980 cited in Gatrell 1983).
together and adds to the body of research on issues of how we want to live, our actual living conditions and how these change over time, how we travel and how our travel is influenced by the characteristics of our residential surroundings, and the geographical prerequisites of everyday life. These issues are important for the understanding of people’s everyday life as well as for spatial planning and housing policy formation.

1.4. Outline of the thesis
The remainder of the thesis commences with an overview (Section 2) of the context of research into which the three empirical studies can be placed, including theoretical discussions as well as previous research in similar or related areas of inquiry. This includes space-time resources and restrictions and everyday life, issues related to mobility, destination choice, spatial structure and of course the concept of accessibility. This is followed by an overview (Section 3) of different characteristics of Sweden as a geographical context for the empirical studies in the thesis. Thus, the thesis is contextualized both theoretically and geographically. Next comes an account (Section 4) of the methodology and empirical data sources on which the papers draw and summaries of the three papers (Section 5).

Paper I explores individual preferences concerning proximity to amenities in relation to actual living conditions and residential satisfaction, and lays the groundwork for the following papers. Paper II analyses changes over time regarding proximity to amenities, and relates this to the development of travel behaviour. Paper III is an inquiry into the relationship between the local and regional supply of amenities on the one hand and travel behaviour on the other. Since the three papers build upon each other – the issues raised and the results of one paper have significantly influenced the focus and design of the next – they follow in chronological order in the appendices. Next (Section 6) follows a discussion focused on the key results and conclusions, related issues and potential areas of further research. Finally, a short Swedish summary of the thesis is provided (Section 7).
2. Theoretical research context

This section outlines the theoretical points of departure on which the thesis draws. Section 2.1. is focused on a discussion about the accessibility concept: its theoretical connotations, alternative measures and the different aspects and components which may be included in the concept. Next, the focus of Section 2.2. is on the spatial structure of amenity provision, including the locations of homes and amenities, variations in amenity supply across rural and urban areas as well as within cities, and trends in spatial development over time. In Section 2.3. focus is directed towards the importance of space-time resources and restrictions with regard to the activities of everyday life, and the social differentiation of mobility.

Section 2.4., the longest section, is centred on a discussion of the development over time of individuals’ daily mobility and spatial reach. It is subdivided into several subsections, each addressing a different set of aspects of research into contemporary patterns of daily mobility. These include the linkages between spatial structure and patterns of travel behaviour, including the importance of urban form and pertinent connections to the sustainability debate. Also, the concept of ‘excess travel’ is discussed in the context of normative ideas about ‘appropriate’ levels of mobility as well as the notion of travel as a derived demand. Issues related to the interconnections between different forms of mobility and the importance of local context and immobility are also emphasized. Another issue of central importance in the thesis concerns aspects which may influence destination choice, with specific regard to the importance of distance.

2.1. Aspects of accessibility

Depending on the context in which it is used, different notions of accessibility are highlighted and varying meanings, definitions and empirical operationalizations of the concept are employed. However, as argued by Weber (2006), the concept of accessibility requires certain conditions in order to be meaningful: the existence of spatially separated origins and destinations; a demand among people to move between these locations; and some form of impedance on the movement.

Neutens et al. (2008) identify two main strands in the conceptualization of accessibility where it is considered a property of either places or people. Whereas place-based definitions indicate the ease of access to a place from other places, person-based (i.e., individual) accessibility definitions reflect the ease with which people can reach certain potential destinations. A common trait among different definitions and in discussions of individual accessibility is an emphasis on the ‘ability to reach’ (e.g., Mitchell & Town 1973 cited in Cullinane & Stokes 1998; Kwan 1998; Niles & Hanson 2003; Far-
rington & Farrington 2005) some kinds of amenities. Definitions of accessibility usually express ‘the ease with which people can reach desired activity sites’ (Hanson 2009, p. 2). For instance, Handy & Niemeier (1997, p. 1175) define accessibility as the ‘potential for interaction /.../ the possibility of getting from home to a multitude of destinations offering a spectrum of opportunities for work and play’.

However, beyond this basic ‘reachability, obtainability, attainability’ (Hanson 2000, p. 268) component and the inclusion of some expression of distance or impedance (Couclelis 2000), there is hardly any consensus in the literature as to the precise definition and operationalization of accessibility. There are ‘a million or so notions of accessibility’ (Occelli 2000, p. 288), and perhaps it follows from this that there is no optimal ‘best approach’ to measuring the concept, since this depends on the specific purpose and other prerequisites (Handy & Niemeier 1997). Besides, operationalizations are always proxies for the targeted concept. There is scope for much variation within the broad definition when it comes to the specific issues and components of accessibility that are focused upon. This is of course related to the fact that the accessibility concept is used in several different research contexts and applications, ranging from broad theory to technical operationalizations.

Generally speaking, accessibility measures that are readily applicable and easy to interpret may be flawed from a theoretical point of view, whereas more complex measures may be difficult to put to use in practice (Geurs & van Wee 2004). Over time, the operational definitions of accessibility have developed towards increasing complexity as a result of methodological advancement (Neutens et al. 2008). Kwan (1998) identifies ‘conventional integral’ and ‘space-time’ measures of accessibility as two main approaches to representing individual accessibility. Integral measures evaluate accessibility for a single reference location and are therefore primarily appropriate for place-based accessibility analyses. However, employing these measures for the study of individual accessibility is considered inappropriate. Instead, the use of ‘space-time’ measures is advocated, since these measures are more sensitive to individual differences. This sensitivity comes from an emphasis in these measures on the daily activity schedule (including, e.g., trip-chains) and particular time-geographical constraints of individuals.

Accessibility is multi-faceted and depends on several factors. According to Janelle & Hodge (2000, p. 4), these include ‘physical proximity to opportunities, the technical capability to overcome distance /.../ and the ability to surmount barriers to entry’. A typology of accessibility (Geurs & van Wee 2004) can be based upon four key components of the concept. There is a land-use component that takes into account the supply and demand of activities at origin and destination locations, including the spatial distribution of amenities (‘opportunities’). Next, a transportation component takes into account various properties of the transport system that connects origins and
destinations. Furthermore, a *temporal* component captures time constraints in terms of both the varying availability of amenities throughout the day and the time available to individuals for activity participation. Finally, an *individual* component takes into account the ways needs, abilities and opportunities may vary between individuals and exert a major influence on their accessibility.

De facto access is by no means just a matter of spatial relations. Many other factors may exert an influence, for instance age, income, education, household characteristics and health issues (Geurs & van Wee 2004). Access to mobility resources is of course a key issue and can include private as well as public modes of transport. Space-time resources and constraints as well as the coordination of daily activity schedules are also issues of key importance. As argued by Östh (2007), accessibility can be understood in terms of what is reachable for the individual given such space-time restrictions. Furthermore, as pointed out by Hanson (2000; 2009), access to certain amenities may depend on formal requirements (e.g., possessing the appropriate education or skills required for a job). Access to information and knowledge of the amenity supply structure is naturally also of key importance, and may be hampered by things such as cultural or linguistic barriers. Thus, as argued by Farrington & Farrington (2005) accessibility – or, conversely, ‘poverty of access’ – depends not only on spatial separation but on other forms of ‘separation’ as well. This may include socioeconomic factors such as gender, age, income, ethnicity and other characteristics. This implies that even in the absence of, e.g., space-time constraints, other restrictions that are social in character – for instance, perceptions and cultural factors – may nevertheless limit de facto accessibility. One example of this is how a fear of violence may restrict women’s use of public space (Sandberg & Tollefsen 2010). Thus, accessibility may be seen as a social construction or social phenomenon to some extent and can depend, for instance, on gender, class and other factors.

### 2.2. The varying spatial supply of amenities

Colleoni (2011) argues that ‘styles of mobility and possibilities for access depend on the location of homes and the local distribution of opportunities combined, however, with the wealth of individual, family and relational resources’ (p. 128, emphasis added), thus summarizing several key aspects of accessibility. The spatial dimensions of accessibility are shaped by patterns of distribution of population (i.e., residential locations) and of amenity sites. These patterns generate specific conditions with regard to proximity (or distance). The possibilities for individuals to gain access to amenities through proximity or, alternatively, through mobility is thus heavily influenced by land-use patterns in terms of the spatial allocation of homes, workplaces and other amenities.
Intrapersonal accessibility is an important proxy for accessibility to amenities. As discussed in Farrington & Farrington (2005, p. 5), ‘the person living on top of a mountain, distant from other people, is unlikely to find a school, university, hospital and business centre located on the same peak to provide access to education, health and employment.’ In other words, the spatial distribution of amenity supply points largely follows the population distribution pattern; people being a proxy for other ‘things’, i.e., amenities (Lynch 1981; see also Figures 3–4 and Tables 1–2). Håkansson (2000) shows how intrapersonal accessibility in Sweden has increased dramatically – locally by nearly 100 times – from a historical (1810–1990) perspective. While increasing population size has been the most important factor behind the long-term increase of proximity to other people, growing daily mobility and reach formed the most important factor in the latter decades of the 20th century. Another factor is of course population redistribution; mainly urbanization.

From the above line of reasoning, and as argued in the classic Central Place Theory developed and modified by Christaller, Lösch and Isard, it follows that many amenities are part and parcel of a primarily urban infrastructure. A large and diverse supply of amenities is available only in places with large populations. While cities offer an abundance of numerous kinds of amenities, rural areas largely lack such urban facilities, and suburbs can perhaps be described as a middle ground (Feijten et al. 2008). For instance, Handy & Neimeier (1997) argue that access to a large variety of amenities is the whole point of living in metropolitan areas, since these are the only environments where such conditions exist. This also means that accessibility studies are often biased towards urban environments.

However, it has also been suggested (Farrington & Farrington 2005) that residents of rural areas adapt their accessibility aspirations to what can be deemed a ‘reasonable’ level of expectation, which may be much lower compared to what might be expected in major cities. Also, for rural dwellers who live within ‘an urban sphere’ (Cullinane & Stokes 1998) the lack of local access may naturally be at least partially compensated for by regional access through, e.g., ‘outshopping’ in conjunction with commuting (Paddison & Calderwood 2007; Möller 2009). However, accessibility conditions are of course also likely to differ across individuals, households and groups within rural areas depending on things like daily activity patterns and access to mobility resources. Also, ‘rural areas’ is a wide concept which obscures the

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3 This pattern is clear on the regional and local levels, although it should be mentioned that on the level of residential areas it is not uncommon for, e.g., service functions to be lacking despite relatively sizeable population bases.

4 The concepts of ‘urban’ and ‘rural’ are used throughout the thesis as denominators of different types of living environments in a general sense. However, it should be pointed out that despite their being discussed in these dichotomous terms there are no clear-cut distinctions between these geographical categories, and there is great scope for variation both within these rough categories and between the poles of the dichotomy.
variety present within this category (e.g., Moseley 1979; Andersson-Skog et al. 2011), including the prerequisites for accessibility, for instance in terms of location in relation to towns and provision of public transport.

The geographical differentiation of accessibility across a rural–urban continuum is something of an irrefutable fact. However, while accessibility is an important aspect of welfare (e.g., Wiberg 1983), equal access to services regardless of place of living (e.g., Hay 1995) is not a feasible political goal, as stated in official reports (SOU 2000). Simply put, there are ‘necessary limits to resource allocation’ (Farrington & Farrington 2005, p. 5). Both official reports and research have reported that the development of accessibility is characterized by a trend towards fewer but larger and more widely spaced units with regard to, e.g., service provision. In many rural areas, trends towards deteriorated accessibility have accentuated the ‘rural accessibility problem’, a relatively general phenomenon and as such not unique to the Swedish context. For instance, grocery store and petrol station shutdowns have repeatedly been pointed out as a growing problem (Moseley 1979; Wiberg 1983; Nutley 1998; Swedish National Rural Development Agency 2005; Woods 2005; Amcoff 2009a; Swedish Agency for Growth Policy Analysis 2009).^5 It could even be argued that limited access to service functions is one of the key defining features of rural areas (Pettersson 2002).

Not only the location of amenities but also the specific character of the supply they offer may of course also change, for instance in response to changes in the surrounding supply structure such as the opening of new amenities or the shut-down of previous ones. For instance, a decrease in proximity to the nearest option (e.g., the closing of a corner shop) may perhaps be partially compensated for by an increase in the range of consumption items at a nearby petrol station and the opening of a new hypermarket within convenient driving distance.

Besides the obvious differences in accessibility between rural and urban living environments, there are also differences within and between cities with different characteristics. On an intra-urban scale, residents of parts of metropolitan areas can also be isolated to a considerable extent with respect to nearby access to amenities (Hägerstrand 1987), e.g., as in the case of ‘food deserts’ lacking food retail provision (Wrigley 2002). Cities vary with respect to their degree of centrality, again as explained by Central Place Theory. Whereas major central places serving as commercial centres for large potential consumer populations within the city and in the surrounding ‘umland’ are able to support higher-order goods and services, only lower-order functions such as daily consumption are available in towns with smaller popula-

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^5 However, in this context it is worth mentioning one of the findings of Paper II, namely that the Swedish rural accessibility problem is not so much an issue of negative change as one of persistent differences across different geographies over time.
tions and hence smaller purchasing power (Christaller 1966; Lowe & Moray-das 1975; Wheeler et al. 1998; Næss 2006b).

The development of the spatial structure of society may exhibit different trends on different spatial scales so that processes of dispersion and concentration may occur simultaneously, e.g., on the regional and local scales (Håkansson 2000). The spatial structure of cities and regions is a key precondition for the accessibility conditions of the resident population. On the intra-urban scale, there has been a general trend towards an increasingly dispersed and to varying degrees sprawling urban structure in many Western cities for several decades, encompassing residential as well as, e.g., commercial forms of land use, and strongly intertwined with the development of daily mobility, particularly car use (Anas et al. 1998; Filion et al. 1999; Dieleman & Wegener 2004; Kasanko et al. 2006). However, there have been simultaneous processes of regional concentration of, for instance, retail functions, which are becoming increasingly concentrated to regional population centres (Bergström 2003; Bergström et al. 2004; Woods 2005).

Spatial accessibility conditions are not solely a matter of the amenities provided locally within close proximity to home, but also of those amenities located outside the residential locality but still within reach (cf. Handy 1992, Fotheringham et al. 2000; Schmidt & Courant 2006; Li et al. 2009). Residents of places where the local provision of amenities is limited may benefit from amenities available in, for instance, regional population centres located within reasonable geographical reach. Hence, local and regional accessibility may be regarded as substitutionary or complementary to some extent (Handy 1992). Also, observed increases in travel distances over time, and changes concerning people’s mobility choices, which appear to be shifting increasingly from local towards more distant locations (Frändberg & Vilhelmsen 2011; Scheiner 2010), possibly suggest that the importance of local accessibility may be diminishing relative to the importance of regional accessibility.

2.3. Resources, restrictions, norms and activities in everyday life

Although not explicitly addressed in the three papers of the thesis, time-geography – with its emphasis on the key notions of space-time resources and restrictions – occupies a cornerstone position as a theoretical point of departure in any study focused on accessibility in an everyday life context. Time-geography encompasses a theory and methodology for understanding the interplay between individuals and the surroundings of which they are part, specifically the ways actions and movements are influenced by certain constraints which limit the opportunities of individuals (Holm et al. 1989). The theory captures the basic ‘rules’ and prerequisites for human activities in terms of physical constraints and resources, the need for interaction and
coordination with others, dependence on things like facilities’ opening hours and the factors which shape the boundaries of individual activity spaces. Thus, it is certainly a matter of accessibility.

Hägerstrand (1970) illustrates how the scope for individual action during, for instance, a 24-hour period can be defined as space-time prisms. Participation in different activities may be hindered by ‘prohibitive time-space locations’ (p. 151) of the destinations involved. The role of access to transportation technologies in extending the boundaries of the prisms is also highlighted, since the speed of movement that is available defines the edges of individuals’ potential paths in time and space. However, the scope for individual action is constrained through the inhibiting effects of capacity, coupling and authority restrictions (Hägerstrand 1970; Holm et al. 1989; Lenntorp 2004). In addition to these tangible factors, individual accessibility may also be influenced by people’s subjective views of their potential reach (Lenntorp 2004). Moreover, Hanson (1998) suggests that the conventional focus on physical geographic context should be complemented with a focus on the social geographic context, which is argued to be important for, e.g., access to information communicated through social networks.

In a time-geographical ‘theory of action’ – one of many extensions of Hägerstrand’s original theory – the concepts of ‘want’, ‘can’ and ‘ought’ are used for making visible the importance of different aspects of individual choice: individuals’ wishes and preferences (‘want’); their access to resources and thereby their ability to act according to their wishes (‘can’), and social/societal norms (‘ought’). Thus, ‘want’ is an endogenous property of the individual, ‘ought’ is a property of the exogenous surroundings, and ‘can’ is influenced by endogenous as well as exogenous factors (Holm et al. 1989). Also, the configuration of activity sites and the prerequisites for daily activity patterns – the ‘can’ dimension – are not necessarily fixed and can be altered, either through a change of residential location or through changes at the chosen activity sites.

These concepts may be applied as structuring principles in the analysis of individual choice at different levels of scale, and with regard to different types of choices, including anything from rather mundane daily choices to potentially life-altering decisions related to migration, education, family formation or dissolution etc. As for the context of the thesis, the notions of can/want/ought can be used as a way of understanding individual destination choice. For instance, an individual may wish (‘want’) to visit an amenity located at some distance from her/his home, and may also choose to do so provided that s/he has access to the necessary mobility resources, e.g. a car, to reach this activity site (‘can’). However, the individuals’ choice of activity site may potentially be at odds with the normative ‘ought’ dimension. If there are, e.g., similar service facility options located in the residential vicinity and are therefore reachable by walking or biking, then from the point of view of a
social norm concerning the need to adapt to more sustainable patterns of mobility and transportation – not least in terms of reduced car dependency, fossil-fuel reliance etc. – this individual may perhaps be expected to choose the nearby option rather than to engage in what may be perceived as ‘excess[-ive]’ travel.

One of the fields in which time-geography has been influential is research into people’s everyday life, where attention is drawn to ‘ordinary, routine and repetitive aspects of social life’ (Pinder 2009, p. 223) and focus is largely on daily activities that are often taken for granted (Ellegård 1999). This is another field of research which lies at the core of the thesis, given the emphasis on the home and on amenities associated with (mostly) daily activities. Yet, as in the case of time-geography, it is only briefly discussed in the empirical research papers. Daily activities are bound in time and space to varying degrees – whereas some ‘fixed’ activities presuppose individuals to be present at specific locations at specific times, other activities may be highly flexible. This is partly a reflection of the differences in the degree of essentialness of different activities, ranging from the more or less ‘mandatory’ to the wholly discretionary (Hägerstrand 1987; Vilhelmson 1999a; Ellegård 1999; Schwanen et al. 2008). The need for space-time coordination is of course particularly pronounced concerning shared activities; i.e., activities involving more than one person (Miller 2005).

Activity locations are linked together through daily travel (Vilhelmson 1999a). Certain fixed activities often function as ‘space-time anchors’ or ‘activity pegs’ because of their importance for the organization of other, more flexible activities (Lee & McNally 2003; Miller 2005; Schwanen et al. 2008). Among the spatial anchors, the residential location is one of a kind; a key ‘habitat’ (Hägerstrand 1987) or ‘pocket of local order’ (Hägerstrand 1985; Ellegård 2001) from which we undulate back and forth (Frändberg et al. 2005). Home is a place that is universally relevant, and a place to which we keep returning (‘the principle of return’; Lenntorp 1976 cited in Ellegård & Vilhelmson 2004; Hägerstrand 1985, 1987; Ellegård 2001). However, although home is where most basic everyday activities are anchored (Ellegård & Vilhelmson 2004), the dwelling is not the only origin of daily mobility to activity sites. In particular, the workplace is a key halt in the daily mobility and the organization of daily activities for many people (Vilhelmson 1999a; Hedberg 2005) and may be just as important in the coordination of activities if, for instance, the commute to work is combined with other activities (cf. Kwan 1998). Together, home and work are the key pockets of local order in many people’s everyday lives (Ellegård & Vilhelmson 2004).

Individuals and households have different activity patterns and mobility resources (notably car access), and consequently different needs and prerequisites for accessibility (Hägerstrand 1987; Ben-Akiva & Bowman 1998, Weber 2003, Swedish National Rural Development Agency 2004, Zondag &
Pieters 2005, Devisch et al. 2009; Scheiner 2010). In addition, the accessibilities that are relevant to different individuals vary depending on their specific needs and wants. It follows that the residential location of a household consisting of several members, all with their own specific daily activity schedule, will provide different accessibility conditions for each of them (Ben-Akiva & Bowman 1998; Devisch et al. 2009). If this argument is extended, it also illustrates the importance of considering people’s different needs and uses of resources in different communities within spatial planning policy and practice (Rowland 2003).

Concerning mobility resources, these may include both ‘individual access resources’ (e.g., income, driver’s licence, possession of a vehicle) and ‘local access resources’ or ‘mobility infrastructure’ (such as the presence of public transportation in the residential area) (Colleoni 2011, p. 126–7). The advent, diffusion and adaptation of the spatial fabric of society to transportation technologies has led to increased differences between individuals and groups with varying access to these resources. As argued by Tobler (1999, cited in Miller 2004), contemporary geographies of accessibility are complex. Whereas the scope for mobility was largely homogenous in times of ‘primitive’ transport technologies, the potential differences have since grown drastically (Hägerstrand 1970). Lacking access to mobility resources may thus be a risk factor for social exclusion (e.g., Farrington 2007; Doi et al. 2008).

The social differentiation of mobility (Hägerstrand 1970, 1987; Knowles 2006; Colleoni 2011) ties into issues such as the meaning and impact of mobility deprivation in societal structures which have been adapted to, and therefore presuppose, high mobility (e.g., Cass et al. 2005). Clearly, opportunities for and use of, for instance, public services are negatively influenced for those lacking physical accessibility to service provision locations (Pacione 2005), which is suggestive of how accessibility may be an important indicator of quality of life (Dijst & Kwan 2005; Doi et al. 2008; Hanson 2009), participation in society (Janelle & Hodge 2000), social inclusion and social justice – in short, welfare (Farrington & Farrington 2005). Conversely, the absence of the means for being mobile may be seen as an expression of social exclusion. For instance, lack of car access may entail a lower level of access to important amenities, including employment, services, leisure activities and social relations (Hägerstrand 1987). As mentioned, there is concern that the present spatial development of cities will result in increased travel (in terms of time or distance) for the purpose of reaching services. In particular, there may be a risk that mobility-deprived or otherwise vulnerable groups may be at risk of being excluded from the city’s assets and opportunities (Gallez et al. 1997; Grieco et al. 2000; Mignot et al. 2001; Cass et al. 2005 cited in Colleoni 2011).
2.4. Daily mobility

Mobility over increasingly wide distances has, over time, developed into a behaviour that is embedded in people’s everyday lives and lifestyles, and built into the spatial fabric of the surrounding society in many Western countries (e.g., Sager 2006; Frändberg & Vilhelmson 2011; Colleoni 2011; Banister 2011). The dominating trend concerning daily mobility has long been one of steady growth. In the Swedish context, the average distance travelled on a daily basis has increased continuously, stretching everyday activity spaces and shifting the geographical emphasis increasingly towards the regional (rather than the local) scale. Compared to 1978, by 2006 the average trip length for all travel purposes had increased by 50% – the increase being particularly strong for leisure trips – and most activities were performed outside the residential vicinity (Frändberg & Vilhelmson 2011). Travel in a more general sense – all passenger travel, of which daily mobility is a subset – is also expected to continue growing, at least in the near future, according to projections stretching as far as the year 2020 (SIKA 2005).

While prevalent in much contemporary geographic discussion and research, increasing daily mobility is not a recent phenomenon but rather a process which displays historical continuity. From a long-term perspective, the ability to travel to distant locations has undergone dramatic changes which have fundamentally altered the prerequisites for daily activities (Håkansson 2000). This includes, in recent decades, the development of information and communications technologies (ICT), which enable us to carry out many activities virtually (Cairncross 1997; Kwan 2002; Urry 2002; Vilhelmson & Thulin 2008). Historically, the growth in daily mobility stretches back at least to the advent of transportation technologies, which enabled a spatial separation of homes and workplaces and left very tangible imprints on urban form (Newman 1995; Hansson 2003; Pacione 2005; Colleoni 2011), and onwards to the current issues of car dependency, the geographical extension of labour markets etc. (Vilhelmson 2007; Sandow 2011).

Compared to the situation 150 years ago or so, daily mobility has indeed undergone a revolutionary change. For instance, today the commute to work may easily entail covering a one-way distance of tens of kilometres by car or public transportation, whereas a manageable one-way distance was perhaps only a few kilometres on foot historically, e.g., in the late 19th century. Thus, the accessible geographical range in which jobs and other amenities can be sought and chosen has expanded manifold (Hägerstrand 1970; Lindgren et al. 2002; Urry 2011). A turning point in the development of daily mobility in the Swedish context occurred around 1950, since which it has increased dramatically (Vilhelmson 1999a). This development was naturally strongly intertwined with the advent of mass car ownership on an international scale (Ribeiro et al. 2007 cited in Freudendal-Pedersen 2009; Scheiner 2010). The
car is also projected to consolidate its dominant position in passenger travel at least until the year 2020 (SIKA 2005).

It is the geographical distance covered on a daily basis, rather than the time spent travelling, that has increased; a phenomenon captured by the theory of constant Travel Time Budget (TTB) (Vilhelmson 1990 cited in Vilhelmson 1999a; Mokhtarian and Chen 2004; Zondag & Pieters 2005; Metz 2008). Aggregate travel time tends to remain fairly constant\(^6\) across populations and over time, despite developments in transportation technology which would enable travel time cuts. Thus, it follows that travel time reductions are used to increase geographical reach and travelled distance rather than being translated into smaller TTBs (e.g. Bieber et al. 1994 cited in Salomon & Mokhtarian 1998; Metz 2008, 2010). Mokhtarian & Salomon (2001) even argue that there may be such a thing as an optimal TTB: an ideal amount of travel that people wish to undertake, and which would lead them to wish to increase their time spent travelling if it falls short of the ideal TTB, and vice versa. Sweden is no exception to the phenomenon of constant TTB – daily mobility occupied similar amounts of people’s time at the beginning as at the end of the 20\(^{th}\) century. However, given the diffusion of access to fast modes of transport, the distance covered within the same time frame increased dramatically (SIKA 1998). In this sense, the importance of distance has diminished (Vilhelmson 2005).

However, in this context it should be mentioned that contrary to the many indications that travel is generally on the increase, Metz (2010) observed a recent reversal of the long-term trend of increasing average travel distances (despite relatively constant TTB) in Great Britain. A possible interpretation of this phenomenon is that the demand for daily travel may have reached a point of saturation, due to ‘diminishing marginal utility’ of additional amenities in a situation where individuals already have a broad choice of destinations within reach; a scenario that may be on the path ahead for many other advanced economies besides Great Britain.

2.4.1. The relationship between spatial structure and travel behaviour

There is a substantial body of research literature concerned with different aspects of how spatial structural factors – not least urban morphology – are interrelated to patterns of travel behaviour in terms of, e.g., travel distance, travel time and travel mode. For instance, as discussed above, the current high-mobility regime is inextricably intertwined with the development of car travel, which has altered the spatial organization of society as well as people’s lifestyles (Sager 2006; Vilhelmson 2007; Frändberg & Vilhelmson 2006). However, van Wee et al. (2006) have observed TTB increases over time in the Netherlands.
This development may be interpreted as a spiral in which increasing mobility leads to adaptations of spatial structure, which in turn generate even more mobility, and so on (Vilhelmson 1999b). For instance, processes of urban decentralization and associated issues of, e.g., car dependency are difficult to reverse (Banister 2008), not least because the structure of the built environment tends to be fixed and inert to a substantial degree. Another example is the variation in accessibility conditions across different geographies, not only with regard to amenity supply structure, as discussed above, but also with regard to, e.g., mode choice. The accessibility of urbanites is generally more reliant on public transport and to a lesser extent on travel by car compared to rural areas (e.g., Sandow 2008), although there may also be variations across different cities depending on the characteristics of the existing transport provision and infrastructure.

While the concept of urban sprawl can be defined in many different ways (Galster et al. 2001), it is often used with reference to low-density, and often scattered, development in suburban or peri-urban locations, and the corresponding spatial expansion of cities. Sprawling urban structures may generate an augmented need and demand for mobility, because longer trips are required in order to participate in different activities when land uses such as jobs as well as commercial, service and leisure functions are dispersed within the city (Cooper et al. 2001; Galster et al. 2001; Horner 2002; van Wee et al. 2006; Colleoni 2011). Ewing (2008, p. 521) goes as far as to equate urban sprawl with ‘poor accessibility of related land uses to one another’, which is a situation brought about by insufficient concentration or an inadequate mix of different land uses. Whereas workplaces and other amenities tend to concentrate in central city districts, residential land uses are largely found in locations on the urban periphery (Martinotti 1999; Schwanen et al. 2001; Stead & Marshall 2001; Näss & Jensen 2004; Näss 2006 cited in Colleoni 2011). In urban structures like these, accessibility may become increasingly dependent on mobility – not least by car – rather than proximity (Hanson 2004), since people typically must travel farther from their homes to reach amenities that are increasingly spatially separated (Cullinane & Stokes 1998; Galster et al. 2001).

Urban sprawl is frequently interpreted as an unsustainable urban form, not least because of its proneness to car dependency. In contrast, a more sustainable city – where trip lengths are shorter (e.g., Stead & Marshall 2001; Gaffron et al. 2007; Ewing & Cervero 2010; Scheiner 2010) – may be characterized by relatively large population numbers (preferably at least 50,000), ‘medium’ population density (i.e., at least 40 inhabitants per hectare), mixed (as opposed to single-type) land use patterns and an emphasis on development oriented towards public transport (Banister 2005; 2006 cited in Banister 2008). Such a city may provide ‘close proximity of everyday facilities’ and also, when located in hierarchical polycentric urban regions,
‘high levels of accessibility to higher order facilities’ (Hall & Pain 2006 cited in Banister 2008, p. 73). In the geographical context of a polycentric urban region, van Ham et al. (2001; cf. Stegman 1969; Prillwitz et al. 2007) found that suburban locations between major urban areas may actually offer better labour market accessibility than the urban core.

Although it is commonly assumed that urban areas with large populations and high population density offer a higher degree of accessibility than smaller urban areas, Vilhelmson (2005) found that this is not necessarily the case. At least concerning Swedish urban areas, the relationship is not linear. ‘Middle-sized’ (population 50,000–200,000) towns were found to require less daily mobility of their inhabitants, and may hence be regarded as more accessible compared to both the large metropolitan areas and smaller towns. However, a review of empirical research addressing the relationship between settlement size and travel patterns suggests that the relationship exhibits a certain complexity, and also appears to vary somewhat across geographical contexts (Banister 2005).

Despite the tendencies towards urban sprawl and spatial dispersion of land uses, high density and mixed land use are still present in many European cities (Scheiner 2010). These urban features are among those most commonly associated with sustainability because they are seen as enabling, e.g., short trips and a high prevalence of walking in the daily lives of the population, because of the proximity between residential land use and other forms of land use and associated activities. Based on a comprehensive literature review, Ewing & Cervero (2001) found that trip lengths do indeed tend to be shorter at locations where the land-use features include high density, mixed land use and high ‘accessibility’. However, Meurs & Haaijer (2001) have shown that the effect of spatial structure may differ depending on the type of travel in question: whereas trips with the objective of shopping or recreational or social purposes were clearly influenced by spatial structural aspects, commuting trips were almost solely determined by individual characteristics.

Inner-city residents have frequently been found to travel shorter distances and rely less on the car compared to residents of, e.g., suburban areas. A standard explanation for this is the high concentration of amenities in the urban core (Næss 2006b). In addition, car use in the city is affected by the fact that parking space is usually limited and comes at a relatively high cost. It is also possible that self-selection processes exert an influence (e.g., Meurs & Haaijer 2001), so that people who are less inclined to drive choose inner-city residential locations to a larger extent than those who are more inclined to drive. It follows that differences in patterns of travel behaviour are not exclusively the result of spatial structure. For instance, Scheiner (2010) found that increased car use (in Germany 1976–2002) – which was less pronounced in major cities than in smaller towns and rural areas – was partially
due to spatial structure and partially due to residential self-selection (cf. Salomon & Mokhtarian 1998) into urban areas of households with relatively low car use. Nevertheless, in their review Ewing & Cervero (2001) found trip length to be largely a function of the nature of the built environment, and only to a lesser extent of the socioeconomic characteristics of the travellers, which suggests that the influence of self-selection might be rather limited.

Travel is traditionally seen as a function of the attractiveness of destinations on the one hand and of the friction of distance on the other. The latter is of course closely related to the spatial separation between activities, which is in turn partly a result of spatial planning (Næss 2006b). Different approaches in planning may substantially influence the distances people must bridge to reach the nearest available amenities (Scheiner 2010), and policies of urban development and design can be used as a means to steer travel patterns in specific directions (Stead & Marshall 2001). The abovementioned principles of high density and mixed land use are prevalent in contemporary planning approaches such as the ‘New Urbanism’, which advocates a principle of proximity in the sense that most needs and activities of daily life should be reachable within, for instance, a five-minute walk (Kunstler 1996 cited in Fainstein 2003, cf. Maas 2003). However, the success of these planning principles is based on certain assumptions about individual behaviour, which may or may not be fulfilled. For instance, people will not necessarily choose a residential location as near as possible to their workplace or always utilize the nearest available service amenities.

Also, to this must be added the possibility that travel is perhaps not just an issue of need but also to some degree of ‘intrinsic desire’ for mobility (Salomon & Mokhtarian 1998; Mokhtarian & Salomon 2001; Jain & Lyons 2008), and hence that there is a ‘difference between the need to travel and the demand for travel’ (Breheny et al. 1998 cited in Banister 2005, p. 108, emphasis added). This notion – related to the ‘want’ aspect of individual choice (Holm et al. 1989) – may hamper the efficiency of attempts to improve accessibility and reduce (especially car-borne) mobility through changes to spatial structure and land-use patterns such as heightened proximity to potential destinations (e.g., Banister 2008; Frändberg & Vilhelmson 2010). At least within some mobility-inclined segments of the population (Salomon & Mokhtarian 1998; Handy et al. 2005), people may be reluctant to cut back on their travel. For instance, a modal shift in favour of the car is not necessarily a function of changes to the spatial structure but may also be brought about by realized individual preferences (Bahrendberg 1997 cited in Scheiner 2010). The possibility that travel may be something individuals do not necessarily seek to minimize is key to the idea of excess travel, which is discussed in the following.
2.4.2. 'Excess travel' – overconsumption of mobility?

According to a conventional view of travel, individual mobility in everyday life typically aims to fulfil the purpose of either generating income, maintaining the household or carrying out leisure activities (Salomon & Mokhtarian 1998). Thus, travel is understood as deriving from the demand to reach activity destinations associated with, e.g., work, shopping or recreation (e.g., McFadden 1974; Hoyle & Knowles 1998; Metz 2008). Although it is usually accepted (e.g., Cao et al. 2009) that travel is generated primarily by individuals’ needs and wishes to visit spatially separated activity sites, the ‘negative’ view of travel as a disutility is increasingly challenged (e.g., Jain & Lyons 2008). A proposed notion of an intrinsic desire for or utility of travel may be regarded as the opposite of the derived demand paradigm. However, so far there is only ‘suggestive’ (rather than ‘conclusive’) empirical support for the notion of an intrinsic utility of travel (Metz 2008). As a kind of middle ground between these positions, travel can be seen as an activity like other activities, and can be either an end in itself or derived from the demand for other activities (Banister et al. 2007). However, one possibility is that the increase in leisure travel may have brought about a change in how travel is viewed towards a more positive valuation and a weakening of the ‘derived demand’ aspect of travel (Mokhtarian & Salomon 2001; Schlich et al. 2004; Loo & Chow 2006; Mokhtarian et al. 2006 cited in Banister 2008).

Some commentators have suggested that the contemporary mobility – or even ‘hypermobility’ (Adams 2000) – trends partly take the expression of a supposed overconsumption of mobility, conceptualized as excess travel (e.g., Salomon & Mokhtarian 1998; Mokhtarian & Salomon 2001; Redmond & Mokhtarian 2001; Handy et al. 2005). This concept targets travel steered by rationales other than travel minimization, thus challenging conventional travel behaviour theory. Defining ‘excess’ travel implies trying to distinguish between ‘necessary’ and ‘chosen’ travel (Handy et al. 2005). This usually entails the inclusion of a spatial component and an emphasis on the discrepancy between observed travel on the one hand and a theoretical (minimum) level of travel on the other (Barr et al. 2010). Defining the latter requires due consideration of individual and household choices concerning residential location as well as the location of workplaces and other activity sites (Handy et al. 2005). The concept of excess travel may refer to ‘visiting more distant destinations and/or taking longer routes than is required’ (Cao et al. 2009, p.234) and other cases where there exist alternatives that require less in terms of distance, time, cost or effort (Barr et al. 2010; cf. Mokhtarian & Salomon 2001). The choice of such ‘excessive’ alternatives may be due to a wide range of factors, ranging from things like a lack of knowledge of the opportunity structure (e.g., the existence of closer alternatives) to mobility-inclined lifestyles and attitudes towards travel, and the attractiveness of distant alternatives (Salomon & Mokhtarian 1998).
Plausibly, there may be both pros and cons of too much as well as of too little mobility and, conversely, fixity (Hägerstrand 1987). From an ecological sustainability point of view, excess travel could be interpreted negatively since it is associated with high levels of mobility, with associated emissions etc. Yet, the concept of excess travel is also somewhat problematic because of its normative undertone. According to Sager (2006), the value of mobility extends beyond its instrumental function, i.e., it allows for reaching a larger and more diversified choice set. There are also other values of mobility, for instance a notion of freedom. In addition, there may also be a value of mobility per se; of having the possibility to travel if one so chooses. Moreover, Urry (2002) argues that because ‘co-presence’ is a necessity for much social interaction, a ‘good society’ is one where ‘coerced immobility’ (or mobility, for that matter) and the associated social exclusion is minimized and the potential for people to be co-present maximized. Thus, from a social sustainability point of view, the ability for individuals to freely choose their level of mobility can be seen as a desirable goal.

Moreover, any attempt to distinguish a ‘necessary’ level of mobility from an ‘excessive’ level (or to identify a ‘proper amount’ of mobility (Hägerstrand 1987)) is bound to be problematic. For instance, an individual’s destination choice may be interpreted very differently by an outside observer and by the individual her-/himself – as an outcome of choice or as a necessity (Handy et al. 2005). Moreover, different mobility strategies such as trip-chaining and multipurpose trips, as well as the possibility of multiple trip origins (Arentze & Timmermans 2005; Primerano et al. 2008), need to be taken into account in attempts to measure excess travel. Otherwise, a destination choice that is perhaps not the nearest option, but that provides proximity to other desired activity sites, may be incorrectly interpreted as spatially ‘inefficient’ (Horner & O’Kelly 2007). A typical example is that individuals may opt for amenities which are not the closest considering the origin of the trip, but are in ‘the right direction’ i.e., en route to the subsequent stops of the trip.

The notions underlying the concept of excess travel are akin to the mismatch between highly simplified theoretical assumptions regarding individual behaviour on the one hand and empirical ‘reality’ on the other. For instance, the idea of ‘optimizing’ or ‘economic and spatially rational’ behaviour has often been found to be at odds with the actual characteristics of spatial decision-making processes and choices, which are influenced by, e.g., preferences and attitudes as well as other factors that are not necessarily economically ‘rational’ in a strict sense and therefore result in outcomes other than the ‘least effort/least cost/least distance’ options (Golledge 2008, p. 241).
2.4.3. Interconnected mobilities and sedentarist perspectives

The themes addressed in the thesis as a whole and in the three papers may all be seen as addressing the interconnections between different types of spatial choice. Throughout the thesis, the spatial point of departure is the residential location of individuals, which may be the outcome of long-distance migration, local residential mobility or housing adjustment – or of staying in the same place. In addition, there is a strong emphasis in the thesis on the amenities people visit in an everyday life context and which are subject to processes of destination choice. These different types of spatial choice processes, occurring on different ‘levels’, are interconnected in the sense that current residential location is a key prerequisite for many daily destination choices.

Migration causes a reorganization of daily activities since the ‘hub’ of the individual’s daily space-time prism is repositioned (Fischer & Malmberg 2001; Lundholm 2007a). Migration and residential mobility tend to be associated with life course transitions as well as the development of the professional and educational careers of the household members (e.g., Boyle et al. 1998; Mulder & Hooimeijer 1999 cited in Dieleman 2001; Fischer & Malmberg 2001; Prillwitz et al. 2007). For instance, residential and work location choices are often assumed to be interlinked (Guiliano & Small 1993; Kim et al. 2005). Residential preferences with regard to, e.g., the respective qualities of the dwelling and its surroundings (e.g., Filion et al. 1999; Zondag & Piek 2005; Kim & Morrow-Jones 2007) are related to various factors including life course issues and socioeconomic characteristics (e.g., Kim et al. 2005; Niedomysl 2008) as well as social and family ties (Stjernström 1998; Lundholm et al. 2004; Mulder 2007; Hjälm 2011).

Despite contemporary trends towards an increasing shift of the spatial emphasis of our daily lives from the local to the regional level (Frändberg & Vilhelmsen 2011; Scheiner 2010), most people still live largely local lives. Many activities and movements revolve around certain local, ‘everyday’ places, whereas more distant locations are visited more occasionally (Holloway & Hubbard 2001). An adjacent line of argument – contradicting the notion that the ICT ‘revolution’ is causing a ‘de-spatialization of interaction’ or ‘location-free existence’ (Mitchell 1995 cited in Hanson 1998, p. 242) – is that although ICT may relax space-time constraints and thus increase the flexibility of activities (Kwan 2002), proximity in terms of co-presence in space and time is still a key prerequisite for most forms of human interaction (Urry 2002; Urry 2007 cited in Engelbrekt 2011).

As mentioned, individuals’ current residential location sits at the intersection between different forms of mobility. It may be argued that a residential choice involves not only the dwelling itself but also a ‘package of goods’ (Montgomery & Curtis 2006), including certain spatial relations to other places. The residential location is a key prerequisite for everyday life accessi-
bility conditions, and is thereby closely intertwined with daily mobility patterns (cf. Prillwitz et al. 2007). The current residential location is also the outcome of residential choice processes that may sometimes involve migration over longer distances, but more often short-distance residential mobility or even more often staying; i.e., immobility.

However, mobility and immobility can be argued to presuppose each other since, for instance, mobility and the associated widening of daily activity spaces enable residential stability and immobility (Hägerstrand 1987). A pertinent example of the relationship between different forms of mobility is that between commuting and migration (e.g., Eliasson et al. 2003; Lundholm 2007b), two types of spatial phenomena which are often interpreted as alternative mobility strategies (e.g., Fransson 1991; Hedberg 2005). It has been suggested that migration is often substituted with commuting (Fransson 1991 cited in Hedberg 2005; Green et al. 1999; Westerlund 2006; Lundholm 2007b; van Ham & Hooimeijer 2009); instead of migrating, people prefer to commute over longer distances. This may be seen as a welfare gain in that it allows people to choose rather freely where and how to live whilst still being able to manage their daily activities through the expansion of their daily geographical range beyond the local level. This phenomenon may be assumed to contribute to the current high levels of daily mobility as well as the low rates of migration, and shows how different forms of mobility may to some extent be seen as communicating vessels. The growth in daily mobility may be seen as a prerequisite for, as well as a consequence of, the tendency towards increasing sedentariness with regard to migration.

Internal (interregional) migration rates are relatively low in Europe, for instance compared to the US, and have also shown a declining trend since the 1960s and 1970s in many countries (Fischer et al. 2000). The general preference is to stay rather than to move. From one year to another, most people retain their residence at the same place. Of the moves that do occur, most have the character of local residential mobility. In 2008, for instance, only a third of all internal migration in Sweden involved the crossing of a municipal border (Statistics Sweden 2009). Thus, it may be argued that most people neither move nor consider moving (Fischer et al. 2000) because of, e.g., ties to work and family which, with increasing duration of residence, become increasingly embedded in local contexts (Fischer & Malmberg 2001).

It can be argued that the contemporary mobility trends are somewhat paradoxical (Frändberg et al. 2005). On the level of everyday life, as mentioned, there has been a growth in daily mobility. On the level of more permanent (or semi-permanent) mobility, the situation is rather different. On this level, the dominating trend – and a basis for the organization of society – is stationarity, or alternatively, sedentarity (Fischer et al. 2000; Garvill et al. 2000; Fischer & Malmberg 2001). On the one hand, it can be argued that sedentarist perspectives are being challenged by growing levels of mobility
and a possible diminishing of the importance of sedentary lifestyles (Sheller & Urry 2006). However, on the other hand there is also a discourse which emphasizes the continued importance of immobility, although this issue is perhaps somewhat obscured by the main focus of population geography on mobility in general and migration in particular.

The stability of residential location choices is an important part of the background of the issues explored in the context of the thesis, since this influences the preconditions for everyday life activities in the sense that the geographical range within which activity sites may plausibly be chosen from is ‘set’ to some degree. Although these conditions may of course be altered either through changes in the space-time resources and/or restrictions to the individual, or through changes in the surrounding amenity supply structure, they constitute a baseline for the residents’ spatial accessibility conditions.

2.4.4. Destination choice and the role of distance
As mentioned, residential location is the geographical focal point of all three research papers in the thesis. It is consistently with reference to the residential location that accessibility to amenity destinations is related. As argued above, residential location does generate important prerequisites for daily mobility since it is a key point of origin and of return for trips to daily activities. Yet, residential location vis-à-vis potential amenity destinations is only part of the factors which matter for daily travel, since ‘individual resources, obligations and interests’, for instance, also exert a substantial influence (Næss 2006b, p. 26). Moreover, since choice presupposes that one has the resources necessary to exercise this choice, it merits mentioning that people’s scope for doing so may vary substantially. Not everyone has the opportunity to choose as freely as others may. However, in the following, it is implicitly assumed that individuals do have some degree of freedom of choice with regard to amenity destinations.

When making spatial choices, individuals tend to be unaware of all alternatives that are — potentially — available to them. Instead, the ‘choice universe’ is restricted to a subset of alternatives that are ‘feasible and known to the decision maker’ (Vause 1997, p. 75). Moreover, the scope for individual choice between alternative amenity destinations also varies depending on the activity in question, for instance the degree of flexibility or boundedness in time and space of different activities. For instance, the scope for choice may be rather limited when it comes to the workplace, and much more extensive when it comes to discretionary leisure activities (Vilhelmson 1999a; Meloni et al. 2007; Schwanen et al. 2008). However, many people are less constrained in their destination choices during weekends compared to weekdays, since the space-time constraints of daily life (e.g., with regard to work) are relaxed and allow for more flexibility (Næss 2006b).
While proximity (or distance) is certainly an important constituent of many destination choice processes, it is just one of many factors that may influence destination choice (Wheeler et al. 1998; Yavas 2003). The role of proximity in actual choices and behaviour is not always straightforward, but is rather subject to certain complexities. It seems reasonable to expect that local access to amenities should be associated with a reduced need for travel, especially motorized travel (Banister 2005). Yet, it is not self-evident that the nearest potential option is always the one that is actually chosen, or that proximity is the most important criterion in choosing an amenity destination. Indeed, the ‘location of facilities close to housing does not mean that they will be used’ (Breheny et al. 1998 cited in Banister 2005, p. 108). Potential choices of destinations located nearby are not necessarily the same as de facto choices, in which amenity destinations located further away may be preferred (Salomon & Mokhtarian 1998; Handy & Clifton 2001; Haynes et al. 2003; Burgess et al. 2006 cited in Metz 2010).

Various factors may exert an influence on consumer destination choice, including, e.g., quality, atmosphere and selection (Handy & Clifton 2001), and presumably also the scope for choosing among different (co-localized) amenities. Yavas (2003) identifies a number of different attributes of shopping malls as important motives for consumer patronage, including price competitiveness, variety of stores and product selection, merchandise quality, courtesy of staff and cleanliness, as well as practical considerations such as parking facilities (cf., e.g., Banister 2005) and opening hours. Factors like these, i.e., those that are not necessarily explicitly related the locational attributes of the mall, may be regarded as more important than proximity (Næss 2006b; 2011). Moreover, the choosier the consumer, the more likely they are to be willing to expand the distances travelled to reach amenities that meet their preferences (Reimers & Clulow 2004).

The distances consumers are willing to travel to gain access to goods and services also depend on the order of the goods in question, since substantially longer distances are generally accepted for access to higher-order goods and services than for lower-order daily consumption (Christaller 1966; Wheeler et al. 1998, cf. Crane 1996 cited in Næss 2006b). Acceptable travel distance lengths differ across the various kinds of destinations; the threshold values vary. Concerning some amenities of ‘replicable’ character (Metz 2010), the nearest options are usually chosen because the alternatives are very similar. However, if there are more substantial differences within an amenity category, attractiveness becomes an important criterion and people may thus accept longer travel distances to reach these amenities (Næss 2006a, 2006b). Næss (2006a) found that the longest distances are generally accepted for travel to work or higher education and for socially motivated trips; i.e., visiting family and friends. Moreover, to the extent that distance matters in destination choice, it may often be the case that the distance to
concentrations of amenities, for instance shopping centres where a large and diversified supply is available, represents a more important consideration compared to the distance to single, separate amenities (Næss 2005), for instance because agglomerations of amenities enable multi-purpose trips and hence the coordination of different activities (Lowe & Moraydas 1975). Other potentially important factors include scheduling considerations with respect to daily activity patterns (Arentze & Timmermans 2005), trip-chaining and multi-purpose trips (Arentze & Timmermans 2005; Primerano et al. 2008; Næss 2011), and not least the potentially strong role of routine and habit in everyday life (Wood et al. 2002). If a habitual destination choice pattern is already in place, it is likely that these existing patterns are reproduced and that the individual perhaps does not necessarily engage in destination choice processes to the same extent as might have been the case otherwise.
3. Geographical research context: a background to the Swedish case

This section provides an overview of certain aspects of Sweden as the geographic context for the empirical studies in the thesis. To some extent, the accessibility-related conditions and development trends in Sweden are specifically ‘Swedish’. However, they are also likely to at least partially reflect current conditions and ongoing trends in other comparable Western countries, thus giving the conclusions of the thesis a wider relevance and applicability as well as making it possible to identify differences.

Settlement patterns constitute an important background factor for the research question concerning the spatial accessibility conditions of the population. With its relatively small population of 9.4 million (Statistics Sweden 2010) and comparatively large land area, Sweden is the second most sparsely populated country in the European Union (EU) (see Figure 2) (Eurostat 2011). In 2010, the average population density figure for Sweden was 22.9 inhabitants/km² (Statistics Sweden 2011). However, population density varies substantially within the country, ranging from 0.2 inhabitants per km² in the remote Northern municipality of Arjeplog to 4,504 inhabitants per km² in Stockholm municipality. Between 1995 and 2010, there was a slight increase in average population density from 21.5 to 22.9 inhabitants per km² (Statistics Sweden 2011).


7 Sweden is subdivided into slightly less than 300 municipalities, which represent the main administrative unit at the local level.
8 When it comes to local population density (on a 5 km spatial scale), this is relatively similar across different geographies within Sweden, regardless of settlement size (whether small villages or major cities), as found in Paper II. However, this may be a trait that is particular to Sweden and is likely to be somehow related to the low overall population density.
The population of Sweden is concentrated mainly in the Southern regions and along the coastlines, as shown in the map in Figure 3. The largest population concentrations are found in the three metropolitan regions: Stockholm, Gothenburg and Malmö. In stark contrast, the Northern two-thirds of the country – particularly the interior – are very sparsely populated, with the exception of ‘pockets’ of larger population concentrations mainly in the coastal towns. By and large, the settlement pattern is fairly stable over time. Migration in Sweden is a rather low frequency phenomenon, as is also the case in Europe more generally (Fischer et al. 2000). Over the 1971–2006 period, the share of people moving residence across municipal borders fluctuated between 3.5% and 4.6%, and has seen a slow increase since the early 1980s (Statistics Sweden 2007 cited in Amcoff 2009b). Household size in Sweden is rather small on average, and has been declining in recent decades. In 2003, the average number of people per household was 1.9, which was the lowest in the EU states for which data were available. Also, the share of single-person households is high – in 2003 the figure was 47%, the highest in the EU (Swedish National Board of Housing, Building and Planning & Ministry for Regional Development of the Czech Republic 2005). Hence, for a substantial share of the population accessibility considerations in, for instance, matters related to residential choice may be assumed to be largely at the discretion of the individual, as opposed to something that requires negotiation with other household members.

Sweden is a mature, urbanized society with more than 85% of its population living in urban localities9 in 2010 (Statistics Sweden 2010). During the latter half of the 20th century the population became increasingly concentrated, particularly in the major cities. Conversely, most other areas experienced negative population development, leading to concerns about ‘depopulation’ especially in rural areas (Håkansson 2002). Although the pace of urbanization has slowed down, the share of Swedes living in urban localities is still increasing10 and is currently most pronounced in the three ‘metropolitan’ counties of Stockholm, Skåne and Västra Götaland (Statistics Sweden 2010).

Today’s urban system in Sweden is partially a product of the active regional policy of the 1960s and 1970s. Attempts were made to influence the localization of service amenities and other societal functions locally and regionally to prevent excessive centralization to the metropolitan regions. The

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9 In Sweden, all so-called ‘localities’ are designated as urban while areas outside these are defined as non-urban. According to the formal definition, ‘a locality consists of a group of buildings normally not more than 200 metres apart, and must fulfil a minimum criterion of having at least 200 inhabitants’ (Statistics Sweden 2010, p. 77). The localities cover only 1.3% of the total land area. In 2010, 60% of the population lived in localities with at least 10,000 inhabitants. The definition of locality has been used in all the Nordic countries since 1960, and as of 1971 there is no formal/administrative definition of ‘town’ or ‘city’ in Sweden (Statistics Sweden 2010).

10 Between 2005 and 2010, the share increased by 0.8% (Statistics Sweden 2010).
implementation of this regional policy objective involved a classification of urban areas into different categories depending on population size (Kåpe 1999; SOU 2000), largely in line with the key ideas of Central Place Theory. The existence of a ‘good level of service’ provision in ‘all parts of the country’ is still one of the key objectives of Swedish regional policy (Swedish Ministry of Enterprise, Energy and Communications 2007, p. 6). Local service is seen as a key factor for sustainable regional growth and also for the welfare of the individual citizen. Contemporary efforts to achieve the objectives concerning service provision in rural areas include financial support through ‘regional service programmes’ aimed at supporting accessibility to services – especially groceries and fuel – in rural and sparsely populated areas in Sweden. The regional service programmes may involve various actors and advocate for collaboration between public and private services as well as the non-profit sector, and the participation of a broad range of actors (Swedish Consumer Agency 2009). In this context it should also be mentioned that it is common for, e.g., both public and commercial service amenities to be coordinated and co-localized in rural areas. Grocery shopping, petrol provision, postal services and other functions are gathered at one joint, multi-functional supply point (Swedish Agency for Growth Policy Analysis 2009), a strategy for service provision which may be seen as having sprung from the sparseness of the population in large parts of Sweden.

Patterns of service supply and thereby the accessibility prerequisites of the Swedish population are strongly influenced by spatial structural factors, not least urban form and development. Given their inertia, most of the current built environments and spatial structures are likely to remain and retain their influence on people’s everyday life for a long time to come. From the advent of the modernist school of planning in the 1930s until the 1980s, these planning principles created a lasting imprint on the internal structure of Swedish cities. Efforts to spatially separate different urban functions (land-use zoning) within the cities led to the development of extensive suburbanization, generating urban development patterns similar to those in other cities in Europe and the US. The increasingly sprawling urban morphologies featured, inter alia, large-scale housing projects in peripheral locations on the urban fringe. The latter decades of the 20th century witnessed a shift in planning philosophy away from modernist principles and towards postmodernist ideas. For instance, the New Urbanism movement, which has exerted a substantial influence on Swedish urban planning, criticizes the

\[11\] Among the different service amenities, the development of accessibility over time tends to be seen as perhaps the most problematic in the case of grocery stores, especially in rural areas. Over time, public agencies have reported a continuous decrease in the number of grocery stores. In particular, the smaller stores have tended to disappear while there have been simultaneous increases in the number of larger stores (Swedish Agency for Growth Policy Analysis 2009). These studies are based on other data, definitions and methods than those used in the present thesis (Paper II), which explains the somewhat divergent results with regard to certain aspects of the development of accessibility over time.
phenomenon of sprawl and its consequences (e.g., with reference to sustainability) and advocates more ‘traditional’ principles of planning and urbanism, including higher densities. There are still trends towards sprawl in Swedish cities, e.g., in the form of retail localizations in external shopping centres with ‘big box stores’ as well as other amenities competing with the retailers in the city centre (e.g., Bergström 2000). However, alongside these sprawling developments there is also a trend towards an increasing densification and ‘inward’ urban development (Ståhle 2008). As in other countries, when it comes to the development of localization patterns within the retail sector on a regional (as opposed to intra-urban) scale, processes of restructuring in Sweden in recent decades have involved a trend towards concentration in the major cities, as mentioned above (Bergström 2003; Bergström et al. 2004; Woods 2005).

There is a close correspondence between patterns of population distribution and patterns of amenity supply, and these conditions are in turn associated with variations in the ‘level of welfare’ (SOU 2000, p. 228) across the country. This is evident when comparing maps of intrapersonal accessibility (population potential) (Figure 312; see also Table 1) on the one hand and accessibility with regard to service and leisure amenity supply (Figure 4; see also Table 2) on the other in 2005. The data in both maps represent the average potential accessibility within 5 km to population and amenities, respectively, calculated for the residential locations of the population at the geographical resolution of 10 km squares. The 5 km spatial range was chosen because the population density within this range is highly proportional to the density beyond it (as found in Paper II), and thus also informative of the conditions on a broader spatial scale. Population and amenity supply both display a similar spatial pattern, emphasizing the Southern and coastal regions and encompassing enormous regional variation. Tables 1 and 2, which complement the maps, contain information on the number and share of the population living in the different population potential and amenity supply categories in the maps. It is evident from the tables that both population and amenities are extremely unevenly distributed. For instance, the densest class of population potential (>100,000 within 5 km) contains 18.2% of the population but only covers a miniscule 0.1% of the total land area (Table 1). In contrast, the category with the lowest amenity supply (0–1 within 5 km) covers nearly half (44.9%) the total land area but only describes the accessibility conditions of 1.4% of the population (Table 2) living in these peripheral regions.

12 The densest category of population potential (>100,000 within 5 km) is present in the three largest cities: Stockholm, Gothenburg and Malmö (and nowhere else in the country). However, in the map (Figure 3) this category is only visibly discernible in the case of the two largest cities, Stockholm and Gothenburg. The same goes for the densest category of amenity supply (>750 within 5 km), which is also present in Malmö but is not discernible in the map.
Figure 3: Population distribution in Sweden in 2005. Average population size within 5 km (based on 10 km squares). Source: ASTRID register database.
Figure 4: Supply of service and leisure amenities\textsuperscript{13} in Sweden in 2005. Average amenity supply within 5 km (based on 10 km squares). Source: ASTRID register database.

\textsuperscript{13} The amenities included in the data on which the map is based are: grocery store; shopping centre; store for clothes, shoes etc.; store for electronics, household appliances etc.; care centre; pharmacy; post office; job centre; petrol station with small range of groceries etc.; urban centre; cinema; theatre; restaurant and gym/sports centre (see Table 4).
Table 1: Population distribution in 2005. Average population size within 5 km (based on 10 km squares). Source: ASTRID register database.

<table>
<thead>
<tr>
<th>Average population potential within 5 km (categories identical to Figure 3)</th>
<th>No. of people within category</th>
<th>Share (%) of total population</th>
<th>Cum. share (%) of total population</th>
<th>Land area (km²)</th>
<th>Share (%) of total land area</th>
<th>Cum. share (%) of total land area</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>45</td>
<td>0.0%</td>
<td>0.0%</td>
<td>32,146</td>
<td>7.4%</td>
<td>7.4%</td>
</tr>
<tr>
<td>1 – 100</td>
<td>33,509</td>
<td>0.4%</td>
<td>0.4%</td>
<td>129,735</td>
<td>29.7%</td>
<td>37.1%</td>
</tr>
<tr>
<td>100 – 500</td>
<td>215,380</td>
<td>2.4%</td>
<td>2.8%</td>
<td>83,874</td>
<td>19.2%</td>
<td>56.3%</td>
</tr>
<tr>
<td>500 – 1,000</td>
<td>316,860</td>
<td>3.5%</td>
<td>6.3%</td>
<td>46,237</td>
<td>10.6%</td>
<td>66.9%</td>
</tr>
<tr>
<td>1,000 – 2,500</td>
<td>757,346</td>
<td>8.4%</td>
<td>14.6%</td>
<td>65,908</td>
<td>15.1%</td>
<td>82.0%</td>
</tr>
<tr>
<td>2,500 – 5,000</td>
<td>780,787</td>
<td>8.6%</td>
<td>23.3%</td>
<td>37,253</td>
<td>8.5%</td>
<td>90.5%</td>
</tr>
<tr>
<td>5,000 – 10,000</td>
<td>909,032</td>
<td>10.1%</td>
<td>33.3%</td>
<td>23,417</td>
<td>5.4%</td>
<td>95.9%</td>
</tr>
<tr>
<td>10,000 – 25,000</td>
<td>1,322,145</td>
<td>14.6%</td>
<td>48.0%</td>
<td>12,847</td>
<td>2.9%</td>
<td>98.8%</td>
</tr>
<tr>
<td>25,000 – 50,000</td>
<td>1,428,952</td>
<td>15.8%</td>
<td>63.8%</td>
<td>3,349</td>
<td>0.8%</td>
<td>99.6%</td>
</tr>
<tr>
<td>50,000 – 100,000</td>
<td>1,632,372</td>
<td>18.1%</td>
<td>81.8%</td>
<td>1,136</td>
<td>0.3%</td>
<td>99.9%</td>
</tr>
<tr>
<td>&gt; 100,000</td>
<td>1,641,787</td>
<td>18.2%</td>
<td>100.0%</td>
<td>558</td>
<td>0.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>9,038,215</td>
<td>100%</td>
<td>-</td>
<td>436,460</td>
<td>100%</td>
<td>-</td>
</tr>
</tbody>
</table>

14 In both Tables 1 and 2, the land area of Sweden has been calculated excluding the major lakes (see Figures 3 and 4) but including minor water surfaces.
Table 2: Supply of service and leisure amenities in 2005. Average amenity supply within 5 km (based on 10 km squares). Source: ASTRID register database.

<table>
<thead>
<tr>
<th>Average service and amenity supply within 5 km (categories identical to Figure 4)</th>
<th>No. of people within category</th>
<th>Share (%) of total population</th>
<th>Cum. share (%) of total population</th>
<th>Land area(^{14}) (km(^2))</th>
<th>Share (%) of total land area</th>
<th>Cum. share (%) of total land area</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 1</td>
<td>129,208</td>
<td>1.4%</td>
<td>1.4%</td>
<td>195,909</td>
<td>44.9%</td>
<td>44.9%</td>
</tr>
<tr>
<td>1 – 5</td>
<td>245,560</td>
<td>2.7%</td>
<td>4.1%</td>
<td>103,006</td>
<td>23.6%</td>
<td>68.5%</td>
</tr>
<tr>
<td>5 – 10</td>
<td>523,075</td>
<td>5.8%</td>
<td>9.9%</td>
<td>50,185</td>
<td>11.5%</td>
<td>80.0%</td>
</tr>
<tr>
<td>10 – 25</td>
<td>572,250</td>
<td>6.3%</td>
<td>16.3%</td>
<td>49,226</td>
<td>11.3%</td>
<td>91.3%</td>
</tr>
<tr>
<td>25 – 50</td>
<td>861,231</td>
<td>9.5%</td>
<td>25.8%</td>
<td>20,516</td>
<td>4.7%</td>
<td>96.0%</td>
</tr>
<tr>
<td>50 – 100</td>
<td>994,308</td>
<td>11.0%</td>
<td>36.8%</td>
<td>10,068</td>
<td>2.3%</td>
<td>98.3%</td>
</tr>
<tr>
<td>100 – 250</td>
<td>1,143,209</td>
<td>12.6%</td>
<td>49.4%</td>
<td>5,631</td>
<td>1.3%</td>
<td>99.6%</td>
</tr>
<tr>
<td>250 – 500</td>
<td>1,410,122</td>
<td>15.6%</td>
<td>65.0%</td>
<td>1,056</td>
<td>0.2%</td>
<td>99.8%</td>
</tr>
<tr>
<td>500 – 750</td>
<td>1,508,666</td>
<td>16.7%</td>
<td>81.7%</td>
<td>414</td>
<td>0.1%</td>
<td>99.9%</td>
</tr>
<tr>
<td>&gt; 750</td>
<td>1,650,586</td>
<td>18.3%</td>
<td>100.0%</td>
<td>447</td>
<td>0.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>9,038,215</td>
<td>100%</td>
<td>-</td>
<td>436,460</td>
<td>100%</td>
<td>-</td>
</tr>
</tbody>
</table>
It should be mentioned that the supply of service and leisure amenities represented in the maps only includes supply points located within Sweden. However, accessibility need not be nationally confined. For people living in the regions adjacent to the national borders, the amenity supply in neighbouring countries may also be reachable, if not locally then at least within a regional range. For instance, many residents of the Malmö region may take advantage of the large amenity supply available in Denmark. Cross-border accessibility is a viable alternative for many people, not least given the existence of, e.g., the fixed link across the Öresund strait and the integration of the housing and labour markets on either side of the strait. This has facilitated cross-border commuting, which is becoming increasingly common in the area (Löfgren 2008; Knowles & Matthiessen 2009). Also, in some cases, e.g., the town of Haparanda which is highly integrated with its Finnish ‘twin town’ Tornio, cross-border accessibility is a relevant issue not just on the regional scale but also on the local scale. There are even formalized cross-border collaboration and sharing schemes within public services, e.g., law enforcement, rescue services, postal services and schools (Zalaman 2001; Löfgren 2008). Moreover, cross-border accessibility (e.g., Mattsson & Pettersson 2005) may of course also occur in the opposite direction; i.e., foreigners utilizing amenities on the other side of the border as in the case of Sweden’s role as a shopping destination for Norwegians (Löfgren 2008). This contributes to upholding the existence of service functions in locations in the Swedish border regions where these amenities would perhaps be at risk of disappearing were it not for the influx of foreign customers.

The development of travel patterns within Sweden may be interpreted as indicative of changes in the prerequisites for accessibility, and perhaps the relationship between the proximity (or distance) dimension of the concept on the one hand and the mobility dimension on the other. As mentioned, travel distances are growing longer. Increasing specialization concerning consumption patterns as well as the labour market is an important factor behind the development towards higher mobility. The growth is particularly pronounced for leisure-related travel (Swedish Transport Administration 2011), a travel segment that is on the increase in most, if not all, ‘developed’ countries (Holden 2007). In travel projections for the year 2020, travel for leisure purposes is also expected to continue increasing more than other travel errands in terms of vehicle kilometres travelled (VKT) (SIKA 2005). However, shopping trips and work commutes are also growing longer (Swedish Transport Administration 2011).

In many cases, individuals’ workplaces are located relatively near their homes and hence labour markets are mostly ‘local’ in character (Bienkowska 2007; Sandow 2010). However, as in many other countries, there are ongoing processes of geographical extension of labour market regions – a phenomenon termed ‘regional enlargement’ – associated with an increase in
commuting (Amcoff 2009b). This development has also been promoted by the Swedish government in recent years as part of the regional policy strategies (Swedish Ministry of Enterprise, Energy and Communications 2007; Andersson et al. 2008). As mentioned, commuting occurs at least partially as a substitute for migration, and these alternative mobility strategies are in turn related to, e.g., increases in dual-earner households resulting from the participation of both men and women on the labour market (Westerlund 2006; SOU 2007) and the need for access to large and diverse labour markets for, e.g., those who have invested in specialized education (SOU 2007).

Accessibility-related preferences, priorities and choices – which are among the issues addressed in the thesis – can be assumed to be influenced by living conditions as well as various cultural factors, including attitudinal variation within and across populations. In the World Values Survey, which measures international cross-cultural variation, Sweden occupies an extreme position in that it ranks the highest along both main dimensions: traditional versus secular/rational values and survival versus self-expression values. The values of the Swedish population reflect a high degree of secularized/rational values as well as self-expression-oriented values, which places Sweden in cultural proximity to other high-income countries, especially other Nordic and Northern European countries including Norway, Finland, the Netherlands, Switzerland and Germany. In countries with a well-developed welfare state there is a high level of economic security and standard of living, which allows the population to take these things ‘for granted’. A cultural shift may occur in that people increasingly pursue other goals and emphasize things like ‘self-expression, participation, subjective well-being, trust and quality of life concerns’ (p. 553) including giving priority to gender equality and free choice (Inglehart & Welzel 2010). Also, welfare development to some extent liberates residential location choice from economic concerns and instead allows other ‘immaterial values’ to become of greater concern (Westerlund 2006).

The Swedish welfare state, which has developed since the mid-20th century with the Swedish Social Democratic party as its chief ‘architect’, is responsible for the provision of many service functions through a large public sector, encompassing different agencies. These agencies are found on levels ranging from the national and regional (county councils) to the local (municipalities), which is where most public services are supplied (Lindbom 2001). Like other Western countries in the advanced stages of the so-called demographic transition, one of the main population-related challenges Swedish society and the welfare state face at present is the ageing of the

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15 However, a possible ‘dismantling’ of welfare states, both in Sweden and elsewhere, has also been debated (e.g., Lindbom 2001; Bergh & Erlingsson 2009).
population resulting from declining fertility rates combined with increasing longevity (Malmberg & Sommestad 2000; Hjälm 2011).

Some of the functions provided through the public sector are included among the amenities studied in the thesis, for instance health care centres, job centres, child care, elderly care and schools. Many leisure amenities are provided by the welfare state through the municipalities, including, for instance, various kinds of sports facilities and libraries. However, there are also options available within the private sector for many of these amenities. Since the 1980s, the Swedish economy has undergone a restructuring characterized by increasing liberalization (Bergh & Erlingsson 2009). As a result of this trend towards deregulation and privatization of several functions that had previously been the sole responsibility of the public sector, there are presently privately owned alternatives and more scope for choice when it comes to amenities like postal services, education, pharmacies and job centres.

In sum, this section has served to contextualize the research topics of the thesis in the Swedish setting, covering a wide and diverse range of issues including, e.g., demographic conditions, spatial development trends, regional policy and patterns of amenity provision as well as cultural indicators. While some of the conditions discussed above are specific to the Swedish context, a substantial number of them are likely to have a wider relevance and applicability throughout comparable countries in the Western world.
4. Methods and data

4.1. Methods

4.1.1. Methodological points of departure and considerations
The accessibility literature encompasses countless empirical studies as well as research focused on methodological and theoretical development. A large part of the literature is based on quantitative approaches, but there is substantial variation in the employed methodologies, definitions and operationalizations of accessibility, as well as in the scope and focus of the research. Many accessibility studies focus on the conditions either in specific cities or metropolitan regions, or in rural areas; probably at least partly as a result of the difficulties associated with simultaneously analysing environments that are highly dissimilar with respect to accessibility issues. There appear to be relatively few studies that employ a broad perspective on the spatial dimensions of the accessibility concept. Research like the present thesis is less commonplace in that it is national in terms of geographical context and thus encompasses urban as well as rural areas, and also explicitly targets both spatial dimensions of accessibility, i.e., proximity and mobility (Figure 1), and their respective importance for individual accessibility.

The aim and research questions of the thesis pose certain requirements with regard to the choices of analysis methods as well as types of empirical data. In general terms, the methodological approach is quantitative and makes use of both primary and secondary sources of data. The primary data were collected in a respondent survey, customized for the research project within which the thesis research was conducted. The focus of the survey was, inter alia, individuals’ subjective preferences concerning proximity, their views on their actual living conditions from the point of view of their accessibility needs, and their residential satisfaction. In addition to the attitudinal data provided by the survey, which are of central importance, secondary data were also retrieved from two databases: the ASTRID register database, which contains longitudinal, geo-referenced micro-level data on the entire Swedish population; and the National Travel Survey (NTS) database. When combined, these databases provide unique information on spatial accessibility conditions in terms of the allocation of homes and amenities as well as the travel patterns of the population, both including a temporal component enabling the study of changes over time. Thus, the different types of data used in the thesis complement each other and together enable the pursual of the aim through a focus on not only spatial supply conditions but also individual conditions, preferences and observed behaviour. The combined use of data is also a prerequisite for inquiring into both spatial dimensions of the accessi-
bility concept – proximity and mobility – (Figure 1) and their respective roles in individual accessibility.

The availability of such rich and detailed information as contained in the abovementioned databases provides excellent prerequisites for research into the types of questions posed in the thesis, and contributes to making Sweden a good ‘case’ in terms of geographical context. Although the type of research conducted in the thesis would be somewhat more difficult to conduct in contexts other than Sweden due to the limited availability of micro-level register data, this does not imply that the relevance of the results should only be confined within the national borders. On the contrary, it is likely that the conditions and processes of change that can be empirically traced in Sweden reflect similar processes occurring in other comparable (Western) countries where, for instance, similar trends with regard to spatial development can be observed.

In terms of statistical techniques, the empirical analyses in all three empirical studies rely on descriptive statistics combined with analytical techniques. Descriptive analyses enable the identification of patterns and relationships in the data, which are subsequently further scrutinized through regression modelling. Further details concerning the specific methodological approaches employed in the empirical studies are provided in the respective papers in the appendices.

All papers address both main spatial dimensions of accessibility, proximity (or distance) and mobility (Figure 1), although the weight of the emphasis varies. Broadly speaking, Paper I is focused on the proximity dimension, Paper II on both dimensions simultaneously, and Paper III mainly on the mobility dimension. The papers address the issue of accessibility to everyday life amenities and depart from the same basic selection of indicator amenities. The geographical focal point of all three papers is the residential locations of individuals in the Swedish population; it is with reference to the home that accessibility is explored. However, despite the commonalities between the empirical studies in the thesis, the overarching issue of accessibility is scrutinized from different perspectives, using different empirical data, operationalizations and methodological approaches. Table 3 provides a summary of the approaches taken in each paper with regard to empirical data and methodology.
Table 3: *Data and methodology details for the papers.*

<table>
<thead>
<tr>
<th></th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
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| **Aim**              | 1) To analyse preferences for residential proximity and whether these correspond to actual conditions  
                             2) To identify factors that influence residential satisfaction | To examine changes over time in individuals’ accessibility to amenities in terms of distance to the nearest options and the diversity/size of the supply | To analyse the relationship between travel distances for service trips and the local/regional supply structure |
| **Data source/-s**   | Primary data: Questionnaire (web) survey                                 | Secondary data: ASTRID register database complemented with National Travel Surveys | Secondary data: National Travel Surveys merged with ASTRID register database |
| **Population**       | The Swedish population aged 20–64                                       | ASTRID: The entire Swedish population                                     | ASTRID & National Travel Surveys: The Swedish population aged 6–84         |
| **Time period**      | 2008                                                                    | 1995 and 2005/06                                                          | 1995 and 2005/06                                                          |
| **Methods**          | D e s c r i p t i v e s t a t i s t i c s a n d r e g r e s s i o n m o d e l l i n g |                                                                         |                                                                           |
| **Accessibility indicator (-s)** | Self-reported distance                                                  | 1) Distance to amenities:  
                                        1. Distance to the nearest amenity option for service, leisure and education amenities  
                                        2. Distance to actual (personal) amenities for work and relatives  
                                        2) Scope of the amenity supply:  
                                        1. Share (%) of indicator amenities present within 5 and 50 km for service, leisure and education amenities  
                                        2. Number of workers in the same line of business and number of relatives within 5 and 50 km  | Average number of service amenities within 1, 5 and 50 km, respectively |

42
4.1.2. Methodological delimitations
The focus of the thesis is on broad, general patterns and development trends rather than, e.g., a detailed analysis of the differentiation of accessibility across socioeconomic groups or specific geographical contexts. Although the data used in the empirical studies in the thesis are all disaggregate at micro (individual) level, the account of the results of the analyses is largely focused on an aggregate level rather than broken down by different groups. The exception to this is Paper I, where the results are broken down according to the analytical categories of age, gender and geographic living environment.

Since a substantial part of the results in the thesis are thus reported in aggregate form, for instance in terms of measures of central tendency, much of the internal variation in the data is concealed. Therefore, it is important to remember that there may be substantial differences between general aggregate results and the specific situation of the individuals who, together, make up the aggregate. Not least to avoid falling into the trap of the ecological fallacy, the difference between the aggregate mean and the individual variation should be emphasized.

To illustrate this discussion, Figure 5 shows the distribution in deciles of trip lengths for service trips originating from the respondents’ residential location in 1995 and 2005/06, based on the NTS data used in Paper III. While the mean value was 15.8 km per trip in 1995 and 18.1 km per trip in 2005/06, half the trips were actually shorter than 5.0 km in 1995 and 6.0 km in 2005/06. Only 20% of the trips each year were longer than approximately 20 km. Overall, the distribution is relatively stable over time except for a rather sharp increase in the length of the longest trips.

Figure 5: Trip length (distribution in deciles) for service trips originating from respondents’ residential location in 1995 and 2005/06. Source: SIKA/National Travel Survey (‘RiksRVU’/‘RES’).
The thesis is also focused on accessibility with a focus on *individuals*, which may be seen as another delimitation. The use of individual-level data makes it possible to conduct research on a very detailed level of analysis, which is of course a key strength of the approach. However, the individual level is not the only level that is potentially relevant in accessibility research. The accessibility conditions of the household more generally may be considered equally important as those of the specific individual. One reason why this is presumably the case is that the members of a household tend to divide and coordinate activities and trips related to reproductive labour amongst themselves, for instance grocery shopping. The household unit may be seen as a time-geographical ‘bundle’ (Hägerstrand 1970) composed of its individual members, and the summed or overall accessibility of the household would then be highly significant. Moreover, as mentioned, the accessibility conditions in a specific residential location will presumably also vary among the different members of a household due to varying daily activity schedules (Ben-Akiva & Bowman 1998; Devisch et al. 2009). For these reasons, a change in perspective from the individual to the household would potentially also alter some of the conclusions of the thesis.

Another delimitation that merits commentary is the choice of the *residential location* of individuals as the geographical point of reference. This methodological choice is motivated by the universal importance of the home. Unlike the workplace, for instance, the home is of relevance to all individuals (and not just, e.g., those who work) and is the de facto point of departure for many daily activities and trips.\(^\text{16}\) The reason why the residential location is used in all three papers is to attain the highest possible degree of comparability across the studies. However, it would have been possible to use the workplace, for instance, as an alternative or complementary geographical focal point. In a study designed around the point of view of the workplace, commonplace phenomena such as trip-chaining and multi-purpose trips involving the workplace as one of several ‘stops’ would possibly lead to somewhat different results and thus give a different picture of individuals’ accessibility conditions.

Related to the discussion concerning the geographical focal point, it may be argued that the emphasis on the home location entails an implicit assumption that people live in one ‘permanent’ residential location – an address where they are formally registered as residents – and that this place constitutes the main spatial basis of daily activities. Although this assumption is likely to reflect the living arrangements of many, for others this may be a spatially more complex matter than what is accounted for in this definition. For instance, weekly commuting is associated with dual residency (van

\(^{16} \text{For instance, as mentioned in Paper III, more than 90\% of all trips made for the purpose of service-related activities originated from people’s homes in both 1995 and 2005/06.}\)
Another example is university/college students, who do not always make a formal change of address when moving to a university town. Moreover, people may also move between multiple residential locations, e.g. on a seasonal basis, spending extended periods of time at second homes during parts of the year (Marjavaara 2008).

Clearly, these alternative locations may offer rather different prerequisites with respect to spatial accessibility conditions compared to the ‘permanent’ residential locations, for instance if the ‘first’ home is located in a metropolitan area and the second home in a more rural region. Given the ways the empirical studies of the thesis were designed, these issues cannot be accounted for in the analyses, and it is therefore possible that individuals’ geographical accessibility to amenities is both overestimated and underestimated. For those who live at their second homes for long periods (e.g., seasons), the accessibility conditions at these locations may very well differ substantially from those accounted for based on the methodological approach employed in the thesis. However, although the precise extent of this potential problem is unknown, it is presumably a relatively minor issue. Most people have their daily ‘spatial base’ at their main residential location and, in addition to this, the accessibility conditions of these places are a relevant issue regardless of the occurrence of phenomena such as second-home ownership, dual residency etc.

### 4.1.3. Selection of amenities

All three studies in the thesis were designed around a set of indicator ‘amenities’ (denominated as ‘destinations’ in Paper I). The amenity concept is used in a broad sense, ranging from service functions such as post offices and shopping centres to friends and relatives. The indicator amenities were chosen to represent a rather wide set of everyday activities, as well as some more infrequent activities. Using Hägerstrand’s (1970) terminology, the amenities can be regarded as ‘livability items’ which people need to be able to access in order to ensure individual welfare and quality of life throughout the life course. This concept may refer to things as diverse as dwelling, food, education, work, recreational activities, means of transportation and medical care as well as other services, to name but a few.

A full set of the selected indicator amenities (Table 4) is included in Paper I, where the more specific content and function (where applicable) of the amenities were subject to interpretation on the part of the survey respondents. The original selection of amenities in Paper I also guided the selections for Papers II and III. Paper II includes those amenities which are identifiable in the ASTRID register data by way of Swedish Standard Industrial Classification (‘SNI’) codes. This means that the category ‘cashpoint/ATM’ was excluded, since these facilities have no employees and hence no SNI
code. Also, ‘best friend’ was excluded, since friendship relations are unidentifiable in the register data – the only identifiable social relations are those based on family bonds (see below). Regarding ‘urban centre’, these were defined as urban localities (see footnote 9) with at least 2,000 inhabitants in 1995 and 2005, respectively. ‘Shopping centre’ is defined by way of SNI proxies, namely retail in the form of department stores and hypermarkets, since these types of facilities tend to be co-localized (often at external locations) with a relatively wide range of other retail functions for goods and services. In Paper III, which is focused specifically on service amenities, only this subset of amenities was included in the analysis.

Table 4: Amenities included in the papers.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amenity</th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>Workplace</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Child care (pre-school)</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Children’s school</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University/college</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>Grocery store</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Shopping centre</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Store for clothes, shoes etc.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Store for electronics, household appliances etc.</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Care centre</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Pharmacy</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Cashpoint/ATM</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Post office</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Job centre</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Petrol station with small range of groceries etc.</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Leisure</td>
<td>Cinema</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td></td>
<td>Theatre</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restaurant</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leisure/recreational area</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social/family</td>
<td>Adult children</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parents</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Best friend</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Relative</td>
<td>X</td>
<td>X</td>
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</table>

The SNI codes, which are available with different degrees of specificity, were used at a relatively low level of detail since what mattered for the research purposes was the main function of the amenities rather than their more specific features. Therefore, it should be noted that there is considerable variation within the amenity categories deduced from the SNI codes. For instance ‘grocery store’ encompasses everything from small corner shops to facilities of hypermarket scale.
Also, the different amenities are given equal weight in the analyses. This should be kept in mind particularly concerning urban centres and shopping centres. These are counted as single amenities in the data, i.e., in the same way as amenities like pharmacies and grocery stores, although they actually comprise many amenities of different types. This is also the very reason why these amenities were included in the selection. Urban centres and shopping centres are used as indicators of the presence of a relatively sizeable and broad supply of amenities, including various amenities that are not otherwise specifically accounted for in the analyses since they are not included in the selection of indicator amenities. Urban centres and shopping centres gather a multitude of amenities within spatially relatively confined locations. For this reason, they may also have a ‘magnet’ function which attracts people, e.g., because they provide opportunities to combine several errands. Such factors may be important in destination choice and potentially motivate people to travel farther than they would be willing to do for single amenities (cf. Naess 2005).

4.1.4. Operationalization of accessibility

This section describes and discusses the ways the concept of accessibility is operationalized in the thesis. This also entails a partly theoretical discussion concerned with ways of measuring accessibility, which can be seen as an extension of the above theoretical review of the concept, but with a more pronounced emphasis on methodological issues which are called for as a background to the operationalizations employed in the thesis.

In the thesis, accessibility is analysed with a focus on certain spatial dimensions of the concept, which could be seen as constituents mainly of the land-use component of accessibility (Geurs & van Wee 2004). Although the operationalization of accessibility is somewhat varied in the different papers, in all cases it is based on distance; i.e., an inverted indicator of accessibility-by-proximity and also an indicator of the need for accessibility-by-mobility (Figure 1). The use of distance-based accessibility measures also entails a focus on the physical separation17 between locations. While there are certain limitations18 involved with operationalizing accessibility based on physical distance, such simple measures of accessibility may nevertheless ‘give a good, if rough, indication of accessibility’ (Handy & Niemeier 1997, p. 1182).

17 For instance, according to Gatrell (1983, p. 73), ‘a discussion of any concept of distance hinges on the definition of a set of objects whose ‘location’ and ‘separation’, in whatever sense, is being considered’.
18 Proximity is a necessary but in itself insufficient prerequisite for resource utilization and access (Holm et al. 1989), and accessibility concerns more than just overcoming the friction of distance (Hanson 2000; Weber 2003). Although locational proximity and mobility are key factors, things like space-time constraints (Hägerstrand 1987; Neutens et al. 2008) and information (Hanson 2000) also matter. Also, this way of measuring distance treats space as ‘empty’ in the sense that it does not consider the effects of geographical attributes such as terrain conditions and characteristics of the transportation system (Miller 2004).
In addition, they are straightforward and easy to apply, and because of their low level of abstraction and high level of comprehensibility are easy to transfer to and interpret in an everyday life context.

The operationalizations of accessibility employed in the thesis can be characterized as individual-level, yet place-based. Place-based accessibility definitions (Neutens et al. 2008; cf. Hanson 2000) measure accessibility from a reference location (in this case individuals’ residential locations), focus on a predefined set of opportunities (in this case the amenities) and incorporate an impedance function, e.g., distance, travel time or cost. Although the point of departure is thus a place-based operationalization of accessibility, there is also a strong focus on individual accessibility, not least because the places from which accessibility is measured are individuals’ residential locations\(^\text{19}\); i.e., a disaggregate level. However, the operationalization of accessibility is not ‘person-based’ in the sense of Neutens et al. (2008) since, e.g., individual space-time constraints are not explicitly incorporated into the empirical analyses. Nevertheless, as mentioned these issues are of course highly relevant as part of the theoretical context of the thesis.

The precise definitions of the accessibility indicators vary across the three papers, as do the types of distance measured. Thus, the distance and accessibility measures in the thesis are not entirely comparable across the papers since it is likely that, for instance, the self-reported distances refer to road network distances, which are longer than ‘as the crow flies’ distances; in the Swedish context, straight-line\(^\text{20}\) distance approximates transportation network distance when multiplied by factor 1.3 (Reneland 1998; Amcoff 2009b). Also, self-reported cognitive distance tends to be affected by both rounding and conjecture (Witlox 2007).

Table 3 includes an overview of the different accessibility measures used in the papers. Paper I employs a subjective and ‘cognitive’ (Gatrell 1983) distance measure based on the survey respondents’ \textit{self-reported estimated distances} to amenities.\(^\text{21}\) In Paper III, accessibility to services is indicated by the number of amenities present within spatial ranges of 1, 5 and 50 kilometres based on the average supply size calculated for residential areas. In this paper, travel distance information is obtained through self-reports in respondents’ travel diaries. Paper II includes several accessibility indicators. The distance measure in Paper II follows an approach that can be described as conventional for two reasons. First, it is based on physical straight-line

\(^{19}\) In Paper I and even more so in Paper II, the measurement is high-resolution and point-based, whereas in Paper III it is based on a somewhat lower resolution representation of residential areas.

\(^{20}\) Although straight-line distances – the representation of the shortest possible line between a location pair (Gatrell 1983) – underestimate network travel distances, they nevertheless tend to be an important source of information guiding people’s distance judgments in destination choice situations (Raghunir & Krishna 1996).

\(^{21}\) Which specific amenities the self-reported distances refer to was not specified but was rather left to the discretion of the respondents. Hence, depending on how the questionnaire was interpreted, the distances may refer to either the nearest options known to the respondents or to the chosen amenities they actually use.
Euclidean distance, the most common way of defining proximity between locations (Hanson 2000; Miller 2004). Second, accessibility is indicated by the *distance to the nearest* option within an amenity category, a type of measure which has long been and still remains a common approach to measuring accessibility (Öberg 1976; Haynes et al. 2003; Scheiner 2010). In addition, another measure of ‘scope’ or diversity of the amenity supply is included for the service, leisure and education amenities: the *completeness of the supply* of indicator amenities within spatial ranges of 5 and 50 kilometres, respectively. Concerning work and relatives, this indicator is replaced with a cumulative opportunity measure of the *number of amenities present within the spatial ranges*.

Another methodological issue is the distance ranges used in the analyses of accessibility in Papers II and III, and within which the supply of amenities is measured. The ranges are 5 and 50 kilometres in Paper II and 1, 5 and 50 kilometres in Paper III. The use of the distance zones is a way of distinguishing between local amenities which are located in close proximity to residential locations from regional amenities which are located farther away. Although the notions of nearness and farness are not defined in absolute terms in the thesis, this distinction is nevertheless relevant.

Obviously, there is enormous scope for variation across different geographies concerning the amenity supply available within the chosen spatial ranges. In metropolitan areas a 50 km range would probably cover most of or the entire urban region and thus a large and varied amenity supply. At the opposite end of the density scale, dwellers of remote rural areas may have to travel farther than 50 km to reach many amenities.

It is not self-evident that these particular distance limits represent an obvious way to define the local and regional scales. Geographical aggregation of data may be prone to the modifiable areal unit problem (MAUP) in cases in which the choice of spatial units is made arbitrarily, and different areal definitions may produce different results (Robinson 1998). However, as revealed in analyses of the importance of population density within different spatial ranges for the variation in distance to services (see Paper II), the different ranges are highly correlated. Local-level (1 km and 5 km) population density indicators are strongly indicative of the conditions at farther ranges as well, and therefore MAUP does not appear to be a critical issue in the case of this thesis.

Moreover, the chosen definition of spatial ranges used in the thesis should not be regarded as subjective or arbitrary. Instead, they were chosen as proxies for the distances that can reasonably be bridged by different modes of transport. The 1 and 5 kilometre ranges are used as indicators of the accessi-

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22 Concerning the categories service, leisure and education, distances are measured to the nearest option. However, concerning workplace and relatives, distances are measured to the amenities of each individual; i.e., their own workplace and their own relatives.
bility conditions in the individuals’ local residential area, and capture accessibility to amenities located within a relatively short distance from home and which are presumably often reachable either on foot or by bike. In 2005/06, the average length of trips in Sweden was 2 km for trips made on foot, and 4 km for trips made by bike (SIKA 2007). Thus, the 1 and 5 km ranges may be seen as approximate representations of walking and biking distance, respectively. The 1 km range may also be seen as a proxy for a ‘sub-local’ residential area, and the 5 km range for a somewhat extended local residential area. Since accessibility is not just a matter of local (nearby) access, however, a 50 km range is also used to represent a regional daily spatial reach (cf. Malmberg & Pettersson 2007); a proxy for a reasonable maximum daily commuting range. Within this distance, a larger and more diverse supply of amenities is available to individuals willing to extend their mobility beyond the local range.

4.2. Data

4.2.1. Complementary and integrated sources of data

A key feature and strength of the methodological approach of the thesis is the combination and integration of different sources of quantitative data, primary as well as secondary in character. Together, the data cover a wide range of quantitative data types. Official register data form a cornerstone in two of the papers (II and III). In addition, data from two surveys are analysed: a custom-built web survey as well as two National Travel Surveys (NTS). Together, these three data types complement each other, and enable the analysis of accessibility from the point of view of individual preferences, observed behaviour and general spatial conditions. An important feature of the methodological approach in Paper II and particularly Paper III is the combination and integration of different data not only between but also within the empirical studies. This integrative approach enables analyses that would not have possible if drawing on separate datasets.

In Paper III, the integrated use of NTS data and official register data drawn from ASTRID – both geo-referenced at the residential level – enables a detailed analysis of the relationship between spatial structural factors on the one hand and individual behavioural factors on the other. This analysis would not have been possible had the data sources been analysed separately.

In Paper II, the idea behind the combination of NTS and ASTRID data was to simultaneously study potential distance and behaviour as indicated by the spatial supply structure on the one hand, and actual – i.e., individually chosen – distance and behaviour on the other. Potential accessibility refers to the nearest option within each amenity category, whereas actual accessibility refers to the amenities that are actually chosen by the individual, and
which are not necessarily the ones located nearest to her/his home. The aspiration was to measure accessibility to all indicator amenities in both these ways; i.e., in terms of potential as well as actual accessibility. Data were drawn from ASTRID concerning the ‘impersonal’ spatial structural conditions; i.e., potential accessibility, with regard to the amenity supply as well as personally specific information concerning the actual accessibility to family and relatives. However, since ASTRID does not contain behavioural data on people’s choice of, e.g., service and leisure amenities, this information was obtained from the NTS data. Thus, the inclusion of NTS data creates important prerequisites for the interpretation of the results of the official register data from the ASTRID database; of putting them into perspective. Together, these data sources enable a broad analysis of the potential as well as actual accessibility conditions of the Swedish population.

For the thesis as a whole, the combined use of different empirical materials allows a broad picture of the accessibility issue which encompasses the different spatial dimensions of the concept: proximity (or distance) and mobility, and the relationship between the two.

4.2.2. Web survey

Paper I draws on data collected in a national survey in 2008. The survey, designed at the Department of Social and Economic Geography at Umeå University, targeted respondents’ accessibility from home to various amenities (denominated as ‘destinations’). The key issues addressed in the survey were the importance the individuals ascribed to living in proximity to the different amenities, their current self-reported distances to such amenities, their satisfaction with these distances, the frequency with which they used or visited the amenities in question, and, importantly, their satisfaction with their current residential conditions given their accessibility needs. In addition, the survey featured ‘standard’ questions concerning demographic and socioeconomic characteristics as well as questions pertaining to household characteristics, residential and migration history, daily mobility and access to mobility resources, and ICT use.

A national random sample of 19,553 individuals was drawn from the Swedish population aged 20-64. Two waves of data collection during May–August 2008 yielded a total of 3,110 responses, a response rate of 15.6%. The data collection approach can be described as hybrid, combining traits of both regular and web survey techniques. Although the actual survey was electronic, initial contact with respondents was made through regular mail

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23 On January 1, 2012, the department was renamed the Department of Geography and Economic History as a result of a merger.
(postcards) and included an Internet address to the survey web site and a personal access code.

4.2.2.1. Non-response
High non-response rates do not per definition cause major non-response error (Groves & Peytcheva 2008), and it is rather the representativeness of the collected responses that is important (Cook et al. 2000). Nevertheless, the non-response rate is an important indicator of the risk for bias in the data (Dillman 1991 cited in Sills & Song 2002). The magnitude of non-response error in surveys depends on the non-response rate in combination with the differences between respondents and non-respondents regarding key research variables and other characteristics (Groves & Couper 1998 cited in Couper 2000).

In general, electronic surveys can be expected to yield lower response rates compared to regular mail surveys (as mentioned in, e.g., Cook et al. 2000, Kaplowitz et al. 2004). The success of an electronic (web) survey, in terms of respondent cooperation, is generally considered to be dependent on the respondents’ access to and knowledge of the Internet (Vehovar et al. 2002). Therefore, web-based surveys targeting the general population may be obstructed by insufficient Internet penetration within the population and respondent (un-)willingness to cooperate/participate (Vehovar et al. 1999; Cook et al. 2000). Another aspect that plausibly explains much of the lack of respondent cooperation is that the design of this particular survey required the respondent to take an active step to respond to the survey. This is a marked difference compared to regular mail surveys in which respondents receive a physical questionnaire together with the instructions.

A reason why web surveys may be expected to be successful in Sweden is the generally high level of Internet penetration, not least in international comparison – only New Zealand and Canada had larger shares of Internet users in the population aged 18 and above in 2007 (WIP 2008 cited in Findahl 2008). In 2008 – the year of the survey – 80% of Swedes aged 16 and above were Internet users, and of these 58% used it on a daily basis. With increasing age, Internet usage becomes increasingly less common, especially from retirement age (65) and above. In addition to age, the ‘digital divide’ in the Swedish population cuts across other groups as well. Access to and/or usage of the Internet was less common among those with low education, those with low income, women and singles; compared to the highly educated, the affluent, men and co-habiting/married people (Findahl 2008).

One of the premises of the survey was the probability that a part of the sample may not have Internet access and thus not be able to respond, thereby increasing the likelihood of non-response. As a non-response preventive measure given the abovementioned age-wise segmentation of Inter-
net usage, the upper age limit of the sample frame was drawn at age 65. Other preventive measures included the design of the means of contact (the web application and postcards) with the respondents. These were designed with ease of use, visual qualities and minimizing respondents’ efforts in mind. In particular, the questionnaire web application \(^{24}\) featured a skip pattern of dynamic controls for ‘automatic question filtering’ (Yun & Trumbo 2000). As a result, the content of the questionnaire was partially customized for each respondent to eliminate irrelevant questions as far as possible, and thus reduce the risk of respondent fatigue. The possibility to design a dynamic and interactive version of the rather complex questionnaire was also the main reason why the web survey approach was chosen. Also, since a low (relative) response rate may be partially compensated for by a large number of responses, the sample size for the survey was intentionally boosted to ensure a high absolute number of responses and thereby variation in the data.

For a small number (58) of non-responders, the reasons for non-response are known either because the postcards came back undelivered or through information acquired through personal contacts. Lack of access to a computer and/or Internet was the most common self-reported non-response reason. Most of the 30 respondents (17 women; 13 men) who stated this reason belonged to the ‘older’ age groups, which fits well with the abovementioned age-wise segmentation of Internet use.

Concerning the bulk of the non-respondents, however, the only available information about them is their age in five-year cohorts. The non-respondents had a ‘younger’ age distribution compared to the respondents. Thus, although they represent groups which generally have good access to and knowledge of the Internet, people in the lower age segments responded to a lower degree compared to those in the older age segments. Thus, there is an overrepresentation of the older (45-64) age groups in the survey data. Importantly, the age difference between respondents and non-respondents also indicates that lack of access to the necessary skills and equipment was most likely not a main reason for non-response in the case of this survey.

Early and ‘laggard’ survey respondents tend to differ from each other (Batagelj & Vehovar 1998; Willke et al. 1999 cited in Vehovar et al. 2002). Therefore, a plausible methodological strategy for handling non-response is to compare respondents in the latter phase of survey administration (e.g., after a reminder has been sent) to individuals whose responses were submitted during the early phase. The rationale for this method is that laggard respondents tend to be more similar to non-respondents than are the early respondents (Sax et al. 2003), and the characteristics of this group may thus be indicative of those of the non-respondents.

\(^{24}\) The web application was developed at UMDAC (the Umeå University Computer Centre).
Following this strategy, the first- and second-wave respondents were compared using Chi-Square ($\chi^2$) tests and analysis of variance (ANOVA) (Table 5). As for the research variables, including some of the attitudinal variables, there were some significant ($p<0.05$), albeit minor, differences between the two groups. Some of these differences may be interpreted as indicators of variations in habits, lifestyle patterns, and family characteristics; e.g., the frequency of visiting a gym/sports centre or urban centre, whether the respondents had adult children living outside their household, whether they had considered moving to increase their proximity to children’s main daily activities, and the importance they attached to living in proximity to, for instance, child care and multi-functional petrol stations. Interestingly, the second-wave respondents placed slightly higher importance on proximity compared to the first-wave respondents, which may indicate that the accessibility conditions and strategies of the former group – and perhaps also of the non-respondents – are more oriented towards the proximity dimension of accessibility.

Concerning the demographic and socioeconomic background variables, the non-response analysis suggests that the survey data contains an overrepresentation of the older age segments, as well as of native Swedes and of those with higher (secondary and tertiary) levels of education. Thus, there is a corresponding underrepresentation of the younger age segments, foreign-borns and those with lower levels of education (compulsory or vocational school).

Overall, however, most of the differences between the groups are relatively minor and do not seem likely to pose any serious problems regarding the robustness of the results of the survey. For most of the survey variables, there were no significant differences at all. Also, importantly, there were no significant differences between the groups on the most important research variables, including the dependent variable and virtually all independent variables in the regression. It should also be stressed that the potential for non-response error is not necessarily something that weakens survey results. In fact, an underrepresentation of certain groups among survey respondents, e.g., different age segments or other demographic characteristics, may just as well strengthen the results if they point to conditions which are prevalent among the underrepresented groups.
Table 5: Significant differences between first- and second-wave respondents in the 2008 web survey.

<table>
<thead>
<tr>
<th></th>
<th>First wave</th>
<th>Second wave</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country of origin</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>89.8</td>
<td>85.6</td>
<td></td>
</tr>
<tr>
<td>Nordic countries</td>
<td>3.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>3.4</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>World</td>
<td>3.8</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compulsory school</td>
<td>10.7</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>Vocational school or</td>
<td>13.7</td>
<td>14.8</td>
<td></td>
</tr>
<tr>
<td>similar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper secondary school</td>
<td>28.4</td>
<td>28.1</td>
<td></td>
</tr>
<tr>
<td>University or college</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;3 years</td>
<td>16.2</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>University or college</td>
<td>31.1</td>
<td>29.5</td>
<td></td>
</tr>
<tr>
<td>&gt;3 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adult child/-ren not</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>living in the respon-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dent’s household**</td>
<td>Yes</td>
<td>40.5</td>
<td>35.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>59.5</td>
<td>64.1</td>
</tr>
<tr>
<td><strong>Frequency of visiting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gym/sports centre**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every week</td>
<td>29.5</td>
<td>24.0</td>
<td></td>
</tr>
<tr>
<td>Every month</td>
<td>8.6</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>More seldom</td>
<td>30.4</td>
<td>36.4</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>31.6</td>
<td>30.5</td>
<td></td>
</tr>
<tr>
<td><strong>Frequency of visiting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban centre**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every week</td>
<td>58.0</td>
<td>52.9</td>
<td></td>
</tr>
<tr>
<td>Every month</td>
<td>28.6</td>
<td>30.9</td>
<td></td>
</tr>
<tr>
<td>More seldom</td>
<td>13.0</td>
<td>15.3</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0.4</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td><strong>Internet access at</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>workplace**</td>
<td>Yes</td>
<td>90.7</td>
<td>87.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>9.3</td>
<td>13.0</td>
</tr>
<tr>
<td><strong>Considered moving to</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>increase proximity to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>child care/ children’s</td>
<td>Yes</td>
<td>4.1</td>
<td>7.3</td>
</tr>
<tr>
<td>school**</td>
<td>No</td>
<td>95.9</td>
<td>92.7</td>
</tr>
<tr>
<td><strong>Mean value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age **</td>
<td>46.1</td>
<td>45.0</td>
<td></td>
</tr>
<tr>
<td>**Importance of prox-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>imity to...</td>
<td>Child care (*)</td>
<td>4.5</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>Store for clothes, shoes etc. (*)</td>
<td>3.0</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Store for electronics, household appliances etc. (*)</td>
<td>2.6</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Post office (*)</td>
<td>3.7</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Petrol station with small range of groceries etc. (***</td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Satisfaction with dis-</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tance to care centre**</td>
<td>4.2</td>
<td>4.1</td>
<td></td>
</tr>
</tbody>
</table>

Significance levels: * p<0.05; ** p<0.01; *** p<0.001
4.2.3. National Travel Surveys

The Swedish National Travel Surveys (NTS) comprise a rich micro-level database containing information about individual travel patterns. The NTS are used as a main data source in Paper III, and as a complement to the register data in Paper II. The surveys (denominated as ‘RiksRVU’ in 1995 and ‘RES’ in 2005/06) are designed and collected by SIKA, the public agency for transportation and communications analysis. Variables present in the earlier version of the NTS are also collected for the latter version, creating continuity and allowing for comparisons of individual behaviour over time on key variables (SIKA 2007).

The NTS data are collected by way of telephone interviews based on travel diaries kept by the respondents for one specific ‘survey day’ allocated randomly to respondents over the survey period, which stretches over 12 months (SIKA 2007). The sampling frame is all individuals in the Swedish population aged 6–84. Details on the data collection periods, sample sizes and response rates are provided in Table 6. When weighted, the NTS data are representative of all trips conducted by the Swedish population over the 12-month survey period.

Table 6: Details of the National Travel Surveys 1995 and 2005/2006.
Source: SIKA via Professor Bertil Vilhelmson, Department of Human and Economic Geography, University of Gothenburg.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample (n)</td>
<td>12,326</td>
<td>40,928</td>
</tr>
<tr>
<td>Non-response (n)</td>
<td>2,689 (21.5%)</td>
<td>13,281 (32.4%)</td>
</tr>
</tbody>
</table>

The variables used in Papers II and III represent the respondents’ total daily travel distance for different activities; figures obtained by adding together the lengths of all trips made for the different purposes during the survey day. In Paper II, aggregate NTS information is used for trips within all amenity categories – work, education, service, leisure and social/family (Table 4). Paper III focuses specifically on a subset of the database – namely trips made for service errands – and employs the NTS data in a disaggregate form, i.e., on the individual level. For both papers, only one-way trips originating from the respondents’ residential location were included to optimize comparability with the register data and in compliance with the thesis’ overall emphasis on the residential location.

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25 SIKA has since been renamed 'Trafikanalys' (Transport Analysis).
4.2.4. **ASTRID register database**

One of the advantages of conducting empirical research in the Swedish context is the availability of high-quality micro-level data. The main source of data in Paper II is the ASTRID database, a comprehensive, high-resolution, geo-referenced and longitudinal database comprising all individuals in the Swedish population. The database contains a rich variety of demographic and socioeconomic variables for each year. Of particular importance for the present research is the possibility to identify the family relations and current workplace of each individual in the population, including their geographical coordinates. This is of key importance, since it also allows the identification of various amenities. Given the complete scope of ASTRID, the analyses are not based on a sample but rather on the entire population. The data for ASTRID are collected, and the database maintained, by Statistics Sweden (the national statistics agency). It is placed at the Department of Social and Economic Geography at Umeå University. The database is a key part of a project aimed at developing a micro simulation model for the Swedish population, the ‘SVERIGE’ model.

Among the variables included in the database is information concerning all individuals’ residential locations and, where applicable, the geographical coordinates of their workplace. Through the workplace coordinates it is also possible to identify the locations of service, leisure and educational amenities (see below). The geographical resolution of the data used in Paper II is accurate to 100 m * 100 m for the residential locations of individuals and their relatives and for workplaces; and to 1 km * 1 km for service, education and leisure amenities. In the latter cases, the resolution was truncated to the 1 km level – which is a fully sufficient level of detail – to reduce the number of distance calculations and thus somewhat simplify the computational analysis. However, the locations of all amenities are available at the higher resolution in the database.

Several accessibility indicator variables were constructed for the analyses in Paper II (see above and Paper II in the appendix). These variables were created on the basis of calculations of the straight-line (Euclidean) distance between pairs of coordinates for residential locations and amenities, respectively. For each individual, the distance was measured from their residential location to the nearest of each of the indicator amenities, which were identified through their official Swedish Standard Industrial Classification codes (SNI codes; see above). In addition, each individual in the population was assigned variables representing the total number of amenities of each type available within defined distance ranges (5 and 50 km; see above) from their residential location.

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26 Provided that they have a workplace and/or relatives who are alive and are residents of Sweden.
Concerning the ‘social amenities’ – which in this case are restricted to family members and other relatives – these were identified (provided they were residents of Sweden) through chains of pointers based on information about each individual’s mother and father. More specifically, this was done using a computer program custom designed by Professor Einar Holm at the Department of Social and Economic Geography at Umeå University. Figure 6 illustrates how various types of relatives can be identified via the personal identification numbers (PIDs) of the individual’s mother and father, respectively. The variables constructed represent the distance from the individual’s residential location to the nearest relative of the different types. In the case of children, for instance, for individuals with several children the variable represents the distance to the child living nearest to the parent. The cumulative variables, however, represent the number of relatives of each type living within the defined distance ranges. Also, in addition to the 5 and 50 km ranges used for the ‘non-social’ amenities, a very narrow distance range – the same 100 m square\(^2\) as the residential location – is also included.

In Paper III, variables from ASTRID similar to those described here are used as indicators of the spatial supply of service amenities within 1, 5 and 50 km ranges of individuals’ residential location. However, because of the merger of the ASTRID data with NTS data (see below), the geographical resolution is somewhat lower than in Paper II. This is because the residential (SAMS, Small Areas for Market Statistics; Figure 7) area is the most detailed level of geographical resolution available in the NTS data, and thus the ASTRID data had to be adapted accordingly. This also means that the accessibility indicator variables in Paper III represent average accessibility conditions for residential areas, as opposed to the specific individual accessibility indicators used in Paper II.

\(^{27}\) Relatives living within the same 100 m square include family members in the same household.
Figure 6: Some examples of Mother and Father ‘pointers’ providing necessary and sufficient conditions for defining family relations for each person (P1) in Sweden. Courtesy of Professor Einar Holm.
4.2.4.1. Data merging

The analyses in Paper III are based on a merger of NTS and ASTRID data into an integrated dataset containing spatial as well as individual attributes, including observed travel behaviour. Information concerning the amenity supply was calculated in ASTRID and subsequently added to the NTS database using the roughly 9,000 residential (SAMS) areas28 (Table 7 and Figure 7) as a spatial key. As mentioned, these areas are the highest-resolution geographical units available in both databases.


<table>
<thead>
<tr>
<th></th>
<th>1995</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of populated SAMS areas</td>
<td>8,932</td>
<td>8,949</td>
</tr>
<tr>
<td>Average population size</td>
<td>889</td>
<td>919</td>
</tr>
<tr>
<td>Population size range (min.–max.)</td>
<td>1–16,623</td>
<td>1–17,787</td>
</tr>
</tbody>
</table>

In ASTRID, the average supply of service amenities was calculated for the residential areas as an average figure of the supply available within 1, 5 and 50 kilometres, respectively, based on all individuals aged 6–8429 resident in the area, for the years 1995 and 2005. Since intrapersonal accessibility is a proxy for accessibility to amenities (Lynch 1981), the procedure was repeated concerning average population size within the same spatial ranges. The figures were calculated for each residential area based on its resident individuals’ spatial accessibility to amenities and people, but may also include supply points (and people) located outside the area itself, so long as they were located within the spatial ranges.

The calculated information on average amenity supply and population size within the specified spatial ranges was then added to the NTS databases for 1995 and 2005/06, respectively, using the residential area of the survey respondents as a spatial key between the two datasets. Hence, the respondents in a certain residential area were all assigned the same average supply data, as an indicative measure of their potential accessibility to service amenities within and surrounding their residential area. Thus, all individuals resident in the same area have identical properties regarding the spatial supply structure and hence these characteristics vary across, but not within, residential areas. However, since the individuals also have different attributes in terms of, e.g., socioeconomic characteristics which may potentially differentiate their travel behaviour – for instance, the extent to which they

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28 The SAMS areas, which represent comparable ‘homogenous residential areas’ (Statistics Sweden cited in SOU 2005, p. 50) vary in terms of both area and population size, although the idea is that the areas should have approximately 1,000 inhabitants.

29 For reasons of comparability, the calculations in ASTRID were made only for individuals within the same age interval as those in the NTS sampling frame.
utilize nearby amenities or make longer trips to more distant amenities – the data also include variation within the residential areas.

Figure 7: Municipalities, residential (SAMS) areas and major cities in Sweden.
5. Paper summaries

5.1. Paper I: The advantage of ‘near’: which accessibilities matter to whom?

Of the two spatial dimensions of the accessibility concept (Figure 1), proximity and mobility, the first paper is concerned primarily with the proximity (or conversely, distance) dimension. A key point of departure and background of the study is the importance of geographical proximity for individual accessibility in an everyday life context. However, the specific amenities (denominated as ‘destinations’ in the paper) to which proximity is considered important are likely to vary between individuals and groups. Hence, accessibility is understood as something individual and subjective. With the exception of certain amenities to which accessibility is generally relevant for everyone, different accessibilities presumably matter to different people. Given the importance of accessibility to relevant amenities in everyday life, it may also be assumed that the accessibilities (i.e., proximities) offered by the current residential location with regard to these amenities may influence individuals’ residential satisfaction.

The aim of the paper is twofold. First, it entails an analysis of individual preferences for proximity – proximity preferences – to different amenities and a comparison of these preferences to actual accessibility conditions in terms of distance satisfaction. Second, the study is an inquiry into residential satisfaction and how this is influenced by different factors, particularly accessibility-related factors. Proximity preferences are analysed for a set of amenities with varying characteristics which may be important in an everyday life context. The selection includes a broad and varied range of amenities: work, education, service facilities, leisure and social activities. Individual satisfaction is considered on two levels, in terms both of satisfaction with the distance between the residential location and the amenities, and of residential satisfaction in a more general sense.

The empirical basis of the paper is a national survey of the Swedish population, targeted at individuals in the 20–64 age span. The survey was conducted in 2008 by way of a web-based data collection approach. The data are analysed using descriptive statistics and regression analysis. In the analyses, gender, age and type of living environment – large urban areas, small urban areas and rural areas – are the key analytical categories.

As regards the first part of the aim, proximity was particularly highly valued for destinations pertaining to basic daily activities (especially children’s activities) and social/family relations. Thus, the results show that individuals’ proximity preferences are structured along two dimensions of key importance: practical rationales on the one hand and social rationales on the other. It matters most to have proximity to the things that are important
constituents of everyday life in a practical sense, as well as to people and social relations, which are also important in the ‘larger picture’ of life.

However, in addition to these general results and broad patterns of proximity preferences among the respondents, there were also certain differences across sub-groups according to gender, age and type of living environment. For instance, urbanites living in the largest towns emphasized the importance of proximity to certain amenities – urban centre, grocery store, gym/sports centre, shopping centre and leisure/recreational area – to a higher degree compared to rural dwellers, while the latter group ranked proximity to a petrol station as more important compared to the urban dwellers. These variations in individual proximity preferences reflect the differences across these geographies with different accessibility prerequisites in terms of the spatial supply of amenities in urban and rural areas. It also reflects the different trade-offs with regard to the attributes of rural and urban areas, respectively, in residential choice processes and perhaps also processes of self-selection to some extent. The abovementioned differences in the accessibility conditions across different geographies were also reflected in the differences in the respondents’ degree of de facto distance satisfaction for the amenities. The satisfaction levels were consistently lower among rural dwellers, whose living environments are typically characterized by a highly limited amenity supply structure.

Moreover, the results reflect partly predictable but nevertheless important variations in people’s accessibility needs and preferences across the life course. While respondents in the younger age segments placed higher value on proximity to certain amenities – child care, best friend, gym/sports centre and restaurant – those in the older segments placed more emphasis on other things: care centre, pharmacy and theatre. Also, while respondents of both genders expressed similar proximity preferences in a general sense, women consistently placed higher value on proximity to the amenities compared to the men. This possibly indicates the existence of a pattern of a somewhat higher degree of proximity orientation in women’s accessibility, as opposed to a possible mobility orientation in men’s accessibility. Such a pattern would also reflect, e.g., well documented gender differences in access to mobility resources, mainly private cars.

For most amenities, the respondents expressed a high degree of distance satisfaction. This may be explained by the simple fact that, in general, the self-reported distances were relatively short. In fact, for many of the amenities, there was what could be called a proximity surplus in the sense that the respondents’ valuation of distance satisfaction exceeded the value of their proximity preferences. However, concerning social relations, the distances were considerably longer than in the case of the other amenities and, correspondingly, distance satisfaction was also lower. These ‘social amenities’ were the only cases where the results indicate the existence of mismatches or
proximity deficits in the sense that the respondents expressed a wish to live closer to their social relations. This was most clearly pronounced concerning adult children. Thus, with regard to the abovementioned importance of practical considerations on the one hand and social bonds on the other as the key constructors of individual proximity preferences, the de facto conditions of the respondents were – generally speaking – seen as more than satisfactory with regard to the former, but less so with regard to the latter.

Pursuing the second part of the aim, a regression model was employed to further explore the respondents’ residential satisfaction with the location of their dwelling vis-à-vis the amenities they perceived as important parts of their everyday life accessibility needs. Residential location satisfaction was found to be related to several other variables: type of residential environment, type of tenure and whether the respondents had considered moving as a means of increasing proximity to certain amenities. In particular, there were clear associations between overall residential satisfaction on the one hand and distance satisfaction with regard to specific amenities on the other. The higher the distance satisfaction with regard to particular amenities, the higher the more general level of satisfaction was with the residential location. These associations are interpreted as suggestive that distance satisfaction mediates the importance of geographical proximity (or distance) and proximity preferences (both these sets of variables performed rather poorly when included in preliminary tests for the regression model) for overall residential location satisfaction.

5.2. Paper II: Proximity, accessibility and choice: a matter of taste or condition?

The second paper encompasses both the proximity (or distance) and the mobility dimensions of the accessibility concept (Figure 1), but with an emphasis on the former. The background of the study can be found in the widespread concerns that distances to many activity sites are increasing (e.g., due to urban sprawl, a centralization of amenity facilities and a loss of amenities especially in rural areas), thus generating a growing need for accessibility-by-mobility rather than accessibility-by-proximity in order to reach the activities of everyday life. The focus of the paper is on changes over time in the spatial accessibility conditions of the entire Swedish population over the ten-year time period 1995–2005. In addition, the analysis also entails scrutinizing the reasons why the observed changes have occurred: the changes may be attributed to a spatial redistribution of either the amenities or of the population, or a combination of both.

Accessibility changes are considered in several ways: with regard to both the distance to different amenities, and the size and ‘scope’ (diversity) of the amenity supply. A broad selection of amenities is included in the study, en-
compassing those related to leisure activities, services, work, education and relatives. Distances to amenities are measured from individuals’ residential locations. The distances to leisure, service and education amenities are potential in the sense that they are measured to the nearest option within a category, whereas the distances to work and relatives are actual distances to personally relevant locations. The main data source is the comprehensive official register database ASTRID, containing geo-referenced micro-level information for the entire Swedish population, including their residential locations and the locations of the amenities. Two cross-sections of data are analysed: for 1995 and 2005. As a complement to the register data, additional information is drawn from the National Travel Surveys (NTS) for the same years (1995 and 2005/06) as the ASTRID cross-sections. Through the combination of data sources, the empirical basis allows for the study of changes in spatial amenity supply conditions as well as observed travel behaviour, and a comparison of how these different dimensions of accessibility have developed over time. The methods used are descriptive analysis and regression modelling.

As regards the development of distances, over the ten-year study period, the mean distances to virtually all service, leisure and education amenities decreased, whereas they increased to work and relatives. In other words, there were decreases in potential distances (i.e., distances to the nearest leisure, service and education amenities), while the actual distances to people’s workplaces and to their relatives simultaneously increased.

Concerning a completeness aspect of the amenity supply, most of the different indicator amenities within the service, leisure and education categories were available within a local spatial range of 5 km of people’s homes, and the average figure increased over the study period. Regarding work, there was an increase in the average number of potential employment opportunities within the 5 km distance range. However, there was a slight decrease in the average number of relatives living within 5 km.

Within a regional spatial range of 50 km the service, leisure and education amenities were virtually ubiquitous, with almost all amenities available within this range. Concerning potential jobs, the average number increased considerably over the period, whereas the average number of relatives available within this distance range decreased somewhat.

An analysis of the underlying reasons behind the accessibility changes was undertaken specifically for the service amenities. This revealed that the observed changes over the study period can mainly be attributed to processes of spatial restructuring internally within the service sector. Redistribution of services was the most important explanation behind the decreased potential distances. Although population redistribution also had an impact, it was much more limited than that of redistribution of services. Thus, the observed accessibility increase is a matter of the amenities moving closer to where...
people live rather than one of population settlement patterns changing towards a higher degree of proximity to the amenities.

Although the results reported in the paper are somewhat mixed, by and large they indicate that there has been an increase in proximity to many of the indicator amenities over the study period between 1995 and 2005. Interestingly, however, this development is not reflected in observed patterns of actual travel behaviour, as revealed when juxtaposing the register data results with data drawn from the NTS. Despite the observed increases in potential – i.e., ‘nearest option’ – accessibility to amenities, the actual travel distances of the population have increased over the same period. In addition, the actual travel distances to chosen amenities were substantially longer than potential distances to the nearest amenity options. Thus, in line with the theory of constant TTB, these findings suggest that the increased potential accessibility is not taken advantage of as a means of shortening travel distances. Instead, people – in the aggregate – travel increasingly far to reach their chosen amenities, which are apparently not necessarily the nearest options. It appears likely that at least part of the reasons why people travel ‘farther than necessary’ lies in increasingly selective individual preferences, manifested in their choice of amenity destinations. Hence, the increasing levels of mobility appear to be not so much a result of the requirements of the structural conditions with regard to the supply of amenities, but largely the outcome of individual choice.

5.3. Paper III: The divergent role of spatial access: the changing supply and location of service amenities and service trip length in Sweden

The third paper is an inquiry mainly into the mobility dimension of accessibility (Figure 1), although the proximity dimension in terms of locational accessibility is also very much present in the study. The point of departure is a commonplace assumption according to which access to a local (i.e., proximate) supply of amenities enables people to travel only short distances to reach, for instance, service amenities. However, there is currently also an ongoing discussion which points to increasing levels of mobility and a ‘regionalization’ of individuals’ activity spaces with respect to many daily activities. This may be seen as an indication that the basic idea concerning the relationship between locational accessibility and travel behaviour expressed in the abovementioned assumption may be losing ground.

Also, previous research (including the findings of Paper II) shows that people do not necessarily opt for the nearest alternative when making destination choices in everyday life. To some extent, this behavioural pattern contradicts the abovementioned assumption regarding the connection between local supply and trip length, while simultaneously supporting the no-
tion of the regionalization or stretching of activity spaces. Taken together, these issues raise questions regarding the current state of the relationship between spatial structure and travel behaviour, particularly as to whether the conventionally assumed association between local access and short trips may be in the process of altering or weakening – or whether it still holds, despite the mentioned trends in the development of mobility patterns.

The paper explores the relationship between spatial structure and travel behaviour. More specifically, the aim is to analyse the relationship between the spatial amenity supply structure on the one hand and the distances individuals travel to undertake service activities on the other. Spatial supply structure is operationalized as the numerical size of concentrations of a defined set of service amenities both within and around individuals’ residential areas, and travel distance is operationalized as total daily length of individuals’ service-related trips originating from home. The residential location is in focus for reasons of comparability with Papers I and II, and also because it is the starting point of an overwhelming majority of service trips (>90% in both 1995 and 2005/06). The somewhat narrow focus on service amenities and service trips specifically (as opposed to Papers I and II, which both encompass a broader selection of different amenities) is motivated by the fact that there is often substantial scope for individual choice when it comes to service amenities compared to many other amenities which are more fixed, at least from a short time perspective. Thus, it is a suitable choice for studying issues related to the spatial choice element of travel behaviour.

The empirical analyses, which consist of descriptive statistics and regression modelling, are based on a combination of National Travel Survey (NTS) data and official register data drawn from the ASTRID database containing detailed, geo-referenced micro-level information on the Swedish population (aged 6–84, which is the age span of the NTS sampling frame). By way of using residential (SAMS, Small Areas for Market Statistics) areas as a spatial key between the datasets, a unique integrated dataset is created which enables the analysis of the relationship between travel behaviour and the location of concentrations of service amenities. The analysis is focused on two local spatial ranges (1 and 5 km) and one regional range (50 km). The indicators represent the average amenity supply measured from the point of view of the NTS respondents’ residential areas. The analyses are conducted for two years, 1995 and 2005/06, which adds a certain time depth and an emphasis on change over time.

The analyses revealed that locational (‘spatial’) access to service amenities, measured as the average number of amenities located within the different distance ranges, increased between 1995 and 2005 across all three ranges; i.e., locally as well as regionally. However, the changes were not evenly distributed – for instance, a negative development of locational accessibility was more common on the local scales than on the regional scale, and
vice versa. Despite these differences, the overall results suggest that accessibility conditions developed positively over the period. In particular, the increase in spatial supply on the local scale suggests that the scope for choice also increased for those individuals and groups who are relatively confined to utilizing the supply present in the local surroundings due to a lack of access to the mobility resources necessary to reach the regional supply structure.

Despite the increases in locational accessibility, there was a concomitant increase in observed average trip length, which is in line with the discussion concerning the regionalization of activity spaces. In the regression analyses, strong associations were revealed between locational (local as well as regional) access to service amenities and daily service trip length, for both years. Car access, which is an important indicator of the mobility resources of individuals, was controlled for in the analyses. The results clearly reveal certain aspects of the relationship between spatial structure and behaviour. Trip length was found to be related to spatial structure, and the relationship was stable over time. In other words, the relationship was present and exhibited the same direction of association in both cross-sections of data: for 1995 as well as 2005/06. However, the direction of the association diverged across the spatial scales. On the local scale, the association was negative; i.e., the larger the amenity supply, the shorter the trip length. However, the association was the opposite, i.e. positive, on the regional scale. Hence, while people do appear to make use of the service amenities available locally, they are nevertheless also willing to travel beyond the local range if there is a sufficiently large supply of service amenities within the region. At some point, this extended supply seems to make the additional travel worthwhile. These findings may be interpreted as supportive of both the assumption that access to a local supply enables short trips, and the notion of an ongoing regionalization of activity spaces.

The results indicate that there are indeed strong associations between spatial structure and travel behaviour as these concepts are operationalized in the present study. However, these associations display a certain complexity and depend on the level of scale on which the association is studied. The abovementioned conventional assumption – that local supply enables short travel distances – apparently still holds, and has persisted during the course of the study period, despite the regionalization of activities and the development of virtual substitutes like Internet shopping, which has altered shopping patterns to some extent. Yet, the importance of the spatial structure of the amenity supply is rather limited. Much of the variation (more than 75% both years) in trip length was left unexplained by the models. The limited role of spatial structure in daily mobility choices is in itself an important conclusion. Clearly, there are other, unobserved, factors that play important roles. These factors probably include a substantial element of variation in
individual preferences and corresponding selectivity, and may be less sensitive to the distance aspect of destination choice.
6. Concluding discussion: the accessibility paradox

When juxtaposing the key findings of the three empirical studies upon which the thesis is based, a pattern emerges which may be conceptualized as a multifaceted accessibility paradox. This concluding section is structured around a discussion of the different facets of this paradox, which are briefly outlined in the following before being further elaborated upon in the respective subsections.

Section 6.1. discusses the first facet of the paradox: although proximity to amenities is considered important, it is not necessarily a decisive criterion in individuals’ de facto destination choices. There appears to be a rather pronounced difference between stated preferences on the one hand and revealed behaviour on the other. Further adding to the apparent paradoxality of these findings is the fact that there has been a development over time towards increasing proximity to many amenities – a development which should enable people to increasingly choose local (proximate) options – and yet this does not seem to be the obvious chosen course of action.

In addition, a second facet of the accessibility paradox is outlined in Section 6.2., namely that the development over time has led to increased proximity to many of the amenities to which proximity is regarded as relatively unimportant, while it has simultaneously decreased to some of the amenities to which it is considered most important.

In Section 6.3., a third facet of the accessibility paradox is discussed: the discrepancy between the main focus of the prevailing current discourse on accessibility – which tends to emphasize processes of deterioration of accessibility conditions – and the observed changes reported in the thesis, which point to a development characterized by increased proximity concerning many amenities. Thus, there appears to be a need to somewhat nuance and include additional perspectives in the discourse.

Rather than adding an additional facet to the accessibility paradox, the findings concerning the importance of spatial structure for travel behaviour, discussed in Section 6.4., provide further support for it. Although spatial supply structure displays important relationships with travel behaviour, it is by far not the only influence and thus it is clear that destination choice is a complex matter that depends on much more than access to local options.

Finally, Section 6.5. suggests some areas for further research which may dig more deeply into the accessibility paradox, not least the extent to which it may be explained by other factors and the extent to which it reflects ‘truly’ paradoxical conditions.
6.1. Proximity to amenities is important – and yet unimportant

The thesis shows that, generally speaking, people appreciate living in proximity to and thus having locational accessibility to many amenities, most importantly main everyday activities and social networks of family and friends. Also, people are generally satisfied with the accessibility conditions offered by their residential location vis-à-vis other places they need or wish to visit. In other words, preferences for proximity are largely fulfilled. However, even though proximity to amenities is clearly an appreciated feature of residential environments it is perhaps not necessarily always the key consideration when it comes to individuals’ actual destination choices. Thus, although proximity is seen as important it may nevertheless be relatively unimportant in actual choices.

In fact, it appears to be the case that rather than proximity it is mobility – the other main constituent of the spatial dimensions of the accessibility concept as it is interpreted and empirically studied in the thesis (Figure 1) – which plays a key role in attaining accessibility. It may be argued that, generally speaking, people appear to be more inclined towards accessibility-by-mobility than accessibility-by-proximity in their everyday life destination choices. Although there is of course substantial individual variation, the aggregate behaviour of the population suggests that people often do not opt for the nearest potential amenity alternatives. There is a marked difference between potential (i.e., ‘nearest-option’) distances on the one hand and actual travel distances on the other. This difference, which is also persistent over time, indicates that many people tend to travel farther than what may be considered a theoretical minimum amount of travel. Moreover, even though there has been a decrease over time in the average potential distance to most amenities, there has been a simultaneous increase in average actual travel distances. Thus, the gap between potential and actual travel distances seems to be widening.

The first facet of the accessibility paradox is that although people generally feel that proximity to amenities is important – and even though the development over time has meant that most amenities are reachable within shorter travel distances compared to previously – they do not necessarily make use of the nearest available options. Instead, there is an overall tendency to travel increasingly far in order to reach amenities other than the most proximate ones, but which are perhaps perceived as superior in terms of their specific content or qualities. In this sense, potential accessibility conditions are not reflected in people’s actual choices – at least not in the aggregate – and the mobility dimension of accessibility appears to take precedence over the proximity dimension as the main way of gaining access to desired amenities. Thus, accessibility-related choices and behaviour can be argued to reflect a basic trade-off between proximity and quality, a choice which is enabled by the absence of mobility constraints.
While these findings suggest the existence of a paradox it is important to emphasize that this is a matter of interpretation, and in fact it can be argued that they should not be regarded as paradoxical at all for various reasons. First, it is entirely possible that the reasons why proximate amenities are not chosen concern the non-spatial aspects of accessibility which are beyond the scope of the thesis, for instance knowledge and information, or in some cases admittance requirements. Second, it is hardly surprising that, being in possession of the necessary resources and having the necessary time available to spend on travel, people may choose to travel farther and thus gain access to amenities that would otherwise be unreachable and are for whatever reason perceived as superior to those located at closer range. Third, neither is it strange that people would also like to 'keep their options open' in the sense that the local (proximate) accessibility structure remains intact despite the geographical extension of travel patterns beyond the local level. Even though the local amenity supply is perhaps not actually utilized to any larger extent, it is not necessarily a contradiction to state that its existence is nevertheless not without a certain importance. Rather, it is an expression of the 'option value' (Geurs & van Wee 2004) of locational accessibility even though distance-bridging accessibility may be the approach usually chosen. It is seen as important that these nearby alternatives exist even when their potential remains unrealized, because one day we might need or want to use them (cf. Breheny et al. 1998 cited in Banister 2005). Connected to this is also the issue of people whose ability to travel to more distant amenities is constrained for different reasons. Ensuring their access is of course something that enhances the importance of the existence of local amenity supply even further. In addition, the existence of a land-use structure featuring a high degree of locational accessibility, therefore supporting a possible reduction in travel distances, may be seen as a prerequisite for the gradual adaptation of urban form and travel patterns towards a higher degree of sustainability (Banister 2008).

Fourth, it is also important to keep in mind that the empirical findings, which together indicate the existence of a paradox, are partly based on the analysis of different data expressing different 'things'. More specifically, it is likely that at least a part of the apparent paradox may be explained by the difference between potential ('nearest-option') distances (in the case of service, leisure and education amenities) and the actual distances to individually chosen amenities (in the case of work and family relations). This may be regarded as a comparison of 'apples and oranges' to some extent. Clearly, the indicator amenities differ widely in their degree of anonymity or interchangeability on the one hand and their personalness or uniqueness on the other. The interchangeability of, for instance, a chain store and the uniqueness of a family member can be seen as examples of the extremes in this respect, and most amenities can presumably be placed somewhere on a con-
tinuum between these two poles. The characteristics of different amenities with regard to these qualities are likely to affect their relevance to individuals and hence their possible inclusion as eligible alternatives in destination choice processes. Taken together, all these different caveats suggest that while the observed patterns reported throughout the thesis may be interpreted as paradoxical, this is far from the only plausible point of view.

However, if the findings of the thesis are indeed interpreted in terms of a paradox, there are several pertinent issues that merit discussion. Since the increase in travel distances, in the case of most amenities, is not due to coercive structural conditions in terms of increased distance, it follows that individual choice is a key element of the interpretation of the first facet of the accessibility paradox, and that this choice element may be growing increasingly important. Obviously, a reasonable explanation for why people travel farther than what may be considered ‘necessary’, i.e. a theoretical minimum, is that the amenities available at the more distant locations are in some way perceived as superior to those located closer to home. Travelling farther may thus enable a higher degree of preference fulfilment; of people attaining access to those amenities they actually want to utilize. Hence, one possibility is that the observed patterns of travel behaviour reflect a strive towards a higher degree of ‘optimizing’ (as opposed to ‘satisficing’) (cf. Schwartz et al. 2002). In other words, the scope of the ‘want’ (Holm et al. 1989) dimension of accessibility appears to be substantial.

Before further elaboration on the issues outlined above, it should be noted that the observed changes in locational accessibility have not entailed increased accessibility for all the indicator amenities. People’s de facto distances to both their workplaces and family members have increased on average. Concerning work, this may be an effect of increasing labour market specialization and reflects the current trends of increasing commuting and processes of geographical extension of labour markets (e.g., Amcoff 2009b; Sando 2011). As for the increased distances to family members, this development reflects ongoing processes of population redistribution in general and urbanization in particular, as discussed further below.

Returning now to the above discussion concerning the importance of the choice element and the difference between potential and actual distances, it seems that individuals’ chosen course of action is frequently to use their available mobility resources to reach preferred amenities rather than to try to minimize their travel – findings which at least to some extent run contrary to common assumptions in transport analysis. Having the possibility to choose according to individual taste and needs may clearly be conceptualized as a welfare gain in terms of a higher degree of freedom of choice, preference fulfilment and perhaps even quality of life in a more general sense. However, it is worth mentioning that while scope for choice is usually interpreted in positive terms, it has also been argued that when the options become over-
whelmingly abundant, choice may become a burden rather than a blessing and may result in reduced levels of satisfaction (Schwartz 2004). Hence, it is perhaps not necessarily the case that adding more options to choose among is always, or per definition, associated with higher welfare gains.

In addition, while the welfare gain aspect represents one way of interpreting the increased travel, there are also other and potentially more problematic aspects, not least from a policy point of view. Longer travel distances are largely associated with widespread car use, which thus raises issues about how the development is related to the long-term sustainability of the travel patterns and not least what the future holds concerning the development of these patterns. According to official projections (SIKA 2005), travel – not least by car – in Sweden is expected to continue growing during the 2010s. This suggests that the issue is bound to remain on the agenda during the foreseeable future, for instance with regard to spatial planning policy, the outcomes of which exert a key influence on travel patterns and which is an integrated part of the environmental policy area.

From a strictly normative (‘ought’; Holm et al. 1989) point of view, the increased travel may perhaps be considered ‘excessive’ (e.g., Salomon & Mokhtarian 1998), especially in cases where there are alternative amenity destinations available within a shorter distance than those chosen. The apparent increasing reliance on accessibility-by-mobility rather than accessibility-by-proximity may in this sense be seen as an expression of a growing unsustainability of travel patterns and therefore undesirable from an ‘ought’ perspective. Yet, simultaneously it seems to be what many people ‘want’ (Holm et al. 1989), judging from their revealed behaviour. Here, it may be argued that a restrictive view of travel, motivated primarily by environmental concerns, clashes with the abovementioned welfare dimension, which may be seen as part and parcel of a social sustainability 30 perspective. Thus, there is a potential for conflicts of aims between different constituents of the overriding policy goal of sustainability – usually defined in terms of ecological, economical and social aspects – as well as between what is desirable at the individual micro level on the one hand and for society on a more general macro level on the other. As argued by Cooper et al. (2001), policy aiming for sustainable development is related to issues of choice as well as contemporary Western standards with regard to living conditions, including mobility. If a desired development of more sustainable travel patterns requires that people travel shorter distances and increasingly use travel modes other than

30 However, this interpretation of social sustainability is admittedly somewhat generous compared to the formulation in the original United Nations report (Brundtland 1987) where it is acknowledged that ‘perceived needs are socially and culturally determined’ but also emphasized that ‘sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological [sic!] possible and to which all can reasonably aspire’ (p. 55). There is also a lack of consensus concerning the conceptualization of social sustainability, for instance with regard to the narrowness or broadness of its scope (e.g., Littig & Grießler 2005).
the (fossil-fuelled) car – and if these changes cause people to attain a lower
degree of preference fulfilment – there will no doubt arise difficulties associ-
ated with attempts to induce people to act in disagreement with their wishes
and renounce well-established lifestyle patterns such as car-based mobility.
Also, to further complicate matters, even those who want to switch to more
sustainable levels and forms of mobility may find it difficult to do so given,
for instance, the characteristics of spatial structural conditions which may
act as constraints in this respect, since they are to a substantial extent de-
dsigned for – and therefore ‘require’ – people to travel by car. From the point
of view of ecologically sustainable development, the problems associated
with widespread car use are largely related not to travel per se but to the
associated greenhouse gas emissions, since the dominating fuel sources are
currently fossil-based. However, the problematic aspects of the contempo-
rary patterns of mobility also entail, for instance, the emission of particles
and other health-related issues such as the risks associated with low levels of
physical activity among those who rely on motorized modes of travel.

While extensive mobility comes with substantial welfare and accessibility
advantages, it clearly also entails certain disadvantages and negative extern-
alities. Soft measures, e.g., attempting to modify attitudes, preferences and
social norms in a more sustainable direction, for instance in terms of reduc-
ing travel distances and increasing the attractiveness of the local (proximate)
amenity supply structure, could potentially contribute to a shift in the bal-
cane between the two dimensions of accessibility from the current emphasis
on the mobility dimension towards a more pronounced emphasis on the
proximity dimension. As argued by Banister (2008, p. 76), ‘public acceptabil-
ity is core to successful implementation of radical change’, which is also a
reason why it may be necessary that those who are affected by, e.g., policy
changes geared towards behavioural change in the transportation area are
involved in the process. Plausibly, an increased reliance on accessibility-by-
proximity may also, at least in a theoretical sense, improve the prerequisites
for the upholding and development of a local supply structure in places
where this is currently a challenging task. However, attitude change is most
likely a slow and difficult process, and is hardly as efficient as other, more
‘stick’ – (as opposed to ‘carrot’) – oriented policy styles. For instance, eco-
nomic incentives like increased fuel prices (e.g., by means of ‘carbon taxes’)
would probably be a more efficient way to induce people to change their
priorities and make their accessibility less mobility-oriented. Yet, this would
also lead to adverse consequences on the individual and household levels,
not least in areas where accessibility-by-mobility is not really a matter of
choice but is rather the only realistic option given the characteristics of the
spatial amenity supply structure, and as mentioned with regard to the im-
portant issue of freedom of choice.
6.2. Decreased proximity to important amenities; increased proximity to unimportant amenities

Proximity to social relations, including family members, is regarded as very important. One of the findings in the thesis was that social relations are among few amenities where there exists a ‘proximity deficit’. In addition, these social amenities are among those few amenities where the observed changes in locational accessibility between 1995 and 2005 had resulted in increased average distances. This may be seen as a second facet of the accessibility paradox; i.e., that proximity has increased to many of the things that are seen as relatively unimportant while it has simultaneously decreased to some of the things considered most important.

As the geography of family relations changes towards increasing distances – thus further emphasizing the proximity deficit – the prerequisites for social interaction within families and not least across generations may change (e.g., Lawton et al. 1994). For instance, it may become more difficult to uphold close relations and turn to family for, e.g., support in everyday life. Processes of changing population distribution may affect, for instance, distances between elderly parents and adult children. These distances tend to be on rather different levels in the metropolitan areas compared to rural areas, largely as a result of previous events (or the lack of such events) in people’s migration biographies, particularly events related to urbanization (Malmberg & Pettersson 2007). While the child generation who grew up in rural areas has moved to the cities the parent generation has remained in the rural areas of origin, whereas it is more likely that both parents and children remain in the same place when the children have grown up in urban areas. Also, on a more general level, ongoing processes of population redistribution may also result in further accentuation of the demographic differences between places which attract population and those that migrants leave behind, given the agewise segmentation of migration which is more common among the relatively young than among the older age groups (e.g., Lundholm 2007a). However, from a longer time perspective, the demographic differences between rural and urban areas are likely to diminish or disappear when urbanization results in a concentration in cities of the older generations as well as the younger ones. By the same token, it is possible that the proximity deficit regarding family relations may to some extent be a ‘temporary’ feature and a result of current (and previous) population distribution and migration patterns.

Yet, flows of rural-urban migration, for instance, may eventually be partially reversed through flows of return migration consisting of previous rural-urban migrants who may want to move back to their rural places of origin upon retirement, when the residential location choice becomes less constrained by, e.g., the need for accessibility to employment (Lundholm 2010). While return migration is often understood as incorporating a strong ele-
ment of place attachment, a more low-key way of maintaining contacts with previous places of residence and the people ‘left behind’ there – and thus perhaps a means of ameliorating social proximity deficits – may be through having a second home in the area (Müller & Marjavaara 2011).

6.3. Nuancing the discourse of deteriorating accessibility

Over time (between 1995 and 2005) – and with the definitions and methods of measurement used in the thesis – there has been an average increase in proximity to most amenities, more specifically those in the service, leisure and education categories. These findings provide a rather stark contrast to the prevailing discourse and debate on the development of accessibility, particularly with regard to sparsely populated rural areas but also substantially concerning intra-urban structure. This discourse has a clear emphasis on deterioration of accessibility in the sense that the local (proximate) supply structure – especially regarding service amenities – is gradually being dismantled and/or centralized and that residents therefore must increasingly resort to mobility to gain access to amenities.

Thus, a third facet of the accessibility paradox lies in the contrast between the general discourse on the development of locational accessibility and the actual conditions which emerge in empirical observations. When juxtaposing the abovementioned discourse with the observed changes over time reported in the thesis, the differences may appear somewhat puzzling. There is, perhaps, a need to revisit and add some nuances and complementary perspectives to the discourse. While there are unquestionably vast differences in the accessibility conditions in different geographies, this is chiefly an issue of stable and persistent differences rather than one of a negative development over time. In a cross-section at some point in time, the differences in locational accessibility between urban and rural areas are enormous. These differences are clearly much more dramatic than the comparatively minor differences in this respect over time in the same locations. Thus, the main way individuals’ accessibility conditions may change is through migration within the urban hierarchy rather than through changes within living environments. Also, the rural ‘accessibility problem’ is more a matter of persistent differences between the sparsely and the densely populated areas than of dramatic deterioration over time; two very different perspectives.

Far from being the dominant trend, a change over time characterized by deteriorated accessibility to, for instance, service amenities is a marginal phenomenon and hardly even representative of rural areas in general. In fact, the general trend towards improved locational accessibility to most amenities – i.e., shorter distances to the nearest option and a larger supply to choose from – was found in areas with population density size ranging from
very sparse to very dense. Hence, the accessibility increase was not merely an urban phenomenon. The areas where the locational accessibility conditions did in fact develop negatively – and which were the exception rather than the rule – were not even found primarily in sparsely populated rural areas but rather in dense urban areas. Thus, there was no systematic association between low population density and decreased accessibility.

On average, locational accessibility to many amenities has not only increased over time, but the changes are also – at least concerning service amenities – largely due to a redistribution of the amenities, i.e., of ‘things’ moving closer to where people live rather than the other way around. Thus, contrary to concerns that, e.g., urban trends towards a concentration of functions at external locations may cause an increase in distances to services, a restructuring within the service sector has led to the opposite effect. Moreover, since the amenity destinations actually chosen by individuals are often not those located nearest to their homes, it follows that the increasing travel distances are largely an outcome of individual choice and not of the coercive effects of an unsatisfactory spatial structure. One possible partial explanation regarding the role of service restructuring in the decrease in average potential distances is that locational patterns of amenity supply have developed in the same way as previous patterns of suburbanization of residential land use. Development on the urban fringe has typically been dominated by residential functions, but in many cases these have also increasingly come to be accompanied by other functions. Thus, it is possible that the distances to amenities – which would most likely have increased in the initial phases of suburbanization since, e.g., service amenities and workplaces remained concentrated in central urban areas while homes became dispersed on the periphery – may have subsequently decreased because the amenities have also gradually altered their localization patterns towards a stronger emphasis on peripheral areas.

Much of the abovementioned discourse appears to adhere to a view of accessibility in which accessibility-by-proximity is considered or assumed to be a somehow ‘superior’ form of accessibility while accessibility-by-mobility is seen as a less desirable option. Following such a view, distance-bridging accessibility is something one resorts to when proximate options are unavailable. This interpretation is something one resorts to when proximate options are unavailable. This interpretation is a rather distinct contrast to the findings of the thesis that, generally speaking, people travel increasingly far to reach different amenities, and do so mostly of their own accord and not so much because the spatial supply structure does not offer nearby alternatives. However, one possibility is that mobility is perhaps only perceived as an attractive means of gaining access provided that there are also alternatives based on proximity; i.e., that the mobility is not imposed. Following such an interpretation, when either of the two dimensions of accessibility is unavailable, the one that remains may perhaps lose some of its appeal or ‘charm’ and
instead be perceived as a reminder of the ways accessibility is constrained. Thus, freedom of choice appears to be an important constituent of the relationship between proximity and mobility as different ways of achieving accessibility. While mobility is often interpreted as an expression of freedom, this plausibly presupposes that it occurs as an outcome of choice and is by no means ‘coerced’ as a result of external conditions such as the lack of proximate options. After all, it should not be forgotten that accessibility is not always a matter of choice, and for some people and groups it can be severely constrained.

The discrepancy between the observed general increase in proximity to many amenities on the one hand and the abovementioned general discourse on accessibility on the other may be due to various reasons. Part of the explanation can be sought in the scope and focus of the discussion. The discourse on a negative development of accessibility largely emphasizes what are effectively the anomalies: the places where the development diverges from the general trend of increased proximity. This also implies that much of the debate focuses on developments that affect only a very small fraction of the total Swedish population. It could also be argued that the weight the development in these living environments is given in the discourse is somewhat disproportionate. The overall picture, which conveys ‘good news’ in terms of a general trend towards enhanced locational accessibility for the vast majority and for most amenities, should also be highlighted. Nevertheless, the focus on accessibility-deprived areas and groups is obviously highly relevant and should by no means be ignored. In a certain respect, the fact that the number of people affected is very small is really quite unimportant. The ‘accessibility problem’ is a substantial issue for those concerned, and may severely affect their everyday life prerequisites. Although the living conditions of these groups – who consist of a small minority to begin with, which is also shrinking as a result of depopulation in many rural areas – may ‘disappear’ in a nationally encompassing study such as the present thesis, their experiences and the potential problems they may face are obviously just as important as those of the majority.

Moreover, further explanations for the discrepancy between the observed general increase in proximity to many amenities on the one hand and the abovementioned general discourse on accessibility on the other may include various reasons, not least matters related to methodology. For instance, the chosen time frame may be a key aspect. The absence of a negative trend with regard to accessibility to, e.g., services in the empirical research of the thesis may be due to the bulk of the negative development already having occurred before 1995, which is the starting year for the comparison over time in the thesis. Also, a comparison of the methodologies of the thesis compared to other research – the findings of which may support the abovementioned discourse – would most likely reveal certain differences, for instance con-
cerning the operationalization and identification of amenities. Such differences may lie behind variations when it comes to the empirical findings of different studies, as is the case in any research field. In addition, it is possible that the accessibility to amenities other than those included as indicators in the thesis may display a different direction of development.

The issue of the differences between accessibility 'haves' and 'have-nots' may also be an explanation behind the dominance of the negative focus of the discourse as opposed to the empirical development, which is largely positive. The findings of the thesis do confirm the notion that the gap between these groups, in terms of locational accessibility to amenities, has indeed widened over time. However, this is not so much due to declining accessibility among the 'have-nots' but is rather due to the increasing proximity among the 'haves'. If proximity increases only benefit the 'haves', the relative difference between them and the 'have-nots' increases even without a concomitant decrease in proximity among the latter group. This may be seen as an example of a 'Pareto' improvement whereby the situation improves for some without deteriorating for anyone else, at least not in absolute terms. Thus, the apparent confusion and discrepancy between discourse and empirical conditions may also be an issue of a blending of absolute and relative measures or points of view. Another reason why the discourse on accessibility emphasizes problematic conditions is possibly a confusion of the vast cross-sectional differences on the one hand and the comparatively very marginal differences over time on the other, as discussed above.

6.4. The continued – but limited – importance of spatial structure for travel behaviour
Travel distances for service trips were found to be strongly related to the spatial supply structure concerning service amenities, as may be expected given conventional assumptions about the relationship between spatial structure on the one hand and travel behaviour on the other. However, the relationships are somewhat complex in the sense that there are divergent associations which exist simultaneously and depend on spatial scale. While the presence of a large local supply restrains trip length, a large regional supply is associated with longer trip length. In addition, these relationships were stable over time (1995–2005/06), despite the concomitant development towards widened geographical reach, increasing mobility, a ‘regionalization’ of daily activity spaces and the increasing prevalence of virtual (i.e., ICT-based) alternatives.

Nevertheless, although spatial supply structure explains a substantial share of the variation in trip length, most of the variation nevertheless remains unexplained by these factors alone, indicating the existence of other factors with important roles in destination choice. Rather than adding an-
other facet to the accessibility paradox, these findings confirm and support the abovementioned first facet of the paradox in terms of the difference between potential and actual (individually chosen) distances. Having local access to amenities does not necessarily mean these amenities are those which are actually utilized. Although spatial supply structure – for instance, in terms of local access to amenities – clearly matters and is a key part of the explanation for trip distance, it does not even come close to being the sole explanatory factor. Many other factors are likely to make up the remainder of the explanation, including issues of individual preferences and freedom of choice (discussed above) but also more tangible things like mobility strategies, e.g. multi-purpose trips and trip-chains, which were not accounted for in these analyses.

The conclusion that spatial structure – locally as well as regionally – continues to be a rather strong determinant of trip distance is also a pertinent issue in the discussion of the impact both of people’s ability for geographical mobility and of ICT on the development of travel patterns. More specifically, despite the immense changes in the prerequisites for both ‘corporeal’ and virtual travel (Urry 2002) since around the mid-20th century and not least during the past few decades, it is clear that the local level and the services accessible there remain a strong influential factor for destination choice in everyday life. In other words, the regionalization of daily mobility and the emergence of ICT-based alternative ways of gaining access have not eroded the importance of either physical accessibility in general terms or accessibility on the local scale specifically. Although the ‘limits’ of the friction of distance have no doubt been pushed outward while new ways of bridging distances have simultaneously emerged through technological development and diffusion, these limits still exert a substantial influence on spatial behaviour. At least when it comes to access to service amenities, distance is by no means ‘dead’ (Cairncross 1997).

6.5. Further research
The conclusions of the thesis, which together may be interpreted as different facets of an ‘accessibility paradox’ as discussed above, point to research fields where more work is needed to uncover in more detail the makings and workings of the paradox. More specifically, it would be useful to scrutinize the paradox to determine the extent to which it is indeed paradoxical, and the extent to which it may at least partially be explained by, for instance, the inclusion of factors or the use of methods other than those on which this thesis is based. For instance, it would be possible to determine how much of the observed difference between potential and chosen distances would remain in a sophisticated time-geographical analysis. Such an analysis would allow a consideration of the effects of, for instance, individual space-time
constraints, mobility strategies such as trip-chaining and multiple trip origins, as well as the benefits – with regard to, e.g., the diversity and size of the supply – of visiting amenity concentrations (as opposed to single amenities).

The divergent role of locational access in trip length is one of the issues which merits further research, for instance with regard to the point at which the increasing size of the available amenity supply causes the association with trip distance to ‘switch’ from having a restraining effect to having an augmenting effect. Such a study may answer questions concerning the thresholds at which additional travel becomes worthwhile because it enables access to a larger amenity supply. Furthermore, the difference between potential and actual accessibility and travel patterns also merits further exploration. For instance, it would be possible to employ precise measures of accessibility by way of combining register data with GIS road network data to produce an even more detailed and accurate picture of accessibility conditions. Importantly, this is a way of adding more nuance and precision to the interpretation of the accessibility paradox.

A qualitative approach to the issues at the centre of attention in the thesis may provide a level of depth and detail not possible in quantitative research, and would also add to the interpretation of the quantitative empirical studies in the thesis. For instance, an in-depth interview study would provide the opportunity for a fuller understanding of the accessibility paradox, including matters of destination choice and the role of distance in these decisions, and how people value and manage proximity and mobility as different dimensions of accessibility. Concerning destination choice, conducting interviews may be a way to shed more light upon the specific qualities of potential destinations (whether single amenities or concentrations of amenities) perceived as attractive, or for that matter repelling, and which may therefore trigger people to travel beyond the nearest or local options.

The perspective may also be broadened to focus on households and families, and thus see individuals as part of their everyday life social context. In the context of the family, it would be valuable to dig more deeply into the ways accessibility considerations are integrated into residential choice processes, e.g., how different and possibly competing qualities and priorities are traded off against each other. Another question is how changes in daily activity schedules are managed within households, how people’s accessibility-related preferences develop and change, and how people alter their behaviour both in response to changes in the spatial supply structure and as a result of changes in the accessibility prerequisites of individuals and households. These issues are all related to how people manage and negotiate the ‘logistics’ of everyday life, and can be explored by way of either qualitative and quantitative methodological approaches. In this context, gender aspects are clearly of central concern, for instance in terms of whose accessibility needs are given priority in the joint accessibility strategies of households, for
example with regard to employment choices in dual-earner households. Also, reconstituted families provide an interesting case because of their potentially complex relationships with other households which are likely to add to further dimensions and constraints to accessibility-related prerequisites and strategies.

It would also be valuable to study more in-depth how people’s accessibility strategies, e.g., with regard to the relative importance of proximity and mobility, vary both across different geographies with varying characteristics and prerequisites – for instance in regions where cross-border accessibility is a plausible option – and of course depending on individual and household characteristics. In addition, the results of the thesis, the presentation of which has largely focused on general patterns, could be broken down in an analysis of the differentiation of locational accessibility and accessibility changes across not only different geographies – for instance, in towns occupying different positions in the urban hierarchy – but also different groups with regard to, e.g., demographic and socioeconomic characteristics which may differentiate accessibility within places.

Related to this is the – undoubtedly complex – question of how the physical development of society can be planned in such a way as to enhance the accessibility of vulnerable groups such as those whose mobility is constrained and those living in areas with little or no local access. The issue of how current accessibility-related problems may be ameliorated for these groups and in these geographies is massive in scope, and merits further attention in terms of both research and policy initiatives. If the political ambition is to uphold a settlement structure like the present Swedish one, there is a need to find accessibility strategies or solutions in geographical contexts where the local accessibility conditions are poor. Thus, the accessibility issue is closely intertwined with the development of sustainable patterns of travel behaviour. The role of the car is naturally a pertinent issue in this, since it is usually the only feasible means of transportation in peripheral areas. However, car dependency is not just an issue in rural areas. Given the need to coordinate complex patterns of daily activities and the car-oriented spatial structure of many cities – which is likely to remain for a long time to come – driving is also a necessity for many urbanites (and not least suburbanites).

In sum, there are countless research areas which are all related to the importance of accessibility and how this overriding issue ties into our everyday lives in different ways, on the individual micro level as well as the societal macro level – in terms of daily activities, individual life quality, social welfare, and the planning of the ‘good’ society.
7. Sammanfattning
(summary in Swedish)

Denna avhandling, Tillgänglighetsparadoxen – geografisk närhet, avstånd och mobilitet i vardagsperspektiv, handlar om människors tillgänglighet till olika aktiviteter och funktioner i vardagen. Tillgänglighet är av central betydelse i människors vardagsliv som en grundförutsättning för genomförande av olika aktiviteter, för resursutnyttjande och som en viktig delkomponent inom livskvalitet och välfärd. Därmed är tillgänglighet också en förutsättning för samhällets funktion i vidare bemärkelse, inte minst som en basal målsättning inom samhällsplaneringen.


Avhandlingens syfte är att utforska betydelsen för individuell tillgänglighet av å ena sidan närhet och å andra sidan rörlighet, samt förhållandet dem emellan. Detta sker i form av tre forskningsartiklar med tonvikt på närhet respektive rörlighet utifrån olika perspektiv och med utgångspunkt i olika empiriska material, som tillsammans möjliggör en mångfacetterad bild av tillgänglighetens betydelse och utveckling över tid. I artiklarna studeras olika aspekter på tillgänglighet – människors skilda behov och önskemål av tillgänglighet, vilka faktiska möjligheter som finns inom ramen för den rumsliga struktur i vilken de befinner sig, hur dessa förutsättningar för tillgänglighet i vardagen utvecklas över tid samt hur de samspelar med daglig rörlighet. Eftersom bostadens läge är en central utgångspunkt för vardagens aktiviteter och vilka andra platser som är näbara, används bostadens lokalisering som geografisk utgångspunkt i samtliga tre artiklar.

Den första artikeln har som syfte dels att analysera människors preferenser för närhet till olika destinationer och hur detta överensstämmer med

31 Destinationsbegreppet används eftersom det saknas en vedertagen svensk motsvarighet till det engelska ’amenities’ i den bemärkelse som detta begrepp används i avhandlingen.
deras faktiska boendeförhållanden, dels att identifiera faktorer som samspe-
lar med människors tillfredsställelse eller nöjdhet med sitt boende. Studio
baseras på en enkätundersökning genomförd år 2008 bland individer i åld-
rarna 20—64, bosatta i Sverige. Resultaten visar att närhet upplevs som vik-
tigast till att ena sidan praktiskt betonade destinationer, bl.a. vardagens hu-
vudsakliga aktiviteter (exempelvis det egna arbetet och barnens skola) och å
andra sidan sociala relationer (exempelvis utflyttade vuxna barn och vän-
ner). Närhetspreferenserna varierar i viss mån mellan kvinnor och män,
mellan människor i olika åldersgrupper samt inte minst mellan människor i
olika typer av boendemiljöer (stadsmiljöer respektive mer gles befolkade
miljöer). Trots att det således finns betydelsefulla variationer som speglar
skillnader i tillgänglighetsbehov och -preferenser hos olika individer och
grupper är den sammantagna bilden av människors prioriteringar trots allt
relativt samstämmig. Överlag stämmer också de faktiska boendeförhållan-
dena väl in med närhetspreferenserna, d.v.s. närlheten är relativt stor till de
flesta av de destinationer för vilka närlheten anses vara viktig. Det finns dock
ett väsentligt undantag, nämligen närlheten till sociala relationer, vilken är
föremål för ett närhetsunderskott i det avseendet att människors preferenser
inte har sin motsvarighet i de faktiska förhållandena. Det är också till dessa
’sociala destinationer’ som de genomsnittliga avstånden är som längst. I
vidare analyser visade sig den nöjdhet som enkätRespondenterna gav uttryck
för när det gäller närlheten till de olika destinationerna också ha betydelse för
deras övergripande nöjdhet, totalt sett, med sin bostads läge (lokaliserings-
het) utifrån deras individuella tillgänglighetsbehov och -önskemål. Andra fakto-
rer som samspele med boendenöjdheten var också typen av boendemiljö,
bostadens upplåtelseform samt huruvida respondenterna hade övervägt att
flytta i syfte att uppnå ökad närhet till vissa destinationer.

Den andra artikeln handlar om de faktiska tillgänglighetsförhållandena
för hela Sveriges befolkning samt hur dessa har förändrats. Syftet är att ana-
lysera förändringar över tid i individers tillgänglighet till de olika destinatio-
nerna, både med avseende på avstånd till det närmaste alternativet och des-

tinationsutbudets storlek och diversitet. Analysen baseras på officiella regis-

teruppgifter hämtade ur en databas omfattande hela befolkningen, samt

information från de nationella resvaneundersökningarna för åren 1995 och
2005. Resultaten visar att närheten ökade till de flesta av de studerade desti-

nationerna, både servicefunktioner, fritidsaktiviteter och utbildningsmöjlig-
heter. De enda typerna av destinationer där avstånden blev längre under
perioden var individernas egna arbetsplatser samt familj och släkt. Tillgäng-
lighetsförändringarna kan bero på två huvudsakliga processer: aningen en
geografisk omfördelning av destinationsutbudet, eller en geografisk omför-
delning av befolkningens bosättningsmönster. En analys av orsakerna till
tillgänglighetsförändringar inom servicesektorn visar att den ökade närheten
till servicedestinationer främst beror på omstrukturening av dessa destina-
tioners lokaliseringsmönster, och endast till en mindre del på att befolkningen har 'flyttat närmare' serviceutbudet. Trots att utvecklingen av tillgänglighetsförhållanden i Sverige som nämnts har gått mot en ökad närhet till de flesta typerna av destinationer har det samtidigt skett en parallell ökning av människors genomsnittliga faktiska resavstånd. De faktiska resavstånden är också generellt sett betydligt längre än de potentiella avstånden, d.v.s. avstånden till de närmaste alternativen. Detta tyder på att de destinationer som människor faktiskt väljer att besöka inte nödvändigtvis är de som ligger närmast bostaden rent geografiskt. Avståndet tycks således vara långt ifrån den enda eller ens den viktigaste faktorn i individers val av destinationer i vardagslivet. En trolig förklaring är en ökande selektivitet som tar sig uttryck i att människor i allt större utsträckning väljer alternativ som i hög grad motsvarar deras specifika individuella preferenser snarare än att 'nöja sig' med ett alternativ som uppfattas som mindre attraktivt. För att nå de destinationer som föredras kan det då krävas att man reser längre än till det mest närbelägna alternativen.

Den tredje artikeln är en studie av sambandet mellan å ena sidan den fysiska rumsliga utbudsstrukturer och å andra sidan människors beteende med avseende på resande. Mer specifikt är syftet att analysera förhållandet mellan resavstånd till servicedestinationer och det lokala och regionala serviceutbudets storlek. En viktig utgångspunkt är ett vanligt förekommande antagande om att tillgång till ett stort lokalt utbud möjliggör för människor att uppfylla sina tillgänglighetsbehov lokalt, d.v.s. i närheten av sin bostad, och att behovet av tillgänglighet till destinationer genom rörlighet över större geografiska avstånd därmed är relativt litet. Samtidigt går utvecklingen av de faktiska resmönstren i riktning mot en allt högre grad av regionalisering av aktiviteter, d.v.s. att man ofta reser 'bortanför' den lokala nivån för att genomföra olika typer av vardagsaktiviteter. Studien baseras på en unik kombination av data: officiella registeruppgifter hämtade ur en databas omfattande hela befolkningen har integrerats med data från de nationella resvaneundersökningarna. Detta möjliggör en analys av den rumsliga strukturers betydelse, på olika geografiska nivåer, för hur långt människor reser. Resultaten visar att det finns en tydlig koppling mellan rumslig utbudsstruktur och människors resande. Sambandet skiljer sig dock åt beroende på den geografiska analysnivån. Lokalt (inom en respektive fem km från bostaden) har ett stort utbud av servicedestinationer en dämpande effekt på reslängderna. Däremot har ett stort utbud inom en regional räckvidd (50 km) den motsatta effekten; nämligen att spå på reslängderna. Därmed kan resultaten sägas stödja såväl antagandet om att tillgång till ett lokalt utbud möjliggör ett avståndsmässigt mer begränsat resande, som understryka trenden mot regionalisering av människors aktivitetsmönster. Analyserna visar även att trots att den rumsliga strukturen och utbudets omfattning har avsevärd betydelse för människors resande för serviceärenden i vardagen, återstår en
stor del av resandet att förklara och beror således på andra faktorer, exempelvis betydelsen av att eftersträva uppfyllandet av individuella preferenser.

Då resultaten från de tre empiriska artiklarna ställs mot varandra är det möjligt att urskilja konturerna av en mångfacetterad tillgänglighetsparadox. **En första sida** av tillgänglighetsparadoxen handlar om skillnaden mellan å ena sidan uttryckta preferenser och å andra sidan faktiskt beteende. Trots att närhet uppfattas som viktig för många aktiviteter och ärenden, avspeglar sig dessa preferenser inte nödvändigtvis i människors faktiska destinationsval, där det istället är vanligt att välja mer avlägsna alternativ än de som råkar vara de mest närbelägna. Dessutom ökar de genomsnittliga faktiska resavstånden över tid, trots att det samtidigt skett en ökning i närheten till de flesta typer av destinationer. Därmed kan utvecklingen över tid tolkas som att tillgänglighetsbegreppets rörlighetsdimension fått en allt starkare ställning inom människors tillgänglighetsrelaterade beteenden och strategier jämfört med närhetsdimensionen. **Ytterligare en slutsats** som stärker dessa resonemang, är den relativt begränsade betydelsen av den rumsliga utbudstrukturerna. Även om det lokala respektive regionala serviceutbudets storlek viserligen spelar stor roll för reslängd, förklarar det trots det enbart en del av denna, vilket tyder på att det finns andra faktorer som också är av central betydelse. **En andra sida** av tillgänglighetsparadoxen är att närhetens utveckling över tid har medfört en ökad närhet till många av de destinationer till vilka närheten anses vara av mindre betydelse, samtidigt som närheten har minskat till många av de destinationer till vilka den upplevs vara av största betydelse. Detta kan tolkas som att det har skett en förstärkning av närhetsunderskottet, vilket naturligtvis kan ses som problematiskt ur ett socialt perspektiv. **En tredje sida** av tillgänglighetsparadoxen är diskrepansen mellan å ena sidan den generella debatt som förs om tillgänglighetens utveckling över tid, där bristfälliga förhållanden och negativ utveckling ofta tenderar att betonas, och å andra sidan de faktiska förhållanden som framkommer i avhandlingens empiriska studier. Därmed finns det anledning att nyansera den dominerande och problemorienterade diskursen om tillgänglighet, dock utan att förringa de faktiska tillgänglighetsproblem som är en del av vardagen för vissa individer eller grupper, och på vissa platser.

Sammantaget speglar avhandlingens resultat betydelsen av att kunna välja destinationer i enlighet med individuella preferenser och behov. Denna aspekt av tillgänglighet tycks bli allt viktigare, något som också gör avtryck i observerade resmönster i vilka en, inom forskningen ofta förmodad, strävan hos individer att försöka minimera sitt resande inte nödvändigtvis har högsta prioritet. Tillgänglighet tycks handla om att nå de destinationer som bäst överensstämmer med ens egna preferenser, inte de destinationer som hänsevis råkar ligga närmast den egna bostaden. Med avseende på tillgänglighetsbegreppets rumsliga dimensioner har tillgängligheten utvecklats till att i ökande utsträckning uppnås genom rörlighet snarare än genom närhet.
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